WORK PLAN

SUPPLEMENTAL REMEDIAL INVESTIGATION WORK PLAN
DUWAMISH SHIPYARD, INC.
SEATTLE, WASHINGTON

Prepared for

Washington State Department of Ecology

On Behalf Of

Duwamish Shipyard, Inc.

5628 West Marginal Way SW

Seattle, Washington 98106

Prepared By

Anchor QEA, LLC

720 Olive Way, Suite 1900

Seattle, Washington 98101

March 2013

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LIST OF ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
ACOE	U.S. Army Corps of Engineers
AML	Alaska Marine Lines
AO	Agreed Order
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylenes
cm	centimeter
cm/s	centimeters per second
COCs	chemicals of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSL	Cleanup Screening Levels
CSM	conceptual site model
CSO	Combined Sewer Outfalls
cy	cubic yards
cy/s	cubic yards per second
DGPS	Differential Global Positioning System
DO	Dissolved oxygen
DOC	dissolved organic carbon
DMMP	Dredged Material Management Program
DSI	Duwamish Shipyard, Inc.
DQO	data quality objective
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERA	Ecological Risk Assessment
Glacier	Glacier Northwest
GS	Grain size
HASP	Health and Safety Plan
HCI	Hart Crowser, Inc.
HPAHs	high molecular weight PAHs

LAET	lowest apparent effects threshold
LDW	Lower Duwamish Waterway
LDWG	LDW Group
LOD	limit of detection
LOQ	limit of quantitation
LPAHs	low molecular weight PAHs
MC	Moisture content
MDL	method detection limits
mg/kg	milligrams per kilogram
mg/L	milligram per liter
MLLW	mean lower low water
MTCA	Model Toxics Control Act
ng/kg	nanogram per kilogram
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
ORP	Oxidation reduction potential
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCP	Pentachlorophenol
PID	photo-ionization detector
Port	Port of Seattle
PQL	practical quantitation limit
ppt	Parts per trillion
property	5658 West Marginal Way SW
PSA	Puget Soundkeeper Alliance
QAPP	Quality Assurance Project Plan
RCW	Revised Code of Washington
RI/FS	Remedial Investigation and Feasibility Study
RM	River Miles
SAP	Sampling and Analysis Plan
SEIDG	Summary of Existing Information and Data Gap
Site	5658 West Marginal Way SW
SMS	Sediment Management Standards

SQS	Sediment Quality Standards
SVOCs	semivolatile organic compounds
TBT	Tributyltin
TDS	Total dissolved solids
TEQ	Toxic Equivalency Quotient
TOC	total organic carbon
TPH	total petroleum hydrocarbon
TPH-Dx	TPH diesel range
TPH-G	TPH gasoline range
TPH-O	TPH oil range
TS	total solids
TSS	total suspended solids
TVS	total volatile solids
USGS	U.S. Geological Survey
UST	underground storage tank
VOCs	volatile organic compounds
WAC	Washington Administrative Code
Windward	Windward Environmental, L.L.C.

1 INTRODUCTION

This revised *Supplemental Remedial Investigation Work Plan* (Supplemental RI Work Plan) has been prepared by Anchor QEA, LLC (Anchor QEA) to present the scope of work for completion of a supplemental Remedial Investigation (RI) effort at the Duwamish Shipyard, Inc. (DSI) property located at 5658 West Marginal Way SW (DSI property) and the adjacent aquatic areas (collectively, Site) in Seattle, Washington (Figure 1).

In March 2012, Anchor QEA submitted a Draft Supplemental RI Work Plan to The Washington State Department of Ecology (Ecology). On December 5, 2012, Ecology issued a comment letter regarding the Draft Supplemental RI Work Plan. Ecology's comments emphasized the need for DSI to complete significant additional soil, groundwater, stormwater and sediment investigation (i.e., data collection) in order to develop a dataset sufficient to support a RI/Feasibility Study (FS) report for the Site (Appendix C). Ecology also stated in the December 5, 2012 comment letter that if DSI failed to prepare an "approvable" work plan incorporating the additional data collection requirements, the work plan would be prepared by a third-party contractor working on Ecology's behalf .

Subsequently, in December 2012, DSI invoked dispute resolution to discuss with Ecology its directive to collect significant additional data in upland soil and groundwater, stormwater, and sediments as part of the RI/FS process. DSI and Ecology met in January and February 2013 for technical discussions. Those meetings and subsequent follow-up conferences reinforced Ecology's directive that DSI complete additional investigation work in order for the RI/FS process to move forward.

Consequently, this document has been updated to reflect the additional data collection requirements as directed by Ecology in December 2012 and in January and February 2013. A discussion of the remaining data gaps, including proposed supplemental upland and sediment sampling to address these data gaps, is included in Section 5. A response to Ecology's comments is included in Appendix C.

The objectives of the revised Supplemental RI Work Plan are to:

- Present an update to the Site background description provided in the Agreed Order (AO) RI/Feasibility Study (FS) Work Plan (RI/FS Work Plan; Anchor QEA 2010).
- Present an update to the preliminary Conceptual Site Model (CSM) that addresses all upland and sediment data collected at the Site to date and identifies potential sources of contamination, contamination migration pathways, and receptors.
- Identify remaining data gaps based on the update to the Preliminary CSM and incorporate additional data collection work as required by Ecology's December 5, 2012 comment letter.
- Propose additional investigations to address remaining data gaps, as required by Ecology's December 5, 2012 comment letter and compile a dataset that is acceptable to Ecology for development of the draft RI/FS report.

This revised Supplemental RI Work Plan is supported by a Sampling and Analysis Plan (SAP) (Appendix A), a Quality Assurance Project Plan (QAPP) (Appendix B) and a Health and Safety Plan (HASP) (Anchor QEA 2013 [in preparation]).

1.1 Work Plan Purpose

This revised Supplemental RI Work Plan has been prepared to satisfy the requirements of AO No. DE-6735 and satisfies the requirements of the Model Toxics Control Act (MTCA), Revised Code of Washington (RCW) 70.105D, which is administered by Ecology pursuant to Washington Administrative Code (WAC) 173-340. In addition, the Lower Duwamish Waterway (LDW) was added to the National Priorities List (NPL) and is undergoing an RI/FS with oversight by the U.S. Environmental Protection Agency (EPA). Portions of the Site are located within the study area of the LDW, and upland areas are included within the Glacier Bay Source Control Area.

The purpose of this document is to provide an update to the environmental conditions and preliminary conceptual site model presented in the RI/FS Work Plan (Anchor QEA 2010), based on consideration of additional upland data collected in 2009 and surface and subsurface sediment data collected in 2011. Based on an evaluation of all data collected at the Site to date and the additional data collection directives provided by Ecology in the December 5, 2012 comment letter, this revised Supplemental RI Work Plan also identifies remaining data gaps and presents an approach for the collection of additional data required as part of the Supplemental RI effort in order to generate a data set acceptable to Ecology for development of the draft RI/FS Report.

1.2 Document Organization

This Supplemental RI Work Plan is organized into the following sections:

- Section 2 – Site Background Update
- Section 3 – Environmental Quality Update
- Section 4 – Updated Preliminary Conceptual Site Model
- Section 5 – Data Gaps Assessment
- Section 6 – Supplemental Remedial Investigation Scope of Work
- Section 7 – Next Steps and Schedule
- Section 8 - References

2 SITE BACKGROUND UPDATE

2.1 Property Description

The DSI property includes approximately five acres of land owned by DSI located on the west bank of the LDW. Historical shipyard operational features and property boundaries are shown in Figure 2. Most of the Site consists of upland area, but there are aquatic areas located in the southeast corner of and adjacent to the DSI property.

The berth and waterway areas adjacent to the DSI property are owned by the Port of Seattle (Port) as successor to Commercial Waterway District No. 1. The berth area is 150 feet wide. The waterway is 200 feet wide and has a project depth of -30 feet relative to mean lower low water (MLLW). The U.S. Army Corps of Engineers (ACOE) maintains the waterway channel for navigation in conjunction with the Port. As shown in Figure 2, portions of former shipyard activities (e.g., dry dock operations) extended into the berth area owned by the Port.

The Site is currently being used for container storage and truck access by Alaska Marine Lines (AML). Recent improvements to the shoreline and timber pier at the Site will allow AML to utilize the berth area for barge loading and unloading operations, and these improvements will not obstruct future cleanup of the upland and sediment areas. The Site is bordered to the north by the AML container facility and to the south by the former Glacier NW Seattle Cement Facility (Glacier; now Cal Portland) and Terminal 115. DSI previously leased a graving dock from AML located directly adjacent to the northern DSI/AML property boundary. However, that lease has been terminated, and AML has filled the graving dock with clean fill for upland reuse. West Marginal Way is located immediately west of the Site, and AML owns additional property used for staging across this roadway.

The Site is located in a highly industrialized area zoned for General Industrial (IG1 U/85) use. The eastern boundary abuts the LDW. The LDW was placed on the NPL by EPA in September 2001. The preliminary boundaries of the LDW extend from the Turning Basin downstream to Harbor Island. The Site is located within this initial delineation (approximately between river mile [RM] 1.3 and 1.4). In addition, the Site is listed on

Ecology's Contaminated Sediment Sites List, which was first published in 1996. That list documents sites subject to future investigation and cleanup requirements under MTCA.

2.2 Property Ownership History

Figure 3 provides a summary of the ownership history of the DSI property. DSI purchased the main portions of the DSI property (Parcels B and C) as a tax title purchase from King County in May 1941. Historical aerial photographs (Appendix D) show that the DSI property was vacant in the 1930s prior to its purchase by DSI.

When DSI purchased Parcels B and C, the property to the south was owned by the federal government. After retrofitting an existing lumber plant, the U.S. Army used the property to the south for production of charcoal filters and Whetlerite (a copper-impregnated carbon used in gas mask filters during World Wars I and II).

This adjacent property to the south of the DSI property was then leased by the federal government to Reichhold Chemical, Inc. (Reichhold) between 1945 and 1958 for operation of a chemical manufacturing facility. The Reichhold facility produced pentachlorophenol (PCP), plastic polymers for the automobile industry, various wood-preserving resins, adhesives and glues used in papermaking, and formaldehyde products.

In 1958, Reichhold moved the manufacturing operations to Tacoma, but maintained offices and laboratories at this location until approximately 1961, when Reichhold's lease with the federal government was terminated. This property (located south of the Site) is currently owned by Cal Portland (formerly Glacier).

In 1960, DSI purchased a submerged parcel previously used for log and vessel mooring (Parcels E and F) from Commercial Waterway District #1. That parcel extended south into the Glacier Bay Source Control Area. Four years later, in 1964, DSI exchanged the submerged Glacier Bay parcel (Parcel F) with the Port for land adjacent to DSI's southern boundary (Parcel D). The Port had acquired Parcel D from the federal government that same year. Parcel D contains the location of the former waste treatment tank that was present during Reichhold facility operations, as described in Section 2.4. The Port subsequently leased the former Reichhold property to Kaiser Cement for construction of a cement terminal.

In 1965, DSI purchased the parcel (Parcel A) to the west of DSI's original tract from General Construction Company. This was part of a larger parcel (Parcels A and B) later sold to AML in 1999.

From the 1940s through April 2007, DSI used portions of the waterway berth areas for shipyard operations. No existing leases or other property use agreements are available for these areas.

Since June 2007, the upland portion of the Site has been used for container storage and truck access by AML. Current layout of the Site is shown on Figure 4, and the property is being marketed for sale for industrial use. Likely future uses include container storage and yard operations, equipment storage, or cargo transshipment operations. Future operation as a commercial shipyard is neither planned nor likely to occur.

2.3 Shipyard History

Prior to construction of the DSI facility, the Site consisted of vacant lowland property. King County plant maps and other historical maps show that the DSI property was located along the western shoreline of the Duwamish River prior to waterway development. An aerial photograph from 1936 (Appendix D) shows the conditions of the Site prior to shipyard construction.

DSI formerly engaged in the repair and maintenance of floating vessels and equipment, including tugboats, barges, dredges, fishing vessels, small passenger vessels, and other types of commercial vessels. The marine railway was constructed at the Site in the early 1940s. The majority of the vessels worked on at the shipyard in this period were wooden fishing boats. Boats would be pulled up on the railway and could be sidetracked onto timbers on the shore (as shown on the 1958 oblique aerial photograph in Appendix D). DSI frequently sidetracked boats in the fall, worked on them over the winter, and launched them in the spring. The work consisted mainly of wooden hull repairs and painting. DSI ended the sidetracking process in the late 1950s.

Based on aerial photographs (Appendix D), the graving dock was originally constructed prior to 1946 and was expanded by 1956. DSI used the graving dock under agreements with General Construction, and then later with AML, between 1955 and January 2007. The completed graving dock was 410 feet long and 138 feet wide. Repairs in the graving dock took place below the surface level of the river. Vessels were floated into the graving dock, after which the tide gates were shut and the water was pumped out to create a dry work environment. Pumps were used to continuously keep the concrete floor of the graving dock dry due to leaking from the tide gates. DSI installed a containment system in the 1990s to separate pressure wash water from the water that seeps in through the tide gate.

DSI acquired its first floating, steel dry dock in 1967. This floating dry dock was a small, steel dock that was used until March 2007. It acquired a second, larger wooden dry dock in approximately 1969. After this time, most of the vessel dockings were made on the dry docks. DSI sold the large wooden dry dock in 1990 and replaced it with a 1,000-ton steel dry dock that remained in use until March 2007. Dry dock mooring areas were located within the Port-owned berth areas as shown in Figure 2. The southern dry dock was located within the approximate area of former U.S. Army and Reichhold facility discharges to the LDW via the former 240-foot outfall structure (Appendix E), as described in Section 2. Both dry docks were updated to provide containment for pressure wash wastewater in the 1990s. Wastewater flowed to one end of the dry dock, where it was captured in a collection sump and pumped onshore to a Delta Pollution Control flocculation pretreatment system prior to discharge to the King County sanitary sewer.

During its more recent history, DSI provided services to approximately 60 to 65 vessels per year. The hulls of the vessels being repaired were generally constructed of steel and, infrequently, aluminum or fiberglass. DSI's ship repair services included machine and electrical work, carpentry, steel fabrication, pipe-fitting, sand blasting, pressure washing, and painting.

DSI ceased use of the DSI property for any industrial-related activity in April 2007. The two dry docks have been removed from the DSI property. The upland portion of the property is currently being used by AML for container storage and truck access, with DSI marketing the property for sale for industrial use.

2.3.1 Historical Shipyard Operations and Material Handling by Area

The historical shipyard property and operational features are presented in Figure 2. The historical shipyard operations are discussed as follows by DSI upland and nearshore property areas. This section presents material handling activities and potential historic sources of contamination to upland and aquatic media. A summary of historical shipyard operations and potential sources to environmental media by property area is presented in Table 1, and a layout of historical site operations and upland and over-water building locations since 1941 are shown in Figures 5a through 5d. The results of previous environmental sampling in these upland and aquatic Site areas are discussed in Sections 3 and 4. RI data gaps for these areas are presented in Section 5.

- **Northwest Area:** The historical shipyard facilities in the Northwest Area include the machine shop, storage for spent blasting grit, and a 500-gallon leaded gasoline tank. The machine shop had operations both inside and outside and included small and large parts fabrication, engine work, and pump work. The machine shop building was constructed with a concrete floor. Material use at the machine shop included cutting tool coolant, small parts degreasers, and used oil. Spent blasting grit was stored in a covered shed adjacent to the machine shop. A 500-gallon leaded gasoline underground storage tank (UST) was located between the storage shed and machine shop. The 500-gallon UST was closed in place in 1986.
- **Rail Spur Area:** This area consists of the end of the former Northern Pacific Railway easement rail spur. It is located along the southern property boundary adjacent to the former Glacier/Reichhold/U.S. Army property. The rail spur was used for temporary railcar parking related to the Glacier property. This area also included a wood (joiner) and electrical shop. The wood and electrical shop building was constructed with a concrete floor. DSI used these buildings for vessel interior work such as carpentry and electrical system and component repair and testing. Materials used included wood stains, varnishes, wiring, switches, breakers, and contact cleaners.

- **Central Area:** This area is located in the center of the Site (Parcel C) and is over 200 feet from the shoreline. Historical shipyard uses of the Central Area consisted of vehicle parking, the administrative office building, and underground stormwater line system.
- **2000 UST Removal Area**: This area includes the soils and groundwater in the vicinity of former USTs removed in 2000. A total of four USTs were formerly located in this area: 1) a 3,000-gallon diesel UST; 2) a 1,000-gallon gasoline UST; 3) a 3,000-gallon gasoline UST; and 4) a 3,000-gallon gasoline UST. DSI used the USTs for vehicle and vessel fueling. DSI removed all four USTs in 2000. A focused soil excavation took place at the time of removal, as discussed in Section 3.
- **South Property Area**: The South Property Area consists of areas in the southern portion of the DSI property that borders the former Glacier/Reichhold/U.S. Army property. This area includes buildings used for various storage and paint work. Material handling storage in this area had containment areas for spent blasting grit storage, used oil storage, paint storage, hazardous waste storage, and a solvent still (for paint thinning). Used oil and hazardous waste were transported and disposed offsite with manifest documentation. Small parts and assembly painting took place in the paint booth with a curtain system for containment.
- **Former Shipyard Nearshore Area:** The Former Shipyard Nearshore Area includes the upland areas at the top of the marine railway. This area is bordered on the water side by a bulkhead. It is located within approximately 150 feet of the shoreline. Historical shipyard operations at the Former Shipyard Nearshore Area consisted of early (1940s and 1950s) vessel side-tracking ways, crane and winch activities, blasting grit handling, wastewater treatment, and the steel and pipe shop. Periodic filling of the nearshore area took place in the early shipyard history up to the current bulkhead. Filling material was reported to be soil, broken concrete, scrap steel, and an ACOE-permitted riprap fill.
- **Parcel D Nearshore Area:** This area is located in the southeastern corner of the DSI property. Historical shipyard operations in this area consisted of miscellaneous storage and a small parts blasting shed. The Parcel D Nearshore Area is also the location of the former Reichhold wastewater storage tank and former U.S. Army, Reichhold, and DSI shoreline outfall, as described in Section 2. This outfall was initially connected to septic, laboratory and surface ditch drainage features during

former Reichhold/U.S. Army use. DSI utilized the outfall for discharge of upland stormwater following purchase of the Parcel D Nearshore Area in 1964. The outfall does not currently discharge stormwater or other materials to the LDW.

- **Aquatic Area:** This area is located adjacent to the property in aquatic areas to the east of the Former Shipyard Nearshore Area bulkhead and Parcel D Nearshore Area. Historical shipyard operations in the Aquatic Area consisted of the marine railway, Dry Dock No. 1, Dry Dock No. 2, a blasting grit hopper, paint mixing sheds, the stormwater outfall (former Outfall 005), and the graving dock. These operations supported the over-water vessel repair and maintenance activities including blasting, painting, paint mixing (solvent-thinning), material storage, interior installations, and stormwater discharge. DSI collected wastewater generated during vessel blasting and pumped it to the nearshore wastewater treatment system. It then was pumped to the METRO sanitary system.

  Shipyard operations in the Aquatic Area were inspected and monitored as part of the former shipyard National Pollutant Discharge Elimination System (NPDES) permit. The historical NPDES permit inspection and monitoring resulted in Ecology enforcement actions relating to waste management practices and monitoring parameter exceedances of metals (copper, lead, and zinc) and turbidity. These enforcement actions documented unintentional releases of blasting grit and wastewater to the LDW sediment from the dry docks and graving dock. In order to address aquatic shipyard operation inputs to sediment, the sediment RI activities will include the full list of sediment management standards (SMS) testing parameters, including tributyltin (TBT).

2.4 History of Adjacent Facilities

Properties adjacent to the Site, including MRI Corporation/Port (Terminal 115), AML, and the former Glacier/Reichhold/U.S. Army property, are also properties of interest and included within the Glacier Bay Source Control Area. An overview of the history of these nearby facilities is provided as follows and is consistent with information presented in the Summary of Existing Information and Identification of Data Gaps report (SAIC 2007) prepared for the Glacier Bay Source Control Area under the direction of Ecology.

2.4.1 Cal Portland/Former Glacier/Reichhold/U.S. Army Property

Cal Portland is the current owner of the property located immediately south of the DSI property. The property is currently operated by Cal Portland as a cement terminal, including cement production, storage, and transport. Bulk cement is transported by truck and by barge from a dock and berthing area located on the west side of the waterway adjacent to the Cal Portland property. Historical property use included a lumber company, a U.S. Army facility, the Reichhold facility, and cement terminals.

Prior to 1943, the Cal Portland property was owned by the Carlisle Lumber Company, which operated a lumber mill at the site. After retrofitting an existing lumber plant, the U.S. Army used the property to the south for production of charcoal filters and Whetlerite. Charcoal manufacturing continued through 1944. A historical layout of buildings and other features associated with U.S. Army operations in the 1940s is shown on the 1956 U.S. Army Real Estate Map (Appendix F). Additionally, this map shows the location of a septic drainage line that serviced the main office building and women's and men's restroom buildings near the former impregnating plant and charcoal/carbon building. The drainage line turns north from the warehouse building and connects to a septic tank (currently located on the Site), which then drains east to a former outfall location at the shoreline . The northern portion of the former property is currently owned by DSI and includes the former "open ditch," former railroad spur line #4, former warehouse, and former ammonia tanks. Former surface drainage ditches located in this area of the property also drained to the former outfall location at the LDW shoreline. Other drainage ditches and features to the south collected materials from the upland area of the property and drained to another outfall that extended approximately 240 feet out into the LDW. Locations of these former U.S. Army buildings and operations are also shown on Figure 2 and on Figure 1-2 in Appendix E.

The Cal Portland property was subsequently leased by the federal government to Reichhold, which used the property to produce PCP plastic polymers for the automobile industry, various wood-preserving resins, adhesives, and glues used in papermaking, and formaldehyde products. Ammonia was also used in Reichhold's operations; however, its use could not be related to a specific product. A historical layout of buildings and other features associated with Reichhold's facility operations are presented in the Glacier/Reichhold *Final Remedial Investigation and Feasibility Study Work Plan* (ERM 2011) and is presented as Figure 1-2 in Appendix E. The Reichhold facility utilized the same buildings that were used by former U.S. Army operations, but converted many of the structures to laboratories and storage to support the chemical production activities that occurred between 1945 and 1958. Figure 1-2 (Appendix E) does not show locations of the septic drainage system (except for the former septic tank) and drainage ditches at the northern property area, or the connection to the former outfall location at the LDW shoreline. The former 240-foot outfall is identified on the figure; however, the upland drainage lines have been removed. Based on information provided in Appendix E, it is uncertain as to when (or if) these features were demolished during the timeline of Reichhold's facility operations at the property.

Figure 1-2 (Appendix E) also identifies the location of a former waste treatment tank located east of the presto log storage (U.S. Army) and dry chemical storage (Reichhold) building. This structure is also shown on the 1958 oblique aerial photograph (Appendix D), and was located on property that is currently owned by DSI. The former waste treatment tank was used for management of phenol-containing wastewaters. It is uncertain as to whether there were discharges of wastewater (or chemical wastes) to the LDW from this structure. Locations of the shoreline outfall and 240-foot outfall are also shown on the 1958 oblique aerial photograph.

Residues and wastewaters from PCP manufacturing are typically contaminated with chlorinated dioxins and furans, compounds that have been detected at elevated concentrations in Glacier Bay sediments. Elevated PCP, arsenic, and silver concentrations have been detected on the Cal Portland property in soils and groundwater.

Extensive Ecology file documentation exists for the former Reichhold facility, including wastewater permit files from the Washington State Pollution Control Commission, Ecology's predecessor. Those files indicate that the Reichhold facility discharged wastewaters into the LDW at two locations, which involved the use of ditches and a septic system from the manufacturing area to the river, and later, a deepwater outfall located immediately upstream of the DSI property. Historical wastewaters may also have been managed or disposed of in constructed lagoons or basins on the Cal Portland property (SAIC 2007).

Environmental complaints and inspection reports from the 1950s referenced at various times the discharge of colored, ammonia-containing, acidic, and phenol-containing wastewaters to the LDW and attributed fish kills to these discharges. In 1958, Reichhold moved the manufacturing operations to Tacoma, but maintained offices and laboratories at the Seattle location until approximately 1961, when Reichhold's lease with the federal government was terminated.

The Cal Portland property was subsequently sold to the Port by the federal government. The Port leased the property to a cement corporation for construction of a cement terminal. The facility construction included demolition of the former Reichhold facilities, construction of a loading dock along the waterway, and construction of the cement terminal facility presently located on the Cal Portland property.

Several environmental investigations have been performed in upland and aquatic portions of the Cal Portland property, and the property is currently under an AO with Ecology for upland and sediment remediation. Upland studies have documented the presence of PCP, arsenic, chromium, and silver in soils and groundwater on the Cal Portland property. Elevated arsenic concentrations have been noted in a seep to the LDW in the southern portion of Glacier Bay. Arsenic, cadmium, lead, mercury, silver, and zinc concentrations were reported in the seep samples. In April 2008, Glacier provided Ecology with a Remedial Activities Summary Report for the site. The report indicated that subsurface ozone injection (sparging) was performed for seven years at the Cal Portland property to treat PCP in soil and groundwater. Following treatment, PCP concentrations initially decreased to below MTCA cleanup levels. However, PCP concentrations subsequently increased above MTCA cleanup levels in one groundwater monitoring well. Subsurface injection of hydrogen peroxide was performed twice in 2000 for treatment of arsenic in soil and groundwater. Arsenic concentrations initially decreased but subsequently rebounded above MTCA cleanup levels. Cal Portland is currently completing an RI/FS for the Cal Portland property under an AO with Ecology.

Aquatic studies have documented elevated concentrations of dioxins/furans in surface and subsurface sediments within the Glacier Bay area. Sediment samples collected in the waterway near the Cal Portland property in 2005 and 2007 contained arsenic, zinc, phthalates (butylbenzylphthalate), and polychlorinated biphenyls (PCBs) at concentrations above the Sediment Quality Standards (SQS). High levels of dioxins and furans were also detected in the areas offshore of the Cal Portland property.

Maintenance dredging of the in-water berthing area adjacent to the Cal Portland property has been conducted by Glacier or its predecessors in 1986, 1993, and 2005. The sediments dredged from the northern portion of the in-water berthing area, which is located closest to the Site, contained elevated concentrations of arsenic, copper, TBT, and other heavy metals.

2.4.2 MRI Corporation/Port of Seattle (Terminal 115)

The Port-owned Terminal 115 property is located immediately south of the Cal Portland property. The Terminal 115 property was developed by filling a former bend in the Duwamish River with dredged sediments and other fill materials. Development of the terminal property was completed during the mid-1960s.

A tin reclamation facility was located in the northwest corner of the Terminal 115 property between 1963 and 1998. The facility operated under several company names, including Mandt Chemicals, MRI Corporation, Proler International Corporation, and Schnitzer Steel Industries. Operations included the reclamation of tin from steel cans and glass sludge, with smelting of the reclaimed tin and production of ingots for sale. Wastes produced at the plant included spent plating solution, “black mud” containing tin residue, and alkaline lacquer sludge containing vinyls, epoxys, tin, and lead.

Before 1972, certain wastewaters were managed in two lagoons located in the eastern portion of the MRI property, adjacent to Glacier Bay. The unlined lagoons reportedly operated by settling and evaporation, with no direct discharges to the Duwamish River noted in site documents. The lagoons are visible in the aerial photograph taken in 1966 (Appendix D). Sludges accumulating in the lagoons were reportedly excavated and sold for reclamation. The lagoons were filled and paved in 1972.

After 1972, wastewaters were managed by discharge to the sanitary sewer. Elevated levels of zinc and lead were noted in wastewater monitoring reports filed between the 1970s and 1990s. Solid wastes were reportedly managed by off-site shipment to reclamation facilities or waste treatment/disposal sites.

2.4.3 Alaska Marine Lines

The AML property is located immediately to the north of the Site. AML operates a containerized freight barge terminal and warehouse, which includes a dock and berthing area. A graving dock was formerly located in the southeast corner of the AML property and was leased to DSI until January 2007. The graving dock has been filled by AML for upland use. That work included installation of a new stormwater treatment system consisting of two underground vaults.

AML began operations at the property in 1993 and developed the barge terminal. At that time, the property was regraded and paved, and a concrete dock replaced a former timber dock. AML leased a portion of the former DSI property, which it subsequently purchased from DSI in 1999 (Figure 3).

Environmental conditions at the AML property have been characterized during previous soil and groundwater sampling. Two remedial actions have been conducted at the property, including two UST removals in 1990 and an independent remedial action in 1993 at the portion of the AML property that had been leased from DSI. Hazardous substances detected in soil and groundwater primarily consist of petroleum-related compounds and polycyclic aromatic hydrocarbons (PAHs). Discussions of these remedial actions are provided in Section 3.

2.5 Property Topography and Bathymetry

The topography of the DSI property is relatively flat, ranging from an approximate elevation of 14 feet above MLLW to an approximate elevation of 17 feet MLLW (Figure 4). Figure 6 also shows Site topography and bathymetry and presents the current top of bank and shoreline features. The shoreline along the western side of the marine railway has been bulkheaded.

Armoring has been placed along other portions of the shoreline in the northern and southern areas of the Site.

In-water and overwater structures are located along the shoreline of the waterway, including the shipyard pier, several mooring dolphins, and a float. DSI ceased using the dry docks formerly moored at the Site in March 2007, and the dry docks were subsequently sold and removed.

2.6 Property Geology and Hydrogeology

The geology and hydrology of the Site and surrounding vicinity are described as follows. The information set forth below is based on information presented in existing environmental reports.

2.6.1 Geologic Conditions

The Site is located in the southern part of the Puget Sound Lowland, a broad, relatively level glacial drift plain dissected by a network of deep marine embayments. The Site is located within the floodplain of the Duwamish Valley. The Duwamish Valley is a former marine embayment that has been filled with sediment since the most recent period of glaciation, the Pleistocene Age Vashon Glaciation (Luzier 1969). The Duwamish Valley is bounded to the east and west by glacial drift uplands.

Up to approximately 360 feet of alluvium, consisting of clay, silt, and sand, fills the Duwamish Valley. The alluvial deposits generally overlie the Pleistocene Age Vashon Drift, which ranges in thickness from 0 feet to approximately 200 feet in the Duwamish Valley. The Vashon Drift is composed of sand and gravel glacial outwash deposits overlying a compact silt, clay, sand, and gravel till. In some areas of the Duwamish Valley, the Vashon Drift is absent, and Pre-Tertiary and Tertiary bedrock (undifferentiated sedimentary, metamorphic, and igneous rock) directly underlies the recent alluvial deposits (Richardson et al. 1968).

The portion of the Duwamish Valley in which the Site is located has undergone extensive excavation and filling since the early 1900s. The extent of excavation and filling varies from property to property. The property is located along and consistent with the original shoreline of the Duwamish River, such that the extent of fill activity is less than at other nearby properties (i.e., fill thicknesses are greater at properties located in former river bends and side channels).

The Site geology has been defined by a number of soil borings performed during both the 2006 and 2009 investigations. The surface is underlain by a relatively thin layer of fill, which consists of compact gravel and gray and brown sand that ranges in grain size from very fine to coarse. The fill extends from approximately 2 to 10 feet below ground surface (bgs) in the upland areas. Boring logs identify a pervasive silt layer at the base of the fill, which may represent the uppermost extent of native soil. The extent of the silt layer was identified by five deeper borings (three monitoring wells and two geotechnical borings) and extended to an approximate depth of 12 to 15 feet bgs. Organic material (e.g., plant roots) is also present in this silt layer. Sand content increases in the silt layer along the eastern portion of the Site near the shoreline. Underlying the silt layer is gray sand with intermittent silt interbeds and layers. The shoreline in the eastern portion of the Site has been modified by armoring and bulkheading.

2.6.2 Groundwater

Regional groundwater flow in the unconfined aquifer is typically toward the LDW. Recharge to the water table aquifer is primarily by direct infiltration of precipitation and periodic contributions from streams during high-stage periods (Richardson et al. 1968). Given the variability in sand content in the silt layer at the Site, groundwater aquifer conditions are considered to be unconfined. Regional groundwater conditions include both confined and unconfined aquifers (Washington Division of Geology and Earth Resources 1989).

Site-specific groundwater gradients were defined during the 2009 upland investigation. This investigation included the installation of one piezometer and ten monitoring wells with three of the ten monitoring wells installed in the deeper aquifer (screened at 30 to 40 feet bgs). A transducer study was conducted over a 96-hour period at seven locations on the Site and one location in the LDW, as presented on Figure 7. Based on results of the transducer study, groundwater gradients are generally easterly, toward the LDW. Tidal fluctuation of groundwater elevations was determined to occur along the eastern area of the Site (i.e., within 200 to 300 feet of the shoreline), resulting in tidally-influenced groundwater along the nearshore area prior to discharge into the LDW. Figures 7 and 8 present the results of the transducer study and show the groundwater contours for high-high and low-low tide events, respectively.

Based on the results of boring observations and groundwater monitoring, groundwater levels at the site ranged from approximately 4 to 11 feet bgs with lower water levels at the nearshore area during low tide. Results of transducer study indicate a site-specific hydraulic conductivity (K) ranging from approximately 100 to 750 feet per day, consistent with K values in the sandy fill material observed in shallow borings. Vertical gradients were also calculated at the paired locations for DSI-PZ-01 (shallow) and DSI-MW-03 (deeper). The well screens for these two locations have a 25-foot vertical distance between the screens mid-point. Testing showed a consistent downward vertical gradient (shallow to deep) of approximately 0.015 feet per foot.

2.6.3 Surface Water

The LDW flows generally north to Elliott Bay, though the river flow is subject to periodic reversal due to tidal influences. The waterway receives the majority of its flow from the Green River, which originates at the crest of the Cascade Mountains near Stampede Pass and flows through Howard Hanson Dam (RM 65) and Tacoma Headworks Dam (RM 61). Average annual discharge from the Duwamish Waterway is 65.2 to 66.7 cubic yards per second (cy/s), measured at the U.S. Geological Survey (USGS) Tukwila gauging station, with flow rates varying from 5.6 to 430 cy/s at the Auburn gauging station from 1962 to 1994 (NOAA 1998).

Most of the LDW discharge (i.e., 80 percent) enters Elliott Bay via the West Waterway due to the presence of a sill on the East Waterway (Weston 1999). Flow rates are greatest in the winter because of seasonal precipitation and lowest throughout the late summer dry season.

Streamflow can be increased by surface water sources, such as storm drains, Combined Sewer Outfalls (CSOs), industrial effluents, and nonpoint source inputs, although these sources of flow are expected to be less than 1 percent of total discharge, even during peak flow events (Windward 2003).

Surface water runoff from paved surfaces on the Site was historically captured in a stormwater conveyance system that was discharged at the existing DSI outfall location shown on Figure 4. In 2011, AML re-routed the stormwater to a series of stormwater treatment systems located to the southeast of the former graving dock (Figure 4). All DSI stormwater is now combined with AML stormwater, treated on AML property, and then discharged at the AML stormwater outfall (Figure 4). AML currently manages the NPDES permit for discharge of stormwater at both the DSI and AML outfall locations, as shown on Figure 4. .

2.7 LDW Characteristics

Detailed characteristics of the LDW regarding estuarine features, bathymetry and shoreline conditions, physical sediment characteristics, hydrodynamic conditions, previous maintenance dredging efforts, and natural resource receptors are presented in the RI/FS Work Plan (Anchor QEA 2010) and in the LDW RI/FS (Windward 2010).

3 ENVIRONMENTAL QUALITY UPDATE

The Site, as defined by locations where DSI-related contamination has come to lie, has been the subject of numerous rounds of environmental investigation, including testing of soils, groundwater, and sediments. That work has included testing of on-property and off-property areas. This section discusses current environmental conditions at the Site based on existing information obtained during these prior studies. This discussion addresses environmental conditions at the Site, as well as relevant information for adjacent berth areas and nearby portions of the LDW and the Glacier Bay Source Control Area.

Previous remedial actions are discussed in Section 3.1 and historical stormwater quality is discussed in Section 3.2. These sections provide the necessary context for interpretation of current soil, groundwater, and sediment conditions. Current environmental conditions at the Site are then summarized in Section 3.3 for soil and groundwater, and in Section 3.4 for sediments. Preliminary reference values are presented to compare against existing data; however, cleanup levels will be developed during preparation of the draft RI/FS Report.

3.1 Previous Remedial Actions

Remedial actions have been performed in upland areas of the Site, including the decommissioning of USTs in two areas and the completion of an independent remedial action in the Parcel B area of the (Figure 3). The locations of these previous remedial actions are shown on Figure 9.

3.1.1 1986 Leaded Gasoline UST Closure

In 1986, prior to the enactment of the UST regulations (Chapter 173-360 WAC), a 500-gallon UST holding leaded gasoline was closed in place. Based on available information, that UST was first installed in the 1960s. This tank is located within close proximity to a 26 kilovolt, 100-foot-tall power pole and an adjacent building foundation. At the time of the UST closure, a representative from Seattle City Light visited the Site to assess the threat to the power pole. The representative concurred with DSI's concerns and recommended to the Seattle Fire Department that the UST be filled in place. At the time of closure, no subsurface samples were collected. Although closed in place, the UST does appear on a UST list update that was issued by Ecology on August 10, 2006.

3.1.2 1993 Remedial Action

During the development of the parcel previously leased to and subsequently purchased by AML (shown as Areas A and B on Figure 3), soil affected by an unknown release of petroleum product was discovered. Historically, this area of the property now owned by AML and formerly owned by DSI was leased by DSI to various entities for storage of used machinery, parking of trucks and trailers, and storage and distribution of lumber.

In August 1993, Environmental Services Limited performed a preliminary site assessment consisting of five soil borings, five test pits, and four monitoring wells (the remaining wells, MW4 and MW5, are shown on Figure 9). The results indicated total petroleum hydrocarbon (TPH) constituents in soil and groundwater exceeding MTCA industrial cleanup levels. In response, DSI contracted with Hart Crowser, Inc. (HCI) in October 1993 to oversee the excavation of approximately 650 cy of contaminated soil.

During excavation of the affected soil, several restrictions (a 26-kilovolt buried powerline, a pad-supported power transformer foundation, the graving dock foundation, and the shallow groundwater table) were encountered, limiting the extent of excavation in some areas. After soil removal, 12 confirmation soil samples were collected from the excavation sidewalls. All of these samples met MTCA industrial cleanup levels for semivolatile organic compounds (SVOCs) and eight were below MTCA industrial cleanup levels for TPH gasoline range (TPH-G), TPH diesel range (TPH-Dx), and TPH lubricant oil range (TPH-O). The four samples above MTCA industrial cleanup levels for TPH (Method 418.1) ranged in concentration from 480 milligrams per kilogram (mg/kg) to 13,000 mg/kg. The MTCA industrial cleanup level at the time of the remedial action was 200 mg/kg. The excavation area was backfilled and capped with asphalt, and an additional monitoring well (shown as MW5 on Figure 9) was installed to assess downgradient groundwater quality.

Groundwater samples were collected from MW4 and MW5 over four events in 1994 (two wet and two dry) and one event in February 1999. Analysis of the MW4 data, reported by HCI, indicated a 25 percent reduction in TPH concentrations. For all five sampling events, MW5 met MTCA groundwater cleanup levels for TPH. Benzene, toluene, ethylbenzene, and xylenes (BTEX) were not detected.

3.1.3 2000 Diesel and Gasoline UST Excavations

In 2000, four USTs containing diesel fuel and unleaded gasoline were excavated and removed. Those four USTs were installed between 1968 and 1979. The excavation was performed by Quality Tank Service, Inc., a certified UST decommissioning contractor. The excavation was also supervised by Roy Kuroiwa, a professional engineer registered in the state of Washington.

During the initial excavation, 60 cy of soil were excavated with the USTs, prior to collection of bottom and sidewall soil samples. Seven of the initial confirmation samples contained concentrations of total petroleum hydrocarbons (TPH-Dx and TPH-G) and benzene above MTCA Method A industrial cleanup levels for soil. An additional 20 cy of soil were excavated from these locations and samples were collected.

Five of the second round of confirmation samples exceeded MTCA industrial cleanup levels. Four of the samples exceeded the TPH-G cleanup level and one slightly exceeded the benzene cleanup level. Data documenting results of this testing are provided in the RI/FS Work Plan (Anchor QEA 2010). No groundwater samples were collected as part of the confirmation sampling program.

3.2 Historical Stormwater Quality

Historically, environmental sampling data were collected for stormwater at the Site that came into contact with industrial shipyard operations. A discussion of historical stormwater management and reporting is presented in the EPA Section 104(e) response letter dated May 15, 2006, and prepared by DSI. Sampling results are presented in the Glacier Bay Source Control Area report, *Summary of Existing Information and Identification of Data Gaps* (SAIC 2007). These sampling activities were performed not as part of remedial investigations, but rather under the terms of DSI's former NPDES permit. These data are useful in documenting stormwater management practices during the period of active shipyard operations. However, they do not provide information useful to the analysis of current conditions or sediment source control subsequent to shipyard closure.

The DSI stormwater system was constructed in the mid-1970s. Figure 2 presents the historical stormwater outfall location (Outfall 005) at the shoreline bulkhead. The following discussion addresses the historical stormwater quality from Outfall 005, as the dry dock and graving dock outfalls specifically related to wastewater management.

Previous stormwater inspection and monitoring have included numerous Ecology inspections, DSI discharge monitoring, and observations and sampling by the Puget Soundkeeper Alliance (PSA). Although a majority of inspection and monitoring activity focused on the dry docks and graving dock wastewater handling, required inspection and monitoring of stormwater to Outfall 005 indicated that upland activities contributed contaminant inputs to the stormwater system. Documented upland inputs to the stormwater system included blasting grit and a hand-washing sink from the paint shop.

Historical stormwater monitoring from Outfall 005 involved testing for copper, lead, zinc, turbidity, background turbidity, and oil and grease. This monitoring periodically indicated elevated concentrations of metals (copper, lead, and zinc) and turbidity. In 1995, Ecology required DSI to increase the frequency of stormwater monitoring and implement additional corrective actions, including catch basin inserts, weekly cleaning of paved areas, improving blasting grit storage containment, and improving the stormwater treatment system. The stormwater treatment system consisted of a centrifugal separator system prior to Outfall 005 discharge at the bulkhead. In order to assess historical stormwater inputs to sediment, the sediment RI activities will include the full list of SMS testing parameters, including TBT.

3.3 Current Soil and Groundwater Quality

Extensive soil and groundwater sampling information is available for the Site. Available data are summarized in the Phase 1 Data Memorandum (Anchor QEA 2011a) and as follows.

3.3.1 Recent Upland Investigations

Upland RI efforts were completed at the Site in 2006 and 2009. Figure 10a presents locations of the boring and monitoring well explorations that were completed as part of these investigations, as they are located within the upland and nearshore property areas.

The 2006 Preliminary Site Investigation included sampling soil and groundwater from 12 temporary soil borings (two soil samples and one groundwater sample were collected from each location), and re-sampling of existing groundwater monitoring wells (MW-4 and MW-5).

The 2009 Phase 1 Upland Site Investigation included sampling soil from 20 temporary boring locations, and groundwater from 14 temporary boring locations and ten permanent monitoring well locations. Boring and monitoring well locations were selected to compare 2009 data to 2006 data in the upland area of the Site and to further delineate soil and groundwater contamination in the nearshore area of the Site.

For the purposes of this Supplemental RI Work Plan, upland soil and groundwater data have been preliminarily screened using MTCA Method A (unrestricted land use) and MTCA Method C (industrial land use) screening levels; however, these preliminary screening levels are not proposed as remediation levels or cleanup levels for the Site. The 2006 and 2009 soil and groundwater data have been preliminarily screened for the purposes of identifying additional data gaps in soil and groundwater quality that need to be filled as part of completion of supplemental RI investigation activities. Upon completion of the supplemental investigation, the compiled dataset will be evaluated for Site Applicable or Relevant and Appropriate Requirements (ARARs), and results of this evaluation will be used to determine applicable screening levels, preliminary cleanup levels, and remedial action levels to support development of the draft RI/FS Report for the Site.

3.3.2 Upland Conditions by Property Area

The analytical results from the 2006 and 2009 upland and nearshore investigation efforts are summarized below by Site area. Summaries of existing soil and groundwater data are presented in Tables 2a, 3, 4, 5, and 6. Tables 3 and 4 present soil and groundwater data in comparison to MTCA Method A and MTCA Method C preliminary screening levels for industrial soil and groundwater quality, respectively. Table 5 compares soil data collected within the nearshore areas to SMS criteria, and Table 6 evaluates groundwater data from within the nearshore areas relative to Washington Marine Water Quality Criteria.

Groundwater data are provided both for total metals and for dissolved metals. Due to turbidity in tested groundwater samples, the groundwater data for dissolved metals are used for comparison to groundwater cleanup levels. Total metals data are provided for information purposes, but are not considered representative of groundwater quality.

- **Northwest Area:** Lead exceeds the MTCA Method A screening level in surface soil at one location (DSI-03) completed in 2006, and TPH-G slightly exceeds the MTCA Method A screening level in subsurface soil at the same location. PAH (benzo(a) pyrene) also slightly exceeds the MTCA Method A screening level in one subsurface soil sample at DSI-02, also completed in 2006. In groundwater, TPH-G slightly exceeds the MTCA Method A screening level at DSI-03; however, no screening level exceedance was observed in the groundwater sample collected at DSI-MW-02 in 2009, which is co-located with DSI-03. All other soil and groundwater concentrations are below MTCA Method A screening levels for analytes tested in this area.

- **Rail Spur Area:** Arsenic slightly exceeds the MTCA Method A screening level in surface soil at one boring location (DSI-01) completed in 2006, and also in surface soil at one monitoring well location (DSI-MW-01) installed in 2009. Arsenic concentrations in groundwater exceed MTCA Method A and MTCA Method C screening levels at one boring location (DSI-01) completed in 2006, at two boring locations (DSI-GP-01 and DSI-GP-02) completed in 2009, and at one monitoring well location (DSI-MW-01) installed in 2009. Vinyl chloride also slightly exceeds the MTCA screening level at DSI-MW-01. All other soil and groundwater concentrations are below MTCA Method A screening levels for analytes tested in this area.

- **Central Area:** Soil sampling was performed at six locations in the Central Area of the Site and all constituents were detected below the MTCA Method A and Method C screening levels. For groundwater, arsenic slightly exceeds the MTCA Method A screening level at one monitoring well location (DSI-MW-03), installed in 2009. This monitoring well is screened deeper in the aquifer (30 to 40 feet bgs), and is not representative of shallow groundwater conditions in the Central Area. Vinyl chloride also slightly exceeds MTCA Method A screening levels at three boring locations (DSI-

04, DSI-05, and DSI-08) completed in 2006. All other groundwater concentrations are below MTCA Method A screening levels for analytes tested in this area.

- **2000 UST Removal Area:** Soil sampling was performed at seven locations in the UST Removal Area and only petroleum hydrocarbons and associated constituents were detected above the MTCA Method A and Method C screening levels. TPH-G exceeds MTCA Method A screening levels in surface soil at two boring locations (DSI-06 and DSI-07) completed in 2006, and in near-surface and subsurface soil at four boring locations (DSI-GP-08, DSI-GP-09, DSI-GP-10, and DSI-GP-11) completed in 2009 and one monitoring well location (DSI-MW-04) installed in 2009. TPH-D exceeds MTCA Method A screening levels in surface and subsurface soil at one boring location (DSI-06) completed in 2006, two boring locations (DSI-GP-08 and DSI-GP-09) completed in 2009, and one monitoring well location (DSI-MW-04) installed in 2009. PAH contamination (slightly above MTCA Method A screening levels) in subsurface soil was also observed at one boring location (DSI-06) completed in 2006. TPH-G and TPH-D (and benzene) exceed MTCA Method A screening levels in shallow groundwater at DSI-07, and benzene also exceeds the MTCA Method A screening level in shallow groundwater at DSI-MW-04. All other soil and groundwater concentrations are below MTCA Method A screening levels for analytes tested in this area.

- **Former Shipyard Nearshore Area:** Soil sampling was performed at 11 locations in the Former Shipyard Nearshore Area, and only petroleum hydrocarbons and limited metals were detected above the MTCA Method A and Method C screening levels. Arsenic, cadmium, and lead exceed MTCA screening levels in subsurface soil at one boring location (DSI-09) completed in 2006. Lead was also detected at concentrations exceeding MTCA Method A screening levels in surface and subsurface soils at one boring location (DSI-GP-12) completed in 2009. PAHs exceed MTCA Method A screening levels in surface and subsurface soil at DSI-09, three additional boring locations (DSI-GP-12, DSI-GP-13, and DSI-GP-14) completed in 2009, and two monitoring well locations (DSI-MW-05 and DSI-MW-08) installed in 2009. PAHs and naphthalene were also detected at concentrations exceeding MTCA Method A screening levels at one additional boring location (DSI-GP-15) completed in 2009.

TPH-G exceeds soils screening levels (MTCA Method A) in surface and subsurface soils at DSI-09, DSI-GP-13, DSI-GP-14, and DSI-GP-15. TPH-D also exceeds MTCA Method A screening levels in surface and subsurface soils at DSI-GP-15. In groundwater, the only screening level exceedance (MTCA Method A) was for TPH-D, observed in shallow groundwater at one boring location (DSI-11) completed in 2006.

- **South Property Area:** Soil sampling was performed at three locations along the South Property Area and only arsenic was detected in one soil sample above the MTCA Method A and Method C screening levels. Arsenic and lead slightly exceed the MTCA Method A screening levels in near-surface soil at 2009 boring locations DSI-GP-20 and DSI-GP-21, respectively. Elevated PAH concentrations are also observed in near-surface soil at these boring locations. All other soil concentrations are below MTCA Method A screening levels for analytes tested in this area. Shallow groundwater was sampled and analyzed at three boring locations within the South Property Area in 2009, and no exceedances of MTCA Method A or MTCA Method C screening levels were observed.

- **Parcel D Nearshore Area:** Soil sampling was performed at three locations in the Parcel D Nearshore Area. The results show concentrations of arsenic, petroleum hydrocarbons, and PAHs from two soil sample locations that exceed the MTCA Method A and Method C screening levels. Arsenic slightly exceeds the MTCA Method A screening level in surface soil at one monitoring well location (DSI-MW-10) installed in 2009. TPH-D was also detected at elevated concentrations in surface soil at this location. PAHs were detected at elevated concentrations (exceeding MTCA Method A screening levels) in surface and subsurface soils at one boring location (DSI-12) completed in 2006, one boring location (DSI-GP-17) completed in 2009, and at monitoring well location DSI-MW-10. For groundwater, arsenic was detected at the MTCA Method A screening level in shallow groundwater at DSI-12. PAHs and TPH-D also exceeded MTCA Method A screening levels in shallow groundwater at this location.

3.4 Current Sediment Quality

This section summarizes surface and subsurface sediment chemical testing data collected during the Phase 1 Sediment Investigation, which was completed in March 2011. Figure 10b presents the 2011 surface and subsurface sediment sampling locations. Table 2b presents a summary of the surface and subsurface sediment sampling scheme, including coordinates, mudline elevation, depth of core, and testing suite. Surface sediment results are presented in Table 7, and subsurface sediment results are presented in Table 8.

3.4.1 Sediment Geology and Stratigraphy

The geology of the Duwamish River basin has been described in detail in the LDW Group (LDWG) RI Reports (Windward 2003, 2010). This section presents a summary of the sediment geology and stratigraphy. The Duwamish basin is composed of four main geologic assemblages, which include bedrock (where it exists), upland glacial and non-glacial deposits, quaternary alluvial deposits, and recent fill. Of these, the alluvial and fill deposits were encountered during this study. The alluvial deposits include estuarine fine sands and silts as well as interbedded sequences of silt, sand, and gravel associated with the advance of a prograding delta. These deposits compose the principal aquifer and groundwater pathway for the Duwamish basin. The fill units were created when modifications were made to the Lower Duwamish River post-1900 to support navigation needs in the waterway. The channel was straightened and dredged and the lowlands were filled using the dredged material, creating a layer of fill over most of the lower Duwamish Valley. The channel is still dredged for navigational purposes.

The primary sediments encountered during the LDW RI (Windward 2003, 2010) were further grouped as Recent Alluvium and Fill Deposits, Upper Alluvium, and Lower Alluvium. This stratigraphic convention was used to describe Site geology along with an additional category to distinguish surface sediment.

3.4.1.1 Recent Alluvium (and Fill)

The sediment composition of the Recent Alluvium, as based on investigation-derived grain size analyses, indicates that this unit is predominantly composed of silt (>95 percent) and very fine to fine sand (<5 percent), and includes occasional organic material (wood fibers and fragments). These findings are consistent with those from the LDW RI Subsurface Sediment Data Report (Windward 2007), which indicate that unit thickness varies based on location within the LDW and can range from 3 to 20 feet. These deposits are associated with dredged material from channelization as well as fluvial deposits from upriver sources.

3.4.1.2 Upper Alluvium

The upper alluvium unit consists predominantly of very fine to fine sand (22 to 86 percent) and silt (22 to 79 percent), associated with interbedded and prograding deltaic deposits. Silt commonly occurs within laminated beds. These findings are consistent with the LDW RI Subsurface Sediment Data Report (Windward 2007), which further indicates that these younger alluvial deposits are of relatively constant thickness and depth.

3.4.1.3 Lower Alluvium

The lower alluvium unit typically consists of sands and silty sands, with grain sizes ranging from very fine to coarse sand (15 to 76 percent) and up to 84 percent silt, as indicated by select grain size analyses. These findings are consistent with the LDW RI Subsurface Sediment Data Report (Windward 2007), which further indicates that the maximum unit thickness is up to 100 feet in the central Duwamish Valley. These sediments are associated with the coarser portion of prograding deltaic deposits.

3.4.2 Surface Sediment Quality

Surface sediment was collected from the biologically active zone, 0 to 10 centimeters (cm) below mudline, in the aquatic areas of the Site. Testing was performed to delineate the lateral extent of sediment contamination.

Sediment quality throughout the investigation area is compared to the SMS SQS, for the purposes of protection of ecological health and tribal consumption. Dredged Material Management Program (DMMP) criteria were also applied for those chemicals without SQS criteria (e.g., tributyltin).

Eleven surface sediment samples were collected during the Phase I RI and analyzed for conventional parameters, metals, TBT (porewater and bulk), SVOCs, volatile organic compounds (VOCs), chromium VI, PCBs, pesticides, physical parameters, and selectively for dioxin/furans. A summary of the chemical and physical testing suites is presented in Table 2b. The analytical results are reported in Table 7. Surface sediment locations are shown on Figure 10b.

3.4.2.1 Conventionals

Surface sediment samples were analyzed for total organic carbon (TOC), total solids (TS), total volatile solids (TVS), and moisture content. TOC results ranged from 1.39 to 2.73 percent, which are within the acceptable range for organic carbon normalization. TS percentages ranged from 44.2 to 50.9 percent, TVS ranged from 7.79 to 9.62 percent, and moisture content ranged from 97.2 to 128.7 percent.

3.4.2.2 Metals

All metals in the surface sediment samples were below SMS criteria. Arsenic concentrations ranged from 11 to 30.1 mg/kg, with the highest concentrations at locations DSI-SS-07 and DSI-SS-11, immediately downstream of the Site. Antimony, selenium, silver, and thallium were not detected in any samples.

3.4.2.3 Tributyltin

Bulk and porewater TBT were analyzed in all 11 surface sediment samples. Bulk TBT was detected in 10 of the 11 samples and ranged from 3.6 U (not detected above reporting limit) to 180 micrograms per kilogram (µg/kg). Four stations exceeded the DMMP criteria of 73 µg/kg, with the highest bulk TBT concentrations observed at stations DSI-SS-05 (180 µg/kg) and DSI-SS-07 (170 µg/kg) to the south of the Site. Porewater TBT was detected at only one station (DSI-SS-01), with a concentration of 0.22 J micrograms per liter (µg/L), which exceeds the DMMP screening level of 0.15 µg/L. This station is located offshore of the Parcel D Nearshore Area in the southern portion of the Site.

3.4.2.4 Semivolatile Organic Compounds

PAHs: PAH results did not exceed SMS criteria. Total PAH concentrations ranged from 18 to 192 mg/kg–organic carbon normalized. Concentrations were highest in samples collected along the nearshore areas adjacent to the historical marine railway and decreased upstream of the Site. The highest PAH detections were at stations DSI-SS-05 and DSI-SS-06, which are located adjacent to one of the former dry docks and former graving dock, respectively.

Chlorobenzenes: Chlorobenzenes were not detected in almost all of the surface sediment samples.

Phthalates: Phthalates were below detection limits in the majority of the surface sediment samples.

Phenolics: Phenolics were below detection limits in the majority of the surface sediment samples.

Miscellaneous Extractables: Benzyl alcohol concentrations ranged from 65 to 390 µg/kg, which exceeded the SQS value of 57 µg/kg in all samples. Benzoic acid was detected at all stations and exceeded the SQS value of 650 µg/kg at station DSI-SS-11, with a concentration of 690 µg/kg. DSI-SS-11 has the highest concentrations of both benzyl alcohol and benzoic acid, and is located in the federal navigation channel at the northern extent of the sampling area.

3.4.2.5 Polychlorinated Biphenyls

All 11 surface sediment samples had detections of PCBs for Aroclors 1248, 1254, and 1260. Only one location (DSI-SS-10) was slightly above the SQS value for total PCB (12 mg/kg-OC), with a concentration of 13 mg/kg-OC. This station is located just offshore of the DSI property adjacent to the location of one of the historical dry docks.

3.4.2.6 Volatile Organic Compounds

VOC results were all below detection limits, with the exception of acetone. Acetone was detected at concentrations ranging from 43 to 140 µg/kg, with the highest concentrations at station DSI-SS-11. This station is located in the federal navigation channel at the northern extent of the sampling area.

3.4.2.7 Pesticides

Pesticide results were predominantly below detection limits, with a small number of low-level detections.

3.4.2.8 Dioxin/Furans

Eight surface sediment samples were analyzed for dioxins/furans. Concentrations of dioxin/furans (reported as Toxic Equivalents Quotient [TEQ] mammalian 2005 U=1/2) ranged from 4.0 to 22.3 nanograms per kilogram (ng/kg). Dioxin/furan TEQ concentrations were generally highest at station DSI-SS-01, located offshore of the Parcel D Nearshore Area adjacent to the Former Glacier/Reichhold/U.S. Army property.

3.4.2.9 LDWG Sediment Bioassay Testing

LDWG performed a Phase 2 (baseline) Ecological Risk Assessment (ERA) within the LDW to determine the risk estimates for benthic invertebrate, fish, and wildlife species that may be exposed to chemicals of concern (COCs) found in sediment, water, and aquatic biota. The dataset used in the baseline ERA consists of historical data and sediment and tissue chemistry data collected from the LDW during Phase 2 to supplement the historical data that were used in the Phase 1 ERA (Windward 2003).

To generate more specific information about the nature and extent of effects on benthic invertebrates exposed to sediments with at least one chemical concentration exceeding the SMS SQS sediment criteria, three toxicity tests were conducted by LDWG with surface sediments (0 to 10 cm) collected at 48 locations. The toxicity tests included the following:

1. Acute 10-day amphipod (*Eohaustorius estuarius*) mortality test
2. Acute 48-hour bivalve larvae (*Mytilus galloprovincialis*) normal survival test
3. Chronic 20-day juvenile polychaete (*Neanthes arenaceodentata*) survival and growth test

The results from the three sediment toxicity tests were evaluated using the SMS interpretive criteria for marine toxicity tests (Ecology 2003). Co-located surface sediment samples were collected for chemical and biological toxicity testing in the vicinity of the Site at the following locations:

- Northern Area Bioassay (LDW-SS40): This station was located in the LDW federal navigation channel north of the AML property. A toxicity CSL exceedance was noted at this location.
- Shipyard Area Bioassay (LDW-SS49): One sampling station was located within the Port-owned berth area offshore of the marine railway. This station contained elevated concentrations of arsenic and copper. A CSL toxicity exceedance was noted at this location.
- Eastern Area Bioassay (LDW-SS50): This station was located across the LDW, within the eastern Port-owned berth area. A toxicity CSL exceedance was noted at this location.
- Glacier Bay Bioassays (LDW-SS56, LDW-SS57, and LDW-SS58): These three stations were located within Glacier Bay. Station LDW-SS56 contained elevated dioxin, arsenic, and PCB concentrations, and exhibited a toxicity SQS exceedance. Stations LDW-SS57 and LDW-SS58 contained elevated PCB and dioxin concentrations, and both exhibited toxicity CSL exceedances.

Results of the bioassay sample collection and testing by LDWG have been used to assist in evaluation of Site sediment data collected in 2011. Additional bioassay testing has not been completed as part of the DSI RI sediment investigations.

3.4.3 Subsurface Sediment Quality

Subsurface sediment was sampled at 17 locations in the aquatic areas of the Site, as shown on Figure 10b. Testing was performed to delineate the vertical nature and extent of contamination adjacent to the Site. Sediment quality throughout the investigation area is compared to SMS criteria (Table 8).

3.4.3.1 Recent Alluvium

A total of 45 subsurface sediment samples were analyzed with the recent alluvium. The following subsections describe the sediment quality in terms of recent alluvium deposits.

3.4.3.1.1 Conventionals

Subsurface sediment samples were analyzed for TOC, TS, and selective TVS. TOC results ranged from 1.04 to 3.66 percent, with one sample (DSI-SB-11-1-2) outside the acceptable range for OC normalization. TS results ranged from 48.4 to 85 percent and TVS results ranged from 3.51 to 11.14 percent.

3.4.3.1.2 Metals

Metals were detected in the majority of the recent alluvium subsurface sediment samples and included exceedances of the SMS criteria for arsenic, copper, lead, mercury, and zinc. Antimony, beryllium, cadmium, chromium, chromium VI, nickel, selenium, silver, and thallium were detected in approximately half of the samples and did not exceed the SMS criteria. All other metals were below detection limits.

Arsenic exceeded the SQS value (57 mg/kg) in 24 samples. Stations DSI-SB-06 and DSI-SB-15 did not exceed the SQS value in any sample interval. Arsenic concentrations ranged from 11.7 to 1,290 mg/kg, with the highest concentration at locations DSI-SB-05 adjacent to one of the former dry docks. Arsenic concentrations were predominantly below the SQS value in the 1- to 2-foot sample interval, with concentrations increasing towards the native material contact. Stations DSI-SB-12 and DSI-SB-13 are exceptions to this trend, with higher concentrations in the 1- to 2-foot interval and decreasing in deeper subsurface sample intervals.

Copper was detected in 45 recent alluvium sediment samples and exceeded the SQS value (390 mg/kg) in 19 samples. Stations DSI-SB-02, DSI-SB-06, DSI-SB-14, DSI-SB-15, DSI-SB-16, and DSI-SB-17 did not have exceedances and bound the lateral extent of copper contamination. Concentrations ranged from 72.6 to 2,040 J mg/kg, with the highest concentration at station DSI-SB-08 adjacent to one of the former dry docks. Copper concentrations were predominantly below the SQS value in the 1- to 2-foot sample interval, with concentrations increasing toward the basal contact. Stations DSI-SB-12 and DSI-SB-13 are exceptions to this trend, with higher concentrations in the 1- to 2-foot sample interval and decreasing in deeper sample intervals.

Lead was detected in 45 recent alluvium sediment samples and exceeded the SQS value (450 mg/kg) in 12 samples. Stations DSI-SB-01, DSI-SB-02, DSI-SB-03, DSI-SB-06, DSI-SB-14, DSI-SB-15, DSI-SB-16, and DSI-SB-17 did not have exceedances for lead. Those stations are located at the boundary of the sampling area, and bound the lateral extent of lead contamination. Concentrations ranged from 39 to 1,340 mg/kg, with the highest concentration at station DSI-SB-04 offshore of the dock. Lead concentrations were predominantly below the SQS value in the top 4 feet of the core, with concentrations increasing toward the sandy contact. Stations DSI-SB-12 and DSI-SB-13 are exceptions to this trend, with higher concentrations in the 1- to 2-foot sample interval and decreasing in deeper sample intervals.

Mercury was detected in 45 recent alluvium sediment samples and exceeded the SQS value (0.41 mg/kg) in 21 samples. Stations DSI-SB-01, DSI-SB-03, and DSI-SB-15 did not have exceedances for mercury. These stations are in a transect offshore of the Parcel D Nearshore Area. Mercury concentrations ranged from 0.16 to 3.3 mg/kg, with the highest concentration at station DSI-SB-05, which is located adjacent to a former dry dock. Mercury concentrations were predominantly below the SQS value in the top 4 feet of the core, with concentrations increasing toward the sandy contact. Stations DSI-SB-12 and DSI-SB-13 are exceptions to this trend, with higher concentrations in the 1- to 2-foot sample interval and decreasing in deeper sample intervals.

Zinc was detected in 45 recent alluvium sediment samples and exceeded the SQS value (410 mg/kg) in 21 samples. Stations DSI-SB-14 and DSI-SB-15 did not have exceedances for zinc. Zinc concentrations ranged from 111 J to 4,110 J mg/kg, with the highest concentration at DSI-SB-04, which is located offshore of the dock. Trends in the contaminant profiles were not identified.

3.4.3.1.3 Semivolatile Organic Compounds

PAHs: PAHs were detected in the majority of the recent alluvium subsurface sediment samples. Stations DSI-SB-01, DSI-SB-02, DSI-SB-06, DSI-SB-14, DSI-SB-16, and DSI-SB-17 did not have SQS exceedances for PAHs. These locations effectively bound the lateral extent of PAH contamination, with the exception of the area surrounding DSI-SB-15 to the southeast of the Site. PAH results will be discussed by lower molecular weight PAH (LPAH) and higher molecular weight PAH (HPAH) concentrations. The LPAH results include the following compounds: naphthalene, acenaphthylene, acenaphthene, fluorine, phenanthrene, and anthracene. HPAH results include the following compounds: fluoranthene, pyrene, benzo(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene.

Total LPAH was detected in 45 recent alluvium sediment samples, and exceeded the SQS value (370 mg/kg-OC) in six samples. Stations DSI-SB-01, DSI-SB-02, DSI-SB-03, DSI-SB-05, DSI-SB-06, DSI-SB-08, DSI-SB-12, DSI-SB-13, DSI-SB-14, DSI-SB-16, and DSI-SB-17 did not have exceedances for LPAH. Those stations bound the lateral extent of LPAH contamination to the area offshore of the dock, with two outliers outside of the clean boundary. Stations DSI-SB-04, DSI-SB-09, DSI-SB-10, and DSI-SB-11 are adjacent to the dock, and range in concentrations from 380 to 919 mg/kg-OC. All SMS exceedances in these stations were located in the deepest sample interval in the recent alluvium unit. Sample location DSI-SB-07 is located downstream of the Site, with an SMS criteria exceedance of 1,211 mg/kg-OC in the 11- to 12-foot sample interval. Station DSI-SB-15 is located upstream of the Site at the southeastern extent of the sampling area and had the highest concentration of 1,876 mg/kg-OC in the 11.5- to 12.5-foot sample interval.

Total HPAH was detected in 45 recent alluvium sediment samples and exceeded the SQS value (960 mg/kg-OC) in eight samples. Stations DSI-SB-01, DSI-SB-02, DSI-SB-03, DSI-SB-06, DSI-SB-07, DSI-SB-10, DSI-SB-12, DSI-SB-13, DSI-SB-14, DSI-SB-16, and DSI-SB-17 did not have exceedances for HPAH. These stations bound the lateral extent of HPAH contamination to the area offshore of the dock, with two outlying areas with exceedances. Stations DSI-SB-04, DSI-SB-05, DSI-SB-09, and DSI-SB-11 are adjacent to the dock and range in exceedances from 976 to 1,690 mg/kg-OC. All exceedances in these stations were located in the deepest sample interval in the recent alluvium unit, with the exception of the 4.5- to 5.5-foot interval in DSI-SB-09. Sample location DSI-SB-13 is located downstream of the Site adjacent to the former graving dock and had an exceedance of 1,123 mg/kg-OC in the 1- to 2-foot sample interval. Stations DSI-SB-08 and DSI-SB-15 are located upstream of the Site at the southeastern extent of the sampling area, and had concentrations of 965 mg/kg-OC in the 7- to 8.7-foot interval and 1591 mg/kg-OC in the 11.5- to 12.5-foot interval.

Chlorobenzenes: Chlorobenzenes were not detected in the majority of the recent alluvium subsurface sediment samples.

1,2-dichlorobenzene was detected in 22 samples and exceeded the SQS value (2.3 mg/kg-OC) in eight samples. Stations DSI-SB-05, DSI-SB-08, DSI-SB-09, and DSI-SB-11 contained exceedance samples and are located in a line parallel to the Site near the navigation channel boundary. Exceedances ranged from 3.6 to 7.9 mg/kg-OC and were generally concentrated in the deeper sample intervals. The stations with exceedances are bounded in all directions, effectively defining the nature and extent of contamination.

1,2,4-trichlorobenzene was detected in 11 samples and exceeded the SQS value (0.81 mg/kg-OC) in one sample. Station DSI-SB-09 had a concentration of 2.1 mg/kg-OC in the 4.5- to 5.5-foot sample interval. This location is bounded on all sides by stations below the SQS value.

Phthalates: Phthalate results were below detection limits for the majority of the recent alluvium subsurface sediment samples.

Bis(2-ethylhexyl)phthalate was detected in 39 samples and exceeded the SQS value (47 mg/kg-OC) in six samples. Stations DSI-SB-04, DSI-SB-08, DSI-SB-10, DSI-SB-11, and DSI-SB-13 contained exceedances and are located adjacent to the dock and former dry dock. Exceedances ranged from 47.3 to 329 mg/kg-OC and were generally concentrated in the deeper sample intervals. The stations with exceedances are bounded in all directions, effectively defining the nature and extent of contamination.

Phenolics: 2,4-dimethylphenol was detected in nine samples and exceeded the SQS value of 29 µg/kg dw in two samples. Stations DSI-SB-06 and DSI-SB-09 had concentrations of 100 µg/kg in the 5- to 6.5-foot sample interval and 54 µg/kg in the 11- to 12.1-foot sample interval. These locations are both bounded on all sides by stations with samples below the SMS criteria.

Miscellaneous Extractables: Dibenzofuran was detected in 42 samples and exceeded the SMS value of 15 mg/kg–OC in six samples. Stations DSI-SB-04, DSI-SB-07, DSI-SB-09, DSI-SB-10, and DSI-SB-15 contained exceedances, and are located adjacent to the dock and in two outlying areas. Exceedances ranged from 15.2 to 196 mg/kg–OC, with the highest concentrations in the outlying areas (stations DSI-SB-07 and DSI-SB-15). All exceedances in these stations were located in the deepest sample interval in the recent alluvium unit, with the exception of the 4.5- to 5.5-foot sample interval in DSI-SB-09. The stations closest to the Site with exceedances are bounded in all directions, effectively defining the nature and extent of contamination.

Benzyl alcohol was detected in 22 samples and exceeded the SQS value of 57 µg/kg in 11 samples. Stations DSI-SB-02, DSI-SB-03, DSI-SB-04, DSI-SB-05, DSI-SB-06, DSI-SB-09, DSI-SB-10, DSI-SB-11, and DSI-SB-13 contained samples above SQS criteria. These stations are located offshore of the Site, with exceedances primarily in the 1- to 2-foot sample interval. Exceedances ranged from 85 to 280 µg/kg, with the highest concentration at station DSI-SB-02 above the 2005 Glacier dredging cap. Locations with exceedances are bounded by concentrations below the SQS to the north (DSI-SB-07) and east (stations in the federal navigation channel). The extent of contamination is not bounded upstream of the Site, with the highest concentrations to the south of the Site.

3.4.3.1.4 Polychlorinated Biphenyls

Total PCBs were detected in 45 recent alluvium sediment samples and exceeded the SQS value of 12 mg/kg-OC in 32 samples. Every station contained one or more samples above the SQS. Total PCB (U=1/2) exceedances ranged from 13 to 955 mg/kg-OC, with the highest concentration at station DSI-SB-05 in the 8- to 9.3-foot sample interval. Detected Aroclors included 1248, 1254, and 1260, with one detection of Aroclor 1242. Total PCB concentrations predominantly peaked in the middle of the recent alluvium unit and decreased towards the mudline and sandy contact. All non-detect samples were at or below the SMS criteria.

3.4.3.1.5 Volatile Organic Compounds

VOC results were predominantly below detection limits for all recent alluvium subsurface sediment samples.

1,3,5-trichlorobenzene was detected in five recent alluvium subsurface sediment samples. Detected concentrations ranged from 1.3 to 47 μg/kg, and the highest concentration was in the 10.5- to 11.9-foot sample interval of station DSI-SB-07. This station is located downstream of the Site adjacent to the AML property.

Acetone was detected in all analyzed recent alluvium subsurface sediment samples. Concentrations ranged from 36 to 320 μg/kg and were highest at station DSI-SB-07, which is located downstream of the Site adjacent to the AML property. Acetone concentrations were predominantly higher towards the mudline in the 1- to 2-foot sample interval.

Benzene was detected in one recent alluvium subsurface sediment sample, with a concentration of 4.7 μg/kg. This detection was in the 8- to 8.9-foot sample interval in station DSI-SB-11, which is located at the northern extent of the sampling area.

Chlorobenzene was detected in five recent alluvium subsurface sediment samples. Detected concentrations ranged from 5.7 to 110 μg/kg, with the highest concentrations at station DSI-SB-09 in the 11- to 12.1-foot sample interval. This station is located in the area offshore of the dock. It is bounded by lower concentrations and non-detect samples.

Dichloromethane was detected in seven recent alluvium subsurface sediment samples. Detected concentrations ranged from 2.7 to 19 μg/kg, with the highest concentrations at station DSI-SB-08 in the 7- to 8.7-foot sample interval. This station is located adjacent to former dry dock No. 2 in the 2005 Glacier dredging area.

Toluene was detected in three recent alluvium subsurface sediment samples. Detected concentrations ranged from 2.1 to 3 μg/kg, with the highest concentrations at station DSI-SB-10 in the 5.5- to 7-foot sample interval. This station is located in the area offshore of the dock. It is bounded by lower concentrations and non-detect samples.

3.4.3.1.6 Pesticides

Pesticide results were predominantly below detection limits, with a small number of low-level detections.

3.4.3.1.7 Dioxin/Furans

Concentrations of dioxins/furans (reported as Total TEQ mammalian 2005 U = 1/2) ranged from 12.8 to 686 ng/kg. Ten recent alluvium subsurface sediment samples were analyzed for dioxins/furans, including stations DSI-SB-02, DSI-SB-05, DSI-SB-07, and DSI-SB-09. Dioxin/furan TEQs were highest at station DSI-SB-07 in the 10.5- to 11.9-foot sample interval, which is located just downstream of the Site adjacent to the AML property.

3.4.3.2 Upper Alluvium

Fourteen subsurface sediment samples were analyzed within the upper alluvium unit, and the following sections describe the sediment quality of the upper alluvium unit. Upper alluvium subsurface sediment samples were analyzed in stations DSI-SB-02, DSI-SB-04, DSI-SB-05, DSI-SB-06, DSI-SB-09, DSI-SB-10, DSI-SB-11, and DSI-SB-12. Depths of the upper alluvium contact ranged from 4.3 feet below mudline (at station DSI-SB-12) to 11 feet below mudline (at station DSI-SB-11).

3.4.3.2.1 Conventionals

Upper alluvium subsurface sediment samples were analyzed for TOC and TS. TOC results ranged from 0.265 to 2.19 percent, with two samples outside the acceptable range for OC normalization. TS percentages ranged from 60.4 to 78.1 percent.

3.4.3.2.2 Metals

Arsenic exceeded the SQS value (57 mg/kg) in two samples. Stations DSI-SB-03 and DSI-SB-10 exceeded the SQS in the 10.4- to 11.1-foot and 8.5- to 10-foot sample intervals, respectively. These stations are located offshore of the current dock in the area near the former dry docks. They are bound laterally by stations below the SQS level. A lower sample interval (11.1- to 11.6-foot interval) in DSI-SB-03 was analyzed and arsenic was detected at a concentration below the SQS value. Station DSI-SB-10 is bound vertically by the 10- to 11-

foot sample interval below the SQS level. Arsenic concentrations ranged from 1.3 to 303 mg/kg, with the highest concentration at location DSI-SB-10, which is adjacent to former dry dock No. 1. Arsenic concentrations were highest near the recent alluvium contact and decreased toward the base of the unit. Station DSI-SB-12 is an exception to this trend, with higher concentrations detected in the upper alluvium unit.

Copper was detected in 11 upper alluvium sediment samples and exceeded the SQS value (390 mg/kg) in two samples. Stations DSI-SB-02, DSI-SB-03, DSI-SB-05, DSI-SB-06, DSI-SB-11, and DSI-SB-12 did not have exceedances and effectively bound the lateral extent of copper contamination. Station DSI-SB-09 did not bound the vertical extent of copper due to the exceedance occurring in the lowest sample interval from 12.1 to 12.6 feet. Station DSI-SB-10 is bound vertically by the 10- to 11-foot sample interval below the SMS criteria. Concentrations ranged from 507 to 595 J mg/kg, with the highest concentration at station DSI-SB-10 adjacent to one of the former dry docks. Copper concentrations were highest near the recent alluvium contact and decreased toward the base of the unit. Station DSI-SB-12 is an exception to this trend, with higher concentrations detected in the upper alluvium unit.

Mercury was detected in eight upper alluvium sediment samples and exceeded the SQS value (0.41 mg/kg) in three samples. Stations DSI-SB-03, DSI-SB-09, and DSI-SB-10 had exceedances for mercury. The stations are located in the area offshore of the current dock. Mercury concentrations ranged from non-detect (0.02 U) to 2.4 mg/kg, with the highest concentration at station DSI-SB-09, which is located adjacent to a former dry dock. Mercury concentrations were highest near the recent alluvium contact and decreased toward the base of the unit. Station DSI-SB-09 did not bound the vertical extent of mercury, due to the exceedance occurring in the lowest sample interval from 12.1 to 12.6 feet. Station DSI-SB-10 is bound vertically by the 10- to 11-foot sample interval below the SMS criteria.

Zinc was detected in 11 upper alluvium sediment samples and exceeded the SQS value (410 mg/kg) in two samples. Stations DSI-SB-03 and DSI-SB-10 exceeded SMS criteria in the 10.4- to 11.1-foot and 8.5- to 10-foot sample intervals, respectively. These stations are located offshore of the current dock in the area near the former dry docks. They are bound laterally by stations with concentrations that are below the SMS criteria. A lower sample interval (11.1- to 11.6-foot interval) in DSI-SB-03 was analyzed and zinc was detected at a concentration below the SQS value. Station DSI-SB-10 is bound vertically by the 10- to 11-foot sample interval below the SMS criteria. Zinc concentrations ranged from 609 J to 1,050 J mg/kg, with the highest concentration at station DSI-SB-10, which is adjacent to Former Dry Dock No. 1. Zinc concentrations were highest near the recent alluvium contact and decreased toward the base of the unit. Station DSI-SB-12 is an exception to this trend, with higher concentrations detected in the upper alluvium unit.

3.4.3.2.3 Tributyltin

Bulk TBT was analyzed in 10 upper alluvium subsurface sediment samples. TBT was detected in eight of the 10 samples, and ranged from 3.2 U to 3,900 µg/kg. Four samples exceeded the DMMP SL of 73 µg/kg, including stations DSI-SB-03, DSI-SB-09, DSI-SB-10, and DSI-SB-11, which are located in the area adjacent to the current dock. The highest TBT concentration was at station DSI-SB-03 in the 10.4- to 11.1-foot sample interval. A lower sample interval (11.1- to 11.6-foot interval) in DSI-SB-03 was analyzed and TBT was detected at a concentration below the DMMP screening level. Stations DSI-SB-09 and DSI-SB-11 did not bound the vertical extent of TBT due to the exceedance occurring in the lowest sample interval at the base of the core. Station DSI-SB-10 is bound vertically by the 10- to 11-foot sample interval below the DMMP criteria. TBT concentrations were highest near the recent alluvium contact.

3.4.3.2.4 Semivolatile Organic Compounds

PAHs: Stations DSI-SB-02, DSI-SB-05, DSI-SB-11, and DSI-SB-12 did not have SQS exceedances for PAHs. These locations effectively bound the lateral extent of PAH contamination to the south and north of the Site.

Total LPAH was detected in eight upper alluvium sediment samples and exceeded the SMS SQS value (370 mg/kg-OC) in one sample. Station DSI-SB-10 had an LPAH concentration of 454 mg/kg-OC in the 8.5- to 10-foot sample interval. This station is surrounded on all sides by stations below the screening level, effectively bounding the lateral extent of LPAH contamination. Station DSI-SB-10 is bound vertically by the 10- to 11-foot sample interval, with a LPAH concentration of 17 mg/kg-OC, which is well below the SMS criteria. Total

LPAH concentrations were highest near the recent alluvium contact and decreased towards the base of the unit.

Total HPAH was detected in seven upper alluvium sediment samples and exceeded the SMS SQS value (960 mg/kg-OC) in one sample. Station DSI-SB-10 had an HPAH concentration of 1,224 mg/kg-OC in the 8.5- to 10-foot sample interval. This station is surrounded on all sides by stations below the SMS criteria effectively bounding the lateral extent of HPAH contamination. Station DSI-SB-10 is bound vertically by the 10- to 11-foot sample interval, with a HPAH concentration below detection limits (7.17 U mg/kg-OC), which is well below the SMS criteria. Total HPAH concentrations were highest near the recent alluvium contact and decreased towards the base of the unit.

Chlorobenzenes: 1,2-dichlorobenzene was detected in seven upper alluvium sediment samples and exceeded the SQS value (2.3 mg/kg-OC) in one sample. Station DSI-SB-09 contained an exceedance of 5.1 mg/kg-OC in the 12.1- to 12.6-foot sample interval and is located in the area adjacent to the current dock near the federal navigation channel boundary. The stations with exceedances are bounded to the north and the south in the upper alluvium, effectively defining the lateral nature and extent of contamination in the upper alluvium. A lower interval in DSI-SB-03 is being analyzed to vertically bound the nature and extent of contamination.

Phthalates: Bis(2-ethylhexyl)phthalate was detected in five samples and exceeded the SQS value (47 mg/kg-OC) in three samples. Stations DSI-SB-03, DSI-SB-09, and DSI-SB-10 contained exceedances. They are located adjacent to the dock and former dry docks. Exceedances ranged from 63.9 to 117 mg/kg-OC and were generally concentrated in the sample directly beneath the recent alluvium contact. Station DSI-SB-09 did not bound the vertical extent of bis(2-ethylhexyl)phthalate, due to the exceedance occurring in the lowest sample interval at the base of the core. Stations DSI-SM-03 and DSI-SB-10 are bound vertically, with concentrations below detection limits (7.2 U mg/kg-OC), which is well below the SMS criteria.

Phenolics: Phenolics were below detection limits in the majority of the upper alluvium sediment samples.

Miscellaneous Extractables: Dibenzofuran was detected in six samples and exceeded the SQS value of 15 mg/kg-OC in one sample. Station DSI-SB-10 contained an exceedance of 25.5 mg/kg-OC in the 8.5- to 10-foot sample interval, and is located adjacent to the current dock. This exceedance is bounded in all directions, effectively defining the lateral nature and extent of contamination. Station DSI-SB-10 is bound vertically by the 10- to 11-foot sample interval with a concentration below detection limits (7.2 U mg/kg-OC), which is well below the SMS criteria.

3.4.3.2.5 Volatile Organic Compounds

Acetone was detected in all analyzed upper alluvium subsurface sediment samples. Concentrations ranged from 14 to 64 µg/kg and were highest at station DSI-SB-06, which is located downstream of the Site adjacent to the AML property.

Chlorobenzene was detected in one upper alluvium subsurface sediment sample. The detected concentration of 2.7 µg/kg was located in station DSI-SB-10 in the 10- to 11-foot sample interval. This station is located in the area offshore of the dock. It is bounded laterally by lower concentrations and non-detect samples.

Dichloromethane was detected in two of the five upper alluvium subsurface sediment samples. Detected concentrations ranged from 19 to 22 µg/kg in stations DSI-SB-06 and DSI-SB-02 in the 9.6- to 11-foot and 8.5- to 10-foot sample intervals, respectively. Those stations are located offshore of AML and adjacent to Former Dry Dock No. 2 in the 2005 Glacier dredging area, respectively.

Ethylbenzene was detected in one of the five upper alluvium samples. Station DSI-SB-10 had a concentration of 3.5 µg/kg in the 10- to 11-foot sample interval, which is well below the marine lowest apparent effects threshold (LAET) value of 10 µg/kg. This station is located in the area offshore of the dock and is bounded laterally by lower concentrations and non-detect samples.

3.4.3.2.6 Polychlorinated Biphenyls

Total PCBs were detected in eight upper alluvium subsurface samples and exceeded the SQS value of 12 mg/kg-OC in five samples. Stations DSI-SB-02, DSI-SB-03, DSI-SB-09, DSI-SB-10, and DSI-SB-11 had samples that exceeded the screening levels. Total PCB (U=1/2) exceedances ranged from 21 to 101 mg/kg-OC, with the highest concentration at station DSI-SB-09 in the 12.1- to 12.6-foot sample interval. Detected aroclors included 1248, 1254, and 1260, with aroclor 1254 having the largest concentrations. Total PCB concentrations were highest near the recent alluvium contact and decreased towards the base of the unit. All non-detect samples were at or below the SQS values.

3.4.3.2.7 Pesticides

Results were non-detect in all four of the upper alluvium subsurface sediment samples that were analyzed for pesticides.

3.4.3.2.8 Dioxin/Furans

Concentrations of dioxins/furans (reported as total TEQ mammalian 2005 U=1/2) ranged from 0.51 to 0.56 ng/kg for subsurface sediment samples analyzed within the upper alluvium. A total of two subsurface sediment samples were analyzed for dioxins/furans, at stations DSI-SB-02 and DSI-SB-05.

3.4.3.3 Lower Alluvium

A total of six subsurface sediment samples were analyzed within the lower alluvium unit, and the following sections describe the sediment quality of the lower alluvium unit. Lower alluvium subsurface sediment samples were analyzed in stations DSI-SB-01, DSI-SB-03, DSI-SB-04, DSI-SB-07, and DSI-SB-13. Depths of the upper contact ranged from 3.1 feet below mudline (at station DSI-SB-01) to 11.9 feet below mudline (at station DSI-SB-07).

3.4.3.3.1 Conventionals

Lower alluvium subsurface sediment samples were analyzed for TOC and TS. TOC results ranged from 0.13 to 0.95 percent, with four of the six samples outside the acceptable range for OC normalization. TS percentages ranged from 76.9 to 86.7 percent.

3.4.3.3.2 Metals

Arsenic was detected and exceeded the SQS value (57 mg/kg) in one sample. Station DSI-SB-04 exceeded the SQS value, with a concentration of 802 mg/kg in the 8.3- to 9.3-foot sample interval. DSI-SB-04 also contained exceedances of the SQS values for copper, lead, mercury, and zinc in the 8.3- to 9.3-foot sample interval. Copper was detected at 1,090 mg/kg above the screening level (390 mg/kg), lead was detected at 740 mg/kg above the screening level (450 mg/kg), mercury was detected at 1.4 mg/kg above the screening level (0.41 mg/kg), and zinc was detected at 2,140 mg/kg above the SL of 410 mg/kg. This station is located offshore of the current dock in the nearshore area of the Site. A lower sample interval (the 9.3- to 10.9-foot interval) in DSI-SB-04 was analyzed, and arsenic was detected at a concentration below the SQS value.

3.4.3.3.3 Tributyltin

Bulk TBT was analyzed in six lower alluvium subsurface sediment samples. TBT was detected in four of the six samples, with concentrations ranging from 3.4 U to 710 μg/kg. A sample collected from station DSI-SB-04 in the 8.3- to 9.3-foot interval exceeded the DMMP SL of 73 μg/kg. The station is located in the area adjacent to the current dock and nearshore area. A lower sample interval (the 9.3- to 10.9-foot interval) in DSI-SB-04 was analyzed and arsenic was detected at a concentration below the DMMP screening level. All other samples analyzed from the lower alluvium unit were below the screening level.

3.4.3.3.4 Semivolatile Organic Compounds

PAHs: PAHs were detected in the majority of the lower alluvium subsurface sediment samples and included exceedances of the screening levels for acenaphthene, benzo(g,h,i)perylene, fluoranthene, and phenanthrene. Stations DSI-SB-04 and DSI-SB-07 had SQS exceedances for PAHs. These stations are located in the area adjacent to the current dock and downstream of the Site adjacent to the AML property.

Total LPAH was detected in three lower alluvium sediment samples and did not exceed the SQS value (370 mg/kg-OC) in any of those samples. Detected concentrations ranged from 34.1 to 209 mg/kg-OC, with the highest concentration in the 8.3- to 9.3-foot sample interval of DSI-SB-04. A lower sample interval (the 9.3- to 10.9-foot interval) in DSI-SB-04 was analyzed, and total LPAH was detected at a concentration below the SQS value.

Total HPAH was detected in four lower alluvium sediment samples and did not exceed the SQS value (960 mg/kg-OC) in any of those samples. Detected concentrations ranged from 71.7 to 722 mg/kg-OC, with the highest concentration in the 8.3- to 9.3-foot sample interval of DSI-SB-04. A lower sample interval (the 9.3- to 10.9-foot interval) in DSI-SB-04 was analyzed, and total HPAH was detected at a concentration below the SQS value.

Chlorobenzenes: Chlorobenzenes were detected in only one of the upper alluvium subsurface sediment samples.

Phthalates: Bis(2-ethylhexyl)phthalate was detected and exceeded the SQS value (47 mg/kg-OC) in one sample. Station DSI-SB-04 had a concentration of 126 mg/kg-OC in the 8.3- to 9.3-foot sample interval. This station is located offshore of the current dock. A lower sample interval (the 9.3- to 10.9-foot interval) in station DSI-SB-04 was analyzed, and Bis(2-ethylhexyl)phthalate was detected at a concentration below the SQS value.

Phenolics: Phenolics were below detection limits in the majority of the lower alluvium sediment samples.

Miscellaneous Extractables: Miscellaneous extractables were below detection limits in the majority of the lower alluvium sediment samples.

3.4.3.3.5 Volatile Organic Compounds

VOCs were analyzed in one lower alluvium subsurface sediment sample. The 5- to 6-foot sample interval of station DSI-SB-01 was below detection limits for all VOC compounds, with the exception of acetone detected at 17 µg/kg.

3.4.3.3.6 Polychlorinated Biphenyls

Total PCBs were detected in all five lower alluvium subsurface samples that were analyzed for PCBs and exceeded the SQS value of 12 mg/kg-OC in two samples. Station DSI-SB-04 exceeded the SQS value in the 8.3- to 9.3-foot sample interval, with a concentration of 130 mg/kg-OC and station DSI-SB-13 exceeded the SQS value in the 4.1- to 5-foot sample interval, with a concentration of 154 mg/kg-OC. These stations are located adjacent to the former graving dock and offshore of the current dock, respectively. Detected aroclors included 1248, 1254, and 1260, with aroclor 1254 having the largest concentration.

3.4.3.3.7 Pesticides

Pesticides were analyzed in one lower alluvium subsurface sediment sample, DSI-SB-01 in the 5- to 6-foot sample interval. No pesticides were above detection limits.

3.4.3.3.8 Dioxin/Furans

Dioxin/furans were analyzed in one lower alluvium subsurface sediment sample (11.9- to 12.3-foot sample interval) at DSI-SB-07. A TEQ concentration of 15.9 ng/kg was detected at this location.

4 UPDATED PRELIMINARY CONCEPTUAL SITE MODEL

This section presents an update to the preliminary CSM for the Site. The updated preliminary CSM is based on the existing information summarized in Sections 2 and 3 of this Supplemental RI Work Plan, and incorporates results from the data collected during the 2009 upland and 2011 sediment investigation efforts. The preliminary CSM was updated based on Ecology's December 5, 2012 comments and subsequent meetings between Ecology and DSI.

The updated preliminary CSM is used to assess the current status of source control and to assess the potential need for future remedial actions. This updated preliminary CSM integrates all investigation data collected at the Site to date (including all upland and sediment investigation efforts) and presents a current framework for assessing contaminants and their impact on environmental receptors. The updated preliminary CSM described in this section is used to identify remaining data gaps (Section 5), develop the scope of Supplemental RI activities described in Section 6, and serve as the baseline for ongoing development of the CSM in the draft RI/FS Report.

4.1 Historical and Current Contaminants and Potential Sources

The first part of this updated preliminary CSM is the definition of both historical and current contaminants and potential sources. Section 2 of this Supplemental RI Work Plan provides a discussion of the historical shipyard operations and material handling to provide the context for evaluating potential contamination sources. Section 3 presents an updated description of environmental quality based on all upland and sediment data collected at the Site to date. Table 1 presents the historical shipyard operations by area and the potential historical sources of contamination to environmental media. Graphical interpretation of historical and current potential sources is presented on Figure 11a, and Figures 11b and 11c show conceptual cross sections of the southern and central areas of the Site, respectively. These conceptual site model figures provide information on current and historical operations for both the DSI and Former Glacier/Reichhold/U.S. Army property, and Figures 2 and 3 show overlap of property use by all parties at the current southern boundary of the Site.

The preliminary CSM is used to assess whether known and/or potential sources of historical and current contamination have been controlled. Additionally, this assessment evaluates both contaminants originating on site as well as contaminants originating from off-site sources. The following sections discuss upland and sediment contaminants as identified by previous RI data collection conducted at the Site.

4.1.1 Upland Contaminants

As discussed in Section 3, soil and groundwater contaminants that exceed MTCA Method A and MTCA Method C preliminary screening levels were identified in the upland areas (Northwest Area, Rail Spur Area, Central Area, 2000 UST Removal Area, and South Property Area) and nearshore areas (Former Shipyard Nearshore Area and Parcel D Nearshore Area) at the Site. The contaminants identified in each upland and nearshore area and potential sources are summarized as follows:

- <u>Northwest Area.</u> Historical operations in the Northwest Area, including material handling associated with the former machine shop, gasoline UST and refueling activities, spent grit storage, and general shipyard operations, had the potential for contaminant releases to soil and groundwater. Subsurface soil and groundwater impacts identified during upland sampling in 2006 and 2009 are typically localized and may be attributed to placement of fill material and/or historical site operations. Supplemental soil and groundwater sampling proposed for this area will further delineate the horizontal and vertical nature and extent of contamination and will including testing for metals, carcinogenic PAHs (cPAHs), TPH, and a full list of site-wide COCs (Table 9).

- <u>Rail Spur Area.</u> Though not a main operational area for DSI, the Rail Spur Area included wood (joiner) and electrical shop building where wood stains, varnishes, switches, breakers and contact cleaners were historically used (Figure 2). In addition, the U.S. Army and Reichhold used the area adjacent to the former Northern Pacific Railway spur for temporary railcar parking and to access the former warehouse and laboratory facilities (Figure 2). Upland investigations in 2006 and 2009 identified elevated concentrations of arsenic in Rail Spur Area soil and groundwater that exceed

MTCA preliminary screening levels. Elevated arsenic concentrations have also been recently documented in soil and groundwater immediately south of the Rail Spur Area on Glacier property (Appendix G). It is possible that an off-property source of arsenic in groundwater contributes to elevated groundwater concentrations observed on the Site. Vinyl chloride was also detected in the Rail Spur Area, however, concentrations of vinyl chloride cannot be attributed to a specific historical source located on the Site. Supplemental soil and groundwater sampling proposed for this area will further delineate the horizontal and vertical nature and extent of contamination and will including testing for metals (including arsenic), VOCs, cPAHs, and a full list of Site-wide COCs (Table 9).

- <u>Central Area.</u> The Central Area includes the upland portion of the Site where the former office building, employee parking, machine shops, steel and pipe shop, and former stormwater line were located (Figure 2). Day-to-day activities at the office building and parking areas are not likely to have resulted in the generation or release of contamination, and operational activities at the machine and steel and pipe shops were contained within the structures. The minor screening level exceedances for arsenic in deep groundwater and vinyl chloride in shallow groundwater are not attributed to a source located on the Site, and may be representative of background concentrations in this area. Groundwater infiltration from the former stormwater line may contribute to site groundwater quality. Supplemental soil and groundwater sampling proposed for this area will further delineate the horizontal and vertical nature and extent of contamination and will including testing for metals, cPAHs, and a full list of site-wide COCs (Table 9).

- <u>2000 UST Removal Area.</u> The 2000 UST Removal Area includes the former location of four gasoline and diesel USTs that were removed as part of a previous remedial action (Figure 2). The 2000 UST Removal Area was historically used for sidetracking operations (involving paints and solvents) as vessels were brought to the uplands (via the marine railway) for hull repair and maintenance (Table 1). The 2009 RI investigation identified TPH contamination in soil that is likely attributed to leaks/spills associated with the former USTs. Elevated PAH levels in soil were detected during the 2006 RI activities; the source of PAHs in this area appear to be localized and associated with former shipyard operations (i.e., use of solvents). Supplemental soil and groundwater sampling proposed for this area will further delineate the horizontal and vertical nature and extent of contamination and will including testing for TPH, PAHs, and a full list of Site-wide COCs (Table 9).

- **South Property Area.** The South Property Area was historically utilized by DSI for storage of spent sandblast grit, hazardous waste, and paint (Figure 2). Prior to purchase of the property by the Port and then DSI, the southern portion of this area was also historically utilized by the U.S. Army and Reichhold for drainage of materials from the upland areas of the Former Glacier/Reichhold/U.S. Army property to the LDW. Former Army/Reichhold surface drainage occurred along a network of surface ditches adjacent to the former Reichhold operations buildings immediately north of the current DSI property boundary (Figure 2). Former Army/Reichhold also conveyed septic drainage through a subsurface pipeline that was connected to a septic tank before discharging to the former Army/Reichhold shoreline outfall location shown on Figure 2. As documented in the Former Glacier/Reichhold/U.S. Army RI/FS Work Plan (ERM 2012), the pipeline and septic tank were connected to lavatory facilities during the time that the U.S. Army occupied the property. These lavatory facilities were later converted into laboratories for use by Reichhold in its chemical processing and handling operations at the property. Since the pipeline and septic system remained intact during Reichhold operations, it is possible that the former septic tank was a source of contamination to surrounding soil, groundwater, and sediment. An investigation of the former septic tank location and surrounding media are proposed as part of supplemental RI activities. In addition, supplemental soil and groundwater sampling in this area will be conducted to further delineate the horizontal and vertical nature and extent of contamination and will including testing for a full list of Site-wide COCs (Table 9).

Additional data collected by ERM as part of ongoing remedial investigation efforts at the Former Glacier/Reichhold/U.S. Army property are being evaluated and will be used to update this preliminary CSM during development of the draft RI/FS Report.

- **Former Shipyard Nearshore Area.** The Former Shipyard Nearshore Area includes locations of many of the former shipyard operations along the Site's eastern shoreline (Figure 2). The steel and pipe shop, located at the northeastern corner of the property, was historically used for metal production and fabrications used at the shipyard (Table 1). Previous RI soil sampling in 2006 and 2009 identified metals contamination potentially attributed to spillage of materials outside of the steel and pipe shop building. PAH contamination was found in surface and subsurface soils throughout the area and is likely attributed to placement of impacted fill material and potentially to leaching of contaminants from the creosote-treated timber bulkhead into the nearshore soils. Gasoline and diesel contamination detected in soil samples from the 2009 investigation may be attributed to spillage of materials at the Site and spread of contamination from the UST Removal Area. The majority of the contaminants identified in soil samples collected in 2006 and 2009 were not detected in local groundwater samples, with the exception of TPH-Dx observed in shallow groundwater at DSI-11 in 2006. This boring is co-located with DSI-MW-08 (installed in 2009) and no diesel contamination was identified in the shallow groundwater sample collected from this monitoring well in 2009.

  Soil contaminants detected in the Former Shipyard Nearshore Area could potentially leach to groundwater and discharge to the LDW. In addition, soil migration to sediments (via erosion through the existing timber bulkhead) is a potential ongoing source of contamination to the LDW sediments and surface water. A reconnaissance to identify seeps along the shoreline in this area will be performed as part of supplemental RI activities; identified seeps will be collected and submitted for analysis. Supplemental soil groundwater, and potential seep sampling proposed for this area will further delineate the horizontal and vertical nature and extent of contamination and will including testing for TPH, PAHs, and a full list of Site-wide COCs (Table 9).

- **Parcel D Nearshore Area.** The Parcel D Nearshore Area was purchased by DSI in conjunction with acquisition of the South Property Area (Figure 2). This area includes a small strip of land that was historically utilized for equipment laydown, staging, and completion of small parts blasting operations (in a shed structure; Table 1). Prior to DSI ownership of the Parcel D Nearshore Area, a waste treatment tank was constructed and utilized by Reichhold (as evidenced by the 1958 aerial photograph; Appendix D). The waste treatment tank footprint included the approximate area where soil and groundwater investigations were completed in 2006 and 2009. Specific historical operations associated with the waste treatment tank are not provided in the documents produced by Glacier/Reichhold; however, the soil and groundwater contamination observed in this area is attributed to historical operations of the waste treatment tank and other upland operations conducted by the U.S. Army and Reichhold to the east of the Parcel D Nearshore Area.

Based on historical operations, the Parcel D Nearshore Area includes a potential source of soil and groundwater contamination that may migrate to the LDW. Contaminated soil may be transported to the LDW via erosion processes and groundwater may migrate from the nearshore area to LDW surface water. Supplemental soil and groundwater sampling proposed for this area will further delineate the horizontal and vertical nature and extent of contamination and will including testing for a full list of Site-wide COCs (Table 9).

Summary of Additional Nearshore Data Screening

In addition to the screening level evaluations described in this section and in Section 3, nearshore soil and groundwater data collected in 2006 and 2009 were also preliminarily screened against Washington Marine Water Quality Criteria (acute and chronic thresholds). Results of this preliminary screening effort are presented in Table 6, and the only exceedances of acute and chronic screening levels were observed in the deep nearshore monitoring wells (DSI-MW-07 and DSI-MW-10) for copper and nickel. These deep wells are screened at approximately 30 to 40 feet bgs, and are considered representative of deep background groundwater conditions below the soil and shallow groundwater impacts associated with the Site. The concentrations of copper and nickel observed in these deep monitoring wells are attributed to background conditions and not representative of contamination associated with historical or current operations at the Site. All other nearshore soil and groundwater data are below the acute and chronic thresholds for Washington Marine Water Quality. These preliminary screening levels were used to help identify data gaps. Upon completion of the supplemental investigation work, the compiled dataset will be evaluated for Site ARARs, and results of this evaluation will be used to determine applicable screening levels, preliminary cleanup levels, and remedial action levels to support development of the draft RI/FS Report for the Site.

4.1.2 Sediment Contaminants

Sediment contaminants identified during previous LDW and DSI Phase 1 RI sampling activities include heavy metals, TBT, dioxins/furans, chlorinated benzenes, pentachlorophenol, phthalates, PAHs, and PCB Aroclors, as described below.

Metals and TBT

Heavy metals arsenic, cadmium, copper, lead, mercury, and zinc and are primarily attributed to historical use of sandblast grit on the dry dock structures at the Site. TBT was introduced to shipyard operations in approximately the late 1960s and used on the dry docks until these structures were decommissioned and removed from the Site in the mid-2000s. Concentrations of heavy metals and TBT generally increase with depth in subsurface sediment samples collected as part of the LDW and DSI Phase 1 sediment investigation efforts, suggesting that the contamination is primarily associated with historical operations and has since been buried by the deposition of cleaner sediments. Chemical testing of 11 surface sediment samples as part of the DSI Phase 1 RI activities confirm this observation with the exception of TBT contamination. TBT was detected at concentrations exceeding the SMS SQS screening level in four surface sediment samples located in the northern portion of the Site sediment area, between the northern end of the DSI timber pier and AML pier. The presence of TBT in surface sediments at these locations is potentially attributed to other LDW sources and not only to current operations conducted at the DSI pier.

Arsenic was not detected above sediment screening levels in catch basin sediment, although it was present at elevated concentrations in surface and subsurface sediments. The presence of elevated arsenic concentrations in deeper sediments suggests that the contamination occurred predominantly during the earlier period of operations at the shipyard, rather than during its more recent history.

Dioxins/Furans

Concentrations of dioxin/furan compounds are highest in surface sediments within Glacier Bay, as evidenced by the results of LDW investigation efforts in this area. Surface sediment samples were analyzed for dioxin/furan compounds at eight of the 11 surface sediment sample locations for the DSI Phase 1 Investigation effort, and results indicate that surface sediment concentrations are similar to background observed throughout the LDW study area. Subsurface sediment concentrations for dioxin/furan compounds are similar to surface sediment conditions at the Site, with the exception of two locations. One LDW sediment core (LDW-SC26), located adjacent to the DSI pier, identified a dioxin/furan concentration of 136 parts per trillion (ppt) at a sample depth of 6 to 8 feet below the sediment surface. One other sediment core (DSI-SB-07), collected as part of Phase 1 sediment investigation efforts, identified a dioxin/furan concentration of 686 ppt at a depth of 10.5 to 11.9 feet bgs. DSI-SB-07 is located to the north of the Site adjacent to the existing AML property and former graving dock facility. The source of these elevated dioxin/furan concentrations is not known at this time. Dioxins/furans have not been tested in upland soil at the DSI property; however, past operations do not suggest that the shipyard is a source of these contaminants to LDW sediments.

Chlorinated Benzenes and Pentachlorophenol

Chlorinated benzenes and PCP have been detected in subsurface sediments adjacent to the Site in areas downstream from the former Glacier/Reichhold/U.S. Army operations. Seep testing performed during the LDW RI/FS process did not identify ongoing surface water discharges of these compounds; however, sediment contamination is known to remain within the Glacier Bay area. The potential presence of chlorinated benzene and PCP contamination will be investigated as part of RI/FS investigations that will be conducted at the former Glacier/Reichhold/U.S. Army property. These contaminants were not detected at elevated concentrations in upland and nearshore soil and groundwater samples collected at the Site.

Phthalates, PAHs, and PCB Compounds

Phthalates, PAH compounds, and PCB compounds have been detected broadly throughout the LDW surface and subsurface sediments. These contaminants are known to have numerous confirmed and suspected sources within the LDW, and are not attributed to operations associated with past or current shipyard activities at the Site. PAH contamination is present in subsurface sediment within and around the footprint of the existing DSI pier. This contamination may be attributable to leaching of wood treatment products (i.e., creosote) from the timber structural elements (piles) associated with the DSI pier. PAH compounds are present in the upland and nearshore soils on the Site, but are generally not observed in groundwater. The DSI upland and nearshore areas are not assumed to be a source of PAH contamination to the LDW sediments or surface water except for in the Parcel D Nearshore Area. Additional investigation of the former Glacier/Reichhold/U.S. Army property is needed to determine whether that upland property area is a source of PAH contamination to the LDW.

Biological Testing

Bioassays have been used in previous LDWG investigations (e.g., Windward 2007) to assess potential toxicity of sediment contaminants to benthic organisms. Results of these tests are often difficult to correlate with specific contaminants, especially when multiple contaminants are present within the sediment. Results indicate that areas of sediment toxicity are present adjacent to the Site as well as in areas of the LDW upstream and downstream. Bioassay sample collection and testing were not completed as part of the Phase 1 DSI sediment investigation and are not proposed for the supplemental RI effort.

4.2 Nature and Extent of Contamination

Based on historical site uses and previous RI data collection activities, upland contamination has been broadly delineated for each of the DSI site areas as described in Section 4.1.1. Supplemental RI activities are proposed to further delineate the horizontal and vertical extent of upland contamination at the Site. Based on the above evaluation and comments provided by Ecology in February 2011 and December 2012, questions remain about the full extent and significance of the detected contaminants within the upland and nearshore areas of the Site. Sections 5 and 6 of this Supplemental RI Work Plan identify data gaps that remain within these areas and propose additional investigations to be completed that address each data gap.

Based on data collected as part of LDW investigation and DSI Phase 1 RI sediment activities, sediment contaminants have been identified and the boundaries of sediment impacts potentially associated with the DSI Site and its historical uses have been broadly defined. Ecology's February 2011 comments regarding data gaps in sediment areas were addressed during the Phase 1 sediment investigation effort, which was completed in March 2011. Collection of additional sediment data in the former marine railway area and the LDW is proposed to further delineate the horizontal and vertical nature and extent of sediment contamination and to support the development of a draft RI/FS Report for the Site.

4.2.1 Upland Nature and Extent of Contamination

Known upland contaminants are described in Section 4.1.1. Figures 11a, 11b, and 11c present a conceptual layout of historical and current upland operations at the Site and adjacent former Glacier/Reichhold/U.S. Army property, and show conceptual pathways for migration of this contamination towards the LDW and potential upland and in-water receptors. The impacts to each of the areas appear to be localized and bounded to the specific area or adjacent properties. Evaluation of investigation data being collected at the former Glacier/Reichhold/U.S. Army property will be completed during development of the draft RI/FS Report in order to determine if this property is a source of contamination to the Site.

4.2.2 Sediment Nature and Extent of Contamination

The area of sediment impacts potentially associated with the Site and its historical uses has been broadly delineated by surface and subsurface sediment sampling immediately north, east, and south of the Site. As described in Section 3 and summarized in Section 4.1, the concentrations of Site COCs (i.e., chemicals associated with past and current shipyard operations) in the sediment area generally increase with depth below the mudline, with the base of contamination influenced by the overall depth of recent sediments and historical patterns of dredging and channel maintenance. Figures 11a, 11b, and 11c present conceptual migration pathways and potential receptors for contamination to the LDW potentially resulting from former shipyard operations associated with the dry docks.

No surface or subsurface sediment data have been collected within under-structure areas of the DSI timber dock and marine railway structures. Visual observation of the under-structure areas has identified the presence of debris and sand blast grit at the sediment surface, and the density of treated timber piling within these areas suggests that subsurface sediments are potentially impacted to tip elevations of the timber piles. Surface and shallow subsurface sediment sampling is proposed for the former marine railway area to identify the nature and extent of impacts to sediment, as practicable by access and available sampling methodology.

4.3 Fate and Transport

Multiple processes can affect the fate and transport of contaminants. For upland and shoreline/sediment areas, processes that may transport contamination are listed, along with those that may attenuate contaminant migration, terminate exposure pathways, and/or destroy/neutralize the contamination prior to reaching the receptor.

4.3.1 Upland Processes

Impacts to the upland portion of the Site are associated with surface and subsurface soils, and shallow groundwater (within the fill soils above the permeable silt layer; Figure 11b). Exposure of contaminated subsurface soils is limited in some areas by overlying pavement or foundations.In others areas of the Site, contaminated surface and/or near-surface soils are exposed and without pavement cover. Potential pathways that could result in the transport of upland contaminants are shown on Figures 11b and 11c and include the following:

- Stormwater entrainment
- Soil leaching
- Groundwater migration
- Groundwater extraction
- Vapor migration

As discussed in Sections 5 and 6 of this Supplemental RI Work Plan, additional upland and nearshore information is required in order to assess the impact of these fate and transport processes on contaminants identified in the upland and nearshore portions of the DSI property and their potential receptors.

4.3.2 Shoreline and Sediment Processes

Processes that may result in exposure of contaminated materials to benthic or aquatic receptors include the following:

- Wind and wave erosion
- River scour
- Seismic disturbances
- Propwash or anchor drag
- Construction disturbances

Additional evaluations will be performed as part of the supplemental RI and development of the draft RI/FS Report in order to assess the nature and extent of sediment contamination, potential stability of shoreline sediments, and future impacts of contaminated sediments associated with the Site to the LDW.

4.4 Potential Receptors

In Section 3 of this Supplemental RI Work Plan, all existing environmental data, including upland data collected in 2006 and 2009 and sediment data collected in 2011, are compared to preliminary screening levels based on default MTCA (Method A and Method C) and SMS cleanup levels, and to preliminary screening levels for sediment contaminants regulated under SMS as "other deleterious substances." These comparisons are considered to be preliminary, pending further evaluation of exposure pathways and potentially applicable cleanup levels. The principal upland and aquatic receptors at the Site are shown on Figures 11b and 11c and include the following:

- **Protection of Industrial Workers:** The main potential on-site receptor is a future industrial worker. Direct contact risks for industrial workers can be assessed using MTCA industrial soil cleanup levels. Indoor air exposure risks may require evaluation for areas where VOCs (benzene and vinyl chloride) are present (i.e., the Central Area and the 2000 UST Removal Area); however, current DSI property use by AML does not include any indoor operations.

- **Protection of LDW Aquatic Receptors:** Aquatic receptors in the LDW include fish and shellfish potentially exposed to surface water contaminants. Protection of these receptors can be ensured by preventing adverse impacts of groundwater on surface water quality. Potentially applicable cleanup levels include state and federal water quality criteria protective of human health and ecological receptors.
- **Protection of Benthic Receptors:** Exposure risks for sediment-dwelling organisms and for human consumers of seafood harvested from the LDW will determine applicable cleanup levels for contaminated sediments. These cleanup levels are currently being determined as part of the LDW Superfund remediation process. Cleanup levels for TBT will be consistent with the approach developed for the LDW RI/FS. Cleanup levels for PCBs and dioxin/furan compounds, and potentially for arsenic, continue to be evaluated through the ongoing LDW risk assessment and RI/FS process.

Section 5 of this Supplemental RI Work Plan describes the data gaps affecting the analysis of receptor protection and the development of preliminary cleanup levels applicable to the Site that may be used during development of the draft RI/FS Report. Section 6 describes how these gaps will be filled as part of the proposed scope of work associated with supplemental remedial investigations to be completed at the Site.

5 DATA GAPS ASSESSMENT

This section uses the environmental quality and revised preliminary CSM presented in Sections 3 and 4 to assess the need for additional investigations at the Site. In addition, Ecology provided comment letters regarding the Draft Phase 1 SAP on February 4, 2011 (Appendix C) and the Draft Supplemental RI Work Plan on December 5, 2012 (Appendix C). The 2011 Ecology comment letter included review of and comment on upland data collected in the 2006 and 2009 upland investigation efforts, and also provided comments on the proposed DSI Phase 1 Sediment Investigation effort. Ecology comments and requirements regarding collection of sediment data were incorporated into the Phase 1 Sediment Investigation effort, which was completed in March 2011. The 2012 Ecology comment letter included a review of the Draft Supplemental RI Work Plan and provided comments emphasizing the remaining upland and sediment data gaps. It identified additional environmental investigation needed to develop the RI/FS report. A response to Ecology's December 5, 2012 comments is included in Appendix C. Additional upland and sediment investigations required by Ecology are addressed in the following sections.

5.1 Upland Data Gaps

Data gaps associated with delineation of the nature and extent of contamination in the upland site areas are described below. Following its evaluation of upland data collected in 2006 and 2009, as described in Sections 3 and 4, Ecology identified data gaps and requested additional investigation in the upland and nearshore areas of the Site as follows:

- **Northwest Area:** The extent of soil and groundwater contamination in the Northwest Area was investigated in 2006 and 2009 as part of RI activities. Multiple preliminary screening level exceedances were observed in the deepest analytical sample interval analyzed for soil and in local groundwater monitoring wells. Additional soil and groundwater sampling is required in the vicinity of the spent grit storage shed, machine shop, crane rails, and area adjacent to the western property boundary in order to complete the RI dataset and adequately delineate the horizontal and vertical extent of contamination. Installation of additional groundwater monitoring wells also is required to ensure adequate coverage in this area and to generate a current dataset regarding groundwater quality throughout the upland areas of the Site.

- **Rail Spur Area:** During the 2006 and 2009 investigations, arsenic, vinyl chloride, and other contaminants, were observed in soil and groundwater samples in the Rail Spur Area. Arsenic and cPAHs have also been detected in the former Glacier/Reichhold/U.S. Army property soil and groundwater samples collected adjacent to the Rail Spur Area, immediately south of the DSI property boundary (MW-28S, MW-29S; Figure 10a). Collection of additional soil and groundwater data, including from new stations in the area west of previous investigations adjacent to the railroad tracks, is required to buttress the evaluation of the nature and extent of known arsenic, PAHs, vinyl chloride, and other potential sources of COC contamination in the Rail Spur Area. Review of available testing data from the former Glacier/Reichhold/U.S. Army property is expected to provide additional insight into the source of detected COCs.
- **Central Area:** During the 2006 and 2009 investigations, exceedances of preliminary screening levels of multiple COCs, including VOCs, SVOCs, and metals, were observed in soil and groundwater samples in the Central Area, . Additional soil and groundwater sampling is required near the former steel and pipe shop structure footprint in order to investigate potential sources of metals contamination observed downgradient in the former Shipyard Nearshore Area. Additional soil sampling also is required along the northern property boundary, within the former machine and diesel shop structure footprint and within the former boiler structure footprint, in order to evaluate VOC, TPH, and other potential contamination in this area. Supplemental soil and groundwater sampling adjacent to soil borings advanced in 2006 and 2009 is required to assist in the evaluation of the vertical and horizontal extent of observed vinyl chloride contamination. Additional shallow and deep groundwater sampling throughout the Central Area, including the installation of several new monitoring wells, is required to generate a current dataset regarding groundwater quality for all upland areas of the Site.
- **2000 UST Removal Area:** During the 2006 and 2009 investigations, exceedances of preliminary screening levels of multiple COCs, including TPH, metals, benzene, and cPAHs, were observed in soil and groundwater samples in the 2000 UST Removal Area. The 2000 UST Removal Area includes the location of former side-tracking operations. Ecology’s comments have expressed concern that TBT, metals, and other solvents may have been utilized within this area of the Site as part of historical ship

repair operations. Additional soil and groundwater data collection is required to evaluate the potential presence of TBT and VOCs (e.g., solvents), and to define the vertical extent of known COCs in this upland area of the Site. Additional groundwater sampling is required to generate a current dataset regarding groundwater quality for all upland areas of the Site.

- **South Property Area:** During 2006 and 2009 investigations, exceedances of preliminary screening levels of several COCs, including arsenic, cPAHs, TPH, and several VOCs, were observed in soil and groundwater samples in the South Property Area. Historically, the South Property Area was used for vessel repair and painting and spent grit storage. Additional soil and groundwater data collection is required in the South Property Area to evaluate the potential presence of TBT and PCB Aroclors, and to define the horizontal and vertical extent of known COCs, including VOCs (e.g., chlorinated solvents), metals, and SVOCs, in this upland area of the Site. Additional groundwater sampling is also required to generate a current dataset regarding groundwater quality for all upland areas of the Site. Arsenic and TPH constituents also have been detected in soil and groundwater samples collected at the former Glacier/Reichhold/U.S. Army property adjacent to the South Property Area, immediately south of the DSI property boundary (MW-30S; Figure 10a). Review of available testing data from the former Glacier/Reichhold/U.S. Army property may provide further insight into the source of detected contaminants.
- **Former Shipyard Nearshore Area:** Given the proximity of this area to the LDW shoreline and sediments, historical operations, and previous screening level exceedances of TPH, metals, several VOCs, and cPAHs, additional soil and groundwater data collection is required to fully assess the nature and extent of known and potential (e.g., TBT) contamination in the Former Shipyard Nearshore Area,located downgradient of the 2000 UST Removal Area and historical steel and pipe shop facilities. In light of its location, the extent of TPH and metals contamination in both shallow and deep groundwater zones requires further evaluation in order to update groundwater conditions within this area of the Site. In addition, detections of dioxins/furans in sediments collected during the Phase 1 sediment investigation require additional soil and groundwater testing for dioxins/furans to evaluate the potential soil to sediment pathway.

- **Parcel D Nearshore Area:** During the 2006 and 2009 investigations, multiple COC exceedances were observed in soil and groundwater samples in the Parcel D Nearshore Area, including arsenic, cPAHs, and TPH. PAH impacts detected in soil are potentially attributed to the former Glacier/Reichhold/U.S. Army property waste treatment tank located in this area prior to DSI ownership of this portion of the Site. Additional soil and groundwater data collection is required to fully assess the nature and extent of known and potential (e.g., TBT) contamination in the Former Shipyard Nearshore Area and to obtain a current set of Site-wide groundwater data. TPH constituents also have been detected in groundwater samples collected on the former Glacier/Reichhold/U.S. Army property adjacent to the Parcel D Nearshore Area, immediately southwest of the DSI property boundary (MW-35S; Figure 10a). A review of available testing data from the former Glacier/Reichhold/U.S. Army property will be completed to provide additional insight into the source of detected contaminants in this area of the Site.
- **Stormwater and Catch Basin Solids:** The nature and extent of potential Site contamination associated with former shipyard pollutants present in stormwater or catch basin solids have not been evaluated. AML is routing Site stormwater to a series of treatment systems prior to discharge to the LDW from the AML property outfall (Figure 4). Sampling of Site stormwater and catch basin solids prior to off-site treatment and discharge is required to evaluate potential contamination migration pathways via Site stormwater to LDW surface water and sediments.
- **Seeps:** Seeps have not been documented or sampled as part of historical investigations completed at the Site to date. Impacts to groundwater have been documented for soils and groundwater in the nearshore areas of the Site. Identification, and potential sampling and testing of seeps along the Site's eastern shoreline for all Site COCs is required to evaluate the potential groundwater contamination migration pathway to LDW sediments and surface water.

5.2 Sediment Data Gaps

Surface and subsurface sediment data have been collected at the Site as part of LDW and DSI Site investigations. Summaries of these investigation efforts are presented in Section 3 and DSI Phase 1 sediment investigation data, collected in 2011, are provided in Tables 7 and 8.

As mentioned in Section 4, surface and subsurface sediment data have not been collected within the under-structure areas of the DSI timber dock and marine railway in light of access difficulty and safety considerations for sample collection at this area of the Site. It is possible that portions of the former marine railway would be removed during future construction and/or cleanup activities; as this area was used for historical shipyard operations, delineation of the nature and extent of contamination in surface and subsurface sediments is required to evaluate the potential for contamination migration to LDW sediments. Access is difficult to these areas of the Site, and the presence of significant debris at the sediment surface and treated timber pilings may present challenges for collection of surface and subsurface sediment data. To the extent practicable by the available sampling methodologies, and in light of concerns with access, sediment sampling is required to better understand the vertical and horizontal extent of sediment contamination in the former marine railway area of the Site.

Multiple Site COCs were detected above SMS SQS criteria during the 2011 Phase 1 sediment investigation of surface and subsurface sediments. In surface sediments, TBT, SVOCs, and PCB Aroclors exceeded preliminary screening levels. Contaminants detected in surface sediments also include dioxins/furans and metals, though SMS SQS criteria are not available for these COCs. In subsurface sediments, metals, TBTs, SVOCs, and PCB Aroclors exceeded preliminary screening levels. Dioxins/furans were detected in all subsurface samples in which they were analyzed. In addition, detections of dioxins/furans in surface and subsurface sediments collected by ERM for the former Glacier/Reichhold/U.S. Army property (Appendix G) to the south of the Site indicate that dioxin/furan contamination may be widespread. Based on historical shipyard operations in the sediment areas of the Site and contamination identified in previous investigations at the Site and adjacent properties, additional surface and subsurface sediment data collection and testing for all Site COCs is required to fully assess the nature and extent of known and potential sediment contamination.

5.3 Fate and Transport Processes

Data gaps affecting the analysis of fate and transport properties for upland site media are summarized as follows:

- **Future Land Uses:** Future land uses will affect the potential for contaminant transport, such as via stormwater or release by construction activities, at the Site. Future land use, discussed in the Draft Interim Action Work Plan (Anchor QEA 2011b), includes redevelopment of the upland areas of the Site to accommodate container storage and handling operations. Remedial actions will include removal of source soils, installation of a shoreline retaining wall, and placement of concrete and asphalt pavement to cap the upland Site areas. The draft Interim Action Work Plan will be further evaluated by Ecology following completion of the proposed supplemental RI investigation.
- **Groundwater Gradients and Aquifer Properties:** Groundwater gradients and aquifer properties were assessed in the 2009 transducer study completed as part of upland investigation efforts. Groundwater level measurements will be collected during subsequent required groundwater sampling to further evaluate the groundwater flow-path gradients during periods of low tide when groundwater is discharging to surface waters of the LDW.
- **Groundwater Geochemical Properties:** Groundwater geochemical parameters were assessed during completion of the 2006 and 2009 upland investigation efforts. Shallow groundwater conditions were evaluated as part of 2006 investigation effort and deep groundwater conditions were assessed at three well locations during completion of the 2009 upland investigation effort. Additional groundwater sampling in shallow and deep wells will be completed as required to further evaluate the geochemical properties of groundwater at the Site.

5.4 Cleanup Levels and Exposure Assessment

Cleanup levels and risk assessment evaluations will be included in the draft RI/FS Report for the Site. Selection of preliminary screening levels for soil and groundwater and SMS criteria for sediment is appropriate at this phase of the investigation effort in order to identify data gaps that require further investigation as part of the RI. Upon completion of the supplemental investigation work, the compiled dataset will be evaluated for Site ARARs, and results of this evaluation will be used to determine applicable screening levels, preliminary cleanup levels, and remedial action levels to support development of the draft RI/FS Report for the Site.

A risk assessment also will be addressed in the draft RI/FS Report, and will include protection of human health and ecological receptors at the Site for the various potential contamination migration pathways described in Section 4. Risk assessment will also address the requirements of the LDW remediation effort and ensure that cleanup requirements established for the Site are consistent with those proposed for remediation of the LDW.

6 SUPPLEMENTAL REMEDIAL INVESTIGATION SCOPE OF WORK

This section describes the additional investigations proposed as part of this Supplemental RI Work Plan. These investigations will be implemented upon Ecology's approval, and will be performed in accordance with the methods and procedures described in the SAP (Appendix A) and QAPP (Appendix B) as amended by this document. Table 9 presents a summary of the proposed supplemental soil, groundwater, seep, stormwater, catch basin solids, and sediment data collection. Analytical testing methods to be used and the target laboratory method detection limits (MDLs), limits of detection (LODs), and limits of quantitation (LOQs) for the chemical and physical testing of all media are provided in the QAPP (Tables 3, 4, and 5; Appendix B). All proposed upland sampling locations are presented on Figure 12a. Figures 12b through 12e overlay all proposed upland sampling locations on the historical Site layout maps. Proposed surface and subsurface sediment sampling locations are shown on Figure 13.

6.1 Proposed Supplemental RI Data Collection

6.1.1 Soil Sampling

Soil sampling will be conducted to address data gaps as required by Ecology in the December 5, 2012 comment letter (Appendix C) and as described for all upland site areas in Section 5.1. Thirty-one soil borings will be advanced as part of the supplemental RI, as shown on Figure 12a and summarized in Table 9. Seventeen of these will be temporary soil borings installed by direct-push geoprobe, and 14 will be permanent borings completed using hollow-stem auger methodology. The permanent borings will be sampled by split spoon methodology prior to being completed as permanent monitoring wells for sampling shallow and deep groundwater at the Site.

In response to Ecology requirements, soil samples will be analyzed for 13 priority pollutant metals and barium, SVOCs, VOCs, PCB Aroclors, TPH (including gasoline, diesel, and oil range), pesticides, TBT, chromium VI, and dioxins/furans, as outlined in Table 9. A detailed soil sampling design is presented in the SAP (Table 1; Appendix A).

Each soil boring will be completed and soil sample collected and analyzed as described in the SAP and QAPP (Appendices A and B), and as summarized below:

All borings will be advanced to the native soil contact, with continuous soil samples obtained from three depth intervals in the fill unit and at least one depth interval in the underlying native soil unit. Samples will be composited from 2-foot depth intervals. Exact sampling depth intervals will depend on the lithological units encountered during drilling. Based on the lithologies encountered during the 2009 Phase I upland investigation, soil samples are targeted at approximately 0 to 2 feet bgs (upper fill), 3 to 5 feet bgs (middle fill), 7 to 9 feet bgs (lower fill and contact with the native silt layer), and 10 to 12 feet bgs (native soil).

Soil sampling will continue through all visible contamination until confirmation or clean samples can be taken. Based on visual observations during coring, additional samples may be collected below the deepest level of expected contamination and archived for potential future analysis. In some cases, multiple borings may be necessary to obtain sufficient volume for analysis. Field screening will include sheen testing and photo-ionization detector (PID) monitoring of all sampling intervals.

6.1.2 Groundwater Sampling

Groundwater sampling will be conducted as described for all upland site areas in Section 5.1 to address data gaps identified by Ecology in the December 5, 2012 comment letter (Appendix C). Groundwater samples will be collected from all existing site monitoring wells and piezometers installed in 2009, as well as from 14 new monitoring wells—12 shallow and two deeper wells—that will be installed during this phase of the RI (Figure 12a). The new wells will be installed throughout the Site using a hollow stem auger and developed using the methods outlined in the SAP (Appendix A). All groundwater sampling will be performed using low-flow methodology. All new monitoring wells will be developed prior to sampling. Existing monitoring wells will be redeveloped as necessary. Target well depths and screen intervals are outlined in Table 9 and well locations are shown on Figure 12a.

In response to Ecology requirements, groundwater samples will be analyzed for all site COCs, including total and dissolved metals (13 priority pollutants and barium), SVOCs, VOCs, PCB Aroclors, TPH (including gasoline, diesel, and oil range), pesticides, TBT, chromium VI, dioxins/furans, total dissolved solids (TDS), total suspended solids (TSS), and alkalinity, as outlined in Table 9. In addition, field measurements will include temperature, pH, dissolved oxygen (DO), oxidation reduction potential (ORP), and conductivity.

All groundwater sample collection activities will be conducted at low tide, and groundwater samples will be submitted immediately for analytical testing, according to the analytical methods and reporting limits presented in the QAPP (Appendix B). Additionally, the water level in each well will be measured and evaluated to determine groundwater flow gradients toward the LDW during the low tide periods when the wells are sampled.

6.1.3 Stormwater and Catch Basin Solids Sampling

Stormwater and catch basin solids sampling will be conducted to address required data gaps identified by Ecology in the December 5, 2012 comment letter (Appendix C) as described for all upland site areas in Section 5.1. Stormwater and catch basin solids sampling will be performed at the final catch basin prior to overland routing of Site stormwater for off-site treatment, as shown on Figure 4.

Stormwater will be sampled during a maximum of seven qualifying events, as described below, within a 1-year time period. Sampling will be conducted using procedures consistent with Ecology's stormwater sampling guidance (Ecology 2010). Visual inspection will occur at the sampling location during every event (e.g., observations of floating materials, visible sheen, discoloration, turbidity, and odor in the stormwater discharge). Stormwater collection will occur during the first two hours of a storm event that meets the following conditions provided by Ecology:

- Preceded by at least 24 hours of no more than trace (0.04 inch) precipitation
- Intensity of at least 0.15 inches of rainfall over a 5-hour period in a 24-hour period
- At least 75 percent of the storm event hydrograph, or at least 75 percent of the first 24 hours

The stormwater sample will be collected from the sump in pre-cleaned sample containers attached to a telescoping pole, as described in the SAP (Appendix A). The detailed sampling design for stormwater and catch basin solids samples is outlined in Table 9. As required by Ecology, stormwater testing will include priority pollutant metals (total and dissolved), SVOCs, VOCs, PCB Aroclors, TPH (including gasoline, diesel, and oil range), TBT, and dioxins/furans, as outlined in Table 9. Field measurements will include DO, temperature, pH, ORP, conductivity, and turbidity.

A catch basin solids sample will be collected from the sump when there is no precipitation or accumulated water in order to support collection of all grain sizes present in the catch basin. If standing water is present, an effort will be made to prevent mobilization of the solids while collecting the sample. To comply with Ecology requirements, catch basin solids testing will include the 13 priority pollutant metals, SVOCs, VOCs, PCB Aroclors, TPH (including gasoline, diesel, and oil range), TBT, dioxins/furans, TOC, and grain size (GS), as outlined in Table 9. Field screening for the catch basin solids sample will include sheen testing and PID air monitoring.

6.1.4 Seep Reconnaissance and Sampling

To address required data gaps identified by Ecology in the December 5, 2012 comment letter (Appendix C), a reconnaissance will be performed during low tide conditions to check for seeps along the eastern shoreline areas of the Site (Figure 12a). If seeps are identified during the low tide inspection and appear suitable for seep water sampling, the locations of seeps will be described in a field logbook, photographed, and the coordinates will be recorded using a Differential Global Positioning System (DGPS) for follow-up sampling. The area of planned seep reconnaissance is shown on Figure 12a.

If discovered, seep water samples will be collected along the Site's eastern shoreline, which is currently armored with a timber bulkhead adjacent to the former marine railway. Other armored slopes have been constructed along the northern and southern shoreline areas. Large riprap and steep, sloping shoreline in these areas may limit access for identification of seeps and potential sample collection (Figure 12a). If possible, seep samples will be collected into sample bottles directly from the point of discharge. If necessary, a peristaltic pump may be used for sample collection. Sample collection will adhere to the groundwater sampling guidelines, where applicable, as outlined in the SAP (Appendix A).

To comply with Ecology requirements, seep samples will be analyzed for the 13 priority pollutant metals (total and dissolved), barium, SVOCs, VOCs, PCB Aroclors, TPH (gasoline, diesel, and oil range), dioxin/furans, TBT, chromium VI, pesticides, TDS, and TSS, as outlined in Table 9. Field parameters will be measured prior to sampling and will include salinity, DO, temperature, conductivity, pH, ORP, and turbidity.

6.1.5 UST and Septic Tank Investigation

To address data gaps identified by Ecology in the December 5, 2012 comment letter (Appendix C), an investigation will be conducted to locate, if possible, a historical underground septic tank that might be buried near the southern DSI property boundary (Figure 12a), as well as any other historical USTs that might be remaining in the upland areas. Using maps that show the locations of the historical septic tank and other USTs, test pit transects will be excavated in the area of the former tanks to a maximum depth of 4 feet (or to the water table, whichever is encountered first). All field observations, including the coordinates of all exploratory test pits, will be documented in a field log (Attachment 1 of the SAP). If septic and/or USTs are discovered, soil samples will be collected immediately beneath each tank valve/outlet pipe using the backhoe bucket and will be submitted for the analytical testing parameters specified in Table 9. In addition, the dimensions and depth of the any discovered tanks will be documented and the tank(s) will be photographed.

6.1.6 Sediment Sampling in the Former Marine Railway Area

Surface and shallow subsurface sediment sampling will be conducted to address data gaps identified by Ecology in the December 5, 2012 comment letter (Appendix C) and as described in Section 5.1. Up to five surface and four shallow subsurface sediment samples will be collected beneath the former marine railway area as, shown on Figure 13. Surface sediment samples will be collected using a grab sampling techniques. Co-located subsurface sediment samples at four of the five surface locations will be collected using a hand corer or hand auger. Because over-structure access in the former marine railway area is not safe, sediments cannot be sampled using conventional methods (e.g., vibracore or hollow-stem auger drill rig). As a result, the maximum sampling depth(s) will be limited to the depth(s) practicable using a hand corer or hand auger sampling device. The sediment sampling scheme for the marine railway area is outlined in Table 9, with specific sampling methodologies described in the SAP (Appendix A).

In response to Ecology requirements, sediment testing in the former marine railway area will include SMS metals, SVOCs, VOCs, PCB Aroclors, pesticides, bulk/porewater TBT, chromium VI, and dioxins/furans, as outlined in Table 9. Physical testing parameters will include TS, TOC, TVS, GS, and moisture content (MC). The detailed sediment sampling design is presented in the SAP (Table 4; Appendix A).

6.1.7 Sediment Sampling in the LDW

Surface and subsurface sediment sampling will be conducted to address data gaps identified by Ecology in the December 5, 2012 comment letter (Appendix C) and as described in Section 5.1. Collection of surface sediment samples using Van Veen grab methodology and subsurface sediment samples using vibracore methodology will be performed to obtain additional chemical and physical data to further delineate the horizontal and vertical extent of sediment contamination and to support development of the RI/FS in the sediment area of the Site. The proposed co-located surface and subsurface sediment sampling locations are shown on Figure 13.

Surface sediment samples required to delineate the nature and extent of contamination will be collected from the 0- to 10-cm biologically active zone at locations in the LDW presented on Figure 13. There will be approximately 14 surface sediment sample locations as part of this supplemental surface sediment investigation effort. Additional surface sediment samples may be collected when field observations note the presence of paint chips, sawdust, mill shavings, sand blast grit, or other materials in the sediment at the edge of the proposed sampling plan area. A hydraulic Van Veen sampling device will be used to collect surface sediment samples in the project area. Final sampling methodology in the LDW will depend on access and water level.

Continuous subsurface sediment samples will be collected from at least four depth intervals in each core. Samples will be composited from 2-foot depth intervals. Exact sampling depth intervals will depend on the lithological units and observations of contamination encountered during coring and core processing. Sediment samples will be collected in all areas with visible contamination, as well as from native sediments, if encountered. Field screening will include sheen testing and PID monitoring of all sampling intervals.

In response to Ecology requirements, sediment testing will include SMS metals, SVOCs, VOCs, PCB Aroclors, pesticides, bulk/porewater TBT, chromium VI, and dioxins/furans, as outlined in Table 9. Physical testing parameters will include TS, TOC, TVS, GS, and MC. The detailed sampling design for surface and subsurface LDW sediments is presented in the SAP (Tables 5 and 6; Appendix A).

6.1.8 Data Quality Objectives

The analytical methods proposed in this Supplemental RI Work Plan have been identified in coordination with available services provided by local analytical laboratories. This coordination was performed to ensure that the supplemental investigation uses methods that achieve the lowest technically reliable LOQs (also referred to as practical quantitation limits [PQLs]) possible for each media and each parameter. Analytical methods, laboratory reporting limits, LOQs, and data quality objectives (DQOs) for all sample media and analytical parameters are outlined in the QAPP (Appendix B).

6.2 Review of Former Glacier/Reichhold/U.S. Army Property Data

Upland soil, groundwater, stormwater, and sediment quality data for the former Glacier/Reichhold/U.S. Army property are currently being collected as part of a separate AO process with Ecology. Preliminary soil, groundwater, stormwater, and sediment data were collected at the former Glacier/Reichhold/U.S. Army property in 2011 and 2012; these data were provided to Ecology and are included in Appendix G. All environmental data collected as part of RI efforts at the former Glacier/Reichhold/U.S. Army property will be obtained and reviewed as the data are made available to and by Ecology. Relevant data will be integrated with information collected from the Site as part of the draft RI/FS Report. For this purpose, relevant information includes groundwater gradient information and the nature and extent of heavy metals, PAHs, TBT, TPH, dioxins/furans, and other COCs in soil, groundwater, stormwater and sediments.

6.3 Review of LDW RI/FS Data

As part of data analysis and reporting, additional information from the LDW RI/FS and risk assessment, as applicable, will be compiled and reviewed as necessary. Potentially relevant information includes the following:

- Risk-analysis outputs and sediment cleanup levels proposed for the LDW
- Results of surface and subsurface sediment testing near the DSI property
- Results of sediment transport evaluations
- Plans or potential plans for remediation within the LDW that may impact the DSI property
- Relevant land use or navigation information
- Information on the status of LDW source control efforts

7 NEXT STEPS AND SCHEDULE

Following Ecology approval of this Supplemental RI Work Plan, implementation of the supplemental RI data collection effort will be completed. The data collected as part of this investigation effort will be added to the dataset for the Site and all data will be evaluated as part of the development of the draft RI/FS Report. The draft RI/FS Report will provide an update to the preliminary CSM, identify remedial action objectives, and propose preliminary cleanup levels that are applicable and relevant to the contaminants that have been identified at the Site.

The draft RI/FS Report will identify and evaluate remedial technologies and remedial alternatives that protect human health and the environment by eliminating, reducing, or otherwise controlling risks posed by environmental conditions at the Site. Remedial alternatives will be developed consistent with ongoing LDW cleanup and source control activities and property use planning and development. The draft RI/FS Report is intended to provide sufficient data, analysis, and engineering evaluations to enable the selection of a cleanup action alternative, which is protective of human health and the environment and considers local development plans. A phased approach will be taken, whereby remedial alternatives are developed and screened, followed by a detailed analysis of remedial alternatives in accordance with the MTCA cleanup regulations, WAC 173-340-360 (Ecology 2007). The draft RI/FS Report will contain the primary elements described in the Final AO RI/FS Work Plan (Anchor QEA 2010).

The initial draft RI/FS Report will present a focused evaluation of the upland and nearshore property areas to support development and implementation of the upland interim action, as described below. The focused draft RI/FS Report will identify and evaluate remedial technologies and remedial alternatives that are appropriate for cleanup of the upland and nearshore areas, and will also consider source control for potential contaminant migration to the sediment areas.

In conjunction with development of the draft RI/FS Report, a Draft Interim Action Work Plan will also be prepared to propose cleanup actions that will be implemented, following Ecology approval, in the upland and nearshore areas of the Site. The interim action will be constructed in advance of final cleanup of the Site. By doing so, redevelopment of the upland property areas by the current tenant and the sale of the property (which will generate funds that may not otherwise be available to DSI for cleanup) will not be further delayed pending implementation of the final cleanup action.

The schedule for completion of these next RI/FS activities is as follows:

- Obtain Ecology approval of the Supplemental RI Work Plan and implement supplemental investigations in spring/summer 2013.
- Prepare the draft RI/FS Report and submit to Ecology in early 2014. Develop the draft final RI/FS Report and complete the public comment process throughout 2014.
- Prepare the draft Interim Action Work Plan and submit to Ecology in summer 2014. Approval of the Interim Action Work Plan and completion of the public comment process will occur in winter 2014, and the proposed upland interim action will be constructed in spring/summer 2015.

8 REFERENCES

Anchor QEA (Anchor QEA, LLC), 2010. Agreed Order Remedial Investigation and Feasibility Study (RI/FS) Work Plan. Prepared for Duwamish Shipyard, Inc., Seattle, Washington. August 2010.

Anchor QEA, 2011a. Phase 1 Remedial Investigation Data Memorandum. Prepared for Duwamish Shipyard, Inc. Seattle, Washington. September 2011.

Anchor QEA, 2011b. Draft Interim Action Work Plan. Prepared for Duwamish Shipyard, Inc. Seattle, Washington. January 2011.

Anchor QEA, 2011c. Phase I RI Sampling and Analysis Plan and Quality Assurance Project Plan. Prepared for Duwamish Shipyard, Inc. 2011. Seattle, Washington. May 2011.

Anchor QEA, 2013. Health and Safety Plan. Prepared for Duwamish Shipyard, Inc. Seattle, Washington. In preparation.

Ecology, 2003. Sediment Sampling and Analysis Plan Appendix: Guidance on the Development of Sediment Sampling and Analysis Plans Meeting the Requirements of the Sediment Management Standards (Chapter 173-204 WAC). Ecology Publication No. 03-09-043.

Ecology, 2007. Model Toxics Control Act Regulations: Chapter 173-340 WAC. October 12, 2007.

Ecology 2010. How to do Stormwater Sampling: A Guide for Industrial Facilities. Ecology Publication 02-10-071. Washington Department of Ecology Water Quality Program. Revised March 2010.

ERM, 2011. Draft Remedial Investigation and Feasibility Study Work Plan, Glacier Northwest, Inc. – Reichhold, Inc. Site. Prepared for Glacier Northwest, Inc. and Reichhold, Inc. September 2011.

ERM, 2012. Final Remedial Investigation and Feasibility Study Work Plan, Glacier Northwest, Inc. – Reichhold, Inc. Site. Prepared for Glacier Northwest, Inc. and Reichhold, Inc. August 2012.

Luzier, J.E., 1969. *Geology and Groundwater Resources of Southeastern King County, Washington*. Washington Department of Ecology. Water Supply Bulletin 28.

NOAA (National Oceanic and Atmospheric Administration), 1998. Duwamish Waterway Sediment Characterization Study Report. Damage Assessment Center. Seattle, Washington.

Richardson, D., J.W. Bingham, and R.J. Madison, 1968. *Water Resources of King County Washington*. U.S. Geological Survey. Water-Supply Paper 1852.

SAIC, 2007. Lower Duwamish Water Glacier Bay Source Control Area, Summary of Existing Information and Identification of Data Gap. Prepared for Washington State Department of Ecology. June 2007.

Washington Division of Geology and Earth Resources, 1989. "Engineering Geology in Washington." Bulletin 78.

Weston (Weston Solutions, Inc.), 1999. Site Inspection Report. Lower Duwamish River. RK 2.5 11.5. Volume 1 Report and Appendices. Prepared for U.S. Environmental Protection Agency, Region 10. Seattle, Washington.

Windward Environmental, L.L.C. (Windward), 2003. Phase I Remedial Investigation Report. Prepared for the U.S. Environmental Protection Agency and the Washington Department of Ecology. Seattle, Washington. April 2003.

Windward, 2007. Data Report: Subsurface Sediment Sampling for Chemical Analysis – Final. Prepared for the U.S. Environmental Protection Agency and the Washington Department of Ecology. January 29, 2007.

Windward, 2010. Lower Duwamish Waterway Remedial Investigation. Prepared for Lower Duwamish Waterway Group. Windward Environmental LLC. Seattle, Washington.

TABLES

Table 1
DSI Historical Shipyard Operations and Potential Source Summary

Historical Shipyard Operations By Area	Historical Shipyard Process Summary	Historical Shipyard Process Equipment	Historical Shipyard Material Handling	Historical Shipyard Material Management	Potential Shipyard Contamination Source	Potential Media Pathway
Northwest Area						
UST	500-gallon leaded gasoline storage	Vehicle and equipment fueling	Leaded gasoline (petroleum)	UST closed in-place in 1986	Yes	Soil, Groundwater
Machine Shop - Inside	Small part fabrication (turning of propeller shafting, pump rebuilding)	Lathes (up to 38 inches), drill presses, milling machines, band saws, presses	Cutting tool coolant, small parts degreasers/solvents	Parts and used degreaser/solvents containers, used degreaser/solvent disposal	Yes	Soil, Groundwater
Machine Shop - Outside	Propeller, shafting, rudder, engine, gearbox removal/reinstallation; alignment of shafting to engines/gearboxes; installation of pumps and other machinery	Hand tools, lifts	Lubricating fluids	Used container disposal, drips/spills	Yes	Soil, Groundwater
Spent grit storage	Storage of spent blasting grit	--	Spent blasting grit	Storage, transport/disposal manifest, recycling	Yes	Soil, Groundwater
Rail Spur Area						
Rail spur	Northern Pacific Railway easement	Rail and train parking	--	--	--	--
Wood (Joiner) Shop	Vessel interior fabrication	Table saws, planers, drill press, router	Wood stain and varnish	Used container disposal	Yes	Soil, Groundwater
Electric Shop	Electrical system and component repair and testing	Drill presses, hand tools, testing equipment	Wiring, switches, breakers, contact cleaners	Parts and used cleaner container disposal	Yes	Soil, Groundwater
Central Area						
Parking	Employee and visitor parking	--	--	--	--	--
Office Building	Administrative	--	--	--	--	--
Stormwater Line	Stormwater collection	Storm drain lines, catch basins	Surface erosion and groundwater infiltration	Filter inserts, yard sweeping, NPDES	Yes	Soil, Groundwater, Sediment
2000 UST Removal Area						
USTs	Four USTs: 1) 3,000-gallon diesel; 2) 1,000-gallon gasoline; 3) 3,000-gallon gasoline; 4) 3,000-gallon gasoline	Vehicle and equipment fueling	Diesel and unleaded gasoline (petroleum)	USTs (4) removed in June 2000 with focused excavation	Yes	Soil, Groundwater
South Property Area						
Spent grit storage	Storage of spent blasting grit	--	Spent blasting grit	Containment, storage and manifest transport/disposal, recycling	Yes	Soil, Groundwater, Sediment
Hazardous waste storage	Storage of hazardous waste	--	Used oil, used antifreeze, solvents	Containment, transport/disposal manifest, recycling	Yes	Soil, Groundwater
Paint storage	Storage of paint	--	Paint	Used container disposal	Yes	Soil, Groundwater
Paint shop (booth)	Small parts painting	Paint sprayer or rolls/brushes	Paint, solvents (for thinning)	Air filter, curtain containment system	Yes	Soil, Groundwater
Waste oil storage	Storage of used oil	--	Used oil (petroleum)	Containment, transport/disposal manifest	Yes	Soil, Groundwater
Solvent sill	Storage of solvent (for paint thinning)	Paint mixing, touch up wiping	Solvents	Containment	Yes	Soil, Groundwater
Former Shipyard Nearshore Area						
Side Tracking Ways	Small boats work: hull repair and painting	Wooden hull repair and painting	Paint, solvents, used oil	Unknown	Yes	Soil, Groundwater, Sediment
Cranes/Winch	Vessel and equipment handling	Crane and winch	Motor and lubricating oil	Used oil containment and transport/disposal manifest	Yes	Soil, Groundwater, Sediment
Steel Shop	Cutting of plates and materials for installation and fabrication	Welding and joining equipment (oxygen/acetylene torches)	Scrap materials	Reuse and recycling	--	--

Table 1
DSI Historical Shipyard Operations and Potential Source Summary

Historical Shipyard Operations By Area	Historical Shipyard Process Summary	Historical Shipyard Process Equipment	Historical Shipyard Material Handling	Historical Shipyard Material Management	Potential Shipyard Contamination Source	Potential Media Pathway
Pipe Shop	Pipe fabrication and assembly	Manufacture and assembly of piping systems: saw cutting, bending pipe, pipe welding	Scrap materials	Reuse and recycling	--	--
Wastewater Treatment System	Treatment of wastewater collected in dry docks	Collection sump and flocculation pretreatment	Process wastewater from dry dock operations	Holding tanks and treatment prior to METRO discharge	Yes	Surface Water, Sediment
Sand blast handling	Sand blast grit use and disposal handling	Storage and various transport handling	Blasting grit and spent blasting grit, blasted paint	Containment, yard sweeping	Yes	Soil, Groundwater, Sediment
Backfilling	Bulkhead and nearshore development	Various	Backfill-soil, broken concrete, scrap steel, rock/riprap	Backfill materials	Yes	Soil, Groundwater, Sediment
Parcel D Nearshore Area						
Storage yard	Miscellaneous storage	--	--	--	--	--
Sandblast shed (booth)	Small parts shore side blasting	Blasting equipment, booth	Blasting grit and spent blasting grit, blasted paint	Containment, storage and manifest transport/disposal, recycling	Yes	Soil, Groundwater, Sediment
Aquatic Area						
Marine Railway	Vessel docking-small boat transport to side tracking ways (1940s and 1950s), Small boat work	Railway, pilings, crane and winch operations, small boat work	Vessel storage, stormwater outfall (005) at bulkhead	Vessel hull paint, stormwater discharge, small boat works	Yes	Surface Water, Sediment
Dry Dock No. 1	Haul-out activities: blasting, painting, repairs, installations	Pressure wash/blasting equipment, painting, various assembly/installation	Mill scale, rust, paint, pressure wash/blasting liquid/material, bilge water, blasting grit	Pressure wash/blasting containment, wastewater treatment	Yes	Surface Water, Sediment
Dry Dock No. 2	Haul-out activities: blasting, painting, repairs, installations	Pressure wash/blasting equipment, painting, various assembly/installation	Mill scale, rust, paint, pressure wash/blasting liquid/material, bilge water, blasting grit	Pressure wash/blasting containment, wastewater treatment	Yes	Surface Water, Sediment
Grit hopper	Grit storage and handling	Hopper	Blasting grit	Containment	Yes	Surface Water, Sediment
Paint mixing sheds (2)	Paint mixing	Paint mixing equipment	Paint	Spill containment	Yes	Surface Water, Sediment
Stormwater Outfall (005)	Stormwater management	Storm drain lines	Surface erosion and groundwater infiltration	Stormwater centrifugal /separator system, NPDES permit/monitoring	Yes	Surface Water, Sediment
Graving Dock	Haul-out activities: blasting, painting, repairs, installations	Pressure wash/blasting equipment, painting, various assembly/installation	Mill scale, rust, paint, pressure wash/blasting liquid/material, bilge water, blasting grit	Pressure wash/blasting containment, wastewater treatment	Yes	Surface Water, Sediment

Notes:

NPDES = National Pollutant Discharge Elimination System

UST = underground storage tank

Table 2a
2006 and 2009 Upland Property Investigation Sample Coordinates and Intervals

Station ID	Soil/Catch Basin Sample ID	Sample Interval (feet)		Groundwater Sample ID	Screened Sample Interval (feet)		Northing (feet)	Easting (feet)	Ground Surface Elevation	Soil Chemical and Physical Analysis	Groundwater Chemical and Physical Analysis
DSI01	DSI01-SO-A	0	3	DSI01-GW	0	10	204362.38	1267483.65	15.85	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	VOCs, OP, PCBs, PAHs, Metals, TPH, IOCs
	DSI01-SO-B	4	6	--	--	--	204362.38	1267483.65	15.85	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	--
DSI02	DSI02-SO-A	0	3	DSI02-GW	--	--	204484.72	1267482.28	16.55	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	VOCs, OP, PCBs, PAHs, Metals, TPH, IOCs
	DSI02-SO-B	3	5	--	--	--	204484.72	1267482.28	16.55	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	--
DSI03	DSI03-SO-A	0	3	DSI03-GW	0	10	204614.54	1267538.20	16.56	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	VOCs, OP, PCBs, PAHs, Metals, TPH, IOCs
	DSI03-SO-B	5	6.5	--	--	--	204614.54	1267538.20	16.56	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	--
DSI04	DSI04-SO-A	0	3	DSI04-GW	0	10	204577.53	1267677.30	14.95	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	VOCs, OP, PCBs, PAHs, Metals, TPH, IOCs
	DSI04-SO-B	3	5	--	--	--	204577.53	1267677.30	14.95	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	--
DSI05	DSI05-SO-A	0	3	DSI05-GW	0	10	204414.79	1267664.49	15.38	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	VOCs, OP, PCBs, PAHs, Metals, TPH, IOCs
	DSI05-SO-B	3	5	--	--	--	204414.79	1267664.49	15.38	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	--
DSI06	DSI06-SO-A	0	3	DSI06-GW	0	10	204403.48	1267832.57	15.38	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	VOCs, OP, PCBs, PAHs, Metals, TPH, IOCs
	DSI06-SO-B	4	6	--	--	--	204403.48	1267832.57	15.38	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	--
DSI07	DSI07-SO-A	0	3	DSI07-GW	0	10	204440.17	1267843.29	15.30	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	VOCs, OP, PCBs, PAHs, Metals, TPH, IOCs
	DSI07-SO-B	3	5	--	--	--	204440.17	1267843.29	15.30	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	--
DSI08	DSI08-SO-A	0	3	DSI08-GW	0	10	204599.08	1267815.08	15.08	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	VOCs, OP, PCBs, PAHs, Metals, TPH, IOCs
	DSI08-SO-B	3	5	--	--	--	204599.08	1267815.08	15.08	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	--
DSI09	DSI09-SO-A	0	3	DSI09-GW	0	10	204599.10	1267972.09	15.10	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	VOCs, OP, PCBs, PAHs, Metals, TPH, IOCs
	DSI09-SO-B	3	5	--	--	--	204599.10	1267972.09	15.10	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	--
DSI10	DSI10-SO-A	0	3	DSI10-GW	0	10	204456.02	1267928.63	14.96	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	VOCs, OP, PCBs, PAHs, Metals, TPH, IOCs
	DSI10-SO-B	3	5	--	--	--	204456.02	1267928.63	14.96	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	--
DSI11	DSI11-SO-A	0	3	DSI11-GW	0	10	204358.81	1267970.43	14.74	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	VOCs, OP, PCBs, PAHs, Metals, TPH, IOCs

Table 2a
2006 and 2009 Upland Property Investigation Sample Coordinates and Intervals

Station ID	Soil/Catch Basin Sample ID	Sample Interval (feet)		Groundwater Sample ID	Screened Sample Interval (feet)		Northing (feet)	Easting (feet)	Ground Surface Elevation	Soil Chemical and Physical Analysis	Groundwater Chemical and Physical Analysis
DSI11	DSI11-SO-B	3	5	--	--	--	204358.81	1267970.43	14.74	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	--
DSI12	DSI12-SO-A	0	3	DSI12-GW	0	10	204269.04	1267970.42	14.38	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	VOCs, OP, PCBs, PAHs, Metals, TPH, IOCs
	DSI12-SO-B	3	5	--	--	--	204269.04	1267970.42	14.38	TS, TOC, VOCs, SVOC, OP, PCBs, PAHs, Metals, TPH	--
DSI13	DSI13-CB-YYMMDD	--	--	--	--	--	204534.18	1267506.84	15.60	TS, TOC, CB, PE, SVOC, OP, PCBs, PAHs, Metals, TPH, IOCs	--
DSI14	DSI14-CB-YYMMDD	--	--	--	--	--	204487.92	1267507.37	15.31	TS, TOC, CB, PE, SVOC, OP, PCBs, PAHs, Metals, TPH, IOCs	--
DSI15	DSI15-CB-YYMMDD	--	--	--	--	--	204566.32	1267577.87	14.60	TS, TOC, CB, PE, SVOC, OP, PCBs, PAHs, Metals, TPH, IOCs	--
DSI16	DSI16-CB-YYMMDD	--	--	--	--	--	204603.21	1267662.99	14.75	TS, TOC, CB, PE, SVOC, OP, PCBs, PAHs, Metals, TPH, IOCs	--
DSI17	DSI17-CB-YYMMDD	--	--	--	--	--	204482.78	1267687.03	14.66	TS, TOC, CB, PE, SVOC, OP, PCBs, PAHs, Metals, TPH, IOCs	--
DSI18	DSI18-CB-YYMMDD	--	--	--	--	--	204572.22	1267818.66	14.97	TS, TOC, CB, PE, SVOC, OP, PCBs, PAHs, Metals, TPH, IOCs	--
DSI19	DSI19-CB-YYMMDD	--	--	--	--	--	204512.92	1267823.23	14.49	TS, TOC, CB, PE, SVOC, OP, PCBs, PAHs, Metals, TPH, IOCs	--
DSI20	DSI20-CB-YYMMDD	--	--	--	--	--	204435.85	1267776.70	14.43	TS, TOC, CB, PE, SVOC, OP, PCBs, PAHs, Metals, TPH, IOCs	--
DSI21	DSI21-CB-YYMMDD	--	--	--	--	--	204471.91	1267822.86	15.23	TS, TOC, CB, PE, SVOC, OP, PCBs, PAHs, Metals, TPH, IOCs	--
DSI22	DSI22-CB-YYMMDD	0	1.5	--	--	--	204481.19	1268018.19	--	TS, TOC, CB, PE, SVOC, OP, PCBs, PAHs, Metals, TPH, IOCs	--
DSI23	DSI23-CB-YYMMDD	--	--	--	--	--	204460.68	1267966.97	14.59	TS, TOC, CB, PE, SVOC, OP, PCBs, PAHs, Metals, TPH, IOCs	--
MW-4	--	--	--	MW4-GW-YYMMDD	5	17	204675.26	1267474.81	20.09	--	--
MW-5	--	--	--	MW5-GW-YYMMDD	11	16	204585.26	1267494.81	16.49	--	--
DSI-GP-01	DSI-GP-01-2.5-4.5	2.5	4.5	DSI-GP-01-GW	6.5	6.5	204366.8029	1267444.942	15.63	Arsenic	Dissolved Arsenic, SVOCs
	DSI-GP-01-5.5-7.5	5.5	7.5	--	--	--	204366.8029	1267444.942	15.63	Arsenic	--
DSI-GP-02	DSI-GP-02-2.5-5.5	2.5	5.5	DSI-GP-02-GW	6.5	6.5	204352.9371	1267499.154	15.14	Arsenic	Dissolved Arsenic, SVOCs
	DSI-GP-02-5.5-7.5	5.5	7.5	--	--	--	204352.9371	1267499.154	15.14	Arsenic	--
DSI-GP-03	DSI-GP-03-1.5-4	1.5	4	DSI-GP-03-GW	7.0	7.0	204444.5451	1267485.171	16	Arsenic	Dissolved Arsenic
	DSI-GP-03-5.5-8	5.5	8				204444.5451	1267485.171	16	Arsenic	--
DSI-GP-04	DSI-GP-04-2.5-4.5	2.5	4.5	DSI-GP-04-GW	6.5	6.5	204594.7794	1267562.473	15.74	Petroleum Fractionation	Petroleum
	DSI-GP-04-5.5-7.5	5.5	7.5				204594.7794	1267562.473	15.74	Petroleum Fractionation	--
DSI-GP-05	DSI-GP-05-2-4.5	2	4.5	DSI-GP-05-GW	7.5	7.5	204589.6243	1267499.84	16.54	Petroleum	Petroleum
	DSI-GP-05-5.5-8	5.5	8				204589.6243	1267499.84	16.54	Petroleum	--
DSI-GP-06	DSI-GP-06-3-5	3	5	DSI-GP-06-GW	7.5	7.5	204506.7629	1267588.576	15.72	Petroleum, GS, MC	Petroleum, SVOCs, VOCs
	DSI-GP-06-5.5-8	5.5	8				204506.7629	1267588.576	15.72	Petroleum, GS, MC	--
DSI-GP-07	DSI-GP-07-1.5-4	1.5	4	DSI-GP-07-GW	7.5	7.5	204563.5276	1267662.081	15	Petroleum	Petroleum, SVOCs, VOCs
	DSI-GP-07-5.5-8	5.5	8				204563.5276	1267662.081	15	Petroleum	

Table 2a
2006 and 2009 Upland Property Investigation Sample Coordinates and Intervals

Station ID	Soil/Catch Basin Sample ID	Sample Interval (feet)		Groundwater Sample ID	Screened Sample Interval (feet)		Northing (feet)	Easting (feet)	Ground Surface Elevation	Soil Chemical and Physical Analysis	Groundwater Chemical and Physical Analysis
DSI-GP-08	DSI-GP-08-2-4.5	2	4.5	DSI-GP-08-GW	7.0	7.0	204436.1098	1267860.112	15	Petroleum	Petroleum, SVOCs, VOCs
	DSI-GP-08-5.5-7.5	5.5	7.5				204436.1098	1267860.112	15	Petroleum	--
DSI-GP-09	DSI-GP-09-2-4.5	2	4.5	DSI-GP-09-GW	7.5	7.5	204409.6483	1267877.01	15	Petroleum	Petroleum, SVOCs, VOCs
	DSI-GP-09-6-8	6	8				204409.6483	1267877.01	15	Petroleum Fractionation	--
	DSI-GP-09-9-10	9	10				204409.6483	1267877.01	15	Petroleum	--
DSI-GP-10	DSI-GP-10-2-4	2	4	DSI-GP-10-GW	7.0	7.0	204451.3421	1267792.872	15	Petroleum, BTEX	Petroleum, SVOCs, VOCs
	DSI-GP-10-5.5-7.5	5.5	7.5				204451.3421	1267792.872	15	Petroleum, BTEX	Petroleum, SVOCs, VOCs
DSI-GP-11	DSI-GP-11-1-3.5	1	3.5	DSI-GP-11-GW	8.0	8.0	204484.3955	1267873.095	15	Petroleum, BTEX	Petroleum, SVOCs, VOCs
	DSI-GP-11-5-7.5	5	7.5	--	--	--	204484.3955	1267873.095	15	Petroleum, BTEX	--
DSI-GP-12	DSI-GP-12-1-3.5	1	3.5	--	--	--	204597.2488	1267998.939	14.44	Petroleum, Metals, SVOCs	--
	DSI-GP-12-5-10	5	10	--	--	--	204597.2488	1267998.939	14.44	Petroleum, Metals, SVOCs	--
DSI-GP-13	DSI-GP-13-1-3.5	1	3.5	--	--	--	204516.8391	1267988.723	14.55	Petroleum, Metals, SVOCs, GS, MC	--
	DSI-GP-13-5-7.3	5	7.3	--	--	--	204516.8391	1267988.723	14.55	Petroleum, Metals, SVOCs	--
	DSI-GP-13-8-10	8	10	--	--	--	204516.8391	1267988.723	14.55		--
DSI-GP-14	DSI-GP-14-2.5-4.5	2.5	4.5	--	--	--	204444.8752	1267995.396	14.22	Petroleum, Metals, SVOCs	--
	DSI-GP-14-5-7	5	7	--	--	--	204444.8752	1267995.396	14.22	Petroleum, Metals, SVOCs	--
	DSI-GP-14-8-10	8	10	--	--	--	204444.8752	1267995.396	14.22	TPH-G	--
DSI-GP-15	DSI-GP-15-1.5-4	1.5	4	--	--	--	204385.9068	1267993.205	14.23	Petroleum, Metals, SVOCs	--
	DSI-GP-15-6-8	6	8	--	--	--	204385.9068	1267993.205	14.23	Petroleum, Metals, SVOCs	--
	DSI-GP-15-8-10	8	10	--	--	--	204385.9068	1267993.205	14.23	TPH-G	--
DSI-GP-16	DSI-GP-16-2.1-4.5	2.1	4.5	--	--	--	204368.4526	1268022.755	14.81	Petroleum, Metals, SVOCS	--
	DSI-GP-16-7.5-10	7.5	10	--	--	--	204368.4526	1268022.755	14.81	Petroleum, Metals, SVOCS	--
DSI-GP-17	DSI-GP-17-1.5-4	1.5	4	--	--	--	204304.0397	1267974.893	14.4	GS, MC	--
	DSI-GP-17-5-7.5	5	7.5	--	--	--	204304.0397	1267974.893	14.4	GS, MC	--
DSI-GP-19	DSI-GP-19-3-5	3	5	DSI-GP-19-GW	7.5	7.5	204346.9021	1267668.905	15.98	Petroleum, Metals, SVOCs	Dissolved Arsenic, Petroleum, SVOCs, VOCs
	DSI-GP-19-5.5-8	5.5	8				204346.9021	1267668.905	15.98	Petroleum, Metals, SVOCs	
DSI-GP-20	DSI-GP-20-3-5	3	5	DSI-GP-20-GW	7.5	7.5	204370.1012	1267785.57	15.5	Petroleum, Metals, SVOCs	Dissolved Arsenic, Petroleum, SVOCs, VOCs
	DSI-GP-20-5.5-8	5.5	8				204370.1012	1267785.57	15.5	Petroleum, Metals, SVOCs	
DSI-GP-21	DSI-GP-21-2-4.5	2	4.5	DSI-GP-21-GW	7.5	7.5	204378.83	1267891.799	15.06	Petroleum, Metals, SVOCs	Dissolved Arsenic, Petroleum, SVOCs, VOCs
	DSI-GP-21-5.5-8	5.5	8	--	--	--	204378.83	1267891.799	15.06	Petroleum, Metals, SVOCs	--

Table 2a
2006 and 2009 Upland Property Investigation Sample Coordinates and Intervals

Station ID	Soil/Catch Basin Sample ID	Sample Interval (feet)		Groundwater Sample ID	Screened Sample Interval (feet)		Northing (feet)	Easting (feet)	Ground Surface Elevation	Soil Chemical and Physical Analysis	Groundwater Chemical and Physical Analysis
DSI-GT-01	DSI-GT1-S2	2.5	4	--	--	--	204525.26	1267977.21	14.56	MC	--
	DSI-GT1-S3	5	6.5	--	--	--	204525.26	1267977.21	14.56	MC, GS	--
	DSI-GT1-S4	10	12	--	--	--	204525.26	1267977.21	14.56	MC, AL, CuTriax/Consolidation	--
	DSI-GT1-S5	12	13.5	--	--	--	204525.26	1267977.21	14.56	MC, SG	--
	DSI-GT1-S6	15	16.5	--	--	--	204525.26	1267977.21	14.56	MC, GS	--
	DSI-GT1-S7	20	21.5	--	--	--	204525.26	1267977.21	14.56	MC	--
	DSI-GT1-S8	25	26.5	--	--	--	204525.26	1267977.21	14.56	MC, AL	--
	DSI-GT1-S9	30	31.5	--	--	--	204525.26	1267977.21	14.56	MC, GS	--
	DSI-GT1-S10	35	36.5	--	--	--	204525.26	1267977.21	14.56	MC, SG, AL	--
	DSI-GT1-S11	40	41.5	--	--	--	204525.26	1267977.21	14.56	MC	--
	DSI-GT1-S12	45	46.5	--	--	--	204525.26	1267977.21	14.56	MC, GS	--
	DSI-GT1-S13	50	51.5	--	--	--	204525.26	1267977.21	14.56	MC	--
	DSI-GT1-S14	55	56.5	--	--	--	204525.26	1267977.21	14.56	MC, GS	--
	DSI-GT1-S15	60	61.5	--	--	--	204525.26	1267977.21	14.56	MC	--
DSI-GT-02	DSI-GT2-S1	2.5	4	--	--	--	204368.14	1267979.38	14.73	MC	--
	DSI-GT2-S2	5	6.5	--	--	--	204368.14	1267979.38	14.73	MC, GS	--
	DSI-GT2-S3	7.5	9	--	--	--	204368.14	1267979.38	14.73	MC, SG, AL	--
	DSI-GT2-S4	10	11.5	--	--	--	204368.14	1267979.38	14.73	MC	--
	DSI-GT2-S5	15	16.5	--	--	--	204368.14	1267979.38	14.73	MC	--
	DSI-GT2-S6	20	21.5	--	--	--	204368.14	1267979.38	14.73	MC, GS	--
	DSI-GT2-S7	25	26.5	--	--	--	204368.14	1267979.38	14.73	MC	--
	DSI-GT2-S8	30	31.5	--	--	--	204368.14	1267979.38	14.73	MC	--
	DSI-GT2-S9	35	36.5	--	--	--	204368.14	1267979.38	14.73	MC, GS	--
	DSI-GT2-S10	40	41.5	--	--	--	204368.14	1267979.38	14.73	MC, GS	--
	DSI-GT2-S11	45	46.5	--	--	--	204368.14	1267979.38	14.73	MC	--
	DSI-GT2-S12	50	51.5	--	--	--	204368.14	1267979.38	14.73	MC	--
	DSI-GT2-S13	55	56.5	--	--	--	204368.14	1267979.38	14.73	MC, SG	--
	DSI-GT2-S14	60	61.5	--	--	--	204368.14	1267979.38	14.73	MC	--
	DSI-GT2-S15	65	66.5	--	--	--	204368.14	1267979.38	14.73	MC, GS	--
DSI-MW-01	DSI-MW-01-0.5-2	0.5	2	DSI-MW-01-072209	9.5	9.5	204376.69	1267511.08	15.83	Arsenic, GS, MC	Dissolved Metals, SVOCs, VOCs, DO, redox, cond., PH
	DSI-MW-01-0.5-2.0	0.5	2	--	--	--	204376.69	1267511.08	15.83	Arsenic, GS, MC	--
	DSI-MW-01-5-6.5	5	6.5	--	--	--	204376.69	1267511.08	15.83	Arsenic, GS, MC	--
DSI-MW-02	DSI-MW-02-0-3	0	3	DSI-MW-02-072209	10.0	10.0	204619.49	1267537.85	16.59	Petroleum, GS, MC	Dissolved Metals, SVOCs, VOCs, Petroleum, DO, redox, cond., pH, NO_3^-, SO_4^{2-}, H_2S, Cl, alkalinity
	DSI-MW-02-5.5-7	5.5	7	--	--	--	204619.49	1267537.85	16.59	Petroleum, GS, MC	--
DSI-MW-03	DSI-MW-03-0-3	0	3	DSI-MW-03-072909	35.0	35.0	204467.03	1267731.36	15.26	Petroleum, GS, MC	Dissolved Metals, SVOCs, VOCs, Petroleum, DO, redox, cond., pH, Cl
	DSI-MW-03-5-6.5	5	6.5	--	--	--	204467.03	1267731.36	15.26	Petroleum, GS, MC	--
DSI-MW-04	DSI-MW-04-0.5-2.5	0.5	2.5	DSI-MW-04-072309	9.6	9.6	204416.16	1267894.98	15.41	Petroleum, GS, MC	Dissolved Metals, SVOCs, VOCs, Petroleum, DO, redox, cond., pH, NO_3^-, SO_4^{2-}, H_2S, Cl, alkalinity
	DSI-MW-04-5-6.5	5	6.5	--	--	--	204416.16	1267894.98	15.41	Petroleum, GS, MC	--

Table 2a
2006 and 2009 Upland Property Investigation Sample Coordinates and Intervals

Station ID	Soil/Catch Basin Sample ID	Sample Interval (feet)		Groundwater Sample ID	Screened Sample Interval (feet)		Northing (feet)	Easting (feet)	Ground Surface Elevation	Soil Chemical and Physical Analysis	Groundwater Chemical and Physical Analysis
DSI-MW-05	DSI-MW-05-0.5-3.0	0.5	3	DSI-MW-05-072909	10.5	10.5	204575.21	1267969.75	15.12	Petroleum, metals, SVOCs, GS, MC	Dissolved Metals, SVOCs, VOCs, Petroleum, DO, redox, cond., pH, Cl
	DSI-MW-05-5-8	5	8	--	--	--	204575.21	1267969.75	15.12	Petroleum, metals, SVOCs, GS, MC	--
DSI-MW-06	DSI-MW-06-0.5-3.5	0.5	3.5	DSI-MW-06-072909	11.0	11.0	204456.31	1267953.29	14.75	Petroleum, metals, SVOCs, GS, MC	Dissolved Metals, SVOCs, VOCs, Petroleum, DO, redox, cond., pH, NO_3^-, SO_4^{2-}, H_2S, Cl, alkalinity
	DSI-MW-06-5-8	5	8	--	--	--	204456.31	1267953.29	14.75	Petroleum, metals, SVOCs, GS, MC	--
DSI-MW-07	DSI-MW-07-0.5-2	0.5	2	DSI-MW-07-072409	35.0	35.0	204463.39	1267953.32	14.75	--	Dissolved Metals, SVOCs, VOCs, Petroleum, DO, redox, cond., pH, NO_3^-, SO_4^{2-}, H_2S, Cl, alkalinity
	DSI-MW-07-5-8	5	8	--	--	--	204463.39	1267953.32	14.75	--	--
DSI-MW-08	DSI-MW-08-0.5-2	0.5	2	DSI-MW-08-072809	11.0	11.0	204366.34	1267967.62	14.85	Petroleum, metals, SVOCs	Dissolved Metals, SVOCs, VOCs, Petroleum, DO, redox, cond., pH, Cl
	DSI-MW-08-5-8	5	8	--	--	--	204366.34	1267967.62	14.85	Petroleum, metals, SVOCs	
DSI-MW-09	--	--	--	DSI-MW-09-072809	11.0	11.0	204267.4	1267963.77	14.52	--	Dissolved Metals, SVOCs, VOCs, Petroleum, DO, redox, cond., pH, NO_3^-, SO_4^{2-}, H_2S, Cl, alkalinity
DSI-MW-10	DSI-MW-10-0.5-3.5	0.5	3.5	DSI-MW-10-072809	35.0	35.0	204275.46	1267964.6	14.48	Petroleum, metals, SVOCs, GS, MC	Dissolved Metals, SVOCs, VOCs, Petroleum, DO, redox, cond., pH, Cl
	DSI-MW-10-5-8	5	8	--	--	--	204275.46	1267964.6	14.48	Petroleum, metals, SVOCs, GS, MC	--

Notes:
Horizontal datum is Washington State State Plane North, U.S. Survey feet
Vertical datum is Mean Lower Low Water (MLLW)
AL - Atterberg Limits
BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
CB = Chlorinated Benzenes
GS = Grain Size
IOCs = Ionizable Organic Compounds
MC = Moisture Content
OP = Organochlorine Pesticides
PAHs = Polycyclic Aromatic Hydrocarbons
PCBs = Polychlorinated biphenyls
PE = Phthalate Esters
SVOC = Semivolatile Organic Compounds
SG = Specific Gravity
TS = Total Solids
TOC = Total Organic Carbon
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
DO= Dissolved Oxygen

Table 2b
2011 Sediment Investigation Sample Coordinates and Intervals

Station ID	Actual Coordinates[1,2] Easting (X)	Actual Coordinates[1,2] Northing (Y)	Water Depth[3]	Mudline Elevation[1,2]	Sediment Sample ID	Sampling Interval	Testing Chemistry	Testing Physical	Archive Testing Chemistry	Archive Testing Physical
DSI-SS-01	1268047.45	204251.47	19.1	-14.9	DSI-SS-01	0 to 10 cm	TBT, VOCs, SVOCs, Metals, Cr VI, PCBs, Pesticides, D/F	GS, TS, TOC, MC	--	--
DSI-SS-02	1268218.05	204112.83	39.3	-33.2	DSI-SS-02	0 to 10 cm	TBT, VOCs, SVOCs, Metals, Cr VI, PCBs, Pesticides	GS, TS, TOC, MC	D/F	--
DSI-SS-03	1268169.28	204300.64	28.1	-20.3	DSI-SS-03	0 to 10 cm	TBT, VOCs, SVOCs, Metals, Cr VI, PCBs, Pesticides	GS, TS, TOC, MC	--	--
DSI-SS-04	1268145.51	204406.67	29.7	-21.9	DSI-SS-04	0 to 10 cm	TBT, VOCs, SVOCs, Metals, Cr VI, PCBs, Pesticides	GS, TS, TOC, MC	D/F	--
DSI-SS-05	1268079.88	204648.08	26.1	-21.5	DSI-SS-05	0 to 10 cm	TBT, VOCs, SVOCs, Metals, Cr VI, PCBs, Pesticides, D/F	GS, TS, TOC, MC	--	--
DSI-SS-06	1268018.54	204759.28	26.4	-20.2	DSI-SS-06	0 to 10 cm	TBT, VOCs, SVOCs, Metals, Cr VI, PCBs, Pesticides	GS, TS, TOC, MC	--	--
DSI-SS-07	1267971.92	204896.58	30.8	-21.6	DSI-SS-07	0 to 10 cm	TBT, VOCs, SVOCs, Metals, Cr VI, PCBs, Pesticides	GS, TS, TOC, MC	D/F	--
DSI-SS-08	1268289.08	204317.51	36.1	-32.8	DSI-SS-08	0 to 10 cm	TBT, VOCs, SVOCs, Metals, Cr VI, PCBs, Pesticides, D/F	GS, TS, TOC, MC	--	--
DSI-SS-09	1268219.38	204563.01	37.9	-35.3	DSI-SS-09	0 to 10 cm	TBT, VOCs, SVOCs, Metals, Cr VI, PCBs, Pesticides	GS, TS, TOC, MC	D/F	--
DSI-SS-10	1268127.37	204817.34	37.7	-34.7	DSI-SS-10	0 to 10 cm	TBT, VOCs, SVOCs, Metals, Cr VI, PCBs, Pesticides	GS, TS, TOC, MC	--	--
DSI-SS-11	1268039.92	205062.40	40.7	-35.5	DSI-SS-11	0 to 10 cm	TBT, VOCs, SVOCs, Metals, Cr VI, PCBs, Pesticides, D/F	GS, TS, TOC, MC	--	--

Table 2b
2011 Sediment Investigation Sample Coordinates and Intervals

Station ID	Actual Coordinates[1,2] Easting (X)	Actual Coordinates[1,2] Northing (Y)	Water Depth[3]	Mudline Elevation[1,2]	Sediment Sample ID	Sampling Interval	Testing Chemistry	Testing Physical	Archive Testing Chemistry	Archive Testing Physical
DSI-SB-01	1268042.69	204252.05	20.4	-13.3	DSI-SB-01-1-2	1 to 2 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	--	--
					DSI-SB-01-2-3.1	2 to 3.1 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	--	--
					DSI-SB-01-3.1-4	3.1 to 4 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-01-4-5	4 to 5 ft	--	--	--	--
					DSI-SB-01-5-6	5 to 6 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	--	--
					DSI-SB-01-6-7	6 to 7 ft	--	--	TBT	TS, TOC
					DSI-SB-01-7-8	7 to 8 ft	--	--	--	--
					DSI-SB-01-8-9	8 to 9 ft	--	--	--	--
					DSI-SB-01-9-10	9 to 10 ft	--	--	--	--
					DSI-SB-01-10-11	10 to 11 ft	--	--	--	--
					DSI-SB-01-11-11.9	11 to 11.9 ft	--	--	--	--
DSI-SB-02	1268229.02	204122.16	44.8	-33.9	DSI-SB-02-1-2.3	1 to 2.3 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	D/F	GS
					DSI-SB-02-2.3-3.7	2.3 to 3.7 ft	--	--	--	--
					DSI-SB-02-3.7-5.2	3.7 to 5.2 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	D/F	--
					DSI-SB-02-5.2-7	5.2 to 7 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-02-7-8.5	7 to 8.5 ft	--	--	--	--
					DSI-SB-02-8.5-10	8.5 to 10 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	D/F	GS
					DSI-SB-02-10-11.2	10 to 11.2 ft	--	--	--	--

Table 2b
2011 Sediment Investigation Sample Coordinates and Intervals

Station ID	Actual Coordinates[1,2] Easting (X)	Actual Coordinates[1,2] Northing (Y)	Water Depth[3]	Mudline Elevation[1,2]	Sediment Sample ID	Sampling Interval	Testing Chemistry	Testing Physical	Archive Testing Chemistry	Archive Testing Physical
DSI-SB-03	1268175.77	204299.54	26.6	-21.3	DSI-SB-03-1-2	1 to 2 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	--	GS
					DSI-SB-03-2-3.5	2 to 3.5 ft	--	--	--	--
					DSI-SB-03-3.5-4.5	3.5 to 4.5 ft	--	--	--	--
					DSI-SB-03-4.5-5.8	4.5 to 5.8 ft	--	--	--	--
					DSI-SB-03-5.8-7	5.8 to 7 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-03-7-8.5	7 to 8.5 ft	--	--	--	--
					DSI-SB-03-8.5-9.5	8.5 to 9.5 ft	--	--	--	--
					DSI-SB-03-9.5-10.4	9.5 to 10.4 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-03-10.4-11.1	10.4 to 11.1 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-03-11.1-11.6	11.1 to 11.6 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
DSI-SB-04	1268149.82	204408.41	29.2	-22.2	DSI-SB-04-1-2	1 to 2 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	--	--
					DSI-SB-04-2-4	2 to 4 ft	--	--	--	--
					DSI-SB-04-4-5	4 to 5 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	--	--
					DSI-SB-04-5-6	5 to 6 ft	--	--	--	--
					DSI-SB-04-6-7	6 to 7 ft	--	--	--	--
					DSI-SB-04-7-8.3	7 to 8.3 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	--	--
					DSI-SB-04-8.3-9.3	8.3 to 9.3 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC, GS
					DSI-SB-04-9.3-10.9	9.3 to 10.9 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC

Table 2b
2011 Sediment Investigation Sample Coordinates and Intervals

Station ID	Actual Coordinates[1,2] Easting (X)	Actual Coordinates[1,2] Northing (Y)	Water Depth[3]	Mudline Elevation[1,2]	Sediment Sample ID	Sampling Interval	Testing Chemistry	Testing Physical	Archive Testing Chemistry	Archive Testing Physical
DSI-SB-05	1268087.01	204645.93	24.9	-20.7	DSI-SB-05-1-2	1 to 2 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	D/F	--
					DSI-SB-05-2-3	2 to 3 ft	--	--	--	--
					DSI-SB-05-3-4	3 to 4 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC, GS
					DSI-SB-05-4-5	4 to 5 ft	--	--	--	--
					DSI-SB-05-5-6	5 to 6 ft	--	--	--	--
					DSI-SB-05-6-7	6 to 7 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	D/F	--
					DSI-SB-05-7-8	7 to 8 ft	--	--	--	--
					DSI-SB-05-8-9.3	8 to 9.3 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	--	--
					DSI-SB-05-9.3-11	9.3 to 11 ft	--	--	SVOCs, Metals, TBT, PCBs, D/F	TS, TOC, GS
					DSI-SB-05-11-12	11 to 12 ft	--	--	--	--
					DSI-SB-05-12-13.4	12 to 13.4 ft	--	--	--	--
DSI-SB-06	1268024.88	204754.84	25.1	-19.2	DSI-SB-06-1-2	1 to 2 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-06-2-3.3	2 to 3.3 ft	--	--	--	--
					DSI-SB-06-3.3-5	3.3 to 5 ft	--	--	--	--
					DSI-SB-06-5-6.5	5 to 6.5 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-06-6.5-8	6.5 to 8 ft	--	--	--	--
					DSI-SB-06-8-9.6	8 to 9.6 ft	--	--	--	--
					DSI-SB-06-9.6-11	9.6 to 11 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-06-11-12.2	11 to 12.2 ft	--	--	--	--

Table 2b
2011 Sediment Investigation Sample Coordinates and Intervals

Station ID	Actual Coordinates[1,2] Easting (X)	Actual Coordinates[1,2] Northing (Y)	Water Depth[3]	Mudline Elevation[1,2]	Sediment Sample ID	Sampling Interval	Testing Chemistry	Testing Physical	Archive Testing Chemistry	Archive Testing Physical
DSI-SB-07	1267979.73	204866.57	25.2	-20.3	DSI-SB-07-1-2	1 to 2 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	D/F	--
					DSI-SB-07-2-3.5	2 to 3.5 ft	--	--	--	--
					DSI-SB-07-3.5-4.5	3.5 to 4.5 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	--	--
					DSI-SB-07-4.5-5.5	4.5 to 5.5 ft	--	--	--	--
					DSI-SB-07-5.5-6.5	5.5 to 6.5 ft	--	--	--	--
					DSI-SB-07-6.5-7.5	6.5 to 7.5 ft	--	--	SVOCs, Metals, TBT, PCBs, D/F	TS, TOC
					DSI-SB-07-7.5-8.5	7.5 to 8.5 ft	--	--	--	--
					DSI-SB-07-8.5-9.1	8.5 to 9.1 ft	--	--	--	--
					DSI-SB-07-9.1-10.5	9.1 to 10.5 ft	--	--	--	--
					DSI-SB-07-10.5-11.9	10.5 to 11.9 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	D/F	--
					DSI-SB-07-11.9-12.3	11.9 to 12.3 ft	--	--	D/F	--
DSI-SB-08	1268253.10	204225.31	40.5	-31.0	DSI-SB-08-1-2	1 to 2 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-08-2-3	2 to 3 ft	--	--	--	--
					DSI-SB-08-3-4	3 to 4 ft	--	--	--	--
					DSI-SB-08-4-5	4 to 5 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-08-5-5.9	5 to 5.9 ft	--	--	--	--
					DSI-SB-08-5.9-7	5.9 to 7 ft	--	--	--	--
					DSI-SB-08-7-8.7	7 to 8.7 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-08-8.7-10	8.7 to 10 ft	--	--	--	--
					DSI-SB-08-10-11	10 to 11 ft	--	--	--	--
					DSI-SB-08-11-12	11 to 12 ft	--	--	--	--
					DSI-SB-08-12-13.3	12 to 13.3 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--

Table 2b
2011 Sediment Investigation Sample Coordinates and Intervals

Station ID	Actual Coordinates[1,2] Easting (X)	Actual Coordinates[1,2] Northing (Y)	Water Depth[3]	Mudline Elevation[1,2]	Sediment Sample ID	Sampling Interval	Testing Chemistry	Testing Physical	Archive Testing Chemistry	Archive Testing Physical
DSI-SB-09	1268195.47	204416.39	31.5	-27.0	DSI-SB-09-1-2	1 to 2 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	D/F	--
					DSI-SB-09-2-3	2 to 3 ft	--	--	--	--
					DSI-SB-09-3-4.5	3 to 4.5 ft	--	--	--	--
					DSI-SB-09-4.5-5.5	4.5 to 5.5 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	--	--
					DSI-SB-09-5.5-7	5.5 to 7 ft	--	--	--	--
					DSI-SB-09-7-8.5	7 to 8.5 ft	--	--	--	--
					DSI-SB-09-8.5-10	8.5 to 10 ft	--	--	SVOCs, Metals, TBT, PCBs, D/F	TS, TOC
					DSI-SB-09-10-11	10 to 11 ft	--	--	--	--
					DSI-SB-09-11-12.1	11 to 12.1 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	D/F	--
					DSI-SB-09-12.1-12.6	12.1 to 12.6 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
DSI-SB-10	1268117.63	204532.11	24.7	-22.2	DSI-SB-10-1-2	1 to 2 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-10-2-3.5	2 to 3.5 ft	--	--	--	--
					DSI-SB-10-3.5-4.5	3.5 to 4.5 ft	--	--	--	--
					DSI-SB-10-4.5-5.5	4.5 to 5.5 ft	--	--	--	--
					DSI-SB-10-5.5-7	5.5 to 7 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-10-7-8.5	7 to 8.5 ft	--	--	--	--
					DSI-SB-10-8.5-10	8.5 to 10 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-10-10-11	10 to 11 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-10-11-12.9	11 to 12.9 ft	--	--	--	--

Table 2b
2011 Sediment Investigation Sample Coordinates and Intervals

Station ID	Actual Coordinates[1,2] Easting (X)	Actual Coordinates[1,2] Northing (Y)	Water Depth[3]	Mudline Elevation[1,2]	Sediment Sample ID	Sampling Interval	Testing Chemistry	Testing Physical	Archive Testing Chemistry	Archive Testing Physical
DSI-SB-11	1268162.52	204544.00	30.8	-27.6	DSI-SB-11-1-2	1 to 2 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs	TS, TOC	--	--
					DSI-SB-11-2-3.5	2 to 3.5 ft	--	--	--	--
					DSI-SB-11-3.5-5	3.5 to 5 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-11-5-6	5 to 6 ft	--	--	--	--
					DSI-SB-11-6-6.9	6 to 6.9 ft	--	--	--	--
					DSI-SB-11-6.9-8	6.9 to 8 ft	--	--	--	--
					DSI-SB-11-8-8.9	8 to 8.9 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-11-8.9-10	8.9 to 10 ft	--	--	--	--
					DSI-SB-11-10-11	10 to 11 ft	--	--	--	--
					DSI-SB-11-11-12.3	11 to 12.3 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
DSI-SB-12	1268029.86	204649.54	6.2	-3.7	DSI-SB-12-1-2	1 to 2 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-12-2-3	2 to 3 ft	--	--	--	--
					DSI-SB-12-3-4.3	3 to 4.3 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-12-4.3-5.8	4.3 to 5.8 ft	--	--	Metals, PCBs	TS, TOC
					DSI-SB-12-5.8-7.1	5.8 to 7.1 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-12-7.1-8	7.1 to 8 ft	--	--	--	--
					DSI-SB-12-8-9	8 to 9 ft	--	--	--	GS
					DSI-SB-12-9-10.7	9 to 10.7 ft	--	--	--	--
DSI-SB-13	1267934.22	204726.82	13.6	-6.1	DSI-SB-13-1-2	1 to 2 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-13-2-3	2 to 3 ft	--	--	--	--
					DSI-SB-13-3-4.1	3 to 4.1 ft	SVOC, Metals, Cr VI, TBT, PCBs, VOCs, Pesticides	TS, TOC	--	--
					DSI-SB-13-4.1-5	4.1 to 5 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-13-5-6	5 to 6 ft	--	--	PCBs	TS, TOC
					DSI-SB-13-6-7	6 to 7 ft	--	--	--	--
					DSI-SB-13-7-8.8	7 to 8.8 ft	--	--	--	--

Table 2b
2011 Sediment Investigation Sample Coordinates and Intervals

Station ID	Actual Coordinates[1,2] Easting (X)	Actual Coordinates[1,2] Northing (Y)	Water Depth[3]	Mudline Elevation[1,2]	Sediment Sample ID	Sampling Interval	Testing Chemistry	Testing Physical	Archive Testing Chemistry	Archive Testing Physical
DSI-SB-14	1268049.28	204899.26	38.0	-28.2	DSI-SB-14-1-2	1 to 2 ft	--	--	--	--
					DSI-SB-14-2-3	2 to 3 ft	--	--	--	--
					DSI-SB-14-3-4	3 to 4 ft	--	--	--	--
					DSI-SB-14-4-5	4 to 5 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-14-5-6	5 to 6 ft	--	--	--	--
					DSI-SB-14-6-7	6 to 7 ft	--	--	--	--
					DSI-SB-14-7-8	7 to 8 ft	--	--	--	--
					DSI-SB-14-8-9	8 to 9 ft	--	--	--	--
					DSI-SB-14-9-10.5	9 to 10.5 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-14-10.5-12.1	10.5 to 12.1 ft	--	--	--	--
DSI-SB-15	1268295.15	204244.97	42.7	-33.2	DSI-SB-15-1-2	1 to 2 ft	--	--	--	--
					DSI-SB-15-2-3	2 to 3 ft	--	--	--	--
					DSI-SB-15-3-4	3 to 4 ft	--	--	--	--
					DSI-SB-15-4-5	4 to 5 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-15-5-6	5 to 6 ft	--	--	--	--
					DSI-SB-15-6-7	6 to 7 ft	--	--	--	--
					DSI-SB-15-7-8	7 to 8 ft	--	--	--	--
					DSI-SB-15-8-9.5	8 to 9.5 ft	--	--	--	--
					DSI-SB-15-9.5-10.5	9.5 to 10.5 ft	--	--	--	--
					DSI-SB-15-10.5-11.5	10.5 to 11.5 ft	--	--	--	--
					DSI-SB-15-11.5-12.5	11.5 to 12.5 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
DSI-SB-16	1268239.62	204430.36	41.7	-31.7	DSI-SB-16-1-2	1 to 2 ft	--	--	--	--
					DSI-SB-16-2-3.5	2 to 3.5 ft	--	--	--	--
					DSI-SB-16-3.5-5	3.5 to 5 ft	--	--	--	--
					DSI-SB-16-5-6.5	5 to 6.5 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-16-6.5-7.7	6.5 to 7.7 ft	--	--	--	--
					DSI-SB-16-7.7-8.8	7.7 to 8.8 ft	--	--	--	--
					DSI-SB-16-9.2-10.7	9.2 to 10.7 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-16-10.7-12.1	10.7 to 12.1 ft	--	--	--	--

Table 2b
2011 Sediment Investigation Sample Coordinates and Intervals

Station ID	Actual Coordinates[1,2] Easting (X)	Actual Coordinates[1,2] Northing (Y)	Water Depth[3]	Mudline Elevation[1,2]	Sediment Sample ID	Sampling Interval	Testing Chemistry	Testing Physical	Archive Testing Chemistry	Archive Testing Physical
DSI-SB-17	1268158.30	204671.17	42.5	-32.7	DSI-SB-17-1-2	1 to 2 ft	--	--	--	--
					DSI-SB-17-2-3	2 to 3 ft	--	--	--	--
					DSI-SB-17-3-4	3 to 4 ft	--	--	--	--
					DSI-SB-17-4-5	4 to 5 ft	--	--	--	--
					DSI-SB-17-5-6	5 to 6 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-17-6-7	6 to 7 ft	--	--	--	--
					DSI-SB-17-7-8	7 to 8 ft	--	--	--	--
					DSI-SB-17-8-9	8 to 9 ft	--	--	--	--
					DSI-SB-17-9.4-10.7	9.4 to 10.7 ft	--	--	SVOCs, Metals, TBT, PCBs	TS, TOC
					DSI-SB-17-10.7-12.8	10.7 to 12.8 ft	--	--	--	--

Notes:
ft = feet
cm = centimeters
CR = Chromium
D/F = Dioxin/Furan
GS = Grain Size (not frozen)
MC = Moisture Content
PCB = polychlorinated biphenyl
SVOC = Semi-Volatile Organic Compound
TBT = tributyltin
TOC = Total Organic Carbon
TS = Total Solids
TVS = Total Volatile Solids
VOC = Volatile Organic Compounds
1 = Surface sediment samples were collected by Van Veen methodology. Station IDs DSI-SS-01 to DSI-SS-07 are co-located surface and subsurface sediment stations. Actual coordinates and mudlines are presented for accepted surface sediment samples.
2 = Horizontal Datum is North American Datum of 1983 (NAD) 83 HARN State Plane Washington South, U.S. Survey feet. Vertical datum is Mean Low Low Water (MLLW) mudline determined from continuous surface water level measurements from river transducer.
3 = Water depth presented is at the time of sample collection and measured by lead line. Water levels in the Duwamish River are tidally and seasonally influenced.

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-04	DSI-04	DSI-05	DSI-05	DSI-08	DSI-08	DSI-GP-06	DSI-GP-06	DSI-GP-07
		Sample ID	DSI04-SO-A	DSI04-SO-B	DSI05-SO-A	DSI05-SO-B	DSI08-SO-A	DSI08-SO-B	DSI-GP-06-3-5	DSI-GP-06-5.5-8	DSI-GP-07-1.5-4
		Sample Date	9/27/2006	9/27/2006	9/27/2006	9/27/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009
		Depth	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	3 - 5 feet	5.5 - 8 feet	1.5 - 4 feet
		Sample Type	N	N	N	N	N	N	N	N	N
		X	1267677.299	1267677.299	1267664.491	1267664.491	1267815.082	1267815.082	1267588.576080	1267588.576080	1267662.081370
		Y	204577.5256	204577.5256	204414.7943	204414.7943	204599.0763	204599.0763	204506.762927	204506.762927	204563.527640
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
Conventional Parameters (pct)											
Moisture (water) content			--	--	--	--	--	--	18.72	22.72	--
Total organic carbon			0.579	0.084	1.07	0.226	0.661	0.133	--	--	--
Total solids			74.3	87.6	76.7	88.9	70.4	92.9	--	--	--
Grain Size (pct)											
Percent passing < 1.3 micron sieve			--	--	--	--	--	--	3.5	--	--
Percent retained 1.3 micron sieve			--	--	--	--	--	--	0.7	--	--
Percent retained 3.2 micron sieve			--	--	--	--	--	--	2.1	--	--
Percent retained 7 micron sieve			--	--	--	--	--	--	2.1	--	--
Percent retained 9 micron sieve			--	--	--	--	--	--	0.1 U	--	--
Percent retained 13 micron sieve			--	--	--	--	--	--	1.4	--	--
Percent retained 22 micron sieve			--	--	--	--	--	--	1.4	--	--
Percent retained 32 micron sieve			--	--	--	--	--	--	3.7	--	--
Percent retained 75 micron sieve (#200)			--	--	--	--	--	--	7.9	19.5	--
Percent retained 150 micron sieve (#100)			--	--	--	--	--	--	17.3	16.9	--
Percent retained 250 micron sieve (#60)			--	--	--	--	--	--	33.6	17.1	--
Percent retained 425 micron sieve (#40)			--	--	--	--	--	--	19.9	10.3	--
Percent retained 850 micron sieve (#20)			--	--	--	--	--	--	4	2.4	--
Percent retained 2000 micron sieve (#10)			--	--	--	--	--	--	1.2	0.5	--
Percent retained 4750 micron sieve (#4)			--	--	--	--	--	--	1.3	0.3	--
Percent retained 9500 micron sieve			--	--	--	--	--	--	0.1 U	0.1 U	--
Percent retained 12500 micron sieve			--	--	--	--	--	--	0.1 U	0.1 U	--
Percent retained 19000 micron sieve			--	--	--	--	--	--	0.1 U	0.1 U	--
Percent retained 25K micron sieve			--	--	--	--	--	--	0.1 U	21.2	--
Percent retained 37.5K micron sieve			--	--	--	--	--	--	0.1 U	0.1 U	--
Percent retained 50K micron sieve			--	--	--	--	--	--	0.1 U	0.1 U	--
Percent retained 75K micron sieve			--	--	--	--	--	--	0.1 U	0.1 U	--
Total Gravel			--	--	--	--	--	--	1	20	--
Total Sand			--	--	--	--	--	--	83	66	--
Total Silt			--	--	--	--	--	--	10	--	--
Total Clay			--	--	--	--	--	--	4	--	--
Metals (mg/kg)											
Antimony		1400	--	--	--	--	--	--	--	--	--
Arsenic	20	1050	6.4	1.1	7.1	1.3	4.8	0.7	--	--	--
Cadmium	2	3500	0.5	0.2 U	0.6	0.2 U	0.3 U	0.2 U	--	--	--
Chromium	2000		27.2	10.4	21.1	11	17.7	9.7	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-04	DSI-04	DSI-05	DSI-05	DSI-08	DSI-08	DSI-GP-06	DSI-GP-06	DSI-GP-07
		Sample ID	DSI04-SO-A	DSI04-SO-B	DSI05-SO-A	DSI05-SO-B	DSI08-SO-A	DSI08-SO-B	DSI-GP-06-3-5	DSI-GP-06-5.5-8	DSI-GP-07-1.5-4
		Sample Date	9/27/2006	9/27/2006	9/27/2006	9/27/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009
		Depth	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	3 - 5 feet	5.5 - 8 feet	1.5 - 4 feet
		Sample Type	N	N	N	N	N	N	N	N	N
		X	1267677.299	1267677.299	1267664.491	1267664.491	1267815.082	1267815.082	1267588.576080	1267588.576080	1267662.081370
		Y	204577.5256	204577.5256	204414.7943	204414.7943	204599.0763	204599.0763	204506.762927	204506.762927	204563.527640
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
Chromium VI	19	10500	0.151 UJ	0.127 UJ	0.142 UJ	0.127 UJ	0.16 UJ	0.116 UJ	--	--	--
Copper		140000	**45.9**	**9**	**122**	**11.9**	**31**	**8.5**	--	--	--
Lead	250		**14**	2 U	**78**	**3**	**11**	2 U	--	--	--
Mercury	2		**0.15**	0.04 U	**0.27**	0.04 U	**0.1**	0.05 U	--	--	--
Nickel		70000	--	--	--	--	--	--	--	--	--
Selenium		17500	--	--	--	--	--	--	--	--	--
Silver		17500	0.4 U	0.3 U	0.4 U	0.3 U	0.4 U	0.3 U	--	--	--
Zinc		1050000	**85.4**	**21.9**	**127**	**26.4**	**52.3**	**30.5**	--	--	--
Volatile Organics (µg/kg)											
1,1,1,2-Tetrachloroethane		105000000	1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
1,1,1-Trichloroethane	2000	7000000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,1,2,2-Tetrachloroethane		70000000	1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
1,1,2-Trichloroethane		14000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,1-Dichloroethane		700000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,1-Dichloroethene		175000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,1-Dichloropropene			1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,2,3-Trichlorobenzene			6.5 U	5.6 U	6.4 UJ	6.4 U	6.4 U	5.7 U	--	--	--
1,2,3-Trichloropropane		14000000	2.6 U	2.2 U	2.5 UJ	2.6 U	2.6 U	2.3 U	--	--	--
1,2,4-Trichlorobenzene		35000000	6.5 U	5.6 U	6.4 UJ	6.4 U	6.4 U	5.7 U	--	--	--
1,2,4-Trimethylbenzene			1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
1,2-Dibromo-3-chloropropane		700000	6.5 U	5.6 U	6.4 UJ	6.4 U	6.4 U	5.7 U	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	5	31500000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,2-Dichlorobenzene		315000000	1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
1,2-Dichloroethane		70000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,2-Dichloroethene, cis-		7000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,2-Dichloroethene, trans-		70000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,2-Dichloropropane			1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)		35000000	1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
1,3-Dichlorobenzene			1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
1,3-Dichloropropane			1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,3-Dichloropropene, cis-			1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,3-Dichloropropene, trans-			1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
1,4-Dichlorobenzene			1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
2,2-Dichloropropane			1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
2-Butanone (MEK)		2100000000	**9.2**	5.6 U	6.4 U	**10**	**6.6**	5.7 U	--	--	--
2-Chlorotoluene		70000000	1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
2-Hexanone (Methyl butyl ketone)			6.5 U	5.6 U	6.4 U	6.4 U	6.4 U	5.7 U	--	--	--
4-Chlorotoluene			1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-04	DSI-04	DSI-05	DSI-05	DSI-08	DSI-08	DSI-GP-06	DSI-GP-06	DSI-GP-07
		Sample ID	DSI04-SO-A	DSI04-SO-B	DSI05-SO-A	DSI05-SO-B	DSI08-SO-A	DSI08-SO-B	DSI-GP-06-3-5	DSI-GP-06-5.5-8	DSI-GP-07-1.5-4
		Sample Date	9/27/2006	9/27/2006	9/27/2006	9/27/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009
		Depth	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	3 - 5 feet	5.5 - 8 feet	1.5 - 4 feet
		Sample Type	N	N	N	N	N	N	N	N	N
		X	1267677.299	1267677.299	1267664.491	1267664.491	1267815.082	1267815.082	1267588.576080	1267588.576080	1267662.081370
		Y	204577.5256	204577.5256	204414.7943	204414.7943	204599.0763	204599.0763	204506.762927	204506.762927	204563.527640
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
4-Isopropyltoluene (4-Cymene)			1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
Acetone		3150000000	**66**	29 U	51 U	**90**	**62**	**49**	--	--	--
Benzene	30	14000000	**1.6**	1.1 U	**1.8**	1.3 U	1.3 U	1.2 U	--	--	--
Bromobenzene			1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
Bromochloromethane			1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Bromodichloromethane		70000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Bromoform (Tribromomethane)		70000000	1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
Bromomethane (Methyl Bromide)		4900000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Carbon disulfide		350000000	**8.6**	1.1 U	1.3 U	**17**	1.3 U	1.2 U	--	--	--
Carbon tetrachloride (Tetrachloromethane)		14000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Chloroethane			1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Chloroform		35000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Chloromethane			1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Dibromochloromethane		70000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Dibromomethane		35000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Dichlorodifluoromethane		700000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Dichloromethane (Methylene chloride)	20	210000000	2.6 U	2.2 U	2.5 U	2.6 U	**2.8**	2.3 U	--	--	--
Ethylbenzene	6000	350000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Isopropylbenzene (Cumene)		350000000	1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
m,p-Xylene			1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		280000000	6.5 U	5.6 U	6.4 U	6.4 U	6.4 U	5.7 U	--	--	--
Methyl tert-butyl ether (MTBE)	100		1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Naphthalene		70000000	--	--	--	--	--	--	--	--	--
n-Butylbenzene			1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
n-Propylbenzene		350000000	1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
o-Xylene		700000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
sec-Butylbenzene			1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
Styrene		700000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
tert-Butylbenzene			1.3 U	1.1 U	1.3 UJ	1.3 U	1.3 U	1.2 U	--	--	--
Tetrachloroethene (PCE)	50	35000000	1.3 U	1.1 U	1.3 U	1.3 U	**3.6**	**1.4**	--	--	--
Toluene	7000	280000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-04	DSI-04	DSI-05	DSI-05	DSI-08	DSI-08	DSI-GP-06	DSI-GP-06	DSI-GP-07
		Sample ID	DSI04-SO-A	DSI04-SO-B	DSI05-SO-A	DSI05-SO-B	DSI08-SO-A	DSI08-SO-B	DSI-GP-06-3-5	DSI-GP-06-5.5-8	DSI-GP-07-1.5-4
		Sample Date	9/27/2006	9/27/2006	9/27/2006	9/27/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009
		Depth	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	3 - 5 feet	5.5 - 8 feet	1.5 - 4 feet
		Sample Type	N	N	N	N	N	N	N	N	N
		X	1267677.299	1267677.299	1267664.491	1267664.491	1267815.082	1267815.082	1267588.576080	1267588.576080	1267662.081370
		Y	204577.5256	204577.5256	204414.7943	204414.7943	204599.0763	204599.0763	204506.762927	204506.762927	204563.527640
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
Trichloroethene (TCE)	30		1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Trichlorofluoromethane (Fluorotrichloromethane)		1050000000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Vinyl chloride		10500000	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Total Xylene (U = 1/2)	9000		1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.2 U	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)											
1-Methylnaphthalene			--	--	--	--	--	--	--	--	--
2-Methylnaphthalene		14000000	**16**	5 U	**26**	4.7 U	**5**	4.9 U	--	--	--
Acenaphthene		210000000	5 U	5 U	4.9 U	4.7 U	5 U	4.9 U	--	--	--
Acenaphthylene			5 U	5 U	**6.4**	4.7 U	5 U	4.9 U	--	--	--
Anthracene		1050000000	**5.9**	5 U	**12**	4.7 U	5 U	4.9 U	--	--	--
Benzo(a)anthracene			**14**	5 U	**28**	4.7 U	**12**	4.9 U	--	--	--
Benzo(a)pyrene	100		**8.4**	5 U	**29**	4.7 U	**12**	4.9 U	--	--	--
Benzo(b)fluoranthene			**16**	5 U	**48**	4.7 U	**18**	4.9 U	--	--	--
Benzo(g,h,i)perylene			5 U	5 U	**13**	4.7 U	**8.4**	4.9 U	--	--	--
Benzo(k)fluoranthene			**13**	5 U	**28**	4.7 U	**13**	4.9 U	--	--	--
Chrysene			**25**	5 U	**50**	4.7 U	**22**	4.9 U	--	--	--
Dibenzo(a,h)anthracene			5 U	5 U	4.9 U	4.7 U	5 U	4.9 U	--	--	--
Fluoranthene		140000000	**40**	5 U	**96**	4.7 U	**37**	4.9 U	--	--	--
Fluorene		140000000	5 U	5 U	**6.9**	4.7 U	5 U	4.9 U	--	--	--
Indeno(1,2,3-c,d)pyrene			**5.4**	5 U	**13**	4.7 U	**7.4**	4.9 U	--	--	--
Naphthalene		70000000	**13**	5 U	**53**	4.7 U	5 U	4.9 U	--	--	--
Phenanthrene			**24**	5 U	**91**	4.7 U	**26**	4.9 U	--	--	--
Pyrene		105000000	**33**	5 U	**72**	4.7 U	**32**	4.9 U	--	--	--
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	100		**14**	5 U	**40**	4.7 U	**18**	4.9 U	--	--	--
Total Naphthalenes (U = 1/2)	5000		**29**	5 U	**79**	4.7 U	**7.5**	4.9 U	--	--	--
Semivolatile Organics (µg/kg)											
1,2,4-Trichlorobenzene		35000000	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene		315000000	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene			--	--	--	--	--	--	--	--	--
2,4-Dimethylphenol		70000000	--	--	--	--	--	--	--	--	--
2-Methylphenol (o-Cresol)		175000000	--	--	--	--	--	--	--	--	--
4-Methylphenol (p-Cresol)		17500000	--	--	--	--	--	--	--	--	--
Benzoic acid		14000000000	--	--	--	--	--	--	--	--	--
Benzyl alcohol		350000000	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate		70000000	--	--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	**A-Central Area**	**A-Central Area**	**A-Central Area**	**A-Central Area**	**A-Central Area**	**A-Central Area**	**A-Central Area**	**A-Central Area**	**A-Central Area**
		Task	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**
		Location ID	**DSI-04**	**DSI-04**	**DSI-05**	**DSI-05**	**DSI-08**	**DSI-08**	**DSI-GP-06**	**DSI-GP-06**	**DSI-GP-07**
		Sample ID	**DSI04-SO-A**	**DSI04-SO-B**	**DSI05-SO-A**	**DSI05-SO-B**	**DSI08-SO-A**	**DSI08-SO-B**	**DSI-GP-06-3-5**	**DSI-GP-06-5.5-8**	**DSI-GP-07-1.5-4**
		Sample Date	**9/27/2006**	**9/27/2006**	**9/27/2006**	**9/27/2006**	**9/28/2006**	**9/28/2006**	**7/14/2009**	**7/14/2009**	**7/14/2009**
		Depth	**0 - 3 feet**	**3 - 5 feet**	**0 - 3 feet**	**3 - 5 feet**	**0 - 3 feet**	**3 - 5 feet**	**3 - 5 feet**	**5.5 - 8 feet**	**1.5 - 4 feet**
		Sample Type	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
		X	**1267677.299**	**1267677.299**	**1267664.491**	**1267664.491**	**1267815.082**	**1267815.082**	**1267588.576080**	**1267588.576080**	**1267662.081370**
		Y	**204577.5256**	**204577.5256**	**204414.7943**	**204414.7943**	**204599.0763**	**204599.0763**	**204506.762927**	**204506.762927**	**204563.527640**
		Coordinate Type	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**
	MTCA Method A Unrestricted	**MTCA Method C Industrial**									
Butylbenzyl phthalate		700000000	--	--	--	--	--	--	--	--	--
Dibenzofuran		3500000	**5.4**	5 U	**16**	4.7 U	5 U	4.9 U	--	--	--
Diethyl phthalate		2800000000	--	--	--	--	--	--	--	--	--
Dimethyl phthalate			--	--	--	--	--	--	--	--	--
Di-n-butyl phthalate		350000000	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalate			--	--	--	--	--	--	--	--	--
Hexachlorobenzene		2800000	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene		3500000	--	--	--	--	--	--	--	--	--
Hexachloroethane		3500000	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine			--	--	--	--	--	--	--	--	--
Pentachlorophenol		17500000	--	--	--	--	--	--	--	--	--
Phenol		1050000000	--	--	--	--	--	--	--	--	--
PCB Aroclors (µg/kg)											
Aroclor 1016		245000	9.6 U	9.5 U	9.8 U	9.6 U	9.8 U	9.5 U	--	--	--
Aroclor 1221			9.6 U	9.5 U	9.8 U	9.6 U	9.8 U	9.5 U	--	--	--
Aroclor 1232			9.6 U	9.5 U	9.8 U	9.6 U	9.8 U	9.5 U	--	--	--
Aroclor 1242			9.6 U	9.5 U	9.8 U	9.6 U	9.8 U	9.5 U	--	--	--
Aroclor 1248			9.6 U	9.5 U	9.8 U	9.6 U	9.8 U	9.5 U	--	--	--
Aroclor 1254		70000	9.6 U	9.5 U	39 U	9.6 U	9.8 U	9.5 U	--	--	--
Aroclor 1260			9.6 UJ	9.5 UJ	**46 J**	9.6 UJ	9.8 U	9.5 U	--	--	--
Total PCB Aroclors (U = 1/2)	1000		9.6 UJ	9.5 UJ	**90 J**	9.6 UJ	9.8 U	9.5 U	--	--	--
Pesticides (µg/kg)											
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			3.2 U	3.1 U	**28**	3.2 U	3.2 U	3.2 U	--	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			3.2 U	3.1 U	3.1 U	3.2 U	3.2 U	3.2 U	--	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		1750000	3.2 U	3.1 U	3.1 U	3.2 U	3.2 U	3.2 U	--	--	--
Aldrin		105000	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
alpha-Chlordane (cis-Chlordane)			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
alpha-Hexachlorocyclohexane (BHC)			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
beta-Hexachlorocyclohexane (BHC)			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
delta-Hexachlorocyclohexane (BHC)			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
Dieldrin		175000	3.2 U	3.1 U	3.1 U	3.2 U	3.2 U	3.2 U	--	--	--
Endosulfan sulfate			3.2 U	3.1 U	3.1 U	3.2 U	3.2 U	3.2 U	--	--	--
Endosulfan-alpha (I)			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-04	DSI-04	DSI-05	DSI-05	DSI-08	DSI-08	DSI-GP-06	DSI-GP-06	DSI-GP-07
		Sample ID	DSI04-SO-A	DSI04-SO-B	DSI05-SO-A	DSI05-SO-B	DSI08-SO-A	DSI08-SO-B	DSI-GP-06-3-5	DSI-GP-06-5.5-8	DSI-GP-07-1.5-4
		Sample Date	9/27/2006	9/27/2006	9/27/2006	9/27/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009
		Depth	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	3 - 5 feet	5.5 - 8 feet	1.5 - 4 feet
		Sample Type	N	N	N	N	N	N	N	N	N
		X	1267677.299	1267677.299	1267664.491	1267664.491	1267815.082	1267815.082	1267588.576080	1267588.576080	1267662.081370
		Y	204577.5256	204577.5256	204414.7943	204414.7943	204599.0763	204599.0763	204506.762927	204506.762927	204563.527640
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
Endosulfan-beta (II)			3.2 U	3.1 U	3.1 U	3.2 U	3.2 U	3.2 U	--	--	--
Endrin		1050000	3.2 U	3.1 U	3.1 U	3.2 U	3.2 U	3.2 U	--	--	--
Endrin aldehyde			3.2 U	3.1 U	3.1 U	3.2 U	3.2 U	3.2 U	--	--	--
Endrin ketone			3.2 U	3.1 U	3.1 U	3.2 U	3.2 U	3.2 U	--	--	--
gamma-Chlordane			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	10	1050000	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
Heptachlor		1750000	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
Heptachlor epoxide		45500	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
Hexachlorobenzene		2800000	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
Hexachlorobutadiene		3500000	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
Methoxychlor		17500000	16 U	16 U	16 U	16 U	16 U	16 U	--	--	--
Toxaphene			160 U	160 U	160 U	160 U	160 U	160 U	--	--	--
Total DDx (U = 1/2)	3000		3.2 U	3.1 U	**31**	3.2 U	3.2 U	3.2 U	--	--	--
Total Petroleum Hydrocarbons (mg/kg)											
Diesel Range Hydrocarbons	2000		**40**	5.5 U	**46**	5.7 U	6.7 U	5.4 U	5.7 U	6.2 U	**15**
Gasoline Range Hydrocarbons	30/100*		**20**	6.4 U	**16**	**8.4**	8.8 U	6.7 U	6.5 U	7.5 U	6.5 U
Motor Oil Range			**100**	11 U	**160**	11 U	**21**	11 U	12 U	12 U	**48**
Extractable Petroleum Hydrocarbons (µg/kg)											
C8-C10 Aliphatics			--	--	--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	--	--
C12-C16 Aliphatics			--	--	--	--	--	--	--	--	--
C16-C21 Aliphatics			--	--	--	--	--	--	--	--	--
C21-C34 Aliphatics			--	--	--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--	--	--
C12-C16 Aromatics			--	--	--	--	--	--	--	--	--
C16-C21 Aromatics			--	--	--	--	--	--	--	--	--
C21-C34 Aromatics			--	--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-04	DSI-04	DSI-05	DSI-05	DSI-08	DSI-08	DSI-GP-06	DSI-GP-06	DSI-GP-07
		Sample ID	DSI04-SO-A	DSI04-SO-B	DSI05-SO-A	DSI05-SO-B	DSI08-SO-A	DSI08-SO-B	DSI-GP-06-3-5	DSI-GP-06-5.5-8	DSI-GP-07-1.5-4
		Sample Date	9/27/2006	9/27/2006	9/27/2006	9/27/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009
		Depth	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	3 - 5 feet	5.5 - 8 feet	1.5 - 4 feet
		Sample Type	N	N	N	N	N	N	N	N	N
		X	1267677.299	1267677.299	1267664.491	1267664.491	1267815.082	1267815.082	1267588.576080	1267588.576080	1267662.081370
		Y	204577.5256	204577.5256	204414.7943	204414.7943	204599.0763	204599.0763	204506.762927	204506.762927	204563.527640
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
Volatile Petroleum Hydrocarbons (µg/kg)											
Benzene	30	14000000	--	--	--	--	--	--	--	--	--
Ethylbenzene	6000	350000000	--	--	--	--	--	--	--	--	--
m,p-Xylene			--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	--	--	--	--	--
n-Decane (C10)			--	--	--	--	--	--	--	--	--
n-Dodecane (C12)			--	--	--	--	--	--	--	--	--
n-Hexane (C6)		210000000	--	--	--	--	--	--	--	--	--
n-Octane (C8)			--	--	--	--	--	--	--	--	--
n-Pentane (C5)			--	--	--	--	--	--	--	--	--
o-Xylene		700000000	--	--	--	--	--	--	--	--	--
Toluene	7000	280000000	--	--	--	--	--	--	--	--	--
C5-C6 Aliphatics			--	--	--	--	--	--	--	--	--
C6-C8 Aliphatics			--	--	--	--	--	--	--	--	--
C8-C10 Aliphatics			--	--	--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--	--	--
C12-C13 Aromatics			--	--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-07	DSI-MW-03	DSI-MW-03	DSI-02	DSI-02	DSI-03	DSI-03	DSI-GP-04	DSI-GP-04	DSI-GP-05
		Sample ID	DSI-GP-07-5.5-8	DSI-MW-03-0-3	DSI-MW-03-5-6.5	DSI02-SO-A	DSI02-SO-B	DSI03-SO-A	DSI03-SO-B	DSI-GP-04-2.5-4.5	DSI-GP-04-5.5-7.5	DSI-GP-05-2-4.5
		Sample Date	7/14/2009	7/13/2009	7/13/2009	9/27/2006	9/27/2006	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/14/2009
		Depth	5.5 - 8 feet	0 - 3 feet	5 - 6.5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	5 - 6.5 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2 - 4.5 feet
		Sample Type	N	N	N	N	N	N	N	N	N	N
		X	1267662.081370	1267731.360000	1267731.360000	1267482.282	1267482.282	1267538.202	1267538.202	1267562.472590	1267562.472590	1267499.840140
		Y	204563.527640	204467.030000	204467.030000	204484.7162	204484.7162	204614.5365	204614.5365	204594.779389	204594.779389	204589.624301
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial										
Conventional Parameters (pct)												
Moisture (water) content			--	**16.31**	--	--	--	--	--	--	--	--
Total organic carbon			--	--	--	**0.305**	**0.698**	**0.325**	**0.781**	--	--	--
Total solids			--	--	--	**96.1**	**78.6**	**96.1**	**89.4**	--	--	--
Grain Size (pct)												
Percent passing < 1.3 micron sieve			--	**5.9**	--	--	--	--	--	--	--	--
Percent retained 1.3 micron sieve			--	**1.7**	--	--	--	--	--	--	--	--
Percent retained 3.2 micron sieve			--	**3.8**	--	--	--	--	--	--	--	--
Percent retained 7 micron sieve			--	**2.5**	--	--	--	--	--	--	--	--
Percent retained 9 micron sieve			--	**3.8**	--	--	--	--	--	--	--	--
Percent retained 13 micron sieve			--	**2.5**	--	--	--	--	--	--	--	--
Percent retained 22 micron sieve			--	**4.2**	--	--	--	--	--	--	--	--
Percent retained 32 micron sieve			--	**7.3**	--	--	--	--	--	--	--	--
Percent retained 75 micron sieve (#200)			--	**7.7**	--	--	--	--	--	--	--	--
Percent retained 150 micron sieve (#100)			--	**9.5**	--	--	--	--	--	--	--	--
Percent retained 250 micron sieve (#60)			--	**15**	--	--	--	--	--	--	--	--
Percent retained 425 micron sieve (#40)			--	**11.5**	--	--	--	--	--	--	--	--
Percent retained 850 micron sieve (#20)			--	**6.2**	--	--	--	--	--	--	--	--
Percent retained 2000 micron sieve (#10)			--	**8.4**	--	--	--	--	--	--	--	--
Percent retained 4750 micron sieve (#4)			--	**7.5**	--	--	--	--	--	--	--	--
Percent retained 9500 micron sieve			--	**2.3**	--	--	--	--	--	--	--	--
Percent retained 12500 micron sieve			--	0.1 U	--	--	--	--	--	--	--	--
Percent retained 19000 micron sieve			--	0.1 U	--	--	--	--	--	--	--	--
Percent retained 25K micron sieve			--	0.1 U	--	--	--	--	--	--	--	--
Percent retained 37.5K micron sieve			--	0.1 U	--	--	--	--	--	--	--	--
Percent retained 50K micron sieve			--	0.1 U	--	--	--	--	--	--	--	--
Percent retained 75K micron sieve			--	0.1 U	--	--	--	--	--	--	--	--
Total Gravel			--	**10**	--	--	--	--	--	--	--	--
Total Sand			--	**50**	--	--	--	--	--	--	--	--
Total Silt			--	**24**	--	--	--	--	--	--	--	--
Total Clay			--	**7.6**	--	--	--	--	--	--	--	--
Metals (mg/kg)												
Antimony		1400	--	--	--	--	--	--	--	--	--	--
Arsenic	20	1050	--	--	--	**18.9**	**5.8**	**7.1**	**10.4**	--	--	--
Cadmium	2	3500	--	--	--	2 U	**0.3**	1 U	**0.5**	--	--	--
Chromium	2000		--	--	--	**5**	**21.7**	**61**	**34**	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

	MTCA Method A Unrestricted	MTCA Method C Industrial										
Site Area			A-Central Area	A-Central Area	A-Central Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area
Task			Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-GP-07	DSI-MW-03	DSI-MW-03	DSI-02	DSI-02	DSI-03	DSI-03	DSI-GP-04	DSI-GP-04	DSI-GP-05
Sample ID			DSI-GP-07-5.5-8	DSI-MW-03-0-3	DSI-MW-03-5-6.5	DSI02-SO-A	DSI02-SO-B	DSI03-SO-A	DSI03-SO-B	DSI-GP-04-2.5-4.5	DSI-GP-04-5.5-7.5	DSI-GP-05-2-4.5
Sample Date			7/14/2009	7/13/2009	7/13/2009	9/27/2006	9/27/2006	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/14/2009
Depth			5.5 - 8 feet	0 - 3 feet	5 - 6.5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	5 - 6.5 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2 - 4.5 feet
Sample Type			N	N	N	N	N	N	N	N	N	N
X			1267662.081370	1267731.360000	1267731.360000	1267482.282	1267482.282	1267538.202	1267538.202	1267562.472590	1267562.472590	1267499.840140
Y			204563.527640	204467.030000	204467.030000	204484.7162	204484.7162	204614.5365	204614.5365	204594.779389	204594.779389	204589.624301
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
Chromium VI	19	10500	--	--	--	0.116 UJ	0.14 UJ	0.111 UJ	0.126 UJ	--	--	--
Copper		140000	--	--	--	**55**	**33.6**	**539**	**238**	--	--	--
Lead	250		--	--	--	20 U	**32**	**460**	**94**	--	--	--
Mercury	2		--	--	--	**0.05**	**0.2**	0.05 U	0.05 U	--	--	--
Nickel		70000	--	--	--	--	--	--	--	--	--	--
Selenium		17500	--	--	--	--	--	--	--	--	--	--
Silver		17500	--	--	--	3 U	0.4 U	2 U	0.8 U	--	--	--
Zinc		1050000	--	--	--	**57**	**57.7**	**129**	**160**	--	--	--
Volatile Organics (µg/kg)												
1,1,1,2-Tetrachloroethane		105000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,1,1-Trichloroethane	2000	7000000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,1,2,2-Tetrachloroethane		70000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,1,2-Trichloroethane		14000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,1-Dichloroethane		700000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,1-Dichloroethene		175000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,1-Dichloropropene			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,2,3-Trichlorobenzene			--	--	--	4.8 U	5.2 U	5.2 U	4.6 U	--	--	--
1,2,3-Trichloropropane		14000000	--	--	--	1.9 U	2.1 U	2.1 U	1.8 U	--	--	--
1,2,4-Trichlorobenzene		35000000	--	--	--	4.8 U	5.2 U	5.2 U	4.6 U	--	--	--
1,2,4-Trimethylbenzene			--	--	--	**3.8**	**100**	1 U	0.9 U	--	--	--
1,2-Dibromo-3-chloropropane		700000	--	--	--	4.8 U	5.2 U	5.2 U	4.6 U	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	5	31500000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,2-Dichlorobenzene		315000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,2-Dichloroethane		70000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,2-Dichloroethene, cis-		7000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,2-Dichloroethene, trans-		70000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,2-Dichloropropane			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)		35000000	--	--	--	**1.2**	**39**	1 U	0.9 U	--	--	--
1,3-Dichlorobenzene			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,3-Dichloropropane			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,3-Dichloropropene, cis-			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,3-Dichloropropene, trans-			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
1,4-Dichlorobenzene			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
2,2-Dichloropropane			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
2-Butanone (MEK)		2100000000	--	--	--	**5.2**	**18**	**11**	**5.2**	--	--	--
2-Chlorotoluene		70000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
2-Hexanone (Methyl butyl ketone)			--	--	--	4.8 U	5.2 U	5.2 U	4.6 U	--	--	--
4-Chlorotoluene			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--

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2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-07	DSI-MW-03	DSI-MW-03	DSI-02	DSI-02	DSI-03	DSI-03	DSI-GP-04	DSI-GP-04	DSI-GP-05
		Sample ID	DSI-GP-07-5.5-8	DSI-MW-03-0-3	DSI-MW-03-5-6.5	DSI02-SO-A	DSI02-SO-B	DSI03-SO-A	DSI03-SO-B	DSI-GP-04-2.5-4.5	DSI-GP-04-5.5-7.5	DSI-GP-05-2-4.5
		Sample Date	7/14/2009	7/13/2009	7/13/2009	9/27/2006	9/27/2006	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/14/2009
		Depth	5.5 - 8 feet	0 - 3 feet	5 - 6.5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	5 - 6.5 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2 - 4.5 feet
		Sample Type	N	N	N	N	N	N	N	N	N	N
		X	1267662.081370	1267731.360000	1267731.360000	1267482.282	1267482.282	1267538.202	1267538.202	1267562.472590	1267562.472590	1267499.840140
		Y	204563.527640	204467.030000	204467.030000	204484.7162	204484.7162	204614.5365	204614.5365	204594.779389	204594.779389	204589.624301
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial										
4-Isopropyltoluene (4-Cymene)			--	--	--	1 U	**6**	1 U	0.9 U	--	--	--
Acetone		3150000000	--	--	--	**83**	**160**	**85**	41 U	--	--	--
Benzene	30	14000000	--	--	--	1 U	**2**	1 U	0.9 U	--	--	--
Bromobenzene			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Bromochloromethane			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Bromodichloromethane		70000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Bromoform (Tribromomethane)		70000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Bromomethane (Methyl Bromide)		4900000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Carbon disulfide		350000000	--	--	--	**1.2**	**4.9**	**1.4**	**1.2**	--	--	--
Carbon tetrachloride (Tetrachloromethane)		14000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Chloroethane			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Chloroform		35000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Chloromethane			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Dibromochloromethane		70000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Dibromomethane		35000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Dichlorodifluoromethane		700000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Dichloromethane (Methylene chloride)	20	210000000	--	--	--	1.9 U	2.1 U	2.1 U	1.8 U	--	--	--
Ethylbenzene	6000	350000000	--	--	--	1 U	**6**	1 U	0.9 U	--	--	--
Isopropylbenzene (Cumene)		350000000	--	--	--	1 U	**19**	1 U	0.9 U	--	--	--
m,p-Xylene			--	--	--	**3.6**	**47**	1 U	0.9 U	--	--	--
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		280000000	--	--	--	4.8 U	5.2 U	5.2 U	4.6 U	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Naphthalene		70000000	--	--	--	--	--	--	--	--	--	--
n-Butylbenzene			--	--	--	1 U	**4.4**	1 U	0.9 U	--	--	--
n-Propylbenzene		350000000	--	--	--	1 U	**9.9**	1 U	0.9 U	--	--	--
o-Xylene		700000000	--	--	--	**1.8**	**26**	1 U	0.9 U	--	--	--
sec-Butylbenzene			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Styrene		700000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
tert-Butylbenzene			--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Tetrachloroethene (PCE)	50	35000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Toluene	7000	280000000	--	--	--	**1.8**	1 U	1 U	0.9 U	--	--	--

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		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-07	DSI-MW-03	DSI-MW-03	DSI-02	DSI-02	DSI-03	DSI-03	DSI-GP-04	DSI-GP-04	DSI-GP-05
		Sample ID	DSI-GP-07-5.5-8	DSI-MW-03-0-3	DSI-MW-03-5-6.5	DSI02-SO-A	DSI02-SO-B	DSI03-SO-A	DSI03-SO-B	DSI-GP-04-2.5-4.5	DSI-GP-04-5.5-7.5	DSI-GP-05-2-4.5
		Sample Date	7/14/2009	7/13/2009	7/13/2009	9/27/2006	9/27/2006	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/14/2009
		Depth	5.5 - 8 feet	0 - 3 feet	5 - 6.5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	5 - 6.5 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2 - 4.5 feet
		Sample Type	N	N	N	N	N	N	N	N	N	N
		X	1267662.081370	1267731.360000	1267731.360000	1267482.282	1267482.282	1267538.202	1267538.202	1267562.472590	1267562.472590	1267499.840140
		Y	204563.527640	204467.030000	204467.030000	204484.7162	204484.7162	204614.5365	204614.5365	204594.779389	204594.779389	204589.624301
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial										
Trichloroethene (TCE)	30		--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Trichlorofluoromethane (Fluorotrichloromethane)		1050000000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Vinyl chloride		10500000	--	--	--	1 U	1 U	1 U	0.9 U	--	--	--
Total Xylene (U = 1/2)	9000		--	--	--	**5.4**	**73**	1 U	0.9 U	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)												
1-Methylnaphthalene			--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene		14000000	--	--	--	**4.7**	**98**	4.7 U	**40**	--	--	--
Acenaphthene		210000000	--	--	--	4.7 U	**120**	**5.6**	4.7 U	--	--	--
Acenaphthylene			--	--	--	4.7 U	4.8 U	4.7 U	4.7 U	--	--	--
Anthracene		1050000000	--	--	--	4.7 U	**100**	**5.1**	**8.5**	--	--	--
Benzo(a)anthracene			--	--	--	4.7 U	**110**	**9.8**	**11**	--	--	--
Benzo(a)pyrene	100		--	--	--	**5.7**	**110**	**10**	**12**	--	--	--
Benzo(b)fluoranthene			--	--	--	**11**	**72**	**12**	**21**	--	--	--
Benzo(g,h,i)perylene			--	--	--	**5.7**	**38**	**7**	**5.2**	--	--	--
Benzo(k)fluoranthene			--	--	--	**9.4**	**90 J**	**14**	**15**	--	--	--
Chrysene			--	--	--	**10**	**140 J**	**17**	**31**	--	--	--
Dibenzo(a,h)anthracene			--	--	--	4.7 U	**12**	4.7 U	4.7 U	--	--	--
Fluoranthene		140000000	--	--	--	**11**	**270**	**26**	**38**	--	--	--
Fluorene		140000000	--	--	--	4.7 U	**120**	**5.1**	**19**	--	--	--
Indeno(1,2,3-c,d)pyrene			--	--	--	4.7 U	**37**	**5.6**	4.7 U	--	--	--
Naphthalene		70000000	--	--	--	**5.2**	**180**	**6.5**	**12**	--	--	--
Phenanthrene			--	--	--	**7.6**	**410 J**	**27**	**100**	--	--	--
Pyrene		105000000	--	--	--	**10**	**280**	**21**	**37**	--	--	--
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	100		--	--	--	**9**	**100 J**	**10**	**17**	--	--	--
Total Naphthalenes (U = 1/2)	5000		--	--	--	**9.9**	**280**	**8.9**	**50**	--	--	--
Semivolatile Organics (µg/kg)												
1,2,4-Trichlorobenzene		35000000	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene		315000000	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene			--	--	--	--	--	--	--	--	--	--
2,4-Dimethylphenol		70000000	--	--	--	--	--	--	--	--	--	--
2-Methylphenol (o-Cresol)		175000000	--	--	--	--	--	--	--	--	--	--
4-Methylphenol (p-Cresol)		17500000	--	--	--	--	--	--	--	--	--	--
Benzoic acid		14000000000	--	--	--	--	--	--	--	--	--	--
Benzyl alcohol		350000000	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate		70000000	--	--	--	--	--	--	--	--	--	--

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		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-07	DSI-MW-03	DSI-MW-03	DSI-02	DSI-02	DSI-03	DSI-03	DSI-GP-04	DSI-GP-04	DSI-GP-05
		Sample ID	DSI-GP-07-5.5-8	DSI-MW-03-0-3	DSI-MW-03-5-6.5	DSI02-SO-A	DSI02-SO-B	DSI03-SO-A	DSI03-SO-B	DSI-GP-04-2.5-4.5	DSI-GP-04-5.5-7.5	DSI-GP-05-2-4.5
		Sample Date	7/14/2009	7/13/2009	7/13/2009	9/27/2006	9/27/2006	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/14/2009
		Depth	5.5 - 8 feet	0 - 3 feet	5 - 6.5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	5 - 6.5 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2 - 4.5 feet
		Sample Type	N	N	N	N	N	N	N	N	N	N
		X	1267662.081370	1267731.360000	1267731.360000	1267482.282	1267482.282	1267538.202	1267538.202	1267562.472590	1267562.472590	1267499.840140
		Y	204563.527640	204467.030000	204467.030000	204484.7162	204484.7162	204614.5365	204614.5365	204594.779389	204594.779389	204589.624301
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial										
Butylbenzyl phthalate		700000000	--	--	--	--	--	--	--	--	--	--
Dibenzofuran		3500000	--	--	--	4.7 U	**56**	4.7 U	**9.4**	--	--	--
Diethyl phthalate		2800000000	--	--	--	--	--	--	--	--	--	--
Dimethyl phthalate			--	--	--	--	--	--	--	--	--	--
Di-n-butyl phthalate		350000000	--	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalate			--	--	--	--	--	--	--	--	--	--
Hexachlorobenzene		2800000	--	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene		3500000	--	--	--	--	--	--	--	--	--	--
Hexachloroethane		3500000	--	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine			--	--	--	--	--	--	--	--	--	--
Pentachlorophenol		17500000	--	--	--	--	--	--	--	--	--	--
Phenol		1050000000	--	--	--	--	--	--	--	--	--	--
PCB Aroclors (µg/kg)												
Aroclor 1016		245000	--	--	--	9.7 U	9.7 U	48 U	9.5 U	--	--	--
Aroclor 1221			--	--	--	9.7 U	9.7 U	48 U	9.5 U	--	--	--
Aroclor 1232			--	--	--	9.7 U	9.7 U	48 U	9.5 U	--	--	--
Aroclor 1242			--	--	--	9.7 U	9.7 U	48 U	9.5 U	--	--	--
Aroclor 1248			--	--	--	9.7 U	9.7 U	48 U	9.5 U	--	--	--
Aroclor 1254		70000	--	--	--	9.7 U	9.7 U	48 U	9.5 U	--	--	--
Aroclor 1260			--	--	--	9.7 UJ	9.7 UJ	**300 J**	**94 J**	--	--	--
Total PCB Aroclors (U = 1/2)	1000		--	--	--	9.7 UJ	9.7 UJ	**400 J**	**120 J**	--	--	--
Pesticides (µg/kg)												
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			--	--	--	3.2 U	3.3 U	3.2 U	3.2 U	--	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			--	--	--	3.2 U	3.3 U	3.2 U	3.2 U	--	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		1750000	--	--	--	3.2 U	3.3 U	3.2 U	3.2 U	--	--	--
Aldrin		105000	--	--	--	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
alpha-Chlordane (cis-Chlordane)			--	--	--	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
alpha-Hexachlorocyclohexane (BHC)			--	--	--	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
beta-Hexachlorocyclohexane (BHC)			--	--	--	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
delta-Hexachlorocyclohexane (BHC)			--	--	--	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
Dieldrin		175000	--	--	--	3.2 U	3.3 U	8.5 U	3.2 U	--	--	--
Endosulfan sulfate			--	--	--	3.2 U	3.3 U	15 U	3.2 U	--	--	--
Endosulfan-alpha (I)			--	--	--	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-07	DSI-MW-03	DSI-MW-03	DSI-02	DSI-02	DSI-03	DSI-03	DSI-GP-04	DSI-GP-04	DSI-GP-05
		Sample ID	DSI-GP-07-5.5-8	DSI-MW-03-0-3	DSI-MW-03-5-6.5	DSI02-SO-A	DSI02-SO-B	DSI03-SO-A	DSI03-SO-B	DSI-GP-04-2.5-4.5	DSI-GP-04-5.5-7.5	DSI-GP-05-2-4.5
		Sample Date	7/14/2009	7/13/2009	7/13/2009	9/27/2006	9/27/2006	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/14/2009
		Depth	5.5 - 8 feet	0 - 3 feet	5 - 6.5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	5 - 6.5 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2 - 4.5 feet
		Sample Type	N	N	N	N	N	N	N	N	N	N
		X	1267662.081370	1267731.360000	1267731.360000	1267482.282	1267482.282	1267538.202	1267538.202	1267562.472590	1267562.472590	1267499.840140
		Y	204563.527640	204467.030000	204467.030000	204484.7162	204484.7162	204614.5365	204614.5365	204594.779389	204594.779389	204589.624301
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial										
Endosulfan-beta (II)			--	--	--	3.2 U	3.3 U	9.9 U	7.2 U	--	--	--
Endrin		1050000	--	--	--	3.2 U	3.3 U	3.2 U	3.2 U	--	--	--
Endrin aldehyde			--	--	--	3.2 U	3.3 U	3.2 U	3.2 U	--	--	--
Endrin ketone			--	--	--	3.2 U	3.3 U	3.2 U	3.2 U	--	--	--
gamma-Chlordane			--	--	--	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	10	1050000	--	--	--	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
Heptachlor		1750000	--	--	--	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
Heptachlor epoxide		45500	--	--	--	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
Hexachlorobenzene		2800000	--	--	--	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
Hexachlorobutadiene		3500000	--	--	--	1.6 U	1.6 U	1.6 U	1.6 U	--	--	--
Methoxychlor		17500000	--	--	--	16 U	16 U	16 U	16 U	--	--	--
Toxaphene			--	--	--	160 U	160 U	160 U	160 U	--	--	--
Total DDx (U = 1/2)	3000		--	--	--	3.2 U	3.3 U	3.2 U	3.2 U	--	--	--
Total Petroleum Hydrocarbons (mg/kg)												
Diesel Range Hydrocarbons	2000		6.4 U	**99**	**27**	**15**	**66**	**61**	**380**	--	--	5.5 U
Gasoline Range Hydrocarbons	30/100*		7.6 U	**4**	4.4 U	4.8 U	**22**	**92***	**110**	--	--	6.2 U
Motor Oil Range			13 U	**220**	**70**	**170**	**130**	**110**	**310**	--	--	11 U
Extractable Petroleum Hydrocarbons (µg/kg)												
C8-C10 Aliphatics			--	--	--	--	--	--	--	**6600 J**	2400 UJ	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	**27000 J**	2400 UJ	--
C12-C16 Aliphatics			--	--	--	--	--	--	--	**290000 J**	2400 UJ	--
C16-C21 Aliphatics			--	--	--	--	--	--	--	**300000 J**	2400 UJ	--
C21-C34 Aliphatics			--	--	--	--	--	--	--	**170000 J**	2400 UJ	--
C8-C10 Aromatics			--	--	--	--	--	--	--	2500 UJ	2400 UJ	--
C10-C12 Aromatics			--	--	--	--	--	--	--	2500 UJ	2400 UJ	--
C12-C16 Aromatics			--	--	--	--	--	--	--	**37000 J**	2400 UJ	--
C16-C21 Aromatics			--	--	--	--	--	--	--	**160000 J**	2400 UJ	--
C21-C34 Aromatics			--	--	--	--	--	--	--	**70000 J**	2400 UJ	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	**A-Central Area**	**A-Central Area**	**A-Central Area**	**A-Northwest Area**	**A-Northwest Area**	**A-Northwest Area**	**A-Northwest Area**	**A-Northwest Area**	**A-Northwest Area**	**A-Northwest Area**
		Task	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**
		Location ID	**DSI-GP-07**	**DSI-MW-03**	**DSI-MW-03**	**DSI-02**	**DSI-02**	**DSI-03**	**DSI-03**	**DSI-GP-04**	**DSI-GP-04**	**DSI-GP-05**
		Sample ID	**DSI-GP-07-5.5-8**	**DSI-MW-03-0-3**	**DSI-MW-03-5-6.5**	**DSI02-SO-A**	**DSI02-SO-B**	**DSI03-SO-A**	**DSI03-SO-B**	**DSI-GP-04-2.5-4.5**	**DSI-GP-04-5.5-7.5**	**DSI-GP-05-2-4.5**
		Sample Date	**7/14/2009**	**7/13/2009**	**7/13/2009**	**9/27/2006**	**9/27/2006**	**9/27/2006**	**9/27/2006**	**7/15/2009**	**7/15/2009**	**7/14/2009**
		Depth	**5.5 - 8 feet**	**0 - 3 feet**	**5 - 6.5 feet**	**0 - 3 feet**	**3 - 5 feet**	**0 - 3 feet**	**5 - 6.5 feet**	**2.5 - 4.5 feet**	**5.5 - 7.5 feet**	**2 - 4.5 feet**
		Sample Type	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
		X	**1267662.081370**	**1267731.360000**	**1267731.360000**	**1267482.282**	**1267482.282**	**1267538.202**	**1267538.202**	**1267562.472590**	**1267562.472590**	**1267499.840140**
		Y	**204563.527640**	**204467.030000**	**204467.030000**	**204484.7162**	**204484.7162**	**204614.5365**	**204614.5365**	**204594.779389**	**204594.779389**	**204589.624301**
		Coordinate Type	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**
	MTCA Method A Unrestricted	**MTCA Method C Industrial**										
Volatile Petroleum Hydrocarbons (µg/kg)												
Benzene	30	14000000	--	--	--	--	--	--	--	1600 U	1200 U	--
Ethylbenzene	6000	350000000	--	--	--	--	--	--	--	1600 U	1200 U	--
m,p-Xylene			--	--	--	--	--	--	--	3100 U	2400 U	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	--	--	--	1600 UJ	1200 UJ	--
n-Decane (C10)			--	--	--	--	--	--	--	**2400**	1200 U	--
n-Dodecane (C12)			--	--	--	--	--	--	--	1600 UJ	1200 UJ	--
n-Hexane (C6)		210000000	--	--	--	--	--	--	--	1600 U	1200 U	--
n-Octane (C8)			--	--	--	--	--	--	--	1600 U	1200 U	--
n-Pentane (C5)			--	--	--	--	--	--	--	1600 U	1200 U	--
o-Xylene		700000000	--	--	--	--	--	--	--	1600 U	1200 U	--
Toluene	7000	280000000	--	--	--	--	--	--	--	1600 U	1200 U	--
C5-C6 Aliphatics			--	--	--	--	--	--	--	16000 U	12000 U	--
C6-C8 Aliphatics			--	--	--	--	--	--	--	16000 U	12000 U	--
C8-C10 Aliphatics			--	--	--	--	--	--	--	**16000**	12000 U	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	16000 U	12000 U	--
C8-C10 Aromatics			--	--	--	--	--	--	--	**35000**	12000 U	--
C10-C12 Aromatics			--	--	--	--	--	--	--	**100000**	12000 U	--
C12-C13 Aromatics			--	--	--	--	--	--	--	**190000**	12000 U	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

Site Area			A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area
Task			Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-GP-05	DSI-MW-02	DSI-MW-02	DSI-01	DSI-01	DSI-GP-01	DSI-GP-01	DSI-GP-02	DSI-GP-02
Sample ID			DSI-GP-05-5.5-8	DSI-MW-02-0-3	DSI-MW-02-5.5-7	DSI01-SO-A	DSI01-SO-B	DSI-GP-01-2.5-4.5	DSI-GP-01-5.5-7.5	DSI-GP-02-2.5-5.5	DSI-GP-02-5.5-7.5
Sample Date			7/14/2009	7/14/2009	7/14/2009	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/15/2009	7/15/2009
Depth			5.5 - 8 feet	0 - 3 feet	5.5 - 7 feet	0 - 3 feet	4 - 6 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2.5 - 5.5 feet	5.5 - 7.5 feet
Sample Type			N	N	N	N	N	N	N	N	N
X			1267499.840140	1267537.850000	1267537.850000	1267483.649	1267483.649	1267444.942240	1267444.942240	1267499.153920	1267499.153920
Y			204589.624301	204619.490000	204619.490000	204362.383	204362.383	204366.802869	204366.802869	204352.937108	204352.937108
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
Conventional Parameters (pct)											
Moisture (water) content			--	5.2	18.85	--	--	--	--	--	--
Total organic carbon			--	--	--	1.11	0.384	--	--	--	--
Total solids			--	--	--	88.4	80.2	--	--	--	--
Grain Size (pct)											
Percent passing < 1.3 micron sieve			--	--	--	--	--	--	--	--	--
Percent retained 1.3 micron sieve			--	--	--	--	--	--	--	--	--
Percent retained 3.2 micron sieve			--	--	--	--	--	--	--	--	--
Percent retained 7 micron sieve			--	--	--	--	--	--	--	--	--
Percent retained 9 micron sieve			--	--	--	--	--	--	--	--	--
Percent retained 13 micron sieve			--	--	--	--	--	--	--	--	--
Percent retained 22 micron sieve			--	--	--	--	--	--	--	--	--
Percent retained 32 micron sieve			--	--	--	--	--	--	--	--	--
Percent retained 75 micron sieve (#200)			--	2.6	13.2	--	--	--	--	--	--
Percent retained 150 micron sieve (#100)			--	3.7	23.4	--	--	--	--	--	--
Percent retained 250 micron sieve (#60)			--	6.6	33.7	--	--	--	--	--	--
Percent retained 425 micron sieve (#40)			--	7.4	15.8	--	--	--	--	--	--
Percent retained 850 micron sieve (#20)			--	7.5	2.2	--	--	--	--	--	--
Percent retained 2000 micron sieve (#10)			--	10.8	0.6	--	--	--	--	--	--
Percent retained 4750 micron sieve (#4)			--	12.6	1	--	--	--	--	--	--
Percent retained 9500 micron sieve			--	6.8	0.1 U	--	--	--	--	--	--
Percent retained 12500 micron sieve			--	14.1	0.1 U	--	--	--	--	--	--
Percent retained 19000 micron sieve			--	9.9	0.1 U	--	--	--	--	--	--
Percent retained 25K micron sieve			--	6.1	0.1 U	--	--	--	--	--	--
Percent retained 37.5K micron sieve			--	0.1 U	0.1 U	--	--	--	--	--	--
Percent retained 50K micron sieve			--	0.1 U	0.1 U	--	--	--	--	--	--
Percent retained 75K micron sieve			--	0.1 U	0.1 U	--	--	--	--	--	--
Total Gravel			--	50	1	--	--	--	--	--	--
Total Sand			--	28	88	--	--	--	--	--	--
Total Silt			--	--	--	--	--	--	--	--	--
Total Clay			--	--	--	--	--	--	--	--	--
Metals (mg/kg)											
Antimony		1400	--	--	--	--	--	--	--	--	--
Arsenic	20	1050	--	--	--	48.1 J	3.5	8	13	10	6
Cadmium	2	3500	--	--	--	0.4	0.2	--	--	--	--
Chromium	2000		--	--	--	20.4	15.9	--	--	--	--

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2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-05	DSI-MW-02	DSI-MW-02	DSI-01	DSI-01	DSI-GP-01	DSI-GP-01	DSI-GP-02	DSI-GP-02
		Sample ID	DSI-GP-05-5.5-8	DSI-MW-02-0-3	DSI-MW-02-5.5-7	DSI01-SO-A	DSI01-SO-B	DSI-GP-01-2.5-4.5	DSI-GP-01-5.5-7.5	DSI-GP-02-2.5-5.5	DSI-GP-02-5.5-7.5
		Sample Date	7/14/2009	7/14/2009	7/14/2009	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/15/2009	7/15/2009
		Depth	5.5 - 8 feet	0 - 3 feet	5.5 - 7 feet	0 - 3 feet	4 - 6 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2.5 - 5.5 feet	5.5 - 7.5 feet
		Sample Type	N	N	N	N	N	N	N	N	N
		X	1267499.840140	1267537.850000	1267537.850000	1267483.649	1267483.649	1267444.942240	1267444.942240	1267499.153920	1267499.153920
		Y	204589.624301	204619.490000	204619.490000	204362.383	204362.383	204366.802869	204366.802869	204352.937108	204352.937108
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
Chromium VI	19	10500	--	--	--	0.125 UJ	0.135 UJ	--	--	--	--
Copper		140000	--	--	--	**103 J**	**20.4**	--	--	--	--
Lead	250		--	--	--	**36 J**	**6**	--	--	--	--
Mercury	2		--	--	--	**0.09**	0.05 U	--	--	--	--
Nickel		70000	--	--	--	--	--	--	--	--	--
Selenium		17500	--	--	--	--	--	--	--	--	--
Silver		17500	--	--	--	0.3 U	0.3 U	--	--	--	--
Zinc		1050000	--	--	--	**192**	**36.8**	--	--	--	--
Volatile Organics (µg/kg)											
1,1,1,2-Tetrachloroethane		105000000	--	--	--	0.9 U	1.1 U	--	--	--	--
1,1,1-Trichloroethane	2000	7000000000	--	--	--	**13**	1.1 U	--	--	--	--
1,1,2,2-Tetrachloroethane		70000000	--	--	--	0.9 U	1.1 U	--	--	--	--
1,1,2-Trichloroethane		14000000	--	--	--	0.9 U	1.1 U	--	--	--	--
1,1-Dichloroethane		700000000	--	--	--	**10**	**7.9**	--	--	--	--
1,1-Dichloroethene		175000000	--	--	--	0.9 U	1.1 U	--	--	--	--
1,1-Dichloropropene			--	--	--	0.9 U	1.1 U	--	--	--	--
1,2,3-Trichlorobenzene			--	--	--	4.6 U	5.6 U	--	--	--	--
1,2,3-Trichloropropane		14000000	--	--	--	1.8 U	2.2 U	--	--	--	--
1,2,4-Trichlorobenzene		35000000	--	--	--	4.6 U	5.6 U	--	--	--	--
1,2,4-Trimethylbenzene			--	--	--	0.9 U	1.1 U	--	--	--	--
1,2-Dibromo-3-chloropropane		700000	--	--	--	4.6 U	5.6 U	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	5	31500000	--	--	--	0.9 U	1.1 U	--	--	--	--
1,2-Dichlorobenzene		315000000	--	--	--	0.9 U	1.1 U	--	--	--	--
1,2-Dichloroethane		70000000	--	--	--	0.9 U	1.1 U	--	--	--	--
1,2-Dichloroethene, cis-		7000000	--	--	--	0.9 U	**2.2**	--	--	--	--
1,2-Dichloroethene, trans-		70000000	--	--	--	0.9 U	1.1 U	--	--	--	--
1,2-Dichloropropane			--	--	--	0.9 U	1.1 U	--	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)		35000000	--	--	--	0.9 U	1.1 U	--	--	--	--
1,3-Dichlorobenzene			--	--	--	0.9 U	1.1 U	--	--	--	--
1,3-Dichloropropane			--	--	--	0.9 U	1.1 U	--	--	--	--
1,3-Dichloropropene, cis-			--	--	--	0.9 U	1.1 U	--	--	--	--
1,3-Dichloropropene, trans-			--	--	--	0.9 U	1.1 U	--	--	--	--
1,4-Dichlorobenzene			--	--	--	0.9 U	1.1 U	--	--	--	--
2,2-Dichloropropane			--	--	--	0.9 U	1.1 U	--	--	--	--
2-Butanone (MEK)		2100000000	--	--	--	**11**	**12**	--	--	--	--
2-Chlorotoluene		70000000	--	--	--	0.9 U	1.1 U	--	--	--	--
2-Hexanone (Methyl butyl ketone)			--	--	--	4.6 U	5.6 U	--	--	--	--
4-Chlorotoluene			--	--	--	0.9 U	1.1 U	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-05	DSI-MW-02	DSI-MW-02	DSI-01	DSI-01	DSI-GP-01	DSI-GP-01	DSI-GP-02	DSI-GP-02
		Sample ID	DSI-GP-05-5.5-8	DSI-MW-02-0-3	DSI-MW-02-5.5-7	DSI01-SO-A	DSI01-SO-B	DSI-GP-01-2.5-4.5	DSI-GP-01-5.5-7.5	DSI-GP-02-2.5-5.5	DSI-GP-02-5.5-7.5
		Sample Date	7/14/2009	7/14/2009	7/14/2009	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/15/2009	7/15/2009
		Depth	5.5 - 8 feet	0 - 3 feet	5.5 - 7 feet	0 - 3 feet	4 - 6 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2.5 - 5.5 feet	5.5 - 7.5 feet
		Sample Type	N	N	N	N	N	N	N	N	N
		X	1267499.840140	1267537.850000	1267537.850000	1267483.649	1267483.649	1267444.942240	1267444.942240	1267499.153920	1267499.153920
		Y	204589.624301	204619.490000	204619.490000	204362.383	204362.383	204366.802869	204366.802869	204352.937108	204352.937108
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
4-Isopropyltoluene (4-Cymene)			--	--	--	0.9 U	1.1 U	--	--	--	--
Acetone		3150000000	--	--	--	**77**	**70**	--	--	--	--
Benzene	30	14000000	--	--	--	0.9 U	**1.2**	--	--	--	--
Bromobenzene			--	--	--	0.9 U	1.1 U	--	--	--	--
Bromochloromethane			--	--	--	0.9 U	1.1 U	--	--	--	--
Bromodichloromethane		70000000	--	--	--	0.9 U	1.1 U	--	--	--	--
Bromoform (Tribromomethane)		70000000	--	--	--	0.9 U	1.1 U	--	--	--	--
Bromomethane (Methyl Bromide)		4900000	--	--	--	0.9 U	1.1 U	--	--	--	--
Carbon disulfide		350000000	--	--	--	**1.8**	**11**	--	--	--	--
Carbon tetrachloride (Tetrachloromethane)		14000000	--	--	--	0.9 U	1.1 U	--	--	--	--
Chloroethane			--	--	--	**1.5**	1.1 U	--	--	--	--
Chloroform		35000000	--	--	--	0.9 U	1.1 U	--	--	--	--
Chloromethane			--	--	--	0.9 U	1.1 U	--	--	--	--
Dibromochloromethane		70000000	--	--	--	0.9 U	1.1 U	--	--	--	--
Dibromomethane		35000000	--	--	--	0.9 U	1.1 U	--	--	--	--
Dichlorodifluoromethane		700000000	--	--	--	0.9 U	1.1 U	--	--	--	--
Dichloromethane (Methylene chloride)	20	210000000	--	--	--	2.1 U	2.6 U	--	--	--	--
Ethylbenzene	6000	350000000	--	--	--	0.9 U	1.1 U	--	--	--	--
Isopropylbenzene (Cumene)		350000000	--	--	--	0.9 U	1.1 U	--	--	--	--
m,p-Xylene			--	--	--	0.9 U	1.1 U	--	--	--	--
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		280000000	--	--	--	4.6 U	5.6 U	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	0.9 U	1.1 U	--	--	--	--
Naphthalene		70000000	--	--	--	--	--	--	--	--	--
n-Butylbenzene			--	--	--	0.9 U	1.1 U	--	--	--	--
n-Propylbenzene		350000000	--	--	--	0.9 U	1.1 U	--	--	--	--
o-Xylene		700000000	--	--	--	0.9 U	1.1 U	--	--	--	--
sec-Butylbenzene			--	--	--	0.9 U	1.1 U	--	--	--	--
Styrene		700000000	--	--	--	0.9 U	1.1 U	--	--	--	--
tert-Butylbenzene			--	--	--	0.9 U	1.1 U	--	--	--	--
Tetrachloroethene (PCE)	50	35000000	--	--	--	**3.7**	**1.3**	--	--	--	--
Toluene	7000	280000000	--	--	--	0.9 U	1.1 U	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

Site Area			A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area
Task			Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-GP-05	DSI-MW-02	DSI-MW-02	DSI-01	DSI-01	DSI-GP-01	DSI-GP-01	DSI-GP-02	DSI-GP-02
Sample ID			DSI-GP-05-5.5-8	DSI-MW-02-0-3	DSI-MW-02-5.5-7	DSI01-SO-A	DSI01-SO-B	DSI-GP-01-2.5-4.5	DSI-GP-01-5.5-7.5	DSI-GP-02-2.5-5.5	DSI-GP-02-5.5-7.5
Sample Date			7/14/2009	7/14/2009	7/14/2009	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/15/2009	7/15/2009
Depth			5.5 - 8 feet	0 - 3 feet	5.5 - 7 feet	0 - 3 feet	4 - 6 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2.5 - 5.5 feet	5.5 - 7.5 feet
Sample Type			N	N	N	N	N	N	N	N	N
X			1267499.840140	1267537.850000	1267537.850000	1267483.649	1267483.649	1267444.942240	1267444.942240	1267499.153920	1267499.153920
Y			204589.624301	204619.490000	204619.490000	204362.383	204362.383	204366.802869	204366.802869	204352.937108	204352.937108
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
Trichloroethene (TCE)	30		--	--	--	0.9 U	1.1 U	--	--	--	--
Trichlorofluoromethane (Fluorotrichloromethane)		1050000000	--	--	--	0.9 U	1.1 U	--	--	--	--
Vinyl chloride		10500000	--	--	--	0.9 U	1.1 U	--	--	--	--
Total Xylene (U = 1/2)	9000		--	--	--	0.9 U	1.1 U	--	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)											
1-Methylnaphthalene			--	--	--	--	--	--	--	--	--
2-Methylnaphthalene		14000000	--	--	--	**19**	5 U	--	--	--	--
Acenaphthene		210000000	--	--	--	**5.8**	5 U	--	--	--	--
Acenaphthylene			--	--	--	**9.1**	5 U	--	--	--	--
Anthracene		1050000000	--	--	--	**44**	**8.4**	--	--	--	--
Benzo(a)anthracene			--	--	--	**64**	**9.9**	--	--	--	--
Benzo(a)pyrene	100		--	--	--	**56**	**9.4**	--	--	--	--
Benzo(b)fluoranthene			--	--	--	**120**	**15**	--	--	--	--
Benzo(g,h,i)perylene			--	--	--	**65**	**9.4**	--	--	--	--
Benzo(k)fluoranthene			--	--	--	**74**	**17**	--	--	--	--
Chrysene			--	--	--	**130**	**22**	--	--	--	--
Dibenzo(a,h)anthracene			--	--	--	**18**	5 U	--	--	--	--
Fluoranthene		140000000	--	--	--	**170**	**36**	--	--	--	--
Fluorene		140000000	--	--	--	**11**	5 U	--	--	--	--
Indeno(1,2,3-c,d)pyrene			--	--	--	**54**	**8.9**	--	--	--	--
Naphthalene		70000000	--	--	--	**24**	**5**	--	--	--	--
Phenanthrene			--	--	--	**68**	**14**	--	--	--	--
Pyrene		105000000	--	--	--	**140**	**29**	--	--	--	--
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	100		--	--	--	**90**	**15**	--	--	--	--
Total Naphthalenes (U = 1/2)	5000		--	--	--	**43**	**7.5**	--	--	--	--
Semivolatile Organics (µg/kg)											
1,2,4-Trichlorobenzene		35000000	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene		315000000	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene			--	--	--	--	--	--	--	--	--
2,4-Dimethylphenol		70000000	--	--	--	--	--	--	--	--	--
2-Methylphenol (o-Cresol)		175000000	--	--	--	--	--	--	--	--	--
4-Methylphenol (p-Cresol)		17500000	--	--	--	--	--	--	--	--	--
Benzoic acid		14000000000	--	--	--	--	--	--	--	--	--
Benzyl alcohol		350000000	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate		70000000	--	--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-05	DSI-MW-02	DSI-MW-02	DSI-01	DSI-01	DSI-GP-01	DSI-GP-01	DSI-GP-02	DSI-GP-02
		Sample ID	DSI-GP-05-5.5-8	DSI-MW-02-0-3	DSI-MW-02-5.5-7	DSI01-SO-A	DSI01-SO-B	DSI-GP-01-2.5-4.5	DSI-GP-01-5.5-7.5	DSI-GP-02-2.5-5.5	DSI-GP-02-5.5-7.5
		Sample Date	7/14/2009	7/14/2009	7/14/2009	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/15/2009	7/15/2009
		Depth	5.5 - 8 feet	0 - 3 feet	5.5 - 7 feet	0 - 3 feet	4 - 6 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2.5 - 5.5 feet	5.5 - 7.5 feet
		Sample Type	N	N	N	N	N	N	N	N	N
		X	1267499.840140	1267537.850000	1267537.850000	1267483.649	1267483.649	1267444.942240	1267444.942240	1267499.153920	1267499.153920
		Y	204589.624301	204619.490000	204619.490000	204362.383	204362.383	204366.802869	204366.802869	204352.937108	204352.937108
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
Butylbenzyl phthalate		700000000	--	--	--	--	--	--	--	--	--
Dibenzofuran		3500000	--	--	--	**12**	5 U	--	--	--	--
Diethyl phthalate		2800000000	--	--	--	--	--	--	--	--	--
Dimethyl phthalate			--	--	--	--	--	--	--	--	--
Di-n-butyl phthalate		350000000	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalate			--	--	--	--	--	--	--	--	--
Hexachlorobenzene		2800000	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene		3500000	--	--	--	--	--	--	--	--	--
Hexachloroethane		3500000	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine			--	--	--	--	--	--	--	--	--
Pentachlorophenol		17500000	--	--	--	--	--	--	--	--	--
Phenol		1050000000	--	--	--	--	--	--	--	--	--
PCB Aroclors (µg/kg)											
Aroclor 1016		245000	--	--	--	9.8 U	9.8 U	--	--	--	--
Aroclor 1221			--	--	--	9.8 U	9.8 U	--	--	--	--
Aroclor 1232			--	--	--	9.8 U	9.8 U	--	--	--	--
Aroclor 1242			--	--	--	9.8 U	9.8 U	--	--	--	--
Aroclor 1248			--	--	--	9.8 U	9.8 U	--	--	--	--
Aroclor 1254		70000	--	--	--	9.8 U	9.8 U	--	--	--	--
Aroclor 1260			--	--	--	**43 J**	**10 J**	--	--	--	--
Total PCB Aroclors (U = 1/2)	1000		--	--	--	**72 J**	**40 J**	--	--	--	--
Pesticides (µg/kg)											
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			--	--	--	3.3 U	3.2 U	--	--	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			--	--	--	3.3 U	3.2 U	--	--	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		1750000	--	--	--	3.3 U	3.2 U	--	--	--	--
Aldrin		105000	--	--	--	1.6 U	1.6 U	--	--	--	--
alpha-Chlordane (cis-Chlordane)			--	--	--	1.6 U	1.6 U	--	--	--	--
alpha-Hexachlorocyclohexane (BHC)			--	--	--	1.6 U	1.6 U	--	--	--	--
beta-Hexachlorocyclohexane (BHC)			--	--	--	1.6 U	1.6 U	--	--	--	--
delta-Hexachlorocyclohexane (BHC)			--	--	--	1.6 U	1.6 U	--	--	--	--
Dieldrin		175000	--	--	--	3.3 U	3.2 U	--	--	--	--
Endosulfan sulfate			--	--	--	3.3 U	3.2 U	--	--	--	--
Endosulfan-alpha (I)			--	--	--	1.6 U	1.6 U	--	--	--	--

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		Site Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-05	DSI-MW-02	DSI-MW-02	DSI-01	DSI-01	DSI-GP-01	DSI-GP-01	DSI-GP-02	DSI-GP-02
		Sample ID	DSI-GP-05-5.5-8	DSI-MW-02-0-3	DSI-MW-02-5.5-7	DSI01-SO-A	DSI01-SO-B	DSI-GP-01-2.5-4.5	DSI-GP-01-5.5-7.5	DSI-GP-02-2.5-5.5	DSI-GP-02-5.5-7.5
		Sample Date	7/14/2009	7/14/2009	7/14/2009	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/15/2009	7/15/2009
		Depth	5.5 - 8 feet	0 - 3 feet	5.5 - 7 feet	0 - 3 feet	4 - 6 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2.5 - 5.5 feet	5.5 - 7.5 feet
		Sample Type	N	N	N	N	N	N	N	N	N
		X	1267499.840140	1267537.850000	1267537.850000	1267483.649	1267483.649	1267444.942240	1267444.942240	1267499.153920	1267499.153920
		Y	204589.624301	204619.490000	204619.490000	204362.383	204362.383	204366.802869	204366.802869	204352.937108	204352.937108
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
Endosulfan-beta (II)			--	--	--	3.3 U	3.2 U	--	--	--	--
Endrin		1050000	--	--	--	3.3 U	3.2 U	--	--	--	--
Endrin aldehyde			--	--	--	3.3 U	3.2 U	--	--	--	--
Endrin ketone			--	--	--	3.3 U	3.2 U	--	--	--	--
gamma-Chlordane			--	--	--	1.6 U	1.6 U	--	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	10	1050000	--	--	--	1.6 U	1.6 U	--	--	--	--
Heptachlor		1750000	--	--	--	1.6 U	1.6 U	--	--	--	--
Heptachlor epoxide		45500	--	--	--	1.6 U	1.6 U	--	--	--	--
Hexachlorobenzene		2800000	--	--	--	1.6 U	1.6 U	--	--	--	--
Hexachlorobutadiene		3500000	--	--	--	1.6 U	1.6 U	--	--	--	--
Methoxychlor		17500000	--	--	--	16 U	16 U	--	--	--	--
Toxaphene			--	--	--	160 U	160 U	--	--	--	--
Total DDx (U = 1/2)	3000		--	--	--	3.3 U	3.2 U	--	--	--	--
Total Petroleum Hydrocarbons (mg/kg)											
Diesel Range Hydrocarbons	2000		5.8 U	**28**	**8.4**	**65**	**12**	--	--	--	--
Gasoline Range Hydrocarbons	30/100*		8.4 U	**4.9**	**53**	5.3 U	6.3 U	--	--	--	--
Motor Oil Range			12 U	**100**	**44**	**140**	**33**	--	--	--	--
Extractable Petroleum Hydrocarbons (µg/kg)											
C8-C10 Aliphatics			--	--	--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	--	--
C12-C16 Aliphatics			--	--	--	--	--	--	--	--	--
C16-C21 Aliphatics			--	--	--	--	--	--	--	--	--
C21-C34 Aliphatics			--	--	--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--	--	--
C12-C16 Aromatics			--	--	--	--	--	--	--	--	--
C16-C21 Aromatics			--	--	--	--	--	--	--	--	--
C21-C34 Aromatics			--	--	--	--	--	--	--	--	--

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		Site Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-05	DSI-MW-02	DSI-MW-02	DSI-01	DSI-01	DSI-GP-01	DSI-GP-01	DSI-GP-02	DSI-GP-02
		Sample ID	DSI-GP-05-5.5-8	DSI-MW-02-0-3	DSI-MW-02-5.5-7	DSI01-SO-A	DSI01-SO-B	DSI-GP-01-2.5-4.5	DSI-GP-01-5.5-7.5	DSI-GP-02-2.5-5.5	DSI-GP-02-5.5-7.5
		Sample Date	7/14/2009	7/14/2009	7/14/2009	9/27/2006	9/27/2006	7/15/2009	7/15/2009	7/15/2009	7/15/2009
		Depth	5.5 - 8 feet	0 - 3 feet	5.5 - 7 feet	0 - 3 feet	4 - 6 feet	2.5 - 4.5 feet	5.5 - 7.5 feet	2.5 - 5.5 feet	5.5 - 7.5 feet
		Sample Type	N	N	N	N	N	N	N	N	N
		X	1267499.840140	1267537.850000	1267537.850000	1267483.649	1267483.649	1267444.942240	1267444.942240	1267499.153920	1267499.153920
		Y	204589.624301	204619.490000	204619.490000	204362.383	204362.383	204366.802869	204366.802869	204352.937108	204352.937108
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial									
Volatile Petroleum Hydrocarbons (µg/kg)											
Benzene	30	14000000	--	--	--	--	--	--	--	--	--
Ethylbenzene	6000	350000000	--	--	--	--	--	--	--	--	--
m,p-Xylene			--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	--	--	--	--	--
n-Decane (C10)			--	--	--	--	--	--	--	--	--
n-Dodecane (C12)			--	--	--	--	--	--	--	--	--
n-Hexane (C6)		210000000	--	--	--	--	--	--	--	--	--
n-Octane (C8)			--	--	--	--	--	--	--	--	--
n-Pentane (C5)			--	--	--	--	--	--	--	--	--
o-Xylene		700000000	--	--	--	--	--	--	--	--	--
Toluene	7000	280000000	--	--	--	--	--	--	--	--	--
C5-C6 Aliphatics			--	--	--	--	--	--	--	--	--
C6-C8 Aliphatics			--	--	--	--	--	--	--	--	--
C8-C10 Aliphatics			--	--	--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--	--	--
C12-C13 Aromatics			--	--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-03	DSI-GP-03	DSI-MW-01	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-03-1.5-4	DSI-GP-03-5.5-8	DSI-MW-01-0.5-2.0	DSI-MW-01-5-6.5	DSI-GP-19-3-5	DSI-GP-19-5.5-8	DSI-GP-69-5.5-8	DSI-GP-20-3-5
		Sample Date	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/16/2009	7/16/2009	7/16/2009	7/15/2009
		Depth	1.5 - 4 feet	5.5 - 8 feet	0.5 - 2 feet	5 - 6.5 feet	3 - 5 feet	5.5 - 8 feet	5.5 - 8 feet	3 - 5 feet
		Sample Type	N	N	N	N	N	N	FD	N
		X	1267485.170900	1267485.170900	1267511.080000	1267511.080000	1267668.904820	1267668.904820	1267668.904820	1267785.569970
		Y	204444.545110	204444.545110	204376.690000	204376.690000	204346.902103	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
Conventional Parameters (pct)										
Moisture (water) content			--	--	**15.84**	**26.96**	--	--	--	--
Total organic carbon			--	--	--	--	--	--	--	--
Total solids			--	--	--	--	--	--	--	--
Grain Size (pct)										
Percent passing < 1.3 micron sieve			--	--	**4.2**	--	--	--	--	--
Percent retained 1.3 micron sieve			--	--	**0.8**	--	--	--	--	--
Percent retained 3.2 micron sieve			--	--	**3.4**	--	--	--	--	--
Percent retained 7 micron sieve			--	--	**1.3**	--	--	--	--	--
Percent retained 9 micron sieve			--	--	**1.7**	--	--	--	--	--
Percent retained 13 micron sieve			--	--	**3.8**	--	--	--	--	--
Percent retained 22 micron sieve			--	--	**5.9**	--	--	--	--	--
Percent retained 32 micron sieve			--	--	**20.3**	--	--	--	--	--
Percent retained 75 micron sieve (#200)			--	--	**11.8**	**16.3**	--	--	--	--
Percent retained 150 micron sieve (#100)			--	--	**4.8**	**22.2**	--	--	--	--
Percent retained 250 micron sieve (#60)			--	--	**7**	**29.7**	--	--	--	--
Percent retained 425 micron sieve (#40)			--	--	**7.5**	**18.8**	--	--	--	--
Percent retained 850 micron sieve (#20)			--	--	**6.2**	**3**	--	--	--	--
Percent retained 2000 micron sieve (#10)			--	--	**9.1**	**0.4**	--	--	--	--
Percent retained 4750 micron sieve (#4)			--	--	**6.5**	**0.4**	--	--	--	--
Percent retained 9500 micron sieve			--	--	**2.6**	0.1 U	--	--	--	--
Percent retained 12500 micron sieve			--	--	**3.1**	0.1 U	--	--	--	--
Percent retained 19000 micron sieve			--	--	0.1 U	0.1 U	--	--	--	--
Percent retained 25K micron sieve			--	--	0.1 U	0.1 U	--	--	--	--
Percent retained 37.5K micron sieve			--	--	0.1 U	0.1 U	--	--	--	--
Percent retained 50K micron sieve			--	--	0.1 U	0.1 U	--	--	--	--
Percent retained 75K micron sieve			--	--	0.1 U	0.1 U	--	--	--	--
Total Gravel			--	--	**10**	**0.4**	--	--	--	--
Total Sand			--	--	**37**	**90**	--	--	--	--
Total Silt			--	--	**36**	--	--	--	--	--
Total Clay			--	--	**5**	--	--	--	--	--
Metals (mg/kg)										
Antimony		1400	--	--	--	--	5 UJ	6 UJ	--	5 UJ
Arsenic	20	1050	**7**	6 U	**23**	**7**	**10**	6 U	--	**24**
Cadmium	2	3500	--	--	--	--	0.2 U	0.2 U	--	0.2 U
Chromium	2000		--	--	--	--	**12**	**10.8**	--	**12.1**

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-03	DSI-GP-03	DSI-MW-01	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-03-1.5-4	DSI-GP-03-5.5-8	DSI-MW-01-0.5-2.0	DSI-MW-01-5-6.5	DSI-GP-19-3-5	DSI-GP-19-5.5-8	DSI-GP-69-5.5-8	DSI-GP-20-3-5
		Sample Date	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/16/2009	7/16/2009	7/16/2009	7/15/2009
		Depth	1.5 - 4 feet	5.5 - 8 feet	0.5 - 2 feet	5 - 6.5 feet	3 - 5 feet	5.5 - 8 feet	5.5 - 8 feet	3 - 5 feet
		Sample Type	N	N	N	N	N	N	FD	N
		X	1267485.170900	1267485.170900	1267511.080000	1267511.080000	1267668.904820	1267668.904820	1267668.904820	1267785.569970
		Y	204444.545110	204444.545110	204376.690000	204376.690000	204346.902103	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
Chromium VI	19	10500	--	--	--	--	--	--	--	--
Copper		140000	--	--	--	--	**10.3**	**9.2**	--	**16.5**
Lead	250		--	--	--	--	**3**	2 U	--	**7**
Mercury	2		--	--	--	--	0.02 U	0.03 U	--	**0.02**
Nickel		70000	--	--	--	--	**8**	**8**	--	**8**
Selenium		17500	--	--	--	--	0.5 U	0.6 U	--	0.5 U
Silver		17500	--	--	--	--	0.3 U	0.4 U	--	0.3 U
Zinc		1050000	--	--	--	--	**26 J**	**35 J**	--	**28**
Volatile Organics (µg/kg)										
1,1,1,2-Tetrachloroethane		105000000	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	2000	7000000000	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane		70000000	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane		14000000	--	--	--	--	--	--	--	--
1,1-Dichloroethane		700000000	--	--	--	--	--	--	--	--
1,1-Dichloroethene		175000000	--	--	--	--	--	--	--	--
1,1-Dichloropropene			--	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene			--	--	--	--	--	--	--	--
1,2,3-Trichloropropane		14000000	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene		35000000	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene			--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane		700000	--	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	5	31500000	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene		315000000	--	--	--	--	--	--	--	--
1,2-Dichloroethane		70000000	--	--	--	--	--	--	--	--
1,2-Dichloroethene, cis-		7000000	--	--	--	--	--	--	--	--
1,2-Dichloroethene, trans-		70000000	--	--	--	--	--	--	--	--
1,2-Dichloropropane			--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)		35000000	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene			--	--	--	--	--	--	--	--
1,3-Dichloropropane			--	--	--	--	--	--	--	--
1,3-Dichloropropene, cis-			--	--	--	--	--	--	--	--
1,3-Dichloropropene, trans-			--	--	--	--	--	--	--	--
1,4-Dichlorobenzene			--	--	--	--	--	--	--	--
2,2-Dichloropropane			--	--	--	--	--	--	--	--
2-Butanone (MEK)		2100000000	--	--	--	--	--	--	--	--
2-Chlorotoluene		70000000	--	--	--	--	--	--	--	--
2-Hexanone (Methyl butyl ketone)			--	--	--	--	--	--	--	--
4-Chlorotoluene			--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-03	DSI-GP-03	DSI-MW-01	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-03-1.5-4	DSI-GP-03-5.5-8	DSI-MW-01-0.5-2.0	DSI-MW-01-5-6.5	DSI-GP-19-3-5	DSI-GP-19-5.5-8	DSI-GP-69-5.5-8	DSI-GP-20-3-5
		Sample Date	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/16/2009	7/16/2009	7/16/2009	7/15/2009
		Depth	1.5 - 4 feet	5.5 - 8 feet	0.5 - 2 feet	5 - 6.5 feet	3 - 5 feet	5.5 - 8 feet	5.5 - 8 feet	3 - 5 feet
		Sample Type	N	N	N	N	N	N	FD	N
		X	1267485.170900	1267485.170900	1267511.080000	1267511.080000	1267668.904820	1267668.904820	1267668.904820	1267785.569970
		Y	204444.545110	204444.545110	204376.690000	204376.690000	204346.902103	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
4-Isopropyltoluene (4-Cymene)			--	--	--	--	--	--	--	--
Acetone		3150000000	--	--	--	--	--	--	--	--
Benzene	30	14000000	--	--	--	--	--	--	--	--
Bromobenzene			--	--	--	--	--	--	--	--
Bromochloromethane			--	--	--	--	--	--	--	--
Bromodichloromethane		70000000	--	--	--	--	--	--	--	--
Bromoform (Tribromomethane)		70000000	--	--	--	--	--	--	--	--
Bromomethane (Methyl Bromide)		4900000	--	--	--	--	--	--	--	--
Carbon disulfide		350000000	--	--	--	--	--	--	--	--
Carbon tetrachloride (Tetrachloromethane)		14000000	--	--	--	--	--	--	--	--
Chloroethane			--	--	--	--	--	--	--	--
Chloroform		35000000	--	--	--	--	--	--	--	--
Chloromethane			--	--	--	--	--	--	--	--
Dibromochloromethane		70000000	--	--	--	--	--	--	--	--
Dibromomethane		35000000	--	--	--	--	--	--	--	--
Dichlorodifluoromethane		700000000	--	--	--	--	--	--	--	--
Dichloromethane (Methylene chloride)	20	210000000	--	--	--	--	--	--	--	--
Ethylbenzene	6000	350000000	--	--	--	--	--	--	--	--
Isopropylbenzene (Cumene)		350000000	--	--	--	--	--	--	--	--
m,p-Xylene			--	--	--	--	--	--	--	--
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		280000000	--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	--	--	--	--
Naphthalene		70000000	--	--	--	--	--	--	--	--
n-Butylbenzene			--	--	--	--	--	--	--	--
n-Propylbenzene		350000000	--	--	--	--	--	--	--	--
o-Xylene		700000000	--	--	--	--	--	--	--	--
sec-Butylbenzene			--	--	--	--	--	--	--	--
Styrene		700000000	--	--	--	--	--	--	--	--
tert-Butylbenzene			--	--	--	--	--	--	--	--
Tetrachloroethene (PCE)	50	35000000	--	--	--	--	--	--	--	--
Toluene	7000	280000000	--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-03	DSI-GP-03	DSI-MW-01	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-03-1.5-4	DSI-GP-03-5.5-8	DSI-MW-01-0.5-2.0	DSI-MW-01-5-6.5	DSI-GP-19-3-5	DSI-GP-19-5.5-8	DSI-GP-69-5.5-8	DSI-GP-20-3-5
		Sample Date	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/16/2009	7/16/2009	7/16/2009	7/15/2009
		Depth	1.5 - 4 feet	5.5 - 8 feet	0.5 - 2 feet	5 - 6.5 feet	3 - 5 feet	5.5 - 8 feet	5.5 - 8 feet	3 - 5 feet
		Sample Type	N	N	N	N	N	N	FD	N
		X	1267485.170900	1267485.170900	1267511.080000	1267511.080000	1267668.904820	1267668.904820	1267668.904820	1267785.569970
		Y	204444.545110	204444.545110	204376.690000	204376.690000	204346.902103	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
Trichloroethene (TCE)	30		--	--	--	--	--	--	--	--
Trichlorofluoromethane (Fluorotrichloromethane)		1050000000	--	--	--	--	--	--	--	--
Vinyl chloride		10500000	--	--	--	--	--	--	--	--
Total Xylene (U = 1/2)	9000		--	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)										
1-Methylnaphthalene			--	--	--	--	20 U	20 U	19 U	**12 J**
2-Methylnaphthalene		14000000	--	--	--	--	20 U	20 U	19 U	**15 J**
Acenaphthene		210000000	--	--	--	--	20 U	20 U	19 U	20 U
Acenaphthylene			--	--	--	--	20 U	20 U	19 U	**120**
Anthracene		1050000000	--	--	--	--	20 U	20 U	19 U	**55**
Benzo(a)anthracene			--	--	--	--	20 U	20 U	19 U	**250**
Benzo(a)pyrene	100		--	--	--	--	20 U	20 U	19 U	**300**
Benzo(b)fluoranthene			--	--	--	--	20 U	20 U	19 U	**170**
Benzo(g,h,i)perylene			--	--	--	--	20 U	20 U	19 U	**130**
Benzo(k)fluoranthene			--	--	--	--	20 U	20 U	19 U	**180**
Chrysene			--	--	--	--	20 U	20 U	19 U	**360**
Dibenzo(a,h)anthracene			--	--	--	--	20 U	20 U	19 U	**48**
Fluoranthene		140000000	--	--	--	--	20 U	20 U	19 U	**400**
Fluorene		140000000	--	--	--	--	20 U	20 U	19 U	**19 J**
Indeno(1,2,3-c,d)pyrene			--	--	--	--	20 U	20 U	19 U	**120**
Naphthalene		70000000	--	--	--	--	20 U	20 U	19 U	**34**
Phenanthrene			--	--	--	--	20 U	20 U	19 U	**100**
Pyrene		105000000	--	--	--	--	20 U	20 U	19 U	**410**
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	100		--	--	--	--	20 U	20 U	19 U	**400**
Total Naphthalenes (U = 1/2)	5000		--	--	--	--	20 U	20 U	19 U	**61 J**
Semivolatile Organics (µg/kg)										
1,2,4-Trichlorobenzene		35000000	--	--	--	--	20 U	20 U	19 U	20 U
1,2-Dichlorobenzene		315000000	--	--	--	--	20 U	20 U	19 U	20 U
1,4-Dichlorobenzene			--	--	--	--	20 U	20 U	19 U	20 U
2,4-Dimethylphenol		70000000	--	--	--	--	20 U	20 U	19 U	20 U
2-Methylphenol (o-Cresol)		175000000	--	--	--	--	20 U	20 U	19 U	20 U
4-Methylphenol (p-Cresol)		17500000	--	--	--	--	20 U	20 U	19 U	20 U
Benzoic acid		14000000000	--	--	--	--	200 U	200 U	190 U	200 UJ
Benzyl alcohol		350000000	--	--	--	--	20 U	20 U	19 U	20 U
Bis(2-ethylhexyl) phthalate		70000000	--	--	--	--	20 U	**14 J**	**14 J**	20 U

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		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-03	DSI-GP-03	DSI-MW-01	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-03-1.5-4	DSI-GP-03-5.5-8	DSI-MW-01-0.5-2.0	DSI-MW-01-5-6.5	DSI-GP-19-3-5	DSI-GP-19-5.5-8	DSI-GP-69-5.5-8	DSI-GP-20-3-5
		Sample Date	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/16/2009	7/16/2009	7/16/2009	7/15/2009
		Depth	1.5 - 4 feet	5.5 - 8 feet	0.5 - 2 feet	5 - 6.5 feet	3 - 5 feet	5.5 - 8 feet	5.5 - 8 feet	3 - 5 feet
		Sample Type	N	N	N	N	N	N	FD	N
		X	1267485.170900	1267485.170900	1267511.080000	1267511.080000	1267668.904820	1267668.904820	1267668.904820	1267785.569970
		Y	204444.545110	204444.545110	204376.690000	204376.690000	204346.902103	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
Butylbenzyl phthalate		700000000	--	--	--	--	20 U	20 U	19 U	20 U
Dibenzofuran		3500000	--	--	--	--	20 U	20 U	19 U	20 U
Diethyl phthalate		2800000000	--	--	--	--	20 U	20 U	19 U	20 U
Dimethyl phthalate			--	--	--	--	20 U	20 U	19 U	20 U
Di-n-butyl phthalate		350000000	--	--	--	--	20 U	20 U	19 U	20 U
Di-n-octyl phthalate			--	--	--	--	20 U	20 U	19 U	20 U
Hexachlorobenzene		2800000	--	--	--	--	20 U	20 U	19 U	20 U
Hexachlorobutadiene		3500000	--	--	--	--	20 U	20 U	19 U	20 U
Hexachloroethane		3500000	--	--	--	--	20 U	20 U	19 U	20 U
N-Nitrosodiphenylamine			--	--	--	--	20 U	20 U	19 U	20 UJ
Pentachlorophenol		17500000	--	--	--	--	98 U	99 U	96 U	97 UJ
Phenol		1050000000	--	--	--	--	20 U	20 U	19 U	20 U
PCB Aroclors (µg/kg)										
Aroclor 1016		245000	--	--	--	--	--	--	--	--
Aroclor 1221			--	--	--	--	--	--	--	--
Aroclor 1232			--	--	--	--	--	--	--	--
Aroclor 1242			--	--	--	--	--	--	--	--
Aroclor 1248			--	--	--	--	--	--	--	--
Aroclor 1254		70000	--	--	--	--	--	--	--	--
Aroclor 1260			--	--	--	--	--	--	--	--
Total PCB Aroclors (U = 1/2)	1000		--	--	--	--	--	--	--	--
Pesticides (µg/kg)										
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			--	--	--	--	--	--	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			--	--	--	--	--	--	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		1750000	--	--	--	--	--	--	--	--
Aldrin		105000	--	--	--	--	--	--	--	--
alpha-Chlordane (cis-Chlordane)			--	--	--	--	--	--	--	--
alpha-Hexachlorocyclohexane (BHC)			--	--	--	--	--	--	--	--
beta-Hexachlorocyclohexane (BHC)			--	--	--	--	--	--	--	--
delta-Hexachlorocyclohexane (BHC)			--	--	--	--	--	--	--	--
Dieldrin		175000	--	--	--	--	--	--	--	--
Endosulfan sulfate			--	--	--	--	--	--	--	--
Endosulfan-alpha (I)			--	--	--	--	--	--	--	--

Table 3

2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-03	DSI-GP-03	DSI-MW-01	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-03-1.5-4	DSI-GP-03-5.5-8	DSI-MW-01-0.5-2.0	DSI-MW-01-5-6.5	DSI-GP-19-3-5	DSI-GP-19-5.5-8	DSI-GP-69-5.5-8	DSI-GP-20-3-5
		Sample Date	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/16/2009	7/16/2009	7/16/2009	7/15/2009
		Depth	1.5 - 4 feet	5.5 - 8 feet	0.5 - 2 feet	5 - 6.5 feet	3 - 5 feet	5.5 - 8 feet	5.5 - 8 feet	3 - 5 feet
		Sample Type	N	N	N	N	N	N	FD	N
		X	1267485.170900	1267485.170900	1267511.080000	1267511.080000	1267668.904820	1267668.904820	1267668.904820	1267785.569970
		Y	204444.545110	204444.545110	204376.690000	204376.690000	204346.902103	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
Endosulfan-beta (II)			--	--	--	--	--	--	--	--
Endrin		1050000	--	--	--	--	--	--	--	--
Endrin aldehyde			--	--	--	--	--	--	--	--
Endrin ketone			--	--	--	--	--	--	--	--
gamma-Chlordane			--	--	--	--	--	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	10	1050000	--	--	--	--	--	--	--	--
Heptachlor		1750000	--	--	--	--	--	--	--	--
Heptachlor epoxide		45500	--	--	--	--	--	--	--	--
Hexachlorobenzene		2800000	--	--	--	--	--	--	--	--
Hexachlorobutadiene		3500000	--	--	--	--	--	--	--	--
Methoxychlor		17500000	--	--	--	--	--	--	--	--
Toxaphene			--	--	--	--	--	--	--	--
Total DDx (U = 1/2)	3000		--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Hydrocarbons	2000		--	--	--	--	5.5 U	6.3 U	--	**15**
Gasoline Range Hydrocarbons	30/100*		--	--	--	--	6.5 U	7.2 U	--	7 U
Motor Oil Range			--	--	--	--	11 U	13 U	--	**23**
Extractable Petroleum Hydrocarbons (µg/kg)										
C8-C10 Aliphatics			--	--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	--
C12-C16 Aliphatics			--	--	--	--	--	--	--	--
C16-C21 Aliphatics			--	--	--	--	--	--	--	--
C21-C34 Aliphatics			--	--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--	--
C12-C16 Aromatics			--	--	--	--	--	--	--	--
C16-C21 Aromatics			--	--	--	--	--	--	--	--
C21-C34 Aromatics			--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-03	DSI-GP-03	DSI-MW-01	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-03-1.5-4	DSI-GP-03-5.5-8	DSI-MW-01-0.5-2.0	DSI-MW-01-5-6.5	DSI-GP-19-3-5	DSI-GP-19-5.5-8	DSI-GP-69-5.5-8	DSI-GP-20-3-5
		Sample Date	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/16/2009	7/16/2009	7/16/2009	7/15/2009
		Depth	1.5 - 4 feet	5.5 - 8 feet	0.5 - 2 feet	5 - 6.5 feet	3 - 5 feet	5.5 - 8 feet	5.5 - 8 feet	3 - 5 feet
		Sample Type	N	N	N	N	N	N	FD	N
		X	1267485.170900	1267485.170900	1267511.080000	1267511.080000	1267668.904820	1267668.904820	1267668.904820	1267785.569970
		Y	204444.545110	204444.545110	204376.690000	204376.690000	204346.902103	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
Volatile Petroleum Hydrocarbons (µg/kg)										
Benzene	30	14000000	--	--	--	--	--	--	--	--
Ethylbenzene	6000	350000000	--	--	--	--	--	--	--	--
m,p-Xylene			--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	--	--	--	--
n-Decane (C10)			--	--	--	--	--	--	--	--
n-Dodecane (C12)			--	--	--	--	--	--	--	--
n-Hexane (C6)		210000000	--	--	--	--	--	--	--	--
n-Octane (C8)			--	--	--	--	--	--	--	--
n-Pentane (C5)			--	--	--	--	--	--	--	--
o-Xylene		700000000	--	--	--	--	--	--	--	--
Toluene	7000	280000000	--	--	--	--	--	--	--	--
C5-C6 Aliphatics			--	--	--	--	--	--	--	--
C6-C8 Aliphatics			--	--	--	--	--	--	--	--
C8-C10 Aliphatics			--	--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--	--
C12-C13 Aromatics			--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

Site Area			A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
Task			Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic
Location ID			DSI-GP-20	DSI-GP-21	DSI-GP-21	DSI-GP-21	DSI-06	DSI-06	DSI-07	DSI-07
Sample ID			DSI-GP-20-5.5-8	DSI-GP-21-2-4.5	DSI-GP-21-5.5-8	DSI-GP-71-2-4.5	DSI06-SO-A	DSI06-SO-B	DSI07-SO-A	DSI07-SO-B
Sample Date			7/15/2009	7/16/2009	7/16/2009	7/16/2009	9/27/2006	9/27/2006	9/28/2006	9/28/2006
Depth			5.5 - 8 feet	2 - 4.5 feet	5.5 - 8 feet	2 - 4.5 feet	0 - 3 feet	4 - 6 feet	0 - 3 feet	3 - 5 feet
Sample Type			N	N	N	FD	N	N	N	N
X			1267785.569970	1267891.799470	1267891.799470	1267891.799470	1267832.573	1267832.573	1267843.294	1267843.294
Y			204370.101158	204378.830032	204378.830032	204378.830032	204403.4785	204403.4785	204440.1651	204440.1651
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
Conventional Parameters (pct)										
Moisture (water) content			--	--	--	--	--	--	--	--
Total organic carbon			--	--	--	--	**1.37**	**0.308**	**1.05**	**0.097**
Total solids			--	--	--	--	**78.4**	**90.2**	**74.1**	**95.5**
Grain Size (pct)										
Percent passing < 1.3 micron sieve			--	--	--	--	--	--	--	--
Percent retained 1.3 micron sieve			--	--	--	--	--	--	--	--
Percent retained 3.2 micron sieve			--	--	--	--	--	--	--	--
Percent retained 7 micron sieve			--	--	--	--	--	--	--	--
Percent retained 9 micron sieve			--	--	--	--	--	--	--	--
Percent retained 13 micron sieve			--	--	--	--	--	--	--	--
Percent retained 22 micron sieve			--	--	--	--	--	--	--	--
Percent retained 32 micron sieve			--	--	--	--	--	--	--	--
Percent retained 75 micron sieve (#200)			--	--	--	--	--	--	--	--
Percent retained 150 micron sieve (#100)			--	--	--	--	--	--	--	--
Percent retained 250 micron sieve (#60)			--	--	--	--	--	--	--	--
Percent retained 425 micron sieve (#40)			--	--	--	--	--	--	--	--
Percent retained 850 micron sieve (#20)			--	--	--	--	--	--	--	--
Percent retained 2000 micron sieve (#10)			--	--	--	--	--	--	--	--
Percent retained 4750 micron sieve (#4)			--	--	--	--	--	--	--	--
Percent retained 9500 micron sieve			--	--	--	--	--	--	--	--
Percent retained 12500 micron sieve			--	--	--	--	--	--	--	--
Percent retained 19000 micron sieve			--	--	--	--	--	--	--	--
Percent retained 25K micron sieve			--	--	--	--	--	--	--	--
Percent retained 37.5K micron sieve			--	--	--	--	--	--	--	--
Percent retained 50K micron sieve			--	--	--	--	--	--	--	--
Percent retained 75K micron sieve			--	--	--	--	--	--	--	--
Total Gravel			--	--	--	--	--	--	--	--
Total Sand			--	--	--	--	--	--	--	--
Total Silt			--	--	--	--	--	--	--	--
Total Clay			--	--	--	--	--	--	--	--
Metals (mg/kg)										
Antimony		1400	6 UJ	6 UJ	6 UJ	5 UJ	--	--	--	--
Arsenic	20	1050	6 U	6 U	6 U	5 U	**7**	**2.2**	**4.3 J**	**1.6**
Cadmium	2	3500	0.2 U	**0.5**	0.2 U	**0.3**	**0.3**	0.2 U	0.3 U	0.2 U
Chromium	2000		**9.5**	**62.4**	**20.6**	**45.2**	**20**	**15.2**	**19.6**	**25.9**

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic
		Location ID	DSI-GP-20	DSI-GP-21	DSI-GP-21	DSI-GP-21	DSI-06	DSI-06	DSI-07	DSI-07
		Sample ID	DSI-GP-20-5.5-8	DSI-GP-21-2-4.5	DSI-GP-21-5.5-8	DSI-GP-71-2-4.5	DSI06-SO-A	DSI06-SO-B	DSI07-SO-A	DSI07-SO-B
		Sample Date	7/15/2009	7/16/2009	7/16/2009	7/16/2009	9/27/2006	9/27/2006	9/28/2006	9/28/2006
		Depth	5.5 - 8 feet	2 - 4.5 feet	5.5 - 8 feet	2 - 4.5 feet	0 - 3 feet	4 - 6 feet	0 - 3 feet	3 - 5 feet
		Sample Type	N	N	N	FD	N	N	N	N
		X	1267785.569970	1267891.799470	1267891.799470	1267891.799470	1267832.573	1267832.573	1267843.294	1267843.294
		Y	204370.101158	204378.830032	204378.830032	204378.830032	204403.4785	204403.4785	204440.1651	204440.1651
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
Chromium VI	19	10500	--	--	--	--	0.143 UJ	0.12 UJ	0.15 UJ	0.115 UJ
Copper		140000	**9.4**	**26.4**	**18.5**	**21.4**	**37.1**	**18.2**	**52.1 J**	**10.3**
Lead	250		2 U	**39**	**50**	**264**	**14**	**6**	**11 J**	**3**
Mercury	2		0.02 U	**0.08**	0.02 U	**0.04**	**0.14**	0.05 U	**0.72 J**	0.04 U
Nickel		70000	**6**	**12**	**11**	**12**	--	--	--	--
Selenium		17500	0.6 U	0.6 U	0.5 U	0.5 U	--	--	--	--
Silver		17500	0.4 U	0.3 U	0.3 U	0.3 U	0.4 U	0.3 U	0.4 U	0.3 U
Zinc		1050000	**20**	**117 J**	**81 J**	**89 J**	**57.5**	**33.6**	**53.2**	**29.1**
Volatile Organics (µg/kg)										
1,1,1,2-Tetrachloroethane		105000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,1,1-Trichloroethane	2000	7000000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,1,2,2-Tetrachloroethane		70000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,1,2-Trichloroethane		14000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,1-Dichloroethane		700000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,1-Dichloroethene		175000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,1-Dichloropropene			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,2,3-Trichlorobenzene			--	--	--	--	470 U	5.5 U	6.1 U	6.2 U
1,2,3-Trichloropropane		14000000	--	--	--	--	190 U	2.2 U	2.4 U	2.5 U
1,2,4-Trichlorobenzene		35000000	--	--	--	--	470 U	5.5 U	6.1 U	6.2 U
1,2,4-Trimethylbenzene			--	--	--	--	**120**	1.1 U	**3200**	**51**
1,2-Dibromo-3-chloropropane		700000	--	--	--	--	470 U	5.5 U	6.1 U	6.2 U
1,2-Dibromoethane (Ethylene dibromide)	5	31500000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,2-Dichlorobenzene		315000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,2-Dichloroethane		70000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,2-Dichloroethene, cis-		7000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,2-Dichloroethene, trans-		70000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,2-Dichloropropane			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,3,5-Trimethylbenzene (Mesitylene)		35000000	--	--	--	--	93 U	1.1 U	**80**	**15**
1,3-Dichlorobenzene			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,3-Dichloropropane			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,3-Dichloropropene, cis-			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,3-Dichloropropene, trans-			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
1,4-Dichlorobenzene			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
2,2-Dichloropropane			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
2-Butanone (MEK)		2100000000	--	--	--	--	**780**	**13**	**27**	**16**
2-Chlorotoluene		70000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
2-Hexanone (Methyl butyl ketone)			--	--	--	--	470 U	5.5 U	6.1 U	6.2 U
4-Chlorotoluene			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

Site Area			**A-South Property Area**	**A-South Property Area**	**A-South Property Area**	**A-South Property Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**
Task			**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**
Location ID			**DSI-GP-20**	**DSI-GP-21**	**DSI-GP-21**	**DSI-GP-21**	**DSI-06**	**DSI-06**	**DSI-07**	**DSI-07**
Sample ID			**DSI-GP-20-5.5-8**	**DSI-GP-21-2-4.5**	**DSI-GP-21-5.5-8**	**DSI-GP-71-2-4.5**	**DSI06-SO-A**	**DSI06-SO-B**	**DSI07-SO-A**	**DSI07-SO-B**
Sample Date			**7/15/2009**	**7/16/2009**	**7/16/2009**	**7/16/2009**	**9/27/2006**	**9/27/2006**	**9/28/2006**	**9/28/2006**
Depth			**5.5 - 8 feet**	**2 - 4.5 feet**	**5.5 - 8 feet**	**2 - 4.5 feet**	**0 - 3 feet**	**4 - 6 feet**	**0 - 3 feet**	**3 - 5 feet**
Sample Type			**N**	**N**	**N**	**FD**	**N**	**N**	**N**	**N**
X			**1267785.569970**	**1267891.799470**	**1267891.799470**	**1267891.799470**	**1267832.573**	**1267832.573**	**1267843.294**	**1267843.294**
Y			**204370.101158**	**204378.830032**	**204378.830032**	**204378.830032**	**204403.4785**	**204403.4785**	**204440.1651**	**204440.1651**
Coordinate Type			**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**
	MTCA Method A Unrestricted	**MTCA Method C Industrial**								
4-Isopropyltoluene (4-Cymene)			--	--	--	--	93 U	1.1 U	1.2 U	**1.3**
Acetone		3150000000	--	--	--	--	**6500**	**92**	6.1 U	**110**
Benzene	30	14000000	--	--	--	--	**260**	**1.7**	**50**	**6**
Bromobenzene			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Bromochloromethane			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Bromodichloromethane		70000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Bromoform (Tribromomethane)		70000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Bromomethane (Methyl Bromide)		4900000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Carbon disulfide		350000000	--	--	--	--	93 U	**30**	**3.3**	**10**
Carbon tetrachloride (Tetrachloromethane)		14000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Chloroethane			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Chloroform		35000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Chloromethane			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Dibromochloromethane		70000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Dibromomethane		35000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Dichlorodifluoromethane		700000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Dichloromethane (Methylene chloride)	20	210000000	--	--	--	--	190 U	2.5 U	**2.6**	2.5 U
Ethylbenzene	6000	350000000	--	--	--	--	93 U	1.1 U	**60**	**7.4**
Isopropylbenzene (Cumene)		350000000	--	--	--	--	93 U	1.1 U	**34**	**5**
m,p-Xylene			--	--	--	--	**290**	**1.5**	**160**	**13**
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		280000000	--	--	--	--	470 U	5.5 U	6.1 U	6.2 U
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Naphthalene		70000000	--	--	--	--	--	--	**69**	**47**
n-Butylbenzene			--	--	--	--	93 U	1.1 U	**22**	**20**
n-Propylbenzene		350000000	--	--	--	--	93 U	1.1 U	**120**	**28**
o-Xylene		700000000	--	--	--	--	**100**	1.1 U	**5.1**	1.2 U
sec-Butylbenzene			--	--	--	--	93 U	1.1 U	1.2 U	**5.4**
Styrene		700000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
tert-Butylbenzene			--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Tetrachloroethene (PCE)	50	35000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Toluene	7000	280000000	--	--	--	--	93 U	1.1 U	**5.5**	1.2 U

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic
		Location ID	DSI-GP-20	DSI-GP-21	DSI-GP-21	DSI-GP-21	DSI-06	DSI-06	DSI-07	DSI-07
		Sample ID	DSI-GP-20-5.5-8	DSI-GP-21-2-4.5	DSI-GP-21-5.5-8	DSI-GP-71-2-4.5	DSI06-SO-A	DSI06-SO-B	DSI07-SO-A	DSI07-SO-B
		Sample Date	7/15/2009	7/16/2009	7/16/2009	7/16/2009	9/27/2006	9/27/2006	9/28/2006	9/28/2006
		Depth	5.5 - 8 feet	2 - 4.5 feet	5.5 - 8 feet	2 - 4.5 feet	0 - 3 feet	4 - 6 feet	0 - 3 feet	3 - 5 feet
		Sample Type	N	N	N	FD	N	N	N	N
		X	1267785.569970	1267891.799470	1267891.799470	1267891.799470	1267832.573	1267832.573	1267843.294	1267843.294
		Y	204370.101158	204378.830032	204378.830032	204378.830032	204403.4785	204403.4785	204440.1651	204440.1651
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
Trichloroethene (TCE)	30		--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Trichlorofluoromethane (Fluorotrichloromethane)		1050000000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Vinyl chloride		10500000	--	--	--	--	93 U	1.1 U	1.2 U	1.2 U
Total Xylene (U = 1/2)	9000		--	--	--	--	**400**	**2.1**	**170**	**14**
Polycyclic Aromatic Hydrocarbons (µg/kg)										
1-Methylnaphthalene			20 U	**40**	**28**	--	--	--	--	--
2-Methylnaphthalene		14000000	20 U	**17 J**	**12 J**	--	**33**	27 U	**22**	**66**
Acenaphthene		210000000	20 U	19 U	20 U	--	30 U	27 U	5 U	**9.9**
Acenaphthylene			20 U	**74**	20 U	--	30 U	**48**	5 U	5 U
Anthracene		1050000000	20 U	**23**	20 U	--	30 U	27 U	**5.5**	**7.9**
Benzo(a)anthracene			20 U	**190**	**15 J**	--	**30**	**43**	**14**	**6.4**
Benzo(a)pyrene	100		20 U	**230**	**18 J**	--	**39**	**99**	**11**	**5.9**
Benzo(b)fluoranthene			20 U	**79**	**14 J**	--	**57**	**91**	**16**	**5.9**
Benzo(g,h,i)perylene			20 U	**110**	20 U	--	30 U	**54**	**9.5**	5 U
Benzo(k)fluoranthene			20 U	**79**	**14 J**	--	**54**	**94**	**14**	5 U
Chrysene			20 U	**270**	**36**	--	**78**	**120**	**22**	**6.9**
Dibenzo(a,h)anthracene			20 U	**23**	20 U	--	30 U	27 U	5 U	5 U
Fluoranthene		140000000	20 U	**230**	**25**	--	**120**	**120**	**45**	**15**
Fluorene		140000000	20 U	**9.8 J**	**10 J**	--	30 U	**27**	5 U	**14**
Indeno(1,2,3-c,d)pyrene			20 U	**95**	20 U	--	30 U	**48**	**7**	5 U
Naphthalene		70000000	20 U	**63**	**18 J**	--	**57**	**27**	--	--
Phenanthrene			20 U	**41**	**46**	--	**90**	**80**	**25**	**13**
Pyrene		105000000	20 U	**330**	**37**	--	**160**	**320**	**34**	**21**
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	100		20 U	**280**	**20 J**	--	**60**	**130**	**17**	**7.9**
Total Naphthalenes (U = 1/2)	5000		20 U	**100 J**	**58 J**	--	**90**	**40**	**22**	**66**
Semivolatile Organics (µg/kg)										
1,2,4-Trichlorobenzene		35000000	20 U	19 U	20 U	--	--	--	--	--
1,2-Dichlorobenzene		315000000	20 U	19 U	20 U	--	--	--	--	--
1,4-Dichlorobenzene			20 U	19 U	20 U	--	--	--	--	--
2,4-Dimethylphenol		70000000	20 U	19 U	20 U	--	--	--	--	--
2-Methylphenol (o-Cresol)		175000000	20 U	19 U	20 U	--	--	--	--	--
4-Methylphenol (p-Cresol)		17500000	20 U	19 U	20 U	--	--	--	--	--
Benzoic acid		14000000000	200 UJ	190 U	200 U	--	--	--	--	--
Benzyl alcohol		350000000	20 UJ	19 U	20 U	--	--	--	--	--
Bis(2-ethylhexyl) phthalate		70000000	**21**	**2600**	**280**	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic
		Location ID	DSI-GP-20	DSI-GP-21	DSI-GP-21	DSI-GP-21	DSI-06	DSI-06	DSI-07	DSI-07
		Sample ID	DSI-GP-20-5.5-8	DSI-GP-21-2-4.5	DSI-GP-21-5.5-8	DSI-GP-71-2-4.5	DSI06-SO-A	DSI06-SO-B	DSI07-SO-A	DSI07-SO-B
		Sample Date	7/15/2009	7/16/2009	7/16/2009	7/16/2009	9/27/2006	9/27/2006	9/28/2006	9/28/2006
		Depth	5.5 - 8 feet	2 - 4.5 feet	5.5 - 8 feet	2 - 4.5 feet	0 - 3 feet	4 - 6 feet	0 - 3 feet	3 - 5 feet
		Sample Type	N	N	N	FD	N	N	N	N
		X	1267785.569970	1267891.799470	1267891.799470	1267891.799470	1267832.573	1267832.573	1267843.294	1267843.294
		Y	204370.101158	204378.830032	204378.830032	204378.830032	204403.4785	204403.4785	204440.1651	204440.1651
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
Butylbenzyl phthalate		700000000	20 U	19 U	20 U	--	--	--	--	--
Dibenzofuran		3500000	20 U	19 U	20 U	--	30 U	27 U	5 U	5 U
Diethyl phthalate		2800000000	20 U	**19**	20 U	--	--	--	--	--
Dimethyl phthalate			20 U	19 U	20 U	--	--	--	--	--
Di-n-butyl phthalate		350000000	20 U	19 U	20 U	--	--	--	--	--
Di-n-octyl phthalate			20 U	19 U	20 U	--	--	--	--	--
Hexachlorobenzene		2800000	20 U	19 U	20 U	--	--	--	--	--
Hexachlorobutadiene		3500000	20 U	19 U	20 U	--	--	--	--	--
Hexachloroethane		3500000	20 UJ	19 U	20 U	--	--	--	--	--
N-Nitrosodiphenylamine			20 UJ	19 U	34 U	--	--	--	--	--
Pentachlorophenol		17500000	98 UJ	96 U	98 U	--	--	--	--	--
Phenol		1050000000	20 U	**49**	**17 J**	--	--	--	--	--
PCB Aroclors (μg/kg)										
Aroclor 1016		245000	--	--	--	--	9.7 U	9.7 U	9.7 U	9.6 U
Aroclor 1221			--	--	--	--	9.7 U	9.7 U	9.7 U	9.6 U
Aroclor 1232			--	--	--	--	9.7 U	9.7 U	9.7 U	9.6 U
Aroclor 1242			--	--	--	--	9.7 U	9.7 U	9.7 U	9.6 U
Aroclor 1248			--	--	--	--	9.7 U	9.7 U	9.7 U	9.6 U
Aroclor 1254		70000	--	--	--	--	9.7 U	9.7 U	9.7 U	9.6 U
Aroclor 1260			--	--	--	--	9.7 UJ	9.7 UJ	9.7 U	9.6 U
Total PCB Aroclors (U = 1/2)	1000		--	--	--	--	9.7 UJ	9.7 UJ	9.7 U	9.6 U
Pesticides (μg/kg)										
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			--	--	--	--	3.2 U	3.3 U	3.2 U	3.2 U
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			--	--	--	--	3.2 U	3.3 U	3.2 U	3.2 U
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		1750000	--	--	--	--	3.2 U	3.3 U	3.2 U	3.2 U
Aldrin		105000	--	--	--	--	1.6 U	1.7 U	1.6 U	1.6 U
alpha-Chlordane (cis-Chlordane)			--	--	--	--	1.6 U	1.7 U	1.6 U	1.6 U
alpha-Hexachlorocyclohexane (BHC)			--	--	--	--	1.6 U	1.7 U	1.6 U	1.6 U
beta-Hexachlorocyclohexane (BHC)			--	--	--	--	1.6 U	1.7 U	1.6 U	1.6 U
delta-Hexachlorocyclohexane (BHC)			--	--	--	--	1.6 U	1.7 U	1.6 U	1.6 U
Dieldrin		175000	--	--	--	--	3.2 U	3.3 U	3.2 U	3.2 U
Endosulfan sulfate			--	--	--	--	3.2 U	3.3 U	3.2 U	3.2 U
Endosulfan-alpha (I)			--	--	--	--	1.6 U	1.7 U	1.6 U	1.6 U

Table 3

2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

Site Area			A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
Task			Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic
Location ID			DSI-GP-20	DSI-GP-21	DSI-GP-21	DSI-GP-21	DSI-06	DSI-06	DSI-07	DSI-07
Sample ID			DSI-GP-20-5.5-8	DSI-GP-21-2-4.5	DSI-GP-21-5.5-8	DSI-GP-71-2-4.5	DSI06-SO-A	DSI06-SO-B	DSI07-SO-A	DSI07-SO-B
Sample Date			7/15/2009	7/16/2009	7/16/2009	7/16/2009	9/27/2006	9/27/2006	9/28/2006	9/28/2006
Depth			5.5 - 8 feet	2 - 4.5 feet	5.5 - 8 feet	2 - 4.5 feet	0 - 3 feet	4 - 6 feet	0 - 3 feet	3 - 5 feet
Sample Type			N	N	N	FD	N	N	N	N
X			1267785.569970	1267891.799470	1267891.799470	1267891.799470	1267832.573	1267832.573	1267843.294	1267843.294
Y			204370.101158	204378.830032	204378.830032	204378.830032	204403.4785	204403.4785	204440.1651	204440.1651
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
Endosulfan-beta (II)			--	--	--	--	3.2 U	3.3 U	3.2 U	3.2 U
Endrin		1050000	--	--	--	--	3.2 U	3.3 U	3.2 U	3.2 U
Endrin aldehyde			--	--	--	--	3.2 U	3.3 U	3.2 U	3.2 U
Endrin ketone			--	--	--	--	3.2 U	3.3 U	3.2 U	3.2 U
gamma-Chlordane			--	--	--	--	1.6 U	1.7 U	1.6 U	1.6 U
gamma-Hexachlorocyclohexane (BHC) (Lindane)	10	1050000	--	--	--	--	1.6 U	1.7 U	1.6 U	1.6 U
Heptachlor		1750000	--	--	--	--	1.6 U	1.7 U	1.6 U	1.6 U
Heptachlor epoxide		45500	--	--	--	--	1.6 U	1.7 U	1.6 U	1.6 U
Hexachlorobenzene		2800000	--	--	--	--	1.6 U	1.7 U	1.6 U	1.6 U
Hexachlorobutadiene		3500000	--	--	--	--	1.6 U	1.7 U	1.6 U	1.6 U
Methoxychlor		17500000	--	--	--	--	16 U	17 U	16 U	16 U
Toxaphene			--	--	--	--	160 U	170 U	160 U	160 U
Total DDx (U = 1/2)	3000		--	--	--	--	3.2 U	3.3 U	3.2 U	3.2 U
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Hydrocarbons	2000		5.9 U	**10**	**34**	--	**2700**	**2200**	**16**	**20**
Gasoline Range Hydrocarbons	30/100*		6.6 U	**6.5**	6.5 U	--	**120**	**13**	**74**	**36**
Motor Oil Range			12 U	**20**	**160**	--	**260**	**190**	**29**	**18**
Extractable Petroleum Hydrocarbons (µg/kg)										
C8-C10 Aliphatics			--	--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	--
C12-C16 Aliphatics			--	--	--	--	--	--	--	--
C16-C21 Aliphatics			--	--	--	--	--	--	--	--
C21-C34 Aliphatics			--	--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--	--
C12-C16 Aromatics			--	--	--	--	--	--	--	--
C16-C21 Aromatics			--	--	--	--	--	--	--	--
C21-C34 Aromatics			--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-South Property Area	A-South Property Area	A-South Property Area	A-South Property Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic
		Location ID	DSI-GP-20	DSI-GP-21	DSI-GP-21	DSI-GP-21	DSI-06	DSI-06	DSI-07	DSI-07
		Sample ID	DSI-GP-20-5.5-8	DSI-GP-21-2-4.5	DSI-GP-21-5.5-8	DSI-GP-71-2-4.5	DSI06-SO-A	DSI06-SO-B	DSI07-SO-A	DSI07-SO-B
		Sample Date	7/15/2009	7/16/2009	7/16/2009	7/16/2009	9/27/2006	9/27/2006	9/28/2006	9/28/2006
		Depth	5.5 - 8 feet	2 - 4.5 feet	5.5 - 8 feet	2 - 4.5 feet	0 - 3 feet	4 - 6 feet	0 - 3 feet	3 - 5 feet
		Sample Type	N	N	N	FD	N	N	N	N
		X	1267785.569970	1267891.799470	1267891.799470	1267891.799470	1267832.573	1267832.573	1267843.294	1267843.294
		Y	204370.101158	204378.830032	204378.830032	204378.830032	204403.4785	204403.4785	204440.1651	204440.1651
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial								
Volatile Petroleum Hydrocarbons (µg/kg)										
Benzene	30	14000000	--	--	--	--	--	--	--	--
Ethylbenzene	6000	350000000	--	--	--	--	--	--	--	--
m,p-Xylene			--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	--	--	--	--
n-Decane (C10)			--	--	--	--	--	--	--	--
n-Dodecane (C12)			--	--	--	--	--	--	--	--
n-Hexane (C6)		210000000	--	--	--	--	--	--	--	--
n-Octane (C8)			--	--	--	--	--	--	--	--
n-Pentane (C5)			--	--	--	--	--	--	--	--
o-Xylene		700000000	--	--	--	--	--	--	--	--
Toluene	7000	280000000	--	--	--	--	--	--	--	--
C5-C6 Aliphatics			--	--	--	--	--	--	--	--
C6-C8 Aliphatics			--	--	--	--	--	--	--	--
C8-C10 Aliphatics			--	--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--	--
C12-C13 Aromatics			--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
		Task	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-10	DSI-10	DSI-GP-08	DSI-GP-08	DSI-GP-08	DSI-GP-09	DSI-GP-09	DSI-GP-09	DSI-GP-10	DSI-GP-10	DSI-GP-11	DSI-GP-11
		Sample ID	DSI10-SO-A	DSI10-SO-B	DSI-GP-08-2-4.5	DSI-GP-08-5.5-7.5	DSI-GP-58-5.5-7.5	DSI-GP-09-2-4.5	DSI-GP-09-6-8	DSI-GP-09-9-10	DSI-GP-10-2-4	DSI-GP-10-5.5-7.5	DSI-GP-11-1-3.5	DSI-GP-11-5-7.5
		Sample Date	9/28/2006	9/28/2006	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/14/2009	7/14/2009
		Depth	0 - 3 feet	3 - 5 feet	2 - 4.5 feet	5.5 - 7.5 feet	5.5 - 7.5 feet	2 - 4.5 feet	6 - 8 feet	9 - 10 feet	2 - 4 feet	5.5 - 7.5 feet	1 - 3.5 feet	5 - 7.5 feet
		Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N
		X	1267928.635	1267928.635	1267860.111520	1267860.111520	1267860.111520	1267877.010250	1267877.010250	1267877.010250	1267792.872320	1267792.872320	1267873.094710	1267873.094710
		Y	204456.0222	204456.0222	204436.109838	204436.109838	204436.109838	204409.648291	204409.648291	204409.648291	204451.342065	204451.342065	204484.395476	204484.395476
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial												
Conventional Parameters (pct)														
Moisture (water) content			--	--	--	--	--	--	--	--	--	--	--	--
Total organic carbon			**1.3**	**0.147**	--	--	--	--	--	--	--	--	--	--
Total solids			**69.7**	**95.3**	--	--	--	--	--	--	--	--	--	--
Grain Size (pct)														
Percent passing < 1.3 micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 1.3 micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 3.2 micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 7 micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 9 micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 13 micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 22 micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 32 micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 75 micron sieve (#200)			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 150 micron sieve (#100)			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 250 micron sieve (#60)			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 425 micron sieve (#40)			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 850 micron sieve (#20)			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 2000 micron sieve (#10)			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 4750 micron sieve (#4)			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 9500 micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 12500 micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 19000 micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 25K micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 37.5K micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 50K micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Percent retained 75K micron sieve			--	--	--	--	--	--	--	--	--	--	--	--
Total Gravel			--	--	--	--	--	--	--	--	--	--	--	--
Total Sand			--	--	--	--	--	--	--	--	--	--	--	--
Total Silt			--	--	--	--	--	--	--	--	--	--	--	--
Total Clay			--	--	--	--	--	--	--	--	--	--	--	--
Metals (mg/kg)														
Antimony		1400	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	20	1050	**6.2**	**1.9**	--	--	--	--	--	--	--	--	--	--
Cadmium	2	3500	0.3 U	0.2 U	--	--	--	--	--	--	--	--	--	--
Chromium	2000		**20.2**	**14.2**	--	--	--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
		Task	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-10	DSI-10	DSI-GP-08	DSI-GP-08	DSI-GP-08	DSI-GP-09	DSI-GP-09	DSI-GP-09	DSI-GP-10	DSI-GP-10	DSI-GP-11	DSI-GP-11
		Sample ID	DSI10-SO-A	DSI10-SO-B	DSI-GP-08-2-4.5	DSI-GP-08-5.5-7.5	DSI-GP-58-5.5-7.5	DSI-GP-09-2-4.5	DSI-GP-09-6-8	DSI-GP-09-9-10	DSI-GP-10-2-4	DSI-GP-10-5.5-7.5	DSI-GP-11-1-3.5	DSI-GP-11-5-7.5
		Sample Date	9/28/2006	9/28/2006	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/14/2009	7/14/2009
		Depth	0 - 3 feet	3 - 5 feet	2 - 4.5 feet	5.5 - 7.5 feet	5.5 - 7.5 feet	2 - 4.5 feet	6 - 8 feet	9 - 10 feet	2 - 4 feet	5.5 - 7.5 feet	1 - 3.5 feet	5 - 7.5 feet
		Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N
		X	1267928.635	1267928.635	1267860.111520	1267860.111520	1267860.111520	1267877.010250	1267877.010250	1267877.010250	1267792.872320	1267792.872320	1267873.094710	1267873.094710
		Y	204456.0222	204456.0222	204436.109838	204436.109838	204436.109838	204409.648291	204409.648291	204409.648291	204451.342065	204451.342065	204484.395476	204484.395476
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial												
Chromium VI	19	10500	0.157 UJ	0.117 UJ	--	--	--	--	--	--	--	--	--	--
Copper		140000	**29**	**8.8**	--	--	--	--	--	--	--	--	--	--
Lead	250		**8**	**11**	--	--	--	--	--	--	--	--	--	--
Mercury	2		**0.11**	0.04 U	--	--	--	--	--	--	--	--	--	--
Nickel		70000	--	--	--	--	--	--	--	--	--	--	--	--
Selenium		17500	--	--	--	--	--	--	--	--	--	--	--	--
Silver		17500	0.4 U	0.3 U	--	--	--	--	--	--	--	--	--	--
Zinc		1050000	**43.7**	**25.2**	--	--	--	--	--	--	--	--	--	--
Volatile Organics (µg/kg)														
1,1,1,2-Tetrachloroethane		105000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	2000	7000000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane		70000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane		14000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane		700000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethene		175000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,1-Dichloropropene			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene			6 U	5.1 U	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane		14000000	2.4 U	2 U	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene		35000000	6 U	5.1 U	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane		700000	6 U	5.1 U	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	5	31500000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene		315000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane		70000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethene, cis-		7000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethene, trans-		70000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)		35000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropane			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropene, cis-			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropene, trans-			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
2-Butanone (MEK)		2100000000	**6.5**	5.1 U	--	--	--	--	--	--	--	--	--	--
2-Chlorotoluene		70000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
2-Hexanone (Methyl butyl ketone)			6 U	5.1 U	--	--	--	--	--	--	--	--	--	--
4-Chlorotoluene			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--

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Site Area			A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
Task			DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-10	DSI-10	DSI-GP-08	DSI-GP-08	DSI-GP-08	DSI-GP-09	DSI-GP-09	DSI-GP-09	DSI-GP-10	DSI-GP-10	DSI-GP-11	DSI-GP-11
Sample ID			DSI10-SO-A	DSI10-SO-B	DSI-GP-08-2-4.5	DSI-GP-08-5.5-7.5	DSI-GP-58-5.5-7.5	DSI-GP-09-2-4.5	DSI-GP-09-6-8	DSI-GP-09-9-10	DSI-GP-10-2-4	DSI-GP-10-5.5-7.5	DSI-GP-11-1-3.5	DSI-GP-11-5-7.5
Sample Date			9/28/2006	9/28/2006	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/14/2009	7/14/2009
Depth			0 - 3 feet	3 - 5 feet	2 - 4.5 feet	5.5 - 7.5 feet	5.5 - 7.5 feet	2 - 4.5 feet	6 - 8 feet	9 - 10 feet	2 - 4 feet	5.5 - 7.5 feet	1 - 3.5 feet	5 - 7.5 feet
Sample Type			N	N	N	N	FD	N	N	N	N	N	N	N
X			1267928.635	1267928.635	1267860.111520	1267860.111520	1267860.111520	1267877.010250	1267877.010250	1267877.010250	1267792.872320	1267792.872320	1267873.094710	1267873.094710
Y			204456.0222	204456.0222	204436.109838	204436.109838	204436.109838	204409.648291	204409.648291	204409.648291	204451.342065	204451.342065	204484.395476	204484.395476
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial												
4-Isopropyltoluene (4-Cymene)			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Acetone		3150000000	**55**	35 U	--	--	--	--	--	--	--	--	--	--
Benzene	30	14000000	1.2 U	1 U	--	--	--	--	--	--	**19 J**	1.3 U	**2.2**	1.1 U
Bromobenzene			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Bromochloromethane			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane		70000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Bromoform (Tribromomethane)		70000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Bromomethane (Methyl Bromide)		4900000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Carbon disulfide		350000000	1.2 U	**1**	--	--	--	--	--	--	--	--	--	--
Carbon tetrachloride (Tetrachloromethane)		14000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Chloroethane			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Chloroform		35000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Chloromethane			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane		70000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Dibromomethane		35000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane		700000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Dichloromethane (Methylene chloride)	20	210000000	2.4 U	**2.3**	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	6000	350000000	1.2 U	1 U	--	--	--	--	--	--	35 UJ	1.3 U	1.2 U	1.1 U
Isopropylbenzene (Cumene)		350000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
m,p-Xylene			1.2 U	1 U	--	--	--	--	--	--	7.7 UJ	1.3 U	**1.8**	1.1 U
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		280000000	6 U	5.1 U	--	--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Naphthalene		70000000	--	--	--	--	--	--	--	--	--	--	--	--
n-Butylbenzene			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
n-Propylbenzene		350000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
o-Xylene		700000000	1.2 U	1 U	--	--	--	--	--	--	13 UJ	1.3 U	1.2 U	1.1 U
sec-Butylbenzene			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Styrene		700000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
tert-Butylbenzene			1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Tetrachloroethene (PCE)	50	35000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Toluene	7000	280000000	1.2 U	1 U	--	--	--	--	--	--	**7.9 J**	1.3 U	1.2 U	1.1 U

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Site Area			A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
Task			DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-10	DSI-10	DSI-GP-08	DSI-GP-08	DSI-GP-08	DSI-GP-09	DSI-GP-09	DSI-GP-09	DSI-GP-10	DSI-GP-10	DSI-GP-11	DSI-GP-11
Sample ID			DSI10-SO-A	DSI10-SO-B	DSI-GP-08-2-4.5	DSI-GP-08-5.5-7.5	DSI-GP-58-5.5-7.5	DSI-GP-09-2-4.5	DSI-GP-09-6-8	DSI-GP-09-9-10	DSI-GP-10-2-4	DSI-GP-10-5.5-7.5	DSI-GP-11-1-3.5	DSI-GP-11-5-7.5
Sample Date			9/28/2006	9/28/2006	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/14/2009	7/14/2009
Depth			0 - 3 feet	3 - 5 feet	2 - 4.5 feet	5.5 - 7.5 feet	5.5 - 7.5 feet	2 - 4.5 feet	6 - 8 feet	9 - 10 feet	2 - 4 feet	5.5 - 7.5 feet	1 - 3.5 feet	5 - 7.5 feet
Sample Type			N	N	N	N	FD	N	N	N	N	N	N	N
X			1267928.635	1267928.635	1267860.111520	1267860.111520	1267860.111520	1267877.010250	1267877.010250	1267877.010250	1267792.872320	1267792.872320	1267873.094710	1267873.094710
Y			204456.0222	204456.0222	204436.109838	204436.109838	204436.109838	204409.648291	204409.648291	204409.648291	204451.342065	204451.342065	204484.395476	204484.395476
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial												
Trichloroethene (TCE)	30		1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane (Fluorotrichloromethane)		1050000000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Vinyl chloride		10500000	1.2 U	1 U	--	--	--	--	--	--	--	--	--	--
Total Xylene (U = 1/2)	9000		1.2 U	1 U	--	--	--	--	--	--	13 UJ	1.3 U	**2.4**	1.1 U
Polycyclic Aromatic Hydrocarbons (µg/kg)														
1-Methylnaphthalene			--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene		14000000	**7.8**	5 U	--	--	--	--	--	--	--	--	--	--
Acenaphthene		210000000	4.8 U	5 U	--	--	--	--	--	--	--	--	--	--
Acenaphthylene			4.8 U	5 U	--	--	--	--	--	--	--	--	--	--
Anthracene		1050000000	**11**	5 U	--	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene			**18**	5 U	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	100		**15**	5 U	--	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene			**20**	5 U	--	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene			**6.3**	5 U	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene			**18**	5 U	--	--	--	--	--	--	--	--	--	--
Chrysene			**23**	5 U	--	--	--	--	--	--	--	--	--	--
Dibenzo(a,h)anthracene			4.8 U	5 U	--	--	--	--	--	--	--	--	--	--
Fluoranthene		140000000	**61**	5 U	--	--	--	--	--	--	--	--	--	--
Fluorene		140000000	**7.3**	5 U	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene			**6.3**	5 U	--	--	--	--	--	--	--	--	--	--
Naphthalene		70000000	**7.3**	5 U	--	--	--	--	--	--	--	--	--	--
Phenanthrene			**27**	5 U	--	--	--	--	--	--	--	--	--	--
Pyrene		105000000	**51**	5 U	--	--	--	--	--	--	--	--	--	--
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	100		**20**	5 U	--	--	--	--	--	--	--	--	--	--
Total Naphthalenes (U = 1/2)	5000		**15**	5 U	--	--	--	--	--	--	--	--	--	--
Semivolatile Organics (µg/kg)														
1,2,4-Trichlorobenzene		35000000	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene		315000000	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene			--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dimethylphenol		70000000	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylphenol (o-Cresol)		175000000	--	--	--	--	--	--	--	--	--	--	--	--
4-Methylphenol (p-Cresol)		17500000	--	--	--	--	--	--	--	--	--	--	--	--
Benzoic acid		14000000000	--	--	--	--	--	--	--	--	--	--	--	--
Benzyl alcohol		350000000	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate		70000000	--	--	--	--	--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
		Task	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-10	DSI-10	DSI-GP-08	DSI-GP-08	DSI-GP-08	DSI-GP-09	DSI-GP-09	DSI-GP-09	DSI-GP-10	DSI-GP-10	DSI-GP-11	DSI-GP-11
		Sample ID	DSI10-SO-A	DSI10-SO-B	DSI-GP-08-2-4.5	DSI-GP-08-5.5-7.5	DSI-GP-58-5.5-7.5	DSI-GP-09-2-4.5	DSI-GP-09-6-8	DSI-GP-09-9-10	DSI-GP-10-2-4	DSI-GP-10-5.5-7.5	DSI-GP-11-1-3.5	DSI-GP-11-5-7.5
		Sample Date	9/28/2006	9/28/2006	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/14/2009	7/14/2009
		Depth	0 - 3 feet	3 - 5 feet	2 - 4.5 feet	5.5 - 7.5 feet	5.5 - 7.5 feet	2 - 4.5 feet	6 - 8 feet	9 - 10 feet	2 - 4 feet	5.5 - 7.5 feet	1 - 3.5 feet	5 - 7.5 feet
		Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N
		X	1267928.635	1267928.635	1267860.111520	1267860.111520	1267860.111520	1267877.010250	1267877.010250	1267877.010250	1267792.872320	1267792.872320	1267873.094710	1267873.094710
		Y	204456.0222	204456.0222	204436.109838	204436.109838	204436.109838	204409.648291	204409.648291	204409.648291	204451.342065	204451.342065	204484.395476	204484.395476
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial												
Butylbenzyl phthalate		700000000	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzofuran		3500000	**6.8**	5 U	--	--	--	--	--	--	--	--	--	--
Diethyl phthalate		2800000000	--	--	--	--	--	--	--	--	--	--	--	--
Dimethyl phthalate			--	--	--	--	--	--	--	--	--	--	--	--
Di-n-butyl phthalate		350000000	--	--	--	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalate			--	--	--	--	--	--	--	--	--	--	--	--
Hexachlorobenzene		2800000	--	--	--	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene		3500000	--	--	--	--	--	--	--	--	--	--	--	--
Hexachloroethane		3500000	--	--	--	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine			--	--	--	--	--	--	--	--	--	--	--	--
Pentachlorophenol		17500000	--	--	--	--	--	--	--	--	--	--	--	--
Phenol		1050000000	--	--	--	--	--	--	--	--	--	--	--	--
PCB Aroclors (µg/kg)														
Aroclor 1016		245000	9.8 U	9.4 U	--	--	--	--	--	--	--	--	--	--
Aroclor 1221			9.8 U	9.4 U	--	--	--	--	--	--	--	--	--	--
Aroclor 1232			9.8 U	9.4 U	--	--	--	--	--	--	--	--	--	--
Aroclor 1242			9.8 U	9.4 U	--	--	--	--	--	--	--	--	--	--
Aroclor 1248			9.8 U	9.4 U	--	--	--	--	--	--	--	--	--	--
Aroclor 1254		70000	9.8 U	9.4 U	--	--	--	--	--	--	--	--	--	--
Aroclor 1260			9.8 U	9.4 U	--	--	--	--	--	--	--	--	--	--
Total PCB Aroclors (U = 1/2)	1000		9.8 U	9.4 U	--	--	--	--	--	--	--	--	--	--
Pesticides (µg/kg)														
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			3.3 U	3.3 U	--	--	--	--	--	--	--	--	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			3.3 U	3.3 U	--	--	--	--	--	--	--	--	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		1750000	3.3 U	3.3 U	--	--	--	--	--	--	--	--	--	--
Aldrin		105000	1.6 U	1.7 U	--	--	--	--	--	--	--	--	--	--
alpha-Chlordane (cis-Chlordane)			1.6 U	1.7 U	--	--	--	--	--	--	--	--	--	--
alpha-Hexachlorocyclohexane (BHC)			1.6 U	1.7 U	--	--	--	--	--	--	--	--	--	--
beta-Hexachlorocyclohexane (BHC)			1.6 U	1.7 U	--	--	--	--	--	--	--	--	--	--
delta-Hexachlorocyclohexane (BHC)			1.6 U	1.7 U	--	--	--	--	--	--	--	--	--	--
Dieldrin		175000	3.3 U	3.3 U	--	--	--	--	--	--	--	--	--	--
Endosulfan sulfate			3.3 U	3.3 U	--	--	--	--	--	--	--	--	--	--
Endosulfan-alpha (I)			1.6 U	1.7 U	--	--	--	--	--	--	--	--	--	--

	MTCA Method A Unrestricted	MTCA Method C Industrial												
Site Area			A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
Task			DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-10	DSI-10	DSI-GP-08	DSI-GP-08	DSI-GP-08	DSI-GP-09	DSI-GP-09	DSI-GP-09	DSI-GP-10	DSI-GP-10	DSI-GP-11	DSI-GP-11
Sample ID			DSI10-SO-A	DSI10-SO-B	DSI-GP-08-2-4.5	DSI-GP-08-5.5-7.5	DSI-GP-58-5.5-7.5	DSI-GP-09-2-4.5	DSI-GP-09-6-8	DSI-GP-09-9-10	DSI-GP-10-2-4	DSI-GP-10-5.5-7.5	DSI-GP-11-1-3.5	DSI-GP-11-5-7.5
Sample Date			9/28/2006	9/28/2006	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/16/2009	7/14/2009	7/14/2009
Depth			0 - 3 feet	3 - 5 feet	2 - 4.5 feet	5.5 - 7.5 feet	5.5 - 7.5 feet	2 - 4.5 feet	6 - 8 feet	9 - 10 feet	2 - 4 feet	5.5 - 7.5 feet	1 - 3.5 feet	5 - 7.5 feet
Sample Type			N	N	N	N	FD	N	N	N	N	N	N	N
X			1267928.635	1267928.635	1267860.111520	1267860.111520	1267860.111520	1267877.010250	1267877.010250	1267877.010250	1267792.872320	1267792.872320	1267873.094710	1267873.094710
Y			204456.0222	204456.0222	204436.109838	204436.109838	204436.109838	204409.648291	204409.648291	204409.648291	204451.342065	204451.342065	204484.395476	204484.395476
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
Endosulfan-beta (II)			3.3 U	3.3 U	--	--	--	--	--	--	--	--	--	--
Endrin		1050000	3.3 U	3.3 U	--	--	--	--	--	--	--	--	--	--
Endrin aldehyde			3.3 U	3.3 U	--	--	--	--	--	--	--	--	--	--
Endrin ketone			3.3 U	3.3 U	--	--	--	--	--	--	--	--	--	--
gamma-Chlordane			1.6 U	1.7 U	--	--	--	--	--	--	--	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	10	1050000	1.6 U	1.7 U	--	--	--	--	--	--	--	--	--	--
Heptachlor		1750000	1.6 U	1.7 U	--	--	--	--	--	--	--	--	--	--
Heptachlor epoxide		45500	1.6 U	1.7 U	--	--	--	--	--	--	--	--	--	--
Hexachlorobenzene		2800000	1.6 U	1.7 U	--	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene		3500000	1.6 U	1.7 U	--	--	--	--	--	--	--	--	--	--
Methoxychlor		17500000	16 U	17 U	--	--	--	--	--	--	--	--	--	--
Toxaphene			160 U	170 U	--	--	--	--	--	--	--	--	--	--
Total DDx (U = 1/2)	3000		3.3 U	3.3 U	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (mg/kg)														
Diesel Range Hydrocarbons	2000		**16**	5.2 U	**2300**	**400**	**490**	**2200**	--	8.1 U	**1000**	6.4 U	**110**	**27**
Gasoline Range Hydrocarbons	30/100*		8.3 U	6 U	**160**	**430**	**410**	**320**	--	12 U	**560**	8.1 U	**44**	7.8 U
Motor Oil Range			**39**	10 U	**220**	**33**	**40**	**1200**	--	16 U	**360**	13 U	**210**	**300**
Extractable Petroleum Hydrocarbons (µg/kg)														
C8-C10 Aliphatics			--	--	--	--	--	--	2500 U	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	2500 U	--	--	--	--	--
C12-C16 Aliphatics			--	--	--	--	--	--	2500 U	--	--	--	--	--
C16-C21 Aliphatics			--	--	--	--	--	--	2500 UJ	--	--	--	--	--
C21-C34 Aliphatics			--	--	--	--	--	--	2500 U	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	2500 U	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	2500 U	--	--	--	--	--
C12-C16 Aromatics			--	--	--	--	--	--	2500 U	--	--	--	--	--
C16-C21 Aromatics			--	--	--	--	--	--	2500 U	--	--	--	--	--
C21-C34 Aromatics			--	--	--	--	--	--	2500 UJ	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**
		Task	**DSI 2006 Historic**	**DSI 2006 Historic**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**
		Location ID	**DSI-10**	**DSI-10**	**DSI-GP-08**	**DSI-GP-08**	**DSI-GP-08**	**DSI-GP-09**	**DSI-GP-09**	**DSI-GP-09**	**DSI-GP-10**	**DSI-GP-10**	**DSI-GP-11**	**DSI-GP-11**
		Sample ID	**DSI10-SO-A**	**DSI10-SO-B**	**DSI-GP-08-2-4.5**	**DSI-GP-08-5.5-7.5**	**DSI-GP-58-5.5-7.5**	**DSI-GP-09-2-4.5**	**DSI-GP-09-6-8**	**DSI-GP-09-9-10**	**DSI-GP-10-2-4**	**DSI-GP-10-5.5-7.5**	**DSI-GP-11-1-3.5**	**DSI-GP-11-5-7.5**
		Sample Date	**9/28/2006**	**9/28/2006**	**7/16/2009**	**7/16/2009**	**7/16/2009**	**7/16/2009**	**7/16/2009**	**7/16/2009**	**7/16/2009**	**7/16/2009**	**7/14/2009**	**7/14/2009**
		Depth	**0 - 3 feet**	**3 - 5 feet**	**2 - 4.5 feet**	**5.5 - 7.5 feet**	**5.5 - 7.5 feet**	**2 - 4.5 feet**	**6 - 8 feet**	**9 - 10 feet**	**2 - 4 feet**	**5.5 - 7.5 feet**	**1 - 3.5 feet**	**5 - 7.5 feet**
		Sample Type	**N**	**N**	**N**	**N**	**FD**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
		X	**1267928.635**	**1267928.635**	**1267860.111520**	**1267860.111520**	**1267860.111520**	**1267877.010250**	**1267877.010250**	**1267877.010250**	**1267792.872320**	**1267792.872320**	**1267873.094710**	**1267873.094710**
		Y	**204456.0222**	**204456.0222**	**204436.109838**	**204436.109838**	**204436.109838**	**204409.648291**	**204409.648291**	**204409.648291**	**204451.342065**	**204451.342065**	**204484.395476**	**204484.395476**
		Coordinate Type	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**
	MTCA Method A Unrestricted	**MTCA Method C Industrial**												
Volatile Petroleum Hydrocarbons (µg/kg)														
Benzene	30	14000000	--	--	--	--	--	--	1200 U	--	--	--	--	--
Ethylbenzene	6000	350000000	--	--	--	--	--	--	1200 U	--	--	--	--	--
m,p-Xylene			--	--	--	--	--	--	2400 U	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	--	--	1200 UJ	--	--	--	--	--
n-Decane (C10)			--	--	--	--	--	--	1200 U	--	--	--	--	--
n-Dodecane (C12)			--	--	--	--	--	--	1200 UJ	--	--	--	--	--
n-Hexane (C6)		210000000	--	--	--	--	--	--	1200 U	--	--	--	--	--
n-Octane (C8)			--	--	--	--	--	--	1200 U	--	--	--	--	--
n-Pentane (C5)			--	--	--	--	--	--	1200 U	--	--	--	--	--
o-Xylene		700000000	--	--	--	--	--	--	1200 U	--	--	--	--	--
Toluene	7000	280000000	--	--	--	--	--	--	1200 U	--	--	--	--	--
C5-C6 Aliphatics			--	--	--	--	--	--	12000 U	--	--	--	--	--
C6-C8 Aliphatics			--	--	--	--	--	--	12000 U	--	--	--	--	--
C8-C10 Aliphatics			--	--	--	--	--	--	12000 U	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	12000 U	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	12000 U	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	12000 U	--	--	--	--	--
C12-C13 Aromatics			--	--	--	--	--	--	12000 U	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-MW-04	DSI-MW-04	DSI-09	DSI-09	DSI-11	DSI-11	DSI-GP-12	DSI-GP-12	DSI-GP-13	DSI-GP-13	DSI-GP-14	DSI-GP-14	DSI-GP-14
		Sample ID	DSI-MW-04-0.5-2.5	DSI-MW-04-5-6.5	DSI09-SO-A	DSI09-SO-B	DSI11-SO-A	DSI11-SO-B	DSI-GP-12-1-3.5	DSI-GP-12-5-10	DSI-GP-13-1-3.5	DSI-GP-13-5-7.3	DSI-GP-14-2.5-4.5	DSI-GP-14-5-7	DSI-GP-14-8-10
		Sample Date	7/14/2009	7/14/2009	9/28/2006	9/28/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009
		Depth	0.5 - 2.5 feet	5 - 6.5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	1 - 3.5 feet	5 - 10 feet	1 - 3.5 feet	5 - 7.3 feet	2.5 - 4.5 feet	5 - 7 feet	8 - 10 feet
		Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N
		X	1267894.980000	1267894.980000	1267972.093	1267972.093	1267970.43	1267970.43	1267998.939230	1267998.939230	1267988.722970	1267988.722970	1267995.395670	1267995.395670	1267995.395670
		Y	204416.160000	204416.160000	204599.0992	204599.0992	204358.8091	204358.8091	204597.248788	204597.248788	204516.839114	204516.839114	204444.875241	204444.875241	204444.875241
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial													
Conventional Parameters (pct)															
Moisture (water) content			19.25	26.94	--	--	--	--	--	--	11.59	--	--	--	--
Total organic carbon			--	--	0.939	2.35	1.34	0.099	--	--	--	--	--	--	--
Total solids			--	--	92.6	89.6	76.1	93.7	--	--	--	--	--	--	--
Grain Size (pct)															
Percent passing < 1.3 micron sieve			7.7	--	--	--	--	--	--	--	3.2	--	--	--	--
Percent retained 1.3 micron sieve			6.4	--	--	--	--	--	--	--	1.4	--	--	--	--
Percent retained 3.2 micron sieve			7.7	--	--	--	--	--	--	--	2.3	--	--	--	--
Percent retained 7 micron sieve			8.4	--	--	--	--	--	--	--	2.8	--	--	--	--
Percent retained 9 micron sieve			1.9	--	--	--	--	--	--	--	1.8	--	--	--	--
Percent retained 13 micron sieve			10.3	--	--	--	--	--	--	--	2.8	--	--	--	--
Percent retained 22 micron sieve			5.1	--	--	--	--	--	--	--	4.1	--	--	--	--
Percent retained 32 micron sieve			6.8	--	--	--	--	--	--	--	10.5	--	--	--	--
Percent retained 75 micron sieve (#200)			6.9	12.6	--	--	--	--	--	--	10.5	--	--	--	--
Percent retained 150 micron sieve (#100)			7.7	28.6	--	--	--	--	--	--	11.8	--	--	--	--
Percent retained 250 micron sieve (#60)			10.4	39.2	--	--	--	--	--	--	22.8	--	--	--	--
Percent retained 425 micron sieve (#40)			7.6	13	--	--	--	--	--	--	22.2	--	--	--	--
Percent retained 850 micron sieve (#20)			2.3	0.8	--	--	--	--	--	--	3.4	--	--	--	--
Percent retained 2000 micron sieve (#10)			3.1	0.2	--	--	--	--	--	--	0.5	--	--	--	--
Percent retained 4750 micron sieve (#4)			5	0.3	--	--	--	--	--	--	0.1 U	--	--	--	--
Percent retained 9500 micron sieve			2.5	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	--
Percent retained 12500 micron sieve			0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	--
Percent retained 19000 micron sieve			0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	--
Percent retained 25K micron sieve			0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	--
Percent retained 37.5K micron sieve			0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	--
Percent retained 50K micron sieve			0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	--
Percent retained 75K micron sieve			0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	--
Total Gravel			8	0.3	--	--	--	--	--	--	0.1 U	--	--	--	--
Total Sand			35	90	--	--	--	--	--	--	71	--	--	--	--
Total Silt			40	--	--	--	--	--	--	--	24	--	--	--	--
Total Clay			14	--	--	--	--	--	--	--	4.6	--	--	--	--
Metals (mg/kg)															
Antimony		1400	--	--	--	--	--	--	20 UJ	7 UJ	5 UJ	6 UJ	6 UJ	6 UJ	--
Arsenic	20	1050	--	--	3.7	20.2	4.4	1.4	20 U	9	5 U	6 U	9	8	--
Cadmium	2	3500	--	--	0.3	8.5	0.3	0.2 U	0.9	0.4	0.2 U	0.2 U	0.2 U	0.2 U	--
Chromium	2000		--	--	17.4	36	17.1	11.4	30 J	22.1 J	15.7	13.4	22	18.1	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-MW-04	DSI-MW-04	DSI-09	DSI-09	DSI-11	DSI-11	DSI-GP-12	DSI-GP-12	DSI-GP-13	DSI-GP-13	DSI-GP-14	DSI-GP-14	DSI-GP-14
		Sample ID	DSI-MW-04-0.5-2.5	DSI-MW-04-5-6.5	DSI09-SO-A	DSI09-SO-B	DSI11-SO-A	DSI11-SO-B	DSI-GP-12-1-3.5	DSI-GP-12-5-10	DSI-GP-13-1-3.5	DSI-GP-13-5-7.3	DSI-GP-14-2.5-4.5	DSI-GP-14-5-7	DSI-GP-14-8-10
		Sample Date	7/14/2009	7/14/2009	9/28/2006	9/28/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009
		Depth	0.5 - 2.5 feet	5 - 6.5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	1 - 3.5 feet	5 - 10 feet	1 - 3.5 feet	5 - 7.3 feet	2.5 - 4.5 feet	5 - 7 feet	8 - 10 feet
		Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N
		X	1267894.980000	1267894.980000	1267972.093	1267972.093	1267970.43	1267970.43	1267998.939230	1267998.939230	1267988.722970	1267988.722970	1267995.395670	1267995.395670	1267995.395670
		Y	204416.160000	204416.160000	204599.0992	204599.0992	204358.8091	204358.8091	204597.248788	204597.248788	204516.839114	204516.839114	204444.875241	204444.875241	204444.875241
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial													
Chromium VI	19	10500	--	--	0.117 UJ	0.124 UJ	**2.05 J**	0.12 UJ	--	--	--	--	--	--	--
Copper		140000	--	--	**65.9**	**3310**	**49**	**8.4**	**251 J**	**57.8 J**	**46.5**	**26.3**	**159**	**85**	--
Lead	250		--	--	**118**	**4940**	**92**	2 U	**492 J**	**342 J**	**53**	**10**	**98**	**52**	--
Mercury	2		--	--	**0.31**	**0.18**	**0.76**	0.04 U	**0.59**	**0.07**	**0.16**	**0.06**	**1.63**	**0.68**	--
Nickel		70000	--	--	--	--	--	--	**28 J**	**12 J**	**8**	**11**	**14**	**14**	--
Selenium		17500	--	--	--	--	--	--	0.6 U	0.7 U	0.5 U	0.6 U	0.6 U	0.6 U	--
Silver		17500	--	--	0.3 U	**1.2**	0.4 U	0.3 U	0.9 U	0.4 U	0.3 U	0.4 U	0.3 U	0.4 U	--
Zinc		1050000	--	--	**115**	**5840**	**78.3**	**23**	**386**	**223**	**98**	**53**	**227**	**133**	--
Volatile Organics (µg/kg)															
1,1,1,2-Tetrachloroethane		105000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
1,1,1-Trichloroethane	2000	7000000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane		70000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
1,1,2-Trichloroethane		14000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
1,1-Dichloroethane		700000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
1,1-Dichloroethene		175000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
1,1-Dichloropropene			--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene			--	--	5.2 U	5 UJ	5.6 U	5.3 U	--	--	--	--	--	--	--
1,2,3-Trichloropropane		14000000	--	--	2.1 U	2 UJ	2.2 U	2.1 U	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene		35000000	--	--	5.2 U	5 UJ	5.6 U	5.3 U	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene			--	--	1 U	**1.4 J**	1.1 U	1.1 U	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane		700000	--	--	5.2 U	5 UJ	5.6 U	5.3 U	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	5	31500000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
1,2-Dichlorobenzene		315000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
1,2-Dichloroethane		70000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
1,2-Dichloroethene, cis-		7000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
1,2-Dichloroethene, trans-		70000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
1,2-Dichloropropane			--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)		35000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
1,3-Dichlorobenzene			--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
1,3-Dichloropropane			--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
1,3-Dichloropropene, cis-			--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
1,3-Dichloropropene, trans-			--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
1,4-Dichlorobenzene			--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
2,2-Dichloropropane			--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
2-Butanone (MEK)		2100000000	--	--	**10**	5 U	**12**	**9.4**	--	--	--	--	--	--	--
2-Chlorotoluene		70000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
2-Hexanone (Methyl butyl ketone)			--	--	5.2 U	5 UJ	5.6 U	5.3 U	--	--	--	--	--	--	--
4-Chlorotoluene			--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

Site Area			**A-UST Removal Area**	**A-UST Removal Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**
Task			**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**
Location ID			**DSI-MW-04**	**DSI-MW-04**	**DSI-09**	**DSI-09**	**DSI-11**	**DSI-11**	**DSI-GP-12**	**DSI-GP-12**	**DSI-GP-13**	**DSI-GP-13**	**DSI-GP-14**	**DSI-GP-14**	**DSI-GP-14**
Sample ID			**DSI-MW-04-0.5-2.5**	**DSI-MW-04-5-6.5**	**DSI09-SO-A**	**DSI09-SO-B**	**DSI11-SO-A**	**DSI11-SO-B**	**DSI-GP-12-1-3.5**	**DSI-GP-12-5-10**	**DSI-GP-13-1-3.5**	**DSI-GP-13-5-7.3**	**DSI-GP-14-2.5-4.5**	**DSI-GP-14-5-7**	**DSI-GP-14-8-10**
Sample Date			**7/14/2009**	**7/14/2009**	**9/28/2006**	**9/28/2006**	**9/28/2006**	**9/28/2006**	**7/14/2009**	**7/14/2009**	**7/13/2009**	**7/13/2009**	**7/13/2009**	**7/13/2009**	**7/13/2009**
Depth			**0.5 - 2.5 feet**	**5 - 6.5 feet**	**0 - 3 feet**	**3 - 5 feet**	**0 - 3 feet**	**3 - 5 feet**	**1 - 3.5 feet**	**5 - 10 feet**	**1 - 3.5 feet**	**5 - 7.3 feet**	**2.5 - 4.5 feet**	**5 - 7 feet**	**8 - 10 feet**
Sample Type			**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
X			**1267894.980000**	**1267894.980000**	**1267972.093**	**1267972.093**	**1267970.43**	**1267970.43**	**1267998.939230**	**1267998.939230**	**1267988.722970**	**1267988.722970**	**1267995.395670**	**1267995.395670**	**1267995.395670**
Y			**204416.160000**	**204416.160000**	**204599.0992**	**204599.0992**	**204358.8091**	**204358.8091**	**204597.248788**	**204597.248788**	**204516.839114**	**204516.839114**	**204444.875241**	**204444.875241**	**204444.875241**
Coordinate Type			**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**
	MTCA Method A Unrestricted	**MTCA Method C Industrial**													
4-Isopropyltoluene (4-Cymene)			--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
Acetone		3150000000	--	--	**100**	**55**	**96**	**70**	--	--	--	--	--	--	--
Benzene	30	14000000	--	--	**1**	**1.3**	**2.3**	1.1 U	--	--	--	--	--	--	--
Bromobenzene			--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
Bromochloromethane			--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Bromodichloromethane		70000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Bromoform (Tribromomethane)		70000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
Bromomethane (Methyl Bromide)		4900000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Carbon disulfide		350000000	--	--	1 U	**1.6**	**1.9**	**15**	--	--	--	--	--	--	--
Carbon tetrachloride (Tetrachloromethane)		14000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Chloroethane			--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Chloroform		35000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Chloromethane			--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Dibromochloromethane		70000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
Dibromomethane		35000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Dichlorodifluoromethane		700000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Dichloromethane (Methylene chloride)	20	210000000	--	--	2.1 U	2 U	2.2 U	2.1 U	--	--	--	--	--	--	--
Ethylbenzene	6000	350000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
Isopropylbenzene (Cumene)		350000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
m,p-Xylene			--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		280000000	--	--	5.2 U	5 U	5.6 U	5.3 U	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Naphthalene		70000000	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Butylbenzene			--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
n-Propylbenzene		350000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
o-Xylene		700000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
sec-Butylbenzene			--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
Styrene		700000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
tert-Butylbenzene			--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
Tetrachloroethene (PCE)	50	35000000	--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
Toluene	7000	280000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

	MTCA Method A Unrestricted	MTCA Method C Industrial													
Site Area			**A-UST Removal Area**	**A-UST Removal Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Former Nearshore Area**
Task			**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**
Location ID			**DSI-MW-04**	**DSI-MW-04**	**DSI-09**	**DSI-09**	**DSI-11**	**DSI-11**	**DSI-GP-12**	**DSI-GP-12**	**DSI-GP-13**	**DSI-GP-13**	**DSI-GP-14**	**DSI-GP-14**	**DSI-GP-14**
Sample ID			**DSI-MW-04-0.5-2.5**	**DSI-MW-04-5-6.5**	**DSI09-SO-A**	**DSI09-SO-B**	**DSI11-SO-A**	**DSI11-SO-B**	**DSI-GP-12-1-3.5**	**DSI-GP-12-5-10**	**DSI-GP-13-1-3.5**	**DSI-GP-13-5-7.3**	**DSI-GP-14-2.5-4.5**	**DSI-GP-14-5-7**	**DSI-GP-14-8-10**
Sample Date			**7/14/2009**	**7/14/2009**	**9/28/2006**	**9/28/2006**	**9/28/2006**	**9/28/2006**	**7/14/2009**	**7/14/2009**	**7/13/2009**	**7/13/2009**	**7/13/2009**	**7/13/2009**	**7/13/2009**
Depth			**0.5 - 2.5 feet**	**5 - 6.5 feet**	**0 - 3 feet**	**3 - 5 feet**	**0 - 3 feet**	**3 - 5 feet**	**1 - 3.5 feet**	**5 - 10 feet**	**1 - 3.5 feet**	**5 - 7.3 feet**	**2.5 - 4.5 feet**	**5 - 7 feet**	**8 - 10 feet**
Sample Type			**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
X			**1267894.980000**	**1267894.980000**	**1267972.093**	**1267972.093**	**1267970.43**	**1267970.43**	**1267998.939230**	**1267998.939230**	**1267988.722970**	**1267988.722970**	**1267995.395670**	**1267995.395670**	**1267995.395670**
Y			**204416.160000**	**204416.160000**	**204599.0992**	**204599.0992**	**204358.8091**	**204358.8091**	**204597.248788**	**204597.248788**	**204516.839114**	**204516.839114**	**204444.875241**	**204444.875241**	**204444.875241**
Coordinate Type			**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**
Trichloroethene (TCE)	30		--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Trichlorofluoromethane (Fluorotrichloromethane)		1050000000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Vinyl chloride		10500000	--	--	1 U	1 U	1.1 U	1.1 U	--	--	--	--	--	--	--
Total Xylene (U = 1/2)	9000		--	--	1 U	1 UJ	1.1 U	1.1 U	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)															
1-Methylnaphthalene			--	--	--	--	--	--	12 U	19 U	**860**	**200**	**320**	**5600**	--
2-Methylnaphthalene		14000000	--	--	**47**	**34**	**19**	4.8 U	**17**	19 U	**740**	**160**	**150**	**5900**	--
Acenaphthene		210000000	--	--	**82**	**30**	**6.9**	4.8 U	**19**	19 U	**130**	**64 J**	**110**	**460**	--
Acenaphthylene			--	--	**14**	**5.4**	**14**	4.8 U	**22**	19 U	33 U	80 U	41 U	58 U	--
Anthracene		1050000000	--	--	**87**	**19**	**18**	4.8 U	**57**	19 U	**460**	**89**	**70**	**78**	--
Benzo(a)anthracene			--	--	**160**	**27**	**54**	4.8 U	**110**	**51**	**380**	**110**	**120**	**76**	--
Benzo(a)pyrene	100		--	--	**180**	**23**	**61**	4.8 U	**110**	**45**	**390**	**120**	**130**	**76**	--
Benzo(b)fluoranthene			--	--	**240**	**35**	**73**	4.8 U	**170**	**61**	**250**	**83**	**170**	**88**	--
Benzo(g,h,i)perylene			--	--	**110**	**9.9**	**37**	4.8 U	**62**	**20**	**97**	80 U	**50**	58 U	--
Benzo(k)fluoranthene			--	--	**230**	**26**	**67**	4.8 U	**130**	**44**	**420**	**83**	**160**	**91**	--
Chrysene			--	--	**280**	**54**	**87**	4.8 U	**140**	**65**	**430**	**140**	**180**	**140**	--
Dibenzo(a,h)anthracene			--	--	**38**	5 U	**8.4**	4.8 U	**24**	19 U	**21 J**	80 U	**19 J**	58 U	--
Fluoranthene		140000000	--	--	**480**	**91**	**120**	4.8 U	**320**	**160**	**1300**	**260**	**380**	**260**	--
Fluorene		140000000	--	--	**88**	**35**	**7.9**	4.8 U	**17**	19 U	**610**	**170**	**280**	**1200**	--
Indeno(1,2,3-c,d)pyrene			--	--	**110**	**9.4**	**35**	4.8 U	**52**	19 U	**87**	80 U	**50**	58 U	--
Naphthalene		70000000	--	--	**74**	**58**	**24**	4.8 U	**22**	19 U	**190**	**42 J**	30 U	190 U	--
Phenanthrene			--	--	**370**	**140**	**54**	4.8 U	**270**	**33**	**1400**	**470**	**300**	**1300**	--
Pyrene		105000000	--	--	**400**	**110**	**120**	4.8 U	**160**	**110**	**1000**	**320**	**300**	**230**	--
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	100		--	--	**260**	**34**	**86**	4.8 U	**160**	**63**	**510 J**	**200**	**200 J**	**110**	--
Total Naphthalenes (U = 1/2)	5000		--	--	**120**	**92**	**43**	4.8 U	**45**	19 U	**1800**	**400 J**	**500**	**12000**	--
Semivolatile Organics (µg/kg)															
1,2,4-Trichlorobenzene		35000000	--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
1,2-Dichlorobenzene		315000000	--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
1,4-Dichlorobenzene			--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
2,4-Dimethylphenol		70000000	--	--	--	--	--	--	12 UJ	19 UJ	35 U	80 U	31 U	58 U	--
2-Methylphenol (o-Cresol)		175000000	--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
4-Methylphenol (p-Cresol)		17500000	--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
Benzoic acid		14000000000	--	--	--	--	--	--	120 U	190 U	330 U	800 U	300 U	580 U	--
Benzyl alcohol		350000000	--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
Bis(2-ethylhexyl) phthalate		70000000	--	--	--	--	--	--	**24**	19 U	**22 J**	80 U	**56**	**38 J**	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-MW-04	DSI-MW-04	DSI-09	DSI-09	DSI-11	DSI-11	DSI-GP-12	DSI-GP-12	DSI-GP-13	DSI-GP-13	DSI-GP-14	DSI-GP-14	DSI-GP-14
		Sample ID	DSI-MW-04-0.5-2.5	DSI-MW-04-5-6.5	DSI09-SO-A	DSI09-SO-B	DSI11-SO-A	DSI11-SO-B	DSI-GP-12-1-3.5	DSI-GP-12-5-10	DSI-GP-13-1-3.5	DSI-GP-13-5-7.3	DSI-GP-14-2.5-4.5	DSI-GP-14-5-7	DSI-GP-14-8-10
		Sample Date	7/14/2009	7/14/2009	9/28/2006	9/28/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009
		Depth	0.5 - 2.5 feet	5 - 6.5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	1 - 3.5 feet	5 - 10 feet	1 - 3.5 feet	5 - 7.3 feet	2.5 - 4.5 feet	5 - 7 feet	8 - 10 feet
		Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N
		X	1267894.980000	1267894.980000	1267972.093	1267972.093	1267970.43	1267970.43	1267998.939230	1267998.939230	1267988.722970	1267988.722970	1267995.395670	1267995.395670	1267995.395670
		Y	204416.160000	204416.160000	204599.0992	204599.0992	204358.8091	204358.8091	204597.248788	204597.248788	204516.839114	204516.839114	204444.875241	204444.875241	204444.875241
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial													
Butylbenzyl phthalate		700000000	--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
Dibenzofuran		3500000	--	--	**32**	**18**	**7.9**	4.8 U	**38**	19 U	**89**	80 U	**70**	**290**	--
Diethyl phthalate		2800000000	--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
Dimethyl phthalate			--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
Di-n-butyl phthalate		350000000	--	--	--	--	--	--	**15**	19 U	33 U	80 U	30 U	58 U	--
Di-n-octyl phthalate			--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
Hexachlorobenzene		2800000	--	--	--	--	--	--	**300**	19 U	33 U	80 U	30 U	58 U	--
Hexachlorobutadiene		3500000	--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
Hexachloroethane		3500000	--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
N-Nitrosodiphenylamine			--	--	--	--	--	--	12 UJ	19 UJ	440 UJ	97 UJ	190 UJ	670 UJ	--
Pentachlorophenol		17500000	--	--	--	--	--	--	62 UJ	96 UJ	160 U	400 U	150 U	290 U	--
Phenol		1050000000	--	--	--	--	--	--	12 U	19 U	33 U	80 U	30 U	58 U	--
PCB Aroclors (µg/kg)															
Aroclor 1016		245000	--	--	9.6 U	9.8 U	9.8 U	9.9 U	--	--	--	--	--	--	--
Aroclor 1221			--	--	9.6 U	9.8 U	9.8 U	9.9 U	--	--	--	--	--	--	--
Aroclor 1232			--	--	9.6 U	9.8 U	9.8 U	9.9 U	--	--	--	--	--	--	--
Aroclor 1242			--	--	9.6 U	9.8 U	9.8 U	9.9 U	--	--	--	--	--	--	--
Aroclor 1248			--	--	9.6 U	9.8 U	9.8 U	9.9 U	--	--	--	--	--	--	--
Aroclor 1254		70000	--	--	9.6 U	9.8 U	9.8 U	9.9 U	--	--	--	--	--	--	--
Aroclor 1260			--	--	9.6 U	9.8 U	**35**	9.9 U	--	--	--	--	--	--	--
Total PCB Aroclors (U = 1/2)	1000		--	--	9.6 U	9.8 U	**64**	9.9 U	--	--	--	--	--	--	--
Pesticides (µg/kg)															
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			--	--	3.2 U	3.3 U	3.2 U	3.3 UJ	--	--	--	--	--	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			--	--	3.2 U	3.3 U	3.2 U	3.3 UJ	--	--	--	--	--	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		1750000	--	--	3.2 U	3.3 U	3.2 U	3.3 UJ	--	--	--	--	--	--	--
Aldrin		105000	--	--	1.6 U	1.6 U	1.6 U	1.6 UJ	--	--	--	--	--	--	--
alpha-Chlordane (cis-Chlordane)			--	--	1.6 U	1.6 U	1.6 U	1.6 UJ	--	--	--	--	--	--	--
alpha-Hexachlorocyclohexane (BHC)			--	--	1.6 U	1.6 U	1.6 U	1.6 UJ	--	--	--	--	--	--	--
beta-Hexachlorocyclohexane (BHC)			--	--	1.6 U	1.6 U	1.6 U	1.6 UJ	--	--	--	--	--	--	--
delta-Hexachlorocyclohexane (BHC)			--	--	1.6 U	1.6 U	1.6 U	1.6 UJ	--	--	--	--	--	--	--
Dieldrin		175000	--	--	3.2 U	3.3 U	3.2 U	3.3 UJ	--	--	--	--	--	--	--
Endosulfan sulfate			--	--	3.2 U	3.3 U	3.2 U	3.3 UJ	--	--	--	--	--	--	--
Endosulfan-alpha (I)			--	--	1.6 U	1.6 U	1.6 U	1.6 UJ	--	--	--	--	--	--	--

Table 3
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Site Area			A-UST Removal Area	A-UST Removal Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
Task			Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-MW-04	DSI-MW-04	DSI-09	DSI-09	DSI-11	DSI-11	DSI-GP-12	DSI-GP-12	DSI-GP-13	DSI-GP-13	DSI-GP-14	DSI-GP-14	DSI-GP-14
Sample ID			DSI-MW-04-0.5-2.5	DSI-MW-04-5-6.5	DSI09-SO-A	DSI09-SO-B	DSI11-SO-A	DSI11-SO-B	DSI-GP-12-1-3.5	DSI-GP-12-5-10	DSI-GP-13-1-3.5	DSI-GP-13-5-7.3	DSI-GP-14-2.5-4.5	DSI-GP-14-5-7	DSI-GP-14-8-10
Sample Date			7/14/2009	7/14/2009	9/28/2006	9/28/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009
Depth			0.5 - 2.5 feet	5 - 6.5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	1 - 3.5 feet	5 - 10 feet	1 - 3.5 feet	5 - 7.3 feet	2.5 - 4.5 feet	5 - 7 feet	8 - 10 feet
Sample Type			N	N	N	N	N	N	N	N	N	N	N	N	N
X			1267894.980000	1267894.980000	1267972.093	1267972.093	1267970.43	1267970.43	1267998.939230	1267998.939230	1267988.722970	1267988.722970	1267995.395670	1267995.395670	1267995.395670
Y			204416.160000	204416.160000	204599.0992	204599.0992	204358.8091	204358.8091	204597.248788	204597.248788	204516.839114	204516.839114	204444.875241	204444.875241	204444.875241
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial													
Endosulfan-beta (II)			--	--	3.2 U	3.3 U	3.2 U	3.3 UJ	--	--	--	--	--	--	--
Endrin		1050000	--	--	3.2 U	3.3 U	3.2 U	3.3 UJ	--	--	--	--	--	--	--
Endrin aldehyde			--	--	3.2 U	3.3 U	3.2 U	3.3 UJ	--	--	--	--	--	--	--
Endrin ketone			--	--	3.2 U	3.3 U	3.2 U	3.3 UJ	--	--	--	--	--	--	--
gamma-Chlordane			--	--	1.6 U	1.6 U	1.6 U	1.6 UJ	--	--	--	--	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	10	1050000	--	--	1.6 U	1.6 U	1.6 U	1.6 UJ	--	--	--	--	--	--	--
Heptachlor		1750000	--	--	1.6 U	1.6 U	1.6 U	1.6 UJ	--	--	--	--	--	--	--
Heptachlor epoxide		45500	--	--	1.6 U	1.6 U	1.6 U	1.6 UJ	--	--	--	--	--	--	--
Hexachlorobenzene		2800000	--	--	1.6 U	1.6 U	1.6 U	1.6 UJ	--	--	--	--	--	--	--
Hexachlorobutadiene		3500000	--	--	1.6 U	1.6 U	1.6 U	1.6 UJ	--	--	--	--	--	--	--
Methoxychlor		17500000	--	--	16 U	16 U	16 U	16 UJ	--	--	--	--	--	--	--
Toxaphene			--	--	160 U	160 U	160 U	160 UJ	--	--	--	--	--	--	--
Total DDx (U = 1/2)	3000		--	--	3.2 U	3.3 U	3.2 U	3.3 UJ	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (mg/kg)															
Diesel Range Hydrocarbons	2000		3800	17	42	56	120	5.5 U	23	7 U	1300	160	760	1800	--
Gasoline Range Hydrocarbons	30/100*		320	5.2 U	14	200	8	5.9 U	7.5 U	8.6 U	310	17	320	820	9.3 U
Motor Oil Range			230 U	12 U	87	110	180	11 U	91	28	750	350	300	270	--
Extractable Petroleum Hydrocarbons (µg/kg)															
C8-C10 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C12-C16 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C16-C21 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C34 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C12-C16 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C16-C21 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C21-C34 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--	--

Table 3

2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

Site Area			A-UST Removal Area	A-UST Removal Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
Task			Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-MW-04	DSI-MW-04	DSI-09	DSI-09	DSI-11	DSI-11	DSI-GP-12	DSI-GP-12	DSI-GP-13	DSI-GP-13	DSI-GP-14	DSI-GP-14	DSI-GP-14
Sample ID			DSI-MW-04-0.5-2.5	DSI-MW-04-5-6.5	DSI09-SO-A	DSI09-SO-B	DSI11-SO-A	DSI11-SO-B	DSI-GP-12-1-3.5	DSI-GP-12-5-10	DSI-GP-13-1-3.5	DSI-GP-13-5-7.3	DSI-GP-14-2.5-4.5	DSI-GP-14-5-7	DSI-GP-14-8-10
Sample Date			7/14/2009	7/14/2009	9/28/2006	9/28/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009
Depth			0.5 - 2.5 feet	5 - 6.5 feet	0 - 3 feet	3 - 5 feet	0 - 3 feet	3 - 5 feet	1 - 3.5 feet	5 - 10 feet	1 - 3.5 feet	5 - 7.3 feet	2.5 - 4.5 feet	5 - 7 feet	8 - 10 feet
Sample Type			N	N	N	N	N	N	N	N	N	N	N	N	N
X			1267894.980000	1267894.980000	1267972.093	1267972.093	1267970.43	1267970.43	1267998.939230	1267998.939230	1267988.722970	1267988.722970	1267995.395670	1267995.395670	1267995.395670
Y			204416.160000	204416.160000	204599.0992	204599.0992	204358.8091	204358.8091	204597.248788	204597.248788	204516.839114	204516.839114	204444.875241	204444.875241	204444.875241
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial													
Volatile Petroleum Hydrocarbons (µg/kg)															
Benzene	30	14000000	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	6000	350000000	--	--	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylene			--	--	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	--	--	--	--	--	--	--	--	--
n-Decane (C10)			--	--	--	--	--	--	--	--	--	--	--	--	--
n-Dodecane (C12)			--	--	--	--	--	--	--	--	--	--	--	--	--
n-Hexane (C6)		210000000	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Octane (C8)			--	--	--	--	--	--	--	--	--	--	--	--	--
n-Pentane (C5)			--	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene		700000000	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	7000	280000000	--	--	--	--	--	--	--	--	--	--	--	--	--
C5-C6 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C8 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C8-C10 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--	--
C12-C13 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--	--

Table 3

2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-14	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-16	DSI-GP-16
		Sample ID	DSI-GP-64-5-7	DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-GP-65-1.5-4	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
		Sample Date	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009
		Depth	5 - 7 feet	1.5 - 4 feet	6 - 8 feet	8 - 10 feet	1.5 - 4 feet	2.1 - 4.5 feet	7.5 - 10 feet
		Sample Type	FD	N	N	N	FD	N	N
		X	1267995.395670	1267993.205440	1267993.205440	1267993.205440	1267993.205440	1268022.755370	1268022.755370
		Y	204444.875241	204385.906847	204385.906847	204385.906847	204385.906847	204368.452602	204368.452602
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial							
Conventional Parameters (pct)									
Moisture (water) content			--	--	--	--	--	--	--
Total organic carbon			--	--	--	--	--	--	--
Total solids			--	--	--	--	--	--	--
Grain Size (pct)									
Percent passing < 1.3 micron sieve			--	--	--	--	--	--	--
Percent retained 1.3 micron sieve			--	--	--	--	--	--	--
Percent retained 3.2 micron sieve			--	--	--	--	--	--	--
Percent retained 7 micron sieve			--	--	--	--	--	--	--
Percent retained 9 micron sieve			--	--	--	--	--	--	--
Percent retained 13 micron sieve			--	--	--	--	--	--	--
Percent retained 22 micron sieve			--	--	--	--	--	--	--
Percent retained 32 micron sieve			--	--	--	--	--	--	--
Percent retained 75 micron sieve (#200)			--	--	--	--	--	--	--
Percent retained 150 micron sieve (#100)			--	--	--	--	--	--	--
Percent retained 250 micron sieve (#60)			--	--	--	--	--	--	--
Percent retained 425 micron sieve (#40)			--	--	--	--	--	--	--
Percent retained 850 micron sieve (#20)			--	--	--	--	--	--	--
Percent retained 2000 micron sieve (#10)			--	--	--	--	--	--	--
Percent retained 4750 micron sieve (#4)			--	--	--	--	--	--	--
Percent retained 9500 micron sieve			--	--	--	--	--	--	--
Percent retained 12500 micron sieve			--	--	--	--	--	--	--
Percent retained 19000 micron sieve			--	--	--	--	--	--	--
Percent retained 25K micron sieve			--	--	--	--	--	--	--
Percent retained 37.5K micron sieve			--	--	--	--	--	--	--
Percent retained 50K micron sieve			--	--	--	--	--	--	--
Percent retained 75K micron sieve			--	--	--	--	--	--	--
Total Gravel			--	--	--	--	--	--	--
Total Sand			--	--	--	--	--	--	--
Total Silt			--	--	--	--	--	--	--
Total Clay			--	--	--	--	--	--	--
Metals (mg/kg)									
Antimony		1400	--	5 UJ	6 UJ	--	--	5 UJ	7 UJ
Arsenic	20	1050	--	5 U	6 U	--	--	5 U	7 U
Cadmium	2	3500	--	0.2 U	0.3 U	--	--	0.2 U	0.3 U
Chromium	2000		--	**11.5**	**12.9**	--	--	**10.6**	**14**

Table 3
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		Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-14	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-16	DSI-GP-16
		Sample ID	DSI-GP-64-5-7	DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-GP-65-1.5-4	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
		Sample Date	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009
		Depth	5 - 7 feet	1.5 - 4 feet	6 - 8 feet	8 - 10 feet	1.5 - 4 feet	2.1 - 4.5 feet	7.5 - 10 feet
		Sample Type	FD	N	N	N	FD	N	N
		X	1267995.395670	1267993.205440	1267993.205440	1267993.205440	1267993.205440	1268022.755370	1268022.755370
		Y	204444.875241	204385.906847	204385.906847	204385.906847	204385.906847	204368.452602	204368.452602
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial							
Chromium VI	19	10500	--	--	--	--	--	--	--
Copper		140000	--	**8.4**	**11.4**	--	--	**8**	**18.7**
Lead	250		--	**3**	3 U	--	--	2 U	**6**
Mercury	2		--	0.02 U	0.03 U	--	--	0.02 U	0.03 U
Nickel		70000	--	**7**	**9**	--	--	**7**	**10**
Selenium		17500	--	0.5 U	0.6 U	--	--	0.5 U	0.7 U
Silver		17500	--	0.3 U	0.4 U	--	--	0.3 U	0.4 U
Zinc		1050000	--	**23**	**25**	--	--	**23**	**43**
Volatile Organics (µg/kg)									
1,1,1,2-Tetrachloroethane		105000000	--	--	--	--	--	--	--
1,1,1-Trichloroethane	2000	7000000000	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane		70000000	--	--	--	--	--	--	--
1,1,2-Trichloroethane		14000000	--	--	--	--	--	--	--
1,1-Dichloroethane		700000000	--	--	--	--	--	--	--
1,1-Dichloroethene		175000000	--	--	--	--	--	--	--
1,1-Dichloropropene			--	--	--	--	--	--	--
1,2,3-Trichlorobenzene			--	--	--	--	--	--	--
1,2,3-Trichloropropane		14000000	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene		35000000	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene			--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane		700000	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	5	31500000	--	--	--	--	--	--	--
1,2-Dichlorobenzene		315000000	--	--	--	--	--	--	--
1,2-Dichloroethane		70000000	--	--	--	--	--	--	--
1,2-Dichloroethene, cis-		7000000	--	--	--	--	--	--	--
1,2-Dichloroethene, trans-		70000000	--	--	--	--	--	--	--
1,2-Dichloropropane			--	--	--	--	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)		35000000	--	--	--	--	--	--	--
1,3-Dichlorobenzene			--	--	--	--	--	--	--
1,3-Dichloropropane			--	--	--	--	--	--	--
1,3-Dichloropropene, cis-			--	--	--	--	--	--	--
1,3-Dichloropropene, trans-			--	--	--	--	--	--	--
1,4-Dichlorobenzene			--	--	--	--	--	--	--
2,2-Dichloropropane			--	--	--	--	--	--	--
2-Butanone (MEK)		2100000000	--	--	--	--	--	--	--
2-Chlorotoluene		70000000	--	--	--	--	--	--	--
2-Hexanone (Methyl butyl ketone)			--	--	--	--	--	--	--
4-Chlorotoluene			--	--	--	--	--	--	--

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		Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-14	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-16	DSI-GP-16
		Sample ID	DSI-GP-64-5-7	DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-GP-65-1.5-4	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
		Sample Date	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009
		Depth	5 - 7 feet	1.5 - 4 feet	6 - 8 feet	8 - 10 feet	1.5 - 4 feet	2.1 - 4.5 feet	7.5 - 10 feet
		Sample Type	FD	N	N	N	FD	N	N
		X	1267995.395670	1267993.205440	1267993.205440	1267993.205440	1267993.205440	1268022.755370	1268022.755370
		Y	204444.875241	204385.906847	204385.906847	204385.906847	204385.906847	204368.452602	204368.452602
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial							
4-Isopropyltoluene (4-Cymene)			--	--	--	--	--	--	--
Acetone		3150000000	--	--	--	--	--	--	--
Benzene	30	14000000	--	--	--	--	--	--	--
Bromobenzene			--	--	--	--	--	--	--
Bromochloromethane			--	--	--	--	--	--	--
Bromodichloromethane		70000000	--	--	--	--	--	--	--
Bromoform (Tribromomethane)		70000000	--	--	--	--	--	--	--
Bromomethane (Methyl Bromide)		4900000	--	--	--	--	--	--	--
Carbon disulfide		350000000	--	--	--	--	--	--	--
Carbon tetrachloride (Tetrachloromethane)		14000000	--	--	--	--	--	--	--
Chloroethane			--	--	--	--	--	--	--
Chloroform		35000000	--	--	--	--	--	--	--
Chloromethane			--	--	--	--	--	--	--
Dibromochloromethane		70000000	--	--	--	--	--	--	--
Dibromomethane		35000000	--	--	--	--	--	--	--
Dichlorodifluoromethane		700000000	--	--	--	--	--	--	--
Dichloromethane (Methylene chloride)	20	210000000	--	--	--	--	--	--	--
Ethylbenzene	6000	350000000	--	--	--	--	--	--	--
Isopropylbenzene (Cumene)		350000000	--	--	--	--	--	--	--
m,p-Xylene			--	--	--	--	--	--	--
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		280000000	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	--	--	--
Naphthalene		70000000	--	--	--	--	--	--	--
n-Butylbenzene			--	--	--	--	--	--	--
n-Propylbenzene		350000000	--	--	--	--	--	--	--
o-Xylene		700000000	--	--	--	--	--	--	--
sec-Butylbenzene			--	--	--	--	--	--	--
Styrene		700000000	--	--	--	--	--	--	--
tert-Butylbenzene			--	--	--	--	--	--	--
Tetrachloroethene (PCE)	50	35000000	--	--	--	--	--	--	--
Toluene	7000	280000000	--	--	--	--	--	--	--

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2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-14	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-16	DSI-GP-16
		Sample ID	DSI-GP-64-5-7	DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-GP-65-1.5-4	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
		Sample Date	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009
		Depth	5 - 7 feet	1.5 - 4 feet	6 - 8 feet	8 - 10 feet	1.5 - 4 feet	2.1 - 4.5 feet	7.5 - 10 feet
		Sample Type	FD	N	N	N	FD	N	N
		X	1267995.395670	1267993.205440	1267993.205440	1267993.205440	1267993.205440	1268022.755370	1268022.755370
		Y	204444.875241	204385.906847	204385.906847	204385.906847	204385.906847	204368.452602	204368.452602
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial							
Trichloroethene (TCE)	30		--	--	--	--	--	--	--
Trichlorofluoromethane (Fluorotrichloromethane)		1050000000	--	--	--	--	--	--	--
Vinyl chloride		10500000	--	--	--	--	--	--	--
Total Xylene (U = 1/2)	9000		--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)									
1-Methylnaphthalene			--	**5200**	**3100**	--	--	20 U	19 U
2-Methylnaphthalene		14000000	--	**390**	**200 J**	--	--	20 U	19 U
Acenaphthene		210000000	--	**330 J**	**200**	--	--	20 U	19 U
Acenaphthylene			--	160 U	77 U	--	--	20 U	19 U
Anthracene		1050000000	--	**120 J**	**54 J**	--	--	20 U	19 U
Benzo(a)anthracene			--	160 U	77 U	--	--	**11 J**	19 U
Benzo(a)pyrene	100		--	160 U	77 U	--	--	**12 J**	19 U
Benzo(b)fluoranthene			--	160 U	77 U	--	--	20 U	19 U
Benzo(g,h,i)perylene			--	160 U	77 U	--	--	20 U	19 U
Benzo(k)fluoranthene			--	160 U	77 U	--	--	20 U	19 U
Chrysene			--	**83 J**	**41 J**	--	--	**12 J**	19 U
Dibenzo(a,h)anthracene			--	160 U	77 U	--	--	20 U	19 U
Fluoranthene		140000000	--	160 U	**51 J**	--	--	**24**	**16 J**
Fluorene		140000000	--	**1700**	**880**	--	--	20 U	19 U
Indeno(1,2,3-c,d)pyrene			--	160 U	77 U	--	--	20 U	19 U
Naphthalene		70000000	--	270 U	170 U	--	--	20 U	19 U
Phenanthrene			--	**1700**	**970**	--	--	**15 J**	19 U
Pyrene		105000000	--	**180**	**93**	--	--	**23**	**12 J**
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	100		--	**120 J**	**58 J**	--	--	**20 J**	19 U
Total Naphthalenes (U = 1/2)	5000		--	**5700**	**3000 J**	--	--	20 U	19 U
Semivolatile Organics (µg/kg)									
1,2,4-Trichlorobenzene		35000000	--	160 U	77 U	--	--	20 U	19 U
1,2-Dichlorobenzene		315000000	--	160 U	77 U	--	--	20 U	19 U
1,4-Dichlorobenzene			--	160 U	77 U	--	--	20 U	19 U
2,4-Dimethylphenol		70000000	--	160 U	77 U	--	--	20 U	19 U
2-Methylphenol (o-Cresol)		175000000	--	160 U	77 U	--	--	20 U	19 U
4-Methylphenol (p-Cresol)		17500000	--	160 U	77 U	--	--	20 U	19 U
Benzoic acid		14000000000	--	1600 U	770 U	--	--	200 U	190 U
Benzyl alcohol		350000000	--	160 U	77 U	--	--	20 U	19 U
Bis(2-ethylhexyl) phthalate		70000000	--	160 U	77 U	--	--	20 U	**16 J**

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		Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-14	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-16	DSI-GP-16
		Sample ID	DSI-GP-64-5-7	DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-GP-65-1.5-4	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
		Sample Date	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009
		Depth	5 - 7 feet	1.5 - 4 feet	6 - 8 feet	8 - 10 feet	1.5 - 4 feet	2.1 - 4.5 feet	7.5 - 10 feet
		Sample Type	FD	N	N	N	FD	N	N
		X	1267995.395670	1267993.205440	1267993.205440	1267993.205440	1267993.205440	1268022.755370	1268022.755370
		Y	204444.875241	204385.906847	204385.906847	204385.906847	204385.906847	204368.452602	204368.452602
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial							
Butylbenzyl phthalate		700000000	--	160 U	77 U	--	--	20 U	19 U
Dibenzofuran		3500000	--	**420 J**	**240 J**	--	--	20 U	19 U
Diethyl phthalate		2800000000	--	160 U	77 U	--	--	20 U	**19 J**
Dimethyl phthalate			--	160 U	77 U	--	--	20 U	19 U
Di-n-butyl phthalate		350000000	--	160 U	77 U	--	--	20 U	19 U
Di-n-octyl phthalate			--	160 U	77 U	--	--	20 U	19 U
Hexachlorobenzene		2800000	--	160 U	77 U	--	--	20 U	19 U
Hexachlorobutadiene		3500000	--	160 U	77 U	--	--	20 U	19 U
Hexachloroethane		3500000	--	160 U	77 U	--	--	20 U	19 U
N-Nitrosodiphenylamine			--	1800 UJ	880 UJ	--	--	20 UJ	19 UJ
Pentachlorophenol		17500000	--	810 U	380 U	--	--	98 U	97 U
Phenol		1050000000	--	160 U	77 U	--	--	20 U	19 U
PCB Aroclors (µg/kg)									
Aroclor 1016		245000	--	--	--	--	--	--	--
Aroclor 1221			--	--	--	--	--	--	--
Aroclor 1232			--	--	--	--	--	--	--
Aroclor 1242			--	--	--	--	--	--	--
Aroclor 1248			--	--	--	--	--	--	--
Aroclor 1254		70000	--	--	--	--	--	--	--
Aroclor 1260			--	--	--	--	--	--	--
Total PCB Aroclors (U = 1/2)	1000		--	--	--	--	--	--	--
Pesticides (µg/kg)									
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			--	--	--	--	--	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			--	--	--	--	--	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		1750000	--	--	--	--	--	--	--
Aldrin		105000	--	--	--	--	--	--	--
alpha-Chlordane (cis-Chlordane)			--	--	--	--	--	--	--
alpha-Hexachlorocyclohexane (BHC)			--	--	--	--	--	--	--
beta-Hexachlorocyclohexane (BHC)			--	--	--	--	--	--	--
delta-Hexachlorocyclohexane (BHC)			--	--	--	--	--	--	--
Dieldrin		175000	--	--	--	--	--	--	--
Endosulfan sulfate			--	--	--	--	--	--	--
Endosulfan-alpha (I)			--	--	--	--	--	--	--

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		Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-14	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-16	DSI-GP-16
		Sample ID	DSI-GP-64-5-7	DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-GP-65-1.5-4	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
		Sample Date	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009
		Depth	5 - 7 feet	1.5 - 4 feet	6 - 8 feet	8 - 10 feet	1.5 - 4 feet	2.1 - 4.5 feet	7.5 - 10 feet
		Sample Type	FD	N	N	N	FD	N	N
		X	1267995.395670	1267993.205440	1267993.205440	1267993.205440	1267993.205440	1268022.755370	1268022.755370
		Y	204444.875241	204385.906847	204385.906847	204385.906847	204385.906847	204368.452602	204368.452602
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial							
Endosulfan-beta (II)			--	--	--	--	--	--	--
Endrin		1050000	--	--	--	--	--	--	--
Endrin aldehyde			--	--	--	--	--	--	--
Endrin ketone			--	--	--	--	--	--	--
gamma-Chlordane			--	--	--	--	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	10	1050000	--	--	--	--	--	--	--
Heptachlor		1750000	--	--	--	--	--	--	--
Heptachlor epoxide		45500	--	--	--	--	--	--	--
Hexachlorobenzene		2800000	--	--	--	--	--	--	--
Hexachlorobutadiene		3500000	--	--	--	--	--	--	--
Methoxychlor		17500000	--	--	--	--	--	--	--
Toxaphene			--	--	--	--	--	--	--
Total DDx (U = 1/2)	3000		--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (mg/kg)									
Diesel Range Hydrocarbons	2000		--	**9000**	**3500**	--	**12000**	5.2 U	7.2 U
Gasoline Range Hydrocarbons	30/100*		**710**	**140**	**1200**	**20**	--	6.6 U	10 U
Motor Oil Range			--	1000 U	250 U	--	1100 U	10 U	14 U
Extractable Petroleum Hydrocarbons (µg/kg)									
C8-C10 Aliphatics			--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--
C12-C16 Aliphatics			--	--	--	--	--	--	--
C16-C21 Aliphatics			--	--	--	--	--	--	--
C21-C34 Aliphatics			--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--
C12-C16 Aromatics			--	--	--	--	--	--	--
C16-C21 Aromatics			--	--	--	--	--	--	--
C21-C34 Aromatics			--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-14	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-GP-16	DSI-GP-16
		Sample ID	DSI-GP-64-5-7	DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-GP-65-1.5-4	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
		Sample Date	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009	7/13/2009
		Depth	5 - 7 feet	1.5 - 4 feet	6 - 8 feet	8 - 10 feet	1.5 - 4 feet	2.1 - 4.5 feet	7.5 - 10 feet
		Sample Type	FD	N	N	N	FD	N	N
		X	1267995.395670	1267993.205440	1267993.205440	1267993.205440	1267993.205440	1268022.755370	1268022.755370
		Y	204444.875241	204385.906847	204385.906847	204385.906847	204385.906847	204368.452602	204368.452602
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial							
Volatile Petroleum Hydrocarbons (µg/kg)									
Benzene	30	14000000	--	--	--	--	--	--	--
Ethylbenzene	6000	350000000	--	--	--	--	--	--	--
m,p-Xylene			--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	--	--	--
n-Decane (C10)			--	--	--	--	--	--	--
n-Dodecane (C12)			--	--	--	--	--	--	--
n-Hexane (C6)		210000000	--	--	--	--	--	--	--
n-Octane (C8)			--	--	--	--	--	--	--
n-Pentane (C5)			--	--	--	--	--	--	--
o-Xylene		700000000	--	--	--	--	--	--	--
Toluene	7000	280000000	--	--	--	--	--	--	--
C5-C6 Aliphatics			--	--	--	--	--	--	--
C6-C8 Aliphatics			--	--	--	--	--	--	--
C8-C10 Aliphatics			--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--
C12-C13 Aromatics			--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

Site Area			B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
Task			Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-MW-05	DSI-MW-05	DSI-MW-06	DSI-MW-06	DSI-MW-08	DSI-MW-08	DSI-12	DSI-12	DSI-GP-17	DSI-GP-17	DSI-MW-10	DSI-MW-10
Sample ID			DSI-MW-05-0.5-3.0	DSI-MW-05-5-8	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI12-SO-A	DSI12-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
Sample Date			7/14/2009	7/14/2009	7/15/2009	7/15/2009	7/15/2009	7/15/2009	9/28/2006	9/28/2006	7/13/2009	7/13/2009	7/14/2009	7/14/2009
Depth			0.5 - 3 feet	5 - 8 feet	0.5 - 3.5 feet	5 - 8 feet	0.5 - 2 feet	5 - 8 feet	0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0.5 - 3.5 feet	5 - 8 feet
Sample Type			N	N	N	N	N	N	N	N	N	N	N	N
X			1267969.750000	1267969.750000	1267953.290000	1267953.290000	1267967.620000	1267967.620000	1267970.416	1267970.416	1267974.892510	1267974.892510	1267964.600000	1267964.600000
Y			204575.210000	204575.210000	204456.310000	204456.310000	204366.340000	204366.340000	204269.044	204269.044	204304.039660	204304.039660	204275.460000	204275.460000
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial												
Conventional Parameters (pct)														
Moisture (water) content			--	--	15.5	31.48	--	--	--	--	8.84	39.49	--	--
Total organic carbon			--	--	--	--	--	--	1.25	1.12	--	--	--	--
Total solids			--	--	--	--	--	--	87.7	86.7	--	--	--	--
Grain Size (pct)														
Percent passing < 1.3 micron sieve			--	--	3.9	2.4	--	--	--	--	--	7.8	--	--
Percent retained 1.3 micron sieve			--	--	2	2.4	--	--	--	--	--	6.2	--	--
Percent retained 3.2 micron sieve			--	--	4.9	2.9	--	--	--	--	--	10.9	--	--
Percent retained 7 micron sieve			--	--	2.9	4.8	--	--	--	--	--	8.5	--	--
Percent retained 9 micron sieve			--	--	2.4	1.9	--	--	--	--	--	5.4	--	--
Percent retained 13 micron sieve			--	--	4.9	1.4	--	--	--	--	--	7.8	--	--
Percent retained 22 micron sieve			--	--	5.4	2.9	--	--	--	--	--	9.3	--	--
Percent retained 32 micron sieve			--	--	16.8	4.8	--	--	--	--	--	5.4	--	--
Percent retained 75 micron sieve (#200)			--	--	7.9	18.7	--	--	--	--	4.5	13.8	--	--
Percent retained 150 micron sieve (#100)			--	--	10	23.6	--	--	--	--	15.6	13.2	--	--
Percent retained 250 micron sieve (#60)			--	--	18.6	22.4	--	--	--	--	34.9	8.1	--	--
Percent retained 425 micron sieve (#40)			--	--	14.5	5.7	--	--	--	--	21.1	3	--	--
Percent retained 850 micron sieve (#20)			--	--	2.4	1	--	--	--	--	3.8	0.6	--	--
Percent retained 2000 micron sieve (#10)			--	--	0.9	0.7	--	--	--	--	0.6	0.1	--	--
Percent retained 4750 micron sieve (#4)			--	--	1.3	0.2	--	--	--	--	0.7	0.1 U	--	--
Percent retained 9500 micron sieve			--	--	1.2	1.3	--	--	--	--	1.9	0.1 U	--	--
Percent retained 12500 micron sieve			--	--	0.1 U	2.9	--	--	--	--	0.1 U	0.1 U	--	--
Percent retained 19000 micron sieve			--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--
Percent retained 25K micron sieve			--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--
Percent retained 37.5K micron sieve			--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--
Percent retained 50K micron sieve			--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--
Percent retained 75K micron sieve			--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--
Total Gravel			--	--	3	4	--	--	--	--	3	0.1 U	--	--
Total Sand			--	--	53	71	--	--	--	--	80	40	--	--
Total Silt			--	--	37	19	--	--	--	--	--	47	--	--
Total Clay			--	--	5.9	4.8	--	--	--	--	--	14	--	--
Metals (mg/kg)														
Antimony		1400	5 UJ	6 UJ	6 UJ	6 UJ	5 UJ	6 UJ	--	--	5 UJ	7 UJ	5 UJ	6 UJ
Arsenic	20	1050	12	6 U	6	6 U	8	6 U	17.1	3.3	5 U	7 U	25	14
Cadmium	2	3500	0.2	0.3 U	0.2 U	0.3 U	0.3	0.2 U	0.2	0.2 U	0.2 U	0.3 U	0.2 U	0.3 U
Chromium	2000		16.1 J	11.1 J	10.9	10.8	19.8	9.7	20.1	15.5	12.8	14.3	15 J	18.3 J

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2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-MW-05	DSI-MW-05	DSI-MW-06	DSI-MW-06	DSI-MW-08	DSI-MW-08	DSI-12	DSI-12	DSI-GP-17	DSI-GP-17	DSI-MW-10	DSI-MW-10
		Sample ID	DSI-MW-05-0.5-3.0	DSI-MW-05-5-8	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI12-SO-A	DSI12-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
		Sample Date	7/14/2009	7/14/2009	7/15/2009	7/15/2009	7/15/2009	7/15/2009	9/28/2006	9/28/2006	7/13/2009	7/13/2009	7/14/2009	7/14/2009
		Depth	0.5 - 3 feet	5 - 8 feet	0.5 - 3.5 feet	5 - 8 feet	0.5 - 2 feet	5 - 8 feet	0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0.5 - 3.5 feet	5 - 8 feet
		Sample Type	N	N	N	N	N	N	N	N	N	N	N	N
		X	1267969.750000	1267969.750000	1267953.290000	1267953.290000	1267967.620000	1267967.620000	1267970.416	1267970.416	1267974.892510	1267974.892510	1267964.600000	1267964.600000
		Y	204575.210000	204575.210000	204456.310000	204456.310000	204366.340000	204366.340000	204269.044	204269.044	204304.039660	204304.039660	204275.460000	204275.460000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial												
Chromium VI	19	10500	--	--	--	--	--	--	0.125 UJ	0.123 UJ	--	--	--	--
Copper		140000	**38.6 J**	**11.2 J**	**19.7**	**21.9**	**77.8**	**18.3**	**34.2**	**18.1**	**15**	**18.2**	**27.2 J**	**28 J**
Lead	250		**56 J**	3 UJ	**9**	**5**	**56**	**5**	**20**	**6**	**3**	**3**	**17 J**	**11 J**
Mercury	2		**0.12**	0.02 U	**0.04**	0.03 U	**0.21**	**0.1**	**0.08**	0.05 U	0.03 U	0.03 U	**0.07**	**0.04**
Nickel		70000	**8 J**	**7 J**	**7**	**8**	**17**	**11**	--	--	**8**	**10**	**8 J**	**12 J**
Selenium		17500	0.5 U	0.6 U	0.6 U	0.7 U	0.5 U	0.6 U	--	--	0.5 U	0.7 U	0.6 U	0.7 U
Silver		17500	0.3 U	0.4 U	0.3 U	0.4 U	0.3 U	0.4 U	0.3 U	0.3 U	0.3 U	0.4 U	0.3 U	0.4 U
Zinc		1050000	**81**	**42**	**34**	**27**	**91**	**39**	**77.4**	**36.8**	**44**	**32**	**88**	**56**
Volatile Organics (µg/kg)														
1,1,1,2-Tetrachloroethane		105000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,1,1-Trichloroethane	2000	7000000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,1,2,2-Tetrachloroethane		70000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,1,2-Trichloroethane		14000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,1-Dichloroethane		700000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,1-Dichloroethene		175000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,1-Dichloropropene			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,2,3-Trichlorobenzene			--	--	--	--	--	--	4.9 U	5.4 U	--	--	--	--
1,2,3-Trichloropropane		14000000	--	--	--	--	--	--	2 U	2.2 U	--	--	--	--
1,2,4-Trichlorobenzene		35000000	--	--	--	--	--	--	4.9 U	5.4 U	--	--	--	--
1,2,4-Trimethylbenzene			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,2-Dibromo-3-chloropropane		700000	--	--	--	--	--	--	4.9 U	5.4 U	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	5	31500000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,2-Dichlorobenzene		315000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,2-Dichloroethane		70000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,2-Dichloroethene, cis-		7000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,2-Dichloroethene, trans-		70000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,2-Dichloropropane			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)		35000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,3-Dichlorobenzene			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,3-Dichloropropane			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,3-Dichloropropene, cis-			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,3-Dichloropropene, trans-			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
1,4-Dichlorobenzene			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
2,2-Dichloropropane			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
2-Butanone (MEK)		2100000000	--	--	--	--	--	--	**5.6**	5.4 U	--	--	--	--
2-Chlorotoluene		70000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
2-Hexanone (Methyl butyl ketone)			--	--	--	--	--	--	4.9 U	5.4 U	--	--	--	--
4-Chlorotoluene			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--

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Site Area			B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
Task			Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-MW-05	DSI-MW-05	DSI-MW-06	DSI-MW-06	DSI-MW-08	DSI-MW-08	DSI-12	DSI-12	DSI-GP-17	DSI-GP-17	DSI-MW-10	DSI-MW-10
Sample ID			DSI-MW-05-0.5-3.0	DSI-MW-05-5-8	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI12-SO-A	DSI12-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
Sample Date			7/14/2009	7/14/2009	7/15/2009	7/15/2009	7/15/2009	7/15/2009	9/28/2006	9/28/2006	7/13/2009	7/13/2009	7/14/2009	7/14/2009
Depth			0.5 - 3 feet	5 - 8 feet	0.5 - 3.5 feet	5 - 8 feet	0.5 - 2 feet	5 - 8 feet	0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0.5 - 3.5 feet	5 - 8 feet
Sample Type			N	N	N	N	N	N	N	N	N	N	N	N
X			1267969.750000	1267969.750000	1267953.290000	1267953.290000	1267967.620000	1267967.620000	1267970.416	1267970.416	1267974.892510	1267974.892510	1267964.600000	1267964.600000
Y			204575.210000	204575.210000	204456.310000	204456.310000	204366.340000	204366.340000	204269.044	204269.044	204304.039660	204304.039660	204275.460000	204275.460000
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial												
4-Isopropyltoluene (4-Cymene)			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Acetone		3150000000	--	--	--	--	--	--	**57**	**45**	--	--	--	--
Benzene	30	14000000	--	--	--	--	--	--	**1.4**	**3**	--	--	--	--
Bromobenzene			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Bromochloromethane			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Bromodichloromethane		70000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Bromoform (Tribromomethane)		70000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Bromomethane (Methyl Bromide)		4900000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Carbon disulfide		350000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Carbon tetrachloride (Tetrachloromethane)		14000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Chloroethane			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Chloroform		35000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Chloromethane			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Dibromochloromethane		70000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Dibromomethane		35000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Dichlorodifluoromethane		700000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Dichloromethane (Methylene chloride)	20	210000000	--	--	--	--	--	--	2 U	2.2 U	--	--	--	--
Ethylbenzene	6000	350000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Isopropylbenzene (Cumene)		350000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
m,p-Xylene			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		280000000	--	--	--	--	--	--	4.9 U	5.4 U	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Naphthalene		70000000	--	--	--	--	--	--	--	--	--	--	--	--
n-Butylbenzene			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
n-Propylbenzene		350000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
o-Xylene		700000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
sec-Butylbenzene			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Styrene		700000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
tert-Butylbenzene			--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Tetrachloroethene (PCE)	50	35000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Toluene	7000	280000000	--	--	--	--	--	--	1 U	**3.4**	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

Site Area			B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
Task			Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-MW-05	DSI-MW-05	DSI-MW-06	DSI-MW-06	DSI-MW-08	DSI-MW-08	DSI-12	DSI-12	DSI-GP-17	DSI-GP-17	DSI-MW-10	DSI-MW-10
Sample ID			DSI-MW-05-0.5-3.0	DSI-MW-05-5-8	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI12-SO-A	DSI12-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
Sample Date			7/14/2009	7/14/2009	7/15/2009	7/15/2009	7/15/2009	7/15/2009	9/28/2006	9/28/2006	7/13/2009	7/13/2009	7/14/2009	7/14/2009
Depth			0.5 - 3 feet	5 - 8 feet	0.5 - 3.5 feet	5 - 8 feet	0.5 - 2 feet	5 - 8 feet	0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0.5 - 3.5 feet	5 - 8 feet
Sample Type			N	N	N	N	N	N	N	N	N	N	N	N
X			1267969.750000	1267969.750000	1267953.290000	1267953.290000	1267967.620000	1267967.620000	1267970.416	1267970.416	1267974.892510	1267974.892510	1267964.600000	1267964.600000
Y			204575.210000	204575.210000	204456.310000	204456.310000	204366.340000	204366.340000	204269.044	204269.044	204304.039660	204304.039660	204275.460000	204275.460000
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial												
Trichloroethene (TCE)	30		--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Trichlorofluoromethane (Fluorotrichloromethane)		1050000000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Vinyl chloride		10500000	--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Total Xylene (U = 1/2)	9000		--	--	--	--	--	--	1 U	1.1 U	--	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)														
1-Methylnaphthalene			19 U	19 U	19 U	19 U	56 U	22	--	--	20 U	19 U	300	1000
2-Methylnaphthalene		14000000	19 U	19 U	19 U	19 U	56 U	19 U	230	300	20 U	19 U	290	330
Acenaphthene		210000000	19 U	19 U	19 U	19 U	56 U	19 U	37 U	45	20 U	19 U	330	2700
Acenaphthylene			25	19 U	19 U	19 U	54 J	19 U	880	1700	30	19 U	3000	2000
Anthracene		1050000000	61	19 U	19 U	19 U	33 J	19 U	290	450	10 J	19 U	2800	3200
Benzo(a)anthracene			230 J	19 U	19 U	19 U	77	16 J	1800	3600	78	19 U	5000	5300
Benzo(a)pyrene	100		220 J	19 U	30	19 U	110 J	19	3000	7900	94	19 U	7600	6000
Benzo(b)fluoranthene			220	19 U	19 U	19 U	88 J	16 J	1700	3400	76	19 U	4100	3200
Benzo(g,h,i)perylene			82 J	19 U	19 U	19 U	73 J	14 J	1300	2900	38 J	19 U	1900	1200
Benzo(k)fluoranthene			230 J	19 U	19 U	19 U	70 J	11 J	2100	5600	83	19 U	4100	3200
Chrysene			260 J	19 U	10 J	19 U	120	24	3000	7500	120	19 U	7300	7200
Dibenzo(a,h)anthracene			37 J	19 U	19 U	19 U	56 U	19 U	390	900	13 J	19 U	740	490
Fluoranthene		140000000	570 J	19 U	21	19 U	140	27	2500	6000	120	19 U	9500	14000
Fluorene		140000000	19 U	19 U	19 U	19 U	56 U	19 U	67	53	20 U	19 U	1800	3100
Indeno(1,2,3-c,d)pyrene			83 J	19 U	19 U	19 U	76 J	11 J	1200	2700	36 J	19 U	1800	1200
Naphthalene		70000000	19 U	19 U	19 U	19 U	56 U	19 U	340	470	20 U	19 U	380	510
Phenanthrene			370 J	19 U	19 U	19 U	58	12 J	510	640	27	19 U	6800	6300
Pyrene		105000000	350 J	19 U	17 J	19 U	120	31	4000	10000	170	19 U	9200	11000
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	100		300 J	19 U	30 J	19 U	100 J	26 J	4000	10000	120 J	19 U	9000	7000
Total Naphthalenes (U = 1/2)	5000		19 U	19 U	19 U	19 U	56 U	41	570	800	20 U	19 U	1000	2000
Semivolatile Organics (µg/kg)														
1,2,4-Trichlorobenzene		35000000	19 U	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U
1,2-Dichlorobenzene		315000000	19 U	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U
1,4-Dichlorobenzene			19 U	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U
2,4-Dimethylphenol		70000000	19 UJ	19 UJ	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 UJ	59 UJ
2-Methylphenol (o-Cresol)		175000000	19 UJ	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U
4-Methylphenol (p-Cresol)		17500000	19 UJ	19 U	19 U	19 U	56 U	19 U	--	--	16 J	19 U	81 U	59 U
Benzoic acid		14000000000	190 UJ	190 U	190 UJ	190 UJ	560 UJ	190 UJ	--	--	200 U	190 U	810 U	590 U
Benzyl alcohol		350000000	19 UJ	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U
Bis(2-ethylhexyl) phthalate		70000000	19 U	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U

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Site Area			B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
Task			Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-MW-05	DSI-MW-05	DSI-MW-06	DSI-MW-06	DSI-MW-08	DSI-MW-08	DSI-12	DSI-12	DSI-GP-17	DSI-GP-17	DSI-MW-10	DSI-MW-10
Sample ID			DSI-MW-05-0.5-3.0	DSI-MW-05-5-8	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI12-SO-A	DSI12-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
Sample Date			7/14/2009	7/14/2009	7/15/2009	7/15/2009	7/15/2009	7/15/2009	9/28/2006	9/28/2006	7/13/2009	7/13/2009	7/14/2009	7/14/2009
Depth			0.5 - 3 feet	5 - 8 feet	0.5 - 3.5 feet	5 - 8 feet	0.5 - 2 feet	5 - 8 feet	0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0.5 - 3.5 feet	5 - 8 feet
Sample Type			N	N	N	N	N	N	N	N	N	N	N	N
X			1267969.750000	1267969.750000	1267953.290000	1267953.290000	1267967.620000	1267967.620000	1267970.416	1267970.416	1267974.892510	1267974.892510	1267964.600000	1267964.600000
Y			204575.210000	204575.210000	204456.310000	204456.310000	204366.340000	204366.340000	204269.044	204269.044	204304.039660	204304.039660	204275.460000	204275.460000
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial												
Butylbenzyl phthalate		700000000	19 U	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U
Dibenzofuran		3500000	19 U	19 U	19 U	19 U	56 U	19 U	37 U	38 U	20 U	19 U	**230**	**360**
Diethyl phthalate		2800000000	19 U	19 U	19 U	19 U	56 U	19 U	--	--	**27**	19 U	81 U	59 U
Dimethyl phthalate			19 U	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U
Di-n-butyl phthalate		350000000	19 U	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U
Di-n-octyl phthalate			19 U	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U
Hexachlorobenzene		2800000	19 U	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U
Hexachlorobutadiene		3500000	19 U	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U
Hexachloroethane		3500000	19 UJ	19 U	19 U	19 U	56 U	19 U	--	--	20 UJ	19 U	81 U	59 U
N-Nitrosodiphenylamine			19 UJ	19 UJ	19 UJ	19 UJ	56 UJ	19 UJ	--	--	20 UJ	19 UJ	81 UJ	59 UJ
Pentachlorophenol		17500000	97 UJ	97 UJ	95 UJ	96 UJ	280 UJ	96 UJ	--	--	99 U	97 U	400 UJ	290 UJ
Phenol		1050000000	19 U	19 U	19 U	19 U	56 U	19 U	--	--	20 U	19 U	81 U	59 U
PCB Aroclors (µg/kg)														
Aroclor 1016		245000	--	--	--	--	--	--	29 U	29 U	--	--	--	--
Aroclor 1221			--	--	--	--	--	--	29 U	29 U	--	--	--	--
Aroclor 1232			--	--	--	--	--	--	29 U	29 U	--	--	--	--
Aroclor 1242			--	--	--	--	--	--	29 U	29 U	--	--	--	--
Aroclor 1248			--	--	--	--	--	--	29 U	29 U	--	--	--	--
Aroclor 1254		70000	--	--	--	--	--	--	29 U	29 U	--	--	--	--
Aroclor 1260			--	--	--	--	--	--	29 U	29 U	--	--	--	--
Total PCB Aroclors (U = 1/2)	1000		--	--	--	--	--	--	29 U	29 U	--	--	--	--
Pesticides (µg/kg)														
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			--	--	--	--	--	--	3.3 U	3.3 U	--	--	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			--	--	--	--	--	--	3.3 U	3.3 U	--	--	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		1750000	--	--	--	--	--	--	3.3 U	12 U	--	--	--	--
Aldrin		105000	--	--	--	--	--	--	1.6 U	1.6 U	--	--	--	--
alpha-Chlordane (cis-Chlordane)			--	--	--	--	--	--	1.6 U	1.6 U	--	--	--	--
alpha-Hexachlorocyclohexane (BHC)			--	--	--	--	--	--	1.6 U	1.6 U	--	--	--	--
beta-Hexachlorocyclohexane (BHC)			--	--	--	--	--	--	4 U	3.1 U	--	--	--	--
delta-Hexachlorocyclohexane (BHC)			--	--	--	--	--	--	1.6 U	1.6 U	--	--	--	--
Dieldrin		175000	--	--	--	--	--	--	3.3 U	3.3 U	--	--	--	--
Endosulfan sulfate			--	--	--	--	--	--	19 U	21 U	--	--	--	--
Endosulfan-alpha (I)			--	--	--	--	--	--	1.6 U	1.6 U	--	--	--	--

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		Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-MW-05	DSI-MW-05	DSI-MW-06	DSI-MW-06	DSI-MW-08	DSI-MW-08	DSI-12	DSI-12	DSI-GP-17	DSI-GP-17	DSI-MW-10	DSI-MW-10
		Sample ID	DSI-MW-05-0.5-3.0	DSI-MW-05-5-8	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI12-SO-A	DSI12-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
		Sample Date	7/14/2009	7/14/2009	7/15/2009	7/15/2009	7/15/2009	7/15/2009	9/28/2006	9/28/2006	7/13/2009	7/13/2009	7/14/2009	7/14/2009
		Depth	0.5 - 3 feet	5 - 8 feet	0.5 - 3.5 feet	5 - 8 feet	0.5 - 2 feet	5 - 8 feet	0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0.5 - 3.5 feet	5 - 8 feet
		Sample Type	N	N	N	N	N	N	N	N	N	N	N	N
		X	1267969.750000	1267969.750000	1267953.290000	1267953.290000	1267967.620000	1267967.620000	1267970.416	1267970.416	1267974.892510	1267974.892510	1267964.600000	1267964.600000
		Y	204575.210000	204575.210000	204456.310000	204456.310000	204366.340000	204366.340000	204269.044	204269.044	204304.039660	204304.039660	204275.460000	204275.460000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial												
Endosulfan-beta (II)			--	--	--	--	--	--	3.3 U	3.3 U	--	--	--	--
Endrin		1050000	--	--	--	--	--	--	14 U	17 U	--	--	--	--
Endrin aldehyde			--	--	--	--	--	--	3.3 U	3.3 U	--	--	--	--
Endrin ketone			--	--	--	--	--	--	15 U	16 U	--	--	--	--
gamma-Chlordane			--	--	--	--	--	--	1.6 U	1.6 U	--	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	10	1050000	--	--	--	--	--	--	1.6 U	1.6 U	--	--	--	--
Heptachlor		1750000	--	--	--	--	--	--	1.6 U	1.6 U	--	--	--	--
Heptachlor epoxide		45500	--	--	--	--	--	--	1.6 U	3.8 U	--	--	--	--
Hexachlorobenzene		2800000	--	--	--	--	--	--	1.6 U	1.6 U	--	--	--	--
Hexachlorobutadiene		3500000	--	--	--	--	--	--	1.6 U	1.6 U	--	--	--	--
Methoxychlor		17500000	--	--	--	--	--	--	16 U	16 U	--	--	--	--
Toxaphene			--	--	--	--	--	--	160 U	160 U	--	--	--	--
Total DDx (U = 1/2)	3000		--	--	--	--	--	--	3.3 U	12 U	--	--	--	--
Total Petroleum Hydrocarbons (mg/kg)														
Diesel Range Hydrocarbons	2000		**43**	6.2 U	**270**	**7.2**	**140**	**17**	**88**	**170**	**9.2**	6.8 U	**850**	**300**
Gasoline Range Hydrocarbons	30/100*		4.1 U	5.2 U	7.2 U	8.6 U	**8.5**	7.6 U	6.6 U	**27**	5.6 U	9.2 U	**270**	**62**
Motor Oil Range			**180**	**17**	**40**	**14**	**390**	**22**	**130**	**240**	**22**	14 U	**530**	**210**
Extractable Petroleum Hydrocarbons (µg/kg)														
C8-C10 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--
C12-C16 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--
C16-C21 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--
C21-C34 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--
C12-C16 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--
C16-C21 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--
C21-C34 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--

Table 3
2006 and 2009 Investigation Analytical Results for Soil Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-MW-05	DSI-MW-05	DSI-MW-06	DSI-MW-06	DSI-MW-08	DSI-MW-08	DSI-12	DSI-12	DSI-GP-17	DSI-GP-17	DSI-MW-10	DSI-MW-10
		Sample ID	DSI-MW-05-0.5-3.0	DSI-MW-05-5-8	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI12-SO-A	DSI12-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
		Sample Date	7/14/2009	7/14/2009	7/15/2009	7/15/2009	7/15/2009	7/15/2009	9/28/2006	9/28/2006	7/13/2009	7/13/2009	7/14/2009	7/14/2009
		Depth	0.5 - 3 feet	5 - 8 feet	0.5 - 3.5 feet	5 - 8 feet	0.5 - 2 feet	5 - 8 feet	0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0.5 - 3.5 feet	5 - 8 feet
		Sample Type	N	N	N	N	N	N	N	N	N	N	N	N
		X	1267969.750000	1267969.750000	1267953.290000	1267953.290000	1267967.620000	1267967.620000	1267970.416	1267970.416	1267974.892510	1267974.892510	1267964.600000	1267964.600000
		Y	204575.210000	204575.210000	204456.310000	204456.310000	204366.340000	204366.340000	204269.044	204269.044	204304.039660	204304.039660	204275.460000	204275.460000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Unrestricted	MTCA Method C Industrial												
Volatile Petroleum Hydrocarbons (µg/kg)														
Benzene	30	14000000	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	6000	350000000	--	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylene			--	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	100		--	--	--	--	--	--	--	--	--	--	--	--
n-Decane (C10)			--	--	--	--	--	--	--	--	--	--	--	--
n-Dodecane (C12)			--	--	--	--	--	--	--	--	--	--	--	--
n-Hexane (C6)		210000000	--	--	--	--	--	--	--	--	--	--	--	--
n-Octane (C8)			--	--	--	--	--	--	--	--	--	--	--	--
n-Pentane (C5)			--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene		700000000	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	7000	280000000	--	--	--	--	--	--	--	--	--	--	--	--
C5-C6 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--
C6-C8 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--
C8-C10 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--
C10-C12 Aliphatics			--	--	--	--	--	--	--	--	--	--	--	--
C8-C10 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--
C10-C12 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--
C12-C13 Aromatics			--	--	--	--	--	--	--	--	--	--	--	--

Notes:
Detected concentration is greater than MTCA Method A Unrestricted screening level
Bold = Detected result
J = Estimated value
U = Compound analyzed, but not detected above detection limit
UJ = Compound analyzed, but not detected above estimated detection limit
* = MTCA A values for Gasoline Range Hydrocarbons are dependant on benzene and total of tolulene, ethyl benzene, and xylene concentrations. Where BTEX was not analyzed, the 30 mg/kg criteria has been applied.
Totals are calculated as the sum of all detected results and one-half the undetected reporting limit. If all are undetected results, the highest reporting limit value is reported as the sum.
Total Naphthalenes includes Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene
Total DDx consists of the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT if measured.
µg/kg = micrograms per kilogram
FD = Field Duplicate
mg/kg = milligrams per kilogram
MTCA = Model Toxics Control Act
RI = Remedial Investigation
TEQ = Toxics Equivalency Quotient
N = Normal Field Sample
Carcinogenic PAH (cPAH) values include a minimum calculation of 7 analytes: Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene and Indeno(1,2,3-c,d)pyrene. The calculation is based on MTCA cleanup Regulation, Table 708-2 "Toxicity Equivalency Factors for Minimum Required Carcinogenic Polyaromatic Hydrocarbons (cPAHs)" under WAC 173-340-708(e).

Table 4

2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Northwest Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-04	DSI-05	DSI-08	DSI-GP-06	DSI-GP-07	DSI-MW-03	DSI-02
		Sample ID	DSI04-GW	DSI05-GW	DSI08-GW	DSI-GP-06-GW	DSI-GP-07-GW	DSI-MW-03-072909	DSI02-GW
		Sample Date	9/27/2006	9/27/2006	9/28/2006	7/14/2009	7/14/2009	7/29/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267677.299	1267664.491	1267815.082	1267588.576080	1267662.081370	1267731.360000	1267482.282
		Y	204577.5256	204414.7943	204599.0763	204506.762927	204563.527640	204467.030000	204484.7162
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Conventional Parameters (mg/l)									
Alkalinity, Bicarbonate as calcium cabonate (CaCO3)			--	--	--	--	--	--	--
Alkalinity, Carbonate as calcium cabonate (CaCO3)			--	--	--	--	--	--	--
Alkalinity, Hydroxide as calcium cabonate (CaCO3)			--	--	--	--	--	--	--
Alkalinity, total as calcium carbonate (CaCO3)			--	--	--	--	--	--	--
Chloride (total)			--	--	--	--	--	**11900**	--
Nitrate + nitrite as nitrogen			--	--	--	--	--	--	--
Nitrate as nitrogen			--	--	--	--	--	--	--
Nitrite as nitrogen			--	--	--	--	--	--	--
Sulfate			--	--	--	--	--	--	--
Sulfide			--	--	--	--	--	--	--
Metals (µg/l)									
Arsenic			**11.2**	**2**	**11.8**	--	--	--	**16.4**
Cadmium			**0.2**	0.2 U	**0.3**	--	--	--	**0.3**
Chromium			**29**	**6**	**37**	--	--	--	**49**
Copper			**55.6**	**15.2**	**70.4**	--	--	**2.09**	**86.7**
Lead			**13**	**6**	**12**	--	--	--	**11**
Mercury			0.1 U	0.1 U	**0.12**	--	--	--	**0.1**
Nickel			--	--	--	--	--	2.02 UJ	--
Silver			0.2 U	0.2 U	**0.4**	--	--	--	**0.3**
Zinc			**92**	**25**	**103**	--	--	--	**137**
Metals, Dissolved (µg/l)									
Antimony		14	--	--	--	--	--	2 U	--
Arsenic	5	10.5	**2.2**	**0.6**	**1.4**	--	--	**7**	**2.4**
Cadmium	5	35	0.2 U	0.2 U	0.2 U	--	--	2 U	0.2 U
Chromium	50		2 U	2 U	2 U	--	--	5 U	0.5 U
Copper		1400	**0.7**	0.5 U	**0.7**	--	--	**10**	0.5 U
Lead	15		1 U	1 U	1 U	--	--	10 U	1 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Northwest Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-04	DSI-05	DSI-08	DSI-GP-06	DSI-GP-07	DSI-MW-03	DSI-02
		Sample ID	DSI04-GW	DSI05-GW	DSI08-GW	DSI-GP-06-GW	DSI-GP-07-GW	DSI-MW-03-072909	DSI02-GW
		Sample Date	9/27/2006	9/27/2006	9/28/2006	7/14/2009	7/14/2009	7/29/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267677.299	1267664.491	1267815.082	1267588.576080	1267662.081370	1267731.360000	1267482.282
		Y	204577.5256	204414.7943	204599.0763	204506.762927	204563.527640	204467.030000	204484.7162
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Mercury	2		0.1 U	0.1 U	0.1 U	--	--	0.02 U	0.1 U
Nickel		700	--	--	--	--	--	**18**	--
Selenium		175	--	--	--	--	--	**12**	--
Silver		175	0.2 U	0.2 U	0.2 U	--	--	2 U	0.2 U
Zinc		10500	4 U	**7**	4 U	--	--	40 U	4 U
Volatile Organics (µg/l)									
1,1,1,2-Tetrachloroethane		525	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane	200	35000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane		70	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane		3500	0.2 U	**0.2**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethene		875	0.2 U	0.2 U	0.2 U	--	--	--	0.2 U
1,1-Dichloropropene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane		70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene		175	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trimethylbenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.4**
1,2-Dibromo-3-chloropropane		3.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (Ethylene dibromide)	0.01	158	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene		1575	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane	5	350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethene, cis-		35	**0.6**	0.2 U	0.2 U	--	--	--	0.2 U
1,2-Dichloroethene, trans-		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene (Mesitylene)		175	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.3**
1,3-Dichlorobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropene, cis-			0.2 U	0.2 U	0.2 U	--	--	--	0.2 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Northwest Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-04	DSI-05	DSI-08	DSI-GP-06	DSI-GP-07	DSI-MW-03	DSI-02
		Sample ID	DSI04-GW	DSI05-GW	DSI08-GW	DSI-GP-06-GW	DSI-GP-07-GW	DSI-MW-03-072909	DSI02-GW
		Sample Date	9/27/2006	9/27/2006	9/28/2006	7/14/2009	7/14/2009	7/29/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267677.299	1267664.491	1267815.082	1267588.576080	1267662.081370	1267731.360000	1267482.282
		Y	204577.5256	204414.7943	204599.0763	204506.762927	204563.527640	204467.030000	204484.7162
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
1,3-Dichloropropene, trans-			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,2-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 U
2-Butanone (MEK)		10500	1 U	1 U	1 U	5 U	5 U	5 U	1 U
2-Chlorotoluene		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone (Methyl butyl ketone)			3 U	3 U	3 U	5 U	5 U	5 U	3 U
4-Chlorotoluene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Isopropyltoluene (4-Cymene)			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Acetone		15800	**3.8**	3 U	**5.5**	5 U	5 U	5 U	**8**
Benzene	5	70	0.2 U	**0.2**	**0.3**	0.2 U	0.2 U	0.2 U	0.2 U
Bromobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromochloromethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromodichloromethane		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform (Tribromomethane)		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromomethane (Methyl Bromide)		24.5	0.2 U	0.2 U	0.2 U	0.5 U	0.5 U	0.5 U	0.2 U
Carbon disulfide		1750	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.6**
Carbon tetrachloride (Tetrachloromethane)		70	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform		175	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloromethane			0.2 U	0.2 U	0.2 U	0.5 U	0.5 U	0.5 U	0.2 U
Dibromochloromethane		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane		175	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichlorodifluoromethane		3500	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichloromethane (Methylene chloride)	5	1050	0.3 U	0.3 U	0.3 U	0.5 U	0.5 U	0.5 U	0.3 U
Ethylbenzene	700	1750	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene		17.5	--	--	--	0.5 U	0.5 U	0.5 U	--
Isopropylbenzene (Cumene)		1750	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
m,p-Xylene			0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	**0.5**

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Northwest Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-04	DSI-05	DSI-08	DSI-GP-06	DSI-GP-07	DSI-MW-03	DSI-02
		Sample ID	DSI04-GW	DSI05-GW	DSI08-GW	DSI-GP-06-GW	DSI-GP-07-GW	DSI-MW-03-072909	DSI02-GW
		Sample Date	9/27/2006	9/27/2006	9/28/2006	7/14/2009	7/14/2009	7/29/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267677.299	1267664.491	1267815.082	1267588.576080	1267662.081370	1267731.360000	1267482.282
		Y	204577.5256	204414.7943	204599.0763	204506.762927	204563.527640	204467.030000	204484.7162
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		1400	1 U	1 U	1 U	5 U	5 U	5 U	1 U
Methyl tert-butyl ether (MTBE)	20		0.2 U	0.2 U	0.2 U	0.5 U	0.5 U	0.5 U	0.2 U
Naphthalene		350	--	--	--	0.5 U	0.5 U	0.5 U	--
n-Butylbenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
n-Propylbenzene		1750	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
o-Xylene		3500	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.2**
sec-Butylbenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Styrene		3500	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
tert-Butylbenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethene (PCE)	5	175	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Toluene	1000	1400	**0.5**	**0.4**	**0.4**	0.2 U	0.2 U	**0.3**	**0.7**
Trichloroethene (TCE)	5		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane (Fluorotrichloromethane)		5250	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl chloride	0.2	52.5	**0.6**	**0.3**	**0.4**	0.2 U	**0.2**	0.2 U	0.2 U
Total Xylene (U = 1/2)	1000		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	**0.7**
Polycyclic Aromatic Hydrocarbons (PAH) (µg/l)									
1-Methylnaphthalene			--	--	--	0.01 U	0.01 U	0.01 U	--
2-Methylnaphthalene		70	0.02 U	**0.12**	0.06 U	0.01 U	**0.018**	0.01 U	0.07 U
Acenaphthene		2100	0.01 U	**0.06**	**0.01 J**	0.01 U	0.01 U	0.01 U	**0.03**
Acenaphthylene			0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Anthracene		10500	0.01 U	**0.01 J**	**0.01 J**	0.01 U	0.01 U	0.01 U	**0.01 J**
Benzo(a)anthracene			0.01 U	**0.01 J**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(a)pyrene	0.1		0.01 U	**0.01 J**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(b)fluoranthene			0.01 U	**0.01 J**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(g,h,i)perylene			0.01 U	**0.01 J**	0.01 U	0.01 U	**0.019**	0.01 U	0.01 U
Benzo(k)fluoranthene			0.01 U	**0.01 J**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chrysene			0.01 U	**0.02**	**0.01 J**	0.01 U	**0.016**	0.01 U	**0.01 J**
Dibenzo(a,h)anthracene			0.01 U	0.01 U	0.01 U	0.01 U	**0.018**	0.01 U	0.01 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Northwest Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-04	DSI-05	DSI-08	DSI-GP-06	DSI-GP-07	DSI-MW-03	DSI-02
		Sample ID	DSI04-GW	DSI05-GW	DSI08-GW	DSI-GP-06-GW	DSI-GP-07-GW	DSI-MW-03-072909	DSI02-GW
		Sample Date	9/27/2006	9/27/2006	9/28/2006	7/14/2009	7/14/2009	7/29/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267677.299	1267664.491	1267815.082	1267588.576080	1267662.081370	1267731.360000	1267482.282
		Y	204577.5256	204414.7943	204599.0763	204506.762927	204563.527640	204467.030000	204484.7162
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Fluoranthene		1400	**0.01**	**0.02**	**0.02**	0.01 U	**0.023**	0.01 U	**0.02**
Fluorene		1400	0.01 U	**0.01**	**0.01 J**	0.01 U	0.01 U	0.01 U	**0.03**
Indeno(1,2,3-c,d)pyrene			0.01 U	**0.01 J**	0.01 U	0.01 U	**0.02**	0.01 U	0.01 U
Naphthalene		350	**0.07**	**0.16**	**0.08**	**0.088**	**0.033**	**0.016**	**0.12**
Phenanthrene			**0.01**	**0.04**	**0.03**	0.01 U	**0.019**	0.01 U	**0.05**
Pyrene		1050	**0.01 J**	**0.02**	**0.01**	0.01 U	**0.023**	0.01 U	**0.02**
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	0.1		0.01 U	**0.01 J**	**0.008 J**	0.01 U	**0.01**	0.01 U	**0.008 J**
Total Naphthalenes (U = 1/2)	160		**0.08**	**0.28**	**0.1**	**0.098**	**0.056**	**0.026**	**0.2**
Semivolatile Organics (µg/l)									
1,2,4-Trichlorobenzene		175	--	--	--	1 UJ	1 UJ	1 UJ	--
1,2-Dichlorobenzene		1575	--	--	--	1 UJ	1 UJ	1 UJ	--
1,4-Dichlorobenzene			--	--	--	1 UJ	1 UJ	1 UJ	--
2,4-Dimethylphenol		350	--	--	--	1 U	1 U	1 U	--
2-Methylphenol (o-Cresol)		875	--	--	--	1 U	1 U	1 U	--
4-Methylphenol (p-Cresol)		87.5	--	--	--	1 U	1 U	1 U	--
Benzoic acid		140000	--	--	--	10 U	10 U	10 U	--
Benzyl alcohol		1750	--	--	--	5 U	5 U	5 U	--
Bis(2-ethylhexyl) phthalate		700	--	--	--	1 U	1 U	1 U	--
Butylbenzyl phthalate		7000	--	--	--	1 U	1 U	1 U	--
Dibenzofuran		35	0.01 U	**0.01 J**	**0.01 J**	0.01 U	0.01 U	0.01 U	**0.01**
Diethyl phthalate		28000	--	--	--	1 U	1 U	1 U	--
Dimethyl phthalate			--	--	--	1 U	1 U	1 U	--
Di-n-butyl phthalate		3500	--	--	--	1 U	1 U	1 U	--
Di-n-octyl phthalate			--	--	--	1 U	1 U	1 U	--
Hexachlorobenzene		28	--	--	--	1 U	1 U	1 U	--
Hexachlorobutadiene		17.5	--	--	--	1 UJ	1 UJ	1 UJ	--
Hexachloroethane		17.5	--	--	--	1 UJ	1 UJ	1 UJ	--
N-Nitrosodiphenylamine			--	--	--	1 UJ	1 UJ	1 U	--

Table 4

2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Northwest Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-04	DSI-05	DSI-08	DSI-GP-06	DSI-GP-07	DSI-MW-03	DSI-02
		Sample ID	DSI04-GW	DSI05-GW	DSI08-GW	DSI-GP-06-GW	DSI-GP-07-GW	DSI-MW-03-072909	DSI02-GW
		Sample Date	9/27/2006	9/27/2006	9/28/2006	7/14/2009	7/14/2009	7/29/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267677.299	1267664.491	1267815.082	1267588.576080	1267662.081370	1267731.360000	1267482.282
		Y	204577.5256	204414.7943	204599.0763	204506.762927	204563.527640	204467.030000	204484.7162
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Pentachlorophenol		175	--	--	--	5 UJ	5 UJ	5 U	--
Phenol		5250	--	--	--	1 U	1 U	1 U	--
Polychlorinated Biphenyl (PCB) Aroclors (µg/l)									
Aroclor 1016		2.45	0.02 U	0.02 U	0.02 U	--	--	--	0.02 U
Aroclor 1221			0.02 U	0.02 U	0.02 U	--	--	--	0.02 U
Aroclor 1232			0.02 U	0.02 U	0.02 U	--	--	--	0.02 U
Aroclor 1242			0.02 U	0.02 U	0.02 U	--	--	--	0.02 U
Aroclor 1248			0.02 U	0.02 U	0.02 U	--	--	--	0.02 U
Aroclor 1254		0.7	0.02 U	0.02 U	0.02 U	--	--	--	0.02 U
Aroclor 1260			0.02 UJ	0.02 UJ	0.02 U	--	--	--	0.02 UJ
Total PCB Aroclors (U = 1/2)	0.1		0.02 UJ	0.02 UJ	0.02 U	--	--	--	0.02 UJ
Pesticides (µg/l)									
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			0.011 U	0.011 U	0.01 U	--	--	--	0.011 U
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			0.011 U	0.011 U	0.01 U	--	--	--	0.011 U
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		17.5	0.011 U	0.011 U	0.01 U	--	--	--	0.011 U
Aldrin		0.525	0.0054 U	0.0053 U	0.005 U	--	--	--	0.0056 U
alpha-Chlordane (cis-Chlordane)			0.0054 U	0.0053 U	0.005 U	--	--	--	0.0056 U
alpha-Hexachlorocyclohexane (BHC)			0.0054 U	0.0053 U	0.005 U	--	--	--	0.0056 U
beta-Hexachlorocyclohexane (BHC)			0.0054 U	0.0053 U	0.005 U	--	--	--	0.0056 U
delta-Hexachlorocyclohexane (BHC)			0.0054 U	0.0053 U	0.005 U	--	--	--	0.0056 U
Dieldrin		1.75	0.011 U	0.011 U	0.01 U	--	--	--	0.011 U
Endosulfan sulfate			0.011 U	0.011 U	0.01 U	--	--	--	0.011 U
Endosulfan-alpha (I)			0.0054 U	0.0053 U	0.005 U	--	--	--	0.0056 U
Endosulfan-beta (II)			0.011 U	0.011 U	0.01 U	--	--	--	0.011 U
Endrin		10.5	0.011 U	0.011 U	0.01 U	--	--	--	0.011 U
Endrin aldehyde			0.011 U	0.011 U	0.01 U	--	--	--	0.011 U
Endrin ketone			0.011 U	0.011 U	0.01 U	--	--	--	0.011 U
gamma-Chlordane			0.0054 U	0.0053 U	0.005 U	--	--	--	0.0056 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Central Area	A-Northwest Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-04	DSI-05	DSI-08	DSI-GP-06	DSI-GP-07	DSI-MW-03	DSI-02
		Sample ID	DSI04-GW	DSI05-GW	DSI08-GW	DSI-GP-06-GW	DSI-GP-07-GW	DSI-MW-03-072909	DSI02-GW
		Sample Date	9/27/2006	9/27/2006	9/28/2006	7/14/2009	7/14/2009	7/29/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267677.299	1267664.491	1267815.082	1267588.576080	1267662.081370	1267731.360000	1267482.282
		Y	204577.5256	204414.7943	204599.0763	204506.762927	204563.527640	204467.030000	204484.7162
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
gamma-Hexachlorocyclohexane (BHC) (Lindane)	0.2	10.5	0.0054 U	0.0053 U	0.005 U	--	--	--	0.0056 U
Heptachlor		17.5	0.0054 U	0.0053 U	0.005 U	--	--	--	0.0056 U
Heptachlor epoxide		0.2275	0.0054 U	0.0053 U	0.005 U	--	--	--	0.0056 U
Hexachlorobenzene		28	0.0054 U	0.0053 U	0.005 U	--	--	--	0.0056 U
Hexachlorobutadiene		17.5	0.0054 U	0.0053 U	0.005 U	--	--	--	0.0056 U
Methoxychlor		175	0.054 U	0.053 U	0.05 U	--	--	--	0.056 U
Toxaphene			0.54 U	0.53 U	0.5 U	--	--	--	0.56 U
Total DDx (U = 1/2)	0.3		0.011 U	0.011 U	0.01 U	--	--	--	0.011 U
Total Petroleum Hydrocarbons (mg/l)									
Diesel Range Hydrocarbons	0.5		0.25 U	0.25 U	0.25 U	0.25 UJ	0.25 UJ	0.25 U	0.25 U
Gasoline Range Hydrocarbons	0.8		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Motor Oil Range			0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-03	MW-4[a]	MW-5[a]	DSI-GP-04	DSI-GP-05	DSI-MW-02	DSI-01
		Sample ID	DSI03-GW	MW-4-GW-060929	MW-5-GW-060929	DSI-GP-04-GW	DSI-GP-05-GW	DSI-MW-02-072209	DSI01-GW
		Sample Date	9/27/2006	9/29/2006	9/29/2006	7/15/2009	7/14/2009	7/22/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267538.202	1267474.81	1267494.81	1267562.472590	1267499.840140	1267537.850000	1267483.649
		Y	204614.5365	204675.26	204585.26	204594.779389	204589.624301	204619.490000	204362.383
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Conventional Parameters (mg/l)									
Alkalinity, Bicarbonate as calcium cabonate (CaCO3)			--	--	--	--	--	**182**	--
Alkalinity, Carbonate as calcium cabonate (CaCO3)			--	--	--	--	--	1 U	--
Alkalinity, Hydroxide as calcium cabonate (CaCO3)			--	--	--	--	--	1 U	--
Alkalinity, total as calcium carbonate (CaCO3)			--	--	--	--	--	**182**	--
Chloride (total)			--	--	--	--	--	**740 J**	--
Nitrate + nitrite as nitrogen			--	--	--	--	--	0.1 UJ	--
Nitrate as nitrogen			--	--	--	--	--	0.1 UJ	--
Nitrite as nitrogen			--	--	--	--	--	0.1 UJ	--
Sulfate			--	--	--	--	--	**14.9**	--
Sulfide			--	--	--	--	--	0.05 U	--
Metals (µg/l)									
Arsenic			**9.5**	**1**	**4.9**	--	--	--	**84.4**
Cadmium			**0.2**	0.2 U	0.2 U	--	--	--	**0.3**
Chromium			**38**	1 U	**54**	--	--	--	**7**
Copper			**53**	0.5 U	**29**	--	--	--	**18.5**
Lead			**8**	1 U	**2**	--	--	--	**3**
Mercury			0.1 U	0.1 U	0.1 U	--	--	--	0.1 U
Nickel			--	--	--	--	--	--	--
Silver			**0.3**	0.2 U	**0.8**	--	--	--	0.2 UJ
Zinc			**147**	**4**	**14**	--	--	--	**33**
Metals, Dissolved (µg/l)									
Antimony		14	--	--	--	--	--	0.2 U	--
Arsenic	5	10.5	**1.5**	**1**	**3.4**	--	--	**0.5**	**68.4**
Cadmium	5	35	0.2 U	0.2 U	0.2 U	--	--	0.2 U	0.2 U
Chromium	50		2 U	1 U	**42**	--	--	2 U	0.5 UJ
Copper		1400	**0.8**	0.5 U	**14.3**	--	--	**0.9**	0.5 U
Lead	15		1 U	1 U	1 U	--	--	1 U	1 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-03	MW-4[a]	MW-5[a]	DSI-GP-04	DSI-GP-05	DSI-MW-02	DSI-01
		Sample ID	DSI03-GW	MW-4-GW-060929	MW-5-GW-060929	DSI-GP-04-GW	DSI-GP-05-GW	DSI-MW-02-072209	DSI01-GW
		Sample Date	9/27/2006	9/29/2006	9/29/2006	7/15/2009	7/14/2009	7/22/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267538.202	1267474.81	1267494.81	1267562.472590	1267499.840140	1267537.850000	1267483.649
		Y	204614.5365	204675.26	204585.26	204594.779389	204589.624301	204619.490000	204362.383
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Mercury	2		0.1 U	0.1 U	0.1 U	--	--	0.02 U	0.1 U
Nickel		700	--	--	--	--	--	**4**	--
Selenium		175	--	--	--	--	--	**0.8**	--
Silver		175	0.2 U	0.2 U	**0.4**	--	--	0.2 U	0.2 U
Zinc		10500	**13**	**4**	**8**	--	--	**15**	**5**
Volatile Organics (μg/l)									
1,1,1,2-Tetrachloroethane		525	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,1,1-Trichloroethane	200	35000	0.2 U	0.2 U	0.6 U	--	--	0.2 U	**1**
1,1,2,2-Tetrachloroethane		350	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,1,2-Trichloroethane		70	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,1-Dichloroethane		3500	0.2 U	**0.4**	0.6 U	--	--	0.2 U	**0.2**
1,1-Dichloroethene		875	0.2 U	0.2 U	0.6 U	--	--	--	0.2 U
1,1-Dichloropropene			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,2,3-Trichlorobenzene			0.5 U	0.5 U	1.5 U	--	--	0.5 U	0.5 U
1,2,3-Trichloropropane		70	0.5 U	0.5 U	1.5 U	--	--	0.5 U	0.5 U
1,2,4-Trichlorobenzene		175	0.5 U	0.5 U	1.5 U	--	--	0.5 U	0.5 U
1,2,4-Trimethylbenzene			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane		3.5	0.5 U	0.5 U	1.5 U	--	--	0.5 U	0.5 U
1,2-Dibromoethane (Ethylene dibromide)	0.01	158	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,2-Dichlorobenzene		1575	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,2-Dichloroethane	5	350	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,2-Dichloroethene, cis-		35	**0.2**	0.2 U	0.6 U	--	--	--	**0.5**
1,2-Dichloroethene, trans-		350	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,2-Dichloropropane			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,3,5-Trimethylbenzene (Mesitylene)		175	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,3-Dichlorobenzene			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,3-Dichloropropane			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,3-Dichloropropene, cis-			0.2 U	0.2 U	0.6 U	--	--	--	0.2 U

Table 4

2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-03	MW-4[a]	MW-5[a]	DSI-GP-04	DSI-GP-05	DSI-MW-02	DSI-01
		Sample ID	DSI03-GW	MW-4-GW-060929	MW-5-GW-060929	DSI-GP-04-GW	DSI-GP-05-GW	DSI-MW-02-072209	DSI01-GW
		Sample Date	9/27/2006	9/29/2006	9/29/2006	7/15/2009	7/14/2009	7/22/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267538.202	1267474.81	1267494.81	1267562.472590	1267499.840140	1267537.850000	1267483.649
		Y	204614.5365	204675.26	204585.26	204594.779389	204589.624301	204619.490000	204362.383
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
1,3-Dichloropropene, trans-			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
1,4-Dichlorobenzene			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
2,2-Dichloropropane			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
2-Butanone (MEK)		10500	1 U	1 U	3 U	--	--	5 U	1 U
2-Chlorotoluene		350	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
2-Hexanone (Methyl butyl ketone)			3 U	3 U	9 U	--	--	5 U	3 U
4-Chlorotoluene			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
4-Isopropyltoluene (4-Cymene)			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Acetone		15800	**6.3**	**4.1**	9 U	--	--	5 U	**5.4**
Benzene	5	70	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Bromobenzene			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Bromochloromethane			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Bromodichloromethane		350	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Bromoform (Tribromomethane)		350	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Bromomethane (Methyl Bromide)		24.5	0.2 U	0.2 U	0.6 U	--	--	0.5 U	0.2 U
Carbon disulfide		1750	0.2 U	0.2 U	0.6 U	--	--	0.2 U	**0.2**
Carbon tetrachloride (Tetrachloromethane)		70	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Chloroethane			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Chloroform		175	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Chloromethane			0.2 U	0.2 U	0.6 U	--	--	0.5 U	0.2 U
Dibromochloromethane		350	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Dibromomethane		175	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Dichlorodifluoromethane		3500	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Dichloromethane (Methylene chloride)	5	1050	0.3 U	**0.3**	0.9 U	--	--	0.5 U	0.3 U
Ethylbenzene	700	1750	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Hexachlorobutadiene		17.5	--	--	--	--	--	0.5 U	--
Isopropylbenzene (Cumene)		1750	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
m,p-Xylene			**0.5**	0.4 U	1.2 U	--	--	0.4 U	0.4 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-03	MW-4[a]	MW-5[a]	DSI-GP-04	DSI-GP-05	DSI-MW-02	DSI-01
		Sample ID	DSI03-GW	MW-4-GW-060929	MW-5-GW-060929	DSI-GP-04-GW	DSI-GP-05-GW	DSI-MW-02-072209	DSI01-GW
		Sample Date	9/27/2006	9/29/2006	9/29/2006	7/15/2009	7/14/2009	7/22/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267538.202	1267474.81	1267494.81	1267562.472590	1267499.840140	1267537.850000	1267483.649
		Y	204614.5365	204675.26	204585.26	204594.779389	204589.624301	204619.490000	204362.383
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		1400	1 U	1 U	3 U	--	--	5 U	1 U
Methyl tert-butyl ether (MTBE)	20		0.2 U	0.2 U	0.6 U	--	--	0.5 U	0.2 U
Naphthalene		350	--	**8.7**	--	--	--	0.5 U	--
n-Butylbenzene			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
n-Propylbenzene		1750	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
o-Xylene		3500	**0.2**	0.2 U	0.6 U	--	--	0.2 U	0.2 U
sec-Butylbenzene			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Styrene		3500	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
tert-Butylbenzene			0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Tetrachloroethene (PCE)	5	175	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Toluene	1000	1400	**0.6**	0.2 U	0.6 U	--	--	0.2 U	**0.5**
Trichloroethene (TCE)	5		0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Trichlorofluoromethane (Fluorotrichloromethane)		5250	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Vinyl chloride	0.2	52.5	0.2 U	0.2 U	0.6 U	--	--	0.2 U	0.2 U
Total Xylene (U = 1/2)	1000		**0.7**	0.4 U	1 U	--	--	0.4 U	0.4 U
Polycyclic Aromatic Hydrocarbons (PAH) (µg/l)									
1-Methylnaphthalene			--	--	--	--	--	**0.018**	--
2-Methylnaphthalene		70	**0.11**	**1.3**	0.01 U	--	--	**0.02**	0.1 U
Acenaphthene		2100	**0.01**	**2.9**	0.01 U	--	--	0.01 U	**0.07**
Acenaphthylene			0.01 U	**0.08**	0.01 U	--	--	0.01 U	0.01 U
Anthracene		10500	**0.02**	**0.14**	0.01 U	--	--	0.01 U	**0.02**
Benzo(a)anthracene			**0.03**	0.01 U	0.01 U	--	--	0.01 U	**0.01 J**
Benzo(a)pyrene	0.1		**0.02**	0.01 U	0.01 U	--	--	0.01 U	0.01 U
Benzo(b)fluoranthene			**0.02**	0.01 U	0.01 U	--	--	0.01 U	0.01 U
Benzo(g,h,i)perylene			**0.01 J**	0.01 U	0.01 U	--	--	0.01 U	0.01 U
Benzo(k)fluoranthene			**0.03**	0.01 U	0.01 U	--	--	0.01 U	0.01 U
Chrysene			**0.06**	0.01 U	0.01 U	--	--	0.01 U	**0.01**
Dibenzo(a,h)anthracene			**0.01 J**	0.01 U	0.01 U	--	--	0.01 U	0.01 U

Table 4

2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-03	MW-4[a]	MW-5[a]	DSI-GP-04	DSI-GP-05	DSI-MW-02	DSI-01
		Sample ID	DSI03-GW	MW-4-GW-060929	MW-5-GW-060929	DSI-GP-04-GW	DSI-GP-05-GW	DSI-MW-02-072209	DSI01-GW
		Sample Date	9/27/2006	9/29/2006	9/29/2006	7/15/2009	7/14/2009	7/22/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267538.202	1267474.81	1267494.81	1267562.472590	1267499.840140	1267537.850000	1267483.649
		Y	204614.5365	204675.26	204585.26	204594.779389	204589.624301	204619.490000	204362.383
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Fluoranthene		1400	**0.02**	**0.13**	**0.01 J**	--	--	0.01 U	**0.05**
Fluorene		1400	**0.02**	**2**	**0.01 J**	--	--	0.01 U	**0.06**
Indeno(1,2,3-c,d)pyrene			**0.01 J**	0.01 U	0.01 U	--	--	0.01 U	0.01 U
Naphthalene		350	**0.13**	--	**0.01 J**	--	--	0.01 U	**0.12**
Phenanthrene			**0.06**	**0.15**	**0.02**	--	--	0.01 U	**0.14**
Pyrene		1050	**0.01**	**0.07**	**0.01 J**	--	--	0.01 U	**0.04**
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	0.1		**0.03 J**	0.01 U	0.01 U	--	--	0.01 U	**0.008 J**
Total Naphthalenes (U = 1/2)	160		**0.24**	**1.3**	**0.02 J**	--	--	**0.043**	**0.17**
Semivolatile Organics (µg/l)									
1,2,4-Trichlorobenzene		175	--	--	--	--	--	1 UJ	--
1,2-Dichlorobenzene		1575	--	--	--	--	--	1 UJ	--
1,4-Dichlorobenzene			--	--	--	--	--	1 UJ	--
2,4-Dimethylphenol		350	--	--	--	--	--	1 U	--
2-Methylphenol (o-Cresol)		875	--	--	--	--	--	1 U	--
4-Methylphenol (p-Cresol)		87.5	--	--	--	--	--	1 U	--
Benzoic acid		140000	--	--	--	--	--	10 U	--
Benzyl alcohol		1750	--	--	--	--	--	5 U	--
Bis(2-ethylhexyl) phthalate		700	--	--	--	--	--	1 U	--
Butylbenzyl phthalate		7000	--	--	--	--	--	1 U	--
Dibenzofuran		35	**0.01**	**0.13**	0.01 U	--	--	0.01 U	**0.03**
Diethyl phthalate		28000	--	--	--	--	--	1 U	--
Dimethyl phthalate			--	--	--	--	--	1 U	--
Di-n-butyl phthalate		3500	--	--	--	--	--	1 U	--
Di-n-octyl phthalate			--	--	--	--	--	1 U	--
Hexachlorobenzene		28	--	--	--	--	--	1 U	--
Hexachlorobutadiene		17.5	--	--	--	--	--	1 UJ	--
Hexachloroethane		17.5	--	--	--	--	--	1 UJ	--
N-Nitrosodiphenylamine			--	--	--	--	--	1 UJ	--

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-03	MW-4[a]	MW-5[a]	DSI-GP-04	DSI-GP-05	DSI-MW-02	DSI-01
		Sample ID	DSI03-GW	MW-4-GW-060929	MW-5-GW-060929	DSI-GP-04-GW	DSI-GP-05-GW	DSI-MW-02-072209	DSI01-GW
		Sample Date	9/27/2006	9/29/2006	9/29/2006	7/15/2009	7/14/2009	7/22/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267538.202	1267474.81	1267494.81	1267562.472590	1267499.840140	1267537.850000	1267483.649
		Y	204614.5365	204675.26	204585.26	204594.779389	204589.624301	204619.490000	204362.383
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Pentachlorophenol		175	--	--	--	--	--	5 U	--
Phenol		5250	--	--	--	--	--	1 U	--
Polychlorinated Biphenyl (PCB) Aroclors (µg/l)									
Aroclor 1016		2.45	0.02 U	0.02 U	0.02 UJ	--	--	--	0.02 U
Aroclor 1221			0.02 U	0.02 U	0.02 UJ	--	--	--	0.02 U
Aroclor 1232			0.02 U	0.02 U	0.02 UJ	--	--	--	0.02 U
Aroclor 1242			0.02 U	0.02 U	0.02 UJ	--	--	--	0.02 U
Aroclor 1248			0.02 U	0.02 U	0.02 UJ	--	--	--	0.02 U
Aroclor 1254		0.7	0.02 U	0.02 U	0.02 UJ	--	--	--	0.02 U
Aroclor 1260			0.02 UJ	0.02 U	0.02 UJ	--	--	--	0.02 UJ
Total PCB Aroclors (U = 1/2)	0.1		0.02 UJ	0.02 U	0.02 UJ	--	--	--	0.02 UJ
Pesticides (µg/l)									
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			0.011 U	0.01 U	0.01 U	--	--	--	0.011 U
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			0.011 U	0.01 U	0.01 U	--	--	--	0.011 U
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		17.5	0.011 U	0.01 U	0.01 U	--	--	--	0.011 U
Aldrin		0.525	0.0055 U	0.005 U	0.005 U	--	--	--	0.0054 U
alpha-Chlordane (cis-Chlordane)			0.0055 U	0.005 U	0.005 U	--	--	--	0.0054 U
alpha-Hexachlorocyclohexane (BHC)			0.0055 U	0.005 U	0.005 U	--	--	--	0.0054 U
beta-Hexachlorocyclohexane (BHC)			0.0055 U	0.005 U	0.005 U	--	--	--	0.0054 U
delta-Hexachlorocyclohexane (BHC)			0.0055 U	0.005 U	0.005 U	--	--	--	0.0054 U
Dieldrin		1.75	0.011 U	0.01 U	0.01 U	--	--	--	0.011 U
Endosulfan sulfate			0.011 U	0.01 U	0.01 U	--	--	--	0.011 U
Endosulfan-alpha (I)			0.0055 U	0.005 U	0.005 U	--	--	--	0.0054 U
Endosulfan-beta (II)			0.011 U	0.01 U	0.01 U	--	--	--	0.011 U
Endrin		10.5	0.011 U	0.01 U	0.01 U	--	--	--	0.011 U
Endrin aldehyde			0.011 U	0.01 U	0.01 U	--	--	--	0.011 U
Endrin ketone			0.011 U	0.01 U	0.01 U	--	--	--	0.011 U
gamma-Chlordane			0.0055 U	0.005 U	0.005 U	--	--	--	0.0054 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Northwest Area	A-Railspur Area
		Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic
		Location ID	DSI-03	MW-4[a]	MW-5[a]	DSI-GP-04	DSI-GP-05	DSI-MW-02	DSI-01
		Sample ID	DSI03-GW	MW-4-GW-060929	MW-5-GW-060929	DSI-GP-04-GW	DSI-GP-05-GW	DSI-MW-02-072209	DSI01-GW
		Sample Date	9/27/2006	9/29/2006	9/29/2006	7/15/2009	7/14/2009	7/22/2009	9/27/2006
		Sample Type	N	N	N	N	N	N	N
		X	1267538.202	1267474.81	1267494.81	1267562.472590	1267499.840140	1267537.850000	1267483.649
		Y	204614.5365	204675.26	204585.26	204594.779389	204589.624301	204619.490000	204362.383
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
gamma-Hexachlorocyclohexane (BHC) (Lindane)	0.2	10.5	0.0055 U	0.005 U	0.005 U	--	--	--	0.0054 U
Heptachlor		17.5	0.0055 U	0.005 U	0.005 U	--	--	--	0.0054 U
Heptachlor epoxide		0.2275	0.0055 U	0.005 U	0.005 U	--	--	--	0.0054 U
Hexachlorobenzene		28	0.0055 U	0.005 U	0.005 U	--	--	--	0.0054 U
Hexachlorobutadiene		17.5	0.0055 U	--	--	--	--	--	0.0054 U
Methoxychlor		175	0.055 U	0.05 U	0.05 U	--	--	--	0.054 U
Toxaphene			0.55 U	0.5 U	0.5 U	--	--	--	0.54 U
Total DDx (U = 1/2)	0.3		0.011 U	0.01 U	0.01 U	--	--	--	0.011 U
Total Petroleum Hydrocarbons (mg/l)									
Diesel Range Hydrocarbons	0.5		**0.93**	**0.35**	0.25 U	0.25 U	0.25 UJ	0.25 U	0.25 U
Gasoline Range Hydrocarbons	0.8		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Motor Oil Range			0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U

Table 4

2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-01	DSI-GP-02	DSI-GP-03	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-01-GW	DSI-GP-02-GW	DSI-GP-03-GW	DSI-MW-01-072209	DSI-GP-19-GW	DSI-GP-69-GW	DSI-GP-20-GW
		Sample Date	7/15/2009	7/15/2009	7/15/2009	7/22/2009	7/16/2009	7/16/2009	7/15/2009
		Sample Type	N	N	N	N	N	FD	N
		X	1267444.942240	1267499.153920	1267485.170900	1267511.080000	1267668.904820	1267668.904820	1267785.569970
		Y	204366.802869	204352.937108	204444.545110	204376.690000	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Conventional Parameters (mg/l)									
Alkalinity, Bicarbonate as calcium cabonate (CaCO3)			--	--	--	--	--	--	--
Alkalinity, Carbonate as calcium cabonate (CaCO3)			--	--	--	--	--	--	--
Alkalinity, Hydroxide as calcium cabonate (CaCO3)			--	--	--	--	--	--	--
Alkalinity, total as calcium carbonate (CaCO3)			--	--	--	--	--	--	--
Chloride (total)			--	--	--	**1670 J**	--	--	--
Nitrate + nitrite as nitrogen			--	--	--	--	--	--	--
Nitrate as nitrogen			--	--	--	--	--	--	--
Nitrite as nitrogen			--	--	--	--	--	--	--
Sulfate			--	--	--	--	--	--	--
Sulfide			--	--	--	--	--	--	--
Metals (µg/l)									
Arsenic			--	--	--	--	--	--	--
Cadmium			--	--	--	--	--	--	--
Chromium			--	--	--	--	--	--	--
Copper			--	--	--	--	--	--	--
Lead			--	--	--	--	--	--	--
Mercury			--	--	--	--	--	--	--
Nickel			--	--	--	--	--	--	--
Silver			--	--	--	--	--	--	--
Zinc			--	--	--	--	--	--	--
Metals, Dissolved (µg/l)									
Antimony		14	--	--	--	**0.8**	--	--	--
Arsenic	5	10.5	**388**	**25.5**	**3.4**	**48.4**	**1**	**1.1**	**0.8**
Cadmium	5	35	--	--	--	0.2 U	--	--	--
Chromium	50		--	--	--	1 U	--	--	--
Copper		1400	--	--	--	**1**	--	--	--
Lead	15		--	--	--	1 U	--	--	--

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-01	DSI-GP-02	DSI-GP-03	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-01-GW	DSI-GP-02-GW	DSI-GP-03-GW	DSI-MW-01-072209	DSI-GP-19-GW	DSI-GP-69-GW	DSI-GP-20-GW
		Sample Date	7/15/2009	7/15/2009	7/15/2009	7/22/2009	7/16/2009	7/16/2009	7/15/2009
		Sample Type	N	N	N	N	N	FD	N
		X	1267444.942240	1267499.153920	1267485.170900	1267511.080000	1267668.904820	1267668.904820	1267785.569970
		Y	204366.802869	204352.937108	204444.545110	204376.690000	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Mercury	2		--	--	--	0.02 U	--	--	--
Nickel		700	--	--	--	**5.7**	--	--	--
Selenium		175	--	--	--	0.5 U	--	--	--
Silver		175	--	--	--	0.2 U	--	--	--
Zinc		10500	--	--	--	4 U	--	--	--
Volatile Organics (µg/l)									
1,1,1,2-Tetrachloroethane		525	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane	200	35000	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane		350	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane		70	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane		3500	--	--	--	**0.4**	0.2 U	0.2 U	0.2 U
1,1-Dichloroethene		875	--	--	--	--	--	--	--
1,1-Dichloropropene			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene			--	--	--	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane		70	--	--	--	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene		175	--	--	--	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trimethylbenzene			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane		3.5	--	--	--	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (Ethylene dibromide)	0.01	158	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene		1575	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane	5	350	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethene, cis-		35	--	--	--	--	--	--	--
1,2-Dichloroethene, trans-		350	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene (Mesitylene)		175	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene			--	--	--	**0.3**	0.2 U	0.2 U	0.2 U
1,3-Dichloropropane			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropene, cis-			--	--	--	--	--	--	--

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-01	DSI-GP-02	DSI-GP-03	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-01-GW	DSI-GP-02-GW	DSI-GP-03-GW	DSI-MW-01-072209	DSI-GP-19-GW	DSI-GP-69-GW	DSI-GP-20-GW
		Sample Date	7/15/2009	7/15/2009	7/15/2009	7/22/2009	7/16/2009	7/16/2009	7/15/2009
		Sample Type	N	N	N	N	N	FD	N
		X	1267444.942240	1267499.153920	1267485.170900	1267511.080000	1267668.904820	1267668.904820	1267785.569970
		Y	204366.802869	204352.937108	204444.545110	204376.690000	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
1,3-Dichloropropene, trans-			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
2,2-Dichloropropane			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
2-Butanone (MEK)		10500	--	--	--	5 U	5 U	5 U	5 U
2-Chlorotoluene		350	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone (Methyl butyl ketone)			--	--	--	5 U	5 U	5 U	5 U
4-Chlorotoluene			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
4-Isopropyltoluene (4-Cymene)			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Acetone		15800	--	--	--	5 U	5 U	5 U	5 U
Benzene	5	70	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Bromobenzene			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Bromochloromethane			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Bromodichloromethane		350	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform (Tribromomethane)		350	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Bromomethane (Methyl Bromide)		24.5	--	--	--	0.5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide		1750	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Carbon tetrachloride (Tetrachloromethane)		70	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Chloroethane			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform		175	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Chloromethane			--	--	--	0.5 U	0.5 U	0.5 U	0.5 UJ
Dibromochloromethane		350	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane		175	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Dichlorodifluoromethane		3500	--	--	--	0.2 U	0.2 U	0.2 U	0.2 UJ
Dichloromethane (Methylene chloride)	5	1050	--	--	--	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	700	1750	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene		17.5	--	--	--	0.5 U	0.5 U	0.5 UJ	0.5 UJ
Isopropylbenzene (Cumene)		1750	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
m,p-Xylene			--	--	--	0.4 U	0.4 U	0.4 U	0.4 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-01	DSI-GP-02	DSI-GP-03	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-01-GW	DSI-GP-02-GW	DSI-GP-03-GW	DSI-MW-01-072209	DSI-GP-19-GW	DSI-GP-69-GW	DSI-GP-20-GW
		Sample Date	7/15/2009	7/15/2009	7/15/2009	7/22/2009	7/16/2009	7/16/2009	7/15/2009
		Sample Type	N	N	N	N	N	FD	N
		X	1267444.942240	1267499.153920	1267485.170900	1267511.080000	1267668.904820	1267668.904820	1267785.569970
		Y	204366.802869	204352.937108	204444.545110	204376.690000	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		1400	--	--	--	5 U	5 U	5 U	5 U
Methyl tert-butyl ether (MTBE)	20		--	--	--	0.5 U	0.5 U	0.5 U	0.5 U
Naphthalene		350	--	--	--	0.5 U	0.5 U	0.5 U	0.5 U
n-Butylbenzene			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
n-Propylbenzene		1750	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
o-Xylene		3500	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
sec-Butylbenzene			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Styrene		3500	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
tert-Butylbenzene			--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethene (PCE)	5	175	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Toluene	1000	1400	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene (TCE)	5		--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane (Fluorotrichloromethane)		5250	--	--	--	0.2 U	0.2 U	0.2 U	0.2 UJ
Vinyl chloride	0.2	52.5	--	--	--	**0.9**	**0.2**	**0.2**	0.2 UJ
Total Xylene (U = 1/2)	1000		--	--	--	0.4 U	0.4 U	0.4 U	0.4 U
Polycyclic Aromatic Hydrocarbons (PAH) (µg/l)									
1-Methylnaphthalene			0.01 U	0.01 U	--	**0.024**	**0.021**	**0.02**	**0.013**
2-Methylnaphthalene		70	**0.015**	**0.011**	--	**0.028**	**0.04**	**0.035**	**0.029**
Acenaphthene		2100	0.01 U	0.01 U	--	0.01 U	**0.011**	**0.011**	0.01 U
Acenaphthylene			0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	0.01 U
Anthracene		10500	0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(a)anthracene			0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(a)pyrene	0.1		0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(b)fluoranthene			0.01 UJ	0.01 UJ	--	0.01 U	0.01 U	0.01 U	0.01 UJ
Benzo(g,h,i)perylene			0.01 UJ	0.01 UJ	--	0.01 U	0.01 U	0.01 UJ	0.01 UJ
Benzo(k)fluoranthene			0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	0.01 U
Chrysene			0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	0.01 U
Dibenzo(a,h)anthracene			0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	0.01 U

Table 4

2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-01	DSI-GP-02	DSI-GP-03	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-01-GW	DSI-GP-02-GW	DSI-GP-03-GW	DSI-MW-01-072209	DSI-GP-19-GW	DSI-GP-69-GW	DSI-GP-20-GW
		Sample Date	7/15/2009	7/15/2009	7/15/2009	7/22/2009	7/16/2009	7/16/2009	7/15/2009
		Sample Type	N	N	N	N	N	FD	N
		X	1267444.942240	1267499.153920	1267485.170900	1267511.080000	1267668.904820	1267668.904820	1267785.569970
		Y	204366.802869	204352.937108	204444.545110	204376.690000	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Fluoranthene		1400	0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 U	0.01 U
Fluorene		1400	0.01 U	0.01 U	--	0.01 U	**0.023**	**0.021**	**0.023**
Indeno(1,2,3-c,d)pyrene			0.01 U	0.01 U	--	0.01 U	0.01 U	0.01 UJ	0.01 U
Naphthalene		350	**0.059**	**0.038**	--	**0.02**	**0.062**	**0.059**	**0.056**
Phenanthrene			0.01 U	0.01 U	--	0.01 U	**0.021**	**0.018**	**0.023**
Pyrene		1050	0.01 U	**0.014**	--	0.01 U	0.01 U	0.01 U	0.01 U
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	0.1		0.01 UJ	0.01 UJ	--	0.01 U	0.01 U	0.01 UJ	0.01 UJ
Total Naphthalenes (U = 1/2)	160		**0.079**	**0.054**	--	**0.072**	**0.12**	**0.11**	**0.098**
Semivolatile Organics (µg/l)									
1,2,4-Trichlorobenzene		175	1 UJ	1 UJ	--	1 UJ	1 UJ	1 UJ	1 UJ
1,2-Dichlorobenzene		1575	1 UJ	1 UJ	--	1 UJ	1 UJ	1 UJ	1 UJ
1,4-Dichlorobenzene			1 UJ	1 UJ	--	1 UJ	1 UJ	1 UJ	1 UJ
2,4-Dimethylphenol		350	1 U	1 U	--	1 U	1 UJ	1 UJ	1 U
2-Methylphenol (o-Cresol)		875	1 U	1 U	--	1 U	1 U	1 U	1 U
4-Methylphenol (p-Cresol)		87.5	1 U	1 U	--	1 U	1 UJ	1 U	1 U
Benzoic acid		140000	10 U	10 U	--	10 U	10 UJ	10 UJ	10 U
Benzyl alcohol		1750	5 U	5 U	--	5 U	5 UJ	5 U	5 U
Bis(2-ethylhexyl) phthalate		700	1 U	1 U	--	1 U	1 U	1 U	1 U
Butylbenzyl phthalate		7000	1 U	1 U	--	1 U	1 U	1 U	1 U
Dibenzofuran		35	0.01 U	0.01 U	--	0.01 U	**0.021**	**0.019**	**0.021**
Diethyl phthalate		28000	1 U	1 U	--	1 U	1 U	1 U	1 U
Dimethyl phthalate			1 U	1 U	--	1 U	1 U	1 U	1 U
Di-n-butyl phthalate		3500	1 U	1 U	--	1 U	1 U	1 U	1 U
Di-n-octyl phthalate			1 U	1 U	--	1 U	1 U	1 U	1 U
Hexachlorobenzene		28	1 U	1 U	--	1 U	1 U	1 U	1 U
Hexachlorobutadiene		17.5	1 UJ	1 UJ	--	1 UJ	1 UJ	1 UJ	1 UJ
Hexachloroethane		17.5	1 UJ	1 UJ	--	1 UJ	1 UJ	1 UJ	1 UJ
N-Nitrosodiphenylamine			1 UJ	1 UJ	--	1 UJ	1 UJ	1 UJ	1 UJ

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-01	DSI-GP-02	DSI-GP-03	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-01-GW	DSI-GP-02-GW	DSI-GP-03-GW	DSI-MW-01-072209	DSI-GP-19-GW	DSI-GP-69-GW	DSI-GP-20-GW
		Sample Date	7/15/2009	7/15/2009	7/15/2009	7/22/2009	7/16/2009	7/16/2009	7/15/2009
		Sample Type	N	N	N	N	N	FD	N
		X	1267444.942240	1267499.153920	1267485.170900	1267511.080000	1267668.904820	1267668.904820	1267785.569970
		Y	204366.802869	204352.937108	204444.545110	204376.690000	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Pentachlorophenol		175	5 UJ	5 UJ	--	5 U	5 UJ	5 UJ	5 UJ
Phenol		5250	1 U	1 U	--	1 U	1 UJ	1 U	1 U
Polychlorinated Biphenyl (PCB) Aroclors (µg/l)									
Aroclor 1016		2.45	--	--	--	--	--	--	--
Aroclor 1221			--	--	--	--	--	--	--
Aroclor 1232			--	--	--	--	--	--	--
Aroclor 1242			--	--	--	--	--	--	--
Aroclor 1248			--	--	--	--	--	--	--
Aroclor 1254		0.7	--	--	--	--	--	--	--
Aroclor 1260			--	--	--	--	--	--	--
Total PCB Aroclors (U = 1/2)	0.1		--	--	--	--	--	--	--
Pesticides (µg/l)									
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			--	--	--	--	--	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			--	--	--	--	--	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		17.5	--	--	--	--	--	--	--
Aldrin		0.525	--	--	--	--	--	--	--
alpha-Chlordane (cis-Chlordane)			--	--	--	--	--	--	--
alpha-Hexachlorocyclohexane (BHC)			--	--	--	--	--	--	--
beta-Hexachlorocyclohexane (BHC)			--	--	--	--	--	--	--
delta-Hexachlorocyclohexane (BHC)			--	--	--	--	--	--	--
Dieldrin		1.75	--	--	--	--	--	--	--
Endosulfan sulfate			--	--	--	--	--	--	--
Endosulfan-alpha (I)			--	--	--	--	--	--	--
Endosulfan-beta (II)			--	--	--	--	--	--	--
Endrin		10.5	--	--	--	--	--	--	--
Endrin aldehyde			--	--	--	--	--	--	--
Endrin ketone			--	--	--	--	--	--	--
gamma-Chlordane			--	--	--	--	--	--	--

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-Railspur Area	A-South Property Area	A-South Property Area	A-South Property Area
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-01	DSI-GP-02	DSI-GP-03	DSI-MW-01	DSI-GP-19	DSI-GP-19	DSI-GP-20
		Sample ID	DSI-GP-01-GW	DSI-GP-02-GW	DSI-GP-03-GW	DSI-MW-01-072209	DSI-GP-19-GW	DSI-GP-69-GW	DSI-GP-20-GW
		Sample Date	7/15/2009	7/15/2009	7/15/2009	7/22/2009	7/16/2009	7/16/2009	7/15/2009
		Sample Type	N	N	N	N	N	FD	N
		X	1267444.942240	1267499.153920	1267485.170900	1267511.080000	1267668.904820	1267668.904820	1267785.569970
		Y	204366.802869	204352.937108	204444.545110	204376.690000	204346.902103	204346.902103	204370.101158
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
gamma-Hexachlorocyclohexane (BHC) (Lindane)	0.2	10.5	--	--	--	--	--	--	--
Heptachlor		17.5	--	--	--	--	--	--	--
Heptachlor epoxide		0.2275	--	--	--	--	--	--	--
Hexachlorobenzene		28	--	--	--	--	--	--	--
Hexachlorobutadiene		17.5	--	--	--	--	--	--	--
Methoxychlor		175	--	--	--	--	--	--	--
Toxaphene			--	--	--	--	--	--	--
Total DDx (U = 1/2)	0.3		--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (mg/l)									
Diesel Range Hydrocarbons	0.5		--	--	--	--	0.25 U	0.25 U	0.25 U
Gasoline Range Hydrocarbons	0.8		--	--	--	--	0.25 U	0.25 U	0.25 U
Motor Oil Range			--	--	--	--	0.5 U	0.5 U	0.5 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

Site Area			A-South Property Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
Task			Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-GP-21	DSI-06	DSI-07	DSI-07	DSI-10	DSI-GP-08	DSI-GP-09
Sample ID			DSI-GP-21-GW	DSI06-GW	DSI07-GW	DSI57-GW	DSI10-GW	DSI-GP-08-GW	DSI-GP-09-GW
Sample Date			7/16/2009	9/27/2006	9/28/2006	9/28/2006	9/28/2006	7/16/2009	7/16/2009
Sample Type			N	N	N	FD	N	N	N
X			1267891.799470	1267832.573	1267843.294	1267843.294	1267928.635	1267860.111520	1267877.010250
Y			204378.830032	204403.4785	204440.1651	204440.1651	204456.0222	204436.109838	204409.648291
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Conventional Parameters (mg/l)									
Alkalinity, Bicarbonate as calcium cabonate (CaCO3)			--	--	--	--	--	--	--
Alkalinity, Carbonate as calcium cabonate (CaCO3)			--	--	--	--	--	--	--
Alkalinity, Hydroxide as calcium cabonate (CaCO3)			--	--	--	--	--	--	--
Alkalinity, total as calcium carbonate (CaCO3)			--	--	--	--	--	--	--
Chloride (total)			--	--	--	--	--	--	--
Nitrate + nitrite as nitrogen			--	--	--	--	--	--	--
Nitrate as nitrogen			--	--	--	--	--	--	--
Nitrite as nitrogen			--	--	--	--	--	--	--
Sulfate			--	--	--	--	--	--	--
Sulfide			--	--	--	--	--	--	--
Metals (µg/l)									
Arsenic			--	**2.3**	**9.5**	**7.2**	**2.4**	--	--
Cadmium			--	0.2 U	0.2 U	0.2 U	**0.3**	--	--
Chromium			--	2 U	**21**	**14**	**5**	--	--
Copper			--	**7.5**	**39.1**	**24**	**26.1**	--	--
Lead			--	**2**	**6**	**5**	**14**	--	--
Mercury			--	0.1 U	0.1 U	0.1 U	0.1 U	--	--
Nickel			--	--	--	--	--	--	--
Silver			--	0.2 U	0.2 U	0.2 U	0.2 U	--	--
Zinc			--	**9**	**61**	**42**	**19**	--	--
Metals, Dissolved (µg/l)									
Antimony		14	--	--	--	--	--	--	--
Arsenic	5	10.5	0.5 U	**1.8**	**3.8**	**4.2**	**0.8**	--	--
Cadmium	5	35	--	0.2 U	0.2 U	0.2 U	0.2 U	--	--
Chromium	50		--	0.5 U	2 U	2 U	2 U	--	--
Copper		1400	--	0.5 U	**0.6**	**1.1**	0.5 U	--	--
Lead	15		--	1 U	1 U	1 U	1 U	--	--

Table 4

2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	**A-South Property Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**
		Task	**Duwamish Shipyard RI**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**
		Location ID	**DSI-GP-21**	**DSI-06**	**DSI-07**	**DSI-07**	**DSI-10**	**DSI-GP-08**	**DSI-GP-09**
		Sample ID	**DSI-GP-21-GW**	**DSI06-GW**	**DSI07-GW**	**DSI57-GW**	**DSI10-GW**	**DSI-GP-08-GW**	**DSI-GP-09-GW**
		Sample Date	**7/16/2009**	**9/27/2006**	**9/28/2006**	**9/28/2006**	**9/28/2006**	**7/16/2009**	**7/16/2009**
		Sample Type	**N**	**N**	**N**	**FD**	**N**	**N**	**N**
		X	**1267891.799470**	**1267832.573**	**1267843.294**	**1267843.294**	**1267928.635**	**1267860.111520**	**1267877.010250**
		Y	**204378.830032**	**204403.4785**	**204440.1651**	**204440.1651**	**204456.0222**	**204436.109838**	**204409.648291**
		Coordinate Type	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**
	MTCA Method A Ground Water	**MTCA Method C Industrial**							
Mercury	2		--	0.1 U	0.1 U	0.1 U	0.1 U	--	--
Nickel		700	--	--	--	--	--	--	--
Selenium		175	--	--	--	--	--	--	--
Silver		175	--	0.2 U	0.2 U	0.2 U	0.2 U	--	--
Zinc		10500	--	**5**	**6**	**7**	**7**	--	--
Volatile Organics (µg/l)									
1,1,1,2-Tetrachloroethane		525	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane	200	35000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane		70	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane		3500	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.2**	**0.2**
1,1-Dichloroethene		875	--	0.2 U	0.2 U	0.2 U	0.2 U	--	--
1,1-Dichloropropene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane		70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene		175	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trimethylbenzene			**1**	0.2 U	**24**	**26**	0.2 U	**1.4**	**0.8**
1,2-Dibromo-3-chloropropane		3.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (Ethylene dibromide)	0.01	158	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene		1575	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane	5	350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethene, cis-		35	--	0.2 U	0.2 U	0.2 U	0.2 U	--	--
1,2-Dichloroethene, trans-		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene (Mesitylene)		175	**0.7**	0.2 U	**10**	**12**	0.2 U	**0.7**	**0.3**
1,3-Dichlorobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropene, cis-			--	0.2 U	0.2 U	0.2 U	0.2 U	--	--

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-South Property Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
		Task	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-21	DSI-06	DSI-07	DSI-07	DSI-10	DSI-GP-08	DSI-GP-09
		Sample ID	DSI-GP-21-GW	DSI06-GW	DSI07-GW	DSI57-GW	DSI10-GW	DSI-GP-08-GW	DSI-GP-09-GW
		Sample Date	7/16/2009	9/27/2006	9/28/2006	9/28/2006	9/28/2006	7/16/2009	7/16/2009
		Sample Type	N	N	N	FD	N	N	N
		X	1267891.799470	1267832.573	1267843.294	1267843.294	1267928.635	1267860.111520	1267877.010250
		Y	204378.830032	204403.4785	204440.1651	204440.1651	204456.0222	204436.109838	204409.648291
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
1,3-Dichloropropene, trans-			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,2-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Butanone (MEK)		10500	5 U	1 U	1 U	1 U	1 U	5 U	5 U
2-Chlorotoluene		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone (Methyl butyl ketone)			5 U	3 U	3 U	3 U	3 U	5 U	5 U
4-Chlorotoluene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Isopropyltoluene (4-Cymene)			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Acetone		15800	5 U	**3.8**	3 U	3 U	**4.7**	5 U	5 U
Benzene	5	70	**15**	**0.6**	**180**	**210**	0.2 U	**3.6**	**0.3**
Bromobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromochloromethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromodichloromethane		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform (Tribromomethane)		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromomethane (Methyl Bromide)		24.5	0.5 U	0.2 U	0.2 U	0.2 U	0.2 U	0.5 U	0.5 U
Carbon disulfide		1750	0.2 U	0.2 U	0.2 U	0.2 U	**0.3**	0.2 U	0.2 U
Carbon tetrachloride (Tetrachloromethane)		70	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform		175	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloromethane			0.5 U	0.2 U	0.2 U	0.2 U	0.2 U	0.5 U	0.5 U
Dibromochloromethane		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane		175	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichlorodifluoromethane		3500	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichloromethane (Methylene chloride)	5	1050	0.5 U	0.3 U	0.3 U	0.3 U	0.3 U	0.5 U	0.5 U
Ethylbenzene	700	1750	**0.6**	0.2 U	**10**	**11**	0.2 U	**2.2**	**0.7**
Hexachlorobutadiene		17.5	0.5 U	--	--	--	--	0.5 U	0.5 UJ
Isopropylbenzene (Cumene)		1750	**2**	0.2 U	**25**	**28**	0.2 U	**2**	0.2 U
m,p-Xylene			**2.6**	**0.4**	**6.4**	**7.1**	0.4 U	**2.5**	**1.2**

Table 4

2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

Site Area			**A-South Property Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**	**A-UST Removal Area**
Task			**Duwamish Shipyard RI**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**DSI 2006 Historic**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**
Location ID			**DSI-GP-21**	**DSI-06**	**DSI-07**	**DSI-07**	**DSI-10**	**DSI-GP-08**	**DSI-GP-09**
Sample ID			**DSI-GP-21-GW**	**DSI06-GW**	**DSI07-GW**	**DSI57-GW**	**DSI10-GW**	**DSI-GP-08-GW**	**DSI-GP-09-GW**
Sample Date			**7/16/2009**	**9/27/2006**	**9/28/2006**	**9/28/2006**	**9/28/2006**	**7/16/2009**	**7/16/2009**
Sample Type			**N**	**N**	**N**	**FD**	**N**	**N**	**N**
X			**1267891.799470**	**1267832.573**	**1267843.294**	**1267843.294**	**1267928.635**	**1267860.111520**	**1267877.010250**
Y			**204378.830032**	**204403.4785**	**204440.1651**	**204440.1651**	**204456.0222**	**204436.109838**	**204409.648291**
Coordinate Type			**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**
	MTCA Method A Ground Water	**MTCA Method C Industrial**							
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		1400	5 U	1 U	1 U	1 U	1 U	5 U	5 U
Methyl tert-butyl ether (MTBE)	20		0.5 U	0.2 U	0.2 U	0.2 U	0.2 U	0.5 U	0.5 U
Naphthalene		350	**3.8**	--	**4.7**	**4.2**	--	**15**	**28**
n-Butylbenzene			**0.8**	0.2 U	**14**	**13**	0.2 U	**0.6**	0.2 U
n-Propylbenzene		1750	**8**	0.2 U	**94**	**110**	0.2 U	**8.3**	0.2 U
o-Xylene		3500	**0.7**	**0.2**	0.2 U	**0.9**	0.2 U	**0.5**	**0.9**
sec-Butylbenzene			**0.7**	0.2 U	**8.2**	**8.5**	0.2 U	**0.5**	0.2 U
Styrene		3500	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.4**
tert-Butylbenzene			0.2 U	0.2 U	0.2 U	**0.5**	0.2 U	0.2 U	0.2 U
Tetrachloroethene (PCE)	5	175	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Toluene	1000	1400	**0.6**	**0.4**	**4.4**	**4.6**	**0.7**	**0.2**	**0.6**
Trichloroethene (TCE)	5		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane (Fluorotrichloromethane)		5250	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl chloride	0.2	52.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.2**
Total Xylene (U = 1/2)	1000		**3**	**0.6**	**7**	**8**	0.4 U	**3**	**2**
Polycyclic Aromatic Hydrocarbons (PAH) (µg/l)									
1-Methylnaphthalene			**4.6**	--	--	--	--	**4.4**	**2.7**
2-Methylnaphthalene		70	**1.2**	0.06 U	**32**	**28**	0.06 U	**3.5**	**3.2**
Acenaphthene		2100	1 U	**0.09**	**0.54**	**0.53**	**0.11**	**0.74**	**0.57**
Acenaphthylene			**0.069**	**0.01 J**	**0.06**	**0.06**	0.01 U	**0.37**	**1.5**
Anthracene		10500	**0.027**	**0.01 J**	**0.03**	**0.03**	0.01 U	**0.17**	**0.25**
Benzo(a)anthracene			0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.039**	**0.043**
Benzo(a)pyrene	0.1		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.018**	**0.022**
Benzo(b)fluoranthene			0.01 U	0.01 U	0.01 U	0.01 U	**0.01 J**	**0.014**	**0.011**
Benzo(g,h,i)perylene			**0.014**	0.01 U	**0.01 J**	0.01 U	**0.01 J**	**0.02**	**0.02**
Benzo(k)fluoranthene			0.01 U	0.01 U	0.01 U	0.01 U	**0.01 J**	0.01 U	**0.013**
Chrysene			**0.01**	**0.01 J**	**0.01 J**	**0.01 J**	**0.02**	**0.047**	**0.052**
Dibenzo(a,h)anthracene			0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.018**	**0.018**

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-South Property Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
		Task	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-21	DSI-06	DSI-07	DSI-07	DSI-10	DSI-GP-08	DSI-GP-09
		Sample ID	DSI-GP-21-GW	DSI06-GW	DSI07-GW	DSI57-GW	DSI10-GW	DSI-GP-08-GW	DSI-GP-09-GW
		Sample Date	7/16/2009	9/27/2006	9/28/2006	9/28/2006	9/28/2006	7/16/2009	7/16/2009
		Sample Type	N	N	N	FD	N	N	N
		X	1267891.799470	1267832.573	1267843.294	1267843.294	1267928.635	1267860.111520	1267877.010250
		Y	204378.830032	204403.4785	204440.1651	204440.1651	204456.0222	204436.109838	204409.648291
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Fluoranthene		1400	**0.027**	**0.03**	**0.02**	**0.02**	**0.01 J**	**0.17**	**0.26**
Fluorene		1400	**0.27**	**0.03**	**0.57**	**0.54**	**0.01 J**	**1.1**	**0.96**
Indeno(1,2,3-c,d)pyrene			1 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.022**	**0.022**
Naphthalene		350	**2**	**0.15**	--	--	**0.1**	**4**	**10**
Phenanthrene			**0.16**	**0.04**	**0.31**	**0.31**	**0.02**	**1.3**	**1.1**
Pyrene		1050	**0.033**	**0.05**	**0.02**	**0.02**	**0.01**	**0.2**	**0.3**
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	0.1		**0.057**	**0.008 J**	**0.008 J**	**0.008 J**	**0.009 J**	**0.028**	**0.033**
Total Naphthalenes (U = 1/2)	160		**7.8**	**0.2**	**32**	**28**	**0.1**	**12**	**20**
Semivolatile Organics (µg/l)									
1,2,4-Trichlorobenzene		175	1 UJ	--	--	--	--	1 UJ	1 UJ
1,2-Dichlorobenzene		1575	1 UJ	--	--	--	--	1 UJ	1 UJ
1,4-Dichlorobenzene			1 UJ	--	--	--	--	1 UJ	1 UJ
2,4-Dimethylphenol		350	1 UJ	--	--	--	--	1 UJ	1 UJ
2-Methylphenol (o-Cresol)		875	1 U	--	--	--	--	1 U	1 U
4-Methylphenol (p-Cresol)		87.5	1 U	--	--	--	--	1 U	1 U
Benzoic acid		140000	10 UJ	--	--	--	--	10 UJ	10 UJ
Benzyl alcohol		1750	5 U	--	--	--	--	5 U	5 U
Bis(2-ethylhexyl) phthalate		700	1 U	--	--	--	--	1 U	1 U
Butylbenzyl phthalate		7000	1 U	--	--	--	--	1 U	1 U
Dibenzofuran		35	**0.06**	**0.01 J**	**0.14**	**0.14**	0.01 U	**0.2**	**0.16**
Diethyl phthalate		28000	1 U	--	--	--	--	1 U	1 U
Dimethyl phthalate			1 U	--	--	--	--	1 U	1 U
Di-n-butyl phthalate		3500	1 U	--	--	--	--	1 U	1 U
Di-n-octyl phthalate			1 U	--	--	--	--	1 U	1 U
Hexachlorobenzene		28	1 U	--	--	--	--	1 U	1 U
Hexachlorobutadiene		17.5	1 UJ	--	--	--	--	1 UJ	1 UJ
Hexachloroethane		17.5	1 UJ	--	--	--	--	1 UJ	1 UJ
N-Nitrosodiphenylamine			1 UJ	--	--	--	--	1 UJ	1 UJ

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-South Property Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
		Task	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-21	DSI-06	DSI-07	DSI-07	DSI-10	DSI-GP-08	DSI-GP-09
		Sample ID	DSI-GP-21-GW	DSI06-GW	DSI07-GW	DSI57-GW	DSI10-GW	DSI-GP-08-GW	DSI-GP-09-GW
		Sample Date	7/16/2009	9/27/2006	9/28/2006	9/28/2006	9/28/2006	7/16/2009	7/16/2009
		Sample Type	N	N	N	FD	N	N	N
		X	1267891.799470	1267832.573	1267843.294	1267843.294	1267928.635	1267860.111520	1267877.010250
		Y	204378.830032	204403.4785	204440.1651	204440.1651	204456.0222	204436.109838	204409.648291
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Pentachlorophenol		175	5 UJ	--	--	--	--	5 UJ	5 UJ
Phenol		5250	1 U	--	--	--	--	1 U	1 U
Polychlorinated Biphenyl (PCB) Aroclors (µg/l)									
Aroclor 1016		2.45	--	0.02 U	0.02 U	0.02 U	0.02 U	--	--
Aroclor 1221			--	0.02 U	0.08 U	0.08 U	0.02 U	--	--
Aroclor 1232			--	0.02 U	0.04 U	0.08 U	0.02 U	--	--
Aroclor 1242			--	0.02 U	0.02 U	0.02 U	0.02 U	--	--
Aroclor 1248			--	0.02 U	0.02 U	0.02 U	0.02 U	--	--
Aroclor 1254		0.7	--	0.02 U	0.02 U	0.02 U	0.02 U	--	--
Aroclor 1260			--	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	--	--
Total PCB Aroclors (U = 1/2)	0.1		--	0.02 UJ	0.08 UJ	0.08 UJ	0.02 UJ	--	--
Pesticides (µg/l)									
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			--	0.011 U	0.01 U	0.01 U	0.01 U	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			--	0.011 U	0.01 U	0.01 U	0.01 U	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		17.5	--	0.011 U	0.01 U	0.01 U	0.01 U	--	--
Aldrin		0.525	--	0.0055 U	0.005 U	0.005 U	0.005 U	--	--
alpha-Chlordane (cis-Chlordane)			--	0.0055 U	0.005 U	0.005 U	0.005 U	--	--
alpha-Hexachlorocyclohexane (BHC)			--	0.0055 U	0.005 U	0.005 U	0.005 U	--	--
beta-Hexachlorocyclohexane (BHC)			--	0.0055 U	0.005 U	0.005 U	0.005 U	--	--
delta-Hexachlorocyclohexane (BHC)			--	0.0055 U	0.005 U	0.005 U	0.005 U	--	--
Dieldrin		1.75	--	0.011 U	0.01 U	0.01 U	0.01 U	--	--
Endosulfan sulfate			--	0.011 U	0.01 U	0.01 U	0.01 U	--	--
Endosulfan-alpha (I)			--	0.0055 U	0.005 U	0.005 U	0.005 U	--	--
Endosulfan-beta (II)			--	0.011 U	0.01 U	0.01 U	0.01 U	--	--
Endrin		10.5	--	0.011 U	0.01 U	0.01 U	0.01 U	--	--
Endrin aldehyde			--	0.011 U	0.01 U	0.01 U	0.01 U	--	--
Endrin ketone			--	0.011 U	0.01 U	0.01 U	0.01 U	--	--
gamma-Chlordane			--	0.0055 U	0.005 U	0.005 U	0.005 U	--	--

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-South Property Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area
		Task	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-GP-21	DSI-06	DSI-07	DSI-07	DSI-10	DSI-GP-08	DSI-GP-09
		Sample ID	DSI-GP-21-GW	DSI06-GW	DSI07-GW	DSI57-GW	DSI10-GW	DSI-GP-08-GW	DSI-GP-09-GW
		Sample Date	7/16/2009	9/27/2006	9/28/2006	9/28/2006	9/28/2006	7/16/2009	7/16/2009
		Sample Type	N	N	N	FD	N	N	N
		X	1267891.799470	1267832.573	1267843.294	1267843.294	1267928.635	1267860.111520	1267877.010250
		Y	204378.830032	204403.4785	204440.1651	204440.1651	204456.0222	204436.109838	204409.648291
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
gamma-Hexachlorocyclohexane (BHC) (Lindane)	0.2	10.5	--	0.0055 U	0.005 U	0.005 U	0.005 U	--	--
Heptachlor		17.5	--	0.0055 U	0.005 U	0.005 U	0.005 U	--	--
Heptachlor epoxide		0.2275	--	0.0055 U	0.005 U	0.005 U	0.005 U	--	--
Hexachlorobenzene		28	--	0.0055 U	0.005 U	0.005 U	0.005 U	--	--
Hexachlorobutadiene		17.5	--	0.0055 U	0.005 U	0.005 U	0.005 U	--	--
Methoxychlor		175	--	0.055 U	0.05 U	0.05 U	0.05 U	--	--
Toxaphene			--	0.55 U	0.5 U	0.5 U	0.5 U	--	--
Total DDx (U = 1/2)	0.3		--	0.011 U	0.01 U	0.01 U	0.01 U	--	--
Total Petroleum Hydrocarbons (mg/l)									
Diesel Range Hydrocarbons	0.5		0.25 U	0.25 U	**1.9**	**1.9**	0.25 U	0.25 U	0.25 U
Gasoline Range Hydrocarbons	0.8		**0.38**	0.25 U	**2**	**2.2**	0.25 U	**0.38**	0.25 U
Motor Oil Range			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-GP-10	DSI-GP-11	DSI-MW-04	DSI-MW-07	DSI-09	DSI-11	DSI-MW-05
		Sample ID	DSI-GP-10-GW	DSI-GP-11-GW	DSI-MW-04-072309	DSI-MW-07-072409	DSI09-GW	DSI11-GW	DSI-MW-05-072909
		Sample Date	7/16/2009	7/14/2009	7/23/2009	7/24/2009	9/28/2006	9/28/2006	7/29/2009
		Sample Type	N	N	N	N	N	N	N
		X	1267792.872320	1267873.094710	1267894.980000	1267953.320000	1267972.093	1267970.43	1267969.750000
		Y	204451.342065	204484.395476	204416.160000	204463.390000	204599.0992	204358.8091	204575.210000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Conventional Parameters (mg/l)									
Alkalinity, Bicarbonate as calcium cabonate (CaCO3)			--	--	**177**	--	--	--	--
Alkalinity, Carbonate as calcium cabonate (CaCO3)			--	--	1 U	--	--	--	--
Alkalinity, Hydroxide as calcium cabonate (CaCO3)			--	--	1 U	--	--	--	--
Alkalinity, total as calcium carbonate (CaCO3)			--	--	**177**	--	--	--	--
Chloride (total)			--	--	**526**	**15400**	--	--	**461**
Nitrate + nitrite as nitrogen			--	--	1 UJ	--	--	--	--
Nitrate as nitrogen			--	--	1 UJ	--	--	--	--
Nitrite as nitrogen			--	--	1 U	--	--	--	--
Sulfate			--	--	**55.1**	--	--	--	--
Sulfide			--	--	**0.086**	--	--	--	--
Metals (µg/l)									
Arsenic			--	--	--	--	**2.6**	**6.7**	--
Cadmium			--	--	--	--	0.2 U	**1.6**	--
Chromium			--	--	--	--	5 U	**34**	--
Copper			--	--	--	**2.72**	**34.4**	**49.2**	--
Lead			--	--	--	--	**55**	**10**	--
Mercury			--	--	--	--	0.1 U	0.1 U	--
Nickel			--	--	--	2.02 UJ	--	--	--
Silver			--	--	--	--	**0.2**	0.2 U	--
Zinc			--	--	--	--	**98**	**154**	--
Metals, Dissolved (µg/l)									
Antimony		14	--	--	0.2 U	1 U	--	--	0.2 U
Arsenic	5	10.5	--	--	**2.4**	2 U	**1.6**	**0.8**	**0.5**
Cadmium	5	35	--	--	0.2 U	1 U	0.2 U	0.2 U	0.2 U
Chromium	50		--	--	2 U	2 U	2 U	2 U	2 U
Copper		1400	--	--	**0.8**	**13 J**	**0.9**	0.5 U	**1.2**
Lead	15		--	--	1 U	5 U	1 U	1 U	1 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-GP-10	DSI-GP-11	DSI-MW-04	DSI-MW-07	DSI-09	DSI-11	DSI-MW-05
		Sample ID	DSI-GP-10-GW	DSI-GP-11-GW	DSI-MW-04-072309	DSI-MW-07-072409	DSI09-GW	DSI11-GW	DSI-MW-05-072909
		Sample Date	7/16/2009	7/14/2009	7/23/2009	7/24/2009	9/28/2006	9/28/2006	7/29/2009
		Sample Type	N	N	N	N	N	N	N
		X	1267792.872320	1267873.094710	1267894.980000	1267953.320000	1267972.093	1267970.43	1267969.750000
		Y	204451.342065	204484.395476	204416.160000	204463.390000	204599.0992	204358.8091	204575.210000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Mercury	2		--	--	0.02 U	0.02 U	0.1 U	0.1 U	0.02 U
Nickel		700	--	--	**1.6**	**16**	--	--	**5.2**
Selenium		175	--	--	2 U	10 U	--	--	**0.5**
Silver		175	--	--	0.2 U	1 U	0.2 U	0.2 U	0.2 U
Zinc		10500	--	--	4 U	20 U	**44**	**8**	**64**
Volatile Organics (µg/l)									
1,1,1,2-Tetrachloroethane		525	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane	200	35000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane		70	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane		3500	**0.2**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethene		875	--	--	--	--	0.2 U	0.2 U	--
1,1-Dichloropropene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane		70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene		175	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trimethylbenzene			0.2 U	0.2 U	**1.8**	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane		3.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (Ethylene dibromide)	0.01	158	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene		1575	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane	5	350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethene, cis-		35	--	--	--	--	0.2 U	0.2 U	--
1,2-Dichloroethene, trans-		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene (Mesitylene)		175	0.2 U	0.2 U	**0.6**	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropene, cis-			--	--	--	--	0.2 U	0.2 U	--

Table 4

2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**DSI 2006 Historic**	**DSI 2006 Historic**	**Duwamish Shipyard RI**
		Location ID	**DSI-GP-10**	**DSI-GP-11**	**DSI-MW-04**	**DSI-MW-07**	**DSI-09**	**DSI-11**	**DSI-MW-05**
		Sample ID	**DSI-GP-10-GW**	**DSI-GP-11-GW**	**DSI-MW-04-072309**	**DSI-MW-07-072409**	**DSI09-GW**	**DSI11-GW**	**DSI-MW-05-072909**
		Sample Date	**7/16/2009**	**7/14/2009**	**7/23/2009**	**7/24/2009**	**9/28/2006**	**9/28/2006**	**7/29/2009**
		Sample Type	**N**	**N**	**N**	**N**	**N**	**N**	**N**
		X	**1267792.872320**	**1267873.094710**	**1267894.980000**	**1267953.320000**	**1267972.093**	**1267970.43**	**1267969.750000**
		Y	**204451.342065**	**204484.395476**	**204416.160000**	**204463.390000**	**204599.0992**	**204358.8091**	**204575.210000**
		Coordinate Type	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**
	MTCA Method A Ground Water	**MTCA Method C Industrial**							
1,3-Dichloropropene, trans-			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,2-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ
2-Butanone (MEK)		10500	5 U	5 U	5 U	5 U	1 U	1 U	5 U
2-Chlorotoluene		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone (Methyl butyl ketone)			5 U	5 U	5 U	5 U	3 U	3 U	5 U
4-Chlorotoluene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Isopropyltoluene (4-Cymene)			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Acetone		15800	5 U	5 U	5 U	5 U	**4.7**	**6.3**	5 U
Benzene	5	70	0.2 U	0.2 U	**25**	0.2 U	0.2 U	0.2 U	0.2 U
Bromobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromochloromethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromodichloromethane		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform (Tribromomethane)		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromomethane (Methyl Bromide)		24.5	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U	0.2 U	0.5 U
Carbon disulfide		1750	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon tetrachloride (Tetrachloromethane)		70	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform		175	0.2 U	0.2 U	0.2 U	**0.2**	0.2 U	0.2 U	0.2 U
Chloromethane			0.5 U	0.5 U	0.5 U	0.5 U	0.2 U	0.2 U	0.5 U
Dibromochloromethane		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane		175	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichlorodifluoromethane		3500	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichloromethane (Methylene chloride)	5	1050	0.5 U	0.5 U	0.5 U	0.5 U	0.3 U	0.3 U	0.5 U
Ethylbenzene	700	1750	0.2 U	0.2 U	**2.1**	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene		17.5	0.5 U	0.5 U	0.5 UJ	0.5 UJ	--	--	0.5 U
Isopropylbenzene (Cumene)		1750	0.2 U	0.2 U	**0.8**	0.2 U	0.2 U	**0.5**	0.2 U
m,p-Xylene			0.4 U	0.4 U	**3**	0.4 U	0.4 U	**0.5**	0.4 U

Table 4

2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-GP-10	DSI-GP-11	DSI-MW-04	DSI-MW-07	DSI-09	DSI-11	DSI-MW-05
		Sample ID	DSI-GP-10-GW	DSI-GP-11-GW	DSI-MW-04-072309	DSI-MW-07-072409	DSI09-GW	DSI11-GW	DSI-MW-05-072909
		Sample Date	7/16/2009	7/14/2009	7/23/2009	7/24/2009	9/28/2006	9/28/2006	7/29/2009
		Sample Type	N	N	N	N	N	N	N
		X	1267792.872320	1267873.094710	1267894.980000	1267953.320000	1267972.093	1267970.43	1267969.750000
		Y	204451.342065	204484.395476	204416.160000	204463.390000	204599.0992	204358.8091	204575.210000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	**MTCA Method C Industrial**							
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		1400	5 U	5 U	5 U	5 U	1 U	1 U	5 U
Methyl tert-butyl ether (MTBE)	20		0.5 U	0.5 U	0.5 U	0.5 U	0.2 U	0.2 U	0.5 U
Naphthalene		350	0.5 U	0.5 U	**18**	0.5 U	--	--	0.5 U
n-Butylbenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
n-Propylbenzene		1750	0.2 U	0.2 U	**1.4**	0.2 U	0.2 U	**0.5**	0.2 U
o-Xylene		3500	0.2 U	0.2 U	**1.7**	0.2 U	0.2 U	**0.3**	0.2 U
sec-Butylbenzene			0.2 U	0.2 U	**0.2**	0.2 U	0.2 U	**0.2**	0.2 U
Styrene		3500	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
tert-Butylbenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethene (PCE)	5	175	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Toluene	1000	1400	0.2 U	0.2 U	**1**	0.2 U	**0.4**	**0.5**	0.2 U
Trichloroethene (TCE)	5		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane (Fluorotrichloromethane)		5250	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl chloride	0.2	52.5	**0.2**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Total Xylene (U = 1/2)	1000		0.4 U	0.4 U	**4.7**	0.4 U	0.4 U	**0.8**	0.4 U
Polycyclic Aromatic Hydrocarbons (PAH) (µg/l)									
1-Methylnaphthalene			**0.045**	**0.025**	**6**	0.01 U	--	--	0.01 U
2-Methylnaphthalene		70	**0.049**	**0.034**	**0.71**	0.01 U	0.08 U	0.07 U	0.01 U
Acenaphthene		2100	**0.051**	**0.017**	**1.6**	**0.19**	**0.05**	**0.22**	0.01 U
Acenaphthylene			0.01 U	0.01 U	**0.18**	0.01 U	0.01 U	**0.02**	0.01 U
Anthracene		10500	0.01 U	0.01 U	**0.12**	0.01 U	**0.02**	**0.01**	0.01 U
Benzo(a)anthracene			0.01 U	0.01 U	0.01 U	0.01 U	**0.01**	0.01 U	0.01 U
Benzo(a)pyrene	0.1		0.01 U	0.01 U	0.01 U	0.01 U	**0.01 J**	0.01 U	0.01 U
Benzo(b)fluoranthene			0.01 U	0.01 U	0.01 U	0.01 U	**0.01 J**	0.01 U	0.01 U
Benzo(g,h,i)perylene			0.01 U	**0.017**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(k)fluoranthene			0.01 U	0.01 U	0.01 U	0.01 U	**0.01 J**	0.01 U	0.01 U
Chrysene			0.01 U	**0.011**	0.01 U	0.01 U	**0.02**	**0.01 J**	0.01 U
Dibenzo(a,h)anthracene			0.01 U	**0.017**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-GP-10	DSI-GP-11	DSI-MW-04	DSI-MW-07	DSI-09	DSI-11	DSI-MW-05
		Sample ID	DSI-GP-10-GW	DSI-GP-11-GW	DSI-MW-04-072309	DSI-MW-07-072409	DSI09-GW	DSI11-GW	DSI-MW-05-072909
		Sample Date	7/16/2009	7/14/2009	7/23/2009	7/24/2009	9/28/2006	9/28/2006	7/29/2009
		Sample Type	N	N	N	N	N	N	N
		X	1267792.872320	1267873.094710	1267894.980000	1267953.320000	1267972.093	1267970.43	1267969.750000
		Y	204451.342065	204484.395476	204416.160000	204463.390000	204599.0992	204358.8091	204575.210000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Fluoranthene		1400	0.01 U	0.01 U	**0.018**	0.01 U	**0.04**	**0.03**	0.01 U
Fluorene		1400	**0.028**	0.01 U	**1**	**0.1**	**0.03**	**0.16**	0.01 U
Indeno(1,2,3-c,d)pyrene			0.01 U	**0.018**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Naphthalene		350	**0.097**	**0.034**	**7.2**	**0.02**	**0.1**	**0.2**	**0.024**
Phenanthrene			**0.026**	0.01 U	**0.77**	0.01 U	**0.13**	**0.04**	0.01 U
Pyrene		1050	0.01 U	0.01 U	**0.014**	0.01 U	**0.05**	**0.02**	0.01 U
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	0.1		0.01 U	**0.01**	0.01 U	0.01 U	**0.01 J**	**0.008 J**	0.01 U
Total Naphthalenes (U = 1/2)	160		**0.19**	**0.093**	**14**	**0.03**	**0.1**	**0.2**	**0.034**
Semivolatile Organics (µg/l)									
1,2,4-Trichlorobenzene		175	1 UJ	1 UJ	1 UJ	1 UJ	--	--	1 UJ
1,2-Dichlorobenzene		1575	1 UJ	1 UJ	1 UJ	1 UJ	--	--	1 UJ
1,4-Dichlorobenzene			1 UJ	1 UJ	1 UJ	1 UJ	--	--	1 UJ
2,4-Dimethylphenol		350	1 UJ	1 U	1 U	1 U	--	--	1 U
2-Methylphenol (o-Cresol)		875	1 U	1 U	1 U	1 U	--	--	1 U
4-Methylphenol (p-Cresol)		87.5	1 U	1 U	1 U	1 U	--	--	1 U
Benzoic acid		140000	10 UJ	10 U	10 U	10 U	--	--	10 U
Benzyl alcohol		1750	5 U	5 U	5 U	5 U	--	--	5 U
Bis(2-ethylhexyl) phthalate		700	1 U	1 U	1 U	1 U	--	--	1 U
Butylbenzyl phthalate		7000	1 U	1 U	1 U	1 U	--	--	1 U
Dibenzofuran		35	**0.021**	0.01 U	**0.2**	**0.03**	**0.01 J**	**0.03**	0.01 U
Diethyl phthalate		28000	1 U	1 U	1 U	1 U	--	--	1 U
Dimethyl phthalate			1 U	1 U	1 U	1 U	--	--	1 U
Di-n-butyl phthalate		3500	1 U	1 U	1 U	1 U	--	--	1 U
Di-n-octyl phthalate			1 U	1 U	1 U	1 U	--	--	1 U
Hexachlorobenzene		28	1 U	1 U	1 U	1 U	--	--	1 U
Hexachlorobutadiene		17.5	1 UJ	1 UJ	1 UJ	1 UJ	--	--	1 UJ
Hexachloroethane		17.5	1 UJ	1 UJ	1 UJ	1 UJ	--	--	1 UJ
N-Nitrosodiphenylamine			1 UJ	1 UJ	1 U	1 U	--	--	1 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-GP-10	DSI-GP-11	DSI-MW-04	DSI-MW-07	DSI-09	DSI-11	DSI-MW-05
		Sample ID	DSI-GP-10-GW	DSI-GP-11-GW	DSI-MW-04-072309	DSI-MW-07-072409	DSI09-GW	DSI11-GW	DSI-MW-05-072909
		Sample Date	7/16/2009	7/14/2009	7/23/2009	7/24/2009	9/28/2006	9/28/2006	7/29/2009
		Sample Type	N	N	N	N	N	N	N
		X	1267792.872320	1267873.094710	1267894.980000	1267953.320000	1267972.093	1267970.43	1267969.750000
		Y	204451.342065	204484.395476	204416.160000	204463.390000	204599.0992	204358.8091	204575.210000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
Pentachlorophenol		175	5 UJ	5 UJ	5 U	5 U	--	--	5 U
Phenol		5250	1 U	1 U	1 U	1 U	--	--	1 U
Polychlorinated Biphenyl (PCB) Aroclors (µg/l)									
Aroclor 1016		2.45	--	--	--	--	0.02 U	0.02 U	--
Aroclor 1221			--	--	--	--	0.02 U	0.02 U	--
Aroclor 1232			--	--	--	--	0.02 U	0.02 U	--
Aroclor 1242			--	--	--	--	0.02 U	0.02 U	--
Aroclor 1248			--	--	--	--	0.02 U	0.02 U	--
Aroclor 1254		0.7	--	--	--	--	0.02 U	0.02 U	--
Aroclor 1260			--	--	--	--	0.02 UJ	0.02 UJ	--
Total PCB Aroclors (U = 1/2)	0.1		--	--	--	--	0.02 UJ	0.02 UJ	--
Pesticides (µg/l)									
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			--	--	--	--	0.01 U	0.01 U	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			--	--	--	--	0.01 U	0.01 U	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		17.5	--	--	--	--	0.01 U	0.01 U	--
Aldrin		0.525	--	--	--	--	0.005 U	0.005 U	--
alpha-Chlordane (cis-Chlordane)			--	--	--	--	0.005 U	0.005 U	--
alpha-Hexachlorocyclohexane (BHC)			--	--	--	--	0.005 U	0.005 U	--
beta-Hexachlorocyclohexane (BHC)			--	--	--	--	0.005 U	0.005 U	--
delta-Hexachlorocyclohexane (BHC)			--	--	--	--	0.005 U	0.005 U	--
Dieldrin		1.75	--	--	--	--	0.01 U	0.01 U	--
Endosulfan sulfate			--	--	--	--	0.01 U	0.01 U	--
Endosulfan-alpha (I)			--	--	--	--	0.005 U	0.005 U	--
Endosulfan-beta (II)			--	--	--	--	0.01 U	0.01 U	--
Endrin		10.5	--	--	--	--	0.01 U	0.01 U	--
Endrin aldehyde			--	--	--	--	0.01 U	0.01 U	--
Endrin ketone			--	--	--	--	0.01 U	0.01 U	--
gamma-Chlordane			--	--	--	--	0.005 U	0.005 U	--

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	A-UST Removal Area	A-UST Removal Area	A-UST Removal Area	B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-GP-10	DSI-GP-11	DSI-MW-04	DSI-MW-07	DSI-09	DSI-11	DSI-MW-05
		Sample ID	DSI-GP-10-GW	DSI-GP-11-GW	DSI-MW-04-072309	DSI-MW-07-072409	DSI09-GW	DSI11-GW	DSI-MW-05-072909
		Sample Date	7/16/2009	7/14/2009	7/23/2009	7/24/2009	9/28/2006	9/28/2006	7/29/2009
		Sample Type	N	N	N	N	N	N	N
		X	1267792.872320	1267873.094710	1267894.980000	1267953.320000	1267972.093	1267970.43	1267969.750000
		Y	204451.342065	204484.395476	204416.160000	204463.390000	204599.0992	204358.8091	204575.210000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial							
gamma-Hexachlorocyclohexane (BHC) (Lindane)	0.2	10.5	--	--	--	--	0.005 U	0.005 U	--
Heptachlor		17.5	--	--	--	--	0.005 U	0.005 U	--
Heptachlor epoxide		0.2275	--	--	--	--	0.005 U	0.005 U	--
Hexachlorobenzene		28	--	--	--	--	0.005 U	0.005 U	--
Hexachlorobutadiene		17.5	--	--	--	--	0.005 U	0.005 U	--
Methoxychlor		175	--	--	--	--	0.05 U	0.05 U	--
Toxaphene			--	--	--	--	0.5 U	0.5 U	--
Total DDx (U = 1/2)	0.3		--	--	--	--	0.01 U	0.01 U	--
Total Petroleum Hydrocarbons (mg/l)									
Diesel Range Hydrocarbons	0.5		0.25 U	0.25 UJ	0.25 U	0.25 U	0.25 U	**3.2**	0.25 U
Gasoline Range Hydrocarbons	0.8		0.25 U	0.25 U	**0.32**	0.25 U	0.25 U	0.25 U	0.25 U
Motor Oil Range			0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Deep	B- Parcel D Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-MW-05	DSI-MW-06	DSI-MW-08	DSI-MW-10	DSI-12	DSI-MW-09
		Sample ID	DSI-MW-55-072909	DSI-MW-06-072909	DSI-MW-08-072809	DSI-MW-10-072809	DSI12-GW	DSI-MW-09-072809
		Sample Date	7/29/2009	7/29/2009	7/28/2009	7/28/2009	9/28/2006	7/28/2009
		Sample Type	FD	N	N	N	N	N
		X	1267969.750000	1267953.290000	1267967.620000	1267964.600000	1267970.416	1267963.770000
		Y	204575.210000	204456.310000	204366.340000	204275.460000	204269.044	204267.400000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial						
Conventional Parameters (mg/l)								
Alkalinity, Bicarbonate as calcium cabonate (CaCO3)			--	**174**	--	--	--	**152**
Alkalinity, Carbonate as calcium cabonate (CaCO3)			--	1 U	--	--	--	1 U
Alkalinity, Hydroxide as calcium cabonate (CaCO3)			--	1 U	--	--	--	1 U
Alkalinity, total as calcium carbonate (CaCO3)			--	**174**	--	--	--	**152**
Chloride (total)			--	**131**	**193**	**16800**	--	**456**
Nitrate + nitrite as nitrogen			--	0.1 U	--	--	--	0.01 U
Nitrate as nitrogen			--	0.1 U	--	--	--	0.01 U
Nitrite as nitrogen			--	**0.02**	--	--	--	0.01 U
Sulfate			--	**9.5**	--	--	--	**72.9**
Sulfide			--	**0.09**	--	--	--	0.05 U
Metals (µg/l)								
Arsenic			--	--	--	--	**32.5**	--
Cadmium			--	--	--	--	**0.3**	--
Chromium			--	--	--	--	**20**	--
Copper			--	--	--	**3.11**	**126**	--
Lead			--	--	--	--	**27**	--
Mercury			--	--	--	--	**0.12**	--
Nickel			--	--	--	2.02 UJ	--	--
Silver			--	--	--	--	**0.2**	--
Zinc			--	--	--	--	**109**	--
Metals, Dissolved (µg/l)								
Antimony		14	0.2 U	0.2 U	0.2 U	2 U	--	0.2 U
Arsenic	5	10.5	**0.4**	**1.1**	**2**	**3**	**5**	**1.1**
Cadmium	5	35	0.2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U
Chromium	50		2 U	2 U	2 U	5 U	0.5 U	1 U
Copper		1400	**0.9**	**0.8**	**0.8**	**19**	0.5 U	**1.2**
Lead	15		1 U	1 U	1 U	10 U	1 U	1 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Deep	B- Parcel D Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-MW-05	DSI-MW-06	DSI-MW-08	DSI-MW-10	DSI-12	DSI-MW-09
		Sample ID	DSI-MW-55-072909	DSI-MW-06-072909	DSI-MW-08-072809	DSI-MW-10-072809	DSI12-GW	DSI-MW-09-072809
		Sample Date	7/29/2009	7/29/2009	7/28/2009	7/28/2009	9/28/2006	7/28/2009
		Sample Type	FD	N	N	N	N	N
		X	1267969.750000	1267953.290000	1267967.620000	1267964.600000	1267970.416	1267963.770000
		Y	204575.210000	204456.310000	204366.340000	204275.460000	204269.044	204267.400000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial						
Mercury	2		0.02 U	0.02 U	0.02 U	0.02 U	0.1 U	0.02 U
Nickel		700	**5**	**1.8**	**1.2**	**13**	--	**0.9**
Selenium		175	0.5 U	**0.9**	**0.7**	**6**	--	2 U
Silver		175	0.2 U	0.2 U	0.2 U	2 U	0.2 U	0.2 U
Zinc		10500	**61**	4 U	4 U	40 U	4 U	4 U
Volatile Organics (µg/l)								
1,1,1,2-Tetrachloroethane		525	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane	200	35000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane		70	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane		3500	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethene		875	--	--	--	--	0.2 U	--
1,1-Dichloropropene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane		70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene		175	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trimethylbenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane		3.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (Ethylene dibromide)	0.01	158	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene		1575	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane	5	350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethene, cis-		35	--	--	--	--	0.2 U	--
1,2-Dichloroethene, trans-		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene (Mesitylene)		175	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropene, cis-			--	--	--	--	0.2 U	--

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Deep	B- Parcel D Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-MW-05	DSI-MW-06	DSI-MW-08	DSI-MW-10	DSI-12	DSI-MW-09
		Sample ID	DSI-MW-55-072909	DSI-MW-06-072909	DSI-MW-08-072809	DSI-MW-10-072809	DSI12-GW	DSI-MW-09-072809
		Sample Date	7/29/2009	7/29/2009	7/28/2009	7/28/2009	9/28/2006	7/28/2009
		Sample Type	FD	N	N	N	N	N
		X	1267969.750000	1267953.290000	1267967.620000	1267964.600000	1267970.416	1267963.770000
		Y	204575.210000	204456.310000	204366.340000	204275.460000	204269.044	204267.400000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial						
1,3-Dichloropropene, trans-			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,2-Dichloropropane			0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
2-Butanone (MEK)		10500	5 U	5 U	5 U	5 U	1 U	5 U
2-Chlorotoluene		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone (Methyl butyl ketone)			5 U	5 U	5 U	5 U	3 U	5 U
4-Chlorotoluene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Isopropyltoluene (4-Cymene)			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Acetone		15800	5 U	5 U	**5.2**	5 U	**6.3**	5 U
Benzene	5	70	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromochloromethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromodichloromethane		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform (Tribromomethane)		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromomethane (Methyl Bromide)		24.5	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U
Carbon disulfide		1750	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon tetrachloride (Tetrachloromethane)		70	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform		175	0.2 U	0.2 U	0.2 U	**0.2**	0.2 U	**0.2**
Chloromethane			0.5 U	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U
Dibromochloromethane		350	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane		175	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichlorodifluoromethane		3500	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichloromethane (Methylene chloride)	5	1050	0.5 U	0.5 U	0.5 U	0.5 U	0.3 U	0.5 U
Ethylbenzene	700	1750	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene		17.5	0.5 U	0.5 U	0.5 U	0.5 U	--	0.5 U
Isopropylbenzene (Cumene)		1750	0.2 U	0.2 U	**1.2**	0.2 U	**0.5**	0.2 U
m,p-Xylene			0.4 U	0.4 U	0.4 U	0.4 U	**0.5**	0.4 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Deep	B- Parcel D Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-MW-05	DSI-MW-06	DSI-MW-08	DSI-MW-10	DSI-12	DSI-MW-09
		Sample ID	DSI-MW-55-072909	DSI-MW-06-072909	DSI-MW-08-072809	DSI-MW-10-072809	DSI12-GW	DSI-MW-09-072809
		Sample Date	7/29/2009	7/29/2009	7/28/2009	7/28/2009	9/28/2006	7/28/2009
		Sample Type	FD	N	N	N	N	N
		X	1267969.750000	1267953.290000	1267967.620000	1267964.600000	1267970.416	1267963.770000
		Y	204575.210000	204456.310000	204366.340000	204275.460000	204269.044	204267.400000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial						
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))		1400	5 U	5 U	5 U	5 U	1 U	5 U
Methyl tert-butyl ether (MTBE)	20		0.5 U	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U
Naphthalene		350	0.5 U	0.5 U	0.5 U	0.5 U	--	0.5 U
n-Butylbenzene			0.2 U	0.2 U	**0.4**	0.2 U	0.2 U	0.2 U
n-Propylbenzene		1750	0.2 U	0.2 U	**1.6**	0.2 U	**0.5**	0.2 U
o-Xylene		3500	0.2 U	0.2 U	**0.2**	0.2 U	**0.3**	0.2 U
sec-Butylbenzene			0.2 U	0.2 U	**0.7**	0.2 U	**0.2**	0.2 U
Styrene		3500	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
tert-Butylbenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethene (PCE)	5	175	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Toluene	1000	1400	0.2 U	0.2 U	**0.4**	**0.5**	**0.4**	**0.4**
Trichloroethene (TCE)	5		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane (Fluorotrichloromethane)		5250	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl chloride	0.2	52.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Total Xylene (U = 1/2)	1000		0.4 U	0.4 U	**0.4**	0.4 U	**0.8**	0.4 U
Polycyclic Aromatic Hydrocarbons (PAH) (µg/l)								
1-Methylnaphthalene			0.01 U	**0.11**	**1.2**	**0.1**	--	**0.065**
2-Methylnaphthalene		70	0.01 U	**0.016**	**0.059**	0.01 U	**0.47**	0.01 U
Acenaphthene		2100	0.01 U	**4**	**0.7**	**0.26**	**2.2**	**0.41**
Acenaphthylene			0.01 U	0.01 U	0.01 U	**0.028**	**1.8**	**0.083**
Anthracene		10500	0.01 U	**0.024**	0.01 U	**0.15**	**2.6**	**0.017**
Benzo(a)anthracene			0.01 U	0.01 U	0.01 U	**0.011**	**3.4**	**0.034**
Benzo(a)pyrene	0.1		0.01 U	0.01 U	0.01 U	0.01 U	**3.5**	0.01 U
Benzo(b)fluoranthene			0.01 U	0.01 U	0.01 U	0.01 U	**2**	0.01 U
Benzo(g,h,i)perylene			0.01 U	0.01 U	0.01 U	0.01 U	**1.9**	0.01 U
Benzo(k)fluoranthene			0.01 U	0.01 U	0.01 U	0.01 U	**2.2**	0.01 U
Chrysene			0.01 U	0.01 U	0.01 U	**0.015**	**5**	**0.042**
Dibenzo(a,h)anthracene			0.01 U	0.01 U	0.01 U	0.01 U	**0.65**	0.01 U

Table 4

2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Deep	B- Parcel D Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-MW-05	DSI-MW-06	DSI-MW-08	DSI-MW-10	DSI-12	DSI-MW-09
		Sample ID	DSI-MW-55-072909	DSI-MW-06-072909	DSI-MW-08-072809	DSI-MW-10-072809	DSI12-GW	DSI-MW-09-072809
		Sample Date	7/29/2009	7/29/2009	7/28/2009	7/28/2009	9/28/2006	7/28/2009
		Sample Type	FD	N	N	N	N	N
		X	1267969.750000	1267953.290000	1267967.620000	1267964.600000	1267970.416	1267963.770000
		Y	204575.210000	204456.310000	204366.340000	204275.460000	204269.044	204267.400000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial						
Fluoranthene		1400	0.01 U	0.01 U	**0.011**	**0.17**	**8.5**	**0.33**
Fluorene		1400	0.01 U	**0.64**	**0.83**	**0.3**	**3.3**	**0.34**
Indeno(1,2,3-c,d)pyrene			0.01 U	0.01 U	0.01 U	0.01 U	**1.5**	0.01 U
Naphthalene		350	**0.013**	**0.016**	0.01 U	**0.036**	**1.2**	**0.038**
Phenanthrene			**0.011**	0.01 U	0.01 U	**0.43**	**5.6**	**0.02**
Pyrene		1050	0.01 U	**0.01**	**0.011**	**0.18**	**11**	**0.36**
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 1/2)	0.1		0.01 U	0.01 U	0.01 U	**0.0083**	**4.5**	**0.011**
Total Naphthalenes (U = 1/2)	160		**0.023**	**0.14**	**1.3**	**0.14**	**1.7**	**0.11**
Semivolatile Organics (µg/l)								
1,2,4-Trichlorobenzene		175	1 UJ	1 UJ	1 UJ	1 UJ	--	1 UJ
1,2-Dichlorobenzene		1575	1 UJ	1 UJ	1 UJ	1 UJ	--	1 UJ
1,4-Dichlorobenzene			1 UJ	1 UJ	1 UJ	1 UJ	--	1 UJ
2,4-Dimethylphenol		350	1 U	1 U	1 U	1 U	--	1 U
2-Methylphenol (o-Cresol)		875	1 U	1 U	1 U	1 U	--	1 U
4-Methylphenol (p-Cresol)		87.5	1 U	1 U	1 U	1 U	--	1 U
Benzoic acid		140000	10 U	10 U	10 U	10 U	--	10 U
Benzyl alcohol		1750	5 U	5 U	5 U	5 U	--	5 U
Bis(2-ethylhexyl) phthalate		700	1 U	1 U	1 U	1 U	--	1 U
Butylbenzyl phthalate		7000	1 U	1 U	1 U	1 U	--	1 U
Dibenzofuran		35	0.01 U	**0.062**	**0.25**	**0.026**	**0.44**	**0.018**
Diethyl phthalate		28000	1 U	1 U	1 U	1 U	--	1 U
Dimethyl phthalate			1 U	1 U	1 U	1 U	--	1 U
Di-n-butyl phthalate		3500	1 U	1 U	1 U	1 U	--	1 U
Di-n-octyl phthalate			1 U	1 U	1 U	1 U	--	1 U
Hexachlorobenzene		28	1 U	1 U	1 U	1 U	--	1 U
Hexachlorobutadiene		17.5	1 UJ	1 UJ	1 UJ	1 UJ	--	1 UJ
Hexachloroethane		17.5	1 UJ	1 UJ	1 UJ	1 UJ	--	1 UJ
N-Nitrosodiphenylamine			1 U	1 U	1 U	1 U	--	1 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Deep	B- Parcel D Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-MW-05	DSI-MW-06	DSI-MW-08	DSI-MW-10	DSI-12	DSI-MW-09
		Sample ID	DSI-MW-55-072909	DSI-MW-06-072909	DSI-MW-08-072809	DSI-MW-10-072809	DSI12-GW	DSI-MW-09-072809
		Sample Date	7/29/2009	7/29/2009	7/28/2009	7/28/2009	9/28/2006	7/28/2009
		Sample Type	FD	N	N	N	N	N
		X	1267969.750000	1267953.290000	1267967.620000	1267964.600000	1267970.416	1267963.770000
		Y	204575.210000	204456.310000	204366.340000	204275.460000	204269.044	204267.400000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial						
Pentachlorophenol		175	5 U	5 U	5 U	5 U	--	5 U
Phenol		5250	1 U	1 U	1 U	1 U	--	**2.7**
Polychlorinated Biphenyl (PCB) Aroclors (µg/l)								
Aroclor 1016		2.45	--	--	--	--	0.02 U	--
Aroclor 1221			--	--	--	--	0.02 U	--
Aroclor 1232			--	--	--	--	0.02 U	--
Aroclor 1242			--	--	--	--	0.02 U	--
Aroclor 1248			--	--	--	--	0.02 U	--
Aroclor 1254		0.7	--	--	--	--	0.02 U	--
Aroclor 1260			--	--	--	--	0.02 UJ	--
Total PCB Aroclors (U = 1/2)	0.1		--	--	--	--	0.02 UJ	--
Pesticides (µg/l)								
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)			--	--	--	--	0.01 U	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)			--	--	--	--	0.01 U	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)		17.5	--	--	--	--	0.01 U	--
Aldrin		0.525	--	--	--	--	0.005 U	--
alpha-Chlordane (cis-Chlordane)			--	--	--	--	0.005 U	--
alpha-Hexachlorocyclohexane (BHC)			--	--	--	--	0.005 U	--
beta-Hexachlorocyclohexane (BHC)			--	--	--	--	0.005 U	--
delta-Hexachlorocyclohexane (BHC)			--	--	--	--	0.005 U	--
Dieldrin		1.75	--	--	--	--	0.01 U	--
Endosulfan sulfate			--	--	--	--	0.01 U	--
Endosulfan-alpha (I)			--	--	--	--	0.005 U	--
Endosulfan-beta (II)			--	--	--	--	0.01 U	--
Endrin		10.5	--	--	--	--	0.01 U	--
Endrin aldehyde			--	--	--	--	0.01 U	--
Endrin ketone			--	--	--	--	0.01 U	--
gamma-Chlordane			--	--	--	--	0.005 U	--

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Screening Levels

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Deep	B- Parcel D Nearshore Shallow Monitoring Wells	B-Parcel D Nearshore Shallow Monitoring Wells
		Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI
		Location ID	DSI-MW-05	DSI-MW-06	DSI-MW-08	DSI-MW-10	DSI-12	DSI-MW-09
		Sample ID	DSI-MW-55-072909	DSI-MW-06-072909	DSI-MW-08-072809	DSI-MW-10-072809	DSI12-GW	DSI-MW-09-072809
		Sample Date	7/29/2009	7/29/2009	7/28/2009	7/28/2009	9/28/2006	7/28/2009
		Sample Type	FD	N	N	N	N	N
		X	1267969.750000	1267953.290000	1267967.620000	1267964.600000	1267970.416	1267963.770000
		Y	204575.210000	204456.310000	204366.340000	204275.460000	204269.044	204267.400000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	MTCA Method A Ground Water	MTCA Method C Industrial						
gamma-Hexachlorocyclohexane (BHC) (Lindane)	0.2	10.5	--	--	--	--	0.018 U	--
Heptachlor		17.5	--	--	--	--	0.005 U	--
Heptachlor epoxide		0.2275	--	--	--	--	0.005 U	--
Hexachlorobenzene		28	--	--	--	--	0.005 U	--
Hexachlorobutadiene		17.5	--	--	--	--	0.005 U	--
Methoxychlor		175	--	--	--	--	0.05 U	--
Toxaphene			--	--	--	--	0.5 U	--
Total DDx (U = 1/2)	0.3		--	--	--	--	0.01 U	--
Total Petroleum Hydrocarbons (mg/l)								
Diesel Range Hydrocarbons	0.5		0.25 U	0.25 U	0.25 UJ	0.25 UJ	**0.63**	0.25 UJ
Gasoline Range Hydrocarbons	0.8		0.25 U	0.25 U	**0.36**	0.25 U	0.25 U	0.25 U
Motor Oil Range			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table 4
2006 and 2009 Investigation Analytical Results for Groundwater Samples and Comparison with MTCA Method A and C Cleanup Levels

Notes:

Detected concentration is greater than MTCA Method A Groundwater screening level

Detected concentration is greater than MTCA Method C Industrial screening level

Bold = Detected result

J = Estimated value

U = Compound analyzed, but not detected above detection limit

UJ = Compound analyzed, but not detected above estimated detection limit

[a] = Well not re-sampled in 2009

µg/l = micrograms per liter

FD = Field Duplicate

mg/l = milligrams per liter

Totals are calculated as the sum of all detected results and one-half the undetected reporting limit. If all are undetected results, the highest reporting limit value is reported as the sum.

Total Naphthalenes includes Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene.

Total DDx consists of the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT if measured.

NAD83 = North American Datum 1983

N = Normal Field Sample

Carcinogenic PAH (cPAH) values include a minimum calculation of 7 analytes: Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene and Indeno(1,2,3-c,d)pyrene. The calculation is based on MTCA cleanup Regulation, Table 708-2 "Toxicity Equivalency Factors for Minimum Required Carcinogenic Polyaromatic Hydrocarbons (cPAHs)" under WAC 173-340-708(e).

Table 5

2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

				Site Area	Stormwater Solids	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
				Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-22	DSI-09	DSI-09	DSI-GP-12	DSI-GP-12	DSI-MW-05	DSI-MW-05
				Sample ID	DSI22-CB-060929	DSI09-SO-A	DSI09-SO-B	DSI-GP-12-1-3.5	DSI-GP-12-5-10	DSI-MW-05-0.5-3.0	DSI-MW-05-5-8
				Sample Date	9/29/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009	7/14/2009
				Depth	0 - 0 ft	0 - 3 feet	3 - 5 feet	1 - 3.5 feet	5 - 10 feet	0.5 - 3 feet	5 - 8 feet
				Sample Type	N	N	N	N	N	N	N
				X	1268018.19	1267972.093	1267972.093	1267998.939230	1267998.939230	1267969.750000	1267969.750000
				Y	204481.19	204599.0992	204599.0992	204597.248788	204597.248788	204575.210000	204575.210000
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
Conventional Parameters (pct)											
Moisture (water) content					--	--	--	--	--	--	--
Total organic carbon					3.28	0.939	2.35	--	--	--	--
Total solids					67	92.6	89.6	--	--	--	--
Grain Size (pct)											
Percent passing < 1.3 micron sieve					--	--	--	--	--	--	--
Percent retained 1.3 micron sieve					--	--	--	--	--	--	--
Percent retained 3.2 micron sieve					--	--	--	--	--	--	--
Percent retained 7 micron sieve					--	--	--	--	--	--	--
Percent retained 9 micron sieve					--	--	--	--	--	--	--
Percent retained 13 micron sieve					--	--	--	--	--	--	--
Percent retained 22 micron sieve					--	--	--	--	--	--	--
Percent retained 32 micron sieve					--	--	--	--	--	--	--
Percent retained 75 micron sieve (#200)					--	--	--	--	--	--	--
Percent retained 150 micron sieve (#100)					--	--	--	--	--	--	--
Percent retained 250 micron sieve (#60)					--	--	--	--	--	--	--
Percent retained 425 micron sieve (#40)					--	--	--	--	--	--	--
Percent retained 850 micron sieve (#20)					--	--	--	--	--	--	--
Percent retained 2000 micron sieve (#10)					--	--	--	--	--	--	--
Percent retained 4750 micron sieve (#4)					--	--	--	--	--	--	--
Percent retained 9500 micron sieve					--	--	--	--	--	--	--
Percent retained 12500 micron sieve					--	--	--	--	--	--	--
Percent retained 19000 micron sieve					--	--	--	--	--	--	--
Percent retained 25K micron sieve					--	--	--	--	--	--	--
Percent retained 37.5K micron sieve					--	--	--	--	--	--	--
Percent retained 50K micron sieve					--	--	--	--	--	--	--
Percent retained 75K micron sieve					--	--	--	--	--	--	--
Total Gravel					--	--	--	--	--	--	--
Total Sand					--	--	--	--	--	--	--
Total Silt					--	--	--	--	--	--	--
Total Clay					--	--	--	--	--	--	--

Table 5

2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

	2LAET	LAET	SMS SQS	SMS CSL							
Site Area					Stormwater Solids	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
Task					DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID					DSI-22	DSI-09	DSI-09	DSI-GP-12	DSI-GP-12	DSI-MW-05	DSI-MW-05
Sample ID					DSI22-CB-060929	DSI09-SO-A	DSI09-SO-B	DSI-GP-12-1-3.5	DSI-GP-12-5-10	DSI-MW-05-0.5-3.0	DSI-MW-05-5-8
Sample Date					9/29/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009	7/14/2009
Depth					0 - 0 ft	0 - 3 feet	3 - 5 feet	1 - 3.5 feet	5 - 10 feet	0.5 - 3 feet	5 - 8 feet
Sample Type					N	N	N	N	N	N	N
X					1268018.19	1267972.093	1267972.093	1267998.939230	1267998.939230	1267969.750000	1267969.750000
Y					204481.19	204599.0992	204599.0992	204597.248788	204597.248788	204575.210000	204575.210000
Coordinate Type					NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
Metals (mg/kg)											
Antimony					--	--	--	20 UJ	7 UJ	5 UJ	6 UJ
Arsenic	93	57	57	93	**29.7 J**	**3.7**	**20.2**	20 U	**9**	**12**	6 U
Cadmium	6.7	5.1	5.1	6.7	**2**	**0.3**	**8.5**	**0.9**	**0.4**	**0.2**	0.3 U
Chromium	270	260	260	270	**87**	**17.4**	**36**	**30 J**	**22.1 J**	**16.1 J**	**11.1 J**
Chromium VI					--	0.117 UJ	0.124 UJ	--	--	--	--
Copper	530	390	390	390	**2450**	**65.9**	**3310**	**251 J**	**57.8 J**	**38.6 J**	**11.2 J**
Lead	530	450	450	530	**350 J**	**118**	**4940**	**492 J**	**342 J**	**56 J**	3 UJ
Mercury	0.59	0.41	0.41	0.59	**1.05**	**0.31**	**0.18**	**0.59**	**0.07**	**0.12**	0.02 U
Nickel					--	--	--	**28 J**	**12 J**	**8 J**	**7 J**
Selenium					--	--	--	0.6 U	0.7 U	0.5 U	0.6 U
Silver			6.1	6.1	2 U	0.3 U	**1.2**	0.9 U	0.4 U	0.3 U	0.4 U
Zinc	960	410	410	960	**2600**	**115**	**5840**	**386**	**223**	**81**	**42**
Volatile Organics (µg/kg)											
1,1,1,2-Tetrachloroethane					--	1 U	1 UJ	--	--	--	--
1,1,1-Trichloroethane					--	1 U	1 U	--	--	--	--
1,1,2,2-Tetrachloroethane					--	1 U	1 UJ	--	--	--	--
1,1,2-Trichloroethane					--	1 U	1 U	--	--	--	--
1,1-Dichloroethane					--	1 U	1 U	--	--	--	--
1,1-Dichloroethene					--	1 U	1 U	--	--	--	--
1,1-Dichloropropene					--	1 U	1 U	--	--	--	--
1,2,3-Trichlorobenzene					--	5.2 U	5 UJ	--	--	--	--
1,2,3-Trichloropropane					--	2.1 U	2 UJ	--	--	--	--
1,2,4-Trichlorobenzene	51	31			--	5.2 U	5 UJ	--	--	--	--
1,2,4-Trimethylbenzene					--	1 U	**1.4 J**	--	--	--	--
1,2-Dibromo-3-chloropropane					--	5.2 U	5 UJ	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)					--	1 U	1 U	--	--	--	--
1,2-Dichlorobenzene	50	35			--	1 U	1 UJ	--	--	--	--
1,2-Dichloroethane					--	1 U	1 U	--	--	--	--
1,2-Dichloroethene, cis-					--	1 U	1 U	--	--	--	--
1,2-Dichloroethene, trans-					--	1 U	1 U	--	--	--	--
1,2-Dichloropropane					--	1 U	1 U	--	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)					--	1 U	1 UJ	--	--	--	--
1,3-Dichlorobenzene					--	1 U	1 UJ	--	--	--	--
1,3-Dichloropropane					--	1 U	1 UJ	--	--	--	--

Table 5
2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

Site Area					Stormwater Solids	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
Task					DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID					DSI-22	DSI-09	DSI-09	DSI-GP-12	DSI-GP-12	DSI-MW-05	DSI-MW-05
Sample ID					DSI22-CB-060929	DSI09-SO-A	DSI09-SO-B	DSI-GP-12-1-3.5	DSI-GP-12-5-10	DSI-MW-05-0.5-3.0	DSI-MW-05-5-8
Sample Date					9/29/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009	7/14/2009
Depth					0 - 0 ft	0 - 3 feet	3 - 5 feet	1 - 3.5 feet	5 - 10 feet	0.5 - 3 feet	5 - 8 feet
Sample Type					N	N	N	N	N	N	N
X					1268018.19	1267972.093	1267972.093	1267998.939230	1267998.939230	1267969.750000	1267969.750000
Y					204481.19	204599.0992	204599.0992	204597.248788	204597.248788	204575.210000	204575.210000
Coordinate Type					NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
1,3-Dichloropropene, cis-					--	1 U	1 U	--	--	--	--
1,3-Dichloropropene, trans-					--	1 U	1 U	--	--	--	--
1,4-Dichlorobenzene	120	110			--	1 U	1 UJ	--	--	--	--
2,2-Dichloropropane					--	1 U	1 U	--	--	--	--
2-Butanone (MEK)					--	**10**	5 U	--	--	--	--
2-Chlorotoluene					--	1 U	1 UJ	--	--	--	--
2-Hexanone (Methyl butyl ketone)					--	5.2 U	5 UJ	--	--	--	--
4-Chlorotoluene					--	1 U	1 UJ	--	--	--	--
4-Isopropyltoluene (4-Cymene)					--	1 U	1 UJ	--	--	--	--
Acetone					--	**100**	**55**	--	--	--	--
Benzene					--	**1**	**1.3**	--	--	--	--
Bromobenzene					--	1 U	1 UJ	--	--	--	--
Bromochloromethane					--	1 U	1 U	--	--	--	--
Bromodichloromethane					--	1 U	1 U	--	--	--	--
Bromoform (Tribromomethane)					--	1 U	1 UJ	--	--	--	--
Bromomethane (Methyl Bromide)					--	1 U	1 U	--	--	--	--
Carbon disulfide					--	1 U	**1.6**	--	--	--	--
Carbon tetrachloride (Tetrachloromethane)					--	1 U	1 U	--	--	--	--
Chloroethane					--	1 U	1 U	--	--	--	--
Chloroform					--	1 U	1 U	--	--	--	--
Chloromethane					--	1 U	1 U	--	--	--	--
Dibromochloromethane					--	1 U	1 UJ	--	--	--	--
Dibromomethane					--	1 U	1 U	--	--	--	--
Dichlorodifluoromethane					--	1 U	1 U	--	--	--	--
Dichloromethane (Methylene chloride)					--	2.1 U	2 U	--	--	--	--
Ethylbenzene					--	1 U	1 UJ	--	--	--	--
Isopropylbenzene (Cumene)					--	1 U	1 UJ	--	--	--	--
m,p-Xylene					--	1 U	1 UJ	--	--	--	--
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))					--	5.2 U	5 U	--	--	--	--
Methyl tert-butyl ether (MTBE)					--	1 U	1 U	--	--	--	--
n-Butylbenzene					--	1 U	1 UJ	--	--	--	--
n-Propylbenzene					--	1 U	1 UJ	--	--	--	--
o-Xylene					--	1 U	1 UJ	--	--	--	--
sec-Butylbenzene					--	1 U	1 UJ	--	--	--	--
Styrene					--	1 U	1 UJ	--	--	--	--

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				Site Area	Stormwater Solids	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
				Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-22	DSI-09	DSI-09	DSI-GP-12	DSI-GP-12	DSI-MW-05	DSI-MW-05
				Sample ID	DSI22-CB-060929	DSI09-SO-A	DSI09-SO-B	DSI-GP-12-1-3.5	DSI-GP-12-5-10	DSI-MW-05-0.5-3.0	DSI-MW-05-5-8
				Sample Date	9/29/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009	7/14/2009
				Depth	0 - 0 ft	0 - 3 feet	3 - 5 feet	1 - 3.5 feet	5 - 10 feet	0.5 - 3 feet	5 - 8 feet
				Sample Type	N	N	N	N	N	N	N
				X	1268018.19	1267972.093	1267972.093	1267998.939230	1267998.939230	1267969.750000	1267969.750000
				Y	204481.19	204599.0992	204599.0992	204597.248788	204597.248788	204575.210000	204575.210000
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
tert-Butylbenzene					--	1 U	1 UJ	--	--	--	--
Tetrachloroethene (PCE)					--	1 U	1 UJ	--	--	--	--
Toluene					--	1 U	1 U	--	--	--	--
Trichloroethene (TCE)					--	1 U	1 U	--	--	--	--
Trichlorofluoromethane (Fluorotrichloromethane)					--	1 U	1 U	--	--	--	--
Vinyl chloride					--	1 U	1 U	--	--	--	--
Volatile Organics (mg/kg-OC)											
1,2,4-Trichlorobenzene			0.81	1.8	--	0.55 U	0.21 UJ	--	--	--	--
1,2-Dichlorobenzene			2.3	2.3	--	0.11 U	0.043 UJ	--	--	--	--
1,4-Dichlorobenzene			3.1	9	--	0.11 U	0.043 UJ	--	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)											
1-Methylnaphthalene					--	--	--	12 U	19 U	19 U	19 U
2-Methylnaphthalene	1400	670			**160**	**47**	**34**	**17**	19 U	19 U	19 U
Acenaphthene	730	500			**740 J**	**82**	**30**	**19**	19 U	19 U	19 U
Acenaphthylene	1300	1300			59 U	**14**	**5.4**	**22**	19 U	**25**	19 U
Anthracene	4400	960			**440**	**87**	**19**	**57**	19 U	**61**	19 U
Benzo(a)anthracene	1600	1300			**480**	**160**	**27**	**110**	**51**	**230 J**	19 U
Benzo(a)pyrene	3000	1600			**690**	**180**	**23**	**110**	**45**	**220 J**	19 U
Benzo(b)fluoranthene					**740**	**240**	**35**	**170**	**61**	**220**	19 U
Benzo(g,h,i)perylene	720	670			**320**	**110**	**9.9**	**62**	**20**	**82 J**	19 U
Benzo(k)fluoranthene					**930**	**230**	**26**	**130**	**44**	**230 J**	19 U
Chrysene	2800	1400			**1300**	**280**	**54**	**140**	**65**	**260 J**	19 U
Dibenzo(a,h)anthracene	540	230			**80**	**38**	5 U	**24**	19 U	**37 J**	19 U
Fluoranthene	2500	1700			**3200**	**480**	**91**	**320**	**160**	**570 J**	19 U
Fluorene	1000	540			**580**	**88**	**35**	**17**	19 U	19 U	19 U
Indeno(1,2,3-c,d)pyrene	690	600			**280**	**110**	**9.4**	**52**	19 U	**83 J**	19 U
Naphthalene	2400	2100			**410**	**74**	**58**	**22**	19 U	19 U	19 U
Phenanthrene	5400	1500			**2200**	**370**	**140**	**270**	**33**	**370 J**	19 U
Pyrene	3300	2600			**2600 J**	**400**	**110**	**160**	**110**	**350 J**	19 U
Total Benzofluoranthenes (b,j,k) (U = 0)	3600	3200			**1700**	**470**	**61**	**300**	**100**	**450 J**	19 U
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 0)					**1000**	**260**	**33**	**160**	**61**	**300 J**	19 U
Total HPAH (SMS) (U = 0)	17000	12000			**10000 J**	**2000**	**390**	**1300**	**600**	**2300 J**	19 U
Total LPAH (SMS) (U = 0)	13000	5200			**4400 J**	**710**	**300**	**410**	**33**	**460 J**	19 U
Polycyclic Aromatic Hydrocarbons (mg/kg-OC)											
2-Methylnaphthalene			38	64	**4.9**	**5**	**1.4**	--	--	--	--

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				Site Area	Stormwater Solids	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
				Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-22	DSI-09	DSI-09	DSI-GP-12	DSI-GP-12	DSI-MW-05	DSI-MW-05
				Sample ID	DSI22-CB-060929	DSI09-SO-A	DSI09-SO-B	DSI-GP-12-1-3.5	DSI-GP-12-5-10	DSI-MW-05-0.5-3.0	DSI-MW-05-5-8
				Sample Date	9/29/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009	7/14/2009
				Depth	0 - 0 ft	0 - 3 feet	3 - 5 feet	1 - 3.5 feet	5 - 10 feet	0.5 - 3 feet	5 - 8 feet
				Sample Type	N	N	N	N	N	N	N
				X	1268018.19	1267972.093	1267972.093	1267998.939230	1267998.939230	1267969.750000	1267969.750000
				Y	204481.19	204599.0992	204599.0992	204597.248788	204597.248788	204575.210000	204575.210000
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	**LAET**	**SMS SQS**	**SMS CSL**							
Acenaphthene			16	57	**23 J**	**8.7**	**1**	--	--	--	--
Acenaphthylene			66	66	1.8 U	**1.5**	**0.23**	--	--	--	--
Anthracene			220	1200	**13**	**9.3**	**0.81**	--	--	--	--
Benzo(a)anthracene			110	270	**15**	**17**	**1.1**	--	--	--	--
Benzo(a)pyrene			99	210	**21**	**19**	**0.98**	--	--	--	--
Benzo(b)fluoranthene					**23**	**26**	**1.5**	--	--	--	--
Benzo(g,h,i)perylene			31	78	**9.8**	**12**	**0.42**	--	--	--	--
Benzo(k)fluoranthene					**28**	**24**	**1.1**	--	--	--	--
Chrysene			110	460	**40**	**30**	**2.3**	--	--	--	--
Dibenzo(a,h)anthracene			12	33	**2**	**4**	0.21 U	--	--	--	--
Fluoranthene			160	1200	**98**	**51**	**3.9**	--	--	--	--
Fluorene			23	79	**18**	**9.4**	**1.5**	--	--	--	--
Indeno(1,2,3-c,d)pyrene			34	88	**8.5**	**12**	**0.4**	--	--	--	--
Naphthalene			99	170	**13**	**7.9**	**2.5**	--	--	--	--
Phenanthrene			100	480	**67**	**39**	**6**	--	--	--	--
Pyrene			1000	1400	**79 J**	**40**	**4.7**	--	--	--	--
Total Benzofluoranthenes (b,j,k) (U = 0)			230	450	**51**	**50**	**2.6**	--	--	--	--
Total HPAH (SMS) (U = 0)			960	5300	**300 J**	**200**	**16**	--	--	--	--
Total LPAH (SMS) (U = 0)			370	780	**130 J**	**76**	**10**	--	--	--	--

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	2LAET	LAET	SMS SQS	SMS CSL							
Site Area					Stormwater Solids	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
Task					DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID					DSI-22	DSI-09	DSI-09	DSI-GP-12	DSI-GP-12	DSI-MW-05	DSI-MW-05
Sample ID					DSI22-CB-060929	DSI09-SO-A	DSI09-SO-B	DSI-GP-12-1-3.5	DSI-GP-12-5-10	DSI-MW-05-0.5-3.0	DSI-MW-05-5-8
Sample Date					9/29/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009	7/14/2009
Depth					0 - 0 ft	0 - 3 feet	3 - 5 feet	1 - 3.5 feet	5 - 10 feet	0.5 - 3 feet	5 - 8 feet
Sample Type					N	N	N	N	N	N	N
X					1268018.19	1267972.093	1267972.093	1267998.939230	1267998.939230	1267969.750000	1267969.750000
Y					204481.19	204599.0992	204599.0992	204597.248788	204597.248788	204575.210000	204575.210000
Coordinate Type					NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
Semivolatile Organics (µg/kg)											
1,2,4-Trichlorobenzene	51	31			59 U	--	--	12 U	19 U	19 U	19 U
1,2-Dichlorobenzene	50	35			59 U	--	--	12 U	19 U	19 U	19 U
1,3-Dichlorobenzene					59 UJ	--	--	--	--	--	--
1,4-Dichlorobenzene	120	110			59 U	--	--	12 U	19 U	19 U	19 U
2,4-Dimethylphenol			29	29	59 U	--	--	12 UJ	19 UJ	19 UJ	19 UJ
2-Methylphenol (o-Cresol)			63	63	59 U	--	--	12 U	19 U	19 UJ	19 U
4-Methylphenol (p-Cresol)			670	670	**96**	--	--	12 U	19 U	19 UJ	19 U
Benzoic acid			650	650	590 U	--	--	120 U	190 U	190 UJ	190 U
Benzyl alcohol			57	73	240 U	--	--	12 U	19 U	19 UJ	19 U
Bis(2-ethylhexyl) phthalate	1900	1300			**16000**	--	--	**24**	19 U	19 U	19 U
Butylbenzyl phthalate	900	63			**470**	--	--	12 U	19 U	19 U	19 U
Dibenzofuran	700	540			**480**	**32**	**18**	**38**	19 U	19 U	19 U
Diethyl phthalate	1200	200			59 U	--	--	12 U	19 U	19 U	19 U
Dimethyl phthalate	160	71			59 U	--	--	12 U	19 U	19 U	19 U
Di-n-butyl phthalate	5100	1400			**180**	--	--	**15**	19 U	19 U	19 U
Di-n-octyl phthalate		6200			**800**	--	--	12 U	19 U	19 U	19 U
Hexachlorobenzene	70	22			59 U	--	--	**300**	19 U	19 U	19 U
Hexachlorobutadiene	120	11			59 U	--	--	12 U	19 U	19 U	19 U
Hexachloroethane					59 U	--	--	12 U	19 U	19 UJ	19 U
N-Nitrosodiphenylamine					130 UJ	--	--	12 UJ	19 UJ	19 UJ	19 UJ
Pentachlorophenol			360	690	290 UJ	--	--	62 UJ	96 UJ	97 UJ	97 UJ
Phenol			420	1200	**140 J**	--	--	12 U	19 U	19 U	19 U
Semivolatile Organics (mg/kg-OC)											
Dibenzofuran			15	58	**15**	**3.4**	**0.77**	--	--	--	--
Polychlorinated Biphenyl (PCB) Aroclors (µg/kg)											
Aroclor 1016					190 U	9.6 U	9.8 U	--	--	--	--
Aroclor 1221					190 U	9.6 U	9.8 U	--	--	--	--
Aroclor 1232					190 U	9.6 U	9.8 U	--	--	--	--
Aroclor 1242					190 U	9.6 U	9.8 U	--	--	--	--
Aroclor 1248					190 U	9.6 U	9.8 U	--	--	--	--
Aroclor 1254					190 U	9.6 U	9.8 U	--	--	--	--
Aroclor 1260					390 U	9.6 U	9.8 U	--	--	--	--
Total PCB Aroclors (U = 0)	1000	130			390 U	9.6 U	9.8 U	--	--	--	--
PCB Aroclors (mg/kg-OC)											

Table 5
2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

				Site Area	Stormwater Solids	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
				Task	DSI 2006 Historic	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-22	DSI-09	DSI-09	DSI-GP-12	DSI-GP-12	DSI-MW-05	DSI-MW-05
				Sample ID	DSI22-CB-060929	DSI09-SO-A	DSI09-SO-B	DSI-GP-12-1-3.5	DSI-GP-12-5-10	DSI-MW-05-0.5-3.0	DSI-MW-05-5-8
				Sample Date	9/29/2006	9/28/2006	9/28/2006	7/14/2009	7/14/2009	7/14/2009	7/14/2009
				Depth	0 - 0 ft	0 - 3 feet	3 - 5 feet	1 - 3.5 feet	5 - 10 feet	0.5 - 3 feet	5 - 8 feet
				Sample Type	N	N	N	N	N	N	N
				X	1268018.19	1267972.093	1267972.093	1267998.939230	1267998.939230	1267969.750000	1267969.750000
				Y	204481.19	204599.0992	204599.0992	204597.248788	204597.248788	204575.210000	204575.210000
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
Total PCB Aroclors (U = 0)			12	65	12 U	1 U	0.42 U	--	--	--	--
Pesticides (µg/kg)											
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)					4 U	3.2 U	3.3 U	--	--	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)					4 UJ	3.2 U	3.3 U	--	--	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)					4 U	3.2 U	3.3 U	--	--	--	--
Aldrin					2 UJ	1.6 U	1.6 U	--	--	--	--
alpha-Chlordane (cis-Chlordane)					2 UJ	1.6 U	1.6 U	--	--	--	--
alpha-Hexachlorocyclohexane (BHC)					2 U	1.6 U	1.6 U	--	--	--	--
beta-Hexachlorocyclohexane (BHC)					2 U	1.6 U	1.6 U	--	--	--	--
delta-Hexachlorocyclohexane (BHC)					2 U	1.6 U	1.6 U	--	--	--	--
Dieldrin					4 UJ	3.2 U	3.3 U	--	--	--	--
Endosulfan sulfate					4 U	3.2 U	3.3 U	--	--	--	--
Endosulfan-alpha (I)					2 UJ	1.6 U	1.6 U	--	--	--	--
Endosulfan-beta (II)					4 U	3.2 U	3.3 U	--	--	--	--
Endrin					4 U	3.2 U	3.3 U	--	--	--	--
Endrin aldehyde					4 UJ	3.2 U	3.3 U	--	--	--	--
Endrin ketone					4 U	3.2 U	3.3 U	--	--	--	--
gamma-Chlordane					150 UJ	1.6 U	1.6 U	--	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)					2 U	1.6 U	1.6 U	--	--	--	--
Heptachlor					2 U	1.6 U	1.6 U	--	--	--	--
Heptachlor epoxide					2 UJ	1.6 U	1.6 U	--	--	--	--
Hexachlorobenzene	70	22			--	1.6 U	1.6 U	--	--	--	--
Hexachlorobutadiene	120	11			--	1.6 U	1.6 U	--	--	--	--
Methoxychlor					20 U	16 U	16 U	--	--	--	--
Toxaphene					200 U	160 U	160 U	--	--	--	--
Pesticides (mg/kg-OC)											
Hexachlorobenzene			0.38	2.3	--	0.17 U	0.068 U	--	--	--	--
Hexachlorobutadiene			3.9	6.2	--	0.17 U	0.068 U	--	--	--	--
Total Petroleum Hydrocarbons (mg/kg)											
Diesel Range Hydrocarbons					**1400**	**42**	**56**	**23**	7 U	**43**	6.2 U
Gasoline Range Hydrocarbons					20 U	**14**	**200**	7.5 U	8.6 U	4.1 U	5.2 U
Motor Oil Range					**4200**	**87**	**110**	**91**	**28**	**180**	**17**

Table 5
2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

				Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
				Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-GP-13	DSI-GP-13	DSI-MW-06	DSI-MW-06	DSI-GP-14	DSI-GP-14	DSI-GP-14
				Sample ID	DSI-GP-13-1-3.5	DSI-GP-13-5-7.3	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-GP-14-2.5-4.5	DSI-GP-14-5-7	DSI-GP-14-8-10
				Sample Date	7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/13/2009
				Depth	1 - 3.5 feet	5 - 7.3 feet	0.5 - 3.5 feet	5 - 8 feet	2.5 - 4.5 feet	5 - 7 feet	8 - 10 feet
				Sample Type	N	N	N	N	N	N	N
				X	1267988.722970	1267988.722970	1267953.290000	1267953.290000	1267995.395670	1267995.395670	1267995.395670
				Y	204516.839114	204516.839114	204456.310000	204456.310000	204444.875241	204444.875241	204444.875241
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
Conventional Parameters (pct)											
Moisture (water) content					11.59	--	15.5	31.48	--	--	--
Total organic carbon					--	--	--	--	--	--	--
Total solids					--	--	--	--	--	--	--
Grain Size (pct)											
Percent passing < 1.3 micron sieve					3.2	--	3.9	2.4	--	--	--
Percent retained 1.3 micron sieve					1.4	--	2	2.4	--	--	--
Percent retained 3.2 micron sieve					2.3	--	4.9	2.9	--	--	--
Percent retained 7 micron sieve					2.8	--	2.9	4.8	--	--	--
Percent retained 9 micron sieve					1.8	--	2.4	1.9	--	--	--
Percent retained 13 micron sieve					2.8	--	4.9	1.4	--	--	--
Percent retained 22 micron sieve					4.1	--	5.4	2.9	--	--	--
Percent retained 32 micron sieve					10.5	--	16.8	4.8	--	--	--
Percent retained 75 micron sieve (#200)					10.5	--	7.9	18.7	--	--	--
Percent retained 150 micron sieve (#100)					11.8	--	10	23.6	--	--	--
Percent retained 250 micron sieve (#60)					22.8	--	18.6	22.4	--	--	--
Percent retained 425 micron sieve (#40)					22.2	--	14.5	5.7	--	--	--
Percent retained 850 micron sieve (#20)					3.4	--	2.4	1	--	--	--
Percent retained 2000 micron sieve (#10)					0.5	--	0.9	0.7	--	--	--
Percent retained 4750 micron sieve (#4)					0.1 U	--	1.3	0.2	--	--	--
Percent retained 9500 micron sieve					0.1 U	--	1.2	1.3	--	--	--
Percent retained 12500 micron sieve					0.1 U	--	0.1 U	2.9	--	--	--
Percent retained 19000 micron sieve					0.1 U	--	0.1 U	0.1 U	--	--	--
Percent retained 25K micron sieve					0.1 U	--	0.1 U	0.1 U	--	--	--
Percent retained 37.5K micron sieve					0.1 U	--	0.1 U	0.1 U	--	--	--
Percent retained 50K micron sieve					0.1 U	--	0.1 U	0.1 U	--	--	--
Percent retained 75K micron sieve					0.1 U	--	0.1 U	0.1 U	--	--	--
Total Gravel					0.1 U	--	3	4	--	--	--
Total Sand					71	--	53	71	--	--	--
Total Silt					24	--	37	19	--	--	--
Total Clay					4.6	--	5.9	4.8	--	--	--

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2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

Site Area					B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
Task					Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID					DSI-GP-13	DSI-GP-13	DSI-MW-06	DSI-MW-06	DSI-GP-14	DSI-GP-14	DSI-GP-14
Sample ID					DSI-GP-13-1-3.5	DSI-GP-13-5-7.3	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-GP-14-2.5-4.5	DSI-GP-14-5-7	DSI-GP-14-8-10
Sample Date					7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/13/2009
Depth					1 - 3.5 feet	5 - 7.3 feet	0.5 - 3.5 feet	5 - 8 feet	2.5 - 4.5 feet	5 - 7 feet	8 - 10 feet
Sample Type					N	N	N	N	N	N	N
X					1267988.722970	1267988.722970	1267953.290000	1267953.290000	1267995.395670	1267995.395670	1267995.395670
Y					204516.839114	204516.839114	204456.310000	204456.310000	204444.875241	204444.875241	204444.875241
Coordinate Type					NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
Metals (mg/kg)											
Antimony					5 UJ	6 UJ	6 UJ	6 UJ	6 UJ	6 UJ	--
Arsenic	93	57	57	93	5 U	6 U	**6**	6 U	**9**	**8**	--
Cadmium	6.7	5.1	5.1	6.7	0.2 U	0.2 U	0.2 U	0.3 U	0.2 U	0.2 U	--
Chromium	270	260	260	270	**15.7**	**13.4**	**10.9**	**10.8**	**22**	**18.1**	--
Chromium VI					--	--	--	--	--	--	--
Copper	530	390	390	390	**46.5**	**26.3**	**19.7**	**21.9**	**159**	**85**	--
Lead	530	450	450	530	**53**	**10**	**9**	**5**	**98**	**52**	--
Mercury	0.59	0.41	0.41	0.59	**0.16**	**0.06**	**0.04**	0.03 U	**1.63**	**0.68**	--
Nickel					**8**	**11**	**7**	**8**	**14**	**14**	--
Selenium					0.5 U	0.6 U	0.6 U	0.7 U	0.6 U	0.6 U	--
Silver			6.1	6.1	0.3 U	0.4 U	0.3 U	0.4 U	0.3 U	0.4 U	--
Zinc	960	410	410	960	**98**	**53**	**34**	**27**	**227**	**133**	--
Volatile Organics (µg/kg)											
1,1,1,2-Tetrachloroethane					--	--	--	--	--	--	--
1,1,1-Trichloroethane					--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane					--	--	--	--	--	--	--
1,1,2-Trichloroethane					--	--	--	--	--	--	--
1,1-Dichloroethane					--	--	--	--	--	--	--
1,1-Dichloroethene					--	--	--	--	--	--	--
1,1-Dichloropropene					--	--	--	--	--	--	--
1,2,3-Trichlorobenzene					--	--	--	--	--	--	--
1,2,3-Trichloropropane					--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	51	31			--	--	--	--	--	--	--
1,2,4-Trimethylbenzene					--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane					--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)					--	--	--	--	--	--	--
1,2-Dichlorobenzene	50	35			--	--	--	--	--	--	--
1,2-Dichloroethane					--	--	--	--	--	--	--
1,2-Dichloroethene, cis-					--	--	--	--	--	--	--
1,2-Dichloroethene, trans-					--	--	--	--	--	--	--
1,2-Dichloropropane					--	--	--	--	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)					--	--	--	--	--	--	--
1,3-Dichlorobenzene					--	--	--	--	--	--	--
1,3-Dichloropropane					--	--	--	--	--	--	--

Table 5
2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

Site Area					B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
Task					Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID					DSI-GP-13	DSI-GP-13	DSI-MW-06	DSI-MW-06	DSI-GP-14	DSI-GP-14	DSI-GP-14
Sample ID					DSI-GP-13-1-3.5	DSI-GP-13-5-7.3	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-GP-14-2.5-4.5	DSI-GP-14-5-7	DSI-GP-14-8-10
Sample Date					7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/13/2009
Depth					1 - 3.5 feet	5 - 7.3 feet	0.5 - 3.5 feet	5 - 8 feet	2.5 - 4.5 feet	5 - 7 feet	8 - 10 feet
Sample Type					N	N	N	N	N	N	N
X					1267988.722970	1267988.722970	1267953.290000	1267953.290000	1267995.395670	1267995.395670	1267995.395670
Y					204516.839114	204516.839114	204456.310000	204456.310000	204444.875241	204444.875241	204444.875241
Coordinate Type					NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
1,3-Dichloropropene, cis-					--	--	--	--	--	--	--
1,3-Dichloropropene, trans-					--	--	--	--	--	--	--
1,4-Dichlorobenzene	120	110			--	--	--	--	--	--	--
2,2-Dichloropropane					--	--	--	--	--	--	--
2-Butanone (MEK)					--	--	--	--	--	--	--
2-Chlorotoluene					--	--	--	--	--	--	--
2-Hexanone (Methyl butyl ketone)					--	--	--	--	--	--	--
4-Chlorotoluene					--	--	--	--	--	--	--
4-Isopropyltoluene (4-Cymene)					--	--	--	--	--	--	--
Acetone					--	--	--	--	--	--	--
Benzene					--	--	--	--	--	--	--
Bromobenzene					--	--	--	--	--	--	--
Bromochloromethane					--	--	--	--	--	--	--
Bromodichloromethane					--	--	--	--	--	--	--
Bromoform (Tribromomethane)					--	--	--	--	--	--	--
Bromomethane (Methyl Bromide)					--	--	--	--	--	--	--
Carbon disulfide					--	--	--	--	--	--	--
Carbon tetrachloride (Tetrachloromethane)					--	--	--	--	--	--	--
Chloroethane					--	--	--	--	--	--	--
Chloroform					--	--	--	--	--	--	--
Chloromethane					--	--	--	--	--	--	--
Dibromochloromethane					--	--	--	--	--	--	--
Dibromomethane					--	--	--	--	--	--	--
Dichlorodifluoromethane					--	--	--	--	--	--	--
Dichloromethane (Methylene chloride)					--	--	--	--	--	--	--
Ethylbenzene					--	--	--	--	--	--	--
Isopropylbenzene (Cumene)					--	--	--	--	--	--	--
m,p-Xylene					--	--	--	--	--	--	--
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))					--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)					--	--	--	--	--	--	--
n-Butylbenzene					--	--	--	--	--	--	--
n-Propylbenzene					--	--	--	--	--	--	--
o-Xylene					--	--	--	--	--	--	--
sec-Butylbenzene					--	--	--	--	--	--	--
Styrene					--	--	--	--	--	--	--

Table 5

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Site Area					B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
Task					Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID					DSI-GP-13	DSI-GP-13	DSI-MW-06	DSI-MW-06	DSI-GP-14	DSI-GP-14	DSI-GP-14
Sample ID					DSI-GP-13-1-3.5	DSI-GP-13-5-7.3	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-GP-14-2.5-4.5	DSI-GP-14-5-7	DSI-GP-14-8-10
Sample Date					7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/13/2009
Depth					1 - 3.5 feet	5 - 7.3 feet	0.5 - 3.5 feet	5 - 8 feet	2.5 - 4.5 feet	5 - 7 feet	8 - 10 feet
Sample Type					N	N	N	N	N	N	N
X					1267988.722970	1267988.722970	1267953.290000	1267953.290000	1267995.395670	1267995.395670	1267995.395670
Y					204516.839114	204516.839114	204456.310000	204456.310000	204444.875241	204444.875241	204444.875241
Coordinate Type					NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
tert-Butylbenzene					--	--	--	--	--	--	--
Tetrachloroethene (PCE)					--	--	--	--	--	--	--
Toluene					--	--	--	--	--	--	--
Trichloroethene (TCE)					--	--	--	--	--	--	--
Trichlorofluoromethane (Fluorotrichloromethane)					--	--	--	--	--	--	--
Vinyl chloride					--	--	--	--	--	--	--
Volatile Organics (mg/kg-OC)											
1,2,4-Trichlorobenzene			0.81	1.8	--	--	--	--	--	--	--
1,2-Dichlorobenzene			2.3	2.3	--	--	--	--	--	--	--
1,4-Dichlorobenzene			3.1	9	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)											
1-Methylnaphthalene					**860**	**200**	19 U	19 U	**320**	**5600**	--
2-Methylnaphthalene	1400	670			**740**	**160**	19 U	19 U	**150**	**5900**	--
Acenaphthene	730	500			**130**	**64 J**	19 U	19 U	**110**	**460**	--
Acenaphthylene	1300	1300			33 U	80 U	19 U	19 U	41 U	58 U	--
Anthracene	4400	960			**460**	**89**	19 U	19 U	**70**	**78**	--
Benzo(a)anthracene	1600	1300			**380**	**110**	19 U	19 U	**120**	**76**	--
Benzo(a)pyrene	3000	1600			**390**	**120**	**30**	19 U	**130**	**76**	--
Benzo(b)fluoranthene					**250**	**83**	19 U	19 U	**170**	**88**	--
Benzo(g,h,i)perylene	720	670			**97**	80 U	19 U	19 U	**50**	58 U	--
Benzo(k)fluoranthene					**420**	**83**	19 U	19 U	**160**	**91**	--
Chrysene	2800	1400			**430**	**140**	**10 J**	19 U	**180**	**140**	--
Dibenzo(a,h)anthracene	540	230			**21 J**	80 U	19 U	19 U	**19 J**	58 U	--
Fluoranthene	2500	1700			**1300**	**260**	**21**	19 U	**380**	**260**	--
Fluorene	1000	540			**610**	**170**	19 U	19 U	**280**	**1200**	--
Indeno(1,2,3-c,d)pyrene	690	600			**87**	80 U	19 U	19 U	**50**	58 U	--
Naphthalene	2400	2100			**190**	**42 J**	19 U	19 U	30 U	190 U	--
Phenanthrene	5400	1500			**1400**	**470**	19 U	19 U	**300**	**1300**	--
Pyrene	3300	2600			**1000**	**320**	**17 J**	19 U	**300**	**230**	--
Total Benzofluoranthenes (b,j,k) (U = 0)	3600	3200			**670**	**170**	19 U	19 U	**330**	**180**	--
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 0)					**510 J**	**100**	**30 J**	19 U	**200 J**	**100**	--
Total HPAH (SMS) (U = 0)	17000	12000			**4000 J**	**1000**	**80 J**	19 U	**2000 J**	**960**	--
Total LPAH (SMS) (U = 0)	13000	5200			**2800**	**800 J**	19 U	19 U	**800**	**3000**	--
Polycyclic Aromatic Hydrocarbons (mg/kg-OC)											
2-Methylnaphthalene			38	64	--	--	--	--	--	--	--

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				Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
				Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-GP-13	DSI-GP-13	DSI-MW-06	DSI-MW-06	DSI-GP-14	DSI-GP-14	DSI-GP-14
				Sample ID	DSI-GP-13-1-3.5	DSI-GP-13-5-7.3	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-GP-14-2.5-4.5	DSI-GP-14-5-7	DSI-GP-14-8-10
				Sample Date	7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/13/2009
				Depth	1 - 3.5 feet	5 - 7.3 feet	0.5 - 3.5 feet	5 - 8 feet	2.5 - 4.5 feet	5 - 7 feet	8 - 10 feet
				Sample Type	N	N	N	N	N	N	N
				X	1267988.722970	1267988.722970	1267953.290000	1267953.290000	1267995.395670	1267995.395670	1267995.395670
				Y	204516.839114	204516.839114	204456.310000	204456.310000	204444.875241	204444.875241	204444.875241
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
Acenaphthene			16	57	--	--	--	--	--	--	--
Acenaphthylene			66	66	--	--	--	--	--	--	--
Anthracene			220	1200	--	--	--	--	--	--	--
Benzo(a)anthracene			110	270	--	--	--	--	--	--	--
Benzo(a)pyrene			99	210	--	--	--	--	--	--	--
Benzo(b)fluoranthene					--	--	--	--	--	--	--
Benzo(g,h,i)perylene			31	78	--	--	--	--	--	--	--
Benzo(k)fluoranthene					--	--	--	--	--	--	--
Chrysene			110	460	--	--	--	--	--	--	--
Dibenzo(a,h)anthracene			12	33	--	--	--	--	--	--	--
Fluoranthene			160	1200	--	--	--	--	--	--	--
Fluorene			23	79	--	--	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene			34	88	--	--	--	--	--	--	--
Naphthalene			99	170	--	--	--	--	--	--	--
Phenanthrene			100	480	--	--	--	--	--	--	--
Pyrene			1000	1400	--	--	--	--	--	--	--
Total Benzofluoranthenes (b,j,k) (U = 0)			230	450	--	--	--	--	--	--	--
Total HPAH (SMS) (U = 0)			960	5300	--	--	--	--	--	--	--
Total LPAH (SMS) (U = 0)			370	780	--	--	--	--	--	--	--

Table 5

2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

				Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
				Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-GP-13	DSI-GP-13	DSI-MW-06	DSI-MW-06	DSI-GP-14	DSI-GP-14	DSI-GP-14
				Sample ID	DSI-GP-13-1-3.5	DSI-GP-13-5-7.3	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-GP-14-2.5-4.5	DSI-GP-14-5-7	DSI-GP-14-8-10
				Sample Date	7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/13/2009
				Depth	1 - 3.5 feet	5 - 7.3 feet	0.5 - 3.5 feet	5 - 8 feet	2.5 - 4.5 feet	5 - 7 feet	8 - 10 feet
				Sample Type	N	N	N	N	N	N	N
				X	1267988.722970	1267988.722970	1267953.290000	1267953.290000	1267995.395670	1267995.395670	1267995.395670
				Y	204516.839114	204516.839114	204456.310000	204456.310000	204444.875241	204444.875241	204444.875241
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
Semivolatile Organics (µg/kg)											
1,2,4-Trichlorobenzene	51	31			33 U	80 U	19 U	19 U	30 U	58 U	--
1,2-Dichlorobenzene	50	35			33 U	80 U	19 U	19 U	30 U	58 U	--
1,3-Dichlorobenzene					--	--	--	--	--	--	--
1,4-Dichlorobenzene	120	110			33 U	80 U	19 U	19 U	30 U	58 U	--
2,4-Dimethylphenol			29	29	35 U	80 U	19 U	19 U	31 U	58 U	--
2-Methylphenol (o-Cresol)			63	63	33 U	80 U	19 U	19 U	30 U	58 U	--
4-Methylphenol (p-Cresol)			670	670	33 U	80 U	19 U	19 U	30 U	58 U	--
Benzoic acid			650	650	330 U	800 U	190 UJ	190 UJ	300 U	580 U	--
Benzyl alcohol			57	73	33 U	80 U	19 U	19 U	30 U	58 U	--
Bis(2-ethylhexyl) phthalate	1900	1300			**22 J**	80 U	19 U	19 U	**56**	**38 J**	--
Butylbenzyl phthalate	900	63			33 U	80 U	19 U	19 U	30 U	58 U	--
Dibenzofuran	700	540			**89**	80 U	19 U	19 U	**70**	**290**	--
Diethyl phthalate	1200	200			33 U	80 U	19 U	19 U	30 U	58 U	--
Dimethyl phthalate	160	71			33 U	80 U	19 U	19 U	30 U	58 U	--
Di-n-butyl phthalate	5100	1400			33 U	80 U	19 U	19 U	30 U	58 U	--
Di-n-octyl phthalate		6200			33 U	80 U	19 U	19 U	30 U	58 U	--
Hexachlorobenzene	70	22			33 U	80 U	19 U	19 U	30 U	58 U	--
Hexachlorobutadiene	120	11			33 U	80 U	19 U	19 U	30 U	58 U	--
Hexachloroethane					33 U	80 U	19 U	19 U	30 U	58 U	--
N-Nitrosodiphenylamine					440 UJ	97 UJ	19 UJ	19 UJ	190 UJ	670 UJ	--
Pentachlorophenol			360	690	160 U	400 U	95 UJ	96 UJ	150 U	290 U	--
Phenol			420	1200	33 U	80 U	19 U	19 U	30 U	58 U	--
Semivolatile Organics (mg/kg-OC)											
Dibenzofuran			15	58	--	--	--	--	--	--	--
Polychlorinated Biphenyl (PCB) Aroclors (µg/kg)											
Aroclor 1016					--	--	--	--	--	--	--
Aroclor 1221					--	--	--	--	--	--	--
Aroclor 1232					--	--	--	--	--	--	--
Aroclor 1242					--	--	--	--	--	--	--
Aroclor 1248					--	--	--	--	--	--	--
Aroclor 1254					--	--	--	--	--	--	--
Aroclor 1260					--	--	--	--	--	--	--
Total PCB Aroclors (U = 0)	1000	130			--	--	--	--	--	--	--
PCB Aroclors (mg/kg-OC)											

Table 5
2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

				Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
				Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-GP-13	DSI-GP-13	DSI-MW-06	DSI-MW-06	DSI-GP-14	DSI-GP-14	DSI-GP-14
				Sample ID	DSI-GP-13-1-3.5	DSI-GP-13-5-7.3	DSI-MW-06-0.5-3.5	DSI-MW-06-5-8	DSI-GP-14-2.5-4.5	DSI-GP-14-5-7	DSI-GP-14-8-10
				Sample Date	7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009	7/13/2009
				Depth	1 - 3.5 feet	5 - 7.3 feet	0.5 - 3.5 feet	5 - 8 feet	2.5 - 4.5 feet	5 - 7 feet	8 - 10 feet
				Sample Type	N	N	N	N	N	N	N
				X	1267988.722970	1267988.722970	1267953.290000	1267953.290000	1267995.395670	1267995.395670	1267995.395670
				Y	204516.839114	204516.839114	204456.310000	204456.310000	204444.875241	204444.875241	204444.875241
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
Total PCB Aroclors (U = 0)			12	65	--	--	--	--	--	--	--
Pesticides (µg/kg)											
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)					--	--	--	--	--	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)					--	--	--	--	--	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)					--	--	--	--	--	--	--
Aldrin					--	--	--	--	--	--	--
alpha-Chlordane (cis-Chlordane)					--	--	--	--	--	--	--
alpha-Hexachlorocyclohexane (BHC)					--	--	--	--	--	--	--
beta-Hexachlorocyclohexane (BHC)					--	--	--	--	--	--	--
delta-Hexachlorocyclohexane (BHC)					--	--	--	--	--	--	--
Dieldrin					--	--	--	--	--	--	--
Endosulfan sulfate					--	--	--	--	--	--	--
Endosulfan-alpha (I)					--	--	--	--	--	--	--
Endosulfan-beta (II)					--	--	--	--	--	--	--
Endrin					--	--	--	--	--	--	--
Endrin aldehyde					--	--	--	--	--	--	--
Endrin ketone					--	--	--	--	--	--	--
gamma-Chlordane					--	--	--	--	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)					--	--	--	--	--	--	--
Heptachlor					--	--	--	--	--	--	--
Heptachlor epoxide					--	--	--	--	--	--	--
Hexachlorobenzene	70	22			--	--	--	--	--	--	--
Hexachlorobutadiene	120	11			--	--	--	--	--	--	--
Methoxychlor					--	--	--	--	--	--	--
Toxaphene					--	--	--	--	--	--	--
Pesticides (mg/kg-OC)											
Hexachlorobenzene			0.38	2.3	--	--	--	--	--	--	--
Hexachlorobutadiene			3.9	6.2	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (mg/kg)											
Diesel Range Hydrocarbons					**1300**	**160**	**270**	**7.2**	**760**	**1800**	--
Gasoline Range Hydrocarbons					**310**	**17**	7.2 U	8.6 U	**320**	**820**	9.3 U
Motor Oil Range					**750**	**350**	**40**	**14**	**300**	**270**	--

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				Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
				Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-MW-08	DSI-MW-08	DSI-GP-16	DSI-GP-16
				Sample ID	DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
				Sample Date	7/13/2009	7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009
				Depth	1.5 - 4 feet	6 - 8 feet	8 - 10 feet	0.5 - 2 feet	5 - 8 feet	2.1 - 4.5 feet	7.5 - 10 feet
				Sample Type	N	N	N	N	N	N	N
				X	1267993.205440	1267993.205440	1267993.205440	1267967.620000	1267967.620000	1268022.755370	1268022.755370
				Y	204385.906847	204385.906847	204385.906847	204366.340000	204366.340000	204368.452602	204368.452602
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
Conventional Parameters (pct)											
Moisture (water) content					--	--	--	--	--	--	--
Total organic carbon					--	--	--	--	--	--	--
Total solids					--	--	--	--	--	--	--
Grain Size (pct)											
Percent passing < 1.3 micron sieve					--	--	--	--	--	--	--
Percent retained 1.3 micron sieve					--	--	--	--	--	--	--
Percent retained 3.2 micron sieve					--	--	--	--	--	--	--
Percent retained 7 micron sieve					--	--	--	--	--	--	--
Percent retained 9 micron sieve					--	--	--	--	--	--	--
Percent retained 13 micron sieve					--	--	--	--	--	--	--
Percent retained 22 micron sieve					--	--	--	--	--	--	--
Percent retained 32 micron sieve					--	--	--	--	--	--	--
Percent retained 75 micron sieve (#200)					--	--	--	--	--	--	--
Percent retained 150 micron sieve (#100)					--	--	--	--	--	--	--
Percent retained 250 micron sieve (#60)					--	--	--	--	--	--	--
Percent retained 425 micron sieve (#40)					--	--	--	--	--	--	--
Percent retained 850 micron sieve (#20)					--	--	--	--	--	--	--
Percent retained 2000 micron sieve (#10)					--	--	--	--	--	--	--
Percent retained 4750 micron sieve (#4)					--	--	--	--	--	--	--
Percent retained 9500 micron sieve					--	--	--	--	--	--	--
Percent retained 12500 micron sieve					--	--	--	--	--	--	--
Percent retained 19000 micron sieve					--	--	--	--	--	--	--
Percent retained 25K micron sieve					--	--	--	--	--	--	--
Percent retained 37.5K micron sieve					--	--	--	--	--	--	--
Percent retained 50K micron sieve					--	--	--	--	--	--	--
Percent retained 75K micron sieve					--	--	--	--	--	--	--
Total Gravel					--	--	--	--	--	--	--
Total Sand					--	--	--	--	--	--	--
Total Silt					--	--	--	--	--	--	--
Total Clay					--	--	--	--	--	--	--

Table 5

2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

	2LAET	LAET	SMS SQS	SMS CSL							
Site Area					B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
Task					Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID					DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-MW-08	DSI-MW-08	DSI-GP-16	DSI-GP-16
Sample ID					DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
Sample Date					7/13/2009	7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009
Depth					1.5 - 4 feet	6 - 8 feet	8 - 10 feet	0.5 - 2 feet	5 - 8 feet	2.1 - 4.5 feet	7.5 - 10 feet
Sample Type					N	N	N	N	N	N	N
X					1267993.205440	1267993.205440	1267993.205440	1267967.620000	1267967.620000	1268022.755370	1268022.755370
Y					204385.906847	204385.906847	204385.906847	204366.340000	204366.340000	204368.452602	204368.452602
Coordinate Type					NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
Metals (mg/kg)											
Antimony					5 UJ	6 UJ	--	5 UJ	6 UJ	5 UJ	7 UJ
Arsenic	93	57	57	93	5 U	6 U	--	**8**	6 U	5 U	7 U
Cadmium	6.7	5.1	5.1	6.7	0.2 U	0.3 U	--	**0.3**	0.2 U	0.2 U	0.3 U
Chromium	270	260	260	270	**11.5**	**12.9**	--	**19.8**	**9.7**	**10.6**	**14**
Chromium VI					--	--	--	--	--	--	--
Copper	530	390	390	390	**8.4**	**11.4**	--	**77.8**	**18.3**	**8**	**18.7**
Lead	530	450	450	530	**3**	3 U	--	**56**	**5**	2 U	**6**
Mercury	0.59	0.41	0.41	0.59	0.02 U	0.03 U	--	**0.21**	**0.1**	0.02 U	0.03 U
Nickel					**7**	**9**	--	**17**	**11**	**7**	**10**
Selenium					0.5 U	0.6 U	--	0.5 U	0.6 U	0.5 U	0.7 U
Silver			6.1	6.1	0.3 U	0.4 U	--	0.3 U	0.4 U	0.3 U	0.4 U
Zinc	960	410	410	960	**23**	**25**	--	**91**	**39**	**23**	**43**
Volatile Organics (µg/kg)											
1,1,1,2-Tetrachloroethane					--	--	--	--	--	--	--
1,1,1-Trichloroethane					--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane					--	--	--	--	--	--	--
1,1,2-Trichloroethane					--	--	--	--	--	--	--
1,1-Dichloroethane					--	--	--	--	--	--	--
1,1-Dichloroethene					--	--	--	--	--	--	--
1,1-Dichloropropene					--	--	--	--	--	--	--
1,2,3-Trichlorobenzene					--	--	--	--	--	--	--
1,2,3-Trichloropropane					--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	51	31			--	--	--	--	--	--	--
1,2,4-Trimethylbenzene					--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane					--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)					--	--	--	--	--	--	--
1,2-Dichlorobenzene	50	35			--	--	--	--	--	--	--
1,2-Dichloroethane					--	--	--	--	--	--	--
1,2-Dichloroethene, cis-					--	--	--	--	--	--	--
1,2-Dichloroethene, trans-					--	--	--	--	--	--	--
1,2-Dichloropropane					--	--	--	--	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)					--	--	--	--	--	--	--
1,3-Dichlorobenzene					--	--	--	--	--	--	--
1,3-Dichloropropane					--	--	--	--	--	--	--

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				Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
				Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-MW-08	DSI-MW-08	DSI-GP-16	DSI-GP-16
				Sample ID	DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
				Sample Date	7/13/2009	7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009
				Depth	1.5 - 4 feet	6 - 8 feet	8 - 10 feet	0.5 - 2 feet	5 - 8 feet	2.1 - 4.5 feet	7.5 - 10 feet
				Sample Type	N	N	N	N	N	N	N
				X	1267993.205440	1267993.205440	1267993.205440	1267967.620000	1267967.620000	1268022.755370	1268022.755370
				Y	204385.906847	204385.906847	204385.906847	204366.340000	204366.340000	204368.452602	204368.452602
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
1,3-Dichloropropene, cis-					--	--	--	--	--	--	--
1,3-Dichloropropene, trans-					--	--	--	--	--	--	--
1,4-Dichlorobenzene	120	110			--	--	--	--	--	--	--
2,2-Dichloropropane					--	--	--	--	--	--	--
2-Butanone (MEK)					--	--	--	--	--	--	--
2-Chlorotoluene					--	--	--	--	--	--	--
2-Hexanone (Methyl butyl ketone)					--	--	--	--	--	--	--
4-Chlorotoluene					--	--	--	--	--	--	--
4-Isopropyltoluene (4-Cymene)					--	--	--	--	--	--	--
Acetone					--	--	--	--	--	--	--
Benzene					--	--	--	--	--	--	--
Bromobenzene					--	--	--	--	--	--	--
Bromochloromethane					--	--	--	--	--	--	--
Bromodichloromethane					--	--	--	--	--	--	--
Bromoform (Tribromomethane)					--	--	--	--	--	--	--
Bromomethane (Methyl Bromide)					--	--	--	--	--	--	--
Carbon disulfide					--	--	--	--	--	--	--
Carbon tetrachloride (Tetrachloromethane)					--	--	--	--	--	--	--
Chloroethane					--	--	--	--	--	--	--
Chloroform					--	--	--	--	--	--	--
Chloromethane					--	--	--	--	--	--	--
Dibromochloromethane					--	--	--	--	--	--	--
Dibromomethane					--	--	--	--	--	--	--
Dichlorodifluoromethane					--	--	--	--	--	--	--
Dichloromethane (Methylene chloride)					--	--	--	--	--	--	--
Ethylbenzene					--	--	--	--	--	--	--
Isopropylbenzene (Cumene)					--	--	--	--	--	--	--
m,p-Xylene					--	--	--	--	--	--	--
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))					--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)					--	--	--	--	--	--	--
n-Butylbenzene					--	--	--	--	--	--	--
n-Propylbenzene					--	--	--	--	--	--	--
o-Xylene					--	--	--	--	--	--	--
sec-Butylbenzene					--	--	--	--	--	--	--
Styrene					--	--	--	--	--	--	--

Table 5

2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

				Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
				Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-MW-08	DSI-MW-08	DSI-GP-16	DSI-GP-16
				Sample ID	DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
				Sample Date	7/13/2009	7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009
				Depth	1.5 - 4 feet	6 - 8 feet	8 - 10 feet	0.5 - 2 feet	5 - 8 feet	2.1 - 4.5 feet	7.5 - 10 feet
				Sample Type	N	N	N	N	N	N	N
				X	1267993.205440	1267993.205440	1267993.205440	1267967.620000	1267967.620000	1268022.755370	1268022.755370
				Y	204385.906847	204385.906847	204385.906847	204366.340000	204366.340000	204368.452602	204368.452602
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
tert-Butylbenzene					--	--	--	--	--	--	--
Tetrachloroethene (PCE)					--	--	--	--	--	--	--
Toluene					--	--	--	--	--	--	--
Trichloroethene (TCE)					--	--	--	--	--	--	--
Trichlorofluoromethane (Fluorotrichloromethane)					--	--	--	--	--	--	--
Vinyl chloride					--	--	--	--	--	--	--
Volatile Organics (mg/kg-OC)											
1,2,4-Trichlorobenzene			0.81	1.8	--	--	--	--	--	--	--
1,2-Dichlorobenzene			2.3	2.3	--	--	--	--	--	--	--
1,4-Dichlorobenzene			3.1	9	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)											
1-Methylnaphthalene					**5200**	**3100**	--	56 U	**22**	20 U	19 U
2-Methylnaphthalene	1400	670			**390**	**200 J**	--	56 U	19 U	20 U	19 U
Acenaphthene	730	500			**330 J**	**200**	--	56 U	19 U	20 U	19 U
Acenaphthylene	1300	1300			160 U	77 U	--	**54 J**	19 U	20 U	19 U
Anthracene	4400	960			**120 J**	**54 J**	--	**33 J**	19 U	20 U	19 U
Benzo(a)anthracene	1600	1300			160 U	77 U	--	**77**	**16 J**	**11 J**	19 U
Benzo(a)pyrene	3000	1600			160 U	77 U	--	**110 J**	**19**	**12 J**	19 U
Benzo(b)fluoranthene					160 U	77 U	--	**88 J**	**16 J**	20 U	19 U
Benzo(g,h,i)perylene	720	670			160 U	77 U	--	**73 J**	**14 J**	20 U	19 U
Benzo(k)fluoranthene					160 U	77 U	--	**70 J**	**11 J**	20 U	19 U
Chrysene	2800	1400			**83 J**	**41 J**	--	**120**	**24**	**12 J**	19 U
Dibenzo(a,h)anthracene	540	230			160 U	77 U	--	56 U	19 U	20 U	19 U
Fluoranthene	2500	1700			160 U	**51 J**	--	**140**	**27**	**24**	**16 J**
Fluorene	1000	540			**1700**	**880**	--	56 U	19 U	20 U	19 U
Indeno(1,2,3-c,d)pyrene	690	600			160 U	77 U	--	**76 J**	**11 J**	20 U	19 U
Naphthalene	2400	2100			270 U	170 U	--	56 U	19 U	20 U	19 U
Phenanthrene	5400	1500			**1700**	**970**	--	**58**	**12 J**	**15 J**	19 U
Pyrene	3300	2600			**180**	**93**	--	**120**	**31**	**23**	**12 J**
Total Benzofluoranthenes (b,j,k) (U = 0)	3600	3200			160 U	77 U	--	**200 J**	**27 J**	20 U	19 U
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 0)					**0.83 J**	**0.41 J**	--	**100 J**	**25 J**	**10 J**	19 U
Total HPAH (SMS) (U = 0)	17000	12000			**260 J**	**180 J**	--	**900 J**	**170 J**	**80 J**	**28 J**
Total LPAH (SMS) (U = 0)	13000	5200			**3800 J**	**2000 J**	--	**140 J**	**12 J**	**10 J**	19 U
Polycyclic Aromatic Hydrocarbons (mg/kg-OC)											
2-Methylnaphthalene			38	64	--	--	--	--	--	--	--

Table 5
2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

				Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
				Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-MW-08	DSI-MW-08	DSI-GP-16	DSI-GP-16
				Sample ID	DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
				Sample Date	7/13/2009	7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009
				Depth	1.5 - 4 feet	6 - 8 feet	8 - 10 feet	0.5 - 2 feet	5 - 8 feet	2.1 - 4.5 feet	7.5 - 10 feet
				Sample Type	N	N	N	N	N	N	N
				X	1267993.205440	1267993.205440	1267993.205440	1267967.620000	1267967.620000	1268022.755370	1268022.755370
				Y	204385.906847	204385.906847	204385.906847	204366.340000	204366.340000	204368.452602	204368.452602
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
Acenaphthene			16	57	--	--	--	--	--	--	--
Acenaphthylene			66	66	--	--	--	--	--	--	--
Anthracene			220	1200	--	--	--	--	--	--	--
Benzo(a)anthracene			110	270	--	--	--	--	--	--	--
Benzo(a)pyrene			99	210	--	--	--	--	--	--	--
Benzo(b)fluoranthene					--	--	--	--	--	--	--
Benzo(g,h,i)perylene			31	78	--	--	--	--	--	--	--
Benzo(k)fluoranthene					--	--	--	--	--	--	--
Chrysene			110	460	--	--	--	--	--	--	--
Dibenzo(a,h)anthracene			12	33	--	--	--	--	--	--	--
Fluoranthene			160	1200	--	--	--	--	--	--	--
Fluorene			23	79	--	--	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene			34	88	--	--	--	--	--	--	--
Naphthalene			99	170	--	--	--	--	--	--	--
Phenanthrene			100	480	--	--	--	--	--	--	--
Pyrene			1000	1400	--	--	--	--	--	--	--
Total Benzofluoranthenes (b,j,k) (U = 0)			230	450	--	--	--	--	--	--	--
Total HPAH (SMS) (U = 0)			960	5300	--	--	--	--	--	--	--
Total LPAH (SMS) (U = 0)			370	780	--	--	--	--	--	--	--

Table 5

2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

					Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
					Task	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
					Location ID	DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-MW-08	DSI-MW-08	DSI-GP-16	DSI-GP-16
					Sample ID	DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
					Sample Date	7/13/2009	7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009
					Depth	1.5 - 4 feet	6 - 8 feet	8 - 10 feet	0.5 - 2 feet	5 - 8 feet	2.1 - 4.5 feet	7.5 - 10 feet
					Sample Type	N	N	N	N	N	N	N
					X	1267993.205440	1267993.205440	1267993.205440	1267967.620000	1267967.620000	1268022.755370	1268022.755370
					Y	204385.906847	204385.906847	204385.906847	204366.340000	204366.340000	204368.452602	204368.452602
					Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
Semivolatile Organics (µg/kg)											
1,2,4-Trichlorobenzene	51	31				160 U	77 U	--	56 U	19 U	20 U	19 U
1,2-Dichlorobenzene	50	35				160 U	77 U	--	56 U	19 U	20 U	19 U
1,3-Dichlorobenzene						--	--	--	--	--	--	--
1,4-Dichlorobenzene	120	110				160 U	77 U	--	56 U	19 U	20 U	19 U
2,4-Dimethylphenol			29	29		160 U	77 U	--	56 U	19 U	20 U	19 U
2-Methylphenol (o-Cresol)			63	63		160 U	77 U	--	56 U	19 U	20 U	19 U
4-Methylphenol (p-Cresol)			670	670		160 U	77 U	--	56 U	19 U	20 U	19 U
Benzoic acid			650	650		1600 U	770 U	--	560 UJ	190 UJ	200 U	190 U
Benzyl alcohol			57	73		160 U	77 U	--	56 U	19 U	20 U	19 U
Bis(2-ethylhexyl) phthalate	1900	1300				160 U	77 U	--	56 U	19 U	20 U	**16 J**
Butylbenzyl phthalate	900	63				160 U	77 U	--	56 U	19 U	20 U	19 U
Dibenzofuran	700	540				**420 J**	**240 J**	--	56 U	19 U	20 U	19 U
Diethyl phthalate	1200	200				160 U	77 U	--	56 U	19 U	20 U	**19 J**
Dimethyl phthalate	160	71				160 U	77 U	--	56 U	19 U	20 U	19 U
Di-n-butyl phthalate	5100	1400				160 U	77 U	--	56 U	19 U	20 U	19 U
Di-n-octyl phthalate		6200				160 U	77 U	--	56 U	19 U	20 U	19 U
Hexachlorobenzene	70	22				160 U	77 U	--	56 U	19 U	20 U	19 U
Hexachlorobutadiene	120	11				160 U	77 U	--	56 U	19 U	20 U	19 U
Hexachloroethane						160 U	77 U	--	56 U	19 U	20 U	19 U
N-Nitrosodiphenylamine						1800 UJ	880 UJ	--	56 UJ	19 UJ	20 UJ	19 UJ
Pentachlorophenol			360	690		810 U	380 U	--	280 UJ	96 UJ	98 U	97 U
Phenol			420	1200		160 U	77 U	--	56 U	19 U	20 U	19 U
Semivolatile Organics (mg/kg-OC)											
Dibenzofuran			15	58		--	--	--	--	--	--	--
Polychlorinated Biphenyl (PCB) Aroclors (µg/kg)											
Aroclor 1016						--	--	--	--	--	--	--
Aroclor 1221						--	--	--	--	--	--	--
Aroclor 1232						--	--	--	--	--	--	--
Aroclor 1242						--	--	--	--	--	--	--
Aroclor 1248						--	--	--	--	--	--	--
Aroclor 1254						--	--	--	--	--	--	--
Aroclor 1260						--	--	--	--	--	--	--
Total PCB Aroclors (U = 0)	1000	130				--	--	--	--	--	--	--
PCB Aroclors (mg/kg-OC)											

Table 5
2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

Site Area					B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Former Nearshore Area
Task					Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID					DSI-GP-15	DSI-GP-15	DSI-GP-15	DSI-MW-08	DSI-MW-08	DSI-GP-16	DSI-GP-16
Sample ID					DSI-GP-15-1.5-4	DSI-GP-15-6-8	DSI-GP-15-8-10	DSI-MW-08-0.5-2	DSI-MW-08-5-8	DSI-GP-16-2.1-4.5	DSI-GP-16-7.5-10
Sample Date					7/13/2009	7/13/2009	7/13/2009	7/15/2009	7/15/2009	7/13/2009	7/13/2009
Depth					1.5 - 4 feet	6 - 8 feet	8 - 10 feet	0.5 - 2 feet	5 - 8 feet	2.1 - 4.5 feet	7.5 - 10 feet
Sample Type					N	N	N	N	N	N	N
X					1267993.205440	1267993.205440	1267993.205440	1267967.620000	1267967.620000	1268022.755370	1268022.755370
Y					204385.906847	204385.906847	204385.906847	204366.340000	204366.340000	204368.452602	204368.452602
Coordinate Type					NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL							
Total PCB Aroclors (U = 0)			12	65	--	--	--	--	--	--	--
Pesticides (µg/kg)											
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)					--	--	--	--	--	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)					--	--	--	--	--	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)					--	--	--	--	--	--	--
Aldrin					--	--	--	--	--	--	--
alpha-Chlordane (cis-Chlordane)					--	--	--	--	--	--	--
alpha-Hexachlorocyclohexane (BHC)					--	--	--	--	--	--	--
beta-Hexachlorocyclohexane (BHC)					--	--	--	--	--	--	--
delta-Hexachlorocyclohexane (BHC)					--	--	--	--	--	--	--
Dieldrin					--	--	--	--	--	--	--
Endosulfan sulfate					--	--	--	--	--	--	--
Endosulfan-alpha (I)					--	--	--	--	--	--	--
Endosulfan-beta (II)					--	--	--	--	--	--	--
Endrin					--	--	--	--	--	--	--
Endrin aldehyde					--	--	--	--	--	--	--
Endrin ketone					--	--	--	--	--	--	--
gamma-Chlordane					--	--	--	--	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)					--	--	--	--	--	--	--
Heptachlor					--	--	--	--	--	--	--
Heptachlor epoxide					--	--	--	--	--	--	--
Hexachlorobenzene	70	22			--	--	--	--	--	--	--
Hexachlorobutadiene	120	11			--	--	--	--	--	--	--
Methoxychlor					--	--	--	--	--	--	--
Toxaphene					--	--	--	--	--	--	--
Pesticides (mg/kg-OC)											
Hexachlorobenzene			0.38	2.3	--	--	--	--	--	--	--
Hexachlorobutadiene			3.9	6.2	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (mg/kg)											
Diesel Range Hydrocarbons					**9000**	**3500**	--	**140**	**17**	5.2 U	7.2 U
Gasoline Range Hydrocarbons					**140**	**1200**	**20**	**8.5**	7.6 U	6.6 U	10 U
Motor Oil Range					1000 U	250 U	--	**390**	**22**	10 U	14 U

Table 5
2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

				Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
				Task	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-11	DSI-11	DSI-GP-17	DSI-GP-17	DSI-12	DSI-12	DSI-MW-10	DSI-MW-10
				Sample ID	DSI11-SO-A	DSI11-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI12-SO-A	DSI12-SO-B	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
				Sample Date	9/28/2006	9/28/2006	7/13/2009	7/13/2009	9/28/2006	9/28/2006	7/14/2009	7/14/2009
				Depth	0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0 - 3 feet	3 - 5 feet	0.5 - 3.5 feet	5 - 8 feet
				Sample Type	N	N	N	N	N	N	N	N
				X	1267970.43	1267970.43	1267974.892510	1267974.892510	1267970.416	1267970.416	1267964.600000	1267964.600000
				Y	204358.8091	204358.8091	204304.039660	204304.039660	204269.044	204269.044	204275.460000	204275.460000
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL								
Conventional Parameters (pct)												
Moisture (water) content					--	--	8.84	39.49	--	--	--	--
Total organic carbon					1.34	0.099	--	--	1.25	1.12	--	--
Total solids					76.1	93.7	--	--	87.7	86.7	--	--
Grain Size (pct)												
Percent passing < 1.3 micron sieve					--	--	--	7.8	--	--	--	--
Percent retained 1.3 micron sieve					--	--	--	6.2	--	--	--	--
Percent retained 3.2 micron sieve					--	--	--	10.9	--	--	--	--
Percent retained 7 micron sieve					--	--	--	8.5	--	--	--	--
Percent retained 9 micron sieve					--	--	--	5.4	--	--	--	--
Percent retained 13 micron sieve					--	--	--	7.8	--	--	--	--
Percent retained 22 micron sieve					--	--	--	9.3	--	--	--	--
Percent retained 32 micron sieve					--	--	--	5.4	--	--	--	--
Percent retained 75 micron sieve (#200)					--	--	4.5	13.8	--	--	--	--
Percent retained 150 micron sieve (#100)					--	--	15.6	13.2	--	--	--	--
Percent retained 250 micron sieve (#60)					--	--	34.9	8.1	--	--	--	--
Percent retained 425 micron sieve (#40)					--	--	21.1	3	--	--	--	--
Percent retained 850 micron sieve (#20)					--	--	3.8	0.6	--	--	--	--
Percent retained 2000 micron sieve (#10)					--	--	0.6	0.1	--	--	--	--
Percent retained 4750 micron sieve (#4)					--	--	0.7	0.1 U	--	--	--	--
Percent retained 9500 micron sieve					--	--	1.9	0.1 U	--	--	--	--
Percent retained 12500 micron sieve					--	--	0.1 U	0.1 U	--	--	--	--
Percent retained 19000 micron sieve					--	--	0.1 U	0.1 U	--	--	--	--
Percent retained 25K micron sieve					--	--	0.1 U	0.1 U	--	--	--	--
Percent retained 37.5K micron sieve					--	--	0.1 U	0.1 U	--	--	--	--
Percent retained 50K micron sieve					--	--	0.1 U	0.1 U	--	--	--	--
Percent retained 75K micron sieve					--	--	0.1 U	0.1 U	--	--	--	--
Total Gravel					--	--	3	0.1 U	--	--	--	--
Total Sand					--	--	80	40	--	--	--	--
Total Silt					--	--	--	47	--	--	--	--
Total Clay					--	--	--	14	--	--	--	--

Table 5

2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

Site Area					**B-Former Nearshore Area**	**B-Former Nearshore Area**	**B-Parcel D Nearshore Area**	**B-Parcel D Nearshore Area**	**B-Parcel D Nearshore Area**	**B-Parcel D Nearshore Area**	**B-Parcel D Nearshore Area**	**B-Parcel D Nearshore Area**
Task					**DSI 2006 Historic**	**DSI 2006 Historic**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**	**DSI 2006 Historic**	**DSI 2006 Historic**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**
Location ID					**DSI-11**	**DSI-11**	**DSI-GP-17**	**DSI-GP-17**	**DSI-12**	**DSI-12**	**DSI-MW-10**	**DSI-MW-10**
Sample ID					**DSI11-SO-A**	**DSI11-SO-B**	**DSI-GP-17-1.5-4**	**DSI-GP-17-5-7.5**	**DSI12-SO-A**	**DSI12-SO-B**	**DSI-MW-10-0.5-3.5**	**DSI-MW-10-5-8**
Sample Date					**9/28/2006**	**9/28/2006**	**7/13/2009**	**7/13/2009**	**9/28/2006**	**9/28/2006**	**7/14/2009**	**7/14/2009**
Depth					**0 - 3 feet**	**3 - 5 feet**	**1.5 - 4 feet**	**5 - 7.5 feet**	**0 - 3 feet**	**3 - 5 feet**	**0.5 - 3.5 feet**	**5 - 8 feet**
Sample Type					**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
X					**1267970.43**	**1267970.43**	**1267974.892510**	**1267974.892510**	**1267970.416**	**1267970.416**	**1267964.600000**	**1267964.600000**
Y					**204358.8091**	**204358.8091**	**204304.039660**	**204304.039660**	**204269.044**	**204269.044**	**204275.460000**	**204275.460000**
Coordinate Type					**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**
	2LAET	**LAET**	**SMS SQS**	**SMS CSL**								
Metals (mg/kg)												
Antimony					--	--	5 UJ	7 UJ	--	--	5 UJ	6 UJ
Arsenic	93	57	57	93	**4.4**	**1.4**	5 U	7 U	**17.1**	**3.3**	**25**	**14**
Cadmium	6.7	5.1	5.1	6.7	**0.3**	0.2 U	0.2 U	0.3 U	**0.2**	0.2 U	0.2 U	0.3 U
Chromium	270	260	260	270	**17.1**	**11.4**	**12.8**	**14.3**	**20.1**	**15.5**	**15 J**	**18.3 J**
Chromium VI					**2.05 J**	0.12 UJ	--	--	0.125 UJ	0.123 UJ	--	--
Copper	530	390	390	390	**49**	**8.4**	**15**	**18.2**	**34.2**	**18.1**	**27.2 J**	**28 J**
Lead	530	450	450	530	**92**	2 U	**3**	**3**	**20**	**6**	**17 J**	**11 J**
Mercury	0.59	0.41	0.41	0.59	**0.76**	0.04 U	0.03 U	0.03 U	**0.08**	0.05 U	**0.07**	**0.04**
Nickel					--	--	**8**	**10**	--	--	**8 J**	**12 J**
Selenium					--	--	0.5 U	0.7 U	--	--	0.6 U	0.7 U
Silver			6.1	6.1	0.4 U	0.3 U	0.3 U	0.4 U	0.3 U	0.3 U	0.3 U	0.4 U
Zinc	960	410	410	960	**78.3**	**23**	**44**	**32**	**77.4**	**36.8**	**88**	**56**
Volatile Organics (µg/kg)												
1,1,1,2-Tetrachloroethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,1,1-Trichloroethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,1,2,2-Tetrachloroethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,1,2-Trichloroethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,1-Dichloroethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,1-Dichloroethene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,1-Dichloropropene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,2,3-Trichlorobenzene					5.6 U	5.3 U	--	--	4.9 U	5.4 U	--	--
1,2,3-Trichloropropane					2.2 U	2.1 U	--	--	2 U	2.2 U	--	--
1,2,4-Trichlorobenzene	51	31			5.6 U	5.3 U	--	--	4.9 U	5.4 U	--	--
1,2,4-Trimethylbenzene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,2-Dibromo-3-chloropropane					5.6 U	5.3 U	--	--	4.9 U	5.4 U	--	--
1,2-Dibromoethane (Ethylene dibromide)					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,2-Dichlorobenzene	50	35			1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,2-Dichloroethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,2-Dichloroethene, cis-					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,2-Dichloroethene, trans-					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,2-Dichloropropane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,3,5-Trimethylbenzene (Mesitylene)					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,3-Dichlorobenzene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,3-Dichloropropane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--

Table 5

2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

Site Area					B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
Task					DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID					DSI-11	DSI-11	DSI-GP-17	DSI-GP-17	DSI-12	DSI-12	DSI-MW-10	DSI-MW-10
Sample ID					DSI11-SO-A	DSI11-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI12-SO-A	DSI12-SO-B	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
Sample Date					9/28/2006	9/28/2006	7/13/2009	7/13/2009	9/28/2006	9/28/2006	7/14/2009	7/14/2009
Depth					0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0 - 3 feet	3 - 5 feet	0.5 - 3.5 feet	5 - 8 feet
Sample Type					N	N	N	N	N	N	N	N
X					1267970.43	1267970.43	1267974.892510	1267974.892510	1267970.416	1267970.416	1267964.600000	1267964.600000
Y					204358.8091	204358.8091	204304.039660	204304.039660	204269.044	204269.044	204275.460000	204275.460000
Coordinate Type					NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL								
1,3-Dichloropropene, cis-					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,3-Dichloropropene, trans-					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
1,4-Dichlorobenzene	120	110			1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
2,2-Dichloropropane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
2-Butanone (MEK)					**12**	**9.4**	--	--	**5.6**	5.4 U	--	--
2-Chlorotoluene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
2-Hexanone (Methyl butyl ketone)					5.6 U	5.3 U	--	--	4.9 U	5.4 U	--	--
4-Chlorotoluene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
4-Isopropyltoluene (4-Cymene)					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Acetone					**96**	**70**	--	--	**57**	**45**	--	--
Benzene					**2.3**	1.1 U	--	--	**1.4**	**3**	--	--
Bromobenzene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Bromochloromethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Bromodichloromethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Bromoform (Tribromomethane)					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Bromomethane (Methyl Bromide)					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Carbon disulfide					**1.9**	**15**	--	--	1 U	1.1 U	--	--
Carbon tetrachloride (Tetrachloromethane)					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Chloroethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Chloroform					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Chloromethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Dibromochloromethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Dibromomethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Dichlorodifluoromethane					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Dichloromethane (Methylene chloride)					2.2 U	2.1 U	--	--	2 U	2.2 U	--	--
Ethylbenzene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Isopropylbenzene (Cumene)					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
m,p-Xylene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))					5.6 U	5.3 U	--	--	4.9 U	5.4 U	--	--
Methyl tert-butyl ether (MTBE)					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
n-Butylbenzene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
n-Propylbenzene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
o-Xylene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
sec-Butylbenzene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Styrene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--

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2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

Site Area					B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
Task					DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID					DSI-11	DSI-11	DSI-GP-17	DSI-GP-17	DSI-12	DSI-12	DSI-MW-10	DSI-MW-10
Sample ID					DSI11-SO-A	DSI11-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI12-SO-A	DSI12-SO-B	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
Sample Date					9/28/2006	9/28/2006	7/13/2009	7/13/2009	9/28/2006	9/28/2006	7/14/2009	7/14/2009
Depth					0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0 - 3 feet	3 - 5 feet	0.5 - 3.5 feet	5 - 8 feet
Sample Type					N	N	N	N	N	N	N	N
X					1267970.43	1267970.43	1267974.892510	1267974.892510	1267970.416	1267970.416	1267964.600000	1267964.600000
Y					204358.8091	204358.8091	204304.039660	204304.039660	204269.044	204269.044	204275.460000	204275.460000
Coordinate Type					NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL								
tert-Butylbenzene					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Tetrachloroethene (PCE)					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Toluene					1.1 U	1.1 U	--	--	1 U	**3.4**	--	--
Trichloroethene (TCE)					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Trichlorofluoromethane (Fluorotrichloromethane)					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Vinyl chloride					1.1 U	1.1 U	--	--	1 U	1.1 U	--	--
Volatile Organics (mg/kg-OC)												
1,2,4-Trichlorobenzene			0.81	1.8	0.42 U	5.4 U	--	--	0.39 U	0.48 U	--	--
1,2-Dichlorobenzene			2.3	2.3	0.082 U	1.1 U	--	--	0.08 U	0.098 U	--	--
1,4-Dichlorobenzene			3.1	9	0.082 U	1.1 U	--	--	0.08 U	0.098 U	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)												
1-Methylnaphthalene					--	--	20 U	19 U	--	--	**300**	**1000**
2-Methylnaphthalene	1400	670			**19**	4.8 U	20 U	19 U	**230**	**300**	**290**	**330**
Acenaphthene	730	500			**6.9**	4.8 U	20 U	19 U	37 U	**45**	**330**	**2700**
Acenaphthylene	1300	1300			**14**	4.8 U	**30**	19 U	**880**	**1700**	**3000**	**2000**
Anthracene	4400	960			**18**	4.8 U	**10 J**	19 U	**290**	**450**	**2800**	**3200**
Benzo(a)anthracene	1600	1300			**54**	4.8 U	**78**	19 U	**1800**	**3600**	**5000**	**5300**
Benzo(a)pyrene	3000	1600			**61**	4.8 U	**94**	19 U	**3000**	**7900**	**7600**	**6000**
Benzo(b)fluoranthene					**73**	4.8 U	**76**	19 U	**1700**	**3400**	**4100**	**3200**
Benzo(g,h,i)perylene	720	670			**37**	4.8 U	**38 J**	19 U	**1300**	**2900**	**1900**	**1200**
Benzo(k)fluoranthene					**67**	4.8 U	**83**	19 U	**2100**	**5600**	**4100**	**3200**
Chrysene	2800	1400			**87**	4.8 U	**120**	19 U	**3000**	**7500**	**7300**	**7200**
Dibenzo(a,h)anthracene	540	230			**8.4**	4.8 U	**13 J**	19 U	**390**	**900**	**740**	**490**
Fluoranthene	2500	1700			**120**	4.8 U	**120**	19 U	**2500**	**6000**	**9500**	**14000**
Fluorene	1000	540			**7.9**	4.8 U	20 U	19 U	**67**	**53**	**1800**	**3100**
Indeno(1,2,3-c,d)pyrene	690	600			**35**	4.8 U	**36 J**	19 U	**1200**	**2700**	**1800**	**1200**
Naphthalene	2400	2100			**24**	4.8 U	20 U	19 U	**340**	**470**	**380**	**510**
Phenanthrene	5400	1500			**54**	4.8 U	**27**	19 U	**510**	**640**	**6800**	**6300**
Pyrene	3300	2600			**120**	4.8 U	**170**	19 U	**4000**	**10000**	**9200**	**11000**
Total Benzofluoranthenes (b,j,k) (U = 0)	3600	3200			**140**	4.8 U	**160**	19 U	**3800**	**9000**	**8200**	**6400**
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 0)					**86**	4.8 U	**120 J**	19 U	**4000**	**10000**	**9000**	**7000**
Total HPAH (SMS) (U = 0)	17000	12000			**660**	4.8 U	**830 J**	19 U	**20000**	**50000**	**50000**	**50000**
Total LPAH (SMS) (U = 0)	13000	5200			**120**	4.8 U	**70 J**	19 U	**2100**	**3400**	**20000**	**20000**
Polycyclic Aromatic Hydrocarbons (mg/kg-OC)												
2-Methylnaphthalene			38	64	**1.4**	4.8 U	--	--	**18**	**30**	--	--

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				Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
				Task	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-11	DSI-11	DSI-GP-17	DSI-GP-17	DSI-12	DSI-12	DSI-MW-10	DSI-MW-10
				Sample ID	DSI11-SO-A	DSI11-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI12-SO-A	DSI12-SO-B	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
				Sample Date	9/28/2006	9/28/2006	7/13/2009	7/13/2009	9/28/2006	9/28/2006	7/14/2009	7/14/2009
				Depth	0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0 - 3 feet	3 - 5 feet	0.5 - 3.5 feet	5 - 8 feet
				Sample Type	N	N	N	N	N	N	N	N
				X	1267970.43	1267970.43	1267974.892510	1267974.892510	1267970.416	1267970.416	1267964.600000	1267964.600000
				Y	204358.8091	204358.8091	204304.039660	204304.039660	204269.044	204269.044	204275.460000	204275.460000
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL								
Acenaphthene			16	57	**0.51**	4.8 U	--	--	3 U	**4**	--	--
Acenaphthylene			66	66	**1**	4.8 U	--	--	**70**	**150**	--	--
Anthracene			220	1200	**1.3**	4.8 U	--	--	**23**	**40**	--	--
Benzo(a)anthracene			110	270	**4**	4.8 U	--	--	**140**	**320**	--	--
Benzo(a)pyrene			99	210	**4.6**	4.8 U	--	--	**200**	**710**	--	--
Benzo(b)fluoranthene					**5.4**	4.8 U	--	--	**140**	**300**	--	--
Benzo(g,h,i)perylene			31	78	**2.8**	4.8 U	--	--	**100**	**260**	--	--
Benzo(k)fluoranthene					**5**	4.8 U	--	--	**170**	**500**	--	--
Chrysene			110	460	**6.5**	4.8 U	--	--	**200**	**670**	--	--
Dibenzo(a,h)anthracene			12	33	**0.63**	4.8 U	--	--	**31**	**80**	--	--
Fluoranthene			160	1200	**9**	4.8 U	--	--	**200**	**500**	--	--
Fluorene			23	79	**0.59**	4.8 U	--	--	**5.4**	**4.7**	--	--
Indeno(1,2,3-c,d)pyrene			34	88	**2.6**	4.8 U	--	--	**96**	**240**	--	--
Naphthalene			99	170	**1.8**	4.8 U	--	--	**27**	**42**	--	--
Phenanthrene			100	480	**4**	4.8 U	--	--	**41**	**57**	--	--
Pyrene			1000	1400	**9**	4.8 U	--	--	**300**	**900**	--	--
Total Benzofluoranthenes (b,j,k) (U = 0)			230	450	**10**	4.8 U	--	--	**300**	**800**	--	--
Total HPAH (SMS) (U = 0)			960	5300	**49**	4.8 U	--	--	**2000**	**5000**	--	--
Total LPAH (SMS) (U = 0)			370	780	**9.3**	4.8 U	--	--	**170**	**300**	--	--

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				Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
				Task	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-11	DSI-11	DSI-GP-17	DSI-GP-17	DSI-12	DSI-12	DSI-MW-10	DSI-MW-10
				Sample ID	DSI11-SO-A	DSI11-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI12-SO-A	DSI12-SO-B	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
				Sample Date	9/28/2006	9/28/2006	7/13/2009	7/13/2009	9/28/2006	9/28/2006	7/14/2009	7/14/2009
				Depth	0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0 - 3 feet	3 - 5 feet	0.5 - 3.5 feet	5 - 8 feet
				Sample Type	N	N	N	N	N	N	N	N
				X	1267970.43	1267970.43	1267974.892510	1267974.892510	1267970.416	1267970.416	1267964.600000	1267964.600000
				Y	204358.8091	204358.8091	204304.039660	204304.039660	204269.044	204269.044	204275.460000	204275.460000
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL								
Semivolatile Organics (µg/kg)												
1,2,4-Trichlorobenzene	51	31			--	--	20 U	19 U	--	--	81 U	59 U
1,2-Dichlorobenzene	50	35			--	--	20 U	19 U	--	--	81 U	59 U
1,3-Dichlorobenzene					--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	120	110			--	--	20 U	19 U	--	--	81 U	59 U
2,4-Dimethylphenol			29	29	--	--	20 U	19 U	--	--	81 UJ	59 UJ
2-Methylphenol (o-Cresol)			63	63	--	--	20 U	19 U	--	--	81 U	59 U
4-Methylphenol (p-Cresol)			670	670	--	--	**16 J**	19 U	--	--	81 U	59 U
Benzoic acid			650	650	--	--	200 U	190 U	--	--	810 U	590 U
Benzyl alcohol			57	73	--	--	20 U	19 U	--	--	81 U	59 U
Bis(2-ethylhexyl) phthalate	1900	1300			--	--	20 U	19 U	--	--	81 U	59 U
Butylbenzyl phthalate	900	63			--	--	20 U	19 U	--	--	81 U	59 U
Dibenzofuran	700	540			**7.9**	4.8 U	20 U	19 U	37 U	38 U	**230**	**360**
Diethyl phthalate	1200	200			--	--	**27**	19 U	--	--	81 U	59 U
Dimethyl phthalate	160	71			--	--	20 U	19 U	--	--	81 U	59 U
Di-n-butyl phthalate	5100	1400			--	--	20 U	19 U	--	--	81 U	59 U
Di-n-octyl phthalate		6200			--	--	20 U	19 U	--	--	81 U	59 U
Hexachlorobenzene	70	22			--	--	20 U	19 U	--	--	81 U	59 U
Hexachlorobutadiene	120	11			--	--	20 U	19 U	--	--	81 U	59 U
Hexachloroethane					--	--	20 UJ	19 U	--	--	81 U	59 U
N-Nitrosodiphenylamine					--	--	20 UJ	19 UJ	--	--	81 UJ	59 UJ
Pentachlorophenol			360	690	--	--	99 U	97 U	--	--	400 UJ	290 UJ
Phenol			420	1200	--	--	20 U	19 U	--	--	81 U	59 U
Semivolatile Organics (mg/kg-OC)												
Dibenzofuran			15	58	**0.59**	4.8 U	--	--	3 U	3.4 U	--	--
Polychlorinated Biphenyl (PCB) Aroclors (µg/kg)												
Aroclor 1016					9.8 U	9.9 U	--	--	29 U	29 U	--	--
Aroclor 1221					9.8 U	9.9 U	--	--	29 U	29 U	--	--
Aroclor 1232					9.8 U	9.9 U	--	--	29 U	29 U	--	--
Aroclor 1242					9.8 U	9.9 U	--	--	29 U	29 U	--	--
Aroclor 1248					9.8 U	9.9 U	--	--	29 U	29 U	--	--
Aroclor 1254					9.8 U	9.9 U	--	--	29 U	29 U	--	--
Aroclor 1260					**35**	9.9 U	--	--	29 U	29 U	--	--
Total PCB Aroclors (U = 0)	1000	130			**35**	9.9 U	--	--	29 U	29 U	--	--
PCB Aroclors (mg/kg-OC)												

Table 5
2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

				Site Area	B-Former Nearshore Area	B-Former Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area	B-Parcel D Nearshore Area
				Task	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI	DSI 2006 Historic	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
				Location ID	DSI-11	DSI-11	DSI-GP-17	DSI-GP-17	DSI-12	DSI-12	DSI-MW-10	DSI-MW-10
				Sample ID	DSI11-SO-A	DSI11-SO-B	DSI-GP-17-1.5-4	DSI-GP-17-5-7.5	DSI12-SO-A	DSI12-SO-B	DSI-MW-10-0.5-3.5	DSI-MW-10-5-8
				Sample Date	9/28/2006	9/28/2006	7/13/2009	7/13/2009	9/28/2006	9/28/2006	7/14/2009	7/14/2009
				Depth	0 - 3 feet	3 - 5 feet	1.5 - 4 feet	5 - 7.5 feet	0 - 3 feet	3 - 5 feet	0.5 - 3.5 feet	5 - 8 feet
				Sample Type	N	N	N	N	N	N	N	N
				X	1267970.43	1267970.43	1267974.892510	1267974.892510	1267970.416	1267970.416	1267964.600000	1267964.600000
				Y	204358.8091	204358.8091	204304.039660	204304.039660	204269.044	204269.044	204275.460000	204275.460000
				Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	2LAET	LAET	SMS SQS	SMS CSL								
Total PCB Aroclors (U = 0)			12	65	**2.6**	10 U	--	--	2.3 U	2.6 U	--	--
Pesticides (µg/kg)												
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)					3.2 U	3.3 UJ	--	--	3.3 U	3.3 U	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)					3.2 U	3.3 UJ	--	--	3.3 U	3.3 U	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)					3.2 U	3.3 UJ	--	--	3.3 U	12 U	--	--
Aldrin					1.6 U	1.6 UJ	--	--	1.6 U	1.6 U	--	--
alpha-Chlordane (cis-Chlordane)					1.6 U	1.6 UJ	--	--	1.6 U	1.6 U	--	--
alpha-Hexachlorocyclohexane (BHC)					1.6 U	1.6 UJ	--	--	1.6 U	1.6 U	--	--
beta-Hexachlorocyclohexane (BHC)					1.6 U	1.6 UJ	--	--	4 U	3.1 U	--	--
delta-Hexachlorocyclohexane (BHC)					1.6 U	1.6 UJ	--	--	1.6 U	1.6 U	--	--
Dieldrin					3.2 U	3.3 UJ	--	--	3.3 U	3.3 U	--	--
Endosulfan sulfate					3.2 U	3.3 UJ	--	--	19 U	21 U	--	--
Endosulfan-alpha (I)					1.6 U	1.6 UJ	--	--	1.6 U	1.6 U	--	--
Endosulfan-beta (II)					3.2 U	3.3 UJ	--	--	3.3 U	3.3 U	--	--
Endrin					3.2 U	3.3 UJ	--	--	14 U	17 U	--	--
Endrin aldehyde					3.2 U	3.3 UJ	--	--	3.3 U	3.3 U	--	--
Endrin ketone					3.2 U	3.3 UJ	--	--	15 U	16 U	--	--
gamma-Chlordane					1.6 U	1.6 UJ	--	--	1.6 U	1.6 U	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)					1.6 U	1.6 UJ	--	--	1.6 U	1.6 U	--	--
Heptachlor					1.6 U	1.6 UJ	--	--	1.6 U	1.6 U	--	--
Heptachlor epoxide					1.6 U	1.6 UJ	--	--	1.6 U	3.8 U	--	--
Hexachlorobenzene	70	22			1.6 U	1.6 UJ	--	--	1.6 U	1.6 U	--	--
Hexachlorobutadiene	120	11			1.6 U	1.6 UJ	--	--	1.6 U	1.6 U	--	--
Methoxychlor					16 U	16 UJ	--	--	16 U	16 U	--	--
Toxaphene					160 U	160 UJ	--	--	160 U	160 U	--	--
Pesticides (mg/kg-OC)												
Hexachlorobenzene			0.38	2.3	0.12 U	1.6 UJ	--	--	0.13 U	0.14 U	--	--
Hexachlorobutadiene			3.9	6.2	0.12 U	1.6 UJ	--	--	0.13 U	0.14 U	--	--
Total Petroleum Hydrocarbons (mg/kg)												
Diesel Range Hydrocarbons					**120**	5.5 U	**9.2**	6.8 U	**88**	**170**	**850**	**300**
Gasoline Range Hydrocarbons					**8**	5.9 U	5.6 U	9.2 U	6.6 U	**27**	**270**	**62**
Motor Oil Range					**180**	11 U	**22**	14 U	**130**	**240**	**530**	**210**

Table 5
2006 and 2009 Investigation Analytical Results for Selected Soil Samples and Comparison with Washington Sediment Management Standards

Notes:

(yellow)	Detected concentration is greater than 2LAET screening level
(cyan)	Detected concentration is greater than LAET screening level
(green)	Detected concentration is greater than SMS SQS screening level
(orange)	Detected concentration is greater than SMS CSL screening level

Bold = Detected result
J = Estimated value
U = Compound analyzed, but not detected above detection limit
UJ = Compound analyzed, but not detected above estimated detection limit

Total LPAH (Low PAH) are the total of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene and Anthracene. 2-Methylnapthalene is not included in the sum of LPAHs.
Total HPAH (High PAH) are the total of Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzofluoranthenes, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, Dibenzo(a,h)anthracene and Benzo(g,h,i)perylene.
Total DDT consists of the sum of 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT.
Totals are calculated as the sum of all detected results. If all are undetcted results, the highest reporting limit value is reported as the sum.

µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
mg/kg-OC = milligrams per kilogram of organic carbon normalized
CSL = Cleanup Screening Level
LAET = lowest apparent effects threshold
2LAET = Second lowest apparent effects threshold
NAD83 = North American Datum 1983
SMS = Sediment Management Standards
SQS = Sediment Quality Standard
TEQ = Toxic Equivalency Quotient

Table 6
2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-09	DSI-MW-05	DSI-MW-06
		Sample ID	DSI09-GW	DSI-MW-05-072909	DSI-MW-06-072909
		Sample Date	9/28/2006	7/29/2009	7/29/2009
		Sample Type	N	N	N
		X	1267972.093	1267969.750000	1267953.290000
		Y	204599.0992	204575.210000	204456.310000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic			
Conventional Parameters (mg/l)					
Alkalinity, Bicarbonate as calcium cabonate (CaCO3)			--	--	**174**
Alkalinity, Carbonate as calcium cabonate (CaCO3)			--	--	1 U
Alkalinity, Hydroxide as calcium cabonate (CaCO3)			--	--	1 U
Alkalinity, total as calcium carbonate (CaCO3)			--	--	**174**
Chloride (total)			--	**461**	**131**
Nitrate + nitrite as nitrogen			--	--	0.1 U
Nitrate as nitrogen			--	--	0.1 U
Nitrite as nitrogen			--	--	**0.02**
Sulfate			--	--	**9.5**
Sulfide			--	--	**0.09**
Metals (µg/l)					
Arsenic			**2.6**	--	--
Cadmium			0.2 U	--	--
Chromium			5 U	--	--
Copper			**34.4**	--	--
Lead			**55**	--	--
Mercury			0.1 U	--	--
Nickel			--	--	--
Silver			**0.2**	--	--
Zinc			**98**	--	--
Metals, Dissolved (µg/l)					
Antimony			--	0.2 U	0.2 U
Arsenic	69	36	**1.6**	**0.5**	**1.1**
Cadmium	42	9.3	0.2 U	0.2 U	0.2 U
Chromium			2 U	2 U	2 U
Copper	4.8	3.1	**0.9**	**1.2**	**0.8**
Lead	210	8.1	1 U	1 U	1 U
Mercury	1.8	0.025	0.1 U	0.02 U	0.02 U
Nickel	74	8.2	--	**5.2**	**1.8**

Table 6
2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-09	DSI-MW-05	DSI-MW-06
		Sample ID	DSI09-GW	DSI-MW-05-072909	DSI-MW-06-072909
		Sample Date	9/28/2006	7/29/2009	7/29/2009
		Sample Type	N	N	N
		X	1267972.093	1267969.750000	1267953.290000
		Y	204599.0992	204575.210000	204456.310000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic			
Selenium	290	71	--	**0.5**	**0.9**
Silver	1.9		0.2 U	0.2 U	0.2 U
Zinc	90	81	**44**	**64**	4 U
Volatile Organics (µg/l)					
1,1,1,2-Tetrachloroethane			0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane			0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane			0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane			0.2 U	0.2 U	0.2 U
1,1-Dichloroethane			0.2 U	0.2 U	0.2 U
1,1-Dichloroethene			0.2 U	--	--
1,1-Dichloropropene			0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene			0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane			0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene			0.5 U	0.5 U	0.5 U
1,2,4-Trimethylbenzene			0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane			0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (Ethylene dibromide)			0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene			0.2 U	0.2 U	0.2 U
1,2-Dichloroethane			0.2 U	0.2 U	0.2 U
1,2-Dichloroethene, cis-			0.2 U	--	--
1,2-Dichloroethene, trans-			0.2 U	0.2 U	0.2 U
1,2-Dichloropropane			0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene (Mesitylene)			0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene			0.2 U	0.2 U	0.2 U
1,3-Dichloropropane			0.2 U	0.2 U	0.2 U
1,3-Dichloropropene, cis-			0.2 U	--	--
1,3-Dichloropropene, trans-			0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene			0.2 U	0.2 U	0.2 U
2,2-Dichloropropane			0.2 U	0.2 UJ	0.2 UJ
2-Butanone (MEK)			1 U	5 U	5 U

Table 6
2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-09	DSI-MW-05	DSI-MW-06
		Sample ID	DSI09-GW	DSI-MW-05-072909	DSI-MW-06-072909
		Sample Date	9/28/2006	7/29/2009	7/29/2009
		Sample Type	N	N	N
		X	1267972.093	1267969.750000	1267953.290000
		Y	204599.0992	204575.210000	204456.310000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic			
2-Chlorotoluene			0.2 U	0.2 U	0.2 U
2-Hexanone (Methyl butyl ketone)			3 U	5 U	5 U
4-Chlorotoluene			0.2 U	0.2 U	0.2 U
4-Isopropyltoluene (4-Cymene)			0.2 U	0.2 U	0.2 U
Acetone			**4.7**	5 U	5 U
Benzene			0.2 U	0.2 U	0.2 U
Bromobenzene			0.2 U	0.2 U	0.2 U
Bromochloromethane			0.2 U	0.2 U	0.2 U
Bromodichloromethane			0.2 U	0.2 U	0.2 U
Bromoform (Tribromomethane)			0.2 U	0.2 U	0.2 U
Bromomethane (Methyl Bromide)			0.2 U	0.5 U	0.5 U
Carbon disulfide			0.2 U	0.2 U	0.2 U
Carbon tetrachloride (Tetrachloromethane)			0.2 U	0.2 U	0.2 U
Chloroethane			0.2 U	0.2 U	0.2 U
Chloroform			0.2 U	0.2 U	0.2 U
Chloromethane			0.2 U	0.5 U	0.5 U
Dibromochloromethane			0.2 U	0.2 U	0.2 U
Dibromomethane			0.2 U	0.2 U	0.2 U
Dichlorodifluoromethane			0.2 U	0.2 U	0.2 U
Dichloromethane (Methylene chloride)			0.3 U	0.5 U	0.5 U
Ethylbenzene			0.2 U	0.2 U	0.2 U
Hexachlorobutadiene			--	0.5 U	0.5 U
Isopropylbenzene (Cumene)			0.2 U	0.2 U	0.2 U
m,p-Xylene			0.4 U	0.4 U	0.4 U
Methyl isobutyl ketone (4-Methyl-2-pentanone or [MIBK])			1 U	5 U	5 U
Methyl tert-butyl ether (MTBE)			0.2 U	0.5 U	0.5 U
Naphthalene			--	0.5 U	0.5 U
n-Butylbenzene			0.2 U	0.2 U	0.2 U
n-Propylbenzene			0.2 U	0.2 U	0.2 U
o-Xylene			0.2 U	0.2 U	0.2 U

Table 6
2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-09	DSI-MW-05	DSI-MW-06
		Sample ID	DSI09-GW	DSI-MW-05-072909	DSI-MW-06-072909
		Sample Date	9/28/2006	7/29/2009	7/29/2009
		Sample Type	N	N	N
		X	1267972.093	1267969.750000	1267953.290000
		Y	204599.0992	204575.210000	204456.310000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic			
sec-Butylbenzene			0.2 U	0.2 U	0.2 U
Styrene			0.2 U	0.2 U	0.2 U
tert-Butylbenzene			0.2 U	0.2 U	0.2 U
Tetrachloroethene (PCE)			0.2 U	0.2 U	0.2 U
Toluene			**0.4**	0.2 U	0.2 U
Trichloroethene (TCE)			0.2 U	0.2 U	0.2 U
Trichlorofluoromethane (Fluorotrichloromethane)			0.2 U	0.2 U	0.2 U
Vinyl chloride			0.2 U	0.2 U	0.2 U
Polycyclic Aromatic Hydrocarbons (PAH) (µg/l)					
1-Methylnaphthalene			--	0.01 U	**0.11**
2-Methylnaphthalene			0.08 U	0.01 U	**0.016**
Acenaphthene			**0.05**	0.01 U	**4**
Acenaphthylene			0.01 U	0.01 U	0.01 U
Anthracene			**0.02**	0.01 U	**0.024**
Benzo(a)anthracene			**0.01**	0.01 U	0.01 U
Benzo(a)pyrene			**0.01 J**	0.01 U	0.01 U
Benzo(b)fluoranthene			**0.01 J**	0.01 U	0.01 U
Benzo(g,h,i)perylene			0.01 U	0.01 U	0.01 U
Benzo(k)fluoranthene			**0.01 J**	0.01 U	0.01 U
Chrysene			**0.02**	0.01 U	0.01 U
Dibenzo(a,h)anthracene			0.01 U	0.01 U	0.01 U
Fluoranthene			**0.04**	0.01 U	0.01 U
Fluorene			**0.03**	0.01 U	**0.64**
Indeno(1,2,3-c,d)pyrene			0.01 U	0.01 U	0.01 U
Naphthalene			**0.1**	**0.024**	**0.016**
Phenanthrene			**0.13**	0.01 U	0.01 U
Pyrene			**0.05**	0.01 U	**0.01**
Total carcinogenic PAH TEQ (7 minimum CAEPA 2005) (U = 1/2)			**0.01 J**	0.01 U	0.01 U
Semivolatile Organics (µg/l)					
1,2,4-Trichlorobenzene			--	1 UJ	1 UJ

Table 6

2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-09	DSI-MW-05	DSI-MW-06
		Sample ID	DSI09-GW	DSI-MW-05-072909	DSI-MW-06-072909
		Sample Date	9/28/2006	7/29/2009	7/29/2009
		Sample Type	N	N	N
		X	1267972.093	1267969.750000	1267953.290000
		Y	204599.0992	204575.210000	204456.310000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic			
1,2-Dichlorobenzene			--	1 UJ	1 UJ
1,4-Dichlorobenzene			--	1 UJ	1 UJ
2,4-Dimethylphenol			--	1 U	1 U
2-Methylphenol (o-Cresol)			--	1 U	1 U
4-Methylphenol (p-Cresol)			--	1 U	1 U
Benzoic acid			--	10 U	10 U
Benzyl alcohol			--	5 U	5 U
Bis(2-ethylhexyl) phthalate			--	1 U	1 U
Butylbenzyl phthalate			--	1 U	1 U
Dibenzofuran			**0.01 J**	0.01 U	**0.062**
Diethyl phthalate			--	1 U	1 U
Dimethyl phthalate			--	1 U	1 U
Di-n-butyl phthalate			--	1 U	1 U
Di-n-octyl phthalate			--	1 U	1 U
Hexachlorobenzene			--	1 U	1 U
Hexachlorobutadiene			--	1 UJ	1 UJ
Hexachloroethane			--	1 UJ	1 UJ
N-Nitrosodiphenylamine			--	1 U	1 U
Pentachlorophenol	13	7.9	--	5 U	5 U
Phenol			--	1 U	1 U
Polychlorinated Biphenyl Aroclors (µg/l)					
Aroclor 1016			0.02 U	--	--
Aroclor 1221			0.02 U	--	--
Aroclor 1232			0.02 U	--	--
Aroclor 1242			0.02 U	--	--
Aroclor 1248			0.02 U	--	--
Aroclor 1254			0.02 U	--	--
Aroclor 1260			0.02 UJ	--	--
Total Polychlorinated Biphenyl Aroclors (U = 1/2)			0.02 UJ	--	--
Pesticides (µg/l)					

Table 6

2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-09	DSI-MW-05	DSI-MW-06
		Sample ID	DSI09-GW	DSI-MW-05-072909	DSI-MW-06-072909
		Sample Date	9/28/2006	7/29/2009	7/29/2009
		Sample Type	N	N	N
		X	1267972.093	1267969.750000	1267953.290000
		Y	204599.0992	204575.210000	204456.310000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic			
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)	0.13	0.001	0.01 U	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)	0.13	0.001	0.01 U	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)	0.13	0.001	0.01 U	--	--
Aldrin	0.71	0.0019	0.005 U	--	--
alpha-Chlordane (cis-Chlordane)			0.005 U	--	--
alpha-Hexachlorocyclohexane (BHC)			0.005 U	--	--
beta-Hexachlorocyclohexane (BHC)			0.005 U	--	--
delta-Hexachlorocyclohexane (BHC)			0.005 U	--	--
Dieldrin	0.71	0.0019	0.01 U	--	--
Endosulfan sulfate			0.01 U	--	--
Endosulfan-alpha (I)			0.005 U	--	--
Endosulfan-beta (II)			0.01 U	--	--
Endrin	0.037	0.0023	0.01 U	--	--
Endrin aldehyde			0.01 U	--	--
Endrin ketone			0.01 U	--	--
gamma-Chlordane			0.005 U	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	0.16		0.005 U	--	--
Heptachlor	0.053	0.0036	0.005 U	--	--
Heptachlor epoxide			0.005 U	--	--
Hexachlorobenzene			0.005 U	--	--
Hexachlorobutadiene			0.005 U	--	--
Methoxychlor			0.05 U	--	--
Toxaphene	0.21	0.0002	0.5 U	--	--

Table 6
2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

		Site Area	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells
		Task	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-09	DSI-MW-05	DSI-MW-06
		Sample ID	DSI09-GW	DSI-MW-05-072909	DSI-MW-06-072909
		Sample Date	9/28/2006	7/29/2009	7/29/2009
		Sample Type	N	N	N
		X	1267972.093	1267969.750000	1267953.290000
		Y	204599.0992	204575.210000	204456.310000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic			
Total Petroleum Hydrocarbons (mg/l)					
Diesel Range Hydrocarbons			0.25 U	0.25 U	0.25 U
Gasoline Range Hydrocarbons			0.25 U	0.25 U	0.25 U
Motor Oil Range			0.5 U	0.5 U	0.5 U

Table 6

2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

Site Area			B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Deep
Task			Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-MW-07	DSI-11	DSI-MW-08	DSI-12	DSI-MW-09	DSI-MW-10
Sample ID			DSI-MW-07-072409	DSI11-GW	DSI-MW-08-072809	DSI12-GW	DSI-MW-09-072809	DSI-MW-10-072809
Sample Date			7/24/2009	9/28/2006	7/28/2009	9/28/2006	7/28/2009	7/28/2009
Sample Type			N	N	N	N	N	N
X			1267953.320000	1267970.43	1267967.620000	1267970.416	1267963.770000	1267964.600000
Y			204463.390000	204358.8091	204366.340000	204269.044	204267.400000	204275.460000
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic						
Conventional Parameters (mg/l)								
Alkalinity, Bicarbonate as calcium cabonate (CaCO3)			--	--	--	--	**152**	--
Alkalinity, Carbonate as calcium cabonate (CaCO3)			--	--	--	--	1 U	--
Alkalinity, Hydroxide as calcium cabonate (CaCO3)			--	--	--	--	1 U	--
Alkalinity, total as calcium carbonate (CaCO3)			--	--	--	--	**152**	--
Chloride (total)			**15400**	--	**193**	--	**456**	**16800**
Nitrate + nitrite as nitrogen			--	--	--	--	0.01 U	--
Nitrate as nitrogen			--	--	--	--	0.01 U	--
Nitrite as nitrogen			--	--	--	--	0.01 U	--
Sulfate			--	--	--	--	**72.9**	--
Sulfide			--	--	--	--	0.05 U	--
Metals (µg/l)								
Arsenic			--	**6.7**	--	**32.5**	--	--
Cadmium			--	**1.6**	--	**0.3**	--	--
Chromium			--	**34**	--	**20**	--	--
Copper			**2.72**	**49.2**	--	**126**	--	**3.11**
Lead			--	**10**	--	**27**	--	--
Mercury			--	0.1 U	--	**0.12**	--	--
Nickel			2.02 UJ	--	--	--	--	2.02 UJ
Silver			--	0.2 U	--	**0.2**	--	--
Zinc			--	**154**	--	**109**	--	--
Metals, Dissolved (µg/l)								
Antimony			1 U	--	0.2 U	--	0.2 U	2 U
Arsenic	69	36	2 U	**0.8**	**2**	**5**	**1.1**	**3**
Cadmium	42	9.3	1 U	0.2 U	0.2 U	0.2 U	0.2 U	2 U
Chromium			2 U	2 U	2 U	0.5 U	1 U	5 U
Copper	4.8	3.1	**13 J**	0.5 U	**0.8**	0.5 U	**1.2**	**19**
Lead	210	8.1	5 U	1 U	1 U	1 U	1 U	10 U
Mercury	1.8	0.025	0.02 U	0.1 U	0.02 U	0.1 U	0.02 U	0.02 U
Nickel	74	8.2	**16**	--	**1.2**	--	**0.9**	**13**

Table 6

2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

Site Area			B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Deep
Task			Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-MW-07	DSI-11	DSI-MW-08	DSI-12	DSI-MW-09	DSI-MW-10
Sample ID			DSI-MW-07-072409	DSI11-GW	DSI-MW-08-072809	DSI12-GW	DSI-MW-09-072809	DSI-MW-10-072809
Sample Date			7/24/2009	9/28/2006	7/28/2009	9/28/2006	7/28/2009	7/28/2009
Sample Type			N	N	N	N	N	N
X			1267953.320000	1267970.43	1267967.620000	1267970.416	1267963.770000	1267964.600000
Y			204463.390000	204358.8091	204366.340000	204269.044	204267.400000	204275.460000
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic						
Selenium	290	71	10 U	--	**0.7**	--	2 U	**6**
Silver	1.9		1 U	0.2 U	0.2 U	0.2 U	0.2 U	2 U
Zinc	90	81	20 U	**8**	4 U	4 U	4 U	40 U
Volatile Organics (µg/l)								
1,1,1,2-Tetrachloroethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethene			--	0.2 U	--	0.2 U	--	--
1,1-Dichloropropene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trimethylbenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (Ethylene dibromide)			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethene, cis-			--	0.2 U	--	0.2 U	--	--
1,2-Dichloroethene, trans-			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene (Mesitylene)			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropene, cis-			--	0.2 U	--	0.2 U	--	--
1,3-Dichloropropene, trans-			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,2-Dichloropropane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Butanone (MEK)			5 U	1 U	5 U	1 U	5 U	5 U

Table 6
2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

Site Area			B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Deep
Task			Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-MW-07	DSI-11	DSI-MW-08	DSI-12	DSI-MW-09	DSI-MW-10
Sample ID			DSI-MW-07-072409	DSI11-GW	DSI-MW-08-072809	DSI12-GW	DSI-MW-09-072809	DSI-MW-10-072809
Sample Date			7/24/2009	9/28/2006	7/28/2009	9/28/2006	7/28/2009	7/28/2009
Sample Type			N	N	N	N	N	N
X			1267953.320000	1267970.43	1267967.620000	1267970.416	1267963.770000	1267964.600000
Y			204463.390000	204358.8091	204366.340000	204269.044	204267.400000	204275.460000
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic						
2-Chlorotoluene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone (Methyl butyl ketone)			5 U	3 U	5 U	3 U	5 U	5 U
4-Chlorotoluene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Isopropyltoluene (4-Cymene)			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Acetone			5 U	**6.3**	**5.2**	**6.3**	5 U	5 U
Benzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromobenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromochloromethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromodichloromethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform (Tribromomethane)			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromomethane (Methyl Bromide)			0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.5 U
Carbon disulfide			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon tetrachloride (Tetrachloromethane)			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform			**0.2**	0.2 U	0.2 U	0.2 U	**0.2**	**0.2**
Chloromethane			0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.5 U
Dibromochloromethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichlorodifluoromethane			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichloromethane (Methylene chloride)			0.5 U	0.3 U	0.5 U	0.3 U	0.5 U	0.5 U
Ethylbenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene			0.5 UJ	--	0.5 U	--	0.5 U	0.5 U
Isopropylbenzene (Cumene)			0.2 U	**0.5**	**1.2**	**0.5**	0.2 U	0.2 U
m,p-Xylene			0.4 U	**0.5**	0.4 U	**0.5**	0.4 U	0.4 U
Methyl isobutyl ketone (4-Methyl-2-pentanone or [MIBK])			5 U	1 U	5 U	1 U	5 U	5 U
Methyl tert-butyl ether (MTBE)			0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.5 U
Naphthalene			0.5 U	--	0.5 U	--	0.5 U	0.5 U
n-Butylbenzene			0.2 U	0.2 U	**0.4**	0.2 U	0.2 U	0.2 U
n-Propylbenzene			0.2 U	**0.5**	**1.6**	**0.5**	0.2 U	0.2 U
o-Xylene			0.2 U	**0.3**	**0.2**	**0.3**	0.2 U	0.2 U

Table 6
2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

		Site Area	**B-Nearshore Deep**	**B-Nearshore Shallow Monitoring Wells**	**B-Nearshore Shallow Monitoring Wells**	**B-Nearshore Shallow Monitoring Wells**	**B-Nearshore Shallow Monitoring Wells**	**B-Nearshore Deep**
		Task	**Duwamish Shipyard RI**	**DSI 2006 Historic**	**Duwamish Shipyard RI**	**DSI 2006 Historic**	**Duwamish Shipyard RI**	**Duwamish Shipyard RI**
		Location ID	**DSI-MW-07**	**DSI-11**	**DSI-MW-08**	**DSI-12**	**DSI-MW-09**	**DSI-MW-10**
		Sample ID	**DSI-MW-07-072409**	**DSI11-GW**	**DSI-MW-08-072809**	**DSI12-GW**	**DSI-MW-09-072809**	**DSI-MW-10-072809**
		Sample Date	**7/24/2009**	**9/28/2006**	**7/28/2009**	**9/28/2006**	**7/28/2009**	**7/28/2009**
		Sample Type	**N**	**N**	**N**	**N**	**N**	**N**
		X	**1267953.320000**	**1267970.43**	**1267967.620000**	**1267970.416**	**1267963.770000**	**1267964.600000**
		Y	**204463.390000**	**204358.8091**	**204366.340000**	**204269.044**	**204267.400000**	**204275.460000**
		Coordinate Type	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**	**NAD83WAN**
	Marine Acute	**Marine Chronic**						
sec-Butylbenzene			0.2 U	**0.2**	**0.7**	**0.2**	0.2 U	0.2 U
Styrene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
tert-Butylbenzene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethene (PCE)			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Toluene			0.2 U	**0.5**	**0.4**	**0.4**	**0.4**	**0.5**
Trichloroethene (TCE)			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane (Fluorotrichloromethane)			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl chloride			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Polycyclic Aromatic Hydrocarbons (PAH) (µg/l)								
1-Methylnaphthalene			0.01 U	--	**1.2**	--	**0.065**	**0.1**
2-Methylnaphthalene			0.01 U	0.07 U	**0.059**	**0.47**	0.01 U	0.01 U
Acenaphthene			**0.19**	**0.22**	**0.7**	**2.2**	**0.41**	**0.26**
Acenaphthylene			0.01 U	**0.02**	0.01 U	**1.8**	**0.083**	**0.028**
Anthracene			0.01 U	**0.01**	0.01 U	**2.6**	**0.017**	**0.15**
Benzo(a)anthracene			0.01 U	0.01 U	0.01 U	**3.4**	**0.034**	**0.011**
Benzo(a)pyrene			0.01 U	0.01 U	0.01 U	**3.5**	0.01 U	0.01 U
Benzo(b)fluoranthene			0.01 U	0.01 U	0.01 U	**2**	0.01 U	0.01 U
Benzo(g,h,i)perylene			0.01 U	0.01 U	0.01 U	**1.9**	0.01 U	0.01 U
Benzo(k)fluoranthene			0.01 U	0.01 U	0.01 U	**2.2**	0.01 U	0.01 U
Chrysene			0.01 U	**0.01 J**	0.01 U	**5**	**0.042**	**0.015**
Dibenzo(a,h)anthracene			0.01 U	0.01 U	0.01 U	**0.65**	0.01 U	0.01 U
Fluoranthene			0.01 U	**0.03**	**0.011**	**8.5**	**0.33**	**0.17**
Fluorene			**0.1**	**0.16**	**0.83**	**3.3**	**0.34**	**0.3**
Indeno(1,2,3-c,d)pyrene			0.01 U	0.01 U	0.01 U	**1.5**	0.01 U	0.01 U
Naphthalene			**0.02**	**0.2**	0.01 U	**1.2**	**0.038**	**0.036**
Phenanthrene			0.01 U	**0.04**	0.01 U	**5.6**	**0.02**	**0.43**
Pyrene			0.01 U	**0.02**	**0.011**	**11**	**0.36**	**0.18**
Total carcinogenic PAH TEQ (7 minimum CAEPA 2005) (U = 1/2)			0.01 U	**0.008 J**	0.01 U	**4.5**	**0.011**	**0.0083**
Semivolatile Organics (µg/l)								
1,2,4-Trichlorobenzene			1 UJ	--	1 UJ	--	1 UJ	1 UJ

Table 6
2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

Site Area			B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Deep
Task			Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
Location ID			DSI-MW-07	DSI-11	DSI-MW-08	DSI-12	DSI-MW-09	DSI-MW-10
Sample ID			DSI-MW-07-072409	DSI11-GW	DSI-MW-08-072809	DSI12-GW	DSI-MW-09-072809	DSI-MW-10-072809
Sample Date			7/24/2009	9/28/2006	7/28/2009	9/28/2006	7/28/2009	7/28/2009
Sample Type			N	N	N	N	N	N
X			1267953.320000	1267970.43	1267967.620000	1267970.416	1267963.770000	1267964.600000
Y			204463.390000	204358.8091	204366.340000	204269.044	204267.400000	204275.460000
Coordinate Type			NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic						
1,2-Dichlorobenzene			1 UJ	--	1 UJ	--	1 UJ	1 UJ
1,4-Dichlorobenzene			1 UJ	--	1 UJ	--	1 UJ	1 UJ
2,4-Dimethylphenol			1 U	--	1 U	--	1 U	1 U
2-Methylphenol (o-Cresol)			1 U	--	1 U	--	1 U	1 U
4-Methylphenol (p-Cresol)			1 U	--	1 U	--	1 U	1 U
Benzoic acid			10 U	--	10 U	--	10 U	10 U
Benzyl alcohol			5 U	--	5 U	--	5 U	5 U
Bis(2-ethylhexyl) phthalate			1 U	--	1 U	--	1 U	1 U
Butylbenzyl phthalate			1 U	--	1 U	--	1 U	1 U
Dibenzofuran			**0.03**	**0.03**	**0.25**	**0.44**	**0.018**	**0.026**
Diethyl phthalate			1 U	--	1 U	--	1 U	1 U
Dimethyl phthalate			1 U	--	1 U	--	1 U	1 U
Di-n-butyl phthalate			1 U	--	1 U	--	1 U	1 U
Di-n-octyl phthalate			1 U	--	1 U	--	1 U	1 U
Hexachlorobenzene			1 U	--	1 U	--	1 U	1 U
Hexachlorobutadiene			1 UJ	--	1 UJ	--	1 UJ	1 UJ
Hexachloroethane			1 UJ	--	1 UJ	--	1 UJ	1 UJ
N-Nitrosodiphenylamine			1 U	--	1 U	--	1 U	1 U
Pentachlorophenol	13	7.9	5 U	--	5 U	--	5 U	5 U
Phenol			1 U	--	1 U	--	**2.7**	1 U
Polychlorinated Biphenyl Aroclors (µg/l)								
Aroclor 1016			--	0.02 U	--	0.02 U	--	--
Aroclor 1221			--	0.02 U	--	0.02 U	--	--
Aroclor 1232			--	0.02 U	--	0.02 U	--	--
Aroclor 1242			--	0.02 U	--	0.02 U	--	--
Aroclor 1248			--	0.02 U	--	0.02 U	--	--
Aroclor 1254			--	0.02 U	--	0.02 U	--	--
Aroclor 1260			--	0.02 UJ	--	0.02 UJ	--	--
Total Polychlorinated Biphenyl Aroclors (U = 1/2)			--	0.02 UJ	--	0.02 UJ	--	--
Pesticides (µg/l)								

Table 6

2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

		Site Area	B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Deep
		Task	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-MW-07	DSI-11	DSI-MW-08	DSI-12	DSI-MW-09	DSI-MW-10
		Sample ID	DSI-MW-07-072409	DSI11-GW	DSI-MW-08-072809	DSI12-GW	DSI-MW-09-072809	DSI-MW-10-072809
		Sample Date	7/24/2009	9/28/2006	7/28/2009	9/28/2006	7/28/2009	7/28/2009
		Sample Type	N	N	N	N	N	N
		X	1267953.320000	1267970.43	1267967.620000	1267970.416	1267963.770000	1267964.600000
		Y	204463.390000	204358.8091	204366.340000	204269.044	204267.400000	204275.460000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic						
4,4'-Dichlorodiphenyldichloroethane (p,p'-DDD)	0.13	0.001	--	0.01 U	--	0.01 U	--	--
4,4'-Dichlorodiphenyldichloroethylene (p,p'-DDE)	0.13	0.001	--	0.01 U	--	0.01 U	--	--
4,4'-Dichlorodiphenyltrichloroethane (p,p'-DDT)	0.13	0.001	--	0.01 U	--	0.01 U	--	--
Aldrin	0.71	0.0019	--	0.005 U	--	0.005 U	--	--
alpha-Chlordane (cis-Chlordane)			--	0.005 U	--	0.005 U	--	--
alpha-Hexachlorocyclohexane (BHC)			--	0.005 U	--	0.005 U	--	--
beta-Hexachlorocyclohexane (BHC)			--	0.005 U	--	0.005 U	--	--
delta-Hexachlorocyclohexane (BHC)			--	0.005 U	--	0.005 U	--	--
Dieldrin	0.71	0.0019	--	0.01 U	--	0.01 U	--	--
Endosulfan sulfate			--	0.01 U	--	0.01 U	--	--
Endosulfan-alpha (I)			--	0.005 U	--	0.005 U	--	--
Endosulfan-beta (II)			--	0.01 U	--	0.01 U	--	--
Endrin	0.037	0.0023	--	0.01 U	--	0.01 U	--	--
Endrin aldehyde			--	0.01 U	--	0.01 U	--	--
Endrin ketone			--	0.01 U	--	0.01 U	--	--
gamma-Chlordane			--	0.005 U	--	0.005 U	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	0.16		--	0.005 U	--	0.018 U	--	--
Heptachlor	0.053	0.0036	--	0.005 U	--	0.005 U	--	--
Heptachlor epoxide			--	0.005 U	--	0.005 U	--	--
Hexachlorobenzene			--	0.005 U	--	0.005 U	--	--
Hexachlorobutadiene			--	0.005 U	--	0.005 U	--	--
Methoxychlor			--	0.05 U	--	0.05 U	--	--
Toxaphene	0.21	0.0002	--	0.5 U	--	0.5 U	--	--

Table 6

2006 and 2009 Investigation Analytical Results for Selected Groundwater Samples and Comparison with Washington Marine Water Quality Criteria

		Site Area	B-Nearshore Deep	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Shallow Monitoring Wells	B-Nearshore Deep
		Task	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI	DSI 2006 Historic	Duwamish Shipyard RI	Duwamish Shipyard RI
		Location ID	DSI-MW-07	DSI-11	DSI-MW-08	DSI-12	DSI-MW-09	DSI-MW-10
		Sample ID	DSI-MW-07-072409	DSI11-GW	DSI-MW-08-072809	DSI12-GW	DSI-MW-09-072809	DSI-MW-10-072809
		Sample Date	7/24/2009	9/28/2006	7/28/2009	9/28/2006	7/28/2009	7/28/2009
		Sample Type	N	N	N	N	N	N
		X	1267953.320000	1267970.43	1267967.620000	1267970.416	1267963.770000	1267964.600000
		Y	204463.390000	204358.8091	204366.340000	204269.044	204267.400000	204275.460000
		Coordinate Type	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN	NAD83WAN
	Marine Acute	Marine Chronic						
Total Petroleum Hydrocarbons (mg/l)								
Diesel Range Hydrocarbons			0.25 U	**3.2**	0.25 UJ	**0.63**	0.25 UJ	0.25 UJ
Gasoline Range Hydrocarbons			0.25 U	0.25 U	**0.36**	0.25 U	0.25 U	0.25 U
Motor Oil Range			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

Detected concentration is greater than Marine Acute screening level (yellow)

Detected concentration is greater than Marine Chronic screening level (cyan)

Bold = Detected result

J = Estimated value

U = Compound analyzed, but not detected above detection limit

UJ = Compound analyzed, but not detected above estimated detection limit

Totals are calculated as the sum of all detected results and one-half the undetected reporting limit. If all are undetected results, the highest reporting limit value is reported as the sum.

µg/l = micrograms per liter

FD = Field Duplicate

mg/l = milligrams per liter

N = Normal Field Sample

TEQ = Toxic Equivalency Quotient

Carcinogenic PAH (cPAH) values include a minimum calculation of 7 analytes: Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene and Indeno(1,2,3-c,d)pyrene. The calculation is based on MTCA cleanup Regulation, Table 708-2 "Toxicity Equivalency Factors for Minimum Required Carcinogenic Polyaromatic Hydrocarbons (cPAHs)" under WAC 173-340-708(e).

Table 7

2011 Surface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards[1]

Analyte	Location ID	DSI-SS-01	DSI-SS-02	DSI-SS-03	DSI-SS-04	DSI-SS-05	DSI-SS-06	DSI-SS-07	DSI-SS-08	DSI-SS-09	DSI-SS-10	DSI-SS-11
	Sample ID	DSI-SS-01	DSI-SS-02	DSI-SS-03	DSI-SS-04	DSI-SS-05	DSI-SS-06	DSI-SS-07	DSI-SS-08	DSI-SS-09	DSI-SS-10	DSI-SS-11
	Sample Date	3/7/2011	3/8/2011	3/8/2011	3/7/2011	3/7/2011	3/7/2011	3/8/2011	3/7/2011	3/7/2011	3/7/2011	3/7/2011
	Depth	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm
	SMS SQS											
Conventional Parameters (percent)												
Moisture content	--	123.2	128.7	126.6	119.7	112.2	118.3	102.8	116.2	97.2	109.4	120.1
Total organic carbon	--	2.54	2.63	2.09	2.73	2.45	2.52	2.28	1.39	2.12	1.65	2.58
Percent fines [2]	--	97.3	96.3	96.8	95	93.7	95.5	96.9	93.3	95	95.5	95.8
Total solids	--	45.4	44.2	45.3	47.2	48.3	46.7	50.2	47.3	50.5	50.9	45.7
Total volatile solids	--	9.36	9.55	9.62	9.17	9.28	8.98	7.84	8.62	8.57	7.79	8.86
Metals (mg/kg)												
Antimony	--	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
Arsenic	57	24.2	12.4	14.8	16.4	24	18.4	30.1	11	13.3	18.9	27.8
Beryllium	--	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Cadmium	5.1	0.6	0.5	0.5	0.6	0.5	0.6	1.2	0.4 U	0.6	0.5	0.5
Chromium	260	36 J	27 J	30 J	32 J	32 J	34 J	35 J	27 J	33 J	33 J	28 J
Chromium VI [3]	--	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R
Copper	390	93.3	47.3	58.8	67.1	87.7	112	107	42.1	65.1	82.8	59
Lead	450	34	15	22	27	39	36	48	13	26	49	20
Mercury	0.41	0.19	0.12	0.18	0.19	0.14	0.21	0.23	0.1	0.2	0.16	0.13
Nickel	--	28	23	25	25	25	25	27	23	27	25	23
Selenium	--	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Silver	6.1	0.7 U	0.6 U	0.7 U	0.6 U	0.6 U	0.7 U	0.6 U	0.6 U	0.6 U	0.6 U	0.7 U
Thallium	--	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Zinc	410	160	90	106	131	154	155	188	82	118	255	102
Organometallic Compounds (µg/kg)												
Tributyltin (bulk sediment)	73	30	7.2	15	29	180	74	170	3.6 U	7.2	87	32
Organometallic Compounds (µg/L)												
Tributyltin (interstitial water)	--	0.22 J	0.005 UJ	0.005 UJ	0.007 UJ	0.011 UJ	0.008 UJ	0.009 UJ	0.005 UJ	0.007 UJ	0.022 UJ	0.007 UJ
PAHs (µg/kg)												
1-Methylnaphthalene	--	66	26	19 U	9.5 J	11 J	11 J	20 U	19 U	21	16 J	11 J
2-Methylnaphthalene	--	21	20 U	19 U	17 J	28	15 J	12 J	19 U	12 J	11 J	16 J
Acenaphthene	--	25	20 U	13 J	32	52	37	20	19 U	11 J	18 J	16 J
Acenaphthylene	--	19 U	20 U	19 U	12 J	14 J	16 J	20 U	19 U	19 U	19 U	19 U
Anthracene	--	51	9.8 J	28	63	630	74	47	23	40	55	30
Benzo(a)anthracene	--	130	32	94	190	330	270	170	21	130	160	87
Benzo(a)pyrene	--	96	30	60	140	270	240	160 J	21	120	130	82
Benzo(b,j,k)fluoranthenes	--	240	74	150	360	610	540	360	52	280	280	180
Benzo(g,h,i)perylene	--	63	21	38	79	140	120	100	17 J	80	82	59
Chrysene	--	200	46	130	290	450	320	240 J	48	190	210	120
Dibenzo(a,h)anthracene	--	19	20 U	14 J	29	50	40	44	19 U	25	22	19
Fluoranthene	--	300	70	210	560	760	530	350 J	52	240	380	220
Fluorene	--	51	11 J	17 J	33	95	42	25	19 U	16 J	21	19
Indeno(1,2,3-c,d)pyrene	--	56	18 J	36	73	140	110	90	15 J	72	75	52
Naphthalene	--	38	20 U	19 U	28	42	28	17 J	19 U	23	20	27
Phenanthrene	--	150	43	110	160	450	240	150	31	100	210	120
Pyrene	--	250	71	180	420	640	450	450 J	48	240	360	200
Total SMS LPAH (U = 0)	--	315	64	168	328	1,283	437	259	54	190	324	212

Table 7

2011 Surface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards[1]

	Location ID	DSI-SS-01	DSI-SS-02	DSI-SS-03	DSI-SS-04	DSI-SS-05	DSI-SS-06	DSI-SS-07	DSI-SS-08	DSI-SS-09	DSI-SS-10	DSI-SS-11
	Sample ID	DSI-SS-01	DSI-SS-02	DSI-SS-03	DSI-SS-04	DSI-SS-05	DSI-SS-06	DSI-SS-07	DSI-SS-08	DSI-SS-09	DSI-SS-10	DSI-SS-11
	Sample Date	3/7/2011	3/8/2011	3/8/2011	3/7/2011	3/7/2011	3/7/2011	3/8/2011	3/7/2011	3/7/2011	3/7/2011	3/7/2011
	Depth	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm
Analyte	SMS SQS											
Total SMS HPAH (U = 0)	--	**1,114**	**288**	**762**	**1,781**	**2,780**	**2,080**	**1,604**	**222**	**1,097**	**1,419**	**839**
PAHs (mg/kg-OC)												
1-Methylnaphthalene	--	**2.6**	**1.0**	0.91 U	**0.35 J**	**0.45 J**	**0.44 J**	0.88 U	1.4 U	**1.0**	**1 J**	**0.4 J**
2-Methylnaphthalene	38	**0.8**	0.76 U	0.91 U	**0.62 J**	**1.1**	**0.60 J**	**0.53 J**	1.4 U	**0.6 J**	**0.7 J**	**0.6 J**
Acenaphthene	16	**1.0**	0.76 U	**0.62 J**	**1.2**	**2.1**	**1.5**	**0.9**	1.4 U	**0.5 J**	**1 J**	**0.6J**
Acenaphthylene	66	0.75 U	0.76 U	0.91 U	**0.44 J**	**0.57 J**	**0.63 J**	0.88 U	1.4 U	0.9 U	1 U	0.7 U
Anthracene	220	**2.0**	**0.37 J**	**1.3**	**2.3**	**26**	**2.9**	**2.1**	**1.7**	**1.9**	**3.3**	**1.2**
Benzo(a)anthracene	110	**5.1**	**1.2**	**4.5**	**7.0**	**13**	**11**	**7.5**	**1.5**	**6.1**	**10**	**3.4**
Benzo(a)pyrene	99	**3.8**	**1.1**	**2.9**	**5.1**	**11**	**10**	**7.0 J**	**1.5**	**5.7**	**7.9**	**3.2**
Benzo(b,j,k)fluoranthenes		**9.4**	**2.8**	**7.2**	**13**	**25**	**21**	**16**	**3.7**	**13**	**17**	**7.0**
Benzo(g,h,i)perylene	31	**2.5**	**0.8**	**1.8**	**2.9**	**5.7**	**4.8**	**4.4**	**1.2 J**	**3.8**	**5.0**	**2.3**
Chrysene	110	**7.9**	**1.7**	**6.2**	**11**	**18**	**13**	**11 J**	**3.5**	**9.0**	**13**	**4.7**
Dibenzo(a,h)anthracene	12	**0.7**	0.76 U	**0.67 J**	**1.1**	**2.0**	**1.6**	**1.9**	1.4 U	**1.2**	**1.3**	**0.7**
Fluoranthene	160	**12**	**2.7**	**10**	**21**	**31**	**21**	**15 J**	**3.7**	**11**	**23**	**8.5**
Fluorene	23	**2.0**	**0.42 J**	**0.81 J**	**1.2**	**3.9**	**1.7**	**1.1**	1.4 U	**0.75 J**	**1.3**	**0.7**
Indeno(1,2,3-c,d)pyrene	34	**2.2**	**0.68 J**	**1.7**	**2.7**	**5.7**	**4.4**	**3.9**	**1.1 J**	**3.4**	**4.5**	**2.0**
Naphthalene	99	**1.5**	0.76 U	0.91 U	**1.0**	**1.7**	**1.1**	**0.75 J**	1.4 U	**1.1**	**1.2**	**1.0**
Phenanthrene	100	**5.9**	**1.6**	**5.3**	**5.9**	**18**	**10**	**6.6**	**2.2**	**4.7**	**13**	**4.7**
Pyrene	1000	**10**	**2.7**	**8.6**	**15**	**26**	**18**	**20 J**	**3.5**	**11**	**22**	**7.8**
Total SMS LPAH (U = 0)	370	**12**	**2.4**	**8.0**	**12**	**52**	**17**	**11**	**3.9**	**9.0**	**20**	**8.2**
Total SMS HPAH (U = 0)	960	**44**	**11**	**36**	**65**	**113**	**83**	**70**	**16**	**52**	**86**	**33**
Chlorobenzenes (µg/kg)												
1,2-Dichlorobenzene	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
1,3-Dichlorobenzene	--	19 U	20 U	19 U	19 U	19 U	19 U	20 UJ	19 U	19 U	19 U	19 U
1,4-Dichlorobenzene	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	**2.7 J**	1.7 U	1.6 U	1.7 U	1.9 U
1,2,4-Trichlorobenzene	--	4.7 U	4.9 U	4.8 U	4.8 U	4.8 U	4.8 U	4.9 UJ	4.8 U	4.7 U	4.7 U	4.8 U
Hexachlorobenzene	--	0.98 U	**3**	1 U	0.98 U	0.98 U	0.98 U	0.99 U	0.98 U	0.98 U	0.97 U	0.99 U
Chlorobenzenes (mg/kg-OC)												
1,2-Dichlorobenzene	2.3	0.07 U	0.07 U	0.09 U	0.07 U	0.07 U	0.07 U	0.07 U	0.1 U	0.08 U	0.1 U	0.07 U
1,3-Dichlorobenzene	--	0.75 U	0.76 U	0.91 U	0.7 U	0.78 U	0.75 U	0.88 UJ	1.4 U	0.9 U	1.2 U	0.74 U
1,4-Dichlorobenzene	3.1	0.07 U	0.07 U	0.09 U	0.07 U	0.07 U	0.07 U	**0.12 J**	0.1 U	0.08 U	0.1 U	0.07 U
1,2,4-Trichlorobenzene	0.81	0.19 U	0.19 U	0.23 U	0.18 U	0.2 U	0.19 U	0.21 UJ	0.35 U	0.22 U	0.28 U	0.19 U
Hexachlorobenzene	0.38	0.04 U	**0.1**	0.048 U	0.04 U	0.04 U	0.039 U	0.04 U	0.07 U	0.05 U	0.06 U	0.04 U
Phthalates (µg/kg)												
Dimethyl phthalate	--	19 U	20 U	19 U	19 U	19 U	19 U	20 U	19 U	19 U	19 U	19 U
Diethyl phthalate	--	5.1 U	7.7 U	6.6 U	5.2 U	5.1 U	5.2 U	6.7 U	5.2 U	5.1 U	5.1 U	5.5 U
Di-n-butyl phthalate	--	19 U	20 U	**12 J**	19 U	**14 J**	19 U	20 U	19 U	19 U	19 U	19 U
Butylbenzyl phthalate	--	**15 J**	20 UJ	**9.7 J**	**12 J**	19 U	19 U	**16 J**	**9.6 J**	**14 J**	**15 J**	**13 J**
Bis(2-ethylhexyl) phthalate	--	**100**	**470**	**87**	**87**	**73**	**74**	**390 J**	**89**	**140**	**98**	**120**
Di-n-octyl phthalate	--	19 U	20 UJ	19 UJ	19 U	19 U	19 U	20 UJ	19 U	19 U	19 U	19 U
Phthalates (mg/kg-OC)												
Dimethyl phthalate	53	0.75 U	0.76 U	0.91 U	0.7 U	0.78 U	0.75 U	0.88 U	1.4 U	0.9 U	1.2 U	0.74 U
Diethyl phthalate	61	0.20 U	0.2928 U	0.32 U	0.19 U	0.2 U	0.21 U	0.29 U	0.3741 U	0.24 U	0.30 U	0.21 U

Table 7

2011 Surface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards[1]

	Location ID	DSI-SS-01	DSI-SS-02	DSI-SS-03	DSI-SS-04	DSI-SS-05	DSI-SS-06	DSI-SS-07	DSI-SS-08	DSI-SS-09	DSI-SS-10	DSI-SS-11
	Sample ID	DSI-SS-01	DSI-SS-02	DSI-SS-03	DSI-SS-04	DSI-SS-05	DSI-SS-06	DSI-SS-07	DSI-SS-08	DSI-SS-09	DSI-SS-10	DSI-SS-11
	Sample Date	3/7/2011	3/8/2011	3/8/2011	3/7/2011	3/7/2011	3/7/2011	3/8/2011	3/7/2011	3/7/2011	3/7/2011	3/7/2011
	Depth	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm
Analyte	SMS SQS											
Di-n-butyl phthalate	220	0.75 U	0.76 U	0.57 J	0.7 U	0.57 J	0.75 U	0.88 U	1.4 U	0.9 U	1.2 U	0.74 U
Butylbenzyl phthalate	4.9	0.59 J	0.76 UJ	0.46 J	0.44 J	0.78 U	0.75 U	0.70 J	0.69 J	0.66 J	0.90 J	0.50 J
Bis(2-ethylhexyl) phthalate	47	3.9	18	4.2	3.2	3.0	2.9	17 J	6.4	6.6	5.9	4.7
Di-n-octyl phthalate	58	0.75 U	0.76 UJ	0.91 UJ	0.7 U	0.78 U	0.75 U	0.88 UJ	1.4 U	0.9 U	1.2 U	0.74 U
Phenols (µg/kg)												
2,4-Dimethylphenol	29	19 U	20 UJ	19 UJ	19 U	19 U	19 U	20 UJ	19 U	19 U	19 U	19 U
2-Methylphenol (o-Cresol)	63	19 U	20 U	19 U	19 U	19 U	19 U	20 U	19 U	19 U	19 U	19 U
4-Methylphenol (p-Cresol)	670	420	13 J	14 J	370	360	280	18 J	220	180	160	180
Pentachlorophenol	360	14 U	13 U	13 U	13 U	--	17 U	18 U	13 U	12 U	12 U	13 U
Phenol	420	170	18 J	18 J	65	200	99	38	77	100	58	63
Phenols (mg/kg-OC)												
2,4-Dimethylphenol	--	0.75 U	0.76 UJ	0.91 UJ	0.7 U	0.78 U	0.75 U	0.88 UJ	1.4 U	0.9 U	1.2 U	0.74 U
2-Methylphenol (o-Cresol)	--	0.75 U	0.76 U	0.91 U	0.7 U	0.78 U	0.75 U	0.88 U	1.4 U	0.9 U	1.2 U	0.74 U
4-Methylphenol (p-Cresol)	--	17	0.49 J	0.67 J	14	15	11	0.79 J	16	8.5	10	7.0
Pentachlorophenol	--	0.55 U	0.49 U	0.62 U	0.48 U	--	0.67 U	0.79 U	0.4 U	0.57 U	0.73 U	0.50 U
Phenol	--	6.7	0.68 J	0.86 J	2.4	8.2	3.9	1.7	5.5	4.7	3.5	2.4
Miscellaneous Extractables (µg/kg) [4]												
Dibenzofuran	--	27	20 U	9.7 J	30	55	32	16 J	19 U	15 J	15 J	18 J
Hexachlorobutadiene	--	0.98 U	0.98 U	1 U	0.98 U	0.98 U	0.98 U	0.99 U	0.98 U	0.98 U	0.97 U	0.99 U
N-Nitrosodiphenylamine	--	8.9	4.9 UJ	4.8 UJ	4.8 U	4.8 U	4.8 U	4.9 UJ	4.8 U	4.7 U	4.7 U	4.8 U
Benzoic acid	650	600	210	100 J	460	320	380	120 J	240	360	390	690
Benzyl alcohol	57	320	160	73	290	250	240	65	140	180	230	390
Hexachloroethane	--	19 U	20 U	19 U	19 U	19 U	19 U	20 U	19 U	19 U	19 U	19 U
Miscellaneous Extractables (mg/kg-OC) [4]												
Dibenzofuran	15	1.1	0.76 U	0.46 J	1.1	2.2	1.3	0.70 J	1.4 U	0.71 J	0.90 J	0.70 J
Hexachlorobutadiene	3.9	0.04 U	0.04 U	0.05 U	0.04 U	0.04 U	0.04 U	0.04 U	0.07 U	0.05 U	0.06 U	0.04 U
N-Nitrosodiphenylamine	11	0.4	0.19 UJ	0.23 UJ	0.18 U	0.2 U	0.19 U	0.21 UJ	0.35 U	0.22 U	0.28 U	0.19 U
Benzyl alcohol	--	13	6.1	3.5	11	10	10	2.9	10	8.5	14	15
Benzoic acid	--	24	8.0	4.8 J	17	13	15	5.3 J	17	17	24	27
Hexachloroethane	--	0.75 U	0.76 U	0.91 U	0.7 U	0.78 U	0.75 U	0.88 U	1.4 U	0.9 U	1.2 U	0.74 U
PCB Aroclors (µg/kg)												
Aroclor 1016	--	3.9 U	8.6 U	3.9 U	3.9 U	4 U	8.3 U	7.9 U	3.9 U	8 U	8.7 UJ	4 U
Aroclor 1221	--	3.9 U	8.6 U	3.9 U	3.9 U	4 U	8.3 U	7.9 U	3.9 U	8 U	8.7 UJ	4 U
Aroclor 1232	--	3.9 U	8.6 U	3.9 U	3.9 U	4 U	8.3 U	7.9 U	3.9 U	8 U	8.7 UJ	4 U
Aroclor 1242	--	3.9 U	8.6 U	3.9 U	3.9 U	4 U	8.3 U	7.9 U	3.9 U	8 U	8.7 UJ	4 U
Aroclor 1248	--	32	21	25	37	34	55	71	15	40 U	73 J	34
Aroclor 1254	--	44	30	32	47	51	77	110	22	78	85 J	42
Aroclor 1260	--	26	21	18	26	33	61	73	13	47	39	24
Total PCB Aroclors (U = 0)	--	102	72	75	110	118	193	254	50	125	197	100
Total PCB Aroclors (U = 1/2)	--	109.8	89.2	82.8	117.8	126	209.6	269.8	57.8	161	214.4	108
PCB Aroclors (mg/kg-OC)												
Aroclor 1016	--	0.15 U	0.32 U	0.19 U	0.14 U	0.16 U	0.33 U	0.35 U	0.28 U	0.38 U	0.53 UJ	0.16 U
Aroclor 1221	--	0.15 U	0.32 U	0.19 U	0.14 U	0.16 U	0.33 U	0.35 U	0.28 U	0.38 U	0.53 UJ	0.16 U
Aroclor 1232	--	0.15 U	0.32 U	0.19 U	0.14 U	0.16 U	0.33 U	0.35 U	0.28 U	0.38 U	0.53 UJ	0.16 U

Table 7

2011 Surface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards[1]

Analyte	Location ID / Sample ID / Sample Date / Depth / SMS SQS	DSI-SS-01	DSI-SS-02	DSI-SS-03	DSI-SS-04	DSI-SS-05	DSI-SS-06	DSI-SS-07	DSI-SS-08	DSI-SS-09	DSI-SS-10	DSI-SS-11
	Sample ID	DSI-SS-01	DSI-SS-02	DSI-SS-03	DSI-SS-04	DSI-SS-05	DSI-SS-06	DSI-SS-07	DSI-SS-08	DSI-SS-09	DSI-SS-10	DSI-SS-11
	Sample Date	3/7/2011	3/8/2011	3/8/2011	3/7/2011	3/7/2011	3/7/2011	3/8/2011	3/7/2011	3/7/2011	3/7/2011	3/7/2011
	Depth	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm
	SMS SQS											
Aroclor 1242	--	0.15 U	0.32 U	0.19 U	0.14 U	0.16 U	0.33 U	0.35 U	0.28 U	0.38 U	0.53 UJ	0.16 U
Aroclor 1248	--	**1.3**	**0.8**	**1.2**	**1.4**	**1.4**	**2.2**	**3.1**	**1.1**	1.9 U	**4.4 J**	**1.3**
Aroclor 1254	--	**1.7**	**1.1**	**1.5**	**1.7**	**2.1**	**3.1**	**4.8**	**1.6**	**3.7**	**5.2 J**	**1.6**
Aroclor 1260	--	**1.0**	**0.8**	**0.9**	**1.0**	**1.3**	**2.4**	**3.2**	**0.9**	**2.2**	**2.4**	**0.9**
Total PCB Aroclors (U = 0)	12	**4.0**	**2.7**	**3.6**	**4.0**	**4.8**	**7.7**	**11.1**	**3.6**	**5.9**	**11.9**	**3.9**
Total PCB Aroclors (U = 1/2)	12	**4.3**	**3.4**	**4.0**	**4.3**	**5.1**	**8.3**	**11.8**	**4.2**	**7.6**	**13.0**	**4.2**
Volatile Organics (µg/kg)												
1,1,1-Trichloroethane	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
1,1,2-Trichloroethane	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
1,1-Dichloroethane	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
1,1-Dichloroethene	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
1,2-Dichlorobenzene	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
1,2-Dichloroethane	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
1,3,5-Trimethylbenzene (Mesitylene)	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
1,4-Dichlorobenzene	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	**--**	1.7 U	1.6 U	1.7 U	1.9 U
Acetone	--	**79**	**76**	**80**	**57**	**43**	**80**	**68**	**58**	**80**	**65**	**140**
Benzene	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Carbon tetrachloride (Tetrachloromethane)	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Chlorobenzene	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Chloroethane	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Chloroform	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Chloromethane	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Dichloromethane (Methylene chloride)	--	3.6 U	3.6 U	3.8 U	3.5 U	3.4 U	3.6 U	3.4 U	3.5 U	3.2 U	3.4 U	3.7 U
Ethylbenzene	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Hexachlorobutadiene	--	0.98 U	0.98 U	1 U	0.98 U	0.98 U	0.98 U	0.99 U	0.98 U	0.98 U	0.97 U	0.99 U
m,p-Xylene	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
o-Xylene	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Styrene	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Tetrachloroethene (PCE)	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Toluene	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Trichloroethene (TCE)	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Vinyl chloride	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Total Xylene (U = 0)	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Total Xylene (U = 1/2)	--	1.8 U	1.8 U	1.9 U	1.8 U	1.7 U	1.8 U	1.7 U	1.7 U	1.6 U	1.7 U	1.9 U
Pesticides (µg/kg)												
4,4'-DDD (p,p'-DDD)	--	2 U	2 U	**2.8**	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4,4'-DDE (p,p'-DDE)	--	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4,4'-DDT (p,p'-DDT)	--	2 U	2 U	2 U	**5.5**	2 U	**2.7**	**4.7**	2 U	2 U	2 U	2 U
Aldrin	--	0.98 U	0.98 U	1 U	0.98 U	0.98 U	0.98 U	0.99 U	0.98 U	0.98 U	0.97 U	0.99 U
alpha-Chlordane (cis-Chlordane)	--	0.98 U	0.98 U	1 U	0.98 U	0.98 U	0.98 U	0.99 U	0.98 U	0.98 U	0.97 U	0.99 U
alpha-Hexachlorocyclohexane (BHC)	--	0.98 U	0.98 U	1 U	0.98 U	0.98 U	0.98 U	0.99 U	0.98 U	0.98 U	0.97 U	0.99 U
beta-Chlordane (trans-Chlordane)	--	0.98 U	0.98 U	1 U	0.98 U	0.98 U	0.98 U	0.99 U	0.98 U	0.98 U	0.97 U	0.99 U
beta-Hexachlorocyclohexane (BHC)	--	0.98 U	0.98 U	1 U	0.98 U	0.98 U	0.98 U	0.99 U	0.98 U	0.98 U	0.97 U	0.99 U
delta-Hexachlorocyclohexane (BHC)	--	0.98 UJ	0.98 UJ	1 UJ	0.98 UJ	0.98 UJ	0.98 UJ	0.99 UJ	0.98 UJ	0.98 UJ	0.97 UJ	0.99 UJ
Dieldrin	--	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Endosulfan sulfate	--	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

Table 7

2011 Surface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards[1]

	Location ID	DSI-SS-01	DSI-SS-02	DSI-SS-03	DSI-SS-04	DSI-SS-05	DSI-SS-06	DSI-SS-07	DSI-SS-08	DSI-SS-09	DSI-SS-10	DSI-SS-11
	Sample ID	DSI-SS-01	DSI-SS-02	DSI-SS-03	DSI-SS-04	DSI-SS-05	DSI-SS-06	DSI-SS-07	DSI-SS-08	DSI-SS-09	DSI-SS-10	DSI-SS-11
	Sample Date	3/7/2011	3/8/2011	3/8/2011	3/7/2011	3/7/2011	3/7/2011	3/8/2011	3/7/2011	3/7/2011	3/7/2011	3/7/2011
	Depth	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm
Analyte	**SMS SQS**											
Endosulfan-alpha (I)	--	0.98 U	0.98 U	1 U	0.98 U	0.98 U	0.98 U	0.99 U	0.98 U	0.98 U	0.97 U	0.99 U
Endosulfan-beta (II)	--	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Endrin	--	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Endrin aldehyde	--	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Endrin ketone	--	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
gamma-Hexachlorocyclohexane (BHC) (Lindane)	--	0.98 U	0.98 U	1 U	0.98 U	0.98 U	0.98 U	0.99 U	0.98 U	0.98 U	0.97 U	0.99 U
Heptachlor	--	0.98 U	0.98 U	1 U	5.9 U	4.3 U	0.98 U	0.99 U	2.3 U	1.7 U	0.97 U	0.99 U
Heptachlor epoxide	--	0.98 U	0.98 UJ	1 UJ	4.4 U	0.98 U	1.6 U	0.99 UJ	0.98 U	0.98 U	0.97 U	0.99 U
Methoxychlor	--	9.8 U	9.8 U	10 U	9.8 U	9.8 U	9.8 U	9.9 U	9.8 U	9.8 U	9.7 U	9.9 U
Toxaphene	--	98 U	98 U	100 U	98 U	98 U	98 U	99 U	98 U	98 U	97 U	99 U
Total DDx (U = 0)	--	2 U	2 U	**2.8**	**5.5**	2 U	**2.7**	**4.7**	2 U	2 U	2 U	2 U
Total DDx (U = 1/2)	--	2 U	2 U	**4.8**	**7.5**	2 U	**4.7**	**6.7**	2 U	2 U	2 U	2 U
Dioxin Furans (ng/kg)												
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	**0.568 J**	**0.331 J**	--	**0.5 J**	**0.461 J**	--	**0.619 J**	**0.358 J**	**0.415 J**	--	**0.373 J**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	**2.14**	**1.16 J**	--	**1.63 J**	**1.83**	--	**2 J**	**0.77 J**	**1.67 J**	--	**1.07**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	**3.3**	**1.15 J**	--	**1.88 J**	**2.61**	--	**2.6**	**0.948 J**	**2.09**	--	**1.26 J**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	**18.9**	**4.1**	--	**8.97**	**13.4**	--	**12.3**	**3.48**	**9.6**	--	**6.41**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	**7.56**	**2.76**	--	**4.19**	**5.93**	--	**6.25**	**2.53**	**4.58**	--	**3.21**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	**643**	**94.9**	--	**263**	**447**	--	**380**	**103**	**272**	--	**199**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	**6250**	**870**	--	**2550**	**5090**	--	**3480**	**883**	**2310**	--	**1960**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	**1.39**	**0.672 J**	--	**1.14**	**1.24**	--	**1.52**	**0.473 J**	**1.25**	--	**0.745 J**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	**1.51 J**	**0.552 J**	--	**0.898 J**	**1.14 J**	--	**1.25 J**	0.379 U	**0.863 J**	--	**0.602 J**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	**3.86**	**0.845 J**	--	**1.67**	**2.32**	--	**2.57**	**0.622 J**	**1.7**	--	**1.21**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	**27.1**	**3.13**	--	**7.5**	**17.9**	--	**10.6**	**2.07**	**6.39**	--	**5.29**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	**5.32**	**1.14 J**	--	**2.08**	**3.86**	--	**2.78**	**0.958 J**	**1.98 J**	--	**1.48 J**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	**4.26**	**0.708 J**	--	**1.52 J**	**2.81**	--	**1.98 J**	0.422 U	**1.32 J**	--	**0.907 J**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	**9.09**	**1.41 J**	--	**2.89**	**5.98**	--	**4.05**	**1.21 J**	**2.85**	--	**2.13**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	**205**	**18.7**	--	**47**	**71.9**	--	**67.8**	**19**	**50.7**	--	**34.3**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	**17.8**	**1.77 J**	--	**4.87**	**9.37**	--	**6.84**	**1.68 J**	**4.39**	--	**4.01**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	**608**	**56.1**	--	**173**	**233**	--	**254**	**60.5**	**196**	--	**116**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	**11.5 J**	**8.59 J**	--	**8.71 J**	**8.75 J**	--	**10 J**	**5.3 J**	**8.98 J**	--	**5.91 J**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	**27.2**	**10.7 J**	--	**15.2 J**	**16.6 J**	--	**17.2 J**	**6.32 J**	**14.1 J**	--	**9.07**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	**151**	**35.9**	--	**83.7**	**127**	--	**105**	**31.3 J**	**79.8**	--	**45.5**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	**1510**	**235 J**	--	**750 J**	**1460**	--	**974 J**	**262**	**695 J**	--	**423**
Total Tetrachlorodibenzofuran (TCDF)	--	**25.3 J**	**12.8 J**	--	**24 J**	**25.4 J**	--	**33.1 J**	**9.85 J**	**26.4 J**	--	**14.9 J**
Total Pentachlorodibenzofuran (PeCDF)	--	**58.5 J**	**17.1 J**	--	**35.6 J**	**35.2 J**	--	**47.8 J**	**11.9 J**	**35.7 J**	--	**19.6 J**
Total Hexachlorodibenzofuran (HxCDF)	--	**269**	**34.1 J**	--	**89 J**	**153 J**	--	**114**	**26 J**	**83.1 J**	--	**52.9 J**

Table 7

2011 Surface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards[1]

	Location ID	DSI-SS-01	DSI-SS-02	DSI-SS-03	DSI-SS-04	DSI-SS-05	DSI-SS-06	DSI-SS-07	DSI-SS-08	DSI-SS-09	DSI-SS-10	DSI-SS-11
	Sample ID	DSI-SS-01	DSI-SS-02	DSI-SS-03	DSI-SS-04	DSI-SS-05	DSI-SS-06	DSI-SS-07	DSI-SS-08	DSI-SS-09	DSI-SS-10	DSI-SS-11
	Sample Date	3/7/2011	3/8/2011	3/8/2011	3/7/2011	3/7/2011	3/7/2011	3/8/2011	3/7/2011	3/7/2011	3/7/2011	3/7/2011
	Depth	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm	0 to 10 cm
Analyte	**SMS SQS**											
Total Heptachlorodibenzofuran (HpCDF)	--	**780**	**65**	--	**192**	**290**	--	**277**	**62.5**	**207**	--	**132**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)	--	**22.3**	**4.7**	--	**9.6**	**15.3**	--	**13.3**	**4.0**	**9.6**	--	**7.0**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)	--	**22.3**	**4.7**	--	**9.6**	**15.3**	--	**13.3**	**4.0**	**9.6**	--	**7.0**

Notes:

Detected concentration is greater than SMS SQS screening level

Bold = Detected result

J = Estimated value

R = Rejected

U = Compound analyzed, but not detected above detection limit

UJ = Compound analyzed, but not detected above estimated detection limit

1 = Surface sediment data include only Phase 1 RI data collected in March 2008; LDW surface data are not presented in Table 1.

2 = Percent fines calculated as percent material passing the 75 micron (#200) sieve.

3 = Chromium VI data are non-detect at all sample locations, and were rejected due to interference in the matrix spike.

4 = Miscellaneous extractable detections for benzyl alcohol and benzoic acid are observed throughout the Lower Duwamish Waterway site at concentrations that exceed SQS screening levels.

Definitions:

SMS = Sediment Management Standards

SQS = Sediment Quality Standards

LDW FS = Lower Duwamish Waterway Feasibility Study

DMMP = Dredged Material Management Program

cm = centimeter

µg/L = micrograms per liter

µg/kg = micrograms per kilogram

mg/L = milligrams per liter

mg/kg = milligrams per kilogram

ng/kg = nanograms per kilogram

OC = organic carbon

PAHs = polycyclic aromatic hydrocarbons

HPAH = high molecular weight PAH

LPAH = low molecular weight PAH

PCBs = polychlorinated biphenyls

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-02	DSI-SB-02	DSI-SB-02	DSI-SB-02	DSI-SB-03
	Sample ID	DSI-SB-01-1-2	DSI-SB-01-2-3.1	DSI-SB-01-3.1-4	DSI-SB-01-5-6	DSI-SB-01-6-7	DSI-SB-02-1-2.3	DSI-SB-02-3.7-5.2	DSI-SB-02-5.2-7	DSI-SB-02-8.5-10	DSI-SB-03-1-2
	Sample Date	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/11/2011	3/11/2011	3/11/2011	3/11/2011	3/14/2011
	Depth	1 to 2 feet	2 to 3.1 feet	3.1 to 4 feet	5 to 6 feet	6 to 7 feet	1 to 2.3 feet	3.7 to 5.2 feet	5.2 to 7 feet	8.5 to 10 feet	1 to 2 feet
	Stratigraphic Unit	Recent	Recent	Upper Alluvium	Upper Alluvium	Upper Alluvium	Recent	Recent	Upper Alluvium	Upper Alluvium	Recent
	SMS SQS										
Conventional Parameters (percent)											
Total organic carbon	--	1.7	1.26	0.498 J	0.186	0.31 J	2.41	3.46	0.822 J	0.655	2.94
Percent fines [2]	--	--	--	--	--	--	98.2	--	--	56.8	96.1
Total solids	--	54.9	70.2	78.1	79.6	76.9	48.6	59.8	74.2	78.1	49.8
Total volatile solids	--	--	--	--	--	--	--	--	--	--	--
Metals (mg/kg)											
Antimony	--	0.3 UJ	0.5 J	0.4 J	0.2 UJ	--	0.4 UJ	2.4 J	0.3 UJ	0.2 UJ	0.4 UJ
Arsenic	57	36	95	14	6.3	--	16	330	11	1.3	21
Beryllium	--	0.50	0.40	0.10	0.1 U	--	0.40	0.50	0.10	0.1 U	0.40
Cadmium	5.1	0.8 U	0.90	0.2 U	0.2 U	--	0.70	1.6	0.80	0.2 U	0.80
Chromium	260	47	101	14	11	--	36	48	24	8.0	40
Chromium VI [3]	--	-- R	-- R	--	-- R	--	-- R	-- R	--	-- R	5.9
Copper	390	499	691	39	19	--	86.9 J	361 J	59	13.7 J	134
Lead	450	93	133	13	11	--	39	270	36	2 U	58
Mercury	0.41	0.16	0.33	-- R	0.02 U	--	0.18	0.91	0.09 J	0.02 U	0.36 J
Nickel	--	35	39	9.0	8.0	--	27	29	11	5.0	27
Selenium	--	0.8 U	0.7 U	0.6 U	0.6 U	--	1 U	0.8 U	0.6 U	0.6 U	1 U
Silver	6.1	1 U	1 U	0.4 U	0.4 U	--	0.6 U	0.80	0.60	0.4 U	0.6 U
Thallium	--	0.3 U	0.3 U	0.2 U	0.2 U	--	0.4 U	0.40	0.3 U	0.2 U	0.4 U
Zinc	410	354 J	1,510 J	69	45 J	--	145 J	891 J	86	16 J	202
Organometallic Compounds (µg/kg)											
Tributyltin (bulk sediment)	73	52	120	15	58 J	3.5 U	31	740	4	22 J	62
PAHs (µg/kg)											
1-Methylnaphthalene	--	9.8 J	14 J	16 J	18 U	--	19 U	28	18 U	19 U	10 J
2-Methylnaphthalene	--	17 J	24	19 U	18 U	--	19 U	36	18 U	19 U	16 J
Acenaphthene	--	16 J	31	19 U	18 U	--	19 U	77	18 U	19 U	18 J
Acenaphthylene	--	30	14 J	19 U	18 U	--	19 U	22 U	18 U	19 U	19 U
Anthracene	--	68	91	19 U	18 U	--	35	210	11 J	19 U	65
Benzo(a)anthracene	--	220	310	30	18 U	--	110	680	32	19 U	220
Benzo(a)pyrene	--	300	310	22	18 U	--	110	540	32	19 U	260
Benzo(b,j,k)fluoranthenes	--	840	680	63	18 U	--	280	1,200	87	19 U	670
Benzo(g,h,i)perylene	--	160	150	17 J	18 U	--	76	330	27	19 U	160
Chrysene	--	420	430 J	63	18 U	--	150	820	40	19 U	360
Dibenzo(a,h)anthracene	--	67	49	19 U	18 U	--	19	110	18 U	19 U	61
Fluoranthene	--	300	890	64	18 U	--	250	1,900	60	19 U	340
Fluorene	--	25	38	19 U	18 U	--	24	71	18 U	19 U	25
Indeno(1,2,3-c,d)pyrene	--	160	160	11 J	18 U	--	68	300	24	19 U	150
Naphthalene	--	26	16 J	19 U	18 U	--	38	61	13 J	19 U	29
Phenanthrene	--	140	360	170 J	18 U	--	110	590	35	19 U	190
Pyrene	--	770	940	150	18 U	--	260	1,600	130	19 U	800
Total SMS HPAH (U = 0)	--	2,397	3,239	357	18 U	--	1,043	6,280	345	19 U	2,351
Total SMS LPAH (U = 0)	--	305	550	170	18 U	--	207	1,009	59	19 U	327

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-02	DSI-SB-02	DSI-SB-02	DSI-SB-02	DSI-SB-03
	Sample ID	**DSI-SB-01-1-2**	**DSI-SB-01-2-3.1**	**DSI-SB-01-3.1-4**	**DSI-SB-01-5-6**	**DSI-SB-01-6-7**	**DSI-SB-02-1-2.3**	**DSI-SB-02-3.7-5.2**	**DSI-SB-02-5.2-7**	**DSI-SB-02-8.5-10**	**DSI-SB-03-1-2**
	Sample Date	**3/10/2011**	**3/10/2011**	**3/10/2011**	**3/10/2011**	**3/10/2011**	**3/11/2011**	**3/11/2011**	**3/11/2011**	**3/11/2011**	**3/14/2011**
	Depth	**1 to 2 feet**	**2 to 3.1 feet**	**3.1 to 4 feet**	**5 to 6 feet**	**6 to 7 feet**	**1 to 2.3 feet**	**3.7 to 5.2 feet**	**5.2 to 7 feet**	**8.5 to 10 feet**	**1 to 2 feet**
	Stratigraphic Unit	**Recent**	**Recent**	**Upper Alluvium**	**Upper Alluvium**	**Upper Alluvium**	**Recent**	**Recent**	**Upper Alluvium**	**Upper Alluvium**	**Recent**
	SMS SQS										
PAHs (mg/kg-OC)											
1-Methylnaphthalene	--	**0.58 J**	**1.1 J**	**3.2 J**	9.7 U	--	0.79 U	**0.8**	2.2 U	2.9 U	**0.34 J**
2-Methylnaphthalene	38	**1 J**	**1.9**	3.8 U	9.7 U	--	0.79 U	**1.0**	2.2 U	2.9 U	**0.54 J**
Acenaphthene	16	**0.94 J**	**2.5**	3.8 U	9.7 U	--	0.79 U	**2.2**	2.2 U	2.9 U	**0.61 J**
Acenaphthylene	66	**1.8**	**1.1 J**	3.8 U	9.7 U	--	0.79 U	0.64 U	2.2 U	2.9 U	0.65 U
Anthracene	220	**4.0**	**7.2**	3.8 U	9.7 U	--	**1.5**	**6.1**	**1.3 J**	2.9 U	**2.2**
Benzo(a)anthracene	110	**12.9**	**24.6**	**6.0**	9.7 U	--	**4.6**	**19.7**	**3.9**	2.9 U	**7.5**
Benzo(a)pyrene	99	**17.6**	**24.6**	**4.4**	9.7 U	--	**4.6**	**15.6**	**3.9**	2.9 U	**8.8**
Benzo(b,j,k)fluoranthenes	--	**49.4**	**54.0**	**12.7**	9.7 U	--	**11.6**	**34.7**	**10.6**	2.9 U	**22.8**
Benzo(g,h,i)perylene	31	**9.4**	**11.9**	**3.4 J**	9.7 U	--	**3.2**	**9.5**	**3.3**	2.9 U	**5.4**
Chrysene	110	**24.7**	**34.1 J**	**12.7**	9.7 U	--	**6.2**	**23.7**	**4.9**	2.9 U	**12.2**
Dibenzo(a,h)anthracene	12	**3.9**	**3.9**	3.8 U	9.7 U	--	**0.8**	**3.2**	2.2 U	2.9 U	**2.1**
Fluoranthene	160	**17.6**	**70.6**	**12.9**	9.7 U	--	**10.4**	**54.9**	**7.3**	2.9 U	**11.6**
Fluorene	23	**1.5**	**3.0**	3.8 U	9.7 U	--	**1.0**	**2.1**	2.2 U	2.9 U	**0.9**
Indeno(1,2,3-c,d)pyrene	34	**9.4**	**12.7**	**2.2 J**	9.7 U	--	**2.8**	**8.7**	**2.9**	2.9 U	**5.1**
Naphthalene	99	**1.5**	**1.3 J**	3.8 U	9.7 U	--	**1.6**	**1.8**	**1.6 J**	2.9 U	**1.0**
Phenanthrene	100	**8.2**	**28.6**	**34.1 J**	9.7 U	--	**4.6**	**17.1**	**4.3**	2.9 U	**6.5**
Pyrene	1000	**45.3**	**74.6**	**30.1**	9.7 U	--	**10.8**	**46.2**	**15.8**	2.9 U	**27.2**
Total SMS HPAH (U = 0)	960	**141**	**257.1**	**71.7**	9.7 U	--	**43.3**	**182**	**42.0**	2.9 U	**80.0**
Total SMS LPAH (U = 0)	370	**17.9**	**43.7**	**34.1**	9.7 U	--	**8.6**	**29.2**	**7.2**	2.9 U	**11.1**
Chlorobenzenes (µg/kg)											
1,2-Dichlorobenzene	--	1.7 U	1.3 U	4.7 U	1.2 U	--	1.9 U	**12**	4.6 U	**3.5 J**	1.9 U
1,3-Dichlorobenzene	--	20 U	20 U	19 U	18 U	--	19 U	19 U	18 U	19 U	19 U
1,4-Dichlorobenzene	--	1.7 U	1.3 U	4.7 U	1.2 U	--	**3.5 J**	**5.4 J**	4.6 U	1.1 U	1.9 U
1,2,4-Trichlorobenzene	--	4.9 U	4.9 U	4.7 U	4.5 U	--	4.8 U	4.8 U	4.6 U	4.6 U	4.7 U
Hexachlorobenzene	--	0.99 U	0.98 U	--	0.98 U	--	0.97 U	4.8 U	4.6 U	4.6 U	0.99 U
Chlorobenzenes (mg/kg-OC)											
1,2-Dichlorobenzene	2.3	0.1 U	0.1 U	0.94 U	0.6 U	--	0.08 U	**0.3**	0.56 U	**0.53 J**	0.06 U
1,3-Dichlorobenzene	--	1.2 U	1.6 U	3.8 U	9.7 U	--	0.79 U	0.55 U	2.2 U	2.9 U	0.65 U
1,4-Dichlorobenzene	3.1	0.1 U	0.1 U	0.94 U	0.6 U	--	**0.15 J**	**0.16 J**	0.56 U	0.2 U	0.06 U
1,2,4-Trichlorobenzene	0.81	0.29 U	0.39 U	0.94 U	2.4 U	--	0.20 U	0.14 U	0.56 U	0.70 U	0.16 U
Hexachlorobenzene	0.38	0.06 U	0.08 U	--	0.53 U	--	0.04 U	0.14 U	0.56 U	0.70 U	0.03 U
Phthalates (µg/kg)											
Dimethyl phthalate	--	**15 J**	**8.9 J**	19 U	18 U	--	19 U	**23**	18 U	19 U	19 U
Diethyl phthalate	--	5.3 U	**6.2**	5 U	**5.1**	--	**4.9 J**	**7.6**	5 U	**15**	**40**
Di-n-butyl phthalate	--	**13 J**	**11 J**	19 U	18 U	--	19 U	19 U	18 U	19 U	46 U
Butylbenzyl phthalate	--	**30**	**15 J**	19 U	18 U	--	**21**	19 U	18 U	19 U	**38 J**
Bis(2-ethylhexyl) phthalate	--	**670**	**440 J**	25 U	37 U	--	**170**	**760**	61 U	29 U	**240**
Di-n-octyl phthalate	--	20 U	**25**	19 U	18 U	--	19 U	19 U	18 U	19 U	19 U
Phthalates (mg/kg-OC)											
Dimethyl phthalate	53	**0.88 J**	**0.71 J**	3.8 U	9.7 U	--	0.79 U	**0.7**	2.2 U	2.9 U	0.65 U
Diethyl phthalate	61	0.31 U	**0.5**	1.0 U	**2.7**	--	**0.20 J**	**0.2**	0.61 U	**2.3**	**1.4**
Di-n-butyl phthalate	220	**0.76 J**	**0.87 J**	3.8 U	9.7 U	--	0.79 U	0.55 U	2.2 U	2.9 U	1.6 U
Butylbenzyl phthalate	4.9	**1.8**	**1.2 J**	3.8 U	9.7 U	--	**0.9**	0.55 U	2.2 U	2.9 U	**1.3 J**
Bis(2-ethylhexyl) phthalate	47	**39.4**	**35 J**	5.0 U	20 U	--	**7.1**	**22**	7.4 U	4.4 U	**8.2**
Di-n-octyl phthalate	58	1.2 U	**2.0**	3.8 U	9.7 U	--	0.79 U	0.55 U	2.2 U	2.9 U	0.65 U

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-02	DSI-SB-02	DSI-SB-02	DSI-SB-02	DSI-SB-03
	Sample ID	DSI-SB-01-1-2	DSI-SB-01-2-3.1	DSI-SB-01-3.1-4	DSI-SB-01-5-6	DSI-SB-01-6-7	DSI-SB-02-1-2.3	DSI-SB-02-3.7-5.2	DSI-SB-02-5.2-7	DSI-SB-02-8.5-10	DSI-SB-03-1-2
	Sample Date	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/11/2011	3/11/2011	3/11/2011	3/11/2011	3/14/2011
	Depth	1 to 2 feet	2 to 3.1 feet	3.1 to 4 feet	5 to 6 feet	6 to 7 feet	1 to 2.3 feet	3.7 to 5.2 feet	5.2 to 7 feet	8.5 to 10 feet	1 to 2 feet
	Stratigraphic Unit	Recent	Recent	Upper Alluvium	Upper Alluvium	Upper Alluvium	Recent	Recent	Upper Alluvium	Upper Alluvium	Recent
Analytes	SMS SQS										
Phenols (µg/kg)											
2,4-Dimethylphenol	29	20 U	20 U	19 UJ	18 U	--	19 UJ	19 UJ	18 UJ	19 UJ	19 UJ
2-Methylphenol (o-Cresol)	63	20 U	20 U	19 U	18 U	--	19 U	19 U	18 U	19 U	19 U
4-Methylphenol (p-Cresol)	670	**24**	**9.9 J**	19 U	18 U	--	**32**	**54**	18 U	19 U	**21**
Pentachlorophenol	360	**25 J**	14 U	7.6 U	7.7 U	--	12 U	**150 J**	8.1 U	8.1 U	12 U
Phenol	420	**47**	20 U	**12 J**	18 U	--	**120**	**120**	**15 J**	19 U	**42**
Phenols (mg/kg-OC)											
2,4-Dimethylphenol	--	1.2 U	1.6 U	3.8 U	9.7 U	--	0.79 UJ	0.55 UJ	2.2 UJ	2.9 UJ	0.65 UJ
2-Methylphenol (o-Cresol)	--	1.2 U	1.6 U	3.8 U	9.7 U	--	0.79 U	0.55 U	2.2 U	2.9 U	0.65 U
4-Methylphenol (p-Cresol)	--	**1.4**	**0.79 J**	3.8 U	9.7 U	--	**1.3**	**1.6**	2.2 U	2.9 U	**0.7**
Pentachlorophenol	--	**1.5 J**	1.1 U	1.5 U	4.1 U	--	0.50 U	**4.3 J**	0.99 U	1.2 U	0.41 U
Phenol	--	**2.8**	1.6 U	**2.4 J**	9.7 U	--	**5.0**	**3.5**	**1.8 J**	2.9 U	**1.4**
Miscellaneous Extractables (µg/kg) [4]											
Dibenzofuran	--	**20**	**22**	**20**	18 U	--	19 U	**61**	18 U	19 U	**21**
Hexachlorobutadiene	--	0.99 U	0.98 U	4.7 U	0.98 U	--	0.97 U	4.8 U	4.6 U	4.6 U	0.99 U
N-Nitrosodiphenylamine	--	4.9 U	4.9 U	4.7 U	4.5 U	--	4.8 U	**23**	4.6 U	4.6 U	19 U
Benzyl alcohol	57	**43**	20 U	19 UJ	18 U	--	**280**	**85**	18 UJ	19 U	**85**
Benzoic acid	650	**120 J**	200 UJ	190 UJ	180 U	--	**430 J**	190 UJ	180 U	190 UJ	**130 J**
Hexachloroethane	--	20 U	20 UJ	19 U	18 U	--	19 U	19 U	18 U	19 U	19 U
Miscellaneous Extractables (mg/kg-OC) [4]											
Dibenzofuran	15	**1.2**	**1.7**	**4.0**	9.7 U	--	0.79 U	**1.8**	2.2 U	2.9 U	**0.7**
Hexachlorobutadiene	3.9	0.06 U	0.08 U	0.9 U	0.5 U	--	0.04 U	0.1 U	0.6 U	0.7 U	0.03 U
N-Nitrosodiphenylamine	11	0.29 U	0.4 U	0.94 U	2.4 U	--	0.20 U	**0.7**	0.56 U	0.70 U	0.65 U
Benzyl alcohol	--	**2.5**	1.6 U	3.8 U	9.7 U	--	**11.6**	**2.5**	2.2 UJ	2.9 U	**2.9**
Benzoic acid	--	**7.1 J**	16 UJ	38 UJ	97 U	--	**17 J**	5.5 UJ	22 U	29 UJ	**4.4 J**
Hexachloroethane	--	1.2 U	1.6 U	3.8 U	9.7 U	--	0.79 U	0.55 U	2.2 U	2.9 U	0.65 U
PCB Aroclors (µg/kg)											
Aroclor 1016	--	3.8 U	38 U	3.8 U	3.9 U	--	3.9 U	20 U	3.8 U	3.9 U	4 U
Aroclor 1221	--	3.8 U	38 U	3.8 U	3.9 U	--	3.9 U	20 U	3.8 U	3.9 U	4 U
Aroclor 1232	--	3.8 U	38 U	3.8 U	3.9 U	--	3.9 U	20 U	3.8 U	3.9 U	4 U
Aroclor 1242	--	3.8 U	38 U	3.8 U	3.9 U	--	3.9 U	20 U	3.8 U	3.9 U	4 U
Aroclor 1248	--	**28**	**290**	38 U	3.9 U	--	29 U	**250**	**68**	3.9 U	**32**
Aroclor 1254	--	**40**	**490**	**72**	**4.3**	--	**46**	**260**	**72**	3.9 U	**41**
Aroclor 1260	--	**25**	**190**	**26**	3.9 U	--	**35**	**220**	**28**	3.9 U	**29**
Total PCB Aroclors (U = 0)	--	**93**	**970**	**98**	**4.3**	--	**81**	**730**	**168**	3.9 U	**102**
Total PCB Aroclors (U = 1/2)	--	**101**	**1,046**	**125**	**16**	--	**103**	**770**	**176**	3.9 U	**110**
PCB Aroclors (mg/kg-OC)											
Aroclor 1016	--	0.22 U	3.0 U	0.76 U	2.1 U	--	0.16 U	0.58 U	0.46 U	0.60 U	0.14 U
Aroclor 1221	--	0.22 U	3.0 U	0.76 U	2.1 U	--	0.16 U	0.58 U	0.46 U	0.60 U	0.14 U
Aroclor 1232	--	0.22 U	3.0 U	0.76 U	2.1 U	--	0.16 U	0.58 U	0.46 U	0.60 U	0.14 U
Aroclor 1242	--	0.22 U	3.0 U	0.76 U	2.1 U	--	0.16 U	0.58 U	0.46 U	0.60 U	0.14 U
Aroclor 1248	--	**1.6**	**23**	7.6 U	2.1 U	--	1.2 U	**7.2**	**8.3**	0.60 U	**1.1**
Aroclor 1254	--	**2.4**	**39**	**14**	**2.3**	--	**1.9**	**7.5**	**8.8**	0.60 U	**1.4**
Aroclor 1260	--	**1.5**	**15**	**5.2**	2.1 U	--	**1.5**	**6.4**	**3.4**	0.60 U	**1.0**
Total PCB Aroclors (U = 0)	12	**5.5**	**77**	**20**	**2.3**	--	**3.4**	**21**	**20**	0.60 U	**3.5**
Total PCB Aroclors (U = 1/2)	12	**5.9**	**83**	**25**	**8.6**	--	**4.3**	**22**	**21**	0.60 U	**3.7**

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-02	DSI-SB-02	DSI-SB-02	DSI-SB-02	DSI-SB-03
	Sample ID	DSI-SB-01-1-2	DSI-SB-01-2-3.1	DSI-SB-01-3.1-4	DSI-SB-01-5-6	DSI-SB-01-6-7	DSI-SB-02-1-2.3	DSI-SB-02-3.7-5.2	DSI-SB-02-5.2-7	DSI-SB-02-8.5-10	DSI-SB-03-1-2
	Sample Date	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/11/2011	3/11/2011	3/11/2011	3/11/2011	3/14/2011
	Depth	1 to 2 feet	2 to 3.1 feet	3.1 to 4 feet	5 to 6 feet	6 to 7 feet	1 to 2.3 feet	3.7 to 5.2 feet	5.2 to 7 feet	8.5 to 10 feet	1 to 2 feet
	Stratigraphic Unit	Recent	Recent	Upper Alluvium	Upper Alluvium	Upper Alluvium	Recent	Recent	Upper Alluvium	Upper Alluvium	Recent
	SMS SQS										
Volatile Organics (µg/kg)											
1,1,1-Trichloroethane	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
1,1,2-Trichloroethane	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
1,1-Dichloroethane	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
1,1-Dichloroethene	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
1,2-Dichloroethane	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
1,3,5-Trimethylbenzene (Mesitylene)	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Acetone	--	**59**	**99**	--	**17**	--	**82**	**54**	--	**25**	**130**
Benzene	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Carbon tetrachloride (Tetrachloromethane)	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Chlorobenzene	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Chloroethane	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Chloroform	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Chloromethane	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Dichloromethane (Methylene chloride)	--	3.5 U	2.7 U	--	2.4 U	--	3.9 U	2.9 U	--	**22**	3.7 U
Ethylbenzene		1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
m,p-Xylene	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
o-Xylene	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Styrene	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Tetrachloroethene (PCE)	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Toluene	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Trichloroethene (TCE)	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Vinyl chloride	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Total Xylene (U = 0)	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Total Xylene (U = 1/2)	--	1.7 U	1.3 U	--	1.2 U	--	1.9 U	1.5 U	--	1.1 U	1.9 U
Pesticides (µg/kg)											
4,4'-DDD (p,p'-DDD)	--	2 U	2 U	--	2 U	--	2 U	9.7 U	--	--	2 U
4,4'-DDE (p,p'-DDE)	--	2 U	2 U	--	2 U	--	2 U	9.7 U	--	--	2 U
4,4'-DDT (p,p'-DDT)	--	2 U	**11**	--	2 U	--	3.5 U	9.7 U	--	--	4.4 U
Aldrin	--	0.99 U	0.98 U	--	0.98 U	--	0.97 U	4.8 U	--	--	0.99 U
alpha-Chlordane (cis-Chlordane)	--	0.99 U	0.98 U	--	0.98 U	--	0.97 U	4.8 U	--	--	0.99 U
alpha-Hexachlorocyclohexane (BHC)	--	0.99 U	0.98 U	--	0.98 U	--	0.97 U	4.8 U	--	--	0.99 U
beta-Chlordane (trans-Chlordane)	--	0.99 U	0.98 U	--	0.98 U	--	0.97 U	4.8 U	--	--	0.99 U
beta-Hexachlorocyclohexane (BHC)	--	0.99 U	0.98 U	--	0.98 U	--	0.97 U	4.8 U	--	--	0.99 U
delta-Hexachlorocyclohexane (BHC)	--	0.99 UJ	0.98 UJ	--	0.98 UJ	--	0.97 UJ	4.8 UJ	--	--	0.99 UJ
Dieldrin	--	2 U	2 U	--	2 U	--	2 U	9.7 U	--	--	2 U
Endosulfan sulfate	--	2 UJ	2 UJ	--	2 UJ	--	2 U	9.7 U	--	--	2 U
Endosulfan-alpha (I)	--	0.99 U	0.98 U	--	0.98 U	--	0.97 U	4.8 U	--	--	0.99 U
Endosulfan-beta (II)	--	2 U	2 U	--	2 U	--	2 U	9.7 U	--	--	2 U
Endrin	--	2 U	2 U	--	2 U	--	2 U	9.7 U	--	--	2 U
Endrin aldehyde	--	2 UJ	2 UJ	--	2 UJ	--	**3.4 J**	9.7 U	--	--	2 U
Endrin ketone	--	2 U	2 U	--	2 U	--	2 U	9.7 U	--	--	2 U
gamma-Hexachlorocyclohexane (BHC) (Lindane)	--	0.99 U	0.98 U	--	0.98 U	--	0.97 U	4.8 U	--	--	0.99 U
Heptachlor	--	0.99 U	0.98 U	--	0.98 U	--	0.97 U	4.8 U	--	--	0.99 U
Heptachlor epoxide	--	0.99 U	5.3 U	--	0.98 U	--	0.97 U	5.6 U	--	--	0.99 U
Methoxychlor	--	9.9 U	9.8 U	--	9.8 U	--	9.7 U	48 U	--	--	9.9 U

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-01	DSI-SB-02	DSI-SB-02	DSI-SB-02	DSI-SB-02	DSI-SB-03
	Sample ID	DSI-SB-01-1-2	DSI-SB-01-2-3.1	DSI-SB-01-3.1-4	DSI-SB-01-5-6	DSI-SB-01-6-7	DSI-SB-02-1-2.3	DSI-SB-02-3.7-5.2	DSI-SB-02-5.2-7	DSI-SB-02-8.5-10	DSI-SB-03-1-2
	Sample Date	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/11/2011	3/11/2011	3/11/2011	3/11/2011	3/14/2011
	Depth	1 to 2 feet	2 to 3.1 feet	3.1 to 4 feet	5 to 6 feet	6 to 7 feet	1 to 2.3 feet	3.7 to 5.2 feet	5.2 to 7 feet	8.5 to 10 feet	1 to 2 feet
	Stratigraphic Unit	Recent	Recent	Upper Alluvium	Upper Alluvium	Upper Alluvium	Recent	Recent	Upper Alluvium	Upper Alluvium	Recent
	SMS SQS										
Toxaphene	--	99 U	98 U	--	98 U	--	97 U	480 U	--	--	99 U
Total DDx (U = 0)	--	2 U	**11**	--	2 U	--	3.5 U	9.7 U	--	--	4.4 U
Total DDx (U = 1/2)	--	2 U	**13**	--	2 U	--	3.5 U	9.7 U	--	--	4.4 U
Dioxin Furans (ng/kg)											
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	--	--	--	**0.532 J**	**2.10**	--	**0.0575 J**	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	--	--	--	--	**2.38 J**	**7.1 J**	--	**0.291 J**	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	**2.87**	**7.96**	--	**0.16 J**	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	**12.4**	**62.2**	--	**0.257 J**	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	**6.72**	**27.7**	--	0.27 U	--
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	--	--	--	--	**333**	**1,930**	--	**1.27 J**	--
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	--	--	--	--	--	**3,060**	**20,600**	--	**7.82**	--
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	--	--	--	--	--	**1.59**	**3.23**	--	0.331 UJ	--
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	**1.36 J**	**2.97**	--	0.642 U	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	**2.44**	**7.33**	--	0.279 UJ	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	**9.20**	**38.0**	--	0.701 UJ	--
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	**2.85**	**8.90**	--	0.294 UJ	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	**1.84 J**	**7.41**	--	0.0427 U	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	**3.98**	**13.5**	--	**0.136 J**	--
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--	**61.9**	**270**	--	0.595 U	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--	**5.70**	**24.5**	--	**0.109 J**	--
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	--	--	--	--	--	**207**	**829**	--	0.371 U	--
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	--	--	--	**12.1 J**	**20.6 J**	--	**1.04 J**	--
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	--	--	--	--	**20 J**	**54.2 J**	--	**1.01 J**	--
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	**106**	**427**	--	**1.61 J**	--
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	--	--	--	--	**920 J**	**3800 J**	--	**2.65 J**	--
Total Tetrachlorodibenzofuran (TCDF)	--	--	--	--	--	--	**34.9 J**	**78.9 J**	--	**2.8 J**	--
Total Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	**48.7 J**	**125 J**	--	**2.78 J**	--
Total Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	**106 J**	**437 J**	--	1.79 UJ	--
Total Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--	**241**	**1,230**	--	0.851 UJ	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)	--	--	--	--	--	--	**12.8**	**57.1**	--	**0.56**	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)	--	--	--	--	--	--	**12.8**	**57.1**	--	**0.42**	--

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-03	DSI-SB-03	DSI-SB-03	DSI-SB-03	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-05
	Sample ID	DSI-SB-03-5.8-7	DSI-SB-03-9.5-10.4	DSI-SB-03-10.4-11.1	DSI-SB-03-11.1-11.6	DSI-SB-04-1-2	DSI-SB-04-4-5	DSI-SB-04-7-8.3	DSI-SB-04-8.3-9.3	DSI-SB-04-9.3-10.9	DSI-SB-05-1-2
	Sample Date	3/14/2011	3/14/2011	3/14/2011	3/14/2011	3/9/2011	3/9/2011	3/9/2011	3/9/2011	3/9/2011	3/10/2011
	Depth	5.8 to 7 feet	9.5 to 10.4 feet	10.4 to 11.1 feet	11.1 to 11.6 feet	1 to 2 feet	4 to 5 feet	7 to 8.3 feet	8.3 to 9.3 feet	9.3 to 10.9 feet	1 to 2 feet
	Stratigraphic Unit	Recent	Recent	Upper Alluvium	Lower Alluvium	Recent	Recent	Recent	Lower Alluvium	Lower Alluvium	Recent
Analytes	SMS SQS										
Conventional Parameters (percent)											
Total organic carbon	--	**1.73**	**2.49**	**2.19**	**0.957**	**2.54**	**2.42**	**1.65**	**0.954 J**	**0.68**	**1.85**
Percent fines [2]	--	--	--	--	--	--	--	--	**62.9**	--	--
Total solids	--	**74**	**70.2**	**60.4**	**78.4**	**50.9**	**54.6**	**69.7**	**79.2**	**75.8**	**52.7**
Total volatile solids	--	--	--	--	--	**8.54**	**7.24**	**3.51**	--	--	--
Metals (mg/kg)											
Antimony	--	**4.5 J**	**3.1 J**	**0.6 J**	**2.9 J**	0.4 UJ	0.3 UJ	**5 J**	**10 J**	0.3 UJ	**0.5 J**
Arsenic	57	**147**	**191**	**205**	**41.1 J**	**30**	**60**	**550**	**802**	**22.1 J**	**53**
Beryllium	--	**0.30**	**0.20**	**0.50**	0.1 U	**0.40**	**0.50**	**0.90**	**0.40**	0.1 U	**0.40**
Cadmium	5.1	**1.1**	**0.90**	**1.3**	0.2 U	**0.90**	**1.1**	**4.0**	**2.5**	0.3 U	**0.80**
Chromium	260	**68**	**65**	**49 J**	**10.5 J**	**44**	**67**	**223**	**98**	**12.9 J**	**45**
Chromium VI [3]	--	0.538 U	0.563 U	--	--	**-- R**	**-- R**	**-- R**	--	--	**-- R**
Copper	390	**381**	**474**	**375 J**	**23.4 J**	**242**	**578**	**1,740**	**1,090**	**14.5 J**	**212**
Lead	450	**286**	**243**	**261 J**	**10 J**	**80**	**223**	**1,340**	**740**	3 UJ	**79**
Mercury	0.41	**0.25 J**	**0.22 J**	**1.39 J**	**-- R**	**0.30**	**0.31**	**2.7**	**1.4 J**	**-- R**	**0.39**
Nickel	--	**28**	**17**	**25**	**7**	**29**	**37**	**69**	**44**	**10**	**29**
Selenium	--	0.6 U	0.7 U	0.8 UJ	0.6 U	1 U	0.9 U	0.7 U	**0.60**	0.6 U	0.9 U
Silver	6.1	**0.60**	**0.80**	1 U	0.4 U	0.6 U	1 U	**2.0**	**1.5**	0.4 U	0.6 U
Thallium	--	0.3 U	0.3 U	0.3 U	0.3 U	0.4 U	0.3 U	**0.30**	**0.50**	0.3 U	0.4 U
Zinc	410	**924**	**701**	**609 J**	**42 J**	**309 J**	**896 J**	**4,110 J**	**2,140**	**23 J**	**293 J**
Organometallic Compounds (µg/kg)											
Tributyltin (bulk sediment)	73	**150**	**620**	**3,900**	**94 J**	**69**	**380**	**1,500**	**710**	3.5 U	**50**
PAHs (µg/kg)											
1-Methylnaphthalene	--	**37**	**45**	**80 J**	20 U	**26**	**15 J**	**320**	57 U	18 U	**13 J**
2-Methylnaphthalene	--	**48**	**58**	**75 J**	20 U	**40**	**25**	**110**	57 U	18 U	**20**
Acenaphthene	--	**320**	**130**	**380**	20 U	**150**	**30**	**1,900**	**250**	**73**	**31**
Acenaphthylene	--	**11 J**	**28**	**75 J**	20 U	**32**	**26**	**73**	57 U	18 U	**34**
Anthracene	--	**180**	**160**	**550**	20 U	**350**	**130**	**1,000**	**220**	18 U	**270**
Benzo(a)anthracene	--	**450**	**460**	**1,800**	**33**	**760**	**380**	**2600 J**	**750**	18 U	**600**
Benzo(a)pyrene	--	**290**	**340**	**1,400**	**22**	**660**	**440**	**1600 J**	**450**	18 U	**640**
Benzo(b,j,k)fluoranthenes	--	**610**	**740**	**3,100**	**16 J**	**1,400**	**990**	**3200 J**	**1,100**	18 U	**1,500**
Benzo(g,h,i)perylene	--	**160**	**200**	**840**	**52**	**390**	**230**	**720**	**340**	18 U	**260**
Chrysene	--	**520**	**550**	**2,100**	**37**	**1,100**	**520**	**2,400**	**830**	18 U	**910**
Dibenzo(a,h)anthracene	--	**67**	**75**	**260**	20 U	**130**	**80**	**310**	**110**	18 U	**110**
Fluoranthene	--	**1,600**	**1,200**	**4,900**	**110**	**1,700**	**600**	**--**	**2,200**	**16 J**	**810**
Fluorene	--	**250**	**120**	**300**	20 U	**190**	**37**	**420**	**100**	18 U	**55**
Indeno(1,2,3-c,d)pyrene	--	**160**	**190**	**830**	**13 J**	**380**	**220**	**780**	**310**	18 U	**270**
Naphthalene	--	**110**	**210**	**250**	20 U	**92**	**39**	**790 J**	**120**	**18**	**46**
Phenanthrene	--	**900**	**700**	**2,100**	**28**	**1,500**	**270**	**3,000**	**1,300**	**47**	**360**
Pyrene	--	**1,700**	**1,300**	**4,100**	**90**	**1,800**	**1,400**	**7,700**	**1,900**	**15 J**	**1,100**
Total SMS HPAH (U = 0)	--	**4,947**	**4,315**	**16,230**	**321**	**6,920**	**3,870**	**16,110**	**6,890**	**31**	**4,700**
Total SMS LPAH (U = 0)	--	**1,771**	**1,348**	**3,655**	**28**	**2,314**	**532**	**7,183**	**1,990**	**138**	**796**

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-03	DSI-SB-03	DSI-SB-03	DSI-SB-03	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-05
	Sample ID	DSI-SB-03-5.8-7	DSI-SB-03-9.5-10.4	DSI-SB-03-10.4-11.1	DSI-SB-03-11.1-11.6	DSI-SB-04-1-2	DSI-SB-04-4-5	DSI-SB-04-7-8.3	DSI-SB-04-8.3-9.3	DSI-SB-04-9.3-10.9	DSI-SB-05-1-2
	Sample Date	3/14/2011	3/14/2011	3/14/2011	3/14/2011	3/9/2011	3/9/2011	3/9/2011	3/9/2011	3/9/2011	3/10/2011
	Depth	5.8 to 7 feet	9.5 to 10.4 feet	10.4 to 11.1 feet	11.1 to 11.6 feet	1 to 2 feet	4 to 5 feet	7 to 8.3 feet	8.3 to 9.3 feet	9.3 to 10.9 feet	1 to 2 feet
	Stratigraphic Unit	Recent	Recent	Upper Alluvium	Lower Alluvium	Recent	Recent	Recent	Lower Alluvium	Lower Alluvium	Recent
Analytes	SMS SQS										
PAHs (mg/kg-OC)											
1-Methylnaphthalene	--	2.1	1.8	3.7 J	2.1 U	1.0	0.62 J	19.4	6.0 U	2.6 U	0.70 J
2-Methylnaphthalene	38	2.8	2.3	3.4 J	2.1 U	1.6	1.0	6.7	6.0 U	2.6 U	1.1
Acenaphthene	16	18.5	5.2	17.4	2.1 U	5.9	1.2	115	26.2	10.7	1.7
Acenaphthylene	66	0.64 J	1.1	3.4 J	2.1 U	1.3	1.1	4.4	6.0 U	2.6 U	1.8
Anthracene	220	10.4	6.4	25.1	2.1 U	13.8	5.4	60.6	23.1	2.6 U	14.6
Benzo(a)anthracene	110	26.0	18.5	82.2	3.4	29.9	15.7	158 J	78.6	2.6 U	32.4
Benzo(a)pyrene	99	16.8	13.7	63.9	2.3	26.0	18.2	97 J	47.2	2.6 U	34.6
Benzo(b,j,k)fluoranthenes	--	35.3	29.7	141.6	1.7 J	55.1	40.9	194 J	115.3	2.6 U	81.1
Benzo(g,h,i)perylene	31	9.2	8.0	38.4	5.4	15.4	9.5	43.6	35.6	2.6 U	14.1
Chrysene	110	30.1	22.1	95.9	3.9	43.3	21.5	145	87.0	2.6 U	49.2
Dibenzo(a,h)anthracene	12	3.9	3.0	11.9	2.1 U	5.1	3.3	18.8	11.5	2.6 U	5.9
Fluoranthene	160	92.5	48.2	224	11.5	66.9	24.8	--	231	2.4 J	43.8
Fluorene	23	14.5	4.8	13.7	2.1 U	7.5	1.5	25.5	10.5	2.6 U	3.0
Indeno(1,2,3-c,d)pyrene	34	9.2	7.6	37.9	1.4 J	15.0	9.1	47.3	32.5	2.6 U	14.6
Naphthalene	99	6.4	8.4	11.4	2.1 U	3.6	1.6	47.9 J	12.6	2.6	2.5
Phenanthrene	100	52.0	28.1	95.9	2.9	59.1	11.2	182	136	6.9	19.5
Pyrene	1000	98.3	52.2	187	9.4	70.9	57.9	467	199	2.2 J	59.5
Total SMS HPAH (U = 0)	960	286	173	741	33.5	272	160	976	722	4.6	254
Total SMS LPAH (U = 0)	370	102	54.1	167	2.9	91.1	22.0	435	209	20.3	43.0
Chlorobenzenes (µg/kg)											
1,2-Dichlorobenzene	--	1.2 U	1.3 U	20	4.9 U	1.8 UJ	7.8	12	21	14	1.8 U
1,3-Dichlorobenzene	--	18 U	20 U	94 U	20 U	19 U	20 U	19 U	57 U	18 U	19 U
1,4-Dichlorobenzene	--	1.2 U	1.3 U	7	4.9 U	1.8 UJ	6.4	5.1 J	4.7 U	4.6 U	1.8 U
1,2,4-Trichlorobenzene	--	4.6 U	4.9 U	4.7 U	4.9 U	4.8 U	4.9 U	4.7 U	4.7 U	4.6 U	4.7 U
Hexachlorobenzene	--	0.98 U	0.97 U	4.7 U	4.9 U	0.99 U	1.6 U	0.98 U	4.7 U	4.6 U	0.99 U
Chlorobenzenes (mg/kg-OC)											
1,2-Dichlorobenzene	2.3	0.07 U	0.05 U	0.9	0.5 U	0.07 UJ	0.3	0.7	2.2	2.1	0.1 U
1,3-Dichlorobenzene	--	1.0 U	0.80 U	4.3 U	2.1 U	0.75 U	0.83 U	1.2 U	6.0 U	2.6 U	1.0 U
1,4-Dichlorobenzene	3.1	0.07 U	0.05 U	0.3	0.5 U	0.07 UJ	0.3	0.31 J	0.49 U	0.7 U	0.1 U
1,2,4-Trichlorobenzene	0.81	0.27 U	0.20 U	0.21 U	0.5 U	0.19 U	0.20 U	0.28 U	0.49 U	0.7 U	0.25 U
Hexachlorobenzene	0.38	0.057 U	0.039 U	0.21 U	0.5 U	0.039 U	0.066 U	0.059 U	0.49 U	0.7 U	0.05 U
Phthalates (µg/kg)											
Dimethyl phthalate	--	18 U	20 U	94 U	20 U	19 U	69	19 U	57 U	18 U	37
Diethyl phthalate	--	6.6	5.2 U	--	61 U	5.2 U	5.3 U	5 U	5.1 U	14 U	20
Di-n-butyl phthalate	--	18 U	20 U	94 U	20 U	17 J	40	160	80	18 U	17 J
Butylbenzyl phthalate	--	18 UJ	20 UJ	94 U	20 U	29	28	19 U	57 U	18 U	26
Bis(2-ethylhexyl) phthalate	--	240	870	1400	28	200	270	890 J	1200	23 U	740
Di-n-octyl phthalate	--	18 U	20 U	94 U	20 U	19 U	20 U	19 UJ	57 U	18 U	36
Phthalates (mg/kg-OC)											
Dimethyl phthalate	53	1.0 U	0.80 U	4.3 U	2.1 U	0.75 U	2.9	1.2 U	6.0 U	2.6 U	2.0
Diethyl phthalate	61	0.4	0.21 U	--	6.4 U	0.20 U	0.22 U	0.30 U	0.53 U	2.1 U	1.1
Di-n-butyl phthalate	220	1.0 U	0.80 U	4.3 U	2.1 U	0.67 J	1.7	9.7	8.4	2.6 U	0.92 J
Butylbenzyl phthalate	4.9	1.0 UJ	0.80 U	4.3 U	2.1 U	1.1	1.2	1.2 U	6.0 U	2.6 U	1.4
Bis(2-ethylhexyl) phthalate	47	13.9	34.9	63.9	2.9	7.9	11.2	54 J	126.0	3.4 U	40.0
Di-n-octyl phthalate	58	1.0 U	0.80 U	4.3 U	2.1 U	0.75 U	0.83 U	1.2 U	6.0 U	2.6 U	1.9

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-03	DSI-SB-03	DSI-SB-03	DSI-SB-03	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-05
	Sample ID	DSI-SB-03-5.8-7	DSI-SB-03-9.5-10.4	DSI-SB-03-10.4-11.1	DSI-SB-03-11.1-11.6	DSI-SB-04-1-2	DSI-SB-04-4-5	DSI-SB-04-7-8.3	DSI-SB-04-8.3-9.3	DSI-SB-04-9.3-10.9	DSI-SB-05-1-2
	Sample Date	3/14/2011	3/14/2011	3/14/2011	3/14/2011	3/9/2011	3/9/2011	3/9/2011	3/9/2011	3/9/2011	3/10/2011
	Depth	5.8 to 7 feet	9.5 to 10.4 feet	10.4 to 11.1 feet	11.1 to 11.6 feet	1 to 2 feet	4 to 5 feet	7 to 8.3 feet	8.3 to 9.3 feet	9.3 to 10.9 feet	1 to 2 feet
	Stratigraphic Unit	Recent	Recent	Upper Alluvium	Lower Alluvium	Recent	Recent	Recent	Lower Alluvium	Lower Alluvium	Recent
Analytes	SMS SQS										
Phenols (µg/kg)											
2,4-Dimethylphenol	29	18 UJ	**20 J**	94 UJ	39 UJ	19 U	20 U	**22**	57 UJ	37 UJ	19 U
2-Methylphenol (o-Cresol)	63	18 U	**45**	94 U	20 U	19 U	20 U	**11 J**	57 U	18 U	**7.5 J**
4-Methylphenol (p-Cresol)	670	**15 J**	**130**	**52 J**	39 U	**110**	**53**	**130**	57 U	37 U	**43**
Pentachlorophenol	360	8 U	84 U	**160 J**	24 U	18 U	**57 J**	**86 J**	**56**	23 U	18 U
Phenol	420	**110**	**160**	**56 J**	20 U	**75**	**110**	**97**	**45 J**	**16 J**	**58**
Phenols (mg/kg-OC)											
2,4-Dimethylphenol	--	1.0 UJ	**0.80 J**	4.3 UJ	4.1 UJ	0.75 U	0.83 U	**1.3**	6.0 UJ	5.4 UJ	1.0 U
2-Methylphenol (o-Cresol)	--	1.0 U	**1.8**	4.3 UJ	2.1 U	0.75 U	0.83 U	**0.67 J**	6.0 U	2.6 U	**0.41 J**
4-Methylphenol (p-Cresol)	--	**0.87 J**	**5.2**	**2.4 J**	4.1 U	**4.3**	**2.2**	**7.9**	6.0 U	5.4 U	**2.3**
Pentachlorophenol	--	0.46 U	3.4 U	**7.3 J**	2.5 U	0.71 U	**2.4 J**	**5.2 J**	**5.9**	3.4 U	0.97 U
Phenol	--	**6.4**	**6.4**	**2.6 J**	2.1 U	**3.0**	**4.5**	**5.9**	**4.7 J**	**2.4 J**	**3.1**
Miscellaneous Extractables (µg/kg) [4]											
Dibenzofuran	--	**180**	**74**	**180**	20 U	**110**	**26**	**250**	**120**	18 U	**30**
Hexachlorobutadiene	--	0.98 U	0.97 U	4.7 U	4.9 U	0.99 U	0.98 U	0.98 U	4.7 U	4.6 U	0.99 U
N-Nitrosodiphenylamine	--	18 U	20 U	**39**	4.9 U	19 U	20 U	19 U	4.7 U	4.6 U	4.7 U
Benzyl alcohol	57	18 U	**9.7 J**	94 UJ	20 U	**140**	**86**	**11 J**	57 UJ	18 U	**97**
Benzoic acid	650	180 UJ	200 UJ	940 U	390 UJ	**380**	**310**	190 UJ	570 U	370 U	**180 J**
Hexachloroethane	--	18 U	20 U	94 U	20 UJ	19 U	20 U	19 UJ	57 U	18 U	19 U
Miscellaneous Extractables (mg/kg-OC) [4]											
Dibenzofuran	15	**10.0**	**3.0**	**8.2**	2.1 U	**4.3**	**1.1**	**15.2**	**12.6**	2.6 U	**1.6**
Hexachlorobutadiene	3.9	0.06 U	0.04 U	0.2 U	0.5 U	0.04 U	0.04 U	0.06 U	0.5 U	0.7 U	0.05 U
N-Nitrosodiphenylamine	11	1.0 U	0.80 U	**1.8**	0.5 U	0.75 U	0.83 U	1.2 U	0.49 U	0.7 U	0.25 U
Benzyl alcohol	--	1.0 U	**0.39 J**	4.3 UJ	2.1 U	**5.5**	**3.6**	**0.67 J**	6.0 UJ	2.6 U	**5.2**
Benzoic acid	--	10 UJ	8.0 UJ	43 U	40.8 UJ	**15.0**	**12.8**	12 UJ	60 U	54.4 U	**9.7 J**
Hexachloroethane	--	1.0 U	0.80 U	4.3 U	2.1 UJ	0.75 U	0.83 U	1.2 UJ	6.0 U	2.6 U	1.0 U
PCB Aroclors (µg/kg)											
Aroclor 1016	--	3.9 U	19 U	38 U	3.7 U	4 U	7.3 U	75 U	19 U	3.8 U	3.9 U
Aroclor 1221	--	3.9 U	19 U	38 U	3.7 U	4 U	7.3 U	75 U	19 U	3.8 U	3.9 U
Aroclor 1232	--	3.9 U	19 U	38 U	3.7 U	4 U	7.3 U	75 U	19 U	3.8 U	3.9 U
Aroclor 1242	--	3.9 U	19 U	38 U	3.7 U	4 U	7.3 U	75 U	19 U	3.8 U	3.9 U
Aroclor 1248	--	29 U	140 U	**490**	**13**	**75**	**190**	**790**	**390**	3.8 U	**64**
Aroclor 1254	--	**59**	**370**	**840**	**22**	**100**	**230**	**1,300**	**640**	3.8 U	**97**
Aroclor 1260	--	**27**	**110**	**260**	**7.9**	**59**	**90**	**380**	**170**	3.8 U	**77**
Total PCB Aroclors (U = 0)	--	**86**	**480**	**1,590**	**42.9**	**234**	**510**	**2,470**	**1,200**	3.8 U	**238**
Total PCB Aroclors (U = 1/2)	--	**108**	**588**	**1,666**	**50.3**	**242**	**525**	**2,620**	**1,238**	3.8 U	**246**
PCB Aroclors (mg/kg-OC)											
Aroclor 1016	--	0.23 U	0.76 U	1.7 U	0.4 U	0.16 U	0.30 U	4.5 U	2 U	0.6 U	0.21 U
Aroclor 1221	--	0.23 U	0.76 U	1.7 U	0.4 U	0.16 U	0.30 U	4.5 U	2 U	0.6 U	0.21 U
Aroclor 1232	--	0.23 U	0.76 U	1.7 U	0.4 U	0.16 U	0.30 U	4.5 U	2 U	0.6 U	0.21 U
Aroclor 1242	--	0.23 U	0.76 U	1.7 U	0.4 U	0.16 U	0.30 U	4.5 U	2 U	0.6 U	0.21 U
Aroclor 1248	--	1.7 U	5.6 U	**22**	**1.4**	**3.0**	**7.9**	**48**	**41**	0.6 U	**3.5**
Aroclor 1254	--	**3.4**	**15**	**38**	**2.3**	**3.9**	**9.5**	**79**	**67**	0.6 U	**5.2**
Aroclor 1260	--	**1.6**	**4.4**	**12**	**0.8**	**2.3**	**3.7**	**23**	**18**	0.6 U	**4.2**
Total PCB Aroclors (U = 0)	12	**5.0**	**19**	**73**	**4.5**	**9.2**	**21**	**150**	**126**	0.6 U	**13**
Total PCB Aroclors (U = 1/2)	12	**6.3**	**24**	**76**	**5.3**	**9.5**	**22**	**159**	**130**	0.6 U	**13**

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-03	DSI-SB-03	DSI-SB-03	DSI-SB-03	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-05
	Sample ID	**DSI-SB-03-5.8-7**	**DSI-SB-03-9.5-10.4**	**DSI-SB-03-10.4-11.1**	**DSI-SB-03-11.1-11.6**	**DSI-SB-04-1-2**	**DSI-SB-04-4-5**	**DSI-SB-04-7-8.3**	**DSI-SB-04-8.3-9.3**	**DSI-SB-04-9.3-10.9**	**DSI-SB-05-1-2**
	Sample Date	**3/14/2011**	**3/14/2011**	**3/14/2011**	**3/14/2011**	**3/9/2011**	**3/9/2011**	**3/9/2011**	**3/9/2011**	**3/9/2011**	**3/10/2011**
	Depth	**5.8 to 7 feet**	**9.5 to 10.4 feet**	**10.4 to 11.1 feet**	**11.1 to 11.6 feet**	**1 to 2 feet**	**4 to 5 feet**	**7 to 8.3 feet**	**8.3 to 9.3 feet**	**9.3 to 10.9 feet**	**1 to 2 feet**
	Stratigraphic Unit	**Recent**	**Recent**	**Upper Alluvium**	**Lower Alluvium**	**Recent**	**Recent**	**Recent**	**Lower Alluvium**	**Lower Alluvium**	**Recent**
Analytes	**SMS SQS**										
Volatile Organics (µg/kg)											
1,1,1-Trichloroethane	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
1,1,2-Trichloroethane	--	1.2 U	1.3 U	--	--	1.8 UJ	1.8 U	1.4 U	--	--	1.8 U
1,1-Dichloroethane	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
1,1-Dichloroethene	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
1,2-Dichloroethane	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
1,3,5-Trimethylbenzene (Mesitylene)	--	1.2 U	1.3 U	--	--	1.8 UJ	1.8 U	1.4 U	--	--	1.8 U
Acetone	--	**72**	**37**	--	--	**110 J**	**320**	**130**	--	--	**55**
Benzene	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
Carbon tetrachloride (Tetrachloromethane)	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
Chlorobenzene	--	1.2 U	1.3 U	--	--	1.8 UJ	1.8 U	1.4 U	--	--	1.8 U
Chloroethane	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
Chloroform	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
Chloromethane	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
Dichloromethane (Methylene chloride)	--	2.4 U	2.6 U	--	--	3.7 U	**3.9**	2.7 U	--	--	3.7 U
Ethylbenzene		1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
m,p-Xylene	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
o-Xylene	--	1.2 U	1.3 U	--	--	1.8 UJ	1.8 U	1.4 U	--	--	1.8 U
Styrene	--	1.2 U	1.3 U	--	--	1.8 UJ	1.8 U	1.4 U	--	--	1.8 U
Tetrachloroethene (PCE)	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
Toluene	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
Trichloroethene (TCE)	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
Vinyl chloride	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
Total Xylene (U = 0)	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
Total Xylene (U = 1/2)	--	1.2 U	1.3 U	--	--	1.8 U	1.8 U	1.4 U	--	--	1.8 U
Pesticides (µg/kg)											
4,4'-DDD (p,p'-DDD)	--	2 U	1.9 U	--	--	2 U	2 U	16 U	--	--	2 U
4,4'-DDE (p,p'-DDE)	--	2 U	8 U	--	--	2 U	2 U	**15 J**	--	--	2 U
4,4'-DDT (p,p'-DDT)	--	4.5 U	23 U	--	--	**3.6**	6.3 U	**76 J**	--	--	**5.6**
Aldrin	--	0.98 U	0.97 U	--	--	0.99 U	1.2 U	4.7 U	--	--	0.99 U
alpha-Chlordane (cis-Chlordane)	--	0.98 U	0.97 U	--	--	0.99 U	0.98 U	0.98 U	--	--	0.99 U
alpha-Hexachlorocyclohexane (BHC)	--	0.98 U	0.97 U	--	--	0.99 U	0.98 U	0.98 U	--	--	0.99 U
beta-Chlordane (trans-Chlordane)	--	0.98 U	0.97 U	--	--	0.99 U	0.98 U	0.98 U	--	--	0.99 U
beta-Hexachlorocyclohexane (BHC)	--	0.98 U	0.97 U	--	--	0.99 U	3.1 U	1.9 U	--	--	0.99 U
delta-Hexachlorocyclohexane (BHC)	--	0.98 UJ	0.97 UJ	--	--	0.99 UJ	0.98 UJ	0.98 UJ	--	--	0.99 UJ
Dieldrin	--	2 U	1.9 U	--	--	2 U	2 U	25 U	--	--	2 U
Endosulfan sulfate	--	2 U	1.9 U	--	--	2 UJ	2 UJ	28 UJ	--	--	27 UJ
Endosulfan-alpha (I)	--	0.98 U	0.97 U	--	--	0.99 U	0.98 U	3.6 U	--	--	0.99 U
Endosulfan-beta (II)	--	2 U	\	--	--	2 U	2 U	2 U	--	--	2 U
Endrin	--	2 U	9.9 U	--	--	2 U	2 U	20 U	--	--	2 U
Endrin aldehyde	--	2 U	4 U	--	--	2 UJ	2 UJ	5 UJ	--	--	2 UJ
Endrin ketone	--	2 U	1.9 U	--	--	2 U	5.3 U	2 U	--	--	2 U
gamma-Hexachlorocyclohexane (BHC) (Lindane)	--	0.98 U	0.97 U	--	--	0.99 U	4.2 U	0.98 U	--	--	0.99 U
Heptachlor	--	0.98 U	0.97 U	--	--	0.99 U	0.98 U	0.98 U	--	--	0.99 U
Heptachlor epoxide	--	1.9 U	9.8 U	--	--	1.6 U	4 U	21 U	--	--	2.3 U
Methoxychlor	--	9.8 U	19 U	--	--	9.9 U	9.8 U	28 U	--	--	9.9 U

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-03	DSI-SB-03	DSI-SB-03	DSI-SB-03	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-04	DSI-SB-05
	Sample ID	DSI-SB-03-5.8-7	DSI-SB-03-9.5-10.4	DSI-SB-03-10.4-11.1	DSI-SB-03-11.1-11.6	DSI-SB-04-1-2	DSI-SB-04-4-5	DSI-SB-04-7-8.3	DSI-SB-04-8.3-9.3	DSI-SB-04-9.3-10.9	DSI-SB-05-1-2
	Sample Date	3/14/2011	3/14/2011	3/14/2011	3/14/2011	3/9/2011	3/9/2011	3/9/2011	3/9/2011	3/9/2011	3/10/2011
	Depth	5.8 to 7 feet	9.5 to 10.4 feet	10.4 to 11.1 feet	11.1 to 11.6 feet	1 to 2 feet	4 to 5 feet	7 to 8.3 feet	8.3 to 9.3 feet	9.3 to 10.9 feet	1 to 2 feet
	Stratigraphic Unit	Recent	Recent	Upper Alluvium	Lower Alluvium	Recent	Recent	Recent	Lower Alluvium	Lower Alluvium	Recent
	SMS SQS										
Toxaphene	--	98 U	97 U	--	--	99 U	98 U	250 U	--	--	99 U
Total DDx (U = 0)	--	4.5 U	23 U	--	--	**3.6**	6.3 U	**91**	--	--	**5.6**
Total DDx (U = 1/2)	--	4.5 U	23 U	--	--	**5.6**	6.3 U	**99**	--	--	**7.6**
Dioxin Furans (ng/kg)											
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	--	--	--	--	--	--	--	**0.665 J**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	--	--	--	--	--	--	--	--	**3.25 J**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	--	--	--	--	**4.47**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	--	--	--	--	**21.7**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	--	--	--	--	**10.0**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	--	--	--	--	--	--	--	--	**695**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	--	--	--	--	--	--	--	--	--	**6,900**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	--	--	--	--	--	--	--	--	--	**2.37**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	**2.00**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	**4.26**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	**20.6**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	**4.99**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	**4.08**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	**7.44**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--	--	--	--	--	**119**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--	--	--	--	--	**13.5**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	--	--	--	--	--	--	--	--	--	**397**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	--	--	--	--	--	--	--	**15.1 J**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	--	--	--	--	--	--	--	--	**31.1 J**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	--	--	--	--	**217**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	--	--	--	--	--	--	--	--	**2130 J**
Total Tetrachlorodibenzofuran (TCDF)	--	--	--	--	--	--	--	--	--	--	**44.8 J**
Total Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	**81 J**
Total Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	**211 J**
Total Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--	--	--	--	--	**497**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)	--	--	--	--	--	--	--	--	--	--	**23.3**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)	--	--	--	--	--	--	--	--	--	--	**23.3**

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-05	DSI-SB-05	DSI-SB-05	DSI-SB-05	DSI-SB-06	DSI-SB-06	DSI-SB-06	DSI-SB-07	DSI-SB-07	DSI-SB-07
	Sample ID	DSI-SB-05-3-4	DSI-SB-05-6-7	DSI-SB-05-8-9.3	DSI-SB-05-9.3-11	DSI-SB-06-1-2	DSI-SB-06-5-6.5	DSI-SB-06-9.6-11	DSI-SB-07-1-2	DSI-SB-07-3.5-4.5	DSI-SB-07-6.5-7.5
	Sample Date	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/11/2011	3/11/2011	3/11/2011	3/9/2011	3/9/2011	3/9/2011
	Depth	3 to 4 feet	6 to 7 feet	8 to 9.3 feet	9.3 to 11 feet	1 to 2 feet	5 to 6.5 feet	9.6 to 11 feet	1 to 2 feet	3.5 to 4.5 feet	6.5 to 7.5 feet
	Stratigraphic Unit	Recent	Recent	Recent	Upper Alluvium	Recent	Recent	Upper Alluvium	Recent	Recent	Recent
Analytes	SMS SQS										
Conventional Parameters (percent)											
Total organic carbon	--	2.4 J	1.7	1.26	0.316 J	2.78	2.27	1.07	2.45	1.99	2.38
Percent fines [2]	--	97.2	--	--	89.8	--	--	--	--	--	--
Total solids	--	61.3	70.7	74	72.9	52.1	59	76.6	53.5	48.4	60
Total volatile solids	--	--	--	--	--	--	--	--	7.5	11.14	--
Metals (mg/kg)											
Antimony	--	0.3 J	0.3 UJ	5.9 J	0.3 UJ	0.4 UJ	0.5 J	0.3 UJ	0.4 UJ	3.4 J	0.3 UJ
Arsenic	57	61	58	1,290	18	43	36	6.2	26	346	20
Beryllium	--	0.50	0.70	0.70	0.10	0.40	0.40	0.10	0.50	0.50	0.40
Cadmium	5.1	0.80	2.0	4.0	0.3 U	1.0	1.7	0.40	0.80	2.1	2.0
Chromium	260	46	78	120	13	47 J	64	18	41	132	58.6 J
Chromium VI [3]	--	--	-- R	-- R	--	--	-- R	-- R	-- R	-- R	--
Copper	390	783	1,970	1,460	19	292 J	250 J	32 J	190	487	191 J
Lead	450	77	150	1,090	3.0	152 J	240	17	77	974	107 J
Mercury	0.41	0.24 J	0	3.3	-- R	0.37 J	1.1	0.15	0.31	1.3	1.15 J
Nickel	--	31	29	66	9.0	31	28	10	30	32	26
Selenium	--	0.8 U	0.7 U	3 U	0.6 U	1 UJ	0.8 U	0.6 U	0.9 U	1 U	0.8 UJ
Silver	6.1	1 U	2 U	2.7	0.4 U	0.5 U	1.4	0.4 U	0.5 U	1.4	3.7
Thallium	--	0.3 U	0.3 U	0.70	0.3 U	0.4 U	0.3 U	0.3 U	0.4 U	0.4 U	0.3 U
Zinc	410	396	1,070 J	3,590 J	29	499 J	337 J	46 J	249 J	857 J	213 J
Organometallic Compounds (µg/kg)											
Tributyltin (bulk sediment)	73	380	2,400	1,400	3.8	580	7.3	3.4 U	37	240	3.6 U
PAHs (µg/kg)											
1-Methylnaphthalene	--	12 J	21	41	18 U	11 J	27	18 U	11 J	45	31
2-Methylnaphthalene	--	22	24	51	18 U	17 J	50	18 U	20	96	46
Acenaphthene	--	48	180	210	18 U	29	46	27	33	230	78
Acenaphthylene	--	18 U	24	23	18 U	23	28 U	18 U	19 J	29	24
Anthracene	--	130	270	570	18 U	92	140	40 J	95	440	150
Benzo(a)anthracene	--	340	990	1,700	18 U	340	330	98 J	310	1,100	260
Benzo(a)pyrene	--	430	840	1,100	18 U	390	400	98 J	380	750	210
Benzo(b,j,k)fluoranthenes	--	1,200	1,700	2,200	18 U	950	850	190 J	820	1,800	480
Benzo(g,h,i)perylene	--	290	360	490	18 U	240	160	58 J	170	360	130
Chrysene	--	540	1,200	1,800	18 U	700	460	120 J	400	1,400	320
Dibenzo(a,h)anthracene	--	93	140	210	18 U	90	49	22	62	160	62
Fluoranthene	--	780	2,400	7,100	9.2 J	590	1,300	170 J	550	2,900	730
Fluorene	--	40	77	200	18 U	33	75	29	36	600	140
Indeno(1,2,3-c,d)pyrene	--	280	370	520	18 U	220	160	54 J	170	380	110
Naphthalene	--	67	39	170	18 U	35	100	100	51	100	120
Phenanthrene	--	420	640	2,400	18 U	270	330	100	260	2,400	570
Pyrene	--	1,300	2,800	5,900	18 U	920	900	500 J	1,400	2,600	810
Total SMS HPAH (U = 0)	--	4,053	9,100	18,820	9	3,490	3,759	1,120	3,442	9,650	2,632
Total SMS LPAH (U = 0)	--	705	1,230	3,573	18 U	482	691	296	494	3,799	1,082

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-05	DSI-SB-05	DSI-SB-05	DSI-SB-05	DSI-SB-06	DSI-SB-06	DSI-SB-06	DSI-SB-07	DSI-SB-07	DSI-SB-07
	Sample ID	DSI-SB-05-3-4	DSI-SB-05-6-7	DSI-SB-05-8-9.3	DSI-SB-05-9.3-11	DSI-SB-06-1-2	DSI-SB-06-5-6.5	DSI-SB-06-9.6-11	DSI-SB-07-1-2	DSI-SB-07-3.5-4.5	DSI-SB-07-6.5-7.5
	Sample Date	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/11/2011	3/11/2011	3/11/2011	3/9/2011	3/9/2011	3/9/2011
	Depth	3 to 4 feet	6 to 7 feet	8 to 9.3 feet	9.3 to 11 feet	1 to 2 feet	5 to 6.5 feet	9.6 to 11 feet	1 to 2 feet	3.5 to 4.5 feet	6.5 to 7.5 feet
	Stratigraphic Unit	Recent	Recent	Recent	Upper Alluvium	Recent	Recent	Upper Alluvium	Recent	Recent	Recent
Analytes	SMS SQS										
PAHs (mg/kg-OC)											
1-Methylnaphthalene	--	**0.5 J**	**1.2**	**3.3**	5.70 U	**0.40 J**	**1.2**	1.68 U	**0.45 J**	**2.3**	**1.3**
2-Methylnaphthalene	38	**0.9**	**1.4**	**4.0**	5.70 U	**0.61 J**	**2.2**	1.68 U	**0.8**	**4.8**	**1.9**
Acenaphthene	16	**2.0**	**10.6**	**16.7**	5.70 U	**1.0**	**2.0**	**2.5**	**1.3**	**11.6**	**3.3**
Acenaphthylene	66	0.75 U	**1.4**	**1.8**	5.70 U	**0.8**	1.23 U	1.68 U	**0.78 J**	**1.5**	**1.0**
Anthracene	220	**5.4**	**15.9**	**45.2**	5.70 U	**3.3**	**6.2**	**3.74 J**	**3.9**	**22.1**	**6.3**
Benzo(a)anthracene	110	**14.2**	**58.2**	**135**	5.70 U	**12.2**	**14.5**	**9.16 J**	**12.7**	**55.3**	**10.9**
Benzo(a)pyrene	99	**17.9**	**49.4**	**87.3**	5.70 U	**14.0**	**17.6**	**9.16 J**	**15.5**	**37.7**	**8.8**
Benzo(b,j,k)fluoranthenes	--	**50.0**	**100**	**174.6**	5.70 U	**34.2**	**37.4**	**17.8 J**	**33.5**	**90.5**	**20.2**
Benzo(g,h,i)perylene	31	**12.1**	**21.2**	**38.9**	5.70 U	**8.6**	**7.0**	**5.4 J**	**6.9**	**18.1**	**5.5**
Chrysene	110	**22.5**	**70.6**	**143**	5.70 U	**25.2**	**20.3**	**11.2 J**	**16.3**	**70.4**	**13.4**
Dibenzo(a,h)anthracene	12	**3.9**	**8.2**	**16.7**	5.70 U	**3.2**	**2.2**	**2.1**	**2.5**	**8.0**	**2.6**
Fluoranthene	160	**32.5**	**141**	**563**	**2.91 J**	**21.2**	**57.3**	**15.9 J**	**22.4**	**146**	**30.7**
Fluorene	23	**1.7**	**4.5**	**15.9**	5.70 U	**1.2**	**3.3**	**2.7**	**1.5**	**30.2**	**5.9**
Indeno(1,2,3-c,d)pyrene	34	**11.7**	**21.8**	**41.3**	5.70 U	**7.9**	**7.0**	**5.05 J**	**6.9**	**19.1**	**4.6**
Naphthalene	99	**2.8**	**2.3**	**13.5**	5.70 U	**1.3**	**4.4**	**9.3**	**2.1**	**5.0**	**5.0**
Phenanthrene	100	**17.5**	**37.6**	**190**	5.70 U	**9.7**	**14.5**	**9.3**	**10.6**	**121**	**23.9**
Pyrene	1000	**54.2**	**165**	**468**	5.70 U	**33.1**	**39.6**	**46.7 J**	**57.1**	**131**	**34.0**
Total SMS HPAH (U = 0)	960	**169**	**535**	**1,494**	**2.9**	**126**	**166**	**105**	**140**	**485**	**111**
Total SMS LPAH (U = 0)	370	**29.4**	**72.4**	**284**	5.70 U	**17.3**	**30.4**	**27.7**	**20.2**	**191**	**45.5**
Chlorobenzenes (µg/kg)											
1,2-Dichlorobenzene	--	4.6 U	**95**	**72**	4.6 U	4.7 U	**4.1 J**	**2.4 J**	1.8 U	**4.8**	4.9 U
1,3-Dichlorobenzene	--	18 U	**14 J**	**6.4 J**	18 U	19 U	18 U	18 U	20 U	19 U	20 U
1,4-Dichlorobenzene	--	4.6 U	**27**	**14 J**	4.6 U	4.7 U	**4.4 J**	1.1 U	1.8 U	1.9 UJ	**7.1**
1,2,4-Trichlorobenzene	--	4.6 U	**12 J**	**7.2 J**	4.6 U	4.7 U	**2.4 J**	4.6 U	4.9 U	4.8 U	**5.9**
Hexachlorobenzene	--	4.6 U	0.98 U	4.5 U	4.6 U	4.7 U	4.6 U	0.97 U	0.99 U	0.98 U	4.9 U
Chlorobenzenes (mg/kg-OC)											
1,2-Dichlorobenzene	2.3	0.19 U	**5.6**	**5.7**	1.5 U	0.17 U	**0.18 J**	**0.22 J**	0.07 U	**0.2**	0.21 U
1,3-Dichlorobenzene	--	0.75 U	**0.82 J**	**0.51 J**	5.7 U	0.68 U	0.79 U	1.7 U	0.82 U	0.95 U	0.84 U
1,4-Dichlorobenzene	3.1	0.19 U	**1.6**	**1.1 J**	1.5 U	0.17 U	**0.19 J**	0.1 U	0.07 U	0.1 UJ	**0.3**
1,2,4-Trichlorobenzene	0.81	0.19 U	**0.71 J**	**0.57 J**	1.5 U	0.17 U	**0.11 J**	0.43 U	0.2 U	0.24 U	**0.2**
Hexachlorobenzene	0.38	0.19 U	0.058 U	0.36 U	1.5 U	0.17 U	0.20 U	0.091 U	0.04 U	0.049 U	0.21 U
Phthalates (µg/kg)											
Dimethyl phthalate	--	18 U	19 U	18 U	18 U	**17 J**	18 U	18 U	**12 J**	19 U	20 U
Diethyl phthalate	--	5.4 U	5.2 U	4.9 U	5 U	6.8 U	**4.4 J**	**3.1 J**	5.3 U	5.2 U	5.3 U
Di-n-butyl phthalate	--	**12 J**	**6.7 J**	**8.2 J**	18 U	**9.4 J**	18 U	18 U	20 U	**280**	**24**
Butylbenzyl phthalate	--	**26**	19 U	18 U	18 U	**29**	18 U	18 UJ	**21**	19 U	20 U
Bis(2-ethylhexyl) phthalate	--	**410**	**360**	**590**	18 U	**380**	**780**	34 U	**150**	**550**	**440**
Di-n-octyl phthalate	--	18 U	**28**	18 U	18 U	19 U	18 U	18 U	20 U	19 U	20 U
Phthalates (mg/kg-OC)											
Dimethyl phthalate	53	0.75 U	1.1 U	1.4 U	5.7 U	**0.61 J**	0.79 U	1.7 U	**0.49 J**	0.95 U	0.84 U
Diethyl phthalate	61	0.23 U	0.31 U	0.39 U	1.6 U	0.24 U	**0.19 J**	**0.29 J**	0.22 U	0.26 U	0.22 U
Di-n-butyl phthalate	220	**0.5 J**	**0.39 J**	**0.65 J**	5.7 U	**0.34 J**	0.79 U	1.7 U	0.82 U	**14.1**	**1.0**
Butylbenzyl phthalate	4.9	**1.1**	1.1 U	1.4 U	5.7 U	**1.0**	0.79 U	1.7 U	**0.9**	0.95 U	0.84 U
Bis(2-ethylhexyl) phthalate	47	**17.1**	**21.2**	**46.8**	5.7 U	**13.7**	**34.4**	3.2 U	**6.1**	**27.6**	**18.5**
Di-n-octyl phthalate	58	0.75 U	**1.6**	1.4 U	5.7 U	0.68 U	0.79 U	1.7 U	0.82 U	0.95 U	0.84 U

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-05	DSI-SB-05	DSI-SB-05	DSI-SB-05	DSI-SB-06	DSI-SB-06	DSI-SB-06	DSI-SB-07	DSI-SB-07	DSI-SB-07
	Sample ID	DSI-SB-05-3-4	DSI-SB-05-6-7	DSI-SB-05-8-9.3	DSI-SB-05-9.3-11	DSI-SB-06-1-2	DSI-SB-06-5-6.5	DSI-SB-06-9.6-11	DSI-SB-07-1-2	DSI-SB-07-3.5-4.5	DSI-SB-07-6.5-7.5
	Sample Date	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/11/2011	3/11/2011	3/11/2011	3/9/2011	3/9/2011	3/9/2011
	Depth	3 to 4 feet	6 to 7 feet	8 to 9.3 feet	9.3 to 11 feet	1 to 2 feet	5 to 6.5 feet	9.6 to 11 feet	1 to 2 feet	3.5 to 4.5 feet	6.5 to 7.5 feet
	Stratigraphic Unit	Recent	Recent	Recent	Upper Alluvium	Recent	Recent	Upper Alluvium	Recent	Recent	Recent
Analytes	SMS SQS										
Phenols (µg/kg)											
2,4-Dimethylphenol	29	18 UJ	19 U	18 U	18 UJ	19 UJ	**100 J**	18 UJ	20 U	**16 J**	20 UJ
2-Methylphenol (o-Cresol)	63	18 U	19 U	18 U	18 U	19 U	18 U	18 U	20 U	19 U	20 U
4-Methylphenol (p-Cresol)	670	**35**	**36**	**38**	18 U	**22**	**45**	18 U	**44**	**35**	**27**
Pentachlorophenol	360	15 U	**100 J**	**88 J**	8 U	**19 J**	**41 J**	8 U	25 UJ	**87 J**	10 U
Phenol	420	**61**	**20**	**43**	18 U	**210**	**100**	18 U	**33**	**120**	**54**
Phenols (mg/kg-OC)											
2,4-Dimethylphenol	--	0.75 UJ	1.1 U	1.4 U	5.7 UJ	0.68 UJ	**4.4 J**	1.7 UJ	0.82 U	**0.80 J**	0.84 UJ
2-Methylphenol (o-Cresol)	--	0.75 U	1.1 U	1.4 U	5.7 U	0.68 U	0.79 U	1.7 U	0.82 U	0.95 U	0.84 U
4-Methylphenol (p-Cresol)	--	**1.5**	**2.1**	**3.0**	5.7 U	**0.8**	**2.0**	1.7 U	**1.8**	**1.8**	**1.1**
Pentachlorophenol	--	0.63 U	**5.9 J**	**7.0 J**	2.5 U	**0.68 J**	**1.8 J**	0.75 U	1.0 UJ	**4.4 J**	0.42 U
Phenol	--	**2.5**	**1.2**	**3.4**	5.7 U	**7.6**	**4.4**	1.7 U	**1.3**	**6.0**	**2.3**
Miscellaneous Extractables (µg/kg) [4]											
Dibenzofuran	--	**32**	**50**	**130**	18 U	**26**	**54**	**22**	**28**	**220**	**62**
Hexachlorobutadiene	--	4.6 U	0.98 U	4.5 U	4.6 U	4.7 U	4.6 U	0.97 U	0.99 U	0.98 U	4.9 U
N-Nitrosodiphenylamine	--	4.6 U	19 U	28 U	4.6 U	4.7 U	**12**	4.6 U	20 U	19 U	**25**
Benzyl alcohol	57	18 UJ	19 U	18 U	18 UJ	19 UJ	**89**	18 U	**37**	**32**	20 UJ
Benzoic acid	650	**220**	190 U	180 U	180 U	**73 J**	**440 J**	180 UJ	200 U	190 U	**50 J**
Hexachloroethane	--	18 U	19 U	18 U	18 U	19 U	18 U	18 U	20 U	19 U	20 U
Miscellaneous Extractables (mg/kg-OC) [4]											
Dibenzofuran	15	**1.3**	**2.9**	**10.3**	5.7 U	**0.9**	**2.4**	**2.1**	**1.1**	**11.1**	**2.6**
Hexachlorobutadiene	3.9	0.2 U	0.06 U	0.4 U	1.5 U	0.2 U	0.2 U	0.09 U	0.04 U	0.05 U	0.2 U
N-Nitrosodiphenylamine	11	0.19 U	1.1 U	2.2 U	1.5 U	0.17 U	**0.5**	0.43 U	0.82 U	0.95 U	**1.1**
Benzyl alcohol	--	0.75 UJ	1.1 U	1.4 U	5.7 UJ	0.68 UJ	**3.9**	1.7 U	**1.5**	**1.6**	0.84 UJ
Benzoic acid	--	**9.2**	11 U	14 U	57 U	**2.6 J**	**19 J**	17 UJ	8.2 U	9.5 U	**2.1 J**
Hexachloroethane	--	0.75 U	1.1 U	1.4 U	5.7 U	0.68 U	0.79 U	1.7 U	0.82 U	0.95 U	0.84 U
PCB Aroclors (µg/kg)											
Aroclor 1016	--	3.8 U	3.7 U	380 U	3.8 U	20 U	20 U	3.8 U	4 U	130 U	40 U
Aroclor 1221	--	3.8 U	3.7 U	380 U	3.8 U	20 U	20 U	3.8 U	4 U	130 U	40 U
Aroclor 1232	--	3.8 U	3.7 U	380 U	3.8 U	20 U	20 U	3.8 U	4 U	130 U	40 U
Aroclor 1242	--	3.8 U	3.7 U	380 U	3.8 U	20 U	20 U	3.8 U	4 U	130 U	40 U
Aroclor 1248	--	**24**	**85**	3800 U	3.8 U	**120**	**480**	15 U	**91**	**1,200**	**520**
Aroclor 1254	--	**48**	**140**	**8,900**	3.8 U	**210**	**520**	**29**	**150**	**1,400**	**810**
Aroclor 1260	--	**36**	**65**	950 U	3.8 U	**84**	**140**	**19**	**78**	**370**	**620**
Total PCB Aroclors (U = 0)	--	**108**	**290**	**8,900**	3.8 U	**414**	**1,140**	**48**	**319**	**2,970**	**1,950**
Total PCB Aroclors (U = 1/2)	--	**116**	**297**	**12,035**	3.8 U	**454**	**1,180**	**63**	**327**	**3,230**	**2,030**
PCB Aroclors (mg/kg-OC)											
Aroclor 1016	--	0.16 U	0.22 U	30 U	1.2 U	0.72 U	0.88 U	0.36 U	0.16 U	6.5 U	1.7 U
Aroclor 1221	--	0.16 U	0.22 U	30 U	1.2 U	0.72 U	0.88 U	0.36 U	0.16 U	6.5 U	1.7 U
Aroclor 1232	--	0.16 U	0.22 U	30 U	1.2 U	0.72 U	0.88 U	0.36 U	0.16 U	6.5 U	1.7 U
Aroclor 1242	--	0.16 U	0.22 U	30 U	1.2 U	0.72 U	0.88 U	0.36 U	0.16 U	6.5 U	1.7 U
Aroclor 1248	--	**1.0**	**5.0**	302 U	1.2 U	**4.3**	**21**	1.4 U	**3.7**	**60**	**22**
Aroclor 1254	--	**2.0**	**8.2**	**706**	1.2 U	**7.6**	**23**	**2.7**	**6.1**	**70**	**34**
Aroclor 1260	--	**1.5**	**3.8**	75 U	1.2 U	**3.0**	**6.2**	**1.8**	**3.2**	**19**	**26**
Total PCB Aroclors (U = 0)	12	**4.5**	**17**	**706**	1.2 U	**15**	**50**	**4.5**	**13**	**149**	**82**
Total PCB Aroclors (U = 1/2)	12	**4.8**	**17**	**955**	1.2 U	**16**	**52**	**5.9**	**13**	**162**	**85**

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-05	DSI-SB-05	DSI-SB-05	DSI-SB-05	DSI-SB-06	DSI-SB-06	DSI-SB-06	DSI-SB-07	DSI-SB-07	DSI-SB-07
	Sample ID	DSI-SB-05-3-4	DSI-SB-05-6-7	DSI-SB-05-8-9.3	DSI-SB-05-9.3-11	DSI-SB-06-1-2	DSI-SB-06-5-6.5	DSI-SB-06-9.6-11	DSI-SB-07-1-2	DSI-SB-07-3.5-4.5	DSI-SB-07-6.5-7.5
	Sample Date	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/11/2011	3/11/2011	3/11/2011	3/9/2011	3/9/2011	3/9/2011
	Depth	3 to 4 feet	6 to 7 feet	8 to 9.3 feet	9.3 to 11 feet	1 to 2 feet	5 to 6.5 feet	9.6 to 11 feet	1 to 2 feet	3.5 to 4.5 feet	6.5 to 7.5 feet
	Stratigraphic Unit	Recent	Recent	Recent	Upper Alluvium	Recent	Recent	Upper Alluvium	Recent	Recent	Recent
Analytes	SMS SQS										
Volatile Organics (µg/kg)											
1,1,1-Trichloroethane	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
1,1,2-Trichloroethane	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
1,1-Dichloroethane	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
1,1-Dichloroethene	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
1,2-Dichloroethane	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
1,3,5-Trimethylbenzene (Mesitylene)	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	**32 J**	--
Acetone	--	--	**100**	**50**	--	--	**150**	**64**	**68**	**320**	--
Benzene	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
Carbon tetrachloride (Tetrachloromethane)	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
Chlorobenzene	--	--	**6.2**	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
Chloroethane	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
Chloroform	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
Chloromethane	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
Dichloromethane (Methylene chloride)	--	--	**2.7**	2.5 U	--	--	3.3 U	**19**	3.6 U	**5.9**	--
Ethylbenzene		--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	**18**	--
m,p-Xylene	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	**26**	--
o-Xylene	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	**17**	--
Styrene	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
Tetrachloroethene (PCE)	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
Toluene	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	**2.1**	--
Trichloroethene (TCE)	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
Vinyl chloride	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	1.9 U	--
Total Xylene (U = 0)	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	**43**	--
Total Xylene (U = 1/2)	--	--	1.3 U	1.3 U	--	--	1.7 U	1.1 U	1.8 U	**43**	--
Pesticides (µg/kg)											
4,4'-DDD (p,p'-DDD)	--	--	2 U	9.8 U	--	--	10 U	1.9 U	2 U	**15 J**	--
4,4'-DDE (p,p'-DDE)	--	--	2 U	**25**	--	--	21 U	1.9 U	2 U	**9.8 J**	--
4,4'-DDT (p,p'-DDT)	--	--	**3.4**	**130**	--	--	46 U	3.9 U	18 U	**40**	--
Aldrin	--	--	0.98 U	4.9 U	--	--	5 U	0.97 U	0.99 U	2.3 U	--
alpha-Chlordane (cis-Chlordane)	--	--	0.98 U	4.9 U	--	--	5 U	0.97 U	0.99 U	0.98 U	--
alpha-Hexachlorocyclohexane (BHC)	--	--	0.98 U	4.9 U	--	--	5 U	0.97 U	0.99 U	0.98 U	--
beta-Chlordane (trans-Chlordane)	--	--	0.98 U	4.9 U	--	--	5 U	0.97 U	0.99 U	0.98 U	--
beta-Hexachlorocyclohexane (BHC)	--	--	0.98 U	4.9 U	--	--	5 U	0.97 U	0.99 U	0.98 U	--
delta-Hexachlorocyclohexane (BHC)	--	--	0.98 UJ	4.9 UJ	--	--	5 UJ	0.97 UJ	0.99 UJ	0.98 UJ	--
Dieldrin	--	--	2 U	41 U	--	--	10 U	1.9 U	2 U	16 U	--
Endosulfan sulfate	--	--	2 UJ	9.8 UJ	--	--	10 U	1.9 U	2 UJ	2 UJ	--
Endosulfan-alpha (I)	--	--	0.98 U	4.9 U	--	--	5 U	0.97 U	0.99 U	0.98 U	--
Endosulfan-beta (II)	--	--	2 U	9.8 U	--	--	10 U	1.9 U	2 U	2 U	--
Endrin	--	--	2 U	9.8 U	--	--	21 U	1.9 U	2 U	14 U	--
Endrin aldehyde	--	--	2 UJ	35 UJ	--	--	10 U	1.9 U	2 UJ	4 UJ	--
Endrin ketone	--	--	2 U	48 U	--	--	10 U	1.9 U	2 U	2 U	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	--	--	0.98 U	4.9 U	--	--	5 U	0.97 U	0.99 U	0.98 U	--
Heptachlor	--	--	0.98 U	4.9 U	--	--	5 U	0.97 U	0.99 U	0.98 U	--
Heptachlor epoxide	--	--	0.98 U	36 U	--	--	32 U	1.5 U	0.99 U	13 U	--
Methoxychlor	--	--	9.8 U	49 U	--	--	50 U	9.7 U	18 U	24 U	--

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-05	DSI-SB-05	DSI-SB-05	DSI-SB-05	DSI-SB-06	DSI-SB-06	DSI-SB-06	DSI-SB-07	DSI-SB-07	DSI-SB-07
	Sample ID	DSI-SB-05-3-4	DSI-SB-05-6-7	DSI-SB-05-8-9.3	DSI-SB-05-9.3-11	DSI-SB-06-1-2	DSI-SB-06-5-6.5	DSI-SB-06-9.6-11	DSI-SB-07-1-2	DSI-SB-07-3.5-4.5	DSI-SB-07-6.5-7.5
	Sample Date	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/11/2011	3/11/2011	3/11/2011	3/9/2011	3/9/2011	3/9/2011
	Depth	3 to 4 feet	6 to 7 feet	8 to 9.3 feet	9.3 to 11 feet	1 to 2 feet	5 to 6.5 feet	9.6 to 11 feet	1 to 2 feet	3.5 to 4.5 feet	6.5 to 7.5 feet
	Stratigraphic Unit	Recent	Recent	Recent	Upper Alluvium	Recent	Recent	Upper Alluvium	Recent	Recent	Recent
Analytes	SMS SQS										
Toxaphene	--	--	98 U	490 U	--	--	500 U	97 U	99 U	98 U	--
Total DDx (U = 0)	--	--	**3.4**	**155**	--	--	46 U	3.9 U	18 U	**64.8**	--
Total DDx (U = 1/2)	--	--	**5.4**	**160**	--	--	46 U	3.9 U	18 U	**64.8**	--
Dioxin Furans (ng/kg)											
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	**0.41 J**	--	**0.081 J**	--	--	--	**1.01 J**	--	**1.58 J**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	**2.02 J**	--	**0.186 J**	--	--	--	**4.35 J**	--	**6.23 J**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	**3.37**	--	0.0427 U	--	--	--	**5.75**	--	**8.70**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	**38.9**	--	**0.306 J**	--	--	--	**30.8**	--	**73.0**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	**7.84**	--	**0.291 J**	--	--	--	**13.2**	--	**21.8**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	**2,120**	--	**8.40**	--	--	--	**994**	--	**2,230**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	--	**26,200**	--	**78.4**	--	--	--	**10,100**	--	**20,200**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	--	**1.21**	--	0.0791 U	--	--	--	**2.64**	--	**5.70**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	**0.996 J**	--	**0.0751 J**	--	--	--	**2.54**	--	**6.94**
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	**1.94**	--	**0.0553 J**	--	--	--	**5.29**	--	**21.6**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	**13.7**	--	**0.229 J**	--	--	--	**30.1**	--	**162**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	**3.44**	--	**0.0771 J**	--	--	--	**7.23**	--	**31.0**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	**2.84**	--	0.0397 U	--	--	--	**6.17**	--	**27.5**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	**6.59**	--	0.033 U	--	--	--	**10.3**	--	**42.1**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	--	**199**	--	**1.27 J**	--	--	--	**193**	--	**890**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	--	**30.3**	--	**0.18 J**	--	--	--	**21.5**	--	**100**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	--	**998**	--	**3.54 J**	--	--	--	**681**	--	**4,660**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	**18.2 J**	--	**1.76 J**	--	--	--	**19.2 J**	--	**42.5 J**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	**81.2 J**	--	**1.53 J**	--	--	--	**40.3 J**	--	**82.7 J**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	**356**	--	**3.94 J**	--	--	--	**264**	--	**395**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	**3600 J**	--	**15.7 J**	--	--	--	**2720 J**	--	**3970 J**
Total Tetrachlorodibenzofuran (TCDF)	--	--	**20.9 J**	--	**0.176 J**	--	--	--	**51.7 J**	--	**206 J**
Total Pentachlorodibenzofuran (PeCDF)	--	--	**43.9 J**	--	**0.372 J**	--	--	--	**110 J**	--	**392 J**
Total Hexachlorodibenzofuran (HxCDF)	--	--	**204**	--	**2.08 J**	--	--	--	**354 J**	--	**1,490**
Total Heptachlorodibenzofuran (HpCDF)	--	--	**992**	--	**5.32 J**	--	--	--	**852**	--	**4,600**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)	--	--	**42.5**	--	**0.509**	--	--	--	**33.0**	--	**91.3**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)	--	--	**42.5**	--	**0.499**	--	--	--	**33.0**	--	**91.3**

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-07	DSI-SB-07	DSI-SB-08	DSI-SB-08	DSI-SB-08	DSI-SB-08	DSI-SB-09	DSI-SB-09	DSI-SB-09	DSI-SB-09
	Sample ID	DSI-SB-07-10.5-11.9	DSI-SB-07-11.9-12.3	DSI-SB-08-1-2	DSI-SB-08-4-5	DSI-SB-08-7-8.7	DSI-SB-08-12-13.3	DSI-SB-09-1-2	DSI-SB-09-4.5-5.5	DSI-SB-09-8.5-10	DSI-SB-09-11-12.1
	Sample Date	3/9/2011	3/9/2011	3/11/2011	3/11/2011	3/11/2011	3/11/2011	3/10/2011	3/10/2011	3/10/2011	3/10/2011
	Depth	10.5 to 11.9 feet	11.9 to 12.3 feet	1 to 2 feet	4 to 5 feet	7 to 8.7 feet	12 to 13.3 feet	1 to 2 feet	4.5 to 5.5 feet	8.5 to 10 feet	11 to 12.1 feet
	Stratigraphic Unit	Recent	Lower Alluvium	Recent	Recent	Recent	Recent	Recent	Recent	Recent	Recent
	SMS SQS										
Conventional Parameters (percent)											
Total organic carbon	--	1.82	0.935	2.92	2.04	1.04	2.34	2.32	1.89	2.05	1.77
Percent fines [2]	--	--	--	--	--	--	--	--	--	--	--
Total solids	--	54.6	76.9	54	53.3	73.2	67.2	50.5	61.7	59.3	71.5
Total volatile solids	--	7.94	--	--	--	--	--	--	--	--	--
Metals (mg/kg)											
Antimony	--	0.3 UJ	0.2 UJ	0.4 J	0.4 UJ	2.2 J	1.8 J	0.4 UJ	1.6 J	4 J	5 J
Arsenic	57	13	3.3	53	29	454	342	16	566	965	791
Beryllium	--	0.40	0.1 U	0.40	0.50	0.80	0.60	0.40	0.70	0.50	0.70
Cadmium	5.1	1.3	0.2 U	0.90	0.90	2.0	2.2	0.80	3.2	3.9	3.0
Chromium	260	46	13.3 J	40	40 J	79	75	41	78	142 J	97
Chromium VI [3]	--	-- R	--	-- R	--	-- R	-- R	-- R	-- R	--	-- R
Copper	390	73	36.1 J	172 J	227 J	2,040 J	1,470 J	147	1,630	1,380 J	1,810
Lead	450	44	27 J	83	72 J	600	966	62	473	811 J	900
Mercury	0.41	0.69	0.35 J	0.27	0.24 J	1.6	0.49	0.30	0.23	1.33 J	0.83
Nickel	--	26	8.0	27	29	39	38	26	29	54	47
Selenium	--	0.9 U	0.6 UJ	0.9 U	0.9 UJ	0.7 U	0.8 U	1 U	0.80	1.5 J	0.80
Silver	6.1	1.2	0.4 U	0.5 U	0.60	3	1.0	0.6 U	1.0	2.0	2.0
Thallium	--	0.3 U	0.2 U	0.4 U	0.4 U	0.30	0.50	0.4 U	0.40	0.40	1.1
Zinc	410	118 J	41 J	320 J	240 J	2,230 J	1,350 J	396 J	3,080 J	1,980 J	2,650 J
Organometallic Compounds (µg/kg)											
Tributyltin (bulk sediment)	73	3.5 U	3.4 U	94	230	4,200	990	45	3,200	6,500	1,100
PAHs (µg/kg)											
1-Methylnaphthalene	--	1,700	69	19 U	12 J	29	85	20	200	110	130
2-Methylnaphthalene	--	2,600	89	19 U	16 J	30	61	34	270	94	130
Acenaphthene	--	2,700	300	19 U	18 J	140	420	27	480	470	1,000
Acenaphthylene	--	48	19	19 U	20 U	30 U	30 U	32	45	56 J	58
Anthracene	--	990	90	120	42	420	660	110	990	830	2,700
Benzo(a)anthracene	--	920	530 J	240	160	1,100	1,400	310	2,800	1,900	3,700
Benzo(a)pyrene	--	570	460	190	220	710	980	390	2,300	1,300	2,900
Benzo(b,j,k)fluoranthenes	--	1,100	940 J	490	530	1,500	1,900	970	3,900	2,700	4,900
Benzo(g,h,i)perylene	--	240	240	120	150	400	540	250	1,100	680	1,300
Chrysene	--	1,000	620 J	350	220	1,200	1,400	460	3,000	2,200	3,400
Dibenzo(a,h)anthracene	--	92	92	46	46	130	180	73	480	260	510
Fluoranthene	--	3,400	950	470	320	3,300	3,300	500	6,300	6,300	9,500
Fluorene	--	2,600	60	30	18 J	120	330	38	510	310	1,500
Indeno(1,2,3-c,d)pyrene	--	260	220	110	140	400	550	220	1,200	670	1,500
Naphthalene	--	8,700	570	21	27	43	1,300	72	140	270	330
Phenanthrene	--	7,000	170	180	150	1,300	2,000	250	4,100	3,700	9,000
Pyrene	--	2,700	1,200	520	650	2,800	2,900	860	5,600	4,900	7,100
Total SMS HPAH (U = 0)	--	9,182	4,312	2,046	1,906	10,040	11,250	3,063	22,780	18,210	29,910
Total SMS LPAH (U = 0)	--	22,038	1,209	351	255	2,023	4,710	529	6,265	5,636	14,588

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-07	DSI-SB-07	DSI-SB-08	DSI-SB-08	DSI-SB-08	DSI-SB-08	DSI-SB-09	DSI-SB-09	DSI-SB-09	DSI-SB-09
	Sample ID	DSI-SB-07-10.5-11.9	DSI-SB-07-11.9-12.3	DSI-SB-08-1-2	DSI-SB-08-4-5	DSI-SB-08-7-8.7	DSI-SB-08-12-13.3	DSI-SB-09-1-2	DSI-SB-09-4.5-5.5	DSI-SB-09-8.5-10	DSI-SB-09-11-12.1
	Sample Date	3/9/2011	3/9/2011	3/11/2011	3/11/2011	3/11/2011	3/11/2011	3/10/2011	3/10/2011	3/10/2011	3/10/2011
	Depth	10.5 to 11.9 feet	11.9 to 12.3 feet	1 to 2 feet	4 to 5 feet	7 to 8.7 feet	12 to 13.3 feet	1 to 2 feet	4.5 to 5.5 feet	8.5 to 10 feet	11 to 12.1 feet
	Stratigraphic Unit	Recent	Lower Alluvium	Recent	Recent	Recent	Recent	Recent	Recent	Recent	Recent
Analytes	SMS SQS										
PAHs (mg/kg-OC)											
1-Methylnaphthalene	--	93.4	7.4	0.65 U	0.59 J	2.8	3.6	0.9	10.6	5.4	7.3
2-Methylnaphthalene	38	143	9.5	0.65 U	0.78 J	2.9	2.6	1.5	14.3	4.6	7.3
Acenaphthene	16	148	32.1	0.65 U	0.88 J	13.5	17.9	1.2	25.4	22.9	56.5
Acenaphthylene	66	2.6	2.0	0.65 U	0.98 U	2.88 U	1.2821 U	1.4	2.4	2.73 J	3.3
Anthracene	220	54.4	9.6	4.1	2.1	40.4	28.2	4.7	52.4	40.5	153
Benzo(a)anthracene	110	50.5	56.7 J	8.2	7.8	106	59.8	13.4	148	92.7	209
Benzo(a)pyrene	99	31.3	49.2	6.5	10.8	68.3	41.9	16.8	122	63.4	164
Benzo(b,j,k)fluoranthenes	--	60.4	101 J	16.8	26.0	144	81.2	41.8	206	131.7	277
Benzo(g,h,i)perylene	31	13.2	25.7	4.1	7.4	38.5	23.1	10.8	58.2	33.2	73.4
Chrysene	110	54.9	66.3 J	12.0	10.8	115	59.8	19.8	159	107.3	192
Dibenzo(a,h)anthracene	12	5.1	9.8	1.6	2.3	12.5	7.7	3.1	25.4	12.7	28.8
Fluoranthene	160	187	102	16.1	15.7	317	141	21.6	333	307	537
Fluorene	23	143	6.4	1.0	0.88 J	11.5	14.1	1.6	27.0	15.1	84.7
Indeno(1,2,3-c,d)pyrene	34	14.3	23.5	3.8	6.9	38.5	23.5	9.5	63.5	32.7	84.7
Naphthalene	99	478	61.0	0.7	1.3	4.1	55.6	3.1	7.4	13.2	18.6
Phenanthrene	100	385	18.2	6.2	7.4	125	85.5	10.8	217	180	508
Pyrene	1000	148	128	17.8	31.9	269	124	37.1	296	239.0	401
Total SMS HPAH (U = 0)	960	505	461	70.1	93.4	965	481	132	1,205	888	1,690
Total SMS LPAH (U = 0)	370	1,211	129	12.0	12.5	195	201	22.8	331	275	824
Chlorobenzenes (µg/kg)											
1,2-Dichlorobenzene	--	1.9	4.8 U	9	4.9	37	170	1.9 U	150	120	120
1,3-Dichlorobenzene	--	19 U	19 U	19 U	20 U	19 U	19 U	20 U	8.6 J	94 U	9.2 J
1,4-Dichlorobenzene	--	1.7 U	4.8 U	3.3 J	4.9 U	7 J	28 J	6	22	22	37
1,2,4-Trichlorobenzene	--	4.7 U	4.8 U	3.3 J	4.9 U	6.7	4.8	4.9 U	39	15	14 J
Hexachlorobenzene	--	0.98 U	4.8 U	0.99 U	4.9 U	4.8 U	4.8 U	0.99 U	4.8 U	4.7 U	4.6 U
Chlorobenzenes (mg/kg-OC)											
1,2-Dichlorobenzene	2.3	0.1	0.51 U	0.3	0.2	3.6	7.3	0.08 U	7.9	5.9	6.8
1,3-Dichlorobenzene	--	1.0 U	2.0 U	0.65 U	0.98 U	1.8 U	0.81 U	0.86 U	0.46 J	4.6 U	0.52 J
1,4-Dichlorobenzene	3.1	0.09 U	0.51 U	0.11 J	0.24 U	0.67 J	1.2 J	0.3	1.2	1.1	2.1
1,2,4-Trichlorobenzene	0.81	0.26 U	0.51 U	0.11 J	0.24 U	0.6	0.2	0.21 U	2.1	0.7	0.79 J
Hexachlorobenzene	0.38	0.054 U	0.51 U	0.034 U	0.24 U	0.46 U	0.21 U	0.043 U	0.25 U	0.23 U	0.26 U
Phthalates (µg/kg)											
Dimethyl phthalate	--	19 U	19 U	20	9.9 J	19 U	19 U	12 J	19 U	94 U	18 U
Diethyl phthalate	--	5.1 U	5.1 U	5.5	5.3 U	36	6.8	9.7 J	6.7 J	5.1 U	34
Di-n-butyl phthalate	--	19 U	19 U	25 U	13 J	25 U	19 U	27	38	94 U	18 U
Butylbenzyl phthalate	--	19 U	19 U	19 U	21	19 U	19 U	41	36	94 U	18 U
Bis(2-ethylhexyl) phthalate	--	42	19 U	180	420	2000	7700	430	--	780 U	--
Di-n-octyl phthalate	--	19 U	19 U	19 U	20 U	81	19 U	20 U	76	94 U	18 U
Phthalates (mg/kg-OC)											
Dimethyl phthalate	53	1.0 U	2.0 U	0.7	0.49 J	1.8 U	0.81 U	0.52 J	1.0 U	4.9 U	1.0 U
Diethyl phthalate	61	0.28 U	0.55 U	0.2	0.26 U	3.5	0.3	0.42 J	0.35 J	0.25 U	1.9
Di-n-butyl phthalate	220	1.0 U	2.0 U	0.86 U	0.64 J	2.4 U	0.81 U	1.2	2.0	4.6 U	1.0 U
Butylbenzyl phthalate	4.9	1.0 U	2.0 U	0.65 U	1.0	1.8 U	0.81 U	1.8	1.9	4.6 U	1.0 U
Bis(2-ethylhexyl) phthalate	47	2.3	2.0 U	6.2	20.6	192.0	329.0	18.5	--	38 U	--
Di-n-octyl phthalate	58	1.0 U	2.0 U	0.65 U	0.98 U	7.8	0.81 U	0.86 U	4.0	4.6 U	1.0 U

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-07	DSI-SB-07	DSI-SB-08	DSI-SB-08	DSI-SB-08	DSI-SB-08	DSI-SB-09	DSI-SB-09	DSI-SB-09	DSI-SB-09
	Sample ID	**DSI-SB-07-10.5-11.9**	**DSI-SB-07-11.9-12.3**	**DSI-SB-08-1-2**	**DSI-SB-08-4-5**	**DSI-SB-08-7-8.7**	**DSI-SB-08-12-13.3**	**DSI-SB-09-1-2**	**DSI-SB-09-4.5-5.5**	**DSI-SB-09-8.5-10**	**DSI-SB-09-11-12.1**
	Sample Date	**3/9/2011**	**3/9/2011**	**3/11/2011**	**3/11/2011**	**3/11/2011**	**3/11/2011**	**3/10/2011**	**3/10/2011**	**3/10/2011**	**3/10/2011**
	Depth	**10.5 to 11.9 feet**	**11.9 to 12.3 feet**	**1 to 2 feet**	**4 to 5 feet**	**7 to 8.7 feet**	**12 to 13.3 feet**	**1 to 2 feet**	**4.5 to 5.5 feet**	**8.5 to 10 feet**	**11 to 12.1 feet**
	Stratigraphic Unit	**Recent**	**Lower Alluvium**	**Recent**	**Recent**	**Recent**	**Recent**	**Recent**	**Recent**	**Recent**	**Recent**
	SMS SQS										
Phenols (µg/kg)											
2,4-Dimethylphenol	29	**18 J**	19 UJ	19 UJ	20 UJ	19 UJ	**19 J**	20 U	**14 J**	94 UJ	**54**
2-Methylphenol (o-Cresol)	63	19 U	19 U	19 U	20 U	19 U	19 U	20 U	**12 J**	94 U	**54**
4-Methylphenol (p-Cresol)	670	**58**	19 U	19 U	**25**	**33**	**40**	**52**	**51**	**100**	**350**
Pentachlorophenol	360	**50 J**	7.8 U	12 U	12 U	**65 J**	**21 J**	21 U	**310 J**	**170**	**25 J**
Phenol	420	**89**	19 U	**25**	**58**	**23**	**79**	**83**	**41**	**99**	**140**
Phenols (mg/kg-OC)											
2,4-Dimethylphenol	--	**0.99 J**	2.0 UJ	0.65 UJ	0.98 UJ	1.8 UJ	**0.81 J**	0.86 U	**0.74 J**	4.6 UJ	**3.1**
2-Methylphenol (o-Cresol)	--	1.0 U	2.0 U	0.65 U	0.98 U	1.8 U	0.81 U	0.86 U	**0.63 J**	4.6 U	**3.1**
4-Methylphenol (p-Cresol)	--	**3.2**	2.0 U	0.65 U	**1.2**	**3.2**	**1.7**	**2.2**	**2.7**	**4.9**	**20.0**
Pentachlorophenol	--	**2.7 J**	0.83 U	0.41 U	0.59 U	**6.3 J**	**0.90 J**	0.91 U	**16 J**	**8.3**	**1.4 J**
Phenol	--	**4.9**	2.0 U	**0.9**	**2.8**	**2.2**	**3.4**	**3.6**	**2.2**	**4.8**	**7.9**
Miscellaneous Extractables (µg/kg) [4]											
Dibenzofuran	--	**1900**	**41**	19 U	**18 J**	**48**	**240**	**38**	**340**	**180**	**800**
Hexachlorobutadiene	--	0.98 U	4.8 U	0.99 U	4.9 U	4.8 U	4.8 U	0.99 U	4.8 U	4.7 U	4.6 U
N-Nitrosodiphenylamine	--	19 U	4.8 U	**3.5 J**	4.9 U	**19**	**30**	4.9 U	33 U	**32**	100 U
Benzyl alcohol	57	**19**	19 UJ	**35**	20 UJ	19 U	**39**	**150**	**18 J**	94 UJ	18 U
Benzoic acid	650	190 U	190 UJ	190 UJ	**96 J**	190 UJ	190 UJ	**330**	190 U	**160 J**	180 U
Hexachloroethane	--	19 U	19 UJ	19 U	20 U	19 U	19 U	20 U	19 U	94 U	18 U
Miscellaneous Extractables (mg/kg-OC) [4]											
Dibenzofuran	15	**104.4**	**4.4**	0.65 U	**0.88 J**	**4.6**	**10.3**	**1.6**	**18.0**	**8.8**	**45.2**
Hexachlorobutadiene	3.9	0.05 U	0.5 U	0.03 U	0.2 U	0.5 U	0.2 U	0.04 U	0.3 U	0.2 U	0.3 U
N-Nitrosodiphenylamine	11	1.0 U	0.51 U	**0.12 J**	0.24 U	**1.8**	**1.3**	0.21 U	1.7 U	**1.6**	5.6 U
Benzyl alcohol	--	**1.0**	2.0 UJ	**1.2**	0.98 UJ	1.8 U	**1.7**	**6.5**	**0.95 J**	4.6 UJ	1.0 U
Benzoic acid	--	10 U	20 UJ	6.5 UJ	**4.7 J**	18 UJ	8.1 UJ	**14.2**	10 U	**7.8 J**	10 U
Hexachloroethane	--	1.0 U	2.0 UJ	0.65 U	0.98 U	1.8 U	0.81 U	0.86 U	1.0 U	4.6 U	1.0 U
PCB Aroclors (µg/kg)											
Aroclor 1016	--	71 U	3.8 U	4 U	3.8 U	20 U	20 U	3.8 U	160 U	76 U	38 U
Aroclor 1221	--	71 U	3.8 U	4 U	3.8 U	20 U	20 U	3.8 U	160 U	76 U	38 U
Aroclor 1232	--	71 U	3.8 U	4 U	3.8 U	20 U	20 U	3.8 U	160 U	76 U	38 U
Aroclor 1242	--	71 U	3.8 U	4 U	3.8 U	20 U	20 U	**61.0**	160 U	76 U	38 U
Aroclor 1248	--	**280**	11 U	30 U	**76**	200 U	**430**	3.8 U	**1,900**	**770**	**310**
Aroclor 1254	--	**420**	**15**	**51**	**140**	**420**	**530**	**45**	**3,400**	**1,400**	**420**
Aroclor 1260	--	**160**	**11**	**30**	**96**	**89**	**140**	**27**	**1,200**	**1,600**	**840**
Total PCB Aroclors (U = 0)	--	**860**	**26**	**81**	**312**	**509**	**1,100**	**133**	**6,500**	**3,770**	**1,570**
Total PCB Aroclors (U = 1/2)	--	**1,002**	**39**	**104**	**320**	**649**	**1,140**	**141**	**6,820**	**3,922**	**1,646**
PCB Aroclors (mg/kg-OC)											
Aroclor 1016	--	3.9 U	0.41 U	0.14 U	0.19 U	1.9 U	0.85 U	0.16 U	8.5 U	3.7 U	2.1 U
Aroclor 1221	--	3.9 U	0.41 U	0.14 U	0.19 U	1.9 U	0.85 U	0.16 U	8.5 U	3.7 U	2.1 U
Aroclor 1232	--	3.9 U	0.41 U	0.14 U	0.19 U	1.9 U	0.85 U	0.16 U	8.5 U	3.7 U	2.1 U
Aroclor 1242	--	3.9 U	0.41 U	0.14 U	0.19 U	1.9 U	0.85 U	**2.6**	8.5 U	3.7 U	2.1 U
Aroclor 1248	--	**15**	1.8 U	1.0 U	**3.7**	19 U	**18**	0.16 U	**101**	**38**	**18**
Aroclor 1254	--	**23**	**1.6**	**1.7**	**6.9**	**40**	**23**	**1.9**	**180**	**68**	**24**
Aroclor 1260	--	**8.8**	**1.2**	**1.0**	**4.7**	**8.6**	**6.0**	**1.2**	**63**	**78**	**47**
Total PCB Aroclors (U = 0)	12	**47**	**2.8**	**2.8**	**15**	**49**	**47**	**5.7**	**344**	**184**	**89**
Total PCB Aroclors (U = 1/2)	12	**55**	**4.2**	**3.6**	**16**	**62**	**49**	**6.1**	**361**	**191**	**93**

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-07	DSI-SB-07	DSI-SB-08	DSI-SB-08	DSI-SB-08	DSI-SB-08	DSI-SB-09	DSI-SB-09	DSI-SB-09	DSI-SB-09
	Sample ID	DSI-SB-07-10.5-11.9	DSI-SB-07-11.9-12.3	DSI-SB-08-1-2	DSI-SB-08-4-5	DSI-SB-08-7-8.7	DSI-SB-08-12-13.3	DSI-SB-09-1-2	DSI-SB-09-4.5-5.5	DSI-SB-09-8.5-10	DSI-SB-09-11-12.1
	Sample Date	3/9/2011	3/9/2011	3/11/2011	3/11/2011	3/11/2011	3/11/2011	3/10/2011	3/10/2011	3/10/2011	3/10/2011
	Depth	10.5 to 11.9 feet	11.9 to 12.3 feet	1 to 2 feet	4 to 5 feet	7 to 8.7 feet	12 to 13.3 feet	1 to 2 feet	4.5 to 5.5 feet	8.5 to 10 feet	11 to 12.1 feet
	Stratigraphic Unit	Recent	Lower Alluvium	Recent	Recent	Recent	Recent	Recent	Recent	Recent	Recent
Analytes	SMS SQS										
Volatile Organics (µg/kg)											
1,1,1-Trichloroethane	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
1,1,2-Trichloroethane	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
1,1-Dichloroethane	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
1,1-Dichloroethene	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
1,2-Dichloroethane	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
1,3,5-Trimethylbenzene (Mesitylene)	--	**47**	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	**29**
Acetone	--	**76**	--	**160**	--	**53**	**53**	**61**	**64**	--	**110**
Benzene	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
Carbon tetrachloride (Tetrachloromethane)	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
Chlorobenzene	--	1.7 U	--	1.7 U	--	1.3 U	**98**	1.9 U	1.6 U	--	**110**
Chloroethane	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
Chloroform	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
Chloromethane	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
Dichloromethane (Methylene chloride)	--	3.5 U	--	3.4 U	--	**19**	**6.7**	3.9 U	3.2 U	--	**7.3**
Ethylbenzene		**31**	--	1.7 U	--	1.3 U	**120**	1.9 U	1.6 U	--	**120**
m,p-Xylene	--	**34**	--	1.7 U	--	**3.3**	**4.1**	1.9 U	1.6 U	--	**9.4**
o-Xylene	--	**28**	--	1.7 U	--	**3**	**3.7**	1.9 U	1.6 U	--	**8.3**
Styrene	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
Tetrachloroethene (PCE)	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
Toluene	--	**2.8**	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
Trichloroethene (TCE)	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
Vinyl chloride	--	1.7 U	--	1.7 U	--	1.3 U	1.5 U	1.9 U	1.6 U	--	3 U
Total Xylene (U = 0)	--	**62**	--	1.7 U	--	**6.3**	**7.8**	1.9 U	1.6 U	--	**17.7**
Total Xylene (U = 1/2)	--	**62**	--	1.7 U	--	**6.3**	**7.8**	1.9 U	1.6 U	--	**17.7**
Pesticides (µg/kg)											
4,4'-DDD (p,p'-DDD)	--	2 U	--	3.9 U	--	10 U	**40**	2 U	10 U	--	9.7 U
4,4'-DDE (p,p'-DDE)	--	2 U	--	14 U	--	10 U	9.7 U	2 U	**220**	--	9.7 U
4,4'-DDT (p,p'-DDT)	--	2 U	--	56 U	--	47 U	**60**	2 U	**570**	--	9.7 U
Aldrin	--	0.98 U	--	0.99 U	--	5 U	4.8 U	0.99 U	59 U	--	4.8 U
alpha-Chlordane (cis-Chlordane)	--	0.98 U	--	0.99 U	--	5 U	4.8 U	0.99 U	73 U	--	4.8 U
alpha-Hexachlorocyclohexane (BHC)	--	0.98 U	--	0.99 U	--	5 U	4.8 U	0.99 U	5.1 U	--	4.8 U
beta-Chlordane (trans-Chlordane)	--	0.98 U	--	0.99 U	--	5 U	4.8 U	0.99 U	5.1 U	--	4.8 U
beta-Hexachlorocyclohexane (BHC)	--	0.98 U	--	0.99 U	--	5 U	4.8 U	0.99 U	5.1 U	--	4.8 U
delta-Hexachlorocyclohexane (BHC)	--	0.98 UJ	--	0.99 UJ	--	5 UJ	**6.8 J**	0.99 UJ	5.1 UJ	--	4.8 UJ
Dieldrin	--	2 U	--	2 U	--	10 U	9.7 U	2 U	140 U	--	9.7 U
Endosulfan sulfate	--	2 UJ	--	2 U	--	10 U	9.7 U	2 UJ	10 UJ	--	9.7 UJ
Endosulfan-alpha (I)	--	0.98 U	--	21 U	--	5 U	4.8 U	0.99 U	42 U	--	4.8 U
Endosulfan-beta (II)	--	2 U	--	30 U	--	10 U	9.7 U	2 U	180 U	--	9.7 U
Endrin	--	2 U	--	37 U	--	20 U	9.7 U	2 U	200 U	--	59 U
Endrin aldehyde	--	2 UJ	--	13 U	--	10 U	9.7 U	2 UJ	98 UJ	--	9.7 UJ
Endrin ketone	--	2 U	--	2 U	--	10 U	9.7 U	2 U	140 U	--	9.7 U
gamma-Hexachlorocyclohexane (BHC) (Lindane)	--	0.98 U	--	0.99 U	--	5 U	4.8 U	0.99 U	5.1 U	--	4.8 U
Heptachlor	--	0.98 U	--	0.99 U	--	5 U	4.8 U	0.99 U	9.4 U	--	4.8 U
Heptachlor epoxide	--	2.5 U	--	21 U	--	22 U	21 U	0.99 U	260 U	--	46 U
Methoxychlor	--	9.8 U	--	87 U	--	50 U	48 U	9.9 U	480 U	--	190 U

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-07	DSI-SB-07	DSI-SB-08	DSI-SB-08	DSI-SB-08	DSI-SB-08	DSI-SB-09	DSI-SB-09	DSI-SB-09	DSI-SB-09
	Sample ID	DSI-SB-07-10.5-11.9	DSI-SB-07-11.9-12.3	DSI-SB-08-1-2	DSI-SB-08-4-5	DSI-SB-08-7-8.7	DSI-SB-08-12-13.3	DSI-SB-09-1-2	DSI-SB-09-4.5-5.5	DSI-SB-09-8.5-10	DSI-SB-09-11-12.1
	Sample Date	3/9/2011	3/9/2011	3/11/2011	3/11/2011	3/11/2011	3/11/2011	3/10/2011	3/10/2011	3/10/2011	3/10/2011
	Depth	10.5 to 11.9 feet	11.9 to 12.3 feet	1 to 2 feet	4 to 5 feet	7 to 8.7 feet	12 to 13.3 feet	1 to 2 feet	4.5 to 5.5 feet	8.5 to 10 feet	11 to 12.1 feet
	Stratigraphic Unit	Recent	Lower Alluvium	Recent	Recent	Recent	Recent	Recent	Recent	Recent	Recent
Analytes	SMS SQS										
Toxaphene	--	98 U	--	99 U	--	500 U	480 U	99 U	1500 U	--	480 U
Total DDx (U = 0)	--	2 U	--	56 U	--	47 U	**100**	2 U	**790**	--	9.7 U
Total DDx (U = 1/2)	--	2 U	--	56 U	--	47 U	**105**	2 U	**795**	--	9.7 U
Dioxin Furans (ng/kg)											
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	1.53	0.169 J	--	--	--	--	0.793 J	--	1.56	1.61
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	11.9 J	0.8 J	--	--	--	--	3.19 J	--	4.28 J	3.73 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	24.7	0.935 J	--	--	--	--	4.18	--	3.79	4.31
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	589	12.3	--	--	--	--	24.5	--	40.3	31.2
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	61.5	2.34	--	--	--	--	10.0	--	15.4	13.4
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	19,400	321	--	--	--	--	762	--	1,550	924
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	169,000	3290	--	--	--	--	6,970	--	19,500	10,200
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	9.83	0.939 J	--	--	--	--	2.42	--	3.69	2.69
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	34.9	1.93 J	--	--	--	--	2.37	--	2.12	3.03
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	110	2.8	--	--	--	--	5.11	--	5.18	4.23
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	1,330	39.2	--	--	--	--	29.1	--	24.6	13.2
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	196	5.98	--	--	--	--	6.54	--	6.33	4.52
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	244	6.29 J	--	--	--	--	6.35	--	4.86	4.62
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	333	9.27	--	--	--	--	9.16	--	10.8	2.44 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	8,800	166	--	--	--	--	168	--	217	114
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	1,100	25.4	--	--	--	--	17.9	--	24.2	9.26
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	53,500	524	--	--	--	--	653	--	825	359
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	51.7 J	5.1 J	--	--	--	--	15.2 J	--	18.5 J	12.5 J
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	342 J	10.3 J	--	--	--	--	31 J	--	69.9 J	32.2 J
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	2,430	67.4 J	--	--	--	--	212 J	--	347	200
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	25600 J	592	--	--	--	--	2130 J	--	3010 J	1850 J
Total Tetrachlorodibenzofuran (TCDF)	--	180	12.9 J	--	--	--	--	58.9 J	--	61.3 J	42.6 J
Total Pentachlorodibenzofuran (PeCDF)	--	1840 J	57.9 J	--	--	--	--	104 J	--	93.1 J	86.5 J
Total Hexachlorodibenzofuran (HxCDF)	--	15,200	264 J	--	--	--	--	307	--	393	266 J
Total Heptachlorodibenzofuran (HpCDF)	--	28,400	725	--	--	--	--	770	--	1,070	477
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)	--	686	15.9	--	--	--	--	26.6	--	42.4	28.0
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)	--	686	15.9	--	--	--	--	26.6	--	42.4	28.0

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-09	DSI-SB-10	DSI-SB-10	DSI-SB-10	DSI-SB-10	DSI-SB-11	DSI-SB-11	DSI-SB-11	DSI-SB-11	DSI-SB-12
	Sample ID	DSI-SB-09-12.1-12.6	DSI-SB-10-1-2	DSI-SB-10-5.5-7	DSI-SB-10-8.5-10	DSI-SB-10-10-11	DSI-SB-11-1-2	DSI-SB-11-3.5-5	DSI-SB-11-8-8.9	DSI-SB-11-11-12.3	DSI-SB-12-1-2
	Sample Date	3/10/2011	3/14/2011	3/14/2011	3/14/2011	3/14/2011	3/11/2011	3/11/2011	3/11/2011	3/11/2011	3/15/2011
	Depth	12.1 to 12.6 feet	1 to 2 feet	5.5 to 7 feet	8.5 to 10 feet	10 to 11 feet	1 to 2 feet	3.5 to 5 feet	8 to 8.9 feet	11 to 12.3 feet	1 to 2 feet
	Stratigraphic Unit	Upper Alluvium	Recent	Recent	Upper Alluvium	Upper Alluvium	Recent	Recent	Recent	Upper Alluvium	Recent
Analytes	SMS SQS										
Conventional Parameters (percent)											
Total organic carbon	--	1.7	2.81	1.3	0.94	0.265	3.66	2.45	1.47	1.1	2.1
Percent fines [2]	--	--	--	--	--	--	--	--	--	--	--
Total solids	--	70.9	48.8	71.5	74.9	77.6	51.3	51.5	65	70.6	75.6
Total volatile solids	--	--	--	--	--	--	--	--	--	--	--
Metals (mg/kg)											
Antimony	--	0.3 UJ	0.4 UJ	157 J	2.3 J	0.3 UJ	0.4 UJ	0.4 UJ	3.7 J	0.3 UJ	3 J
Arsenic	57	16	37	919	303	12	17	22	888	10	184 J
Beryllium	--	0.20	0.40	0.50	0.30	0.1 U	0.40	0.40	0.50	0.20	0.3 U
Cadmium	5.1	1.0	0.90	3.1	1.1	0.2 U	0.80	0.70	4.2	0.60	1.4
Chromium	260	52.5 J	49	223	66.9 J	11	38	36.5 J	198	25	95 J
Chromium VI [3]	--	--	0.807 U	0.553 U	--	0.511 U	-- R	--	-- R	-- R	0.513 U
Copper	390	507 J	318	1,270	595 J	13	112 J	161 J	1,530 J	82.3 J	1,200 J
Lead	450	217 J	93	857	433 J	2 U	47	46 J	1,000	40	588 J
Mercury	0.41	2.39 J	0.44 J	0.84 J	0.65 J	0.03 UJ	0.22	0.24 J	1.1	0.31	2.78 J
Nickel	--	28	28	80	25	7.0	27	29	114	15	56 J
Selenium	--	0.6 UJ	1 U	1.0	0.7 UJ	0.6 U	0.9 U	1 UJ	1.0	0.7 U	0.6 U
Silver	6.1	0.60	0.6 U	2.0	0.60	0.4 U	0.6 U	0.5 U	2.0	0.4 U	0.9 U
Thallium	--	0.3 U	0.4 U	0.50	0.3 U	0.3 U	0.4 U	0.4 U	0.30	0.3 U	0.3 U
Zinc	410	356 J	326	2,800	1,050 J	20	258 J	171 J	2,490 J	87 J	1,100 J
Organometallic Compounds (µg/kg)											
Tributyltin (bulk sediment)	73	1,100	180	4,400	2,400	3.2 U	64	120	15,000	970	230
PAHs (µg/kg)											
1-Methylnaphthalene	--	96 U	13 J	79	98 U	19 U	19 U	13 J	71	19 U	68
2-Methylnaphthalene	--	53 J	24	40	98 U	19 U	26	18 J	65	19 U	98
Acenaphthene	--	130	68	3,200	480	26	19	18 J	420	23	300
Acenaphthylene	--	96 U	31	19 U	98 U	19 U	19	19 U	37 U	19 U	52
Anthracene	--	320	200	860	580	19 U	97	52	1,100	50	600
Benzo(a)anthracene	--	1,100	640	1,500	1,300	19 U	230	180	2,800	130	1,900
Benzo(a)pyrene	--	900	500	990	960	19 U	250	220	1,900	130	1,800
Benzo(b,j,k)fluoranthenes	--	1,700	1,400	2,000	2,000	19 U	620	560	3,600	290	3,600
Benzo(g,h,i)perylene	--	490	250	470	510	19 U	160	110	910	74	950
Chrysene	--	1,200	880	1,600	1,400	19 U	400	310	3,100	150	2,000
Dibenzo(a,h)anthracene	--	210	100	190	200	19 U	48	42	340	23	320
Fluoranthene	--	3,200	1,300	5,900	3,800	19 U	410	370	7,800	280	4,500
Fluorene	--	150	84	460	370	19 U	44	18 J	270	30	280
Indeno(1,2,3-c,d)pyrene	--	480	260	460	540	19 U	140	120	980	69	940
Naphthalene	--	96	47	330	240	20	50	33	200	42	130
Phenanthrene	--	840	540	7,100	2,600	19 U	240	160	3,600	150	2,100
Pyrene	--	2,800	--	--	2,800	19 U	600	560	6,800	550	5,900
Total SMS HPAH (U = 0)	--	10,380	3,930	11,110	11,510	19 U	2,238	1,912	24,630	1,406	18,310
Total SMS LPAH (U = 0)	--	1,536	970	11,950	4,270	46	469	281	5,590	295	3,462

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-09	DSI-SB-10	DSI-SB-10	DSI-SB-10	DSI-SB-10	DSI-SB-11	DSI-SB-11	DSI-SB-11	DSI-SB-11	DSI-SB-12
	Sample ID	DSI-SB-09-12.1-12.6	DSI-SB-10-1-2	DSI-SB-10-5.5-7	DSI-SB-10-8.5-10	DSI-SB-10-10-11	DSI-SB-11-1-2	DSI-SB-11-3.5-5	DSI-SB-11-8-8.9	DSI-SB-11-11-12.3	DSI-SB-12-1-2
	Sample Date	3/10/2011	3/14/2011	3/14/2011	3/14/2011	3/14/2011	3/11/2011	3/11/2011	3/11/2011	3/11/2011	3/15/2011
	Depth	12.1 to 12.6 feet	1 to 2 feet	5.5 to 7 feet	8.5 to 10 feet	10 to 11 feet	1 to 2 feet	3.5 to 5 feet	8 to 8.9 feet	11 to 12.3 feet	1 to 2 feet
	Stratigraphic Unit	Upper Alluvium	Recent	Recent	Upper Alluvium	Upper Alluvium	Recent	Recent	Recent	Upper Alluvium	Recent
	SMS SQS										
PAHs (mg/kg-OC)											
1-Methylnaphthalene	--	5.65 U	0.46 J	6.1	10.4 U	7.17 U	0.52 U	0.53 J	4.8	1.72 U	3.2
2-Methylnaphthalene	38	3.12 J	0.9	3.1	10.4 U	7.17 U	0.7	0.73 J	4.4	1.72 U	4.7
Acenaphthene	16	7.6	2.4	246	51.1	9.8	0.5	0.73 J	28.6	2.1	14.3
Acenaphthylene	66	5.65 U	1.1	1.46 U	10.4 U	7.17 U	0.5	0.78 U	2.51 U	1.72 U	2.5
Anthracene	220	18.8	7.1	66.2	61.7	7.17 U	2.7	2.1	74.8	4.5	28.6
Benzo(a)anthracene	110	64.7	22.8	115	138	7.17 U	6.3	7.3	190	11.8	90.5
Benzo(a)pyrene	99	52.9	17.8	76.2	102	7.17 U	6.8	9.0	129	11.8	85.7
Benzo(b,j,k)fluoranthenes	--	100	49.8	154	213	7.17 U	16.9	22.9	245	26.4	171
Benzo(g,h,i)perylene	31	28.8	8.9	36.2	54.3	7.17 U	4.4	4.5	61.9	6.7	45.2
Chrysene	110	70.6	31.3	123	149	7.17 U	10.9	12.7	211	13.6	95.2
Dibenzo(a,h)anthracene	12	12.4	3.6	14.6	21	7.17 U	1.3	1.7	23.1	2.1	15.2
Fluoranthene	160	188	46.3	454	404	7.17 U	11.2	15.1	531	25.5	214
Fluorene	23	8.8	3.0	35.4	39.4	7.17 U	1.2	0.7347 J	18.4	2.7	13.3
Indeno(1,2,3-c,d)pyrene	34	28.2	9.3	35.4	57.4	7.17 U	3.8	4.9	66.7	6.3	44.8
Naphthalene	99	5.6	1.7	25.4	25.5	7.5	1.4	1.3	13.6	3.8	6.2
Phenanthrene	100	49.4	19.2	546	277	7.17 U	6.6	6.5	245	13.6	100
Pyrene	1000	165	--	--	298	7.17 U	16.4	22.9	463	50.0	281
Total SMS HPAH (U = 0)	960	611	140	855	1,224	7.17 U	61.1	78.0	1,676	128	872
Total SMS LPAH (U = 0)	370	90.4	34.5	919	454	17.4	12.8	11.5	380	26.8	165
Chlorobenzenes (µg/kg)											
1,2-Dichlorobenzene	--	86	1.9 U	27	16	8.1	2.9 J	4.8 U	61	2.4 J	1.2 U
1,3-Dichlorobenzene	--	96 U	19 U	19 U	98 U	19 U	19 U	19 U	19 U	19 U	19 U
1,4-Dichlorobenzene	--	32	1.9 U	6 J	5.9	1.2 U	5.3 J	4.8 U	15 J	2.5 J	1.2 U
1,2,4-Trichlorobenzene	--	6.3	4.7 U	4.8 U	4.9 U	4.7 U	4.8 U	4.8 U	8.6	4.8 U	4.8 U
Hexachlorobenzene	--	4.8 U	0.97 U	4.8 U	4.9 U	0.97 U	4.8 U	4.8 U	4.7 U	0.98 U	0.98 U
Chlorobenzenes (mg/kg-OC)											
1,2-Dichlorobenzene	2.3	5.1	0.07 U	2.1	1.7	3.1	0.08 J	0.20 U	4.1	0.22 J	0.06 U
1,3-Dichlorobenzene	--	5.6 U	0.68 U	1.5 U	10.4 U	7.2 U	0.52 U	0.78 U	1.3 U	1.7 U	0.90 U
1,4-Dichlorobenzene	3.1	1.9	0.07 U	0.46 J	0.6	0.5 U	0.14 J	0.20 U	1.0 J	0.23 J	0.06 U
1,2,4-Trichlorobenzene	0.81	0.4	0.17 U	0.37 U	0.52 U	1.8 U	0.13 U	0.20 U	0.6	0.44 U	0.23 U
Hexachlorobenzene	0.38	0.28 U	0.035 U	0.37 U	0.52 U	0.37 U	0.13 U	0.20 U	0.32 U	0.089 U	0.047 U
Phthalates (µg/kg)											
Dimethyl phthalate	--	96 U	19 U	19 U	98 U	19 U	19 U	19 U	21	19 U	19 U
Diethyl phthalate	--	5.2 U	5.1 U	5.2 U	5.3 U	5.1 U	5.1	5.1 U	3.9 J	4.8 J	5.2 U
Di-n-butyl phthalate	--	96 U	120 U	320	200	19 U	19 U	31	25 U	19 U	69
Butylbenzyl phthalate	--	96 U	25 J	22 J	98 U	19 U	410	14 J	21	19 U	19 U
Bis(2-ethylhexyl) phthalate	--	1100	300	880	1100	19 U	980	280	800	410	800
Di-n-octyl phthalate	--	96 U	19 U	19 U	98 U	19 U	19 U	19 U	19 U	19 U	19 UJ
Phthalates (mg/kg-OC)											
Dimethyl phthalate	53	5.6 U	0.68 U	1.5 U	10 U	7.2 U	0.52 U	0.78 U	1.4	1.7 U	0.90 U
Diethyl phthalate	61	0.31 U	0.18 U	0.4 U	0.56 U	1.9 U	0.1	0.21 U	0.27 J	0.44 J	0.25 U
Di-n-butyl phthalate	220	5.6 U	4.3 U	24.6	21.3	7.2 U	0.52 U	1.3	1.7 U	1.7 U	3.3
Butylbenzyl phthalate	4.9	5.6 U	0.89 J	1.7 J	10 U	7.2 U	11.2	0.57 J	1.4	1.7 U	0.90 U
Bis(2-ethylhexyl) phthalate	47	64.7	10.7	67.7	117.0	7.2 U	26.8	11.4	54.4	37.3	38.1
Di-n-octyl phthalate	58	5.6 U	0.68 U	1.5 U	10 U	7.2 U	0.52 U	0.78 U	1.3 U	1.7 U	0.90 UJ

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-09	DSI-SB-10	DSI-SB-10	DSI-SB-10	DSI-SB-10	DSI-SB-11	DSI-SB-11	DSI-SB-11	DSI-SB-11	DSI-SB-12
	Sample ID	**DSI-SB-09-12.1-12.6**	**DSI-SB-10-1-2**	**DSI-SB-10-5.5-7**	**DSI-SB-10-8.5-10**	**DSI-SB-10-10-11**	**DSI-SB-11-1-2**	**DSI-SB-11-3.5-5**	**DSI-SB-11-8-8.9**	**DSI-SB-11-11-12.3**	**DSI-SB-12-1-2**
	Sample Date	**3/10/2011**	**3/14/2011**	**3/14/2011**	**3/14/2011**	**3/14/2011**	**3/11/2011**	**3/11/2011**	**3/11/2011**	**3/11/2011**	**3/15/2011**
	Depth	**12.1 to 12.6 feet**	**1 to 2 feet**	**5.5 to 7 feet**	**8.5 to 10 feet**	**10 to 11 feet**	**1 to 2 feet**	**3.5 to 5 feet**	**8 to 8.9 feet**	**11 to 12.3 feet**	**1 to 2 feet**
	Stratigraphic Unit	**Upper Alluvium**	**Recent**	**Recent**	**Upper Alluvium**	**Upper Alluvium**	**Recent**	**Recent**	**Recent**	**Upper Alluvium**	**Recent**
Analytes	**SMS SQS**										
Phenols (µg/kg)											
2,4-Dimethylphenol	29	96 UJ	19 UJ	19 UJ	98 UJ	19 UJ	19 UJ	19 UJ	19 UJ	19 UJ	**16 J**
2-Methylphenol (o-Cresol)	63	96 U	19 U	19 U	98 U	19 U	19 U	19 U	19 U	19 U	19 U
4-Methylphenol (p-Cresol)	670	96 U	**29**	**36**	98 U	19 U	**35**	**48**	**60**	19 U	**57**
Pentachlorophenol	360	**68 J**	13 U	**39 J**	**26**	7.8 U	**14 J**	12 U	24 UJ	8.5 U	**67**
Phenol	420	**53 J**	**49**	19 U	98 U	19 U	**94**	**140**	**47**	**36**	**130**
Phenols (mg/kg-OC)											
2,4-Dimethylphenol	--	5.6 UJ	0.67 UJ	1.5 UJ	10 UJ	7.0 UJ	0.52 UJ	0.78 UJ	1.3 UJ	1.7 UJ	**0.76 J**
2-Methylphenol (o-Cresol)	--	5.6 U	0.67 U	1.5 U	10 U	7.0 U	0.52 U	0.78 U	1.3 U	1.7 U	0.90 U
4-Methylphenol (p-Cresol)	--	5.6 U	**1.0**	**2.8**	10 U	7.0 U	**1.0**	**2.0**	**4.1**	1.7 U	**2.7**
Pentachlorophenol	--	**4 J**	0.46 U	**3 J**	**2.8**	3.0 U	**0.38 J**	0.49 U	1.6 UJ	0.77 U	**3.2**
Phenol	--	**3.1 J**	**1.7**	1.5 U	10 U	7.0 U	**2.6**	**5.7**	**3.2**	**3.3**	**6.2**
Miscellaneous Extractables (µg/kg) [4]											
Dibenzofuran	--	**77 J**	**67**	**780**	**240**	19 U	**28**	**16 J**	**110**	**23**	**160**
Hexachlorobutadiene	--	4.8 U	0.97 U	4.8 U	4.9 U	0.97 U	4.8 U	4.8 U	4.7 U	0.98 U	0.98 U
N-Nitrosodiphenylamine	--	**100**	19 U	19 U	**23**	19 UJ	4.8 U	4.8 U	**34**	**18**	19 U
Benzyl alcohol	57	96 UJ	**130**	19 U	98 UJ	19 UJ	**240**	19 UJ	19 U	19 U	19 U
Benzoic acid	650	960 U	**250 J**	190 UJ	980 U	190 UJ	**380 J**	**180 J**	190 UJ	190 UJ	**98 J**
Hexachloroethane	--	96 U	19 U	19 U	98 U	19 U	19 U	19 U	19 U	19 U	19 U
Miscellaneous Extractables (mg/kg-OC) [4]											
Dibenzofuran	15	**4.5 J**	**2.4**	**60.0**	**25.5**	7.2 U	**0.8**	**0.65 J**	**7.5**	**2.1**	**7.6**
Hexachlorobutadiene	3.9	0.3 U	0.03 U	0.4 U	0.5 U	0.4 U	0.1 U	0.2 U	0.3 U	0.1 U	0.05 U
N-Nitrosodiphenylamine	11	**5.9**	0.68 U	1.5 U	**2.4**	7.2 UJ	0.13 U	0.20 U	**2.3**	**1.6**	0.90 U
Benzyl alcohol	--	5.6 UJ	**4.6**	1.5 U	10 UJ	7.2 UJ	**6.6**	0.78 UJ	1.3 U	1.7 U	0.90 U
Benzoic acid	--	56 U	**8.9 J**	15 UJ	104 U	72 UJ	**10 J**	**7.3 J**	13 UJ	17 UJ	**4.7 J**
Hexachloroethane	--	5.6 U	0.68 U	1.5 U	10 U	7.2 U	0.52 U	0.78 U	1.3 U	1.7 U	0.90 U
PCB Aroclors (µg/kg)											
Aroclor 1016	--	38 U	3.9 U	20 U	19 U	3.9 U	4 U	3.9 U	20 U	4 U	39 U
Aroclor 1221	--	38 U	3.9 U	20 U	19 U	3.9 U	4 U	3.9 U	20 U	4 U	39 U
Aroclor 1232	--	38 U	3.9 U	20 U	19 U	3.9 U	4 U	3.9 U	20 U	4 U	39 U
Aroclor 1242	--	38 U	3.9 U	20 U	19 U	3.9 U	4 U	3.9 U	20 U	4 U	39 UJ
Aroclor 1248	--	**630**	**51**	**200**	**170**	3.9 U	**40**	**46**	200 U	**130**	**450 J**
Aroclor 1254	--	**870**	**63**	**280**	**210**	3.9 U	**53**	**80**	**420**	**110**	**520 J**
Aroclor 1260	--	**140**	**40**	**130**	**62**	3.9 U	**32**	**62**	**460**	**98**	**260 J**
Total PCB Aroclors (U = 0)	--	**1,640**	**154**	**610**	**442**	3.9 U	**125**	**188**	**880**	**338**	**1,230**
Total PCB Aroclors (U = 1/2)	--	**1,716**	**162**	**650**	**480**	3.9 U	**133**	**196**	**1,020**	**346**	**1,308**
PCB Aroclors (mg/kg-OC)											
Aroclor 1016	--	2.2 U	0.14 U	1.5 U	2.0 U	1.5 U	0.11 U	0.16 U	1.4 U	0.36 U	1.9 U
Aroclor 1221	--	2.2 U	0.14 U	1.5 U	2.0 U	1.5 U	0.11 U	0.16 U	1.4 U	0.36 U	1.9 U
Aroclor 1232	--	2.2 U	0.14 U	1.5 U	2.0 U	1.5 U	0.11 U	0.16 U	1.4 U	0.36 U	1.9 U
Aroclor 1242	--	2.2 U	0.14 U	1.5 U	2.0 U	1.5 U	0.11 U	0.16 U	1.4 U	0.36 U	1.9 UJ
Aroclor 1248	--	**37**	**1.8**	**15**	**18**	1.5 U	**1.1**	**1.9**	14 U	**12**	**21 J**
Aroclor 1254	--	**51**	**2.2**	**22**	**22**	1.5 U	**1.4**	**3.3**	**29**	**10**	**25 J**
Aroclor 1260	--	**8.2**	**1.4**	**10**	**6.6**	1.5 U	**0.9**	**2.5**	**31**	**8.9**	**12 J**
Total PCB Aroclors (U = 0)	12	**96**	**5.5**	**47**	**47**	1.5 U	**3.4**	**7.7**	**60**	**31**	**59**
Total PCB Aroclors (U = 1/2)	12	**101**	**5.8**	**50**	**51**	1.5 U	**3.6**	**8.0**	**69**	**31**	**62**

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-09	DSI-SB-10	DSI-SB-10	DSI-SB-10	DSI-SB-10	DSI-SB-11	DSI-SB-11	DSI-SB-11	DSI-SB-11	DSI-SB-12
	Sample ID	**DSI-SB-09-12.1-12.6**	**DSI-SB-10-1-2**	**DSI-SB-10-5.5-7**	**DSI-SB-10-8.5-10**	**DSI-SB-10-10-11**	**DSI-SB-11-1-2**	**DSI-SB-11-3.5-5**	**DSI-SB-11-8-8.9**	**DSI-SB-11-11-12.3**	**DSI-SB-12-1-2**
	Sample Date	**3/10/2011**	**3/14/2011**	**3/14/2011**	**3/14/2011**	**3/14/2011**	**3/11/2011**	**3/11/2011**	**3/11/2011**	**3/11/2011**	**3/15/2011**
	Depth	**12.1 to 12.6 feet**	**1 to 2 feet**	**5.5 to 7 feet**	**8.5 to 10 feet**	**10 to 11 feet**	**1 to 2 feet**	**3.5 to 5 feet**	**8 to 8.9 feet**	**11 to 12.3 feet**	**1 to 2 feet**
	Stratigraphic Unit	**Upper Alluvium**	**Recent**	**Recent**	**Upper Alluvium**	**Upper Alluvium**	**Recent**	**Recent**	**Recent**	**Upper Alluvium**	**Recent**
Analytes	**SMS SQS**										
Volatile Organics (µg/kg)											
1,1,1-Trichloroethane	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
1,1,2-Trichloroethane	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
1,1-Dichloroethane	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
1,1-Dichloroethene	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
1,2-Dichloroethane	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
1,3,5-Trimethylbenzene (Mesitylene)	--	--	1.9 U	**1.3**	--	1.2 U	1.8 U	--	**2.4**	1.2 U	1.2 U
Acetone	--	--	**230**	**97**	--	**14**	**76**	--	**90**	**23**	**80**
Benzene	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	**4.7**	1.2 U	1.2 U
Carbon tetrachloride (Tetrachloromethane)	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
Chlorobenzene	--	--	1.9 U	**5.7**	--	**2.7**	1.8 U	--	**13**	1.2 U	1.2 U
Chloroethane	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
Chloroform	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
Chloromethane	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
Dichloromethane (Methylene chloride)	--	--	3.8 U	2.5 U	--	2.4 U	**4.2**	--	2.7 U	2.4 U	2.3 U
Ethylbenzene		--	1.9 U	**8.3**	--	**3.5**	1.8 U	--	**17**	1.2 U	1.2 U
m,p-Xylene	--	--	1.9 U	**4.8**	--	1.2 U	1.8 U	--	**2.4**	1.2 U	1.2 U
o-Xylene	--	--	1.9 U	**10**	--	**4.1**	1.8 U	--	**8.1**	1.2 U	1.2 U
Styrene	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
Tetrachloroethene (PCE)	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
Toluene	--	--	1.9 U	**3**	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
Trichloroethene (TCE)	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
Vinyl chloride	--	--	1.9 U	1.2 U	--	1.2 U	1.8 U	--	1.3 U	1.2 U	1.2 U
Total Xylene (U = 0)	--	--	1.9 U	**14.8**	--	**4.1**	1.8 U	--	**10.5**	1.2 U	1.2 U
Total Xylene (U = 1/2)	--	--	1.9 U	**14.8**	--	**4.7**	1.8 U	--	**10.5**	1.2 U	1.2 U
Pesticides (µg/kg)											
4,4'-DDD (p,p'-DDD)	--	--	2 U	9.8 U	--	1.9 U	--	--	22 U	2 U	2 U
4,4'-DDE (p,p'-DDE)	--	--	2 U	9.8 U	--	1.9 U	--	--	9.8 U	2 U	14 U
4,4'-DDT (p,p'-DDT)	--	--	2 U	30 U	--	1.9 U	--	--	48 U	6.1 U	35 UJ
Aldrin	--	--	0.97 U	4.9 U	--	0.97 U	--	--	4.9 U	0.98 U	7.1 U
alpha-Chlordane (cis-Chlordane)	--	--	0.97 U	4.9 U	--	0.97 U	--	--	4.9 U	0.98 U	0.98 U
alpha-Hexachlorocyclohexane (BHC)	--	--	0.97 U	4.9 U	--	0.97 U	--	--	4.9 U	0.98 U	0.98 U
beta-Chlordane (trans-Chlordane)	--	--	0.97 U	4.9 U	--	0.97 U	--	--	4.9 U	0.98 U	0.98 U
beta-Hexachlorocyclohexane (BHC)	--	--	0.97 U	4.9 U	--	0.97 U	--	--	4.9 U	0.98 U	0.98 U
delta-Hexachlorocyclohexane (BHC)	--	--	**12 J**	4.9 UJ	--	0.97 UJ	--	--	4.9 UJ	0.98 UJ	6.1 UJ
Dieldrin	--	--	2 U	9.8 U	--	1.9 U	--	--	9.8 U	2 U	11 U
Endosulfan sulfate	--	--	2.8 U	9.8 U	--	1.9 U	--	--	9.8 U	2 U	2 U
Endosulfan-alpha (I)	--	--	0.97 U	4.9 U	--	0.97 U	--	--	4.9 U	0.98 U	20 U
Endosulfan-beta (II)	--	--	2 U	9.8 U	--	1.9 U	--	--	9.8 U	2 U	2 U
Endrin	--	--	3 U	19 U	--	1.9 U	--	--	23 U	3.1 U	15 U
Endrin aldehyde	--	--	2 U	9.8 U	--	18 U	--	--	14 U	2 U	4.6 U
Endrin ketone	--	--	2 U	9.8 U	--	1.9 U	--	--	9.8 U	2 U	2 U
gamma-Hexachlorocyclohexane (BHC) (Lindane)	--	--	0.97 U	4.9 U	--	0.97 U	--	--	4.9 U	0.98 U	0.98 U
Heptachlor	--	--	0.97 U	4.9 U	--	0.97 U	--	--	4.9 U	0.98 U	2.8 U
Heptachlor epoxide	--	--	0.97 U	14 U	--	0.97 U	--	--	15 U	4.7 U	22 U
Methoxychlor	--	--	9.7 U	49 U	--	9.7 U	--	--	49 U	9.8 U	30 UJ

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-09	DSI-SB-10	DSI-SB-10	DSI-SB-10	DSI-SB-10	DSI-SB-11	DSI-SB-11	DSI-SB-11	DSI-SB-11	DSI-SB-12
	Sample ID	DSI-SB-09-12.1-12.6	DSI-SB-10-1-2	DSI-SB-10-5.5-7	DSI-SB-10-8.5-10	DSI-SB-10-10-11	DSI-SB-11-1-2	DSI-SB-11-3.5-5	DSI-SB-11-8-8.9	DSI-SB-11-11-12.3	DSI-SB-12-1-2
	Sample Date	3/10/2011	3/14/2011	3/14/2011	3/14/2011	3/14/2011	3/11/2011	3/11/2011	3/11/2011	3/11/2011	3/15/2011
	Depth	12.1 to 12.6 feet	1 to 2 feet	5.5 to 7 feet	8.5 to 10 feet	10 to 11 feet	1 to 2 feet	3.5 to 5 feet	8 to 8.9 feet	11 to 12.3 feet	1 to 2 feet
	Stratigraphic Unit	Upper Alluvium	Recent	Recent	Upper Alluvium	Upper Alluvium	Recent	Recent	Recent	Upper Alluvium	Recent
	SMS SQS										
Toxaphene	--	--	97 U	490 U	--	97 U	--	--	490 U	98 U	98 U
Total DDx (U = 0)	--	--	2 U	30 U	--	1.9 U	--	--	48 U	6.1 U	35 U
Total DDx (U = 1/2)	--	--	2 U	30 U	--	1.9 U	--	--	48 U	6.1 U	35 U
Dioxin Furans (ng/kg)											
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	--	--	--	--	--	--	--	--	--	--
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	--	--	--	--	--	--	--	--	--	--
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	--	--	--	--	--	--	--	--
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	--	--	--	--	--	--	--	--	--
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	--	--	--	--	--
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	--	--	--	--	--	--	--	--	--
Total Tetrachlorodibenzofuran (TCDF)	--	--	--	--	--	--	--	--	--	--	--
Total Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	--
Total Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--
Total Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--	--	--	--	--	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)	--	--	--	--	--	--	--	--	--	--	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)	--	--	--	--	--	--	--	--	--	--	--

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-12	DSI-SB-12	DSI-SB-12	DSI-SB-13	DSI-SB-13	DSI-SB-13	DSI-SB-13	DSI-SB-14	DSI-SB-14	DSI-SB-15
	Sample ID	DSI-SB-12-3-4.3	DSI-SB-12-4.3-5.8	DSI-SB-12-5.8-7.1	DSI-SB-13-1-2	DSI-SB-13-3-4.1	DSI-SB-13-4.1-5	DSI-SB-13-5-6	DSI-SB-14-4-5	DSI-SB-14-9-10.5	DSI-SB-15-4-5
	Sample Date	3/15/2011	3/15/2011	3/15/2011	3/14/2011	3/14/2011	3/14/2011	3/14/2011	3/15/2011	3/15/2011	3/15/2011
	Depth	3 to 4.3 feet	4.3 to 5.8 feet	5.8 to 7.1 feet	1 to 2 feet	3 to 4.1 feet	4.1 to 5 feet	5 to 6 feet	4 to 5 feet	9 to 10.5 feet	4 to 5 feet
	Stratigraphic Unit	Recent	Upper Alluvium	Upper Alluvium	Recent	Recent	Lower Alluvium	Lower Alluvium	Recent	Recent	Recent
Analytes	SMS SQS										
Conventional Parameters (percent)											
Total organic carbon	--	**1.44**	**1.17**	**1.42**	**2.05**	**1.95**	**0.126**	**0.111**	**2.14**	**2.05**	**2.22**
Percent fines [2]	--	--	--	--	--	--	--	--	--	--	--
Total solids	--	**85**	**71.6**	**73.7**	**60**	**50.7**	**86.7**	**93.6**	**54.2**	**55.4**	**53.6**
Total volatile solids	--	--	--	--	--	--	--	--	--	--	--
Metals (mg/kg)											
Antimony	--	**1.1 J**	0.3 UJ	0.3 UJ	**3.6 J**	**0.8 J**	0.2 UJ	--	0.4 UJ	0.3 UJ	0.4 UJ
Arsenic	57	**45.2 J**	**17**	**27.4 J**	**596**	**104**	**11**	--	**12**	**62**	**20**
Beryllium	--	0.1 U	**0.10**	0.1 U	**0.80**	**0.60**	0.1 U	--	**0.40**	**0.50**	**0.40**
Cadmium	5.1	**0.50**	0.3 U	0.3 U	**2.8**	**1.0**	0.2 U	--	**0.60**	**1.0**	**0.90**
Chromium	260	**36.2 J**	**16.2 J**	**17.5 J**	**89**	**51**	**9.2 J**	--	**35.3 J**	**35 J**	**36.1 J**
Chromium VI [3]	--	0.469 U	--	0.534 U	0.656 U	0.767 U	--	--	--	--	--
Copper	390	**189 J**	**26.3 J**	**40.3 J**	**1,270**	**240**	**18.3 J**	--	**81.6 J**	**219 J**	**105 J**
Lead	450	**273 J**	**11 J**	**38 J**	**749**	**201**	**7 J**	--	**33 J**	**131 J**	**69 J**
Mercury	0.41	**0.7 J**	**0.24 J**	**0.09 J**	**0.72 J**	**0.74 J**	**-- R**	--	**0.18 J**	**0.44 J**	**0.29 J**
Nickel	--	**22 J**	**9.0**	**10 J**	**35**	**23**	**7.0**	--	**29**	**22**	**28**
Selenium	--	0.6 U	0.7 UJ	0.7 U	0.8 U	1 U	0.5 UJ	--	0.9 UJ	0.9 UJ	0.9 UJ
Silver	6.1	0.4 U	0.4 U	0.4 U	**1.0**	1 U	0.3 U	--	0.5 U	**0.60**	0.5 U
Thallium	--	0.2 U	0.3 U	0.3 U	**0.40**	0.4 U	0.2 U	--	0.4 U	0.3 U	0.4 U
Zinc	410	**298 J**	**38 J**	**50 J**	**3,380**	**344**	**30 J**	--	**130 J**	**300 J**	**174 J**
Organometallic Compounds (µg/kg)											
Tributyltin (bulk sediment)	73	**3**	--	**4**	**3,600**	**950**	**19**	--	**29**	**630**	**140**
PAHs (µg/kg)											
1-Methylnaphthalene	--	**13 J**	--	**20**	**68**	**20**	19 U	--	**12 J**	**14 J**	19 U
2-Methylnaphthalene	--	**20**	--	**27**	**99**	**59**	19 U	--	**16 J**	**20**	**13 J**
Acenaphthene	--	**31**	--	**18 J**	**570**	19 U	19 U	--	**15 J**	**40**	**20**
Acenaphthylene	--	**20**	--	**11 J**	**29**	19 U	19 U	--	20 U	20 U	19 U
Anthracene	--	**78**	--	**36**	**870**	**310**	19 U	--	**35**	**100**	**36**
Benzo(a)anthracene	--	**190**	--	**81**	**2,600**	**1,100**	**11 J**	--	**98**	**330**	**120**
Benzo(a)pyrene	--	**270**	--	**130**	**2,300**	**1,400**	**17 J**	--	**130**	**280**	**150**
Benzo(b,j,k)fluoranthenes	--	**570**	--	**290**	**4,200**	**3,000**	**42**	--	**350**	**600**	**370**
Benzo(g,h,i)perylene	--	**140**	--	**78**	**1,100**	**690**	**11 J**	--	**100**	**180**	**110**
Chrysene	--	**280**	--	**110**	**3,100**	**1,700**	**17 J**	--	**150**	**380**	**170**
Dibenzo(a,h)anthracene	--	**50**	--	**24**	**430**	**250**	19 U	--	**31**	**55**	**39**
Fluoranthene	--	**530**	--	**150**	**6,500**	**3,100**	**29**	--	**200**	**830**	**240**
Fluorene	--	**32**	--	**20**	**390**	**120**	19 U	--	**18 J**	**40**	**27**
Indeno(1,2,3-c,d)pyrene	--	**130**	--	**74**	**1,000**	**660**	**10 J**	--	**91**	**160**	**100**
Naphthalene	--	**38**	--	**44**	**260**	**91**	19 U	--	**28**	**30**	**17 J**
Phenanthrene	--	**250**	--	**100**	**3,600**	**880**	19 U	--	**140**	**360**	**140**
Pyrene	--	**1,400**	--	**590**	**6,000**	**5,100**	**99**	--	**340**	**880**	**390**
Total SMS HPAH (U = 0)	--	**2,990**	--	**1,237**	**23,030**	**14,000**	**194**	--	**1,140**	**3,095**	**1,319**
Total SMS LPAH (U = 0)	--	**449**	--	**229**	**5,719**	**1,401**	19 U	--	**236**	**570**	**240**

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-12	DSI-SB-12	DSI-SB-12	DSI-SB-13	DSI-SB-13	DSI-SB-13	DSI-SB-13	DSI-SB-14	DSI-SB-14	DSI-SB-15
	Sample ID	DSI-SB-12-3-4.3	DSI-SB-12-4.3-5.8	DSI-SB-12-5.8-7.1	DSI-SB-13-1-2	DSI-SB-13-3-4.1	DSI-SB-13-4.1-5	DSI-SB-13-5-6	DSI-SB-14-4-5	DSI-SB-14-9-10.5	DSI-SB-15-4-5
	Sample Date	3/15/2011	3/15/2011	3/15/2011	3/14/2011	3/14/2011	3/14/2011	3/14/2011	3/15/2011	3/15/2011	3/15/2011
	Depth	3 to 4.3 feet	4.3 to 5.8 feet	5.8 to 7.1 feet	1 to 2 feet	3 to 4.1 feet	4.1 to 5 feet	5 to 6 feet	4 to 5 feet	9 to 10.5 feet	4 to 5 feet
	Stratigraphic Unit	Recent	Upper Alluvium	Upper Alluvium	Recent	Recent	Lower Alluvium	Lower Alluvium	Recent	Recent	Recent
Analytes	SMS SQS										
PAHs (mg/kg-OC)											
1-Methylnaphthalene	--	**0.90 J**	--	**1.4**	**3.3**	**1.0**	15.1 U	--	**0.56 J**	**0.68 J**	0.86 U
2-Methylnaphthalene	38	**1.4**	--	**1.9**	**4.8**	**3.0**	15.1 U	--	**0.75 J**	**1.0**	**0.59 J**
Acenaphthene	16	**2.2**	--	**1.27 J**	**27.8**	0.97 U	15.1 U	--	**0.70 J**	**2.0**	**0.9**
Acenaphthylene	66	**1.4**	--	**0.77 J**	**1.4**	0.97 U	15.1 U	--	0.93 U	0.98 U	0.86 U
Anthracene	220	**5.4**	--	**2.5**	**42.4**	**15.9**	15.1 U	--	**1.6**	**4.9**	**1.6**
Benzo(a)anthracene	110	**13.2**	--	**5.7**	**127**	**56.4**	**8.7 J**	--	**4.6**	**16.1**	**5.4**
Benzo(a)pyrene	99	**18.8**	--	**9.2**	**112**	**71.8**	**13.5 J**	--	**6.1**	**13.7**	**6.8**
Benzo(b,j,k)fluoranthenes	--	**39.6**	--	**20.4**	**205**	**154**	**33.3**	--	**16.4**	**29.3**	**16.7**
Benzo(g,h,i)perylene	31	**9.7**	--	**5.5**	**53.7**	**35.4**	**8.7 J**	--	**4.7**	**8.8**	**5.0**
Chrysene	110	**19.4**	--	**7.7**	**151**	**87.2**	**13.5 J**	--	**7.0**	**18.5**	**7.7**
Dibenzo(a,h)anthracene	12	**3.5**	--	**1.7**	**21.0**	**12.8**	15.1 U	--	**1.4**	**2.7**	**1.8**
Fluoranthene	160	**36.8**	--	**10.6**	**317**	**159**	**23.0**	--	**9.3**	**40.5**	**10.8**
Fluorene	23	**2.2**	--	**1.4**	**19.0**	**6.2**	15.1 U	--	**0.84 J**	**2.0**	**1.2**
Indeno(1,2,3-c,d)pyrene	34	**9.0**	--	**5.2**	**48.8**	**33.8**	**7.9 J**	--	**4.3**	**7.8**	**4.5**
Naphthalene	99	**2.6**	--	**3.1**	**12.7**	**4.7**	15.1 U	--	**1.3**	**1.5**	**0.77 J**
Phenanthrene	100	**17.4**	--	**7.0**	**176**	**45.1**	15.1 U	--	**6.5**	**17.6**	**6.3**
Pyrene	1000	**97.2**	--	**41.5**	**293**	**262**	**78.6**	--	**15.9**	**42.9**	**17.6**
Total SMS HPAH (U = 0)	960	**208**	--	**87.1**	**1,123**	**718**	**154**	--	**53.3**	**151**	**59.4**
Total SMS LPAH (U = 0)	370	**31.2**	--	**16.1**	**279**	**71.8**	15.1 U	--	**11.0**	**27.8**	**10.8**
Chlorobenzenes (µg/kg)											
1,2-Dichlorobenzene	--	1.2 U	--	1.2 U	**15 J**	1.8 U	4.7 U	--	4.9 U	**7.8**	4.8 U
1,3-Dichlorobenzene	--	19 U	--	19 U	19 U	19 U	19 U	--	20 U	20 U	19 U
1,4-Dichlorobenzene	--	1.2 U	--	1.2 U	1.5 U	1.8 U	4.7 U	--	4.9 U	4.9 U	4.8 U
1,2,4-Trichlorobenzene	--	4.7 U	--	4.7 U	4.8 U	4.8 U	4.7 U	--	4.9 U	4.9 U	4.8 U
Hexachlorobenzene	--	0.97 U	--	0.96 UJ	4.8 U	4.8 U	4.7 U	--	4.9 U	4.9 U	4.8 U
Chlorobenzenes (mg/kg-OC)											
1,2-Dichlorobenzene	2.3	0.08 U	--	0.08 U	**0.73 J**	0.09 U	3.7 U	--	0.23 U	**0.4**	0.22 U
1,3-Dichlorobenzene	--	1.3 U	--	1.3 U	0.93 U	0.97 U	15.1 U	--	0.93 U	0.98 U	0.86 U
1,4-Dichlorobenzene	3.1	0.08 U	--	0.08 U	0.07 U	0.09 U	3.7 U	--	0.23 U	0.24 U	0.22 U
1,2,4-Trichlorobenzene	0.81	0.33 U	--	0.33 U	0.23 U	0.25 U	3.7 U	--	0.23 U	0.24 U	0.22 U
Hexachlorobenzene	0.38	0.067 U	--	0.068 UJ	0.23 U	0.25 U	3.7 U	--	0.23 U	0.24 U	0.22 U
Phthalates (µg/kg)											
Dimethyl phthalate	--	19 U	--	19 U	**11 J**	19 U	19 U	--	20 U	20 U	**11 J**
Diethyl phthalate	--	5.1 U	--	5 U	**7.6**	5.2 U	5 U	--	5.3 U	5.2 U	5.2 U
Di-n-butyl phthalate	--	**20**	--	19 U	19 U	19 U	19 U	--	20 U	20 U	**14 J**
Butylbenzyl phthalate	--	19 U	--	19 U	19 UJ	19 UJ	19 U	--	**18 J**	**26**	**16 J**
Bis(2-ethylhexyl) phthalate	--	**640 J**	--	**11 J**	**970**	**680**	19 U	--	170 U	**390**	**220**
Di-n-octyl phthalate	--	19 UJ	--	19 UJ	19 U	19 U	19 U	--	20 U	20 U	19 U
Phthalates (mg/kg-OC)											
Dimethyl phthalate	53	1.32 U	--	1.3 U	**0.54 J**	0.97 U	15 U	--	0.93 U	0.98 U	**0.50 J**
Diethyl phthalate	61	0.35 U	--	0.35 U	**0.4**	0.27 U	4.0 U	--	0.25 U	0.25 U	0.23 U
Di-n-butyl phthalate	220	**1.4**	--	1.3 U	0.93 U	0.97 U	15 U	--	0.93 U	0.98 U	**0.63 J**
Butylbenzyl phthalate	4.9	1.3 U	--	1.3 U	0.93 UJ	0.97 U	15 U	--	**0.84 J**	**1.3**	**0.72 J**
Bis(2-ethylhexyl) phthalate	47	**44 J**	--	**0.77 J**	**47.3**	**34.9**	15 U	--	7.9 U	**19.0**	**9.9**
Di-n-octyl phthalate	58	1.3 UJ	--	1.3 UJ	0.93 U	0.97 U	15 U	--	0.93 U	0.98 U	0.86 U

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-12	DSI-SB-12	DSI-SB-12	DSI-SB-13	DSI-SB-13	DSI-SB-13	DSI-SB-13	DSI-SB-14	DSI-SB-14	DSI-SB-15
	Sample ID	DSI-SB-12-3-4.3	DSI-SB-12-4.3-5.8	DSI-SB-12-5.8-7.1	DSI-SB-13-1-2	DSI-SB-13-3-4.1	DSI-SB-13-4.1-5	DSI-SB-13-5-6	DSI-SB-14-4-5	DSI-SB-14-9-10.5	DSI-SB-15-4-5
	Sample Date	3/15/2011	3/15/2011	3/15/2011	3/14/2011	3/14/2011	3/14/2011	3/14/2011	3/15/2011	3/15/2011	3/15/2011
	Depth	3 to 4.3 feet	4.3 to 5.8 feet	5.8 to 7.1 feet	1 to 2 feet	3 to 4.1 feet	4.1 to 5 feet	5 to 6 feet	4 to 5 feet	9 to 10.5 feet	4 to 5 feet
	Stratigraphic Unit	Recent	Upper Alluvium	Upper Alluvium	Recent	Recent	Lower Alluvium	Lower Alluvium	Recent	Recent	Recent
Analytes	SMS SQS										
Phenols (µg/kg)											
2,4-Dimethylphenol	29	19 UJ	--	19 UJ	19 UJ	19 UJ	19 UJ	--	20 UJ	20 UJ	19 UJ
2-Methylphenol (o-Cresol)	63	19 U	--	19 U	**12 J**	19 U	19 U	--	20 U	20 U	19 U
4-Methylphenol (p-Cresol)	670	**17 J**	--	**26**	**28**	**31**	19 U	--	**26**	**32**	**55**
Pentachlorophenol	360	16 U	--	8.7 U	**69 J**	**35 J**	7.2 U	--	12 U	**38 J**	24 UJ
Phenol	420	**26**	--	**57**	**59**	**58**	19 U	--	**180**	**20**	**20**
Phenols (mg/kg-OC)											
2,4-Dimethylphenol	--	1.3 UJ	--	1.3 UJ	0.93 UJ	0.97 UJ	15 UJ	--	0.93 UJ	0.98 UJ	0.86 UJ
2-Methylphenol (o-Cresol)	--	1.3 U	--	1.3 U	**0.59 J**	0.97 U	15 U	--	0.93 U	0.98 U	0.86 U
4-Methylphenol (p-Cresol)	--	**1.2 J**	--	**1.8**	**1.4**	**1.6**	15 U	--	**1.2**	**1.6**	**2.5**
Pentachlorophenol	--	1.1 U	--	0.61 U	**3.4 J**	**1.8 J**	5.7 U	--	0.56 U	**1.9 J**	1.1 UJ
Phenol	--	**1.8**	--	**4.0**	**2.9**	**3.0**	15 U	--	**8.4**	**1.0**	**0.9**
Miscellaneous Extractables (µg/kg) [4]											
Dibenzofuran	--	**24**	--	**20**	**230**	19 U	19 U	--	**17 J**	**21**	**18 J**
Hexachlorobutadiene	--	0.97 U	--	0.96 UJ	4.8 U	4.8 U	4.7 U	--	4.9 U	4.9 U	4.8 U
N-Nitrosodiphenylamine	--	19 U	--	19 U	19 U	19 U	4.7 U	--	4.9 U	**6.2**	4.8 U
Benzyl alcohol	57	19 U	--	19 U	**200**	**42**	19 UJ	--	20 UJ	20 UJ	19 UJ
Benzoic acid	650	190 UJ	--	190 U	190 UJ	**320 J**	190 U	--	**170 J**	200 U	**35 J**
Hexachloroethane	--	19 UJ	--	19 U	19 U	19 U	19 U	--	20 U	20 U	19 U
Miscellaneous Extractables (mg/kg-OC) [4]											
Dibenzofuran	15	**1.7**	--	**1.4**	**11.2**	0.97 U	15 U	--	**0.79 J**	**1.0**	**0.81 J**
Hexachlorobutadiene	3.9	0.07 U	--	0.07 UJ	0.2 U	0.2 U	3.7 U	--	0.2 U	0.2 U	0.2 U
N-Nitrosodiphenylamine	11	1.3 U	--	--	--	--	3.7 U	--	0.23 U	**0.3**	0.22 U
Benzyl alcohol	--	1.3 U	--	1.3 U	**9.8**	**2.2**	15 UJ	--	0.93 UJ	0.98 UJ	0.86 UJ
Benzoic acid	--	13 UJ	--	13 U	9.3 UJ	**16 J**	151 U	--	**7.9 J**	9.8 U	**1.58 J**
Hexachloroethane	--	1.3 UJ	--	1.3 U	0.93 U	0.97 U	15 U	--	0.93 U	0.98 U	0.86 U
PCB Aroclors (µg/kg)											
Aroclor 1016	--	3.9 U	3.6 U	3.8 U	33 U	20 U	3.8 U	3.8 U	3.8 U	19 U	3.8 U
Aroclor 1221	--	3.9 U	3.6 U	3.8 U	33 U	20 U	3.8 U	3.8 U	3.8 U	19 U	3.8 U
Aroclor 1232	--	3.9 U	3.6 U	3.8 U	33 U	20 U	3.8 U	3.8 U	3.8 U	19 U	3.8 U
Aroclor 1242	--	3.9 U	3.6 U	3.8 U	33 U	20 U	3.8 U	3.8 U	3.8 U	19 U	3.8 U
Aroclor 1248	--	**180**	8.5 U	**12**	250 U	150 U	77 U	3.8 U	**45**	**180**	**69**
Aroclor 1254	--	**170**	**15**	**16**	**530**	**280**	**160**	3.8 U	**75**	**320**	**110**
Aroclor 1260	--	**120**	**12**	**7.5**	**160**	**160**	**35**	3.8 U	**61**	**110**	**87**
Total PCB Aroclors (U = 0)	--	**470**	**27**	**36**	**690**	**440**	**195**	3.8 U	**181**	**610**	**266**
Total PCB Aroclors (U = 1/2)	--	**478**	**38**	**43**	**881**	**555**	**241**	3.8 U	**189**	**648**	**274**
PCB Aroclors (mg/kg-OC)											
Aroclor 1016	--	0.27 U	0.31 U	0.27 U	1.6 U	1.0 U	3.0 U	3.4 U	0.18 U	0.93 U	0.17 U
Aroclor 1221	--	0.27 U	0.31 U	0.27 U	1.6 U	1.0 U	3.0 U	3.4 U	0.18 U	0.93 U	0.17 U
Aroclor 1232	--	0.27 U	0.31 U	0.27 U	1.6 U	1.0 U	3.0 U	3.4 U	0.18 U	0.93 U	0.17 U
Aroclor 1242	--	0.27 U	0.31 U	0.27 U	1.6 U	1.0 U	3.0 U	3.4 U	0.18 U	0.93 U	0.17 U
Aroclor 1248	--	**13**	0.73 U	**0.8**	12 U	7.7 U	61 U	3.4 U	**2.1**	**8.8**	**3.1**
Aroclor 1254	--	**12**	**1.3**	**1.1**	**25.9**	**14.4**	**127.0**	3.4 U	**3.5**	**15.6**	**5.0**
Aroclor 1260	--	**8.3**	**1.0**	**0.5**	**7.8**	**8.2**	**27.8**	3.4 U	**2.9**	**5.4**	**3.9**
Total PCB Aroclors (U = 0)	12	**33**	**2.3**	**2.5**	**33.7**	**22.6**	**154.8**	3.4 U	**8.5**	**29.8**	**12.0**
Total PCB Aroclors (U = 1/2)	12	**33**	**3.3**	**3.0**	**43.0**	**28.5**	**191.3**	3.4 U	**8.8**	**31.6**	**12.3**

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-12	DSI-SB-12	DSI-SB-12	DSI-SB-13	DSI-SB-13	DSI-SB-13	DSI-SB-13	DSI-SB-14	DSI-SB-14	DSI-SB-15
	Sample ID	**DSI-SB-12-3-4.3**	**DSI-SB-12-4.3-5.8**	**DSI-SB-12-5.8-7.1**	**DSI-SB-13-1-2**	**DSI-SB-13-3-4.1**	**DSI-SB-13-4.1-5**	**DSI-SB-13-5-6**	**DSI-SB-14-4-5**	**DSI-SB-14-9-10.5**	**DSI-SB-15-4-5**
	Sample Date	**3/15/2011**	**3/15/2011**	**3/15/2011**	**3/14/2011**	**3/14/2011**	**3/14/2011**	**3/14/2011**	**3/15/2011**	**3/15/2011**	**3/15/2011**
	Depth	**3 to 4.3 feet**	**4.3 to 5.8 feet**	**5.8 to 7.1 feet**	**1 to 2 feet**	**3 to 4.1 feet**	**4.1 to 5 feet**	**5 to 6 feet**	**4 to 5 feet**	**9 to 10.5 feet**	**4 to 5 feet**
	Stratigraphic Unit	**Recent**	**Upper Alluvium**	**Upper Alluvium**	**Recent**	**Recent**	**Lower Alluvium**	**Lower Alluvium**	**Recent**	**Recent**	**Recent**
	SMS SQS										
Volatile Organics (µg/kg)											
1,1,1-Trichloroethane	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
1,1,2-Trichloroethane	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
1,1-Dichloroethane	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
1,1-Dichloroethene	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
1,2-Dichloroethane	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Acetone	--	**36**	--	**53**	**170**	**85**	--	--	--	--	--
Benzene	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Carbon tetrachloride (Tetrachloromethane)	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Chlorobenzene	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Chloroethane	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Chloroform	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Chloromethane	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Dichloromethane (Methylene chloride)	--	2.3 U	--	2.4 U	2.9 U	3.6 U	--	--	--	--	--
Ethylbenzene		1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
m,p-Xylene	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
o-Xylene	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Styrene	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Tetrachloroethene (PCE)	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Toluene	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Trichloroethene (TCE)	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Vinyl chloride	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Total Xylene (U = 0)	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Total Xylene (U = 1/2)	--	1.2 U	--	1.2 U	1.5 U	1.8 U	--	--	--	--	--
Pesticides (µg/kg)											
4,4'-DDD (p,p'-DDD)	--	1.9 U	--	1.9 UJ	16 U	9.9 U	--	--	--	--	--
4,4'-DDE (p,p'-DDE)	--	6.1 U	--	1.9 UJ	16 U	9.9 U	--	--	--	--	--
4,4'-DDT (p,p'-DDT)	--	21 UJ	--	1.9 UJ	61 U	9.9 U	--	--	--	--	--
Aldrin	--	0.97 U	--	0.96 UJ	8.2 U	4.9 U	--	--	--	--	--
alpha-Chlordane (cis-Chlordane)	--	0.97 U	--	0.96 UJ	8.2 U	4.9 U	--	--	--	--	--
alpha-Hexachlorocyclohexane (BHC)	--	0.97 U	--	0.96 UJ	8.2 U	4.9 U	--	--	--	--	--
beta-Chlordane (trans-Chlordane)	--	0.97 U	--	0.96 UJ	8.2 U	4.9 U	--	--	--	--	--
beta-Hexachlorocyclohexane (BHC)	--	0.97 U	--	0.96 UJ	8.2 U	4.9 U	--	--	--	--	--
delta-Hexachlorocyclohexane (BHC)	--	0.97 UJ	--	0.96 UJ	8.2 UJ	4.9 UJ	--	--	--	--	--
Dieldrin	--	5.1 U	--	1.9 UJ	16 U	9.9 U	--	--	--	--	--
Endosulfan sulfate	--	1.9 U	--	1.9 UJ	16 U	9.9 U	--	--	--	--	--
Endosulfan-alpha (I)	--	0.97 U	--	0.96 UJ	8.2 U	4.9 U	--	--	--	--	--
Endosulfan-beta (II)	--	1.9 U	--	1.9 UJ	16 U	9.9 U	--	--	--	--	--
Endrin	--	13 U	--	1.9 UJ	31 U	9.9 U	--	--	--	--	--
Endrin aldehyde	--	8 U	--	1.9 UJ	16 U	9.9 U	--	--	--	--	--
Endrin ketone	--	1.9 U	--	1.9 UJ	16 U	9.9 U	--	--	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	--	0.97 U	--	0.96 UJ	8.2 U	4.9 U	--	--	--	--	--
Heptachlor	--	2.2 U	--	0.96 UJ	8.2 U	4.9 U	--	--	--	--	--
Heptachlor epoxide	--	11 U	--	0.96 UJ	27 U	9.5 U	--	--	--	--	--
Methoxychlor	--	32 UJ	--	9.6 UJ	82 U	49 U	--	--	--	--	--

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

	Location ID	DSI-SB-12	DSI-SB-12	DSI-SB-12	DSI-SB-13	DSI-SB-13	DSI-SB-13	DSI-SB-13	DSI-SB-14	DSI-SB-14	DSI-SB-15
	Sample ID	**DSI-SB-12-3-4.3**	**DSI-SB-12-4.3-5.8**	**DSI-SB-12-5.8-7.1**	**DSI-SB-13-1-2**	**DSI-SB-13-3-4.1**	**DSI-SB-13-4.1-5**	**DSI-SB-13-5-6**	**DSI-SB-14-4-5**	**DSI-SB-14-9-10.5**	**DSI-SB-15-4-5**
	Sample Date	**3/15/2011**	**3/15/2011**	**3/15/2011**	**3/14/2011**	**3/14/2011**	**3/14/2011**	**3/14/2011**	**3/15/2011**	**3/15/2011**	**3/15/2011**
	Depth	**3 to 4.3 feet**	**4.3 to 5.8 feet**	**5.8 to 7.1 feet**	**1 to 2 feet**	**3 to 4.1 feet**	**4.1 to 5 feet**	**5 to 6 feet**	**4 to 5 feet**	**9 to 10.5 feet**	**4 to 5 feet**
	Stratigraphic Unit	**Recent**	**Upper Alluvium**	**Upper Alluvium**	**Recent**	**Recent**	**Lower Alluvium**	**Lower Alluvium**	**Recent**	**Recent**	**Recent**
Analytes	**SMS SQS**										
Toxaphene	--	97 U	--	96 UJ	820 U	490 U	--	--	--	--	--
Total DDx (U = 0)	--	21 U	--	1.9 UJ	61 U	9.9 U	--	--	--	--	--
Total DDx (U = 1/2)	--	21 U	--	1.9 UJ	61 U	9.9 U	--	--	--	--	--
Dioxin Furans (ng/kg)											
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	--	--	--	--	--	--	--	--	--	--
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	--	--	--	--	--	--	--	--	--	--
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	--	--	--	--	--	--	--	--
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	--	--	--	--	--	--	--	--	--
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--	--	--	--	--	--
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	--	--	--	--	--	--	--	--	--
Total Tetrachlorodibenzofuran (TCDF)	--	--	--	--	--	--	--	--	--	--	--
Total Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--	--	--	--	--	--
Total Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--	--	--	--	--	--
Total Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--	--	--	--	--	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)	--	--	--	--	--	--	--	--	--	--	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)	--	--	--	--	--	--	--	--	--	--	--

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-15	DSI-SB-16	DSI-SB-16	DSI-SB-17	DSI-SB-17
	Sample ID	DSI-SB-15-11.5-12.5	DSI-SB-16-5-6.5	DSI-SB-16-9.2-10.7	DSI-SB-17-5-6	DSI-SB-17-9.4-10.7
	Sample Date	3/15/2011	3/15/2011	3/15/2011	3/16/2011	3/16/2011
	Depth	11.5 to 12.5 feet	5 to 6.5 feet	9.2 to 10.7 feet	5 to 6 feet	9.4 to 10.7 feet
	Stratigraphic Unit	Recent	Recent	Recent	Recent	Recent
	SMS SQS					
Conventional Parameters (percent)						
Total organic carbon	--	**2.25**	**2.1**	**1.87**	**2.07**	**2.19**
Percent fines [2]	--	--	--	--	--	--
Total solids	--	**62.2**	**54.5**	**59.2**	**56.1**	**59.3**
Total volatile solids	--	--	--	--	--	--
Metals (mg/kg)						
Antimony	--	0.3 UJ	**0.5 J**	0.3 UJ	0.3 UJ	0.3 UJ
Arsenic	57	**12**	**194**	**65**	**118**	**21**
Beryllium	--	**0.40**	**0.50**	**0.40**	**0.50**	**0.40**
Cadmium	5.1	**1.3**	**1.2**	**1.5**	**1.5**	**1.4**
Chromium	260	**35.4 J**	**39.5 J**	**39.6 J**	**43 J**	**39.9 J**
Chromium VI [3]	--	--	--	--	--	--
Copper	390	**63.6 J**	**247 J**	**179 J**	**241 J**	**82 J**
Lead	450	**50 J**	**191 J**	**163 J**	**208 J**	**70 J**
Mercury	0.41	**0.31 J**	**0.4 J**	**0.5 J**	**0.5 J**	**0.39 J**
Nickel	--	**21**	**39**	**25**	**29**	**24**
Selenium	--	0.7 UJ	0.8 UJ	0.8 UJ	0.8 UJ	0.9 UJ
Silver	6.1	**0.70**	**0.80**	**0.80**	1 U	**0.90**
Thallium	--	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Zinc	410	**111 J**	**490 J**	**280 J**	**445 J**	**131 J**
Organometallic Compounds (µg/kg)						
Tributyltin (bulk sediment)	73	3.8 U	**570**	**28**	**480**	**12**
PAHs (µg/kg)						
1-Methylnaphthalene	--	**250**	**16 J**	**12 J**	**13 J**	**11 J**
2-Methylnaphthalene	--	**79**	**20**	**18 J**	**20**	**17 J**
Acenaphthene	--	**4,600**	**42**	**18 J**	**36**	**11 J**
Acenaphthylene	--	**60 J**	**15 J**	19 U	**14 J**	19 U
Anthracene	--	**3,800**	**87**	**44**	**90**	**29**
Benzo(a)anthracene	--	**3,700**	**360**	**100**	**310**	**73**
Benzo(a)pyrene	--	**1,600**	**370**	**110**	**320**	**90**
Benzo(b,j,k)fluoranthenes	--	**3,900**	**790**	**230**	**690**	**200**
Benzo(g,h,i)perylene	--	**640**	**230**	**71**	**200**	**59**
Chrysene	--	**4,900**	**420**	**120**	**390**	**96**
Dibenzo(a,h)anthracene	--	**320**	**81**	**26**	**59**	**27**
Fluoranthene	--	**14,000**	**840**	**210**	**760**	**130**
Fluorene	--	**7,700**	**41**	**22**	**30**	**16 J**
Indeno(1,2,3-c,d)pyrene	--	**630**	**210**	**63**	**180**	**52**
Naphthalene	--	**52 J**	**33**	**31**	**32**	**28**
Phenanthrene	--	**26,000**	**330**	**120**	**290**	**82**
Pyrene	--	**10,000**	**1,000**	**320**	**930**	**270**
Total SMS HPAH (U = 0)	--	**35,790**	**3,511**	**1,020**	**3,149**	**797**
Total SMS LPAH (U = 0)	--	**42,212**	**548**	**235**	**492**	**166**

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-15	DSI-SB-16	DSI-SB-16	DSI-SB-17	DSI-SB-17
	Sample ID	DSI-SB-15-11.5-12.5	DSI-SB-16-5-6.5	DSI-SB-16-9.2-10.7	DSI-SB-17-5-6	DSI-SB-17-9.4-10.7
	Sample Date	3/15/2011	3/15/2011	3/15/2011	3/16/2011	3/16/2011
	Depth	11.5 to 12.5 feet	5 to 6.5 feet	9.2 to 10.7 feet	5 to 6 feet	9.4 to 10.7 feet
	Stratigraphic Unit	Recent	Recent	Recent	Recent	Recent
	SMS SQS					
PAHs (mg/kg-OC)						
1-Methylnaphthalene	--	**11.1**	**0.76 J**	**0.64 J**	**0.63 J**	**0.50 J**
2-Methylnaphthalene	38	**3.5**	**1.0**	**0.96 J**	**1.0**	**0.78 J**
Acenaphthene	16	**204**	**2.0**	**0.96 J**	**1.7**	**0.50 J**
Acenaphthylene	66	**2.7 J**	**0.71 J**	1.0 U	**0.68 J**	0.87 U
Anthracene	220	**169**	**4.1**	**2.4**	**4.3**	**1.3**
Benzo(a)anthracene	110	**164**	**17.1**	**5.3**	**15.0**	**3.3**
Benzo(a)pyrene	99	**71.1**	**17.6**	**5.9**	**15.5**	**4.1**
Benzo(b,j,k)fluoranthenes	--	**173**	**37.6**	**12.3**	**33.3**	**9.1**
Benzo(g,h,i)perylene	31	**28.4**	**11.0**	**3.8**	**9.7**	**2.7**
Chrysene	110	**218**	**20.0**	**6.4**	**18.8**	**4.4**
Dibenzo(a,h)anthracene	12	**14.2**	**3.9**	**1.4**	**2.9**	**1.2**
Fluoranthene	160	**622**	**40.0**	**11.2**	**36.7**	**5.9**
Fluorene	23	**342**	**2.0**	**1.2**	**1.4**	**0.73 J**
Indeno(1,2,3-c,d)pyrene	34	**28.0**	**10.0**	**3.4**	**8.7**	**2.4**
Naphthalene	99	**2.3 J**	**1.6**	**1.7**	**1.5**	**1.3**
Phenanthrene	100	**1,156**	**15.7**	**6.4**	**14.0**	**3.7**
Pyrene	1000	**444**	**47.6**	**17.1**	**44.9**	**12.3**
Total SMS HPAH (U = 0)	960	**1,591**	**167**	**54.5**	**152**	**36.4**
Total SMS LPAH (U = 0)	370	**1,876**	**26.1**	**12.6**	**23.8**	**7.6**
Chlorobenzenes (µg/kg)						
1,2-Dichlorobenzene	--	20 U	**7.3**	4.7 U	**8.2**	4.6 U
1,3-Dichlorobenzene	--	79 U	20 U	19 U	19 U	19 U
1,4-Dichlorobenzene	--	20 U	**5.8**	**4.9**	**5.7**	4.6 U
1,2,4-Trichlorobenzene	--	20 U	4.9 U	4.7 U	4.8 U	4.6 U
Hexachlorobenzene	--	20 U	4.9 U	4.7 U	4.8 U	4.6 U
Chlorobenzenes (mg/kg-OC)						
1,2-Dichlorobenzene	2.3	0.89 U	**0.3**	0.25 U	**0.4**	0.21 U
1,3-Dichlorobenzene	--	3.5 U	0.95 U	1.0 U	0.92 U	0.87 U
1,4-Dichlorobenzene	3.1	0.89 U	**0.3**	**0.3**	**0.3**	0.21 U
1,2,4-Trichlorobenzene	0.81	0.89 U	0.23 U	0.25 U	0.23 U	0.21 U
Hexachlorobenzene	0.38	0.89 U	0.23 U	0.25 U	0.23 U	0.21 U
Phthalates (µg/kg)						
Dimethyl phthalate	--	79 U	20 U	19 U	19 U	19 U
Diethyl phthalate	--	21 U	7.2 U	7.4 U	6.8 U	5.1 U
Di-n-butyl phthalate	--	79 U	20 U	19 U	19 U	19 U
Butylbenzyl phthalate	--	79 U	**26**	19 U	**24**	19 U
Bis(2-ethylhexyl) phthalate	--	79 U	**610**	**710**	**610**	**220**
Di-n-octyl phthalate	--	79 U	20 U	19 U	19 U	19 U
Phthalates (mg/kg-OC)						
Dimethyl phthalate	53	3.5 U	0.95 U	1.0 U	0.92 U	0.87 U
Diethyl phthalate	61	0.93 U	0.34 U	0.40 U	0.33 U	0.23 U
Di-n-butyl phthalate	220	3.5 U	0.95 U	1.0 U	0.92 U	0.87 U
Butylbenzyl phthalate	4.9	3.5 U	**1.2**	1.0 U	**1.2**	0.87 U
Bis(2-ethylhexyl) phthalate	47	3.5 U	**29.0**	**38.0**	**29.5**	**10**
Di-n-octyl phthalate	58	3.5 U	0.95 U	1.0 U	0.92 U	0.87 U

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-15	DSI-SB-16	DSI-SB-16	DSI-SB-17	DSI-SB-17
	Sample ID	DSI-SB-15-11.5-12.5	DSI-SB-16-5-6.5	DSI-SB-16-9.2-10.7	DSI-SB-17-5-6	DSI-SB-17-9.4-10.7
	Sample Date	3/15/2011	3/15/2011	3/15/2011	3/16/2011	3/16/2011
	Depth	11.5 to 12.5 feet	5 to 6.5 feet	9.2 to 10.7 feet	5 to 6 feet	9.4 to 10.7 feet
	Stratigraphic Unit	Recent	Recent	Recent	Recent	Recent
	SMS SQS					
Phenols (µg/kg)						
2,4-Dimethylphenol	29	79 UJ	20 UJ	19 UJ	19 UJ	19 UJ
2-Methylphenol (o-Cresol)	63	79 U	20 U	19 U	19 U	19 U
4-Methylphenol (p-Cresol)	670	79 U	**33**	**32**	**31**	**34**
Pentachlorophenol	360	9.7 U	**33 J**	11 U	11 U	11 U
Phenol	420	79 U	**26**	**22**	**29**	**15 J**
Phenols (mg/kg-OC)						
2,4-Dimethylphenol	--	3.5 UJ	0.95 UJ	1.0 UJ	0.92 UJ	0.87 UJ
2-Methylphenol (o-Cresol)	--	3.5 U	0.95 U	1.0 U	0.92 U	0.87 U
4-Methylphenol (p-Cresol)	--	3.5 U	**1.6**	**1.7**	**1.5**	**1.6**
Pentachlorophenol	--	0.43 U	**1.6 J**	0.59 U	0.53 U	0.50 U
Phenol	--	3.5 U	**1.2**	**1.2**	**1.4**	**0.68 J**
Miscellaneous Extractables (µg/kg) [4]						
Dibenzofuran	--	**4400**	**28**	**17 J**	**22**	**13 J**
Hexachlorobutadiene	--	20 U	4.9 U	4.7 U	4.8 U	4.6 U
N-Nitrosodiphenylamine	--	**180**	**7.9**	**4.9**	**8.4**	4.6 U
Benzyl alcohol	57	79 UJ	20 UJ	19 UJ	19 UJ	19 UJ
Benzoic acid	650	790 U	**41 J**	**54 J**	**54 J**	190 U
Hexachloroethane	--	79 U	20 U	19 U	19 U	19 U
Miscellaneous Extractables (mg/kg-OC) [4]						
Dibenzofuran	15	**195.6**	**1.3**	**0.90 J**	**1.1**	**0.59 J**
Hexachlorobutadiene	3.9	0.9 U	0.2 U	0.3 U	0.2 U	0.2 U
N-Nitrosodiphenylamine	11	**8.0**	**0.4**	**0.3**	**0.4**	0.21 U
Benzyl alcohol	--	3.5 UJ	0.95 UJ	1.0 UJ	0.92 UJ	0.87 UJ
Benzoic acid	--	35 U	**2.0 J**	**2.9 J**	**2.6 J**	8.7 U
Hexachloroethane	--	3.5 U	0.95 U	1.0 U	0.92 U	0.87 U
PCB Aroclors (µg/kg)						
Aroclor 1016	--	20 U	19 U	39 U	20 U	37 U
Aroclor 1221	--	20 U	19 U	39 U	20 U	37 U
Aroclor 1232	--	20 U	19 U	39 U	20 U	37 U
Aroclor 1242	--	20 U	19 U	39 U	20 U	37 U
Aroclor 1248	--	**130**	**110**	**360**	**180**	**400**
Aroclor 1254	--	**180**	**190**	**410**	**280**	**500**
Aroclor 1260	--	**81**	**74**	**160**	**220**	**150**
Total PCB Aroclors (U = 0)	--	**391**	**374**	**930**	**680**	**1,050**
Total PCB Aroclors (U = 1/2)	--	**431**	**412**	**1,008**	**720**	**1,124**
PCB Aroclors (mg/kg-OC)						
Aroclor 1016	--	0.89 U	0.90 U	2.1 U	0.97 U	1.7 U
Aroclor 1221	--	0.89 U	0.90 U	2.1 U	0.97 U	1.7 U
Aroclor 1232	--	0.89 U	0.90 U	2.1 U	0.97 U	1.7 U
Aroclor 1242	--	0.89 U	0.90 U	2.1 U	0.97 U	1.7 U
Aroclor 1248	--	**5.8**	**5.2**	**19.3**	**8.7**	**18.3**
Aroclor 1254	--	**8.0**	**9.0**	**21.9**	**13.5**	**22.8**
Aroclor 1260	--	**3.6**	**3.5**	**8.6**	**10.6**	**6.8**
Total PCB Aroclors (U = 0)	12	**17.4**	**17.8**	**49.7**	**32.9**	**47.9**
Total PCB Aroclors (U = 1/2)	12	**19.2**	**19.6**	**53.9**	**34.8**	**51.3**

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-15	DSI-SB-16	DSI-SB-16	DSI-SB-17	DSI-SB-17
	Sample ID	DSI-SB-15-11.5-12.5	DSI-SB-16-5-6.5	DSI-SB-16-9.2-10.7	DSI-SB-17-5-6	DSI-SB-17-9.4-10.7
	Sample Date	3/15/2011	3/15/2011	3/15/2011	3/16/2011	3/16/2011
	Depth	11.5 to 12.5 feet	5 to 6.5 feet	9.2 to 10.7 feet	5 to 6 feet	9.4 to 10.7 feet
	Stratigraphic Unit	Recent	Recent	Recent	Recent	Recent
	SMS SQS					
Volatile Organics (µg/kg)						
1,1,1-Trichloroethane	--	--	--	--	--	--
1,1,2-Trichloroethane	--	--	--	--	--	--
1,1-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethene	--	--	--	--	--	--
1,2-Dichloroethane	--	--	--	--	--	--
1,3,5-Trimethylbenzene (Mesitylene)	--	--	--	--	--	--
Acetone	--	--	--	--	--	--
Benzene	--	--	--	--	--	--
Carbon tetrachloride (Tetrachloromethane)	--	--	--	--	--	--
Chlorobenzene	--	--	--	--	--	--
Chloroethane	--	--	--	--	--	--
Chloroform	--	--	--	--	--	--
Chloromethane	--	--	--	--	--	--
Dichloromethane (Methylene chloride)	--	--	--	--	--	--
Ethylbenzene		--	--	--	--	--
m,p-Xylene	--	--	--	--	--	--
o-Xylene	--	--	--	--	--	--
Styrene	--	--	--	--	--	--
Tetrachloroethene (PCE)	--	--	--	--	--	--
Toluene	--	--	--	--	--	--
Trichloroethene (TCE)	--	--	--	--	--	--
Vinyl chloride	--	--	--	--	--	--
Total Xylene (U = 0)	--	--	--	--	--	--
Total Xylene (U = 1/2)	--	--	--	--	--	--
Pesticides (µg/kg)						
4,4'-DDD (p,p'-DDD)	--	--	--	--	--	--
4,4'-DDE (p,p'-DDE)	--	--	--	--	--	--
4,4'-DDT (p,p'-DDT)	--	--	--	--	--	--
Aldrin	--	--	--	--	--	--
alpha-Chlordane (cis-Chlordane)	--	--	--	--	--	--
alpha-Hexachlorocyclohexane (BHC)	--	--	--	--	--	--
beta-Chlordane (trans-Chlordane)	--	--	--	--	--	--
beta-Hexachlorocyclohexane (BHC)	--	--	--	--	--	--
delta-Hexachlorocyclohexane (BHC)	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--
Endosulfan-alpha (I)	--	--	--	--	--	--
Endosulfan-beta (II)	--	--	--	--	--	--
Endrin	--	--	--	--	--	--
Endrin aldehyde	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--
gamma-Hexachlorocyclohexane (BHC) (Lindane)	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards [1]

Analytes	Location ID	DSI-SB-15	DSI-SB-16	DSI-SB-16	DSI-SB-17	DSI-SB-17
	Sample ID	DSI-SB-15-11.5-12.5	DSI-SB-16-5-6.5	DSI-SB-16-9.2-10.7	DSI-SB-17-5-6	DSI-SB-17-9.4-10.7
	Sample Date	3/15/2011	3/15/2011	3/15/2011	3/16/2011	3/16/2011
	Depth	11.5 to 12.5 feet	5 to 6.5 feet	9.2 to 10.7 feet	5 to 6 feet	9.4 to 10.7 feet
	Stratigraphic Unit	Recent	Recent	Recent	Recent	Recent
	SMS SQS					
Toxaphene	--	--	--	--	--	--
Total DDx (U = 0)	--	--	--	--	--	--
Total DDx (U = 1/2)	--	--	--	--	--	--
Dioxin Furans (ng/kg)						
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	--	--	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	--	--	--	--
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	--	--	--	--	--
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	--	--	--	--	--
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	--	--	--	--	--
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	--	--	--
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	--	--	--	--
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	--	--	--
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	--	--	--	--
Total Tetrachlorodibenzofuran (TCDF)	--	--	--	--	--	--
Total Pentachlorodibenzofuran (PeCDF)	--	--	--	--	--	--
Total Hexachlorodibenzofuran (HxCDF)	--	--	--	--	--	--
Total Heptachlorodibenzofuran (HpCDF)	--	--	--	--	--	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)	--	--	--	--	--	--
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)	--	--	--	--	--	--

Table 8

2011 Subsurface Sediment Investigation Analytical Results and Comparison with Washington Sediment Management Standards[1]

Notes:

1 = Subsurface sediment data include only Phase 1 RI data collected in March 2008; LDW subsurface data are not presented in Table 2.

2 = Percent fines calculated as percent material passing the 75 micron (#200) sieve.

3 = Chromium VI data are non-detect at all sample locations, and were rejected at select sample locations due to interference in the matrix spike.

4 = Miscellaneous extracable detections for benzyl alcohol and benzoic acid are observed throughout the Lower Duwamish Waterway site at concentrations that exceed SQS screening levels.

Definitions:

Detected concentration is greater than SMS SQS screening level

Bold = Detected result

J = Estimated value

U = Compound analyzed, but not detected above detection limit

UJ = Compound analyzed, but not detected above estimated detection limit

R = Rejected

µg/L = micrograms per liter

µg/kg = micrograms per kilogram

mg/L = milligrams per liter

mg/kg = milligrams per kilogram

ng/kg = nanograms per kilogram

OC = organic carbon

LAET = lowest apparent effects threshold

PCBs = polychlorinated biphenyls

PAHs = Polycyclic Aromatic Hydrocarbons

SMS = Sediment Management Standards

SQS = Sediment Quality Standards

Table 9
Supplemental RI Sampling Design

Station ID	Soil/Sediment Sampling Method	Target Soil/Sediment Sampling Interval(s)[1,2]	Convert to Monitoring Well	Groundwater Sampling Method	Groundwater Sampling/Well Screen Interval[1,3]	Soil/Sediment		Groundwater/Stormwater	
						Chemistry[4]	Physical[5]	Chemistry[4,6,7]	Field Parameters[7,9]
Soil and Groundwater - Rail Spur Area									
DSI-MW-01	--	--	--	Low Flow	4.6 - 14.5 ft bgs	--	--	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-02	Geoprobe	0 - 2 ft bgs 3 - 5 ft bgs 7 - 9 ft bgs 10 - 12 ft bgs	Yes, shallow	Low Flow	4.6 - 14.5 ft bgs	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-11	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, TPH, TBT	TS, TOC	--	--
DSIP2-12	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, TPH, TBT	TS, TOC	--	--
DSIP2-13	Geoprobe	see DSIP2-02	Yes, shallow	Low Flow	5 - 15 ft bgs	Metals, SVOCs, TPH, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-14	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, VOCs, TBT	TS, TOC	--	--
DSIP2-15	Geoprobe	see DSIP2-02	Yes, deep	Low Flow	18 - 28 ft bgs	Metals, SVOCs, VOCs, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-16	Geoprobe	see DSIP2-02	Yes, shallow	Low Flow	5 - 15 ft bgs	Metals, SVOCs, VOCs, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
Soil and Groundwater - Northwest Area									
DSI-MW-02	--	--	--	Low Flow	5.1 - 15 ft bgs	--	--	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-01	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT	TS, TOC	--	--
DSIP2-17	Geoprobe	see DSIP2-02	Yes, shallow	Low Flow	5 - 15 ft bgs	Metals, SVOCs, VOCs, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, TBT Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-18	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, TBT	TS, TOC	--	--
DSIP2-19	Geoprobe	see DSIP2-02	Yes, shallow	Low Flow	5 - 15 ft bgs	Metals, SVOCs, TPH, PCBs, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
Soil and Groundwater - Central Area									
DSI-MW-03	--	--	--	Low Flow	29.9 - 39.8 ft bgs	--	--	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSI-PZ-01	--	--	--	Low Flow	5 - 14.7 ft bgs	--	--	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-07	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, D/F, TBT	TS, TOC	--	--
DSIP2-20	Geoprobe	see DSIP2-02	Yes, shallow	Low Flow	5 - 15 ft bgs	Metals, SVOCs, VOCs, PCBs, TPH, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Conventionals, TBT	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-21	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, TBT	TS, TOC	--	--
DSIP2-22	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, TBT	TS, TOC	--	--
DSIP2-23	Geoprobe	see DSIP2-02	Yes, shallow	Low Flow	5 - 15 ft bgs	Metals, SVOCs, VOCs, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity

Table 9
Supplemental RI Sampling Design

Station ID	Soil/Sediment Sampling Method	Target Soil/Sediment Sampling Interval(s)[1,2]	Convert to Monitoring Well	Groundwater Sampling Method	Groundwater Sampling/Well Screen Interval[1,3]	Soil/Sediment Chemistry[4]	Soil/Sediment Physical[5]	Groundwater/Stormwater Chemistry[4,6,7]	Groundwater/Stormwater Field Parameters[7,9]
DSIP2-24	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, VOCs, TPH, TBT	TS, TOC	--	--
DSIP2-25	Geoprobe	see DSIP2-02	Yes, shallow	Low Flow	5 - 15 ft bgs	Metals, SVOCs, VOCs, TPH, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, TPH, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-26	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, VOCs, TPH, TBT	TS, TOC	--	--
DSIP2-30	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, VOCs, TPH, TBT	TS, TOC	--	--
Soil and Groundwater - 2000 UST Removal Area									
DSI-MW-04	--	--	--	Low Flow	4.6 - 14.25 ft bgs	--	--	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-06	Geoprobe	see DSIP2-02	Yes, shallow	Low Flow	5 - 15 ft bgs	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, TPH, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-27	Geoprobe	see DSIP2-02	Yes, shallow	Low Flow	5 - 15 ft bgs	Metals, SVOCs, VOCs, TPH, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, TPH, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-31	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, VOCs, TPH, TBT	TS, TOC	--	--
Soil and Groundwater - Former Shipyard Nearshore Area									
DSI-MW-05	--	--	--	Low Flow	5.5 - 15.2 ft bgs	--	--	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSI-MW-06	--	--	--	Low Flow	5.4 - 15.1 ft bgs	--	--	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSI-MW-07	--	--	--	Low Flow	30.4 - 40 ft bgs	--	--	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSI-MW-08	--	--	--	Low Flow	5.4 - 15.1 ft bgs	--	--	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-08	Geoprobe	see DSIP2-02	Yes, deep	Low Flow	18 - 28 ft bgs	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, D/F, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, TPH, CrVI, TBT, D/F, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-09	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT, D/F	TS, TOC	--	--
DSIP2-28	Geoprobe	see DSIP2-02	Yes, shallow	Low Flow	5 - 15 ft bgs	Metals, SVOCs, VOCs, TPH, CrVI, TBT, D/F	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, TPH, CrVI, TBT, D/F, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
Soil and Groundwater - Parcel D Nearshore Area									
DSI-MW-09	--	--	--	Low Flow	5.5 - 15.3 ft bgs	--	--	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity

Table 9
Supplemental RI Sampling Design

Station ID	Soil/Sediment Sampling Method	Target Soil/Sediment Sampling Interval(s)[1,2]	Convert to Monitoring Well	Groundwater Sampling Method	Groundwater Sampling/Well Screen Interval[1,3]	Soil/Sediment		Groundwater/Stormwater	
						Chemistry[4]	Physical[5]	Chemistry[4,6,7]	Field Parameters[7,9]
DSI-MW-10	--	--	--	Low Flow	30.9 - 50.7 ft bgs	--	--	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-10	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT, D/F	TS, TOC	--	--
DSIP2-29	Geoprobe	see DSIP2-02	Yes, shallow	Low Flow	5 - 15 ft bgs	Metals, SVOCs, VOCs, TPH, CrVI, D/F, TBT	TS, TOC	Total & Dissolved Metals, SVOCs, VOCs, TPH, CrVI, D/F, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity
Soil - South Property Area									
DSIP2-03	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT	TS, TOC	--	--
DSIP2-04	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT	TS, TOC	--	--
DSIP2-05	Geoprobe	see DSIP2-02	No	--	--	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT	TS, TOC	--	--
Stormwater and Catch Basin Solids									
DSIP2-STW-01	--	--	--	Grab	Within 1 ft of water surface	--	--	Total and Dissolved Metals, SVOCs, VOCs, PCBs, CrVI, TPH, D/F, TBT	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-CB-01	Grab	Composite of accumulated sediment thickness	--	--	--	Metals, SVOCs, VOCs, PCBs, CrVI, TPH, D/F, TBT	TS, TOC, GS	--	--
Septic Tank/UST Soils									
DSIP2-ST-01	Test Pit	Beneath tank valve/outlet	--	--	--	Metals, SVOCs, VOCs, PCBs, CrVI, TPH, TBT	TS, TOC	--	--
Seeps									
DSIP2-SP-01	--	--	--	Grab	Point of discharge	--	--	Total & Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, TDS, TSS	Salinity, DO, Temp, pH, ORP, Cond, Turbidity
Surface Sediment - Former Marine Railway Area									
DSIMR-SS-01	Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIMR-SS-02	Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIMR-SS-03	Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIMR-SS-04	Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--

Table 9
Supplemental RI Sampling Design

Station ID	Soil/Sediment Sampling Method	Target Soil/Sediment Sampling Interval(s)[1,2]	Convert to Monitoring Well	Groundwater Sampling Method	Groundwater Sampling/Well Screen Interval[1,3]	Soil/Sediment Chemistry[4]	Soil/Sediment Physical[5]	Groundwater/Stormwater Chemistry[4,6,7]	Groundwater/Stormwater Field Parameters[7,9]
DSIMR-SS-05	Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
Subsurface Sediment - Former Marine Railway Area									
DSIMR-SB-01	Hand Core	Every 2 ft below the mudline to the depth practicable	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIMR-SB-02	Hand Core	Every 2 ft below the mudline to the depth practicable	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIMR-SB-03	Hand Core	Every 2 ft below the mudline to the depth practicable	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIMR-SB-05	Hand Core	Every 2 ft below the mudline to the depth practicable	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
Surface Sediment - LDW									
DSIP2-SS-01	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SS-02	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SS-03	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SS-04	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SS-05	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SS-06	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SS-07	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SS-08	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--

Table 9
Supplemental RI Sampling Design

Station ID	Soil/Sediment Sampling Method	Target Soil/Sediment Sampling Interval(s)[1,2]	Convert to Monitoring Well	Groundwater Sampling Method	Groundwater Sampling/Well Screen Interval[1,3]	Soil/Sediment		Groundwater/Stormwater	
						Chemistry[4]	Physical[5]	Chemistry[4,6,7]	Field Parameters[7,9]
DSIP2-SS-09	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SS-10	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SS-11	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SS-12	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SS-13	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SS-14	Van Veen Grab	0 to 10 cm below mudline	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
Subsurface Sediment - LDW									
DSIP2-SB-01	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SB-02	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SB-03	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SB-04	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SB-05	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SB-06	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SB-07	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SB-08	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--

Table 9
Supplemental RI Sampling Design

Station ID	Soil/Sediment Sampling Method	Target Soil/Sediment Sampling Interval(s)[1,2]	Convert to Monitoring Well	Groundwater Sampling Method	Groundwater Sampling/Well Screen Interval[1,3]	Soil/Sediment		Groundwater/Stormwater	
						Chemistry[4]	Physical[5]	Chemistry[4,6,7]	Field Parameters[7,9]
DSIP2-SB-09	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SB-10	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SB-11	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SB-12	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SB-13	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--
DSIP2-SB-14	Vibracore	Sampling at 2 ft intervals based on lithology	--	--	--	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	--	--

Notes:
1 ft = feet; bgs = below ground surface; cm = centimeters;
2 Soil and subsurface sediment sample depths are approximate; exact sample intervals will be based on lithologic units encountered during sampling.
3 For all new groundwater monitoring wells, final screen intervals will be determined in the field based on lithologic units encountered during well installation/soil sampling.
4 Chemical testing: TPH = Total Petroleum Hydrocarbons (Gasoline, Diesel, and Oil Range), SVOCs = Semi-Volatile Organic Compounds, VOCs = Volatile Organic Compounds, CrVI = Hexavalent Chromium, D/F = Dioxins/Furans
Metals = 13 Priority Pollutant Metals [antimony (Sb), arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), selenium (Se), silver (Ag), thallium (Tl), zinc (Zn)] and barium (Ba),
SMS Metals = As, Cd, Cr, Cu, Pb, Hg, Ag, Zn, PCBs = Polychlorinated Biphenyl Aroclors, TBT = tributyltin
5 Physical testing: TS = Total Solids, TOC = Total Organic Carbon, GS = Grain Size, TVS = Total Volatile Solids, MC = Moisture Content
6 Conventionals = Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Alkalinity, Ammonia, Dissolved sulfide (H2S), Chloride, Sulfate, Nitrate
7 Samples for dissolved metals analysis will be field filtered
8 Field Parameters: DO = Dissolved Oxygen, Temp = Temperature, ORP = Oxidation Reduction Potential, Cond = Conductivity
9 Field screening for all samples will include sheen testing and organic vapor evaluation using a PID.

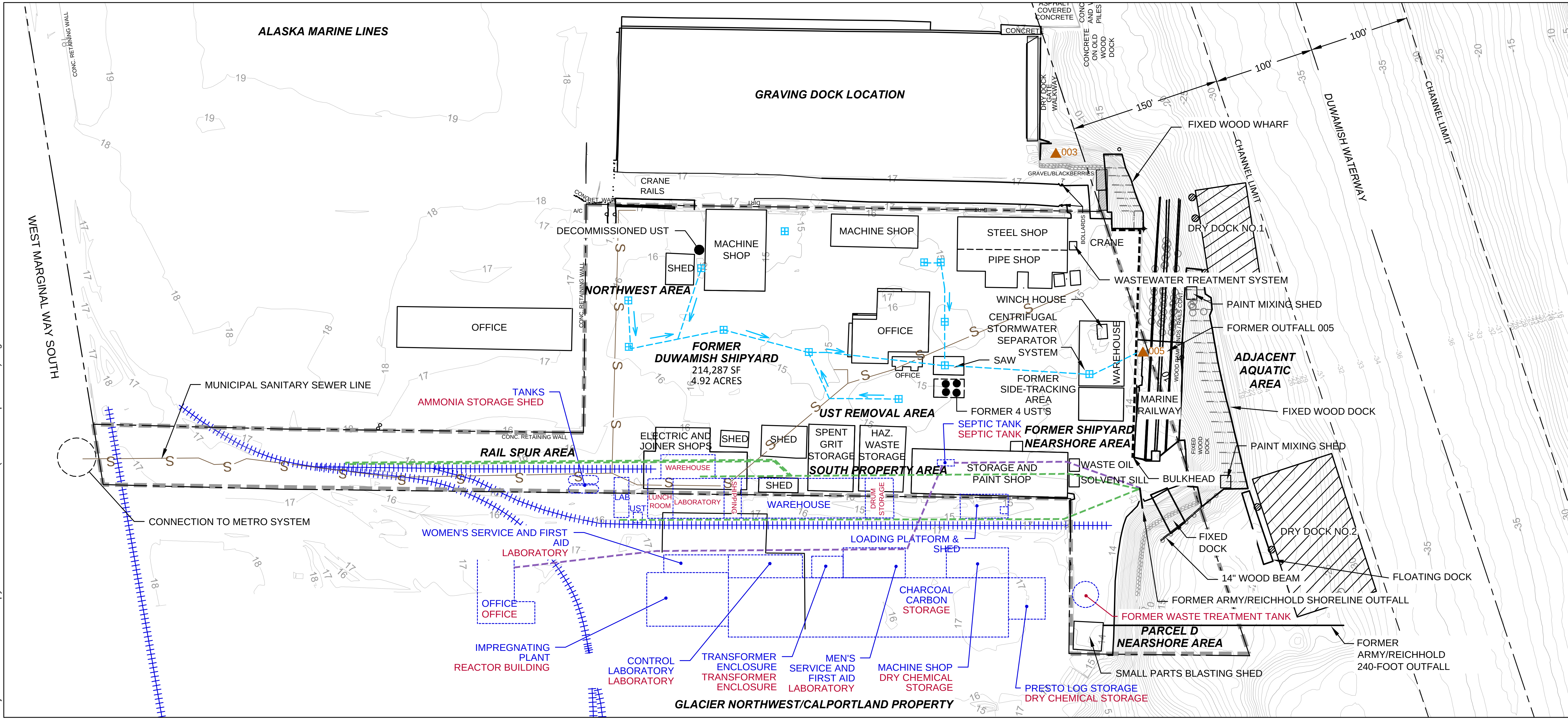
FIGURES

AERIAL SOURCE: Google Earth Pro, 2012.

Mar 11, 2013 2:21pm heriksen K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-000 (Vmap).dwg F1

ANCHOR QEA

Figure 1
Site Vicinity Map
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



SURVEY SOURCE: Bathymetric survey by Blue Water, 10/2006. Topographic survey by APS Survey and Mapping, LLC. Underdock survey by AML and DSI, 12/2006.

HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

NOTE: Rail lines (as shown) represent historic conditions. Current rail line alignment is located as shown on Figure 4.

LEGEND:

- Former Stormwater Line
- Municipal Sanitary Sewer
- Top of Bank
- Subject Property Boundary
- NPDES Outfall
- Topographic and Bathymetric Contours in Feet (MLLW)
- Former Catch Basin Location
- Former Army/Reichhold Septic System
- Former Army/Reichhold Surface Drainage
- OFFICE Former Army Operations
- OFFICE Former Reichhold Operational Uses
- Former Army/Reichhold Buildings
- Former Army/Reichhold Rail Line Configuration

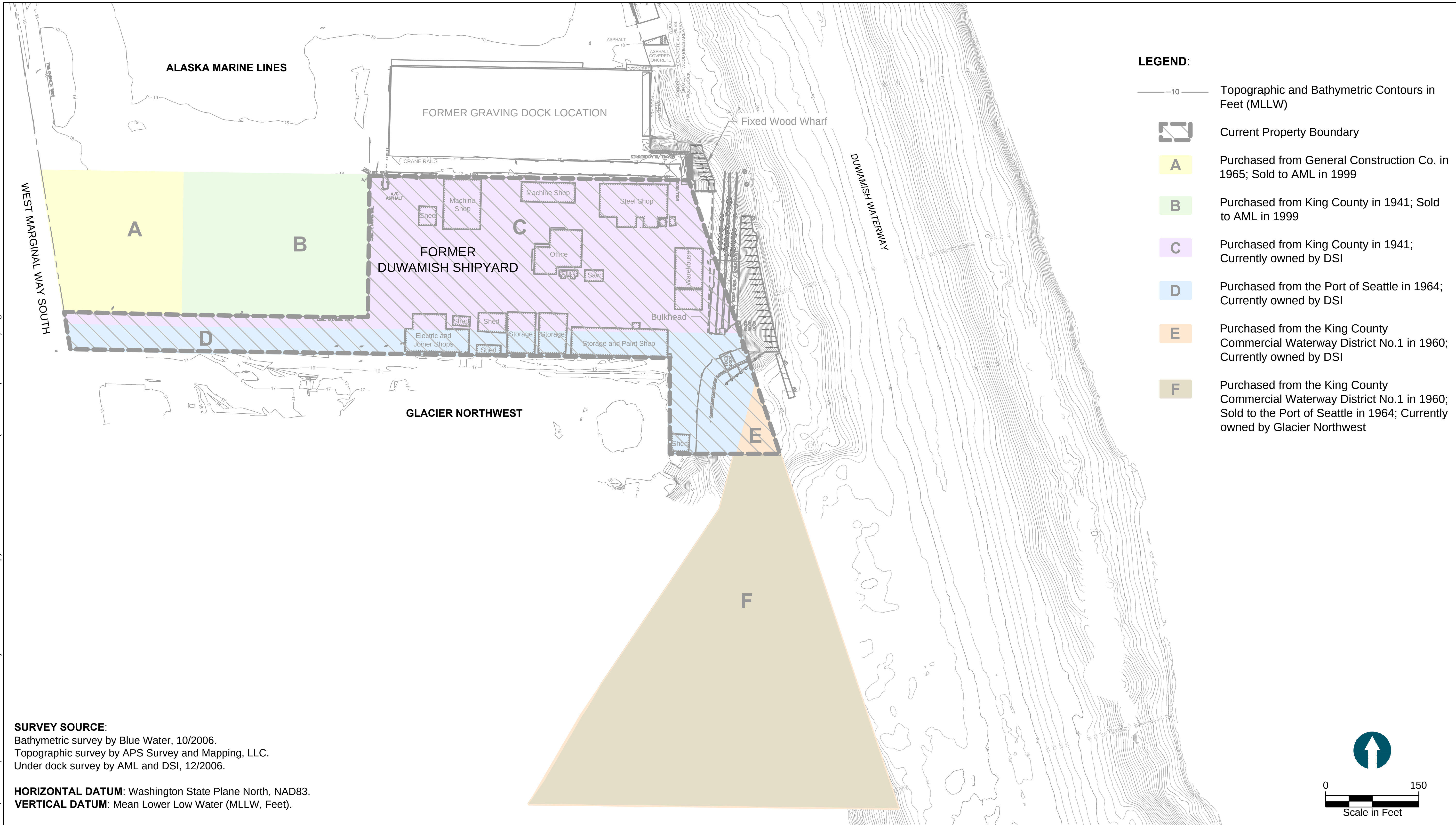
0 100
Scale in Feet

K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-011 (Historical Prop Features).dwg F2

Mar 11, 2013 11:53am heriksen

ANCHOR QEA

Figure 2
Historical Property and Operational Features
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



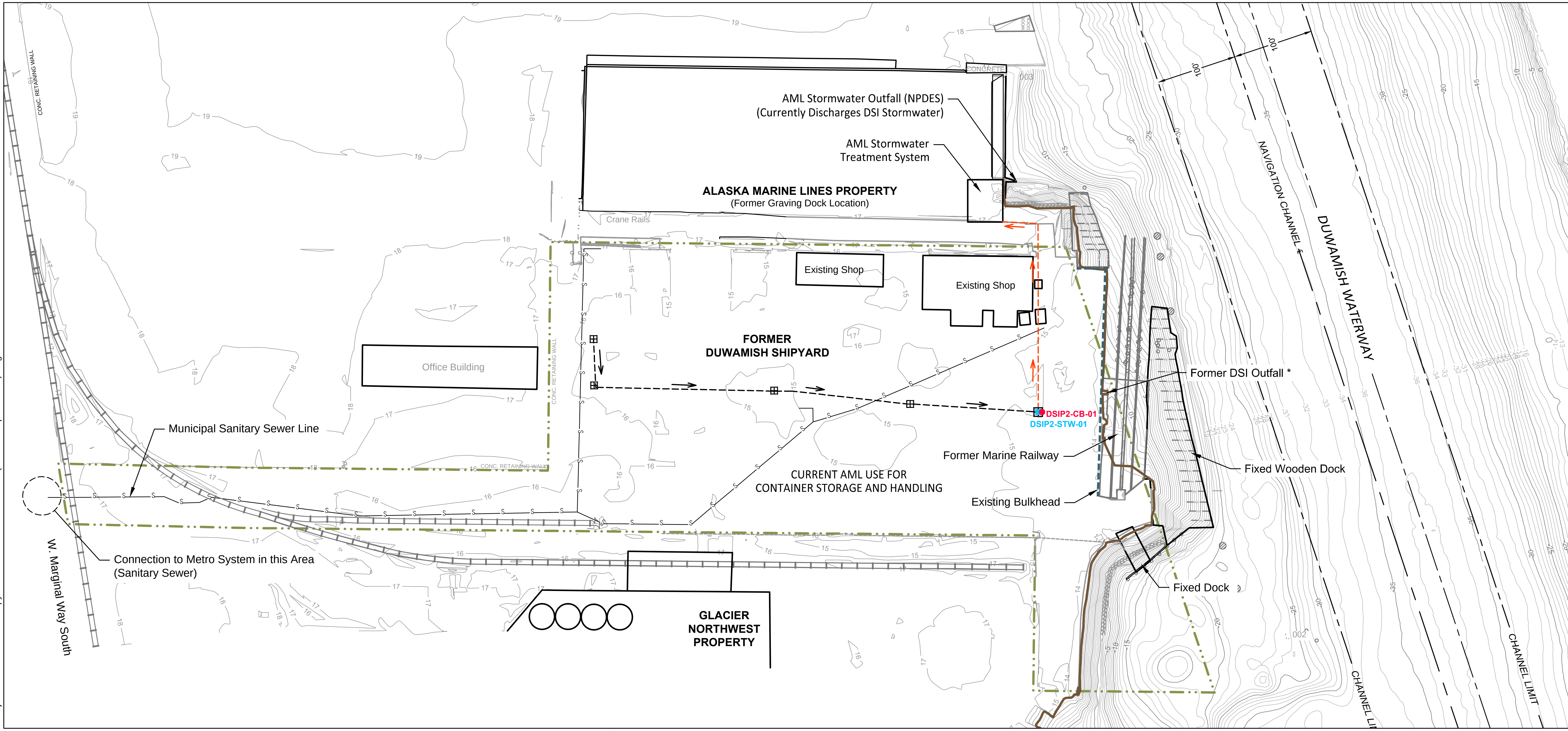
SURVEY SOURCE:
Bathymetric survey by Blue Water, 10/2006.
Topographic survey by APS Survey and Mapping, LLC.
Under dock survey by AML and DSI, 12/2006.

HORIZONTAL DATUM: Washington State Plane North, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW, Feet).

Mar 11, 2013 2:23pm heriksen K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-012 (Historical Prop Boundaries).dwg F3

ANCHOR QEA

Figure 3
Historical Property Boundaries
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



LEGEND:

- Existing Stormwater Line
- DSI Overland Stormwater Route to AML Treatment System
- Municipal Sanitary Sewer Line
- Top of Bank (Approximate)
- Current Property Boundary
- Existing Bulkhead
- Current Rail Alignment
- Topographic and Bathymetric Contours in Feet (MLLW)
- Catch Basin Location
- DSIP2-CB-01 Proposed Stormwater Sampling Location
- DSIP2-STW-01 Proposed Catch Basin Solids Sampling Location

SURVEY SOURCE: Bathymetric survey by Blue Water, 10/2006. Topographic survey by APS Survey and Mapping, LLC. Underdock survey by AML and DSI, 12/2006.

HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

NOTE:
* DSI stormwater is currently routed to existing AML treatment system prior to discharge at AML outfall.

0 100
Scale in Feet

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Mar 11, 2013 2:21pm heriksen

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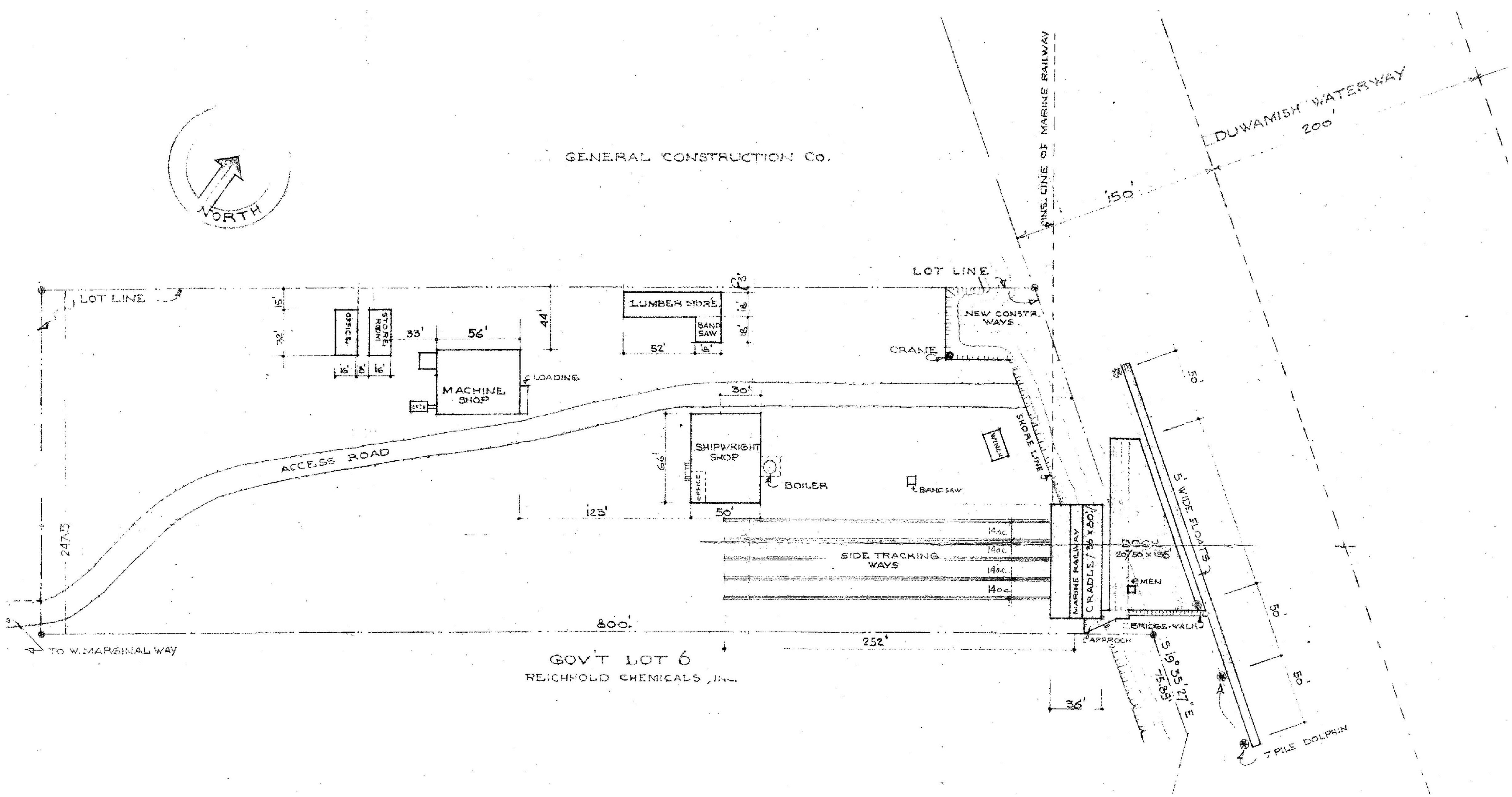
Figure 4
Current Property Features and Proposed Catch Basin Sampling Locations
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.

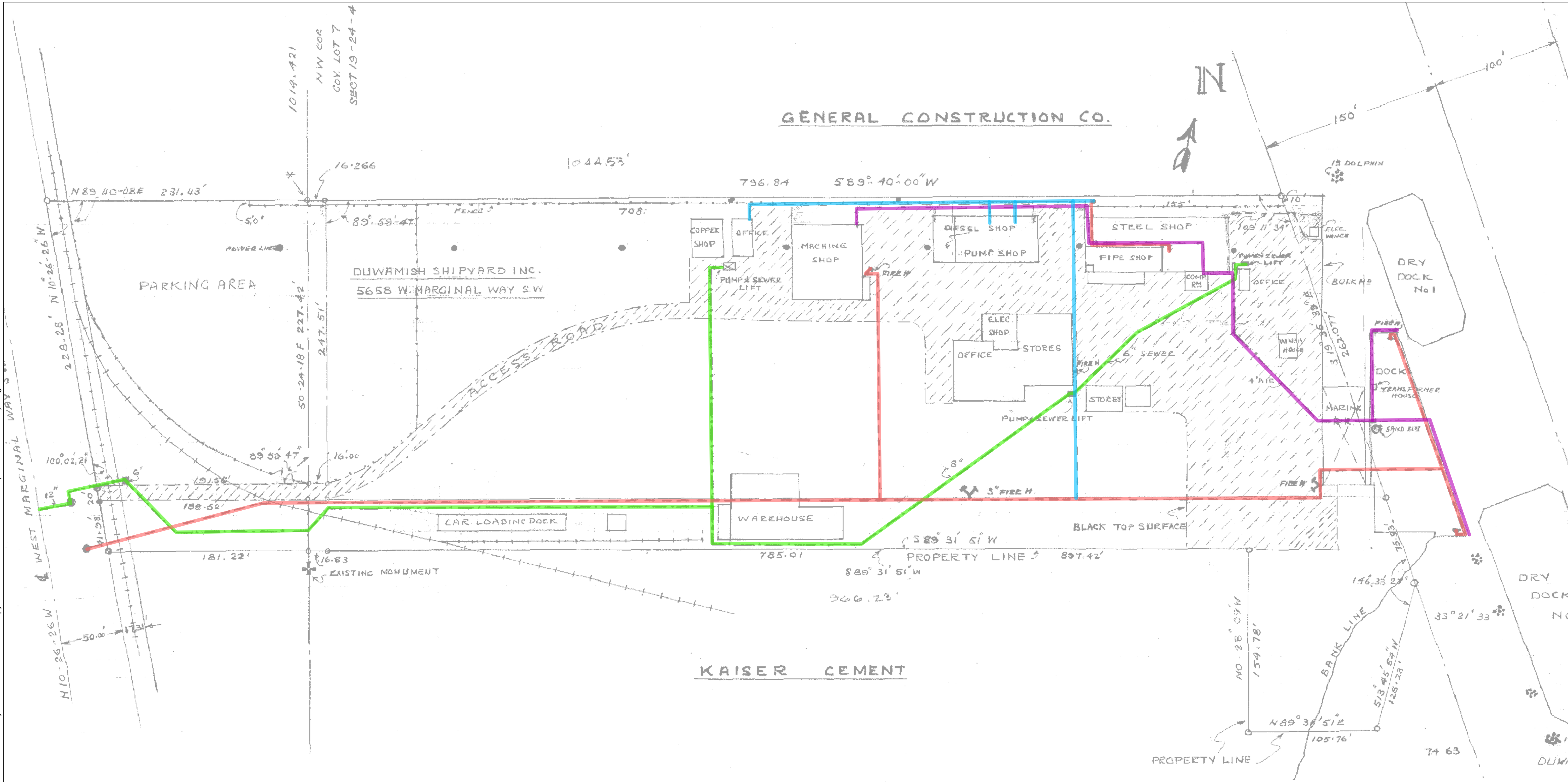


NOTES:
1. Preparation assistance provided by Anchor Environmental, L.L.C.
2. Original drawing prepared by DSI, June 15, 1977.

0 80
Approximate Scale in Feet

Feb 26, 2013 12:00pm heriksen K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-002 (Site1941-1960s).dwg F5a

Figure 5a
Site Layout (1941 - Mid 1960s)
Supplemental Remedial Investigation Work Plan
Duwamish Shipyards, Inc.



LEGEND:

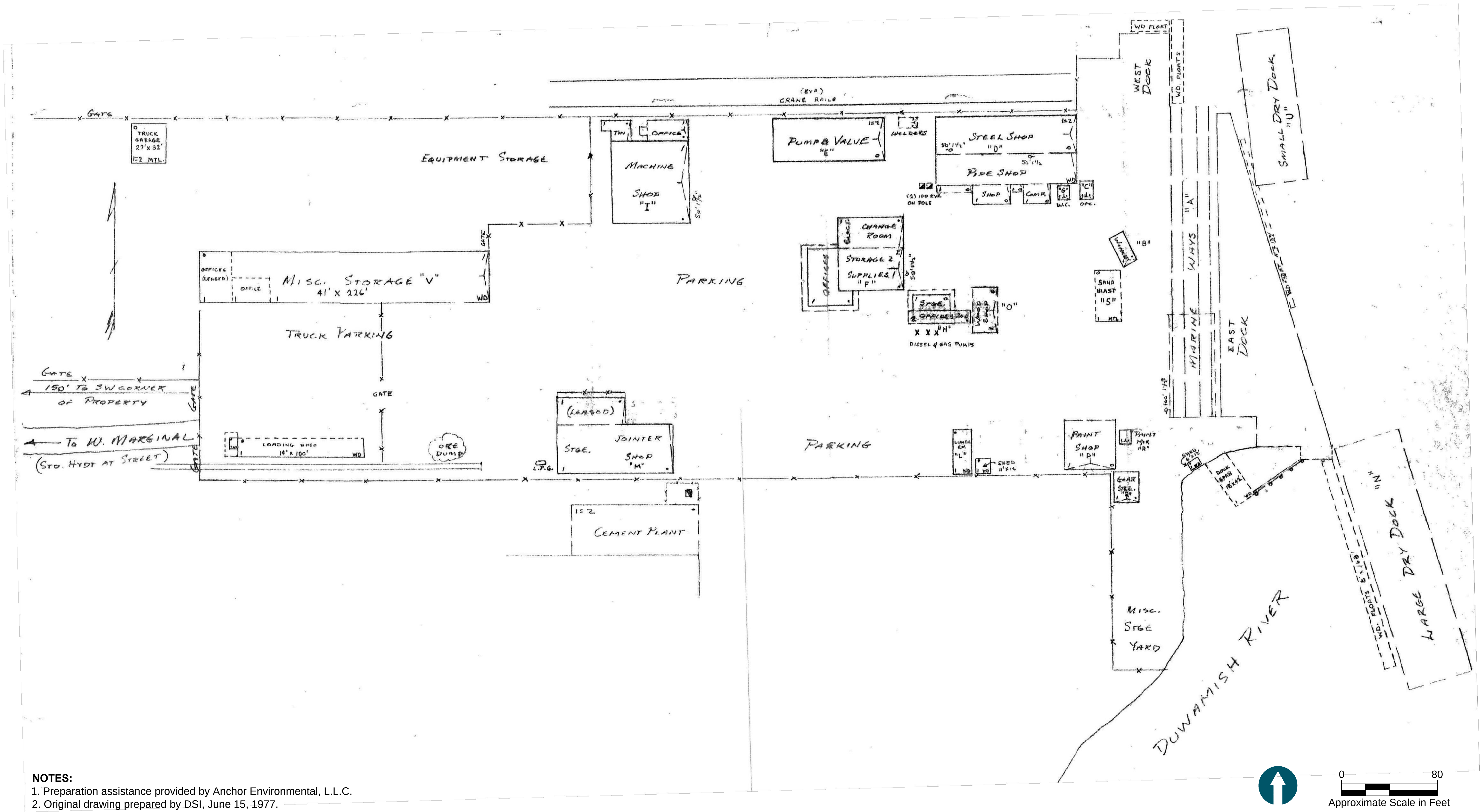
- Air Line
- Fire
- Water Pipe
- Sewer

0 80
Approximate Scale in Feet

NOTES:
1. Preparation assistance provided by Anchor Environmental, L.L.C.
2. Original drawing prepared by DSI, January 24, 1973.

ANCHOR QEA

Figure 5b
Site Layout (Mid 1960s - Mid 1970s)
Supplemental Remedial Investigation Work Plan
Duwamish Shipyards, Inc.

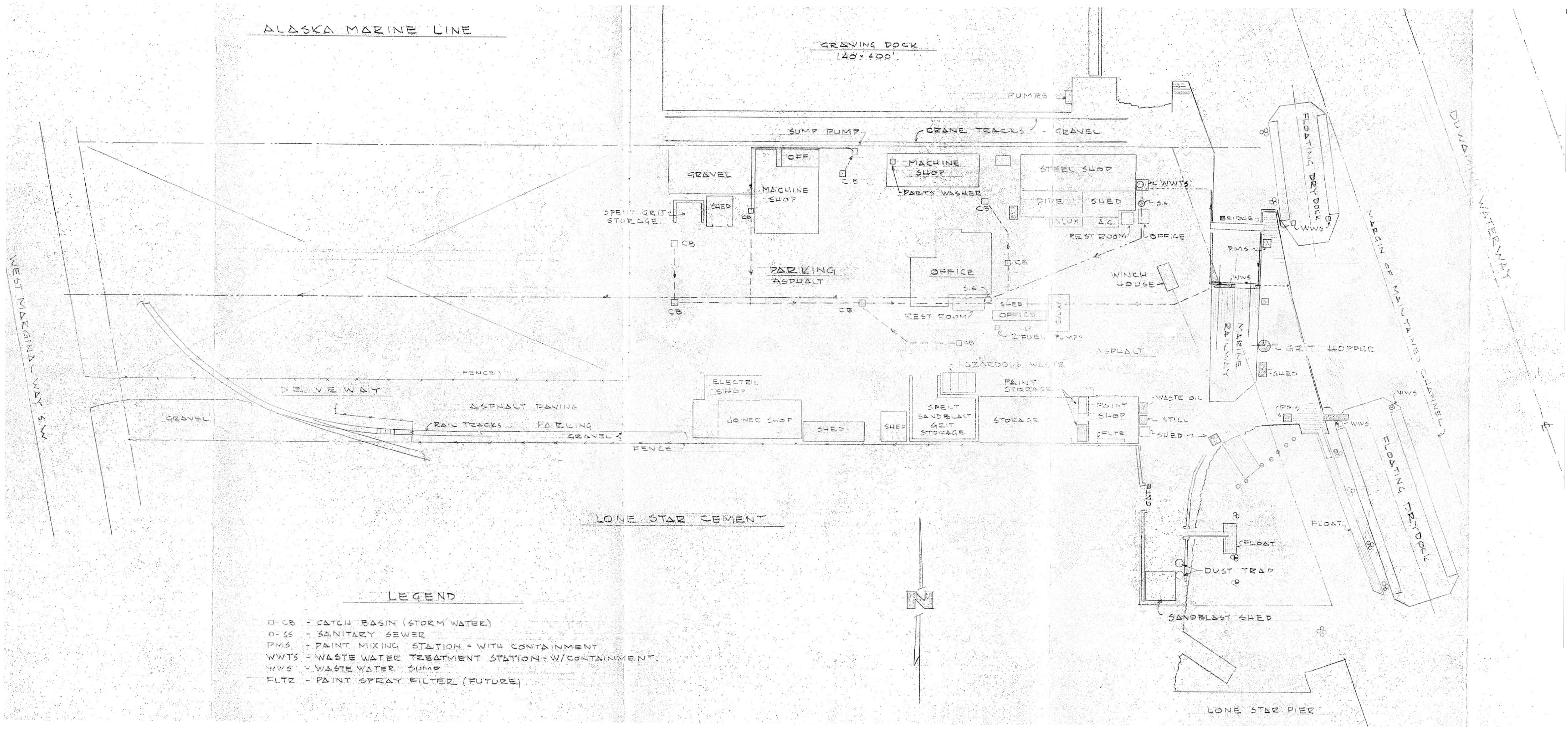


NOTES:
1. Preparation assistance provided by Anchor Environmental, L.L.C.
2. Original drawing prepared by DSI, June 15, 1977.

Feb 26, 2013 12:07pm heriksen K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-004 (Site1970s-1990s).dwg F5c

ANCHOR QEA

Figure 5c
Site Layout (Mid 1970s - Early 1990s)
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



NOTES:

1. Preparation assistance provided by Anchor Environmental, L.L.C.
2. Original drawing prepared by DSI, November 12, 1993.

Figure 5d
Site Layout (Early 1990s - Mid 2000s)
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.

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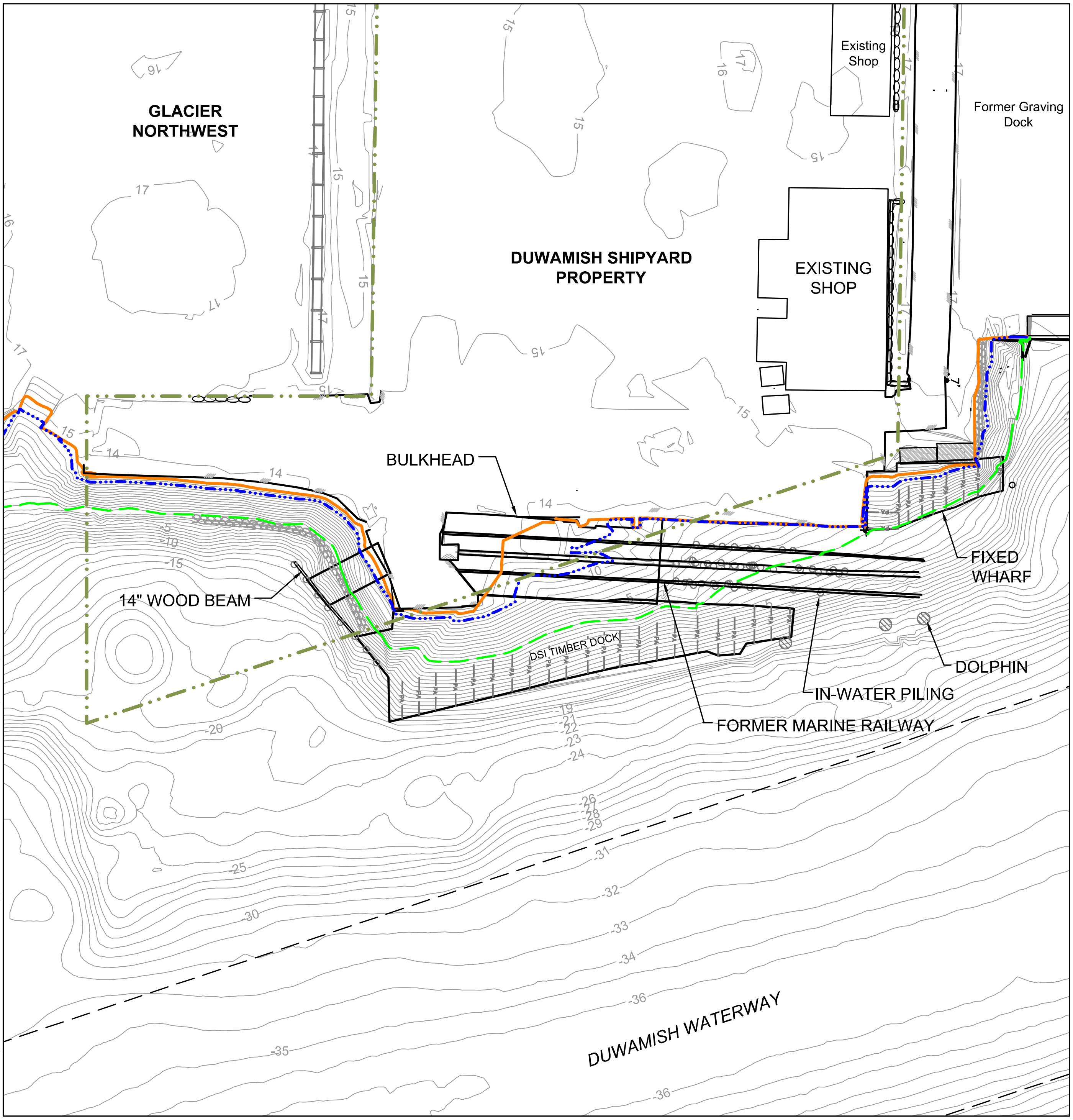


K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-013 (Existing Top of Bank).dwg F6

Mar 11, 2013 11:54am heriksen

SURVEY SOURCE:
Bathymetric survey by Blue Water, 10/2006.
Topographic survey by APS Survey and Mapping, LLC.
Underdock survey by AML and DSI, 12/2006.

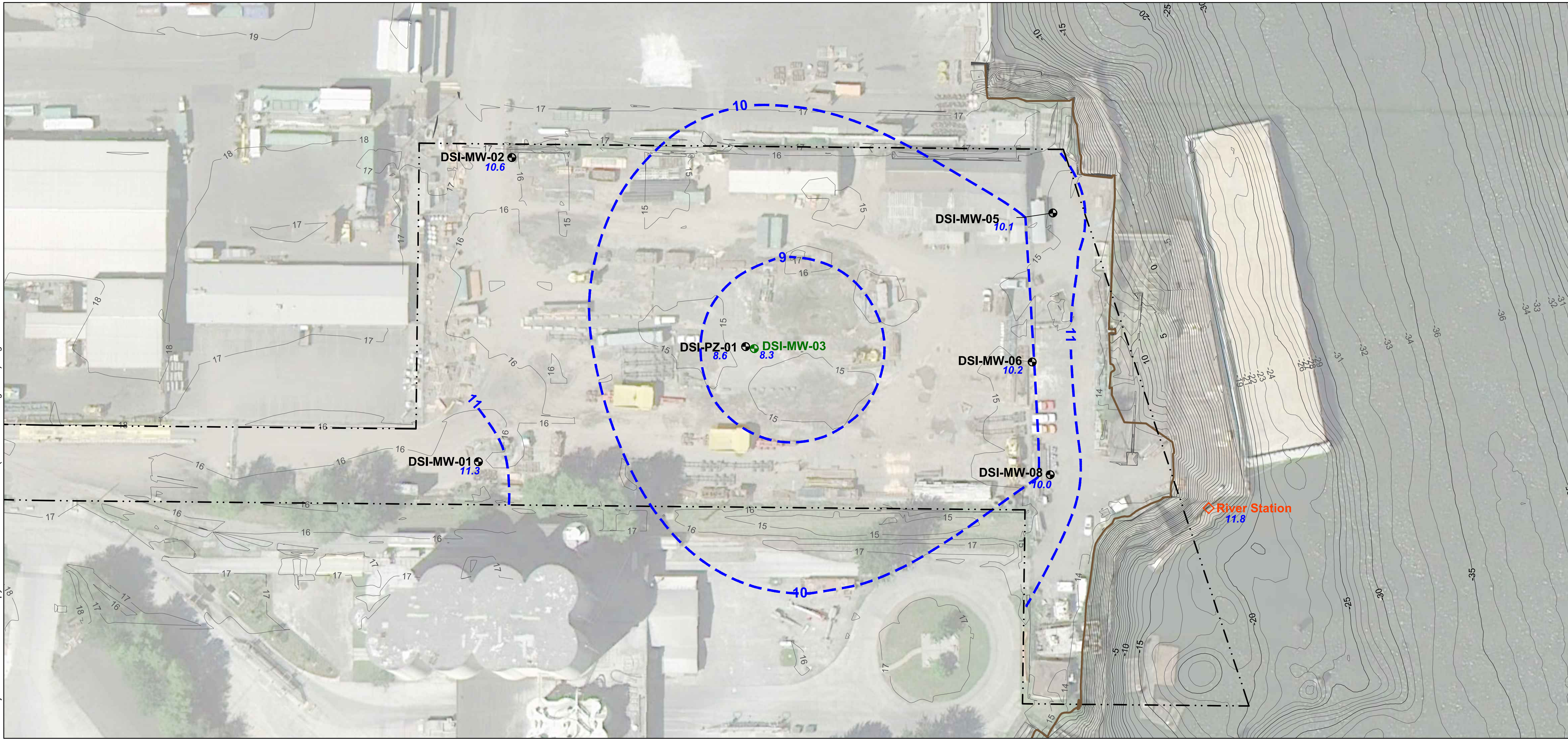
HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:
- Top of Bank (Approximate)
- Mean Higher High Water (MHHW)
- Mean Lower Low Water (MLLW)
- Current Property Boundary
- Current Rail Alignment

0 80
Scale in Feet

Figure 6
Existing Top of Bank with Structures
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.

ANCHOR QEA



Mar 11, 2013 11:58am heriksen

LEGEND:

Top of Bank (Approximate)

Current Property Boundary

Topographic and Bathymetric Contours in Feet (MLLW)

Groundwater Contour (1-foot interval, see Note 1)

2009 UPLAND RI LOCATIONS

DSI-MW-01 Monitoring Well/Piezometer

DSI-MW-03 Deep Monitoring Well

River Station Hydrogeologic Transducer

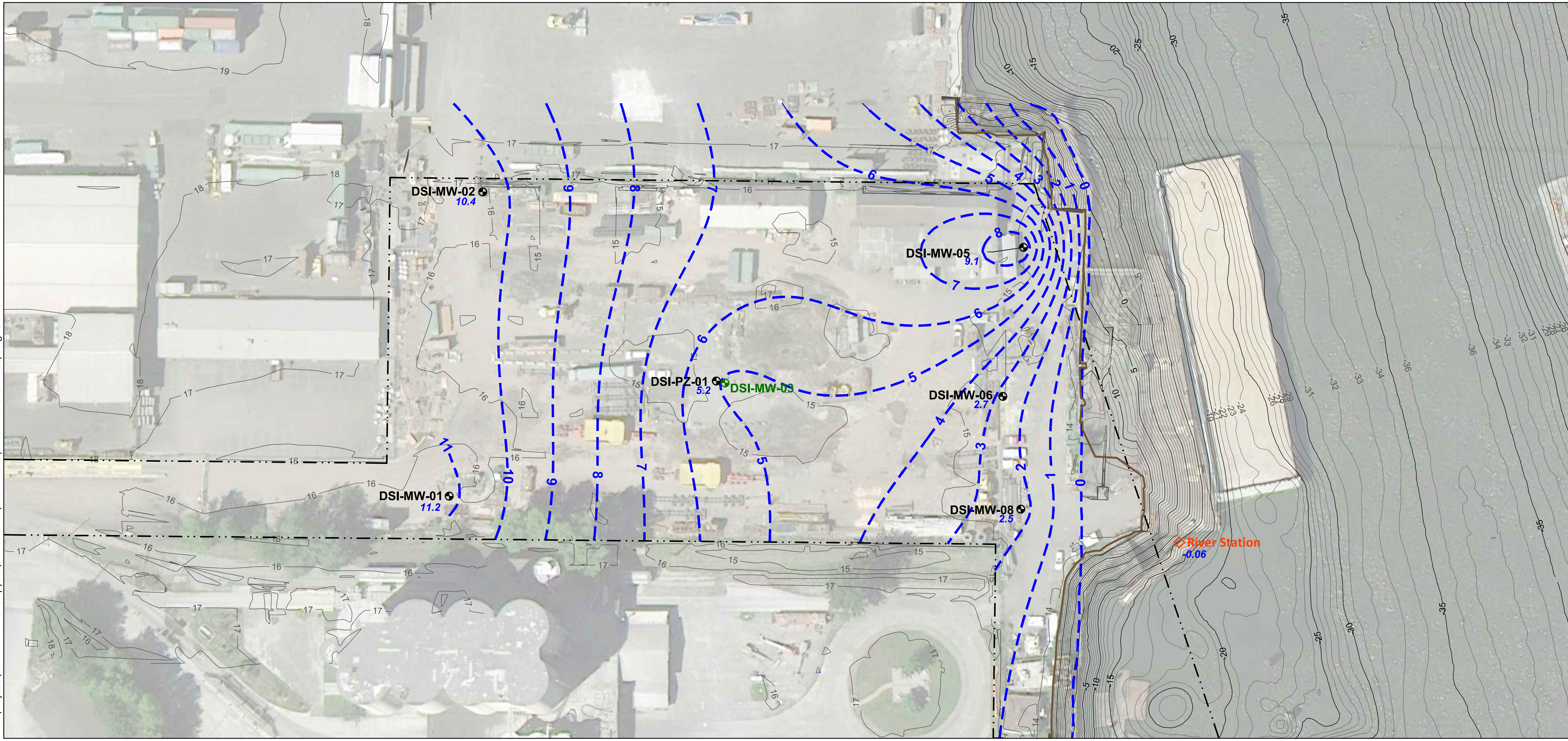
AERIAL SOURCE: Google Earth Pro, 2010.
SURVEY SOURCE: Bathymetric survey by Blue Water, 10/2006. Topographic survey by APS Survey and Mapping, LLC. Underdock survey by AML and DSI, 12/2006.
HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).
NOTES:

1. Groundwater elevation from high-high tide event on August 6, 2009 at 6:45pm.
2. Wells only presented for those included in transducer study.

0 80
Scale in Feet

ANCHOR QEA

Figure 7
Groundwater Contours - High High Tide
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-010 (GWContours Low Tide).dwg F8

Mar 11, 2013 12:00pm heriksen

LEGEND:

- Top of Bank (Approximate)
- Current Property Boundary
- Topographic and Bathymetric Contours in Feet (MLLW)
- 10 Groundwater Contour (1-foot interval, Note 1)

2009 UPLAND RI LOCATIONS

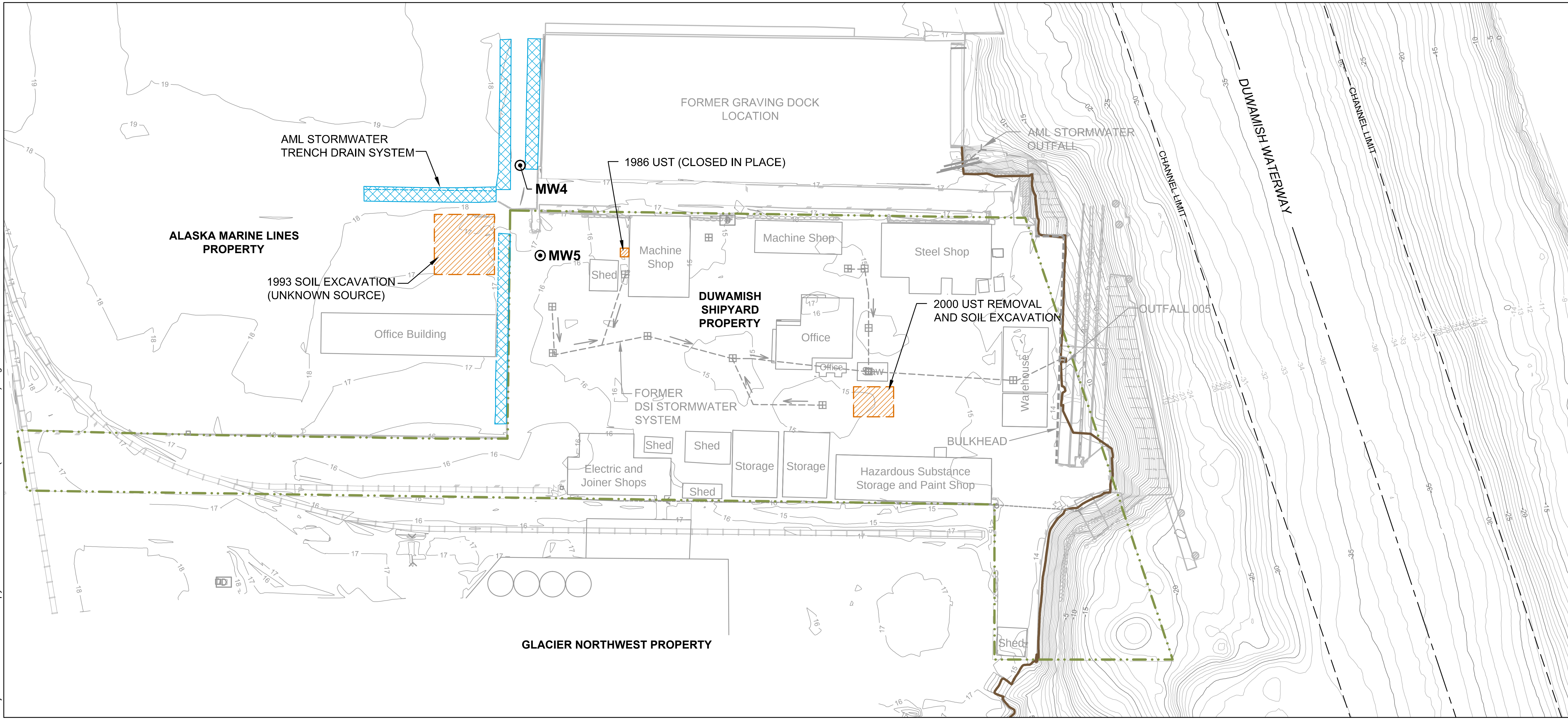
- DSI-MW-01 Monitoring Well/Piezometer
- DSI-MW-03 Deep Monitoring Well
- River Station Hydrogeologic Transducer

AERIAL SOURCE: Google Earth Pro, 2010.
SURVEY SOURCE: Bathymetric survey by Blue Water, 10/2006. Topographic survey by APS Survey and Mapping, LLC. Underdock survey by AML and DSI, 12/2006.
HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).
NOTES:
1. Groundwater elevation from high-high tide event on August 7, 2009 at 12:20pm.
2. Wells only presented for those included in transducer study.

0 80
Scale in Feet

ANCHOR QEA

Figure 8
Groundwater Contours - Low Low Tide
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



SURVEY SOURCE:
Bathymetric survey by Blue Water, 10/2006.
Topographic survey by APS Survey and Mapping, LLC.
Underdock survey by AML and DSI, 12/2006.

HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

NOTE:
Building locations shown on this figure represent historic conditions at the DSI property.

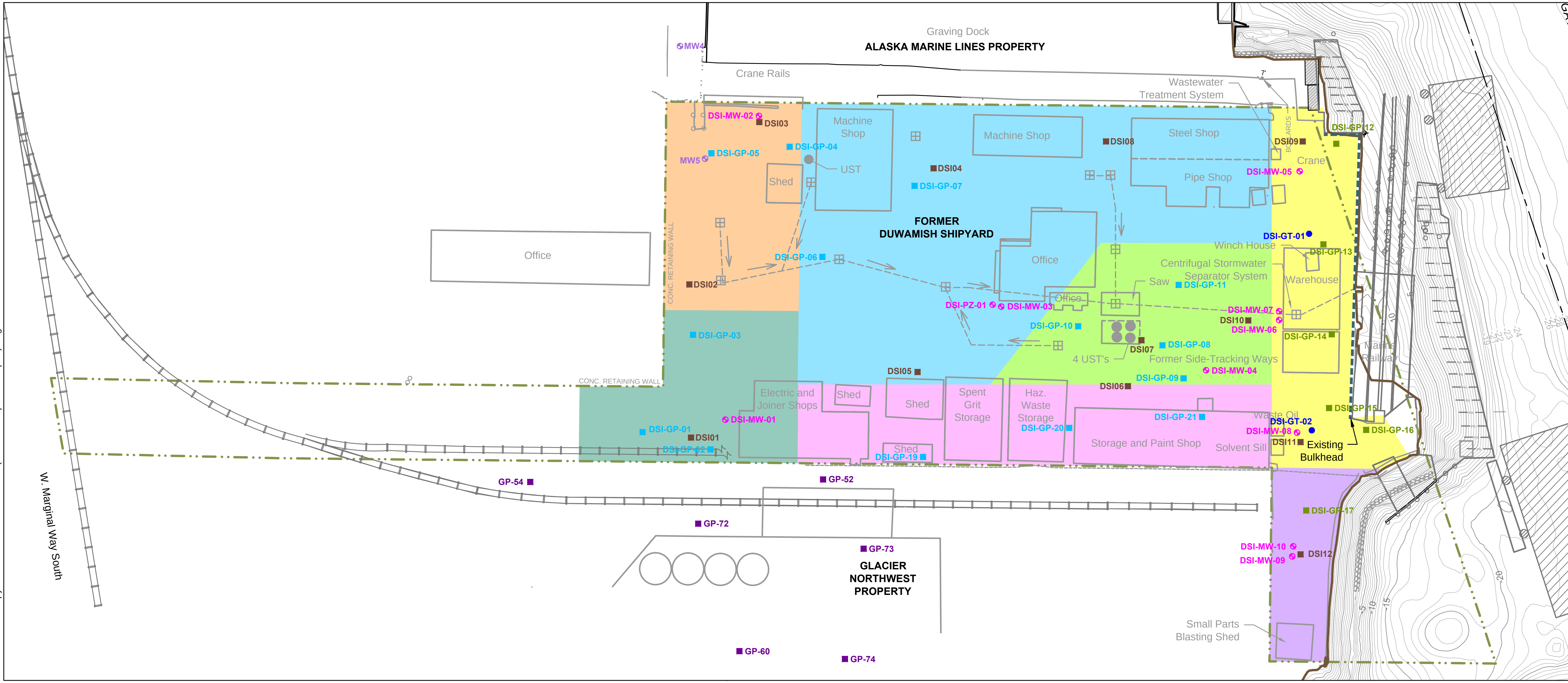
LEGEND:

- Former Stormwater Line and Direction of Flow
- Top of Bank (Approximate)
- Current Property Boundary
- Topographic and Bathymetric Contours in Feet (MLLW)
- Former Catch Basin Location
- Independent Remedial Action Areas
- Trench Drain
- Current Rail Alignment
- MW4 Monitoring Well (Installed as part of 1993 Independent Remedial Action)

0 100
Scale in Feet

ANCHOR QEA

Figure 9
Independent Remedial Action Areas
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



LEGEND:

- Top of Bank (Approximate)
- Current Property Boundary
- Current Rail Alignment
- 15 Topographic and Bathymetric Contours in Feet (MLLW)

- Northwestern Area
- Rail Spur Area
- Central Area
- South Property Area
- UST Removal Area
- Former Shipyard Nearshore Area
- Parcel D Nearshore Area

2006 RI SAMPLING LOCATIONS

- MW5 Monitoring Well
- DSI09 Geoprobe Soil Boring

2009 UPLAND RI LOCATIONS

- DSI-MW-07 Monitoring Well/Piezometer
- DSI-GP-05 Geoprobe - Soil and Groundwater
- DSI-GP-13 Geoprobe - Soil Only
- DSI-GT-01 Geotechnical Boring

SURVEY SOURCE: Bathymetric survey by Blue Water, 10/2006. Topographic survey by APS Survey and Mapping, LLC.
Underdock survey by AML and DSI, 12/2006.

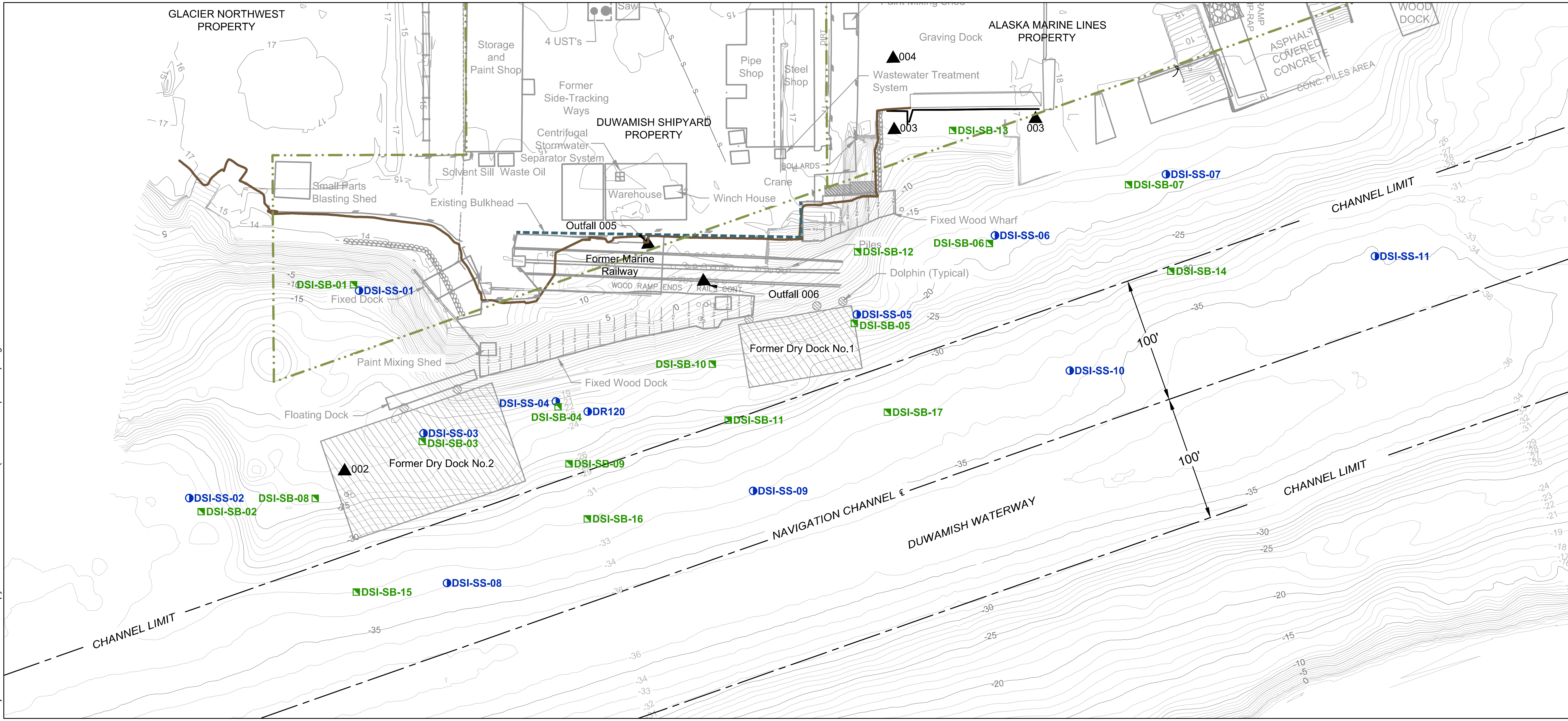
HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

NOTE: Building locations shown on this figure represent historic conditions at the DSI property.

0 80
Scale in Feet

Mar 11, 2013 12:15pm heriksen K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-015 (2006-2009 Upland Samples).dwg F10a

Figure 10a
2006 and 2009 Upland Sampling Locations
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-016 (2011 Sed Sample Locs).dwg F10b

Mar 11, 2013 12:22pm heriksen

LEGEND:

- Existing Bulkhead
- Top of Bank (Approximate)
- Current Property Boundary
- Former NPDES Outfall
- Topographic and Bathymetric Contours in Feet (MLLW)
- Former Catch Basin Location

2011 RI SAMPLING LOCATIONS

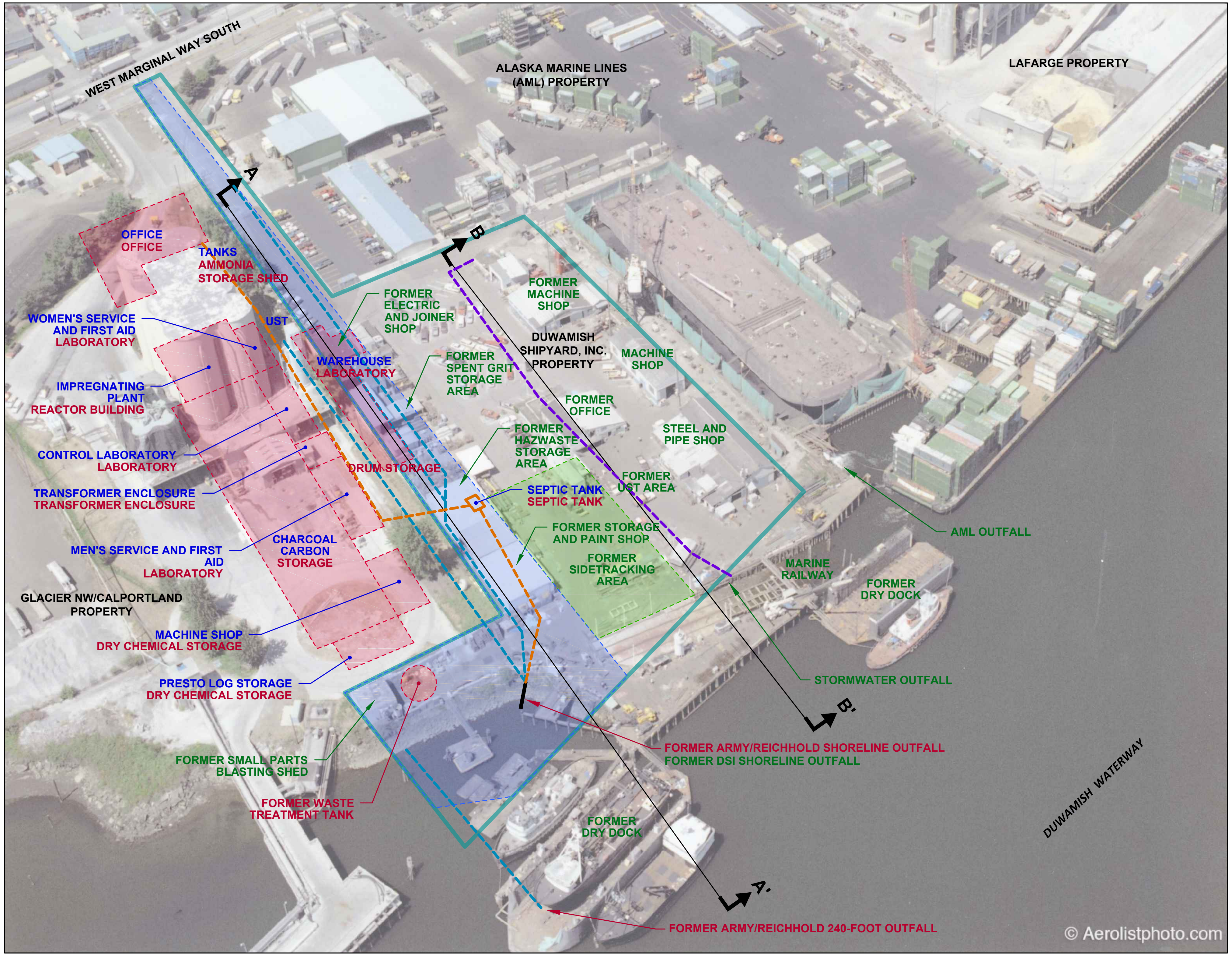
- DSI-SS-10 RI Surface Sediment Sample
- DSI-SB-12 RI Subsurface Sediment Sample

SURVEY SOURCE: Bathymetric survey by Blue Water, 10/2006.
Topographic survey by APS Survey and Mapping, LLC.
Underdock survey by AML and DSI, 12/2006.
HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).
NOTES:
1. Building locations shown on this figure represent historical conditions at the DSI property.
2. Previous subsurface core LDW-SC28 is shown in original location. Location reporting was inconsistent in RI.

0 80
Scale in Feet

ANCHOR QEA

Figure 10b
2011 Sediment Sampling Locations
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



Not to Scale

LEGEND:

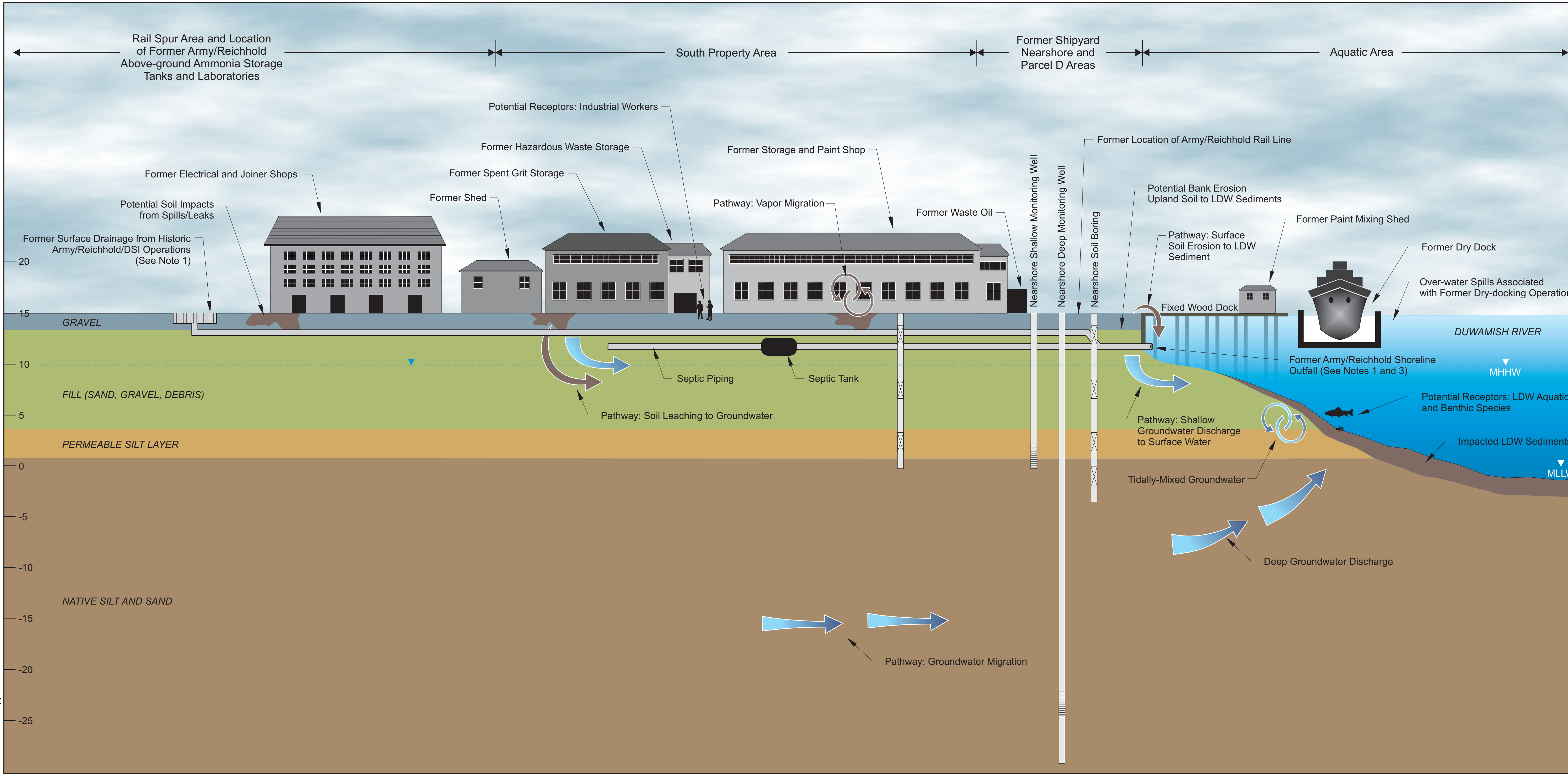
- Current DSI Property Boundary
- DSI Existing Stormwater Conveyance
- Historical Army/Reichhold Drainage
- Historical Army/Reichhold Septic System
- OFFICE — Current and Former Duwamish Shipyard Operations
- OFFICE — Former Army Operations
- OFFICE — Former Reichhold Operations
- Former DSI Marine Rail Side Tracking Area
- Former Army/Reichhold Buildings/Structures
- Parcel D Area purchased by DSI from Port of Seattle in 1964
- Cross Section Location and Designation

NOTES:
1. All labeled locations of buildings and structures as shown on this oblique aerial image are approximate.
2. Army features based on 1956 Department of the Army Real Estate Map.
3. Reichhold features based on 2010 ERM Figure 1-2.
4. Aerial by Aerolistphoto.com
5. Shipyard activities ceased at the property April 2007. The drydocks have been removed from the property.
6. Existing DSI stormwater outfall is currently managed under AML's NPDES permit. AML routed DSI stormwater outfall drainage to the AML outfall in 2011.
7. DSI discharged stormwater through former Army/Reichhold shoreline outfall following purchase of property.

Mar 11, 2013 12:24pm heriksen K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-017 (1994 Shoreline).dwg F11a

ANCHOR QEA

Figure 11a
Oblique Aerial Photograph Showing Shoreline Structures - 1994
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



NOTES:

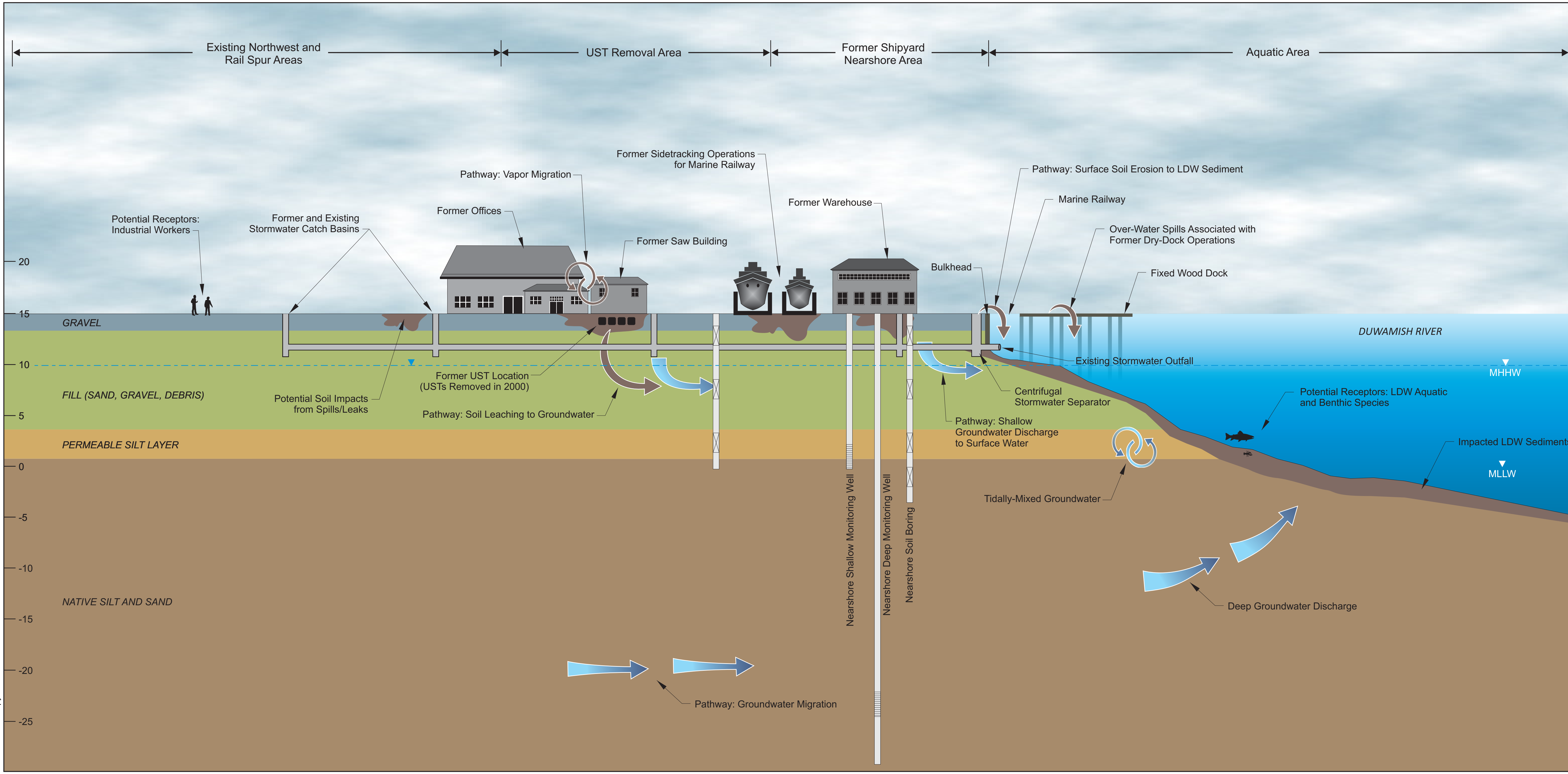
1. Former Army/Reichhold SW outfall provided drainage (sanitary) from historic Army buildings and restrooms. Same drain lines were utilized by Glacier/Reichhold for drainage from laboratories and offices.
2. Historic Army and Reichhold building locations shown on figure.
3. DSI utilized the former Army/Reichhold shoreline outfall for surface stormwater drainage following purchase of the property in 1964.
4. This cross section represents DSI operations at the southern property boundary, which overlapped with previous use by the US Army and Reichold. Locations of surface drainage ditches and subsurface sanitary drain lines (including septic tank) are shown on Figure 2.
5. Upland groundwater fluctuation, seasonal and tidal, is on the order of 2 feet.

Not to Scale
Vertical Exaggeration x10

2/26/2013 herikksen K:/Projects/0111-Duwamish Shipyard/RI Work Plan/1101-CDR-001.cdr

ANCHOR QEA

Figure 11b
Site Conceptual Model Cross Section A-A'
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



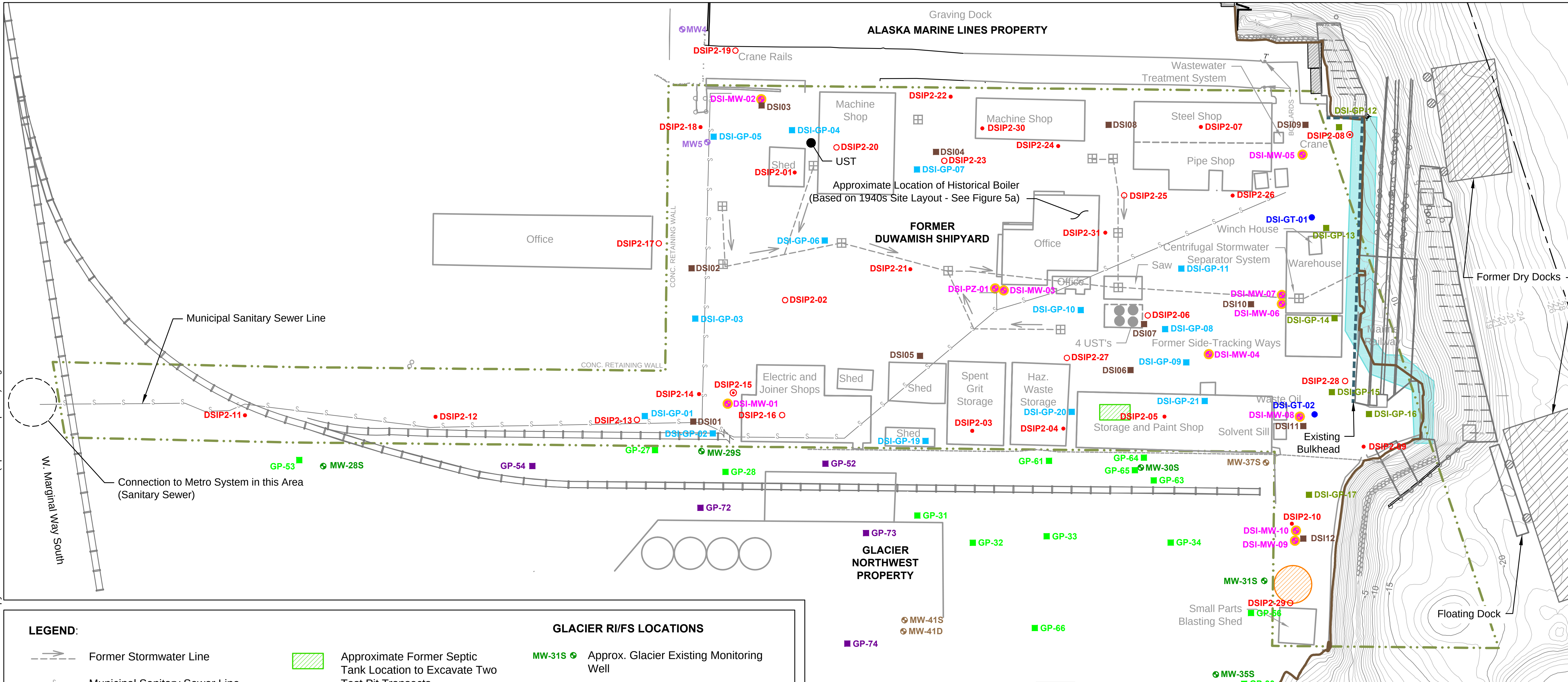
2/26/2013 heriksen K:/Projects/0111-Duwamish Shipyard/RI Work Plan/1101-CDR-001.cdr

NOTE:
1. DSI stormwater currently routed to AML treatment system prior to discharge at AML outfall (located north of DSI property).
2. This cross section represents DSI operations through the central and northern portions of the property. Locations of structures, storm drain lines, and other property features are shown on Figure 2.
3. Upland groundwater fluctuation, seasonal and tidal, is on the order of 2 feet.

Not to Scale
Vertical Exaggeration x10

ANCHOR QEA

Figure 11c
Site Conceptual Model Cross Section B-B'
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



LEGEND:

Former Stormwater Line

Municipal Sanitary Sewer Line

Top of Bank (Approximate)

Current Property Boundary

Current Rail Alignment

Bathymetric Contours in Feet (MLLW)

Former Catch Basin Location

Area of Proposed Seep Reconnaissance

Approximate Former Septic Tank Location to Excavate Two Test Pit Transects

Approximate Former Waste Treatment Location

2009 UPLAND RI LOCATIONS

DSI-MW-07 Monitoring Well/Piezometer

DSI-GP-05 Geoprobe - Soil and Groundwater

DSI-GP-13 Geoprobe - Soil Only

DSI-GT-01 Geotechnical Boring

GLACIER RI/FS LOCATIONS

MW-31S Approx. Glacier Existing Monitoring Well

GP-53 Approx. Glacier Geoprobe Sample

GP-34 Approx. Glacier Proposed Geoprobe (no samples collected)

MW-41S Approx. Glacier Proposed Monitoring Well (no samples collected)

2006 RI SAMPLING LOCATIONS

MW5 Monitoring Well (Not Located in 2009)

DSI09 Geoprobe Soil Boring

PROPOSED SUPPLEMENTAL REMEDIAL INVESTIGATION SAMPLING LOCATIONS

Re-sample Existing Monitoring Well

DSIP2-12 Proposed Soil Boring

DSIP2-13 Proposed Soil Boring - Convert to Shallow Monitoring Well (5-15 feet)

DSIP2-15 Proposed Soil Boring - Convert to Deep Monitoring Well (18-28 feet)

SURVEY SOURCE: Bathymetric survey by Blue Water, 10/2006. Topographic survey by APS Survey and Mapping, LLC. Underdock survey by AML and DSI, 12/2006.
HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).
NOTES:
1. Historical operations presented are consistent with the 104e response.
2. Former Glacier NW features taken from Figure 1-2, Glacier Northwest, Inc. - Reichhold, Inc Site (ERM, November, 2010).
3. Glacier geoprobe and monitoring well locations approximated from Figure 7 of Glacier RI/FS Workplan (ERM, August 2012).

0 80
Scale in Feet

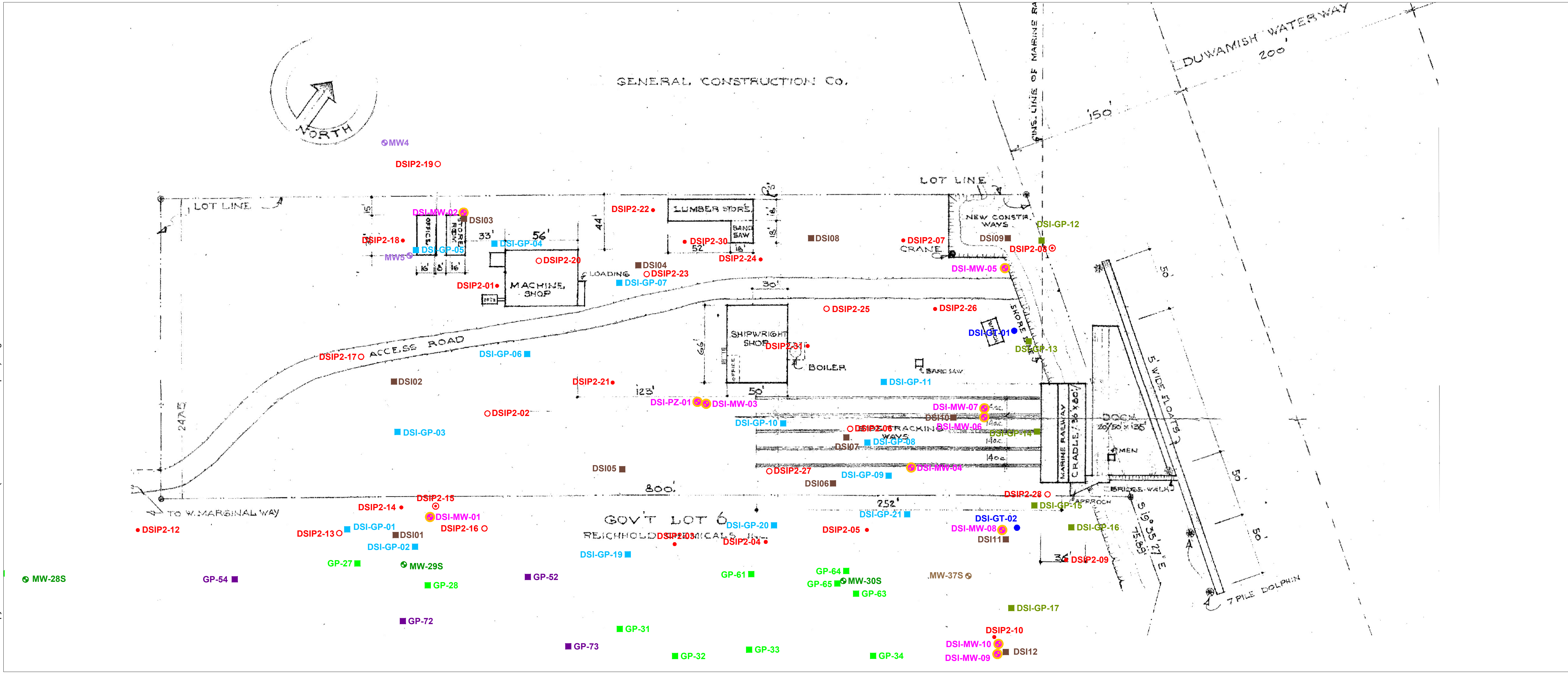
K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-001 (Upland Samp Locs).dwg F12a

Mar 11, 2013 1:35pm herikson

ANCHOR QEA

DRAFT

Figure 12a
Soil, Groundwater, and Seep Sampling Locations
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



2006 RI SAMPLING LOCATIONS

- MW5 — Monitoring Well (Not Located in 2009)
- DSI09 — Geoprobe Soil Boring

2009 UPLAND RI LOCATIONS

- DSI-MW-07 — Monitoring Well/Piezometer
- DSI-GP-05 — Geoprobe - Soil and Groundwater
- DSI-GP-13 — Geoprobe - Soil Only
- DSI-GT-01 — Geotechnical Boring

GLACIER RI/FS LOCATIONS

- MW-31S — Approx. Glacier Existing Monitoring Well
- GP-53 — Approx. Glacier Geoprobe Sample
- GP-34 — Approx. Glacier Proposed Geoprobe (no samples collected)
- MW-41S — Approx. Glacier Proposed Monitoring Well (no samples collected)

PROPOSED SUPPLEMENTAL REMEDIAL INVESTIGATION SAMPLING LOCATIONS

- Re-sample Existing Monitoring Well
- DSIP2-12 — Proposed Soil Boring
- DSIP2-13 — Proposed Soil Boring - Convert to Shallow Monitoring Well (5-15 feet)
- DSIP2-15 — Proposed Soil Boring - Convert to Deep Monitoring Well (18-28 feet)

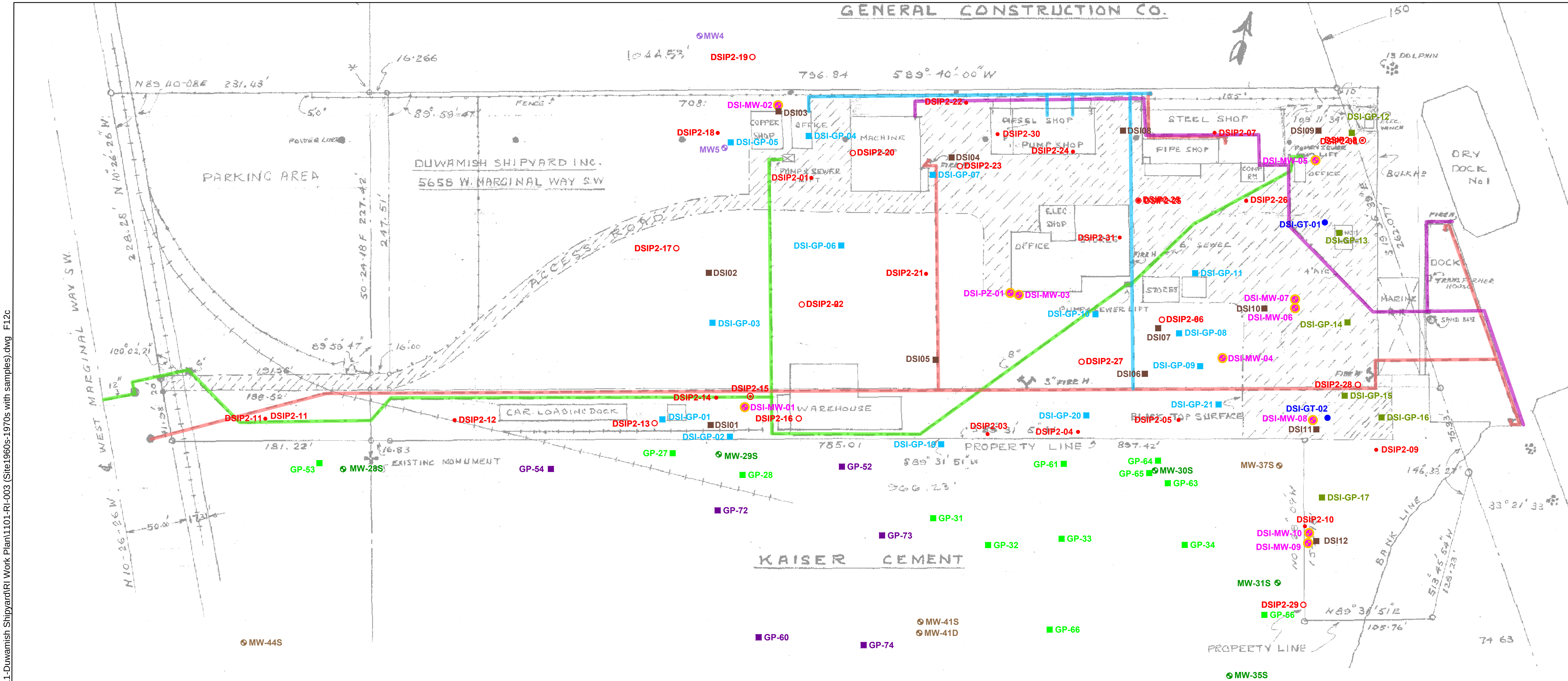
0 80
Approximate Scale in Feet

NOTES:
1. Preparation assistance provided by Anchor Environmental, L.L.C.
2. Original drawing prepared by DSI, June 15, 1977.

K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-002 (Site1941-1960s with samples).dwg F12b
Mar 11, 2013 1:43pm heriksen

ANCHOR QEA

Figure 12b
Site Layout (1941 - Mid 1960s)
Supplemental Remedial Investigation Work Plan
Duwamish Shipyards, Inc.



LEGEND:

- Air Line
- Water Pipe
- Fire
- Sewer

2006 RI SAMPLING LOCATIONS

- MW5 — Monitoring Well (Not Located in 2009)
- DSI09 — Geoprobe Soil Boring

2009 UPLAND RI LOCATIONS

- DSI-MW-07 — Monitoring Well/Piezometer
- DSI-GP-05 — Geoprobe - Soil and Groundwater
- DSI-GP-13 — Geoprobe - Soil Only
- DSI-GT-01 — Geotechnical Boring

GLACIER RI/FS LOCATIONS

- MW-31S — Approx. Glacier Existing Monitoring Well
- GP-53 — Approx. Glacier Geoprobe Sample
- GP-34 — Approx. Glacier Proposed Geoprobe (no samples collected)
- MW-41S — Approx. Glacier Proposed Monitoring Well (no samples collected)

PROPOSED SUPPLEMENTAL REMEDIAL INVESTIGATION SAMPLING LOCATIONS

- Re-sample Existing Monitoring Well
- DSIP2-12 — Proposed Soil Boring
- DSIP2-13 — Proposed Soil Boring - Convert to Shallow Monitoring Well (5-15 feet)
- DSIP2-15 — Proposed Soil Boring - Convert to Deep Monitoring Well (18-28 feet)

0 80
Scale in Feet

NOTES:
1. Preparation assistance provided by Anchor Environmental, L.L.C.
2. Original drawing prepared by DSI, January 24, 1973.

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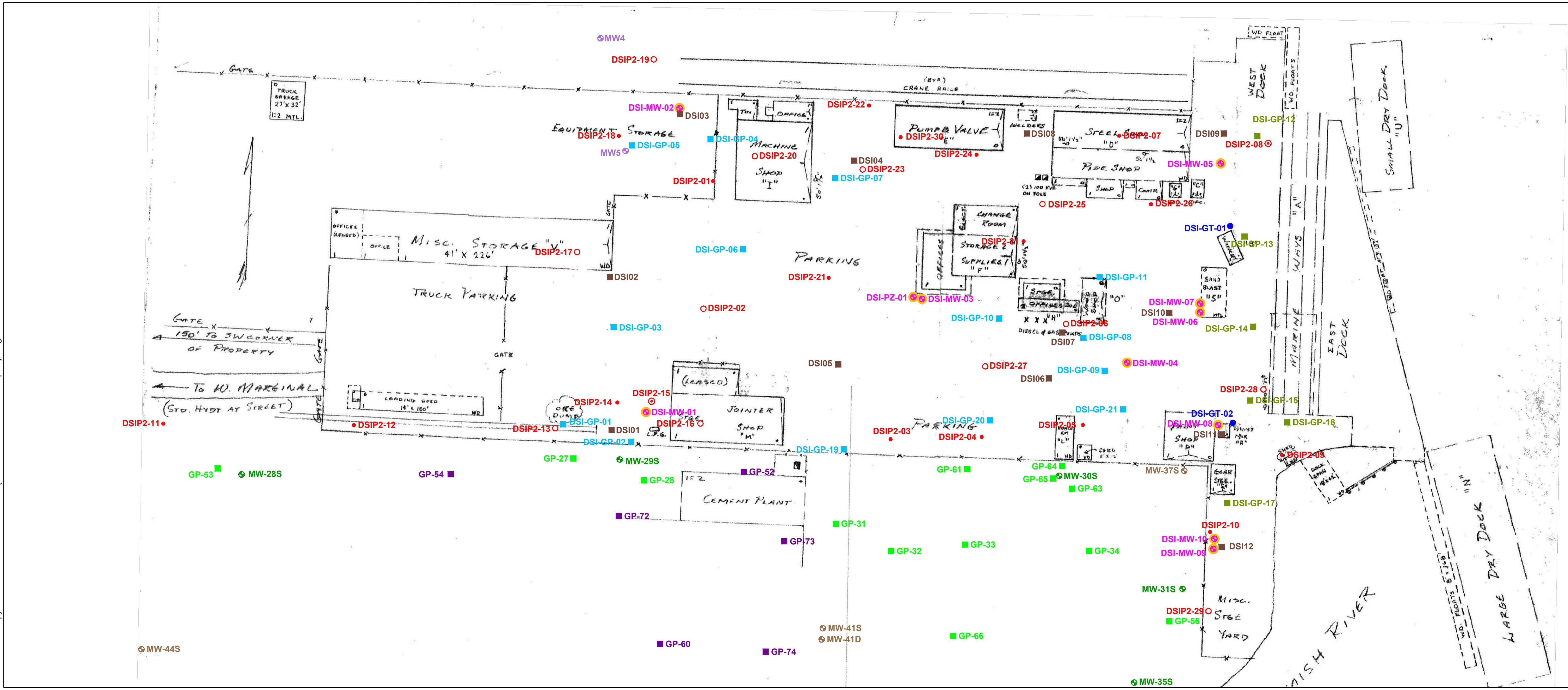
Mar 11, 2013 1:47pm herIksen

ANCHOR QEA

Figure 12c
Site Layout (Mid 1960s - Mid 1970s)
Supplemental Remedial Investigation Work Plan
Duwamish Shipyards, Inc.



2006 RI SAMPLING LOCATIONS

- MW5 — Monitoring Well (Not Located in 2009)
- DSI09 — Geoprobe Soil Boring

2009 UPLAND RI LOCATIONS

- DSI-MW-07 — Monitoring Well/Piezometer
- DSI-GP-05 — Geoprobe - Soil and Groundwater
- DSI-GP-13 — Geoprobe - Soil Only
- DSI-GT-01 — Geotechnical Boring

GLACIER RI/FS LOCATIONS

- MW-31S — Approx. Glacier Existing Monitoring Well
- GP-53 — Approx. Glacier Geoprobe Sample
- GP-34 — Approx. Glacier Proposed Geoprobe (no samples collected)
- MW-41S — Approx. Glacier Proposed Monitoring Well (no samples collected)

PROPOSED SUPPLEMENTAL REMEDIAL INVESTIGATION SAMPLING LOCATIONS

- Re-sample Existing Monitoring Well
- DSIP2-12 — Proposed Soil Boring
- DSIP2-13 — Proposed Soil Boring - Convert to Shallow Monitoring Well (5-15 feet)
- DSIP2-15 — Proposed Soil Boring - Convert to Deep Monitoring Well (18-28 feet)

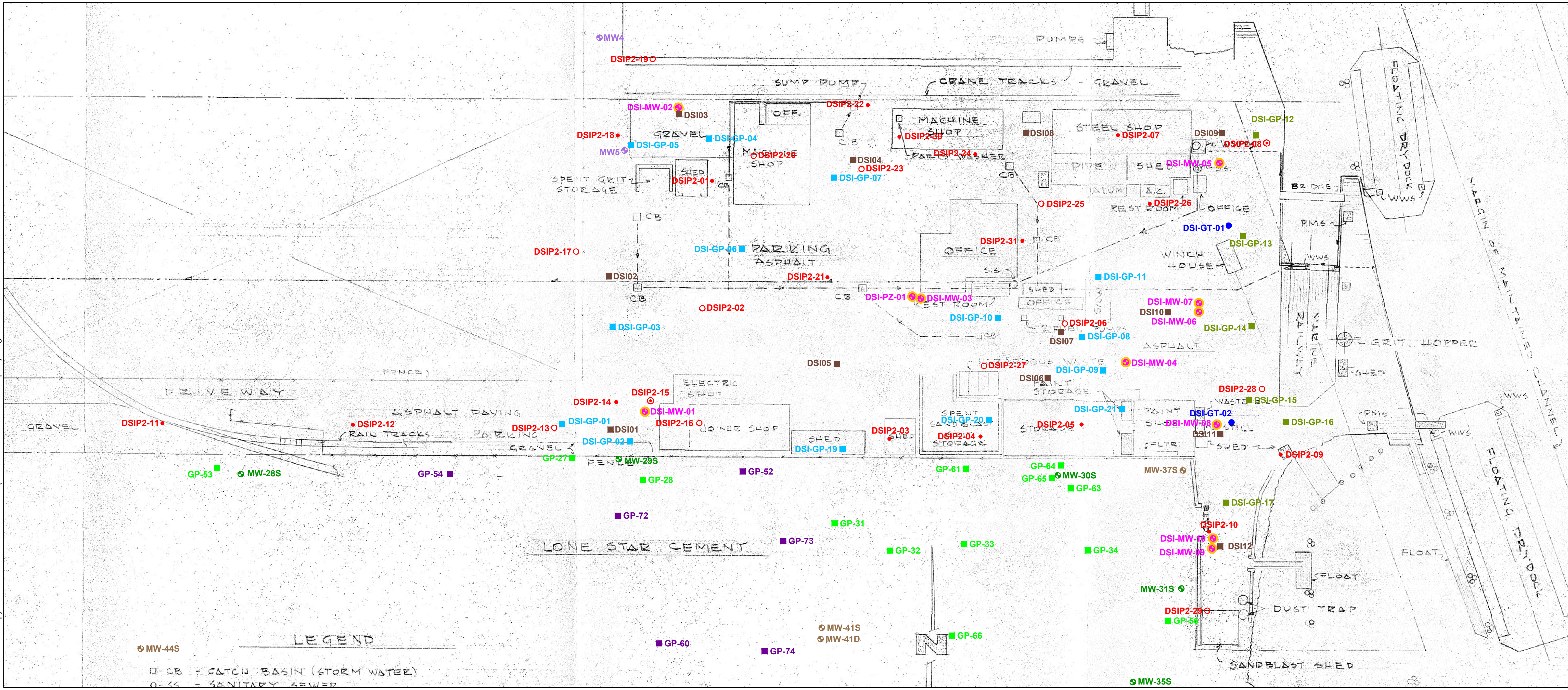
0 80
Scale in Feet

NOTES:
1. Preparation assistance provided by Anchor Environmental, L.L.C.
2. Original drawing prepared by DSI, June 15, 1977.

Mar 11, 2013 1:50pm herikson K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-004 (Site1970s-1990s with samples).dwg F12d

ANCHOR QEA

Figure 12d
Site Layout (Mid 1970s - Early 1990s)
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



2006 RI SAMPLING LOCATIONS

- MW5 — Monitoring Well (Not Located in 2009)
- DSI09 — Geoprobe Soil Boring

2009 UPLAND RI LOCATIONS

- DSI-MW-07 — Monitoring Well/Piezometer
- DSI-GP-05 — Geoprobe - Soil and Groundwater
- DSI-GP-13 — Geoprobe - Soil Only
- DSI-GT-01 — Geotechnical Boring

GLACIER RI/FS LOCATIONS

- MW-31S — Approx. Glacier Existing Monitoring Well
- GP-53 — Approx. Glacier Geoprobe Sample
- GP-34 — Approx. Glacier Proposed Geoprobe (no samples collected)
- MW-41S — Approx. Glacier Proposed Monitoring Well (no samples collected)

PROPOSED SUPPLEMENTAL REMEDIAL INVESTIGATION SAMPLING LOCATIONS

- Re-sample Existing Monitoring Well
- DSIP2-12 — Proposed Soil Boring
- DSIP2-13 — Proposed Soil Boring - Convert to Shallow Monitoring Well (5-15 feet)
- DSIP2-15 — Proposed Soil Boring - Convert to Deep Monitoring Well (18-28 feet)

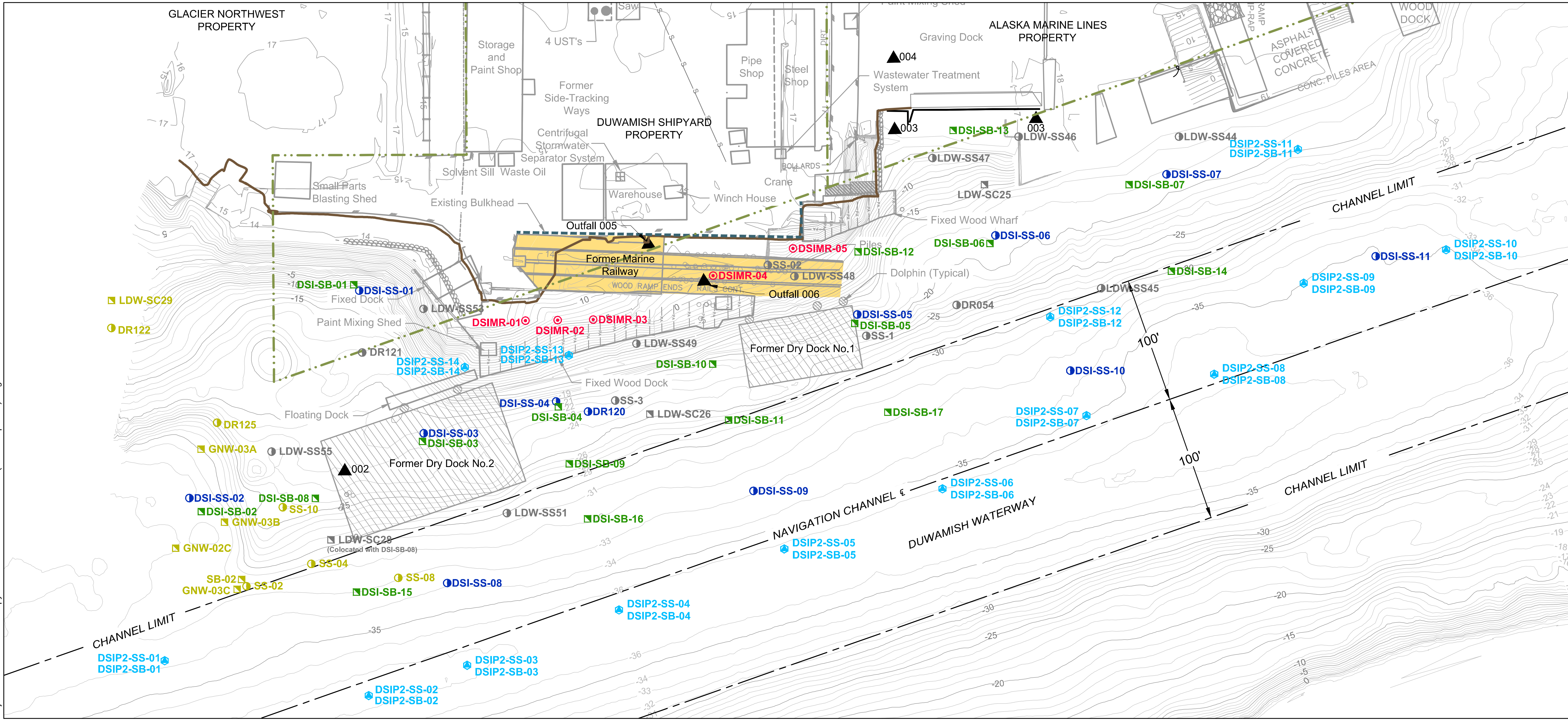
0 80
Scale in Feet

NOTES:
1. Preparation assistance provided by Anchor Environmental, L.L.C.
2. Original drawing prepared by DSI, June 15, 1977.

Mar 11, 2013 2:10pm heriksen K:\Projects\0111-Duwamish Shipyard\RI Work Plan\1101-RI-005 (Site1990s-2000s with samples).dwg F12e

ANCHOR QEA

Figure 12e
Site Layout (Early 1990s - Mid 2000s)
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.



LEGEND:

Municipal Sanitary Sewer Line
Existing Bulkhead
Top of Bank (Approximate)
Current Property Boundary
NPDES Outfall
Topographic and Bathymetric Contours in Feet (MLLW)
Former Catch Basin Location
LDW-SS45 LDW Surface Sediment Sample
LDW-SC25 LDW Subsurface Sediment Sample
SS-04 Glacier Surface Sediment Sample
GNW-02C Glacier Subsurface Sediment Sample

2011 RI SAMPLING LOCATIONS

DSI-SS-10 RI Surface Sediment Sample
DSI-SB-12 RI Subsurface Sediment Sample

PROPOSED SUPPLEMENTAL RI SAMPLING LOCATIONS

DSIMR-03 Proposed Surface and Shallow Subsurface Sediment Sample
DSIP2-SS-01 Proposed Surface Sediment Grab and Co-Located Sediment Core

SURVEY SOURCE: Bathymetric survey by Blue Water, 10/2006.
Topographic survey by APS Survey and Mapping, LLC.
Underdock survey by AML and DSI, 12/2006.
HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).
NOTES:
1. Building locations shown on this figure represent historical conditions at the DSI property.
2. Previous subsurface core LDW-SC28 is shown in original location. Location reporting was inconsistent in RI.

0 80
Scale in Feet

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ANCHOR QEA

Figure 13
Sediment Sampling Locations
Supplemental Remedial Investigation Work Plan
Duwamish Shipyard, Inc.

APPENDIX A
SAMPLING AND ANALYSIS PLAN

SAMPLING AND ANALYSIS PLAN
DUWAMISH SHIPYARD, INC.
SEATTLE, WASHINGTON

Prepared for

Washington State Department of Ecology

On Behalf Of

Duwamish Shipyard, Inc.
5658 West Marginal Way SW
Seattle, Washington 98106

Prepared by

Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, Washington 98101

March 2013

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LIST OF ACRONYMS AND ABBREVIATIONS

°C	degrees centigrade
ARI	Analytical Resources, Inc.
ASTM	ASTM International
bgs	below ground surface
cm	centimeter
COC	chain of custody
DGPS	differential global positioning system
DQO	Data Quality Objective
DSI	Duwamish Shipyard, Inc.
Ecology	Washington State Department of Ecology
FC	Field Coordinator
FS	Feasibility Study
GS	grain size
HASP	Health and Safety Plan
HDPE	high density polyethylene
ID	inside diameter
LDW	Lower Duwamish Waterway
LOD	Limit of Detection
LOQ	Limit of Quantitation
MC	moisture content
MDL	Method Detection Limit
ml	milliliter
MTCA	Model Toxic Control Act
NAD 83	North American Datum of 1983
NELAP	National Environmental Laboratories Accreditation Program
ORP	oxidation reduction potential
PAH	polycyclic aromatic hydrocarbon

PCB	polychlorinated biphenyl
PID	photoionization detector
PSEP	Puget Sound Estuary Program
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RI	remedial investigation
RI/FS Work Plan	*Agreed Order Remedial Investigation and Feasibility Study (RI/FS) Work Plan.* Prepared for Duwamish Shipyard, Inc., Seattle, Washington. August 2010.
SAP	Sampling and Analysis Plan
SAPA	Sediment Sampling and Analysis Plan Appendix
Site	Duwamish Shipyard, Inc. property located at 5658 West Marginal Way SW and the adjacent aquatic areas, collectively
SMS	Sediment Management Standards
Supplemental RI Work Plan	*Supplemental Remedial Investigation Work Plan – Duwamish Shipyard, Inc.* Prepared for the Washington State Department of Ecology on behalf of Duwamish Shipyard, Inc., Seattle, Washington. Prepared by Anchor QEA. March 2013.
SVOC	semivolatile organic compound
TBT	tributyltin
TDS	total dissolved solids
TOC	total organic carbon
TSS	total suspended solids
TVS	total volatile solids
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
WAC	Washington Administrative Code

1 INTRODUCTION

This Sampling and Analysis Plan (SAP) is Appendix A to the *Supplemental Remedial Investigation Work Plan* (Supplemental RI Work Plan), which presents the scope of work for completion of a supplemental Remedial Investigation (RI) effort at the Duwamish Shipyard, Inc. (DSI) property located at 5658 West Marginal Way SW (DSI property) and the adjacent aquatic areas (collectively, Site) in Seattle, Washington (see Figure 1). The Supplemental RI Work Plan describes additional investigations that will be conducted to address remaining data gaps, as required by the Washington State Department of Ecology's (Ecology's) December 5, 2012 comment letter.

This SAP identifies the sampling and analysis protocols, sample location and frequency, equipment, sample handling, and analytical procedures for implementing a supplemental RI at the site. Field work will consist of sampling soil, groundwater, seeps, catch basin solids, storm water, and sediment. This SAP is supported by a Quality Assurance Project Plan (QAPP; Appendix B to the Supplemental RI Work Plan) and a Health and Safety Plan (HASP; Anchor QEA 2013 [in preparation]).

1.1 Purpose and Overview of Supplemental Investigations

The Supplemental RI Work Plan outlines the scope and rationale of upland and sediment sampling and characterization efforts to be conducted at the Site during this supplemental RI. The purpose of this SAP is to provide guidance for each of the supplemental investigation activities at the Site. The proposed upland and sediment sample locations are presented on Figures 2 and 3. The key data collection activities proposed to address the data gaps identified in the *Agreed Order Remedial Investigation and Feasibility Study (RI/FS) Work Plan* (RI/FS Work Plan; Anchor QEA 2010) include:

- **Soil Sampling:** Thirty-one soil borings will be advanced as part of the supplemental RI, as shown on Figure 2. Seventeen of these will be temporary soil borings installed by direct-push geoprobe, and 14 will be permanent borings completed using hollow-stem auger methodology. The permanent borings will be sampled by split spoon methodology prior to being completed as permanent monitoring wells for sampling shallow and deep groundwater at the Site. The soil sampling design is presented in Table 1.

- **Monitoring Well Installation and Development:** Fourteen new monitoring wells, including twelve shallow and two deeper wells, will be installed throughout the Site using a hollow stem auger and developed using the methods outlined in Section 3.4.2. All groundwater sampling will be performed using low-flow methodology. All new monitoring wells will be developed prior to sampling. Existing monitoring wells will be redeveloped as necessary. Target well depths and screen intervals are outlined in Table 2, and well locations are shown on Figure 2.
- **Groundwater Sampling:** Groundwater samples will be collected from all existing Site monitoring wells and piezometers installed in 2009, as well as from 14 new monitoring wells that will be installed during this phase of the RI (Figure 2). Specifically, groundwater will be sampled from ten existing monitoring wells and one existing piezometer, and from the fourteen proposed monitoring wells, as shown on Figure 2. The groundwater sampling design is presented in Table 2.
- **Seep Reconnaissance and Sampling:** A reconnaissance will be performed during low tide conditions to check for seeps along the eastern shoreline areas of the Site (Figure 2). If discovered, seep water samples will be collected during a low-tide event.The sampling design for seep water samples is summarized in Table 2.
- **Stormwater and Catch Basin Solids Sampling:** Stormwater and catch basin solids sampling will be performed at the final catch basin prior to overland routing of Site stormwater for off-site treatment, as shown on Figure 3. Stormwater will be sampled during a maximum of seven qualifying events within a 1-year time period. The sampling design for stormwater and catch basin solids samples is outlined in Table 3.
- **UST and Septic Tank Investigation:** An investigation will be conducted to locate, if possible, a historical underground septic tank that might be buried near the southern DSI property boundary (Figure 2), as well as any other historical USTs that might be remaining in the upland areas. Test pit transects will be excavated in the area of the former tanks to a maximum depth of 4 feet or the water table. If septic and/or USTs are discovered, soil samples will be collected immediately beneath each tank valve/outlet pipe using the backhoe bucket and tested for the parameters specified in Table 1.
- **Sediment Sampling – Former Marine Railway Area:** Up to five surface and four shallow subsurface sediment samples will be collected beneath the former marine railway area as, shown on Figure 4. Surface sediment samples will be collected using

grab sampling techniques. Co-located subsurface sediment samples at four of the five surface locations will be collected using a hand corer or hand auger. Because over-structure access in the former marine railway area is not safe, sediments cannot be sampled using conventional methods (e.g., vibracore or hollow-stem auger drill rig). As a result, the maximum sampling depth(s) will be limited to the depth(s) practicable using a hand corer or hand auger sampling device. The sediment sampling scheme for the former marine railway area is outlined in Table 4.

- **Surface Sediment Sampling – LDW Locations:** Surface sediment samples will be collected from the 0- to 10-cm biologically active zone at approximately 14 locations in the LDW, as shown on Figure 4. Surface sediment samples will be collected using a hydraulic Van Veen grab. Surface sediment testing parameters are outlined in Table 5.
- **Subsurface Sediment Sampling – LDW Locations:** Subsurface sediment samples will be collected at approximately 14 locations in the LDW (co-located with surface sediment sampling locations), as shown on Figure 4. Subsurface sediment samples will be collected using vibracore methodology. Proposed analyses for subsurface sediments are outlined in Table 6.

This SAP was prepared consistent with Ecology's Model Toxic Control Act (MTCA) cleanup regulations (Chapter 173-340 Washington Administrative Code [WAC]; Ecology 2007), Puget Sound Estuary Program (PSEP), and U.S. Environmental Protection Agency (USEPA) protocols for sampling and analysis (Ecology 2008; PSEP 1986, 1997a, 1997b, 1997c; USEPA 1993) and *Test Methods for the Evaluation of Solid Waste: Physical/Chemical Methods, 3rd Edition* (USEPA 1986). The contents and structure of this SAP are consistent with guidance provided in Ecology's *Sediment Source Control Standards User Manual, Appendix B: Sediment Sampling and Analysis Plan Appendix* (SAPA; Ecology 2008).

1.2 Sampling and Analysis Schedule

This SAP presents the supplemental investigations that will be completed to address data gaps required by Ecology in their December 5, 2012 comment letter. All supplemental investigations described in this SAP will be implemented upon Ecology's approval, with an anticipated completion date of fall 2013.

The chemical and physical laboratory analyses described herein, along with subsequent data validation and documentation/database management tasks, are scheduled to occur during fall/winter 2013. The schedule for primary project tasks and key deliverables is presented in the Supplemental RI Work Plan.

1.3 Document Organization

This SAP is organized into the following sections:

- Section 2 – Project Management and Responsibilities
- Section 3 – Upland Sample Collection and Processing
- Section 4 – Sediment Sample Collection and Processing
- Section 5 – Sample Handling Procedures
- Section 6 – Chemical and Physical Analytical Testing
- Section 7 – References

2 PROJECT MANAGEMENT AND RESPONSIBILITIES

This section describes the overall project management strategy for implementing and reporting for the SAP. Additional information about personnel responsible for project management and other roles is included in the QAPP (Appendix B to the Supplemental RI Work Plan).

The Project Manager for Anchor QEA is David Templeton. He will be responsible for overall project coordination, including production of all project deliverables and administrative coordination to ensure timely and successful completion of the project.

The project engineer for Anchor QEA is Matt Woltman, P.E. He is responsible for the direction and supervision of all RI activities, including the supplemental work described in the Supplemental RI Work Plan.

The Field Coordinator (FC) from Anchor QEA will provide overall direction for the field sampling effort in terms of logistics, personnel assignments, and field operations. The FC will supervise field collection of all samples. The FC will also be responsible for positioning samples accurately; recording sample locations, depths and identification; ensuring conformance to sampling and handling requirements, including field decontamination procedures; physical evaluation and logging of samples; and completing chain-of-custody (COC) forms.

Sampling and analysis will be completed with equipment owned or contracted by Anchor QEA. All subconsultants will follow the protocols established in this SAP. Anchor QEA will be responsible for the submittal of environmental samples to the designated laboratories for chemical and physical analyses. The Laboratory Project Manager at each laboratory will provide analytical support and will be responsible for providing certified, pre-cleaned sample containers and sample preservatives (as appropriate) and for ensuring that all chemical analyses meet the project Data Quality Objectives (DQOs) and other quality specifications of the QAPP (Appendix B to the Supplemental RI Work Plan).

3 UPLAND SAMPLE COLLECTION AND PROCESSING

This section presents the sample station locations, sample identification design, site access details, sample positioning parameters, and sample collection and processing methodology. The sample handling requirements are outlined in Section 5.

3.1 Upland Sample Station Location and Identification

Figures 2 and 3 present the proposed upland sampling locations for all soil, groundwater, seeps, stormwater, and catch basin solids. Tables 1 through 3 present detailed summaries of the upland sampling design, including sample nomenclature, sample depths, analytical chemistry, and field screening. The sample nomenclature for soil, groundwater, stormwater, catch basin solids, and seep samples is described below.

Each soil sample will be assigned a unique alphanumeric identifier according to the following method. Each soil sample will be identified as DSI Phase 2 (DSIP2)-Sample Number-Depth Interval. The sample number will be in order of sampling locations beginning with -01. Further nomenclature is as follows:

- Soil sample IDs will have the depth interval (in feet) below ground surface (bgs) added after the sample number (e.g., 1-3). An example of a site sample based on this nomenclature is:
  - DSIP2-01-1-3, indicating a soil sample collected at sample station 01 from a depth interval of 1 to 3 feet bgs
- A field duplicate collected from a sample will be identified by the addition of 50 to the sample number. A duplicate sample of the above-mentioned soil example is:
  - DSIP2-51-1-3
- For rinsate blank samples, RB will be added in front of the sample number. The rinsate blank date (in MMDDYYYY format) will be added to end. As an example, the nomenclature for a rinsate blank of the decontaminated sample processing equipment after sample collection of the above-mentioned soil example on August 15, 2013, is:
  - DSIP2-01-RB-08152013

Each groundwater sample will be assigned a unique alphanumeric identifier according to the following method. Each groundwater sample will be identified as DSI Phase 2 (DSIP2)-Sample Number-Date. The sample number will be in order of sampling locations beginning with -01. Further nomenclature is as follows:

- Groundwater sample IDs from newly installed and existing site monitoring wells will have the date added in MMDDYYYY format after the sample number (e.g., 08152013 for August 15, 2013).
- A field duplicate collected of a groundwater sample will be identified by the addition of 50 to the sample number. An example of a duplicate groundwater sample from station DSIP2-02 on August 15, 2013, is:
  - DSIP2-52-08152013

Each stormwater, catch basin solid, and seep sample will be assigned a unique alphanumeric identifier according to the following method. Each stormwater sample will be identified as DSI Phase 2 (DSIP2)-Sample Medium-Sample Number-Date. The sample number will be in order of sampling locations beginning with -01. Further nomenclature details are as follows:

- The sample medium identifier will be STW for stormwater, CB for catch basin solids, and SP for seep samples.
- The date will be in MMDDYYYY format after the sample number (e.g., 08152013 for August 15, 2013).
- An example of a stormwater sample collected on August 15, 2013, is:
  - DSIP2-STW-01-08152013

3.2 Sample Positioning

Horizontal positioning will be determined in the field by a differential global positioning system (DGPS) based on target coordinates. Anchor QEA will provide the target coordinates in Tables 1 through 3 after finalization of the SAP. The horizontal datum will be North American Datum of 1983 (NAD 83), Washington State Plane North. Measured geographical coordinates for station positions will be recorded and reported to the nearest 0.01 second. In addition, state plane coordinates will be reported to the nearest foot. The DGPS accuracy is less than 1 meter and generally less than 30 centimeters (cm), depending on the satellite coverage and the number of data points collected. Anchor QEA may photograph the locations to aid in understanding the sample location.

A licensed surveyor will survey the vertical elevation of each new monitoring well. Each sampling location will be marked appropriately as field activities take place and as allowed by operational activities at the time of sampling.

3.3 Soil Sampling

This section describes the methods used to obtain discrete soil samples for physical and chemical analysis. Soil samples will be obtained using both geoprobe and hollow-stem auger collection methods. The specific soil sampling details are described in the following subsections.

3.3.1 Geoprobe Collection Methods

Temporary soil borings will be advanced by a direct push (Geoprobe™) drill rig. Coring will be conducted with a 4-foot or 5-foot-long, 1.5-inch inside-diameter (ID) core sampler. The piston tip will be loosened and the sampler advanced into the ground, thereby coring the soil into the inside of the sampler's disposable, single-use plastic liner. The sampler will then be withdrawn to retrieve the liner and the soil sample. The liner will be cut in half lengthwise to remove the soil sample.

For each geoprobe sample, a new liner will be placed inside the core sampler. The core sampler with the piston tip locked will be advanced to the top of the next sample interval. The piston tip will then be released and the core sampler advanced to obtain the next sample. This process will be repeated until refusal is met or sufficient depth is encountered. Groundwater is expected to be encountered at the Site within 15 feet of the ground surface. Between samples, the core sampler, including the piston tip and attached rod, will be decontaminated, stored and handled consistent with the procedures specified in this SAP.

Temporary boreholes will be decommissioned in accordance with state regulations (Chapter 173-160 WAC). Each borehole will be abandoned by filling it with bentonite chips and hydrating, or by filling with bentonite group, concrete, cement grout, or neat cement.

3.3.2 Hollow-Stem Auger Collection Methods

Soil samples from monitoring well locations will be collected during well installation by hollow-stem auger consistent with ASTM International (ASTM) procedures (ASTM D 1452). The 3.375-inch ID hollow-stem auger will be advanced into the soil to the target monitoring well depth, and soil will be collected by advancing a 2-inch outside-diameter, decontaminated split spoon or Shelby tube, using a 140-pound hammer dropped 18 inches. If field conditions require, a 3-inch outside-diameter split spoon and Shelby tube may be used for collection. Decontamination procedures for the split spoon and Shelby tube are presented in Section 5.3.

Cement coring may be required for access to areas where geoprobe and/or hollow stem auger samples will be collected. If needed, cement coring will be conducted by a subcontractor. Cement coring methods will be determined by the subcontractor but may include jack hammering, concrete drilling, and/or geoprobe drilling.

3.3.3 Soil Sampling Design

Soil sampling details are presented in Table 1 and station locations are presented on Figure 2. All borings will be advanced to the native soil contact, with continuous soil samples obtained from three depths intervals in the fill unit and at least one depth interval in the native soil unit. Samples will be composited from two foot depth intervals. Exact sampling depth intervals will depend on the lithological units encountered during drilling. Based on the lithologies encountered during the 2009 Phase I upland investigation, soil samples are targeted at approximately 0 to 2 feet bgs (upper fill), 3 to 5 feet bgs (middle fill), 7 to 9 feet bgs (lower fill), and 10 to 12 feet bgs (native soil).

Soil sampling will continue through all visible contamination until confirmation or clean samples can be taken. Based on visual observations during coring, additional samples may be collected below the deepest level of expected contamination and archived for potential future analysis. Soil testing will include the 13 priority pollutant metals and barium, semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), polychlorinated biphenyl (PCB) Aroclors, total petroleum hydrocarbons (TPH; including gasoline, diesel, and oil range), pesticides, tributyltin (TBT), chromium VI, and dioxins/furans, as outlined in Table 1. In some cases, multiple borings may be necessary to obtain sufficient volume for analysis. Field screening will include sheen testing and photoionization detector (PID) monitoring of all sampling intervals. Final sampling locations may be adjusted in order to obtain access.

3.3.4 Soil Logging and Classification

Geoprobe and hollow stem auger core samples will be continuously examined to develop a lithologic boring log. The samples will be described in the field as to their color, structure, texture, mineral composition, moisture, and percent recovery, according to ASTM D-2488. Anchor QEA field staff will also examine samples for evidence of possible contamination, including presence of anthropogenic material, chemical odor, or staining. Anchor QEA field staff will note all observations on field forms (see Attachment 1). These procedures will be applied to all soils collected at each geoprobe sampling location.

3.3.5 Soil Sample Processing

Anchor QEA field staff will log soil samples on site as described above. Table 1 presents a summary of the soil sample collection details. Prior to sampling, color photographs will be taken of each sample interval.

Discrete soil samples will be taken directly from the selected depth interval. Prior to homogenization, soil sampling for volatile compounds will be performed using ASTM 5035A, in which the soil sample is collected from an undisturbed core using an EnCore sampling device or similar. After soil sampling is complete for volatile compounds, soil will be spooned into a clean stainless steel bowl for homogenization. The soil will be mixed until homogenous in color and texture and then spooned into laboratory-supplied jars for testing. The analytical testing scheme for soil samples is presented in Table 1.

All containers will be kept on ice for transport to the analytical laboratory. Sample collection and handling will be consistent with procedures described below and in the QAPP (Appendix B to the Supplemental RI Work Plan). A COC form will be logged by the processing staff and relinquished to the courier and then to the laboratory staff (see

Attachment 1). Laboratory Method Detection Limits (MDLs), Limits of Detection (LODs), and Limits of Quantitation (LOQs) for all soil parameters are listed in the QAPP (Appendix B to the Supplemental RI Work Plan).

3.4 Groundwater Sampling and Design

Groundwater samples will be collected from all site monitoring wells and piezometers installed in 2009, as well as from new monitoring wells to be installed in this phase of the RI. Specifically, groundwater will be sampled from ten existing monitoring wells and one existing piezometer, and from 14 proposed monitoring wells, as shown on Figure 2. The groundwater sampling design and well construction details are summarized in Table 2.

Groundwater sampling will be performed using low-flow methodology as described in Section 3.4.3. Groundwater samples will be collected at the screened intervals outlined in Table 2.

Field measurements will include temperature, pH, dissolved oxygen (DO), oxidation reduction potential (ORP), turbidity, and conductivity. Laboratory analyses will include total and dissolved metals (13 priority pollutant and barium), SVOCs, VOCs, PCB Aroclors, TPH (including gasoline, diesel, and oil range), pesticides, TBT, chromium VI, dioxins/furans, total dissolved solids (TDS), total suspended solids (TSS), alkalinity, ammonia, dissolved sulfide, chloride, sulfate, and nitrate, as outlined in Table 2. Samples for dissolved metals analysis will be field filtered.

All groundwater sample collection activities will be conducted at low tide, and groundwater samples will be immediately submitted for analytical testing, according to the analytical methods and reporting limits presented in the QAPP (Appendix B to the Supplemental RI Work Plan).

3.4.1 Monitoring Well Installation Methods

Anchor QEA will provide a licensed Washington State geologist to supervise monitoring well installation. Fourteen 2-inch diameter polyvinyl chloride (PVC) monitoring wells will be installed using standard hollow stem auger procedures. The installations will conform to Ecology specifications.

All monitoring wells will be completed with 0.01-slot 2-inch diameter Schedule 40 PVC screen with a flush-threaded bottom cap no longer than 6 inches long. Blank Schedule 40 PVC casing will extend from the top of the screen to approximately 0.5 foot below ground for flush mounted wells and extend to no more than 2.5 feet above ground for stick up wells.

A sand pack equivalent to 10/20 silica sand will be placed in the bottom of the bore hole to 2 feet above the top of the screen in all monitoring wells. The monitoring well will be surged prior to placement of the bentonite seal to prevent bridging and facilitate settling of the sand pack. A bentonite seal consisting of bentonite chips will be placed directly on the sand pack to a depth of approximately 1.5 feet below grade or less. The depth to the top of the sand pack and the bentonite will be tagged with a weighted tape to ensure well completion materials are installed to the correct depth.

Neat cement grout extending from the top of the bentonite seal ground surface will then be placed on top of the bentonite seal. The neat cement grout shall consist of Portland cement types I, II, or III with 5 percent by dry weight of bentonite. The grout will be emplaced by pumping the grout through a tremie pipe inserted through the augers. The tremie pipe will remain within 5 feet of the grout in the annulus, and the pipe will be withdrawn as the grout level rises. A centralizer will be placed at the bottom and every 20 feet on the deep well. The top of the PVC will be fitted with a standard lockable well plug.

Above-ground well completions will consist of a protective steel casing placed around the PVC and extending from at least 6 inches above the PVC to at least 2 feet below ground. A 2-foot diameter surface cement pad extending to a depth of 2 feet will be placed around the steel casing. Three metal posts at least 3 inches in diameter will be placed in a triangular arrangement around the casing and cement pad. The posts will extend from a minimum of 3 feet below ground to a minimum of 3 feet above ground. The well shall be labeled permanently and clearly with a well identification.

The drilling subcontractor will perform decontamination of all drilling equipment prior to moving to the next monitoring well installation. Water generated from decontamination procedures will be contained in 55-gallon drums and disposed at an off-site facility.

3.4.2 Monitoring Well Development

Following installation of all new monitoring wells, well development will be used to restore, to the extent possible, the natural hydraulic disturbed zone around each well. For existing site monitoring wells, the depth of each monitoring well (or piezometer) will be measured prior to sampling. If the depth does not match the depth recorded in 2009, the well will be redeveloped. A variety of techniques are available for developing wells to ensure turbidity-free groundwater samples. The specific method of well development will be decided upon in the field based on the most current available information.

The primary requirement of an effective development technique is to provide reversals or surges in flow to prevent bridging by formation particles, a common problem when flow is always in one direction. Reversals or surges can be created using surge blocks, bailers, pumps, getting tools, or a combination of devices.

Use of air for development should be avoided when samples are to be collected for volatile organic compound analyses. Air surging tends to strip volatiles from the water. In general, formation water should be used for development. However, if low-yielding water-bearing formations are being developed, it may be necessary to introduce water from an outside source. The introduced water must be tested for chemical properties to evaluate its potential impact on the in situ water quality (USEPA 1986).

The common methods for developing wells are described by Aller et al. (1989) and Driscoll (1986) and include:

- Overpumping
- Backwashing
- Surging
- Bailing
- Jetting

- Airlift pumping
- Air surging

Well development procedures that have the potential to alter groundwater quality should not be used. Therefore, methods that involve adding water or other fluids to the well, or that use air to accomplish development, are not recommended. Generally unsuitable methods for monitoring well development include jetting, airlift pumping, and air surging. However, air development techniques may be used if they offer site-specific advantages over other methods and extreme care is taken to prevent air from contacting the screened interval. Air development techniques must only be implemented by an experienced operator.

Recommended monitoring well development methods include pumping, overpumping, bailing, and backwashing, in combination with some form of surging. The most effective combination and timing of these methods must be determined through field testing or from experience developing wells in similar hydrogeologic regimes.

Movement of groundwater into the well in one direction generally results in bridging of the particles. A means of inducing flow reversal is necessary to break down the bridging and produce a stable filter. Aller et al. (1989) state that one of the most effective and efficient methods to induce flow reversal is the careful use of a properly constructed surge block. For a more detailed description of proper usage of a surge block and other methods of achieving flow reversal, see the *Handbook of Suggested Practices for the Design and Installation of Ground-water Monitoring Wells: Technology Support Center, Environmental Monitoring Systems Laboratory* (Aller et al. 1989).

One example of a well development field protocol uses the following procedure:

1. Record static water level and total well depth.
2. Set the pump and record pumping rate and turbidity. Pump until turbidity reaches desired level or stabilizes.
3. Discontinue pumping and surge the well.
4. Measure depth to the bottom of the well. If more than 10 percent of the screen is occluded by sediments, remove excess sediment by bailing.

5. Reset the pump, recording pumping rate and turbidity. Pump until turbidity reaches desired level or stabilizes. If the well has been properly designed, the amount of pumping required to achieve the desired turbidity level will be substantially less than required in the first pumping cycle.
6. Repeat surging and pumping until the well yields water of acceptable turbidity at the beginning of a pumping cycle. A good way to ensure that development is complete is to shut the pump off during the last anticipated pumping cycle, leaving the pump in place, and restarting it some time later. The turbidity of the discharge water should remain low.

The pumping rate used during development must be greater than the highest rate expected to be used during subsequent purging and sampling. In fact, recent field experience suggests that extremely low (i.e., 100 to 500 milliliters per minute) purging and sampling pumping rates may significantly reduce the turbidity of groundwater samples (Puls et al. 1990). The pump intake should be placed close to, or within, the well screen interval.

3.4.2.1 Development Criteria

Development should continue until clear, artifact-free, formation water is produced. Water quality parameters such as specific conductance, pH, temperature, and turbidity should be measured during development and should stabilize before development is stopped. Turbidity measurements are the most critical development criteria. Other parameters should be used to provide supplemental information regarding aquifer conditions. Stabilization of these parameters is indicative of the presence of formation water. If water was added during well construction or development, two to three times the volume of water added must be removed. Finally, the well should be producing visually clear water before development is stopped.

After development is completed, wells should be allowed to stabilize and re-equilibrate before sampling. The time necessary for stabilization depends on the characteristics of the aquifer and the geochemistry of the parameters to be modified. Generally, high-permeability formations require less time (i.e., several days) than low-permeability formations (i.e., several weeks).

3.4.2.2 Development Documentation

Monitoring well development must be thoroughly documented to verify that foreign materials have been removed, formation water is being sampled, and turbidity has reached acceptable levels or stabilized.

The following data should be recorded before and during well development:

1. Date and duration of development.
2. Water level from the marked measuring point on the top of casing before and 24 hours after well development.
3. Depth from top of well casing to the top of any sediment present in the well before, during, and after sampling.
4. Types and quantity of drilling fluids introduced during drilling and development.
5. Field measurements (e.g., turbidity, specific conductance, pH, dissolved oxygen, temperature) taken before, during, and after well development.
6. Volume and physical characteristics of developed water (e.g., odor, color, clarity, and particulate matter).
7. Type and capacity of pump and/or bailer used and pumping rates.
8. Detailed description of all development methods used.

3.4.3 Monitoring Well Water Level Measurement and Sampling Analysis

Groundwater sampling methods used at the Site are designed to obtain samples as representative of in situ groundwater quality as possible. Anchor QEA will collect groundwater level measurements and groundwater samples from the installed wells no sooner than 24 hours after development. Groundwater samples from monitoring wells will be collected using a peristaltic pump with dedicated polyethylene tubing at each well location and in accordance with low-flow groundwater purging and sampling methodology. Sample collection and handling will be consistent with procedures described in Section 5. The monitoring wells will be measured and sampled using the following procedure:

1. Don the required personal protective equipment as defined in the HASP.
2. Ensure that the sampling area is visible to operational activities and communicate with Site personnel.

3. Check the well for any damage or evidence of tampering and record the observations on the field data sheet.
4. Unlock and open the well monument and remove the well cap.
5. Measure and record the depth to water and record the measurement on the field data sheet. Measure water level from reference point to the nearest 0.01 foot.
6. Attach and secure the polyethylene tubing to the peristaltic pump. Lower the tubing slowly into the well. Set the end of the tubing at approximate middle of the well screen. Be careful not to place the end of the tubing on the bottom of the well because this may disturb any sediment present in the bottom of the well.
7. Start pumping the well by selecting the lowest pump speed. Ideally, the pump rate should equal the well recharge rate with little or no water level drawdown in the well (drawdown shall be 0.3 foot or less).
8. During purging, the ultimate low-flow rate should be from 0.1 to 0.5 liter per minute. Measure the pumping rate using a graduated cylinder and stopwatch or similar device. Record the pumping rate and depth to water on the field data sheet or in the logbook.
9. During purging, monitor the field parameters (temperature, pH, turbidity, ORP, conductivity, and dissolved oxygen) approximately every 3 to 5 minutes. A flow-through cell or similar will be used to monitor the field parameters. Begin measuring field parameters after the flow-through cell has been “flushed” with purged groundwater twice.
10. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings, as follows:
    - ±0.1 for pH
    - ±3 percent for conductivity
    - ±10 percent for dissolved oxygen
    - ±10 percent for turbidity
    - ±10 mV for ORP
11. The tubing must not be removed from the well between purging and sampling.
12. If the recharge rate of the well is very low, do not purge the well dry. The water level in the well should stay above the level of the tubing inlet to prevent air entrainment. If air bubbles are observed in the purge stream, lower the flow rate. If

air bubbles are still observed, turn off the pump and allow the well to recover before sampling.

13. Once the field parameters have stabilized, collect the samples directly from the end of the tubing. Volatiles and analyses that degrade by aeration must be collected first. The bottles should be preserved and filled according to the procedures specified in the QAPP.
14. Fill all sample bottles by allowing the pump discharge to flow gently down the inside of the bottle with minimal turbulence. For VOCs, fill each pre-preserved container with sample to just overflowing so that no air bubbles are entrapped inside. Cap each bottle as it is filled. For polycyclic aromatic hydrocarbons (PAHs), fill each 1-liter amber bottle to nearly the top and cap thereafter. Samples collected for dissolved metals analysis will be field-filtered during collection, using disposable 0.45-micron in-line filters. The filters will be attached directly to the peristaltic pump discharge tubing and each in-line filter will be used only once. Fill one 500-milliliter (ml) high density polyethylene (HDPE) bottle to nearly the top and cap thereafter.
15. Once container filling is completed, label each sample (if not pre-labeled) and record each on the COC form. Sample labels should be smudge-proof or covered with transparent tape. Place sample containers into a sealable plastic bag and immediately put into an iced cooler for shipment to the analytical laboratory. Segregate larger bottles with bubble wrap. Ice in coolers must be double-bagged to prevent leakage. Coolers must be packed to the top with bagged ice to prevent warming and bottle breakage.
16. Disconnect the tubing from the pump and dispose of it. The tubing will be dedicated to each well.
17. After sampling is complete, measure the total depth of the well.
18. Close and lock the well.
19. Decontaminate sampling equipment.

All groundwater sample collection activities will be conducted at low tide, and groundwater samples will be immediately submitted for analytical testing, according to the analytical methods and reporting limits presented in the QAPP (Appendix B to the Supplemental RI Work Plan). Additionally, water level measurements in each well will be collected and evaluated to determine groundwater flow gradients toward the LDW during the low tide periods when the wells are sampled.

Duplicate groundwater samples will be collected by filling an identical set of sampling containers simultaneously from the sampling device. Groundwater samples collected for volatile analysis will be placed in 40-ml volatile organic analyte vials with no headspace. Agitation will be minimized during sampling to reduce potential losses of volatile constituents. Trip blanks will be carried for each cooler used to transport groundwater samples for volatile organic analysis to the laboratory. Trip blanks will be prepared by the laboratory by filling representative glassware with known deionized water. Laboratory MDLs, LODs, and LOQs for all groundwater parameters are listed in the QAPP (Appendix B to the Supplemental RI Work Plan).

3.5 Seep Reconnaissance and Sampling

Prior to RI field activities, a reconnaissance will be performed during low-tide conditions to check for potential seeps along the eastern shoreline of the Site (see Figure 2). If seeps are identified during low-tide inspection and appear suitable for seep water sampling, the locations of seeps will be described in a field logbook and photographed, and the coordinates will be recorded using a DGPS for follow-up sampling. The area of planned seep reconnaissance is shown on Figure 2.

If discovered, seep water samples will be collected along a majority of the Site's eastern shoreline, which is currently armored with a timber bulkhead adjacent to the former marine railway. Other armored slopes have been constructed along the northern and southern shoreline areas; large rip rap and steeply sloping shoreline in these areas may limit identification of seeps and potential sample collection (see Figure 2).

Seep samples will be collected into sample bottles directly from the point of discharge if possible. If necessary, a peristaltic pump may be used for sample collection. Sample collection will adhere to the groundwater sampling guidelines, where applicable, as outlined in Section 3.4.3. Based on station access, all seep samples will be collected during low-tide conditions. Field parameters will be measured prior to sampling and will include salinity, DO, conductivity, pH, ORP, and turbidity. Seep samples will be analyzed for total and dissolved metals (13 priority pollutant and barium), SVOCs, VOCs, PCB Aroclors, TPH, dioxin/furans, TBT, chromium VI, pesticides, TDS, and TSS, as outlined in Table 2. Samples for dissolved metals analysis will be field filtered. Seep water samples will be immediately submitted for analytical testing, according to the analytical methods and reporting limits presented in the QAPP (Appendix B to the Supplemental RI Work Plan).

3.6 Stormwater and Catch Basin Solids Sampling

Stormwater and catch basin solids sampling will be completed as part of RI activities. Stormwater and catch basin solids will be collected at the final sump prior to overland routing and off-site treatment at the location shown on Figure 3. The proposed sampling intervals and test parameters for stormwater and catch basin solids are outlined in Table 3. The subsequent sections provide details regarding stormwater and catch basin solids collection and processing methods and sample testing design.

3.6.1 Stormwater Sampling Methodology

Stormwater samples will be collected during a maximum of seven qualifying events, as described below, within a 1-year time period. Sampling will be conducted using procedures consistent with Ecology's stormwater sampling guidance (Ecology 2010). Visual inspection will occur at the sampling location during every event. This inspection includes observations for the presence of floating materials, visible sheen, discoloration, turbidity, odor, etc. in the stormwater discharge. Stormwater collection will occur during the first two hours of a storm event that meets the following conditions provided by Ecology:

- Be preceded by at least 24 hours of no more than a trace (0.04 inch) of precipitation.
- Have an intensity of at least 0.15 inch of rainfall over a 5-hour period in a 24-hour period.
- At least 75 percent of the storm event hydrograph, or at least 75 percent of the first 24 hours.

The stormwater sample will be collected from the sump in pre-cleaned sample containers attached to a telescoping pole, if necessary, as follows:

- Open the catch basin using the appropriate safety equipment, exercising care not to drop the grate or cover on hands or feet.

- Sample from above ground.
- Using strong, waterproof tape such as filament strapping tape, attach the sample bottle to a pole long enough to reach the stormwater.
- Each bottle can be fastened to the pole by either holding the bottle against the pole then wrapping tape tightly around the bottom and top of the bottle, or position the bottle horizontally on the pole with the top somewhat higher than the bottom.
- Do not scrape the bottle against the sides of the manhole pipe to avoid extra solids in the sample.
- When collecting the samples, submerge the bottle with the opening into the flow and with the pole downstream of the bottle.
- If the station proves difficult for sampling by the above-mentioned methods, methods of filling other appropriately clean containers may be used. These methods may include the use of pumps, open containers on lines, niskin type sampling devices, etc.
- Chill samples immediately by placing in a cooler with sealed ice bags or blue ice and maintain at 4 degrees centigrade (°C) or less without freezing.
- Transport or ship samples via courier to the laboratory following the COC procedures listed in Section 5.1.

Field measurements will include DO, temperature, pH, ORP, conductivity, and turbidity. Laboratory analyses will include total and dissolved metals (13 priority pollutant and barium), SVOCs, VOCs, PCB Aroclors, TPH (including gasoline, diesel, and oil range), TBT, and dioxins/furans, as outlined in Table 3. Field screening for stormwater samples will include sheen testing and PID air monitoring.

3.6.2 Catch Basin Solids Sampling Methodology

A catch basin solids sample will be collected from the sump when there is no precipitation or accumulated water in order to support collection of all grain sizes present in the catch basin. If standing water is present, an effort will be made to prevent mobilization of the solids while collecting the sample. Sample collection and handling will be consistent with procedures described below and in Section 5. Catch basin solids will be sampled as follows:

- Open the catch basin using the appropriate safety equipment, exercising care not to drop the grate or cover on hands or feet.

- Sample from above ground.
- Using strong, waterproof tape such as filament strapping tape, attach the decontaminated stainless steel instrument to a pole long enough to reach the catch basin solids.
- Do not scrape the instrument along the sides of the pipe in order to prevent…
- Place the stormwater solids sample in a decontaminated stainless steel bowl, homogenize, and place into pre-cleaned, laboratory-supplied sample jars.
- Chill samples immediately by placing in a cooler with sealed ice bags or blue ice and maintain at 4°C or below without freezing.
- Transport or ship samples via courier to the laboratory following the COC procedures listed in Section 5.1.

Laboratory analyses will include the 13 priority pollutant metals and barium, SVOCs, VOCs, PCB Aroclors, TPH (including gasoline, diesel, and oil range), TBT, dioxins/furans, chromium VI, TS, total organic carbon (TOC), and grain size (GS), as outlined in Table 3. Field screening for the catch basin solids sample will include sheen testing and PID air monitoring.

3.6.3 UST and Septic Tank Investigation

To address data gaps identified by Ecology in the December 5, 2012 comment letter (Appendix C to the Supplemental RI Work Plan), an investigation will be conducted to locate, if possible, a historical underground septic tank that might be buried near the southern DSI property boundary (Figure 2), as well as any other historical USTs that might be remaining in the upland areas. Using maps that show the locations of the historical septic tank and other USTs, test pit transects will be excavated in the area of the former tanks to a maximum depth of 4 feet (or to the water table, whichever is encountered first). All field observations, including the coordinates of all exploratory test pits, will be documented in a field log (Attachment 1). If septic and/or USTs are discovered, soil samples will be collected immediately beneath each tank valve/outlet pipe using the backhoe bucket and will be submitted for the analytical testing parameters specified in Table 1. In addition, the dimensions and depth of the any discovered tanks will be documented and the tank(s) will be photographed.

3.7 Field Quality Assurance Samples

Field quality assurance (QA) samples will be used to evaluate the efficiency of field decontamination and processing procedures. Samples will include field equipment rinsate blanks and field duplicates. QA samples will be blind-labeled and preserved as if they are typical samples. QA samples will be clearly identified on the sample collection logs. Analytical results from the blanks and duplicates will facilitate crosschecking of the data. Detection of analytes in blanks may indicate possible contamination introduced by field or laboratory procedures, while field duplicates indicate overall precision in both field and laboratory procedures. All field QA samples will be documented in the field logbook and verified by the QA/quality control (QC) manager or designee. Additional QA sample collection and processing details are discussed in the following sections and are outlined in the QAPP (Appendix B to the Supplemental RI Work Plan).

3.7.1 Equipment Rinsate Blanks

Equipment rinsate blanks will be obtained after non-dedicated sampling equipment is decontaminated and will involve passing deionized organic-free water through the sampling equipment and transferring the water into an appropriate sampling container. Rinsate blanks will not be collected if single-use or dedicated equipment (e.g., tubing) is used for sampling. Rinsate blanks will be analyzed to determine whether decontamination of sampling equipment is adequate. One equipment rinsate blank will be collected with non-dedicated equipment or, at a minimum, one equipment rinsate blank will be collected for each sampling event. Additional QA/QC sample collection and processing details are outlined in Table 2 of the QAPP (Appendix B to the Supplemental RI Work Plan).

3.7.2 Field Duplicates

Duplicate soil, groundwater, stormwater, and sediment samples will be collected to check the precision of the field sampling and analytical procedures. During each sampling event, at least one blind duplicate sample will be taken from one sampling point at the same time as the regular sample. For soil and sediment, a split sample will be collected from the same homogenized sample interval. For groundwater and stormwater, duplicate samples will be obtained by alternately filling like sample bottles for the two sample sets (original and duplicate). For the above media, one field duplicate sample will be collected for every 20 samples collected. Additional QA/QC sample collection and processing details are outlined in Table 2 of the QAPP (Appendix B to the Supplemental RI Work Plan).

4 SEDIMENT SAMPLE COLLECTION AND PROCESSING

4.1 Sample Station Identification and Locating

Figure 4 presents the proposed surface and subsurface sediment sampling locations. Tables 4, 5, and 6 summarize the sediment sampling design including sample nomenclature for each sampling interval. The sediment sample nomenclature is described below.

Each sample will be assigned a unique alphanumeric identifier according to the following method:

- For Marine Railway Stations, each station ID will be identified by DSI Marine Railway (DSIMR)-Sample Method-Sample Number:
  - Sample method will be identified by two letters: SS for surface sediment, or SB for subsurface sediment
  - Sample number will be in order of sampling locations beginning with -01
- For Lower Duwamish Waterway (LDW) Stations, each station ID will be identified by DSI Phase 2 (DSIP2)-Sample Method-Sample Number:
  - Sample method will be identified by two letters: SS for surface sediment, or SB for subsurface sediment
  - Sample number will be in order of sampling locations beginning with -01
- Subsurface sediment sample IDs will have the depth interval (in feet) below mudline surface added after the sample number (e.g., 1-2)
- Example sample identification nomenclature includes:
  - DSIMR-SS-01: Surface sediment sample collected from the first location in the Marine Railway area
  - DSIMR-SB-01-1-2: Subsurface sediment sample collected from the Marine Railway at a depth interval of 1 to 2 feet below mudline
  - DSIP2-SS-01: Surface sediment sample collected from the first location in the LDW
  - DSIP2-SB-01-1-2: Subsurface sediment sample collected from the LDW at a depth interval of 1 to 2 feet below mudline

- A field duplicate collected from a sample will be identified by the addition of 50 to the sample number. A duplicate sample of the above first example would be DSIMR-SS-51.
- For rinsate blank samples, RB will be added in front of the sample number. The rinsate blank date in MMDDYYYY format will be added to the end. The resulting nomenclature of a rinsate blank of the decontaminated sample processing equipment after sample collection of the above example collected on August 15, 2013, would be DSIMR-SS-RB01-08152013.

Horizontal positioning will be determined in the field by DGPS based on target coordinates. The target coordinates are provided in Tables 4, 5, and 6. The horizontal datum will be NAD 83, Washington State Plane North. Measured geographical coordinates for station positions will be recorded and reported to the nearest 0.01 second. In addition, state plane coordinates will be reported to the nearest foot. The DGPS accuracy is less than 1 meter and generally less than 30 cm, depending on the satellite coverage and the number of data points collected.

4.2 Sediment Collection and Sampling in the Former Marine Railway Area

Up to five surface and four shallow subsurface sediment samples will be collected beneath the former marine railway area, as shown on Figure 4. Sediment sampling will be conducted to address data gaps identified by Ecology in the December 5, 2012 comment letter (Appendix C to the Supplemental RI Work Plan). In response to Ecology requirements, sediment testing in the former marine railway area will include SMS metals, SVOCs, VOCs, PCB Aroclors, pesticides, bulk/porewater TBT, chromium VI, and dioxins/furans, as outlined in Table 4. Physical testing parameters will include TS, TOC, total volatile solids (TVS), GS, and moisture content (MC). Additional sediment sampling details are outlined in Table 4 and in the following subsections.

4.2.1 Surface Sediment Collection Methods – Former Marine Railway Area

A surficial (0 to 10 cm) sediment sample will be collected from each sampling location shown on Figure 4 using a decontaminated stainless steel hand trowel or other amenable hand sampling device (e.g., a shovel). Hip waders or stainless steel boots may be required to safely access stations, based on seasonal conditions, such as the presence of overlying water. If present, debris beneath the former marine railway structure will be removed to the extent practicable prior to sampling. If surficial debris limits sample collection (e.g., refusal), up to two additional attempts will be made within a 10-foot radius of the target sample location and noted in the field daily log (see Attachment 1). The grab sampler will be decontaminated between stations and rinsed with site water between stations.

After sample collection, the following information will be recorded on the Field Log Sheet, on the Sediment Sampling Form, and/or in the field notebook:

- Date, time, and name of person logging sample
- Weather conditions
- Sample location number and coordinates
- Project designation
- Depth of water at the location
- Sediment penetration and depth
- Sediment sample interval
- Sample recovery
- Physical observations such as apparent grain size, wood debris, color, odor, density, layering, anoxic contact, and presence of sheen, shells, or other debris

4.2.2 Surface Sediment Sample Processing – Former Marine Railway Area

Homogenized surface sediment will be spooned immediately into appropriate pre-cleaned, pre-labeled sample containers; placed in coolers filled with ice or equivalent; and maintained at 4°C. Debris and materials more than 0.5 inch in diameter will be omitted from sample containers. Surface sediment samples will be submitted for chemical and physical analyses. Sufficient surface sediment quantity will be collected and archived for potential future chemistry analyses. The surface sediment samples will be analyzed for the analytes listed in Table 4. Sample concentrations will be reported down to the lowest laboratory limits available in order to evaluate for potential exceedences of the SMS and the Draft LDW preliminary screening levels. Analytical methods, MDLs, LODs, and LOQs are defined in the QAPP (Appendix B to the Supplemental RI Work Plan). Table 7 presents the sample handling requirements.

In addition to the location information collected in the field, sample logging of bulk sediment not sampled in containers will involve physical characterization in general accordance with the visual-manual description procedure (ASTM D-2488 modified). The information will be recorded on the Sediment Sampling Forms (see Attachment 1). Physical characterization includes the following:

- Grain size distribution
- Density/consistency
- Plasticity
- Color and moisture content
- Biological structures (e.g., shells, tubes, and bioturbation)
- Presence of debris and quantitative estimate (e.g., wood chips or fibers, paint chips, concrete, sand blast grit, and metal debris)
- Presence of oily sheen
- Odor (e.g., hydrogen sulfide)

Surface sediment samples collected for chemical and physical analysis will be securely packed and hand delivered to Analytical Resources, Inc. (ARI) in Tukwila, Washington. Archived samples will be held at the laboratory.

4.3 Subsurface Sediment Collection and Sampling – Former Marine Railway Area

A hand corer or hand auger will be used for shallow subsurface sampling in the former marine railway area. Sampling in the former marine railway area is subject to accessibility and the ability to successfully penetrate manual coring devices into the subsurface. Selective sets of core samples will be co-located with surface sediment samples and analyzed throughout the study area. Figure 4 shows the proposed subsurface sampling locations. Subsurface sampling will be performed consistent with the methods described below.

4.3.1 Subsurface Sediment Collection Methods – Former Marine Railway Area

All subsurface sediment samples will be collected using a 3-foot long, 2-inch diameter hand corer or amenable device. For each subsurface sediment station, the hand corer will be advanced 3 feet at a time to the depth practicable.

Subsurface sediment samples will be collected in the following manner:

1. Once on station, the hand corer will be manually driven by pushing or using a slide hammer.
2. The hand corer will be advanced 3 feet at a time to the depth practicable.
3. A continuous 3-foot long intact core sample, retained in the sampling device by stainless steel “teeth”, will then be carefully extracted and the PVC inner casing will be removed from the device and capped on both ends for processing.
4. The depth of core penetration will be measured and recorded.

Anchor QEA personnel will record field conditions and drive notes on a standard core log (see Attachment 1). Logs will include the following information:

- Location of each station as determined by DGPS
- Date and time of collection of each sediment sample
- Names of field personnel collecting and handling the samples
- Observations made during sample collection, including weather conditions, complications, debris encountered, and other details associated with the sampling effort
- The sample station identification
- Length and depth intervals of each core section and estimated recovery for each sediment sample as measured from the mudline
- Qualitative notation of apparent resistance of sediment column to coring (how the core drove)
- Any deviation from the approved SAP

4.3.2 Subsurface Sediment Processing Methods – Former Marine Railway Area

Subsurface sediment will be processed on station or along the Site's shoreline. When processed, the core will be cut from the sampling core tube or extruded from the hand auger. Prior to sampling, Anchor QEA field staff will collect color photographs. Field staff also will record a sediment description of each core on a standard core processing log (see Attachment 1). The following parameters will be noted:

- Sample recovery
- Physical soil description in accordance with ASTM procedures (ASTM D 2488 and ASTM D 2487 – Unified Soil Classification System) including soil type, density and consistency of soil, and color
- Odor (e.g., hydrogen sulfide and petroleum)
- Visual stratification, structure and texture
- Vegetation and debris (e.g., wood chips or fibers, paint chips, concrete, sand blast grit, and metal debris)
- Biological activity (e.g., detritus, shells, tubes, bioturbation, and live or dead organisms)
- Presence of oil sheen

Sediment will be sampled every two feet below the mudline to the depth practicable. Field observations such as color, odor, and anthropogenic material (e.g., blasting grit) may also be used to identify/adjust sample intervals. If there is not enough sediment to sample within a discrete observed contaminated interval, an additional core will be collected. A sample from the observed contaminated interval in the additional core will be homogenized with the material from the first core in order to obtain adequate sample volume for analysis.

Discrete samples will be taken directly from the selected depth interval and spooned into a stainless steel bowl for homogenization and then into laboratory-supplied jars. Sample intervals will not exceed 2 feet in order to ensure that discrete sections are sampled. Table 4 presents the subsurface sediment sampling details including sample nomenclature, depth interval and planned analyses. Samples will be placed in a decontaminated stainless steel bowl and mixed using a decontaminated stainless steel mixing spoon. The sediment will be mixed until homogenous in color and texture and then spooned into laboratory-supplied jars for analyses. A COC form will be logged by the processing staff and relinquished to the laboratory staff (see Attachment 1). Sample concentrations will be reported down to the lowest laboratory limits available in order to evaluate for potential exceedences of the SMS and the Draft LDW preliminary screening levels. Analytical methods, MDLs, LODs, and LOQs are defined in the QAPP (Appendix B to the Supplemental RI Work Plan). Table 7 presents the sample handling requirements.

4.4 Surface Sediment Collection and Sampling: LDW Locations

Surface sediment collection at locations in the LDW will be performed using Van Veen grab methodology. Surface sediment sampling in the LDW will be conducted to address data gaps identified by Ecology in the December 5, 2012 comment letter (Appendix C to the Supplemental RI Work Plan).

4.4.1 Surface Sediment Collection Methods - LDW Locations

Surface sediment samples collected for nature and extent testing will be collected from the 0 to 10 cm biologically active zone at locations in the LDW, as presented on Figure 4. There will be approximately 14 surface sediment sample locations. Additional surface sediment samples may be collected when field observations note the presence of paint chips, sawdust, mill shavings, sand blast grit, or other materials in the sediment at the edge of the proposed sampling plan area.

A hydraulic Van Veen grab sampling device will be used to collect surface sediment samples in the project area. Final sampling methodology in the LDW will depend on access and water level. Van Veen sampling locations will be approached at slow boat speeds with minimal wake to minimize disturbance of bottom sediments prior to sampling. Sediment samples will be handled carefully to minimize disturbance during collection and transportation to the laboratory.

The grab sampler will be lowered over the side of the boat from a cable wire at an approximate speed of 0.3 foot per second. When the sampler reaches the mudline, the cable will be drawn taut and DGPS measurements recorded. Each surface grab sample will be retrieved aboard the vessel and evaluated for the following acceptance criteria:

- Overlying water is present and has low turbidity
- Adequate penetration depth is achieved
- Sampler is not overfilled
- Sediment surface is undisturbed
- No signs of winnowing or leaking from sampling device

Grab samples not meeting these criteria will be rejected near the location of sample collection. The process will be repeated until criteria have been met. Deployments will be repeated within a 20-foot radius of the proposed sample location. If adequate penetration is not achieved after multiple attempts, less volume will be accepted and noted in the field notebook. Once accepted, overlying water will be siphoned off and a decontaminated stainless steel trowel, spoon or equivalent will be used to collect only the upper 10 cm of sediment from inside the sampler without touching the sidewalls. The sampler will be decontaminated between stations and rinsed with site water between grabs.

After sample collection, the following information will be recorded on the Field Log Sheet, on the Sediment Sampling Form, and/or in the field notebook:

- Date, time and name of person logging sample
- Weather conditions
- Sample location number and coordinates
- Project designation
- Depth of water at the location and surface elevation
- Sediment penetration and depth
- Sediment sample interval
- Sample recovery
- Physical observations such as apparent grain size, wood debris, color, odor, density, layering, anoxic contact, and presence of sheen, shells, or other debris

4.4.2 Surface Sediment Sample Processing - LDW Locations

Homogenized surface sediment will be spooned immediately into appropriate pre-cleaned, pre-labeled sample containers, placed in coolers filled with ice or equivalent, and maintained at 4°C. Debris and materials more than 0.5 inch in diameter will be omitted from sample containers. Surface sediment samples will be submitted for chemical and physical analyses. Sufficient surface sediment quantity will be collected and archived for potential future chemistry analyses. Surface sediment samples will be analyzed for parameters listed in Table 5. Sample concentrations will be reported down to the lowest laboratory limit available in order to evaluate for potential exceedences of the SMS and the Draft LDW preliminary screening levels. Analytical methods, MDLs, LODs, and LOQs are defined in the QAPP (Appendix B to the Supplemental RI Work Plan). Table 7 presents the sample handling requirements.

In addition to the location information collected in the field, sample logging of bulk sediment not sampled in containers will involve physical characterization in general accordance with the visual-manual description procedure (ASTM D-2488 modified). The information will be recorded on the Sediment Sampling Forms (see Attachment 1). Physical characterization includes the following:

- Grain size distribution
- Density/consistency
- Plasticity
- Color and moisture content
- Biological structures (e.g., shells, tubes, macrophytes, and bioturbation)
- Presence of debris and quantitative estimate (e.g., wood chips or fibers, paint chips, concrete, sand blast grit, and metal debris)
- Presence of oily sheen
- Odor (e.g., hydrogen sulfide)

Surface sediment samples collected for chemical and physical analysis will be securely packed and hand delivered to ARI in Tukwila, Washington. Archived samples will be held at the laboratory.

4.5 Subsurface Sediment Collection and Sampling: LDW Locations

Subsurface sediment sampling will be carried out by vibratory core sampler (vibracore) to collect chemical and physical data to fill data gaps required by Ecology in the December 5, 2012 comment letter (Appendix C to the Supplemental RI Work Plan). Approximately 14 subsurface core sampling locations will be co-located with surface sediment sampling locations throughout the Aquatic Areas of the Site. Figure 4 shows the proposed subsurface sampling locations. Additional subsurface samples may be added when field observations note observed paint chips, sawdust, mill shavings, sand blast grit, or other materials in the sediment at the edge of the proposed sampling plan area.

The subsequent sections provide details regarding vibracore collection methods, vibracore processing methods, and the sampling design plan.

4.5.1 Subsurface Sediment Collection Methods - LDW Locations

All LDW subsurface sediment stations will be collected by vibracore. A vibracore collects a continuous profile of subsurface sediments by utilizing a high frequency vibrating coring device that penetrates into the underlying sediments with minimal distortion. A vibracore is ideal for collecting long, relatively undisturbed cores from a variety of sediment types. Subsurface sediment sampling by vibracore will be advanced up to 15 feet.

Prior to deployment, the following procedure will be used to decontaminate sample tubes:

- Rinse and pre-clean with potable water
- Wash and scrub the tubes in a solution of laboratory grade, non-phosphate-based soap and potable water
- Rinse with potable water
- Rinse three times with distilled water
- Seal both ends of each core tube with aluminum foil

The aluminum foil will be removed immediately prior to placement into the coring device. Care will be taken during sampling to avoid contact of the sample tube with potentially contaminated surfaces.

Vibracore sediment samples will be collected in the following manner:

1. The vessel will maneuver to the proposed sample location.
2. A decontaminated core tube the length of the desired penetration depth will be secured to the vibratory assembly and deployed from the vessel.
3. The cable umbilical to the vibrator assembly will be drawn taut and perpendicular, as the core rests on the bottom sediment.
4. The location of the umbilical hoist will be measured and recorded by the location control personnel, and depth to sediment will be measured with a survey tape attached to the head assembly.
5. A 4-inch-diameter, thin-walled, aluminum tube will be vibratory-driven into the sediment using two counter-rotating vibrating heads.
6. A continuous core sample will be collected to the designated coring depth or until refusal.
7. The depth of core penetration will be measured and recorded.
8. The vibrator will be turned off and the core barrel will be extracted from the sediment using the winch.
9. While suspended from the A-frame, the assembly and core barrel will be sprayed off and then placed on the vessel deck.
10. The core sample will be evaluated at the visible ends of the core tube and the length of recovered sediment will be recorded. If accepted, the core tube will be sectioned into 4-foot to 6.5-foot lengths.

Acceptance criteria for sediment core samples are as follows:

- Overlying water is present and the surface is intact
- The core tube appears intact without obstruction or blocking
- Recovery is greater than 75 percent of drive length

If sample acceptance criteria are not achieved, the sample will be rejected unless modified acceptance criteria are approved by the FC.

Anchor QEA personnel will record field conditions and drive notes on a standard core log (see Attachment 1). Logs will include the following information:

- Water depth at each station sampling using lead-line at point of sampling station
- Location of each station as determined by DGPS
- Date and time of collection of each sediment core sample
- Names of field personnel collecting and handling the samples
- Observations made during sample collection, including weather conditions, complications, ship traffic, and other details associated with the sampling effort
- The sample station identification
- Length and depth intervals of each core section and estimated recovery for each sediment sample as measured from mean lower low water
- Qualitative notation of apparent resistance of sediment column to coring (how the core drove)
- Any deviation from the approved SAP

Once the core samples are deemed acceptable, the cutterhead will be removed and a cap will be placed over the end of the tube and secured firmly in place with duct tape. The core tube will then be removed from the sampler, and the other end of the core will be capped and taped. The core tube will be labeled with permanent black pen and scribed with the location ID and an arrow pointing to the top of core. The cores will then be cut into appropriate lengths for transport to the laboratory for processing. Cores will be cut to a maximum length of 5 feet. The cores will be sealed tightly enough to prevent leakage or disturbance during transport to the processing station. Cores will be transported daily to the on-site processing area. A COC form (see Attachment 1) will be logged by Anchor QEA field staff and maintained by staff at the processing area.

4.5.2 Subsurface Sediment Processing Methods - LDW Locations

The vibracore processing station will most likely be located at the Site. Alternatively, the processing station may be located at the analytical laboratory. Transported cores will be handled consistent with ASTM procedures (ASTM D 4220) and stored upright and cool until processed. When processed, the core caps will be removed and the core will be cut longitudinally using a circular saw. The core will be split with decontaminated stainless steel wire core splitters or spatulas into two halves for sampling.

Prior to sampling, Anchor QEA field staff will collect color photographs. Field staff also will record a sediment description of each core on a standard core processing log (see Attachment 1). The following parameters will be noted:

- Sample recovery
- Physical soil description in accordance with ASTM procedures (ASTM D 2488 and ASTM D 2487 – Unified Soil Classification System) including soil type, density/consistency of soil, and color
- Odor (e.g., hydrogen sulfide and petroleum)
- Visual stratification, structure and texture
- Vegetation and debris (e.g., wood chips or fibers, paint chips, concrete, sand blast grit, and metal debris)
- Biological activity (e.g., detritus, shells, tubes, bioturbation, and live or dead organisms)
- Presence of oil sheen

All cores will be fully logged, photographed, and sampled from discrete 2-foot depth intervals based on lithology or the observation of sediment impacts. Field observations such as color, odor, and anthropogenic material (e.g., blasting grit) will be used to identify sample intervals. If there is not enough sediment to sample within a discrete observed contaminated interval, an additional core will be collected. A sample from the observed contaminated interval in the additional core will be homogenized with the material from the first core in order to obtain adequate sample volume for analysis.

Discrete samples will be taken directly from the selected depth interval and spooned into a stainless steel bowl for homogenization and then into laboratory-supplied jars. Sample intervals will not exceed 2 feet in order to ensure that discrete sections are sampled (see Figure 4). Table 6 presents the subsurface sediment sampling details including sample nomenclature, depth interval and planned analyses. Samples will be placed in a decontaminated stainless steel bowl and mixed using a decontaminated stainless steel mixing spoon. The sediment will be mixed until homogenous in color and texture and then spooned into laboratory-supplied jars for analyses. A COC form will be logged by the processing staff and relinquished to the laboratory staff (see Attachment 1). Subsurface sediment testing will include the parameters listed in Table 6. Sample concentrations will be reported down to the lowest laboratory limits available in order to evaluate for potential exceedences of the SMS and the Draft LDW preliminary screening levels. Analytical methods, MDLs, LODs, and LOQs are defined in the QAPP (Appendix B to the Supplemental RI Work Plan). Table 7 presents the sample handling requirements.

5 SAMPLE HANDLING PROCEDURES

This section addresses the sampling program requirements for maintaining custody of the samples throughout the sample collection and shipping process. It also provides specific procedures for sample shipping.

5.1 Sample Custody Procedures

Samples are considered to be in one's custody if they are: 1) in the custodian's possession or view; 2) in a secured location (under lock) with restricted access; or 3) in a container that is secured with an official seal such that the sample cannot be reached without breaking the seal.

COC procedures will be followed for all samples throughout the collection, handling, and analysis process. The principal document used to track possession and transfer of samples is the COC form (see Attachment 1). Each sample will be represented on a COC form the day it is collected. All data entries will be made using indelible ink pen. Corrections will be made by drawing a single line through the error, writing in the correct information, then dating and initialing the change. Blank lines and spaces on the COC form will be lined-out and dated and initialed by the individual maintaining custody.

A COC form will accompany each cooler of samples to the analytical laboratories. Each person who has custody of the samples will sign the COC form and ensure that the samples are not left unattended unless properly secured. Copies of all COC forms will be retained in the project files.

5.2 Sample Shipping and Receipt Requirements

All samples will be shipped or hand-delivered to the analytical laboratory no later than the day after collection. If samples are collected on Friday, they may be held until the following Monday for shipment, provided that this does not adversely impact holding time requirements. Specific sample shipping procedures are as follows:

- Each cooler or container containing the samples for analysis will be shipped via overnight delivery to the appropriate analytical laboratory. In the event that

Saturday delivery is required, the FC will contact the analytical laboratory before 3 p.m. on Friday to ensure that the laboratory is aware of the number of coolers shipped and the airbill tracking numbers for those coolers. Following each shipment, the FC will call the laboratory and verify that the shipment from the day before has been received and is in good condition.

- Coolant ice will be sealed in separate double plastic bags and placed in the shipping containers.
- Individual sample containers will be placed in a sealable plastic bag, packed to prevent breakage and transported in a sealed ice chest or other suitable container.
- Glass jars will be separated in the shipping container by shock absorbent material (i.e., bubble wrap) to prevent breakage.
- The shipping containers will be clearly labeled with sufficient information (name of project, time and date container was sealed, person sealing the container, and consultant's office name and address) to enable positive identification.
- The shipping waybill number will be documented on all COC forms accompanying the samples.
- A sealed envelope containing COC forms will be enclosed in a plastic bag and taped to the inside lid of the cooler.
- A minimum of two signed and dated COC seals will be placed on adjacent sides of each cooler prior to shipping.
- Each cooler will be wrapped securely with strapping tape, labeled "Glass – Fragile" and "This End Up." In addition, each cooler will be clearly labeled with the laboratory's shipping address and the consultant's return address.

Upon transfer of sample possession to the analytical laboratory, the persons transferring custody of the sample container will sign the COC form. Upon receipt of samples at the laboratory, the shipping container seal will be broken and the receiver will record the condition of the samples on a sample receipt form. COC forms will be used internally in the laboratory to track sample handling and final disposition.

5.3 Field Equipment Decontamination

Sample containers, instruments, working surfaces, technician protective gear, and other items that may come into contact with sediment sample material must meet high standards of cleanliness. All equipment and instruments used that are in direct contact with the sediment collected for analysis must be made of glass, stainless steel, or HDPE. These items will be cleaned prior to each day's use and between sampling or compositing events. Decontamination of all items will follow PSEP protocols. The decontamination procedure is:

1. Pre-wash rinse with tap water.
2. Wash with solution of warm tap water and Alconox soap (brush).
3. Rinse with warm tap water.
4. First rinse with distilled water.
5. Rinse three additional times with distilled water.
6. Cover (no contact) all decontaminated items with aluminum foil.
7. Store in clean, closed container for next use.

5.4 Investigation Derived Waste Management

All soil cuttings obtained from the geoprobe and hollow-stem auger collection activities will be disposed of in 55-gallon drums and consolidated. Sediment remaining after sample processing and sampling will be consolidated with the soil cuttings. Purge water from groundwater wells will be collected on site in 55-gallon drums or other suitable containers selected by the FC. Both solids (soil and sediment) and purge water 55-gallon drums will be located in a secure area and appropriately labeled. After the completion of all RI field sampling activities, the 55-gallon drums will be transported for appropriate disposal. Composite sampling of soil and sediment investigation derived waste will be performed to obtain representative data for solids disposal profiling.

All disposable sampling materials and personal protective equipment used in sample processing, such as disposable coveralls, gloves, and paper towels, will be placed in heavy-duty garbage bags or other appropriate containers. Disposable supplies will be placed in a normal refuse container for disposal as solid waste.

6 CHEMICAL AND PHYSICAL ANALYTICAL TESTING

This section summarizes the target physical and chemical analyses for the various media sampled. All sample analyses will be conducted in accordance with Ecology-approved methods and the QAPP (Appendix B to the Supplemental RI Work Plan). Prior to analysis, all samples will be maintained according to the appropriate holding times and temperatures for each analysis (Table 7). The analytical laboratory will prepare a detailed report in accordance with the QAPP (Appendix B to the Supplemental RI Work Plan).

Prior to the analysis of the samples, the laboratory will calculate method detection limits for each analyte of interest, where applicable. MDLs, LODs, and LOQs are specified in the QAPP (Appendix B to the Supplemental RI Work Plan). To achieve the required detection and quantitation limits, some modifications to the methods may be necessary. These modifications from the specified analytical methods will be provided by the laboratory at the time of establishing the laboratory contract. The modifications must be approved by Ecology prior to implementation.

With the exception of metals and conventionals, detected results will be reported down to the instrument verified LOD. The laboratory should provide the LOD for each analyte in the lab report and/or electronic data deliverable, when possible. Reported values between the LOD and LOQ will be qualified with a "J". Non-detects should be reported at the lowest calibration level (typically the LOQ) or LOD.

Chemical and physical testing will be conducted at ARI, located in Tukwila, Washington. ARI is an Ecology-accredited laboratory and is also accredited under the National Environmental Laboratories Accreditation Program (NELAP). All chemical and physical testing will adhere to the most recent PSEP QA/QC procedures (PSEP 1997b) and PSEP analysis protocols. If more current analytical methods are available, the laboratory will use them.

In completing chemical analyses for this project, the contract laboratory is expected to meet the following minimum requirements:

- Adhere to the methods outlined in the QAPP (Appendix B to the Supplemental RI Work Plan)
- Deliver PDF, hard copy, and electronic data as specified
- Meet reporting requirements for deliverables
- Meet turnaround times for deliverables
- Implement QA/QC procedures discussed in the QAPP including DQOs, laboratory quality control requirements, and performance evaluation testing requirements
- Notify the project QA/QC Manager of any QAPP QA/QC problems when they are identified to allow for quick resolution
- Allow laboratory and data audits to be performed, if deemed necessary

7 REFERENCES

Aller, L., T.W. Bennet, G. Hackett, R.J. Petty, J.H. Lehr, H. Sedoris, D.M. Nielsen, and J.E. Denne, 1989. Handbook of Suggested Practices for the Design and Installation of Ground-water Monitoring Wells: Technology Support Center, Environmental Monitoring Systems Laboratory, EPA600/4-89/034, United States Environmental Protection Agency.

Anchor QEA. 2010. Agreed Order Remedial Investigation and Feasibility Study (RI/FS) Work Plan. Prepared for Duwamish Shipyard, Inc., Seattle, Washington. August 2010.

Anchor QEA, 2013 (in preparation) Health and Safety Plan - Duwamish Shipyard, Inc. Prepared for the Washington State Department of Ecology on behalf of Duwamish Shipyard, Inc. Seattle, WA. Prepared by Anchor QEA. March 2013.

Driscoll, Fletcher F, 1986. Groundwater and Wells, 2nd Edition, Johnson Division, St. Paul, Minnesota.

Ecology, 2007. Model Toxics Control Act Regulations: Chapter 173-340 WAC. October 12, 2007.

Ecology, 2008. Sediment Sampling and Analysis Plan Appendix. Ecology Publication No. 03-09-043. Sediment Source Control Standards User Manual, Washington Department of Ecology Sediment Management Unit. Revised February 2008.

Ecology 2010. How to do Stormwater Sampling: A Guide for Industrial Facilities. Ecology Publication 02-10-071. Washington Department of Ecology Water Quality Program. Revised March 2010.

PSEP (Puget Sound Estuary Program), 1986. Recommended protocols for measuring conventional sediment variables in Puget Sound. Prepared for the U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

PSEP, 1997a. Puget Sound Estuary Program: Recommended Guidelines for Sampling Marine Sediment, Water Column, and Tissue in Puget Sound. Prepared for the U.S. Environmental Protection Agency Region 10, and the Puget Sound Water Quality Authority. Puget Sound Water Quality Authority, Olympia, Washington.

PSEP, 1997b. Puget Sound Estuary Program: Recommended Guidelines for Measuring Organic Compounds in Puget Sound Sediment and Tissue Samples. Prepared for the U.S. Environmental Protection Agency Region 10, and the Puget Sound Water Quality Authority. Puget Sound Water Quality Authority, Olympia, Washington.

PSEP, 1997c. Puget Sound Estuary Program: Recommended Protocols for Measuring Metals in Puget Sound Sediment and Tissue Samples. Prepared for the U.S. Environmental Protection Agency Region 10, and the Puget Sound Water Quality Authority. Puget Sound Water Quality Authority, Olympia, Washington.

Puls, R.W., J.H. Eychaner, and R.M. Powell, 1990. Colloidal-Facilitated Transport of Inorganic Contaminants in Ground Water: Part I, Sampling Considerations, Environmental Research Brief, USEPA, EPA/600/M-90/023.

USEPA (U.S. Environmental Protection Agency), 1986. Test Methods for the Evaluation of Solid Waste: Physical/Chemical Methods, 3rd Edition. EPA SW-846, 1986.

USEPA, 1993. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods – 3rd Edition, Update 4A. EPA SW-846, August 1993.

TABLES

Table 1
Soil Sampling Design

Station ID	Proposed Coordinates[1,2] Easting (X)	Proposed Coordinates[1,2] Northing (Y)	Sample Method	Target Sampling Intervals[3,4]	Sample ID	Soil Testing: Chemistry[5]	Soil Testing: Physical[6,7]	Soil Testing: Archive	Convert to Monitoring Well
Rail Spur Area									
DSIP2-02	1267556.90	204459.26	Geoprobe	Upper Fill (approx. 0-2 ft bgs) Middle Fill (approx. 3-5 ft bgs) Lower Fill (approx. 7-9 ft bgs) Native Silt/Sand (approx. 10-12 ft bgs)	DSIP2-02-Depth	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT	TS, TOC	Frozen	Yes, shallow
DSIP2-11	1267125.86	204367.43	Geoprobe	See DSIP-02	DSIP2-11-Depth	Metals, SVOCs, TPH, TBT	TS, TOC	Frozen	No
DSIP2-12	1267277.93	204366.24	Geoprobe	See DSIP-02	DSIP2-12-Depth	Metals, SVOCs, TPH, TBT	TS, TOC	Frozen	No
DSIP2-13	1267438.64	204363.83	Geoprobe	See DSIP-02	DSIP2-13-Depth	Metals, SVOCs, TPH, TBT	TS, TOC	Frozen	Yes, shallow
DSIP2-14	1267488.18	204384.34	Geoprobe	See DSIP-02	DSIP2-14-Depth	Metals, SVOCs, VOCs, TBT	TS, TOC	Frozen	No
DSIP2-15	1267515.55	204385.38	Geoprobe	See DSIP-02	DSIP2-15-Depth	Metals, SVOCs, VOCs, TBT	TS, TOC	Frozen	Yes, deep
DSIP2-16	1267554.51	204367.58	Geoprobe	See DSIP-02	DSIP2-16-Depth	Metals, SVOCs, VOCs, TBT	TS, TOC	Frozen	Yes, shallow
Northwest Area									
DSIP2-01	1267564.56	204561.08	Geoprobe	See DSIP-02	DSIP2-01-Depth	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT	TS, TOC	Frozen	No
DSIP2-17	1267456.08	204504.53	Geoprobe	See DSIP-02	DSIP2-17-Depth	Metals, SVOCs, VOCs, TBT	TS, TOC	Frozen	Yes, shallow
DSIP2-18	1267489.39	204597.24	Geoprobe	See DSIP-02	DSIP2-18-Depth	Metals, SVOCs, TBT	TS, TOC	Frozen	No
DSIP2-19	1267517.24	204658.29	Geoprobe	See DSIP-02	DSIP2-19-Depth	Metals, SVOCs, TPH, PCBs, TBT	TS, TOC	Frozen	Yes, shallow
Central Area									
DSIP2-07	1267888.67	204597.40	Geoprobe	See DSIP-02	DSIP2-07-Depth	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, D/F, TBT	TS, TOC	Frozen	No
DSIP2-20	1267597.92	204581.08	Geoprobe	See DSIP-02	DSIP2-20-Depth	Metals, SVOCs, VOCs, PCBs, TPH, TBT	TS, TOC	Frozen	Yes, shallow
DSIP2-21	1267656.78	204483.91	Geoprobe	See DSIP-02	DSIP2-21-Depth	Metals, SVOCs, TBT	TS, TOC	Frozen	No
DSIP2-22	1267689.00	204621.51	Geoprobe	See DSIP-02	DSIP2-22-Depth	Metals, SVOCs, TBT	TS, TOC	Frozen	No
DSIP2-23	1267683.95	204570.44	Geoprobe	See DSIP-02	DSIP2-23-Depth	Metals, SVOCs, VOCs, TBT	TS, TOC	Frozen	Yes, shallow
DSIP2-24	1267774.83	204582.17	Geoprobe	See DSIP-02	DSIP2-24-Depth	Metals, SVOCs, VOCs, TPH, TBT	TS, TOC	Frozen	No
DSIP2-25	1267827.44	204542.82	Geoprobe	See DSIP-02	DSIP2-25-Depth	Metals, SVOCs, VOCs, TPH, TBT	TS, TOC	Frozen	Yes, shallow
DSIP2-26	1267914.04	204542.65	Geoprobe	See DSIP-02	DSIP2-26-Depth	Metals, SVOCs, VOCs, TPH, TBT	TS, TOC	Frozen	No
DSIP2-30	1267714.26	204596.24	Geoprobe	See DSIP-02	DSIP2-30-Depth	Metals, SVOCs, VOCs, TPH, TBT	TS, TOC	Frozen	No
2000 UST Removal Area									
DSIP2-06	1267846.29	204447.05	Geoprobe	See DSIP-02	DSIP2-06-Depth	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT	TS, TOC	Frozen	Yes, shallow
DSIP2-27	1267781.76	204413.21	Geoprobe	See DSIP-02	DSIP2-27-Depth	Metals, SVOCs, VOCs, TPH, TBT	TS, TOC	Frozen	Yes, shallow
DSIP2-31	1267812.42	204513.11	Geoprobe	See DSIP-02	DSIP2-31-Depth	Metals, SVOCs, VOCs, TPH, TBT	TS, TOC	Frozen	No
Former Shipyard Nearshore Area									
DSIP2-08	1268007.47	204591.23	Geoprobe	See DSIP-02	DSIP2-08-Depth	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, D/F, TBT	TS, TOC	Frozen	Yes, deep
DSIP2-09	1268018.54	204342.39	Geoprobe	See DSIP-02	DSIP2-09-Depth	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT, D/F	TS, TOC	Frozen	No

Table 1
Soil Sampling Design

Station ID	Proposed Coordinates[1,2]		Sample Method	Target Sampling Intervals[3,4]	Sample ID	Soil Testing			Convert to Monitoring Well
	Easting (X)	Northing (Y)				Chemistry[5]	Physical[6,7]	Archive	
DSIP2-28	1268003.78	204394.77	Geoprobe	See DSIP-02	DSIP2-28-Depth	Metals, SVOCs, VOCs, TPH, CrVI, TBT, D/F	TS, TOC	Frozen	Yes, shallow
Parcel D Nearshore Area									
DSIP2-10	1267961.27	204280.93	Geoprobe	See DSIP-02	DSIP2-10-Depth	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT, D/F	TS, TOC	Frozen	No
DSIP2-29	1267959.94	204217.75	Geoprobe	See DSIP-02	DSIP2-29-Depth	Metals, SVOCs, VOCs, TPH, CrVI, D/F, TBT	TS, TOC	Frozen	Yes, shallow
South Property Area									
DSIP2-03	1267706.24	204355.03	Geoprobe	See DSIP-02	DSIP2-03-Depth	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT	TS, TOC	Frozen	No
DSIP2-04	1267778.94	204356.83	Geoprobe	See DSIP-02	DSIP2-04-Depth	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT	TS, TOC	Frozen	No
DSIP2-05	1267859.64	204366.38	Geoprobe	See DSIP-02	DSIP2-05-Depth	Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, CrVI, TBT	TS, TOC	Frozen	No
Septic Tank/UST Soils									
DSIP2-ST-01	TBD	TBD	Test Pit	Beneath tank valve/outlet	DSIP2-ST-01-Depth	Metals, SVOCs, VOCs, PCBs, CrVI, TPH, TBT	TS, TOC	Frozen	--

Notes:

1. Coordinates will be determined based on finalization of sampling locations. TBD = to be determined
2. Washington State Plane North, North American Datum of 1983 (NAD 83), U.S. Survey Feet
3. Sample depths are approximate and will depend on lithologic units encountered during sampling. Additional samples may be collected if visual/PID screening suggests the presence of contamination.
4. ft = feet; bgs = below ground surface
5. Chemical testing: TPH = Total Petroleum Hydrocarbons (gasoline, diesel, and oil range), SVOCs = semivolatile organic compounds, VOCs = volatile organic compounds, CrVI = Hexavalent Chromium, Metals = 13 Priority Pollutant Metals [antimony (Sb), arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), selenium (Se), silver (Ag), thallium (Tl), zinc (Zn)] and barium (Ba), PCBs = Polychlorinated Biphenyl Aroclors, TBT = tributyltin, D/F = Dioxins/Furans
6. Physical testing: TS = Total Solids, TOC = Total Organic Carbon
7. Field screening for all samples will include sheen testing and organic vapor evaluation using a photo-ionization detector (PID).

UST Underground storage tank

Table 2
Monitoring Well Installation, Groundwater, and Seep Sampling Design

Station ID	Proposed Coordinates[1,2] Easting (X)	Northing (Y)	Sample Method	Well Diameter	Well Screen Interval[3]	Sample ID[4]	Chemistry[5,6]	Field Parameters[7,8]	New or Existing Monitoring Well[9]
Rail Spur Area									
DSI-MW-01	1267511.08	204376.69	Low Flow	2-Inch	4.6 - 14.5 ft bgs	DSI-MW-01-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	Existing
DSIP2-02	1267556.90	204459.26	Low Flow	2-Inch	5 - 15 ft bgs	DSIP2-02-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
DSIP2-13	1267438.64	204363.83	Low Flow	2-Inch	5 - 15 ft bgs	DSIP2-13-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
DSIP2-15	1267515.55	204385.38	Low Flow	2-Inch	18 - 28 ft bgs	DSIP2-15-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
DSIP2-16	1267554.51	204367.58	Low Flow	2-Inch	5 - 15 ft bgs	DSIP2-16-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
Northwest Area									
DSI-MW-02	1267537.85	204619.49	Low Flow	2-Inch	5.1 - 15 ft bgs	DSI-MW-02-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	Existing
DSIP2-17	1267456.08	204504.53	Low Flow	2-Inch	5 - 15 ft bgs	DSIP2-17-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, TBT Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
DSIP2-19	1267517.24	204658.29	Low Flow	2-Inch	5 - 15 ft bgs	DSIP2-19-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
Central Area									
DSI-MW-03	1267731.36	204467.03	Low Flow	2-Inch	29.9 - 39.8 ft bgs	DSI-MW-02-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	Existing
DSI-PZ-01	1267724.47	204468.59	Low Flow	2-Inch	5 - 14.7 ft bgs	DSI-PZ-01-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	Existing
DSIP2-20	1267597.92	204581.08	Low Flow	2-Inch	5 - 15 ft bgs	DSIP2-20-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Conventionals, TBT	DO, Temp, pH, ORP, Cond, Turbidity	New
DSIP2-23	1267683.95	204570.44	Low Flow	2-Inch	5 - 15 ft bgs	DSIP2-23-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
DSIP2-25	1267827.44	204542.82	Low Flow	2-Inch	5 - 15 ft bgs	DSIP2-25-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, TPH, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
2000 UST Removal Area									
DSI-MW-04	1267894.98	204416.16	Low Flow	2-Inch	4.6 - 14.25 ft bgs	DSI-MW-04-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	Existing
DSIP2-06	1267846.29	204447.05	Low Flow	2-Inch	5 - 15 ft bgs	DSIP2-06-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, TPH, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
DSIP2-27	1267781.76	204413.21	Low Flow	2-Inch	5 - 15 ft bgs	DSIP2-27-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, TPH, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
Former Shipyard Nearshore Area									
DSI-MW-05	1267969.75	204575.21	Low Flow	2-Inch	5.5 - 15.2 ft bgs	DSI-MW-05-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	Existing
DSI-MW-06	1267953.29	204456.31	Low Flow	2-Inch	5.4 - 15.1 ft bgs	DSI-MW-06-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	Existing
DSI-MW-07	1267953.32	204463.39	Low Flow	2-Inch	30.4 - 40 ft bgs	DSI-MW-07-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	Existing
DSI-MW-08	1267967.62	204366.34	Low Flow	2-Inch	5.4 - 15.1 ft bgs	DSI-MW-08-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	Existing
DSIP2-08	1268007.47	204591.23	Low Flow	2-Inch	18 - 28 ft bgs	DSIP2-08-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, TPH, CrVI, TBT, D/F, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
DSIP2-28	1268003.78	204394.77	Low Flow	2-Inch	5 - 15 ft bgs	DSIP2-28-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, TPH, CrVI, TBT, D/F, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
Parcel D Nearshore Area									
DSI-MW-09	1268018.54	204342.39	Low Flow	2-Inch	5.5 - 15.3 ft bgs	DSI-MW-09-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	Existing

Table 2
Monitoring Well Installation, Groundwater, and Seep Sampling Design

Station ID	Proposed Coordinates[1,2]		Sample Method	Well Diameter	Well Screen Interval[3]	Sample ID[4]	Chemistry[5,6]	Field Parameters[7,8]	New or Existing Monitoring Well[9]
	Easting (X)	Northing (Y)							
DSI-MW-10	1267964.60	204275.46	Low Flow	2-Inch	30.9 - 40.7 ft bgs	DSI-MW-10-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	Existing
DSIP2-29	1267959.94	204217.75	Low Flow	2-Inch	5 - 15 ft bgs	DSIP2-29-MW-Date	Total and Dissolved Metals, SVOCs, VOCs, TPH, CrVI, D/F, TBT, Conventionals	DO, Temp, pH, ORP, Cond, Turbidity	New
Seep Water Sample									
DSIP2-SP-01	TBD	TBD	Grab	--	Point of Discharge	DSIP2-SP-01-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, TPH, Pesticides, D/F, TBT, CrVI, TDS, TSS	Salinity, DO, Temp, pH, ORP, Cond, Turbidity	--

Notes:
1. Coordinates will be determined based on finalization of sampling locations; TBD = To be determined
2. Washington State Plane North, North American Datum of 1983 (NAD 83), U.S. Survey Feet
3. ft = feet, bgs = below ground surface; actual screen interval depth will be determined in the field based on lithologic units encountered during well installation.
4. Date format is MMDDYYYY
5. Chemical testing: TPH = Total Petroleum Hydrocarbons (gasoline, diesel, and oil range), SVOCs = Semi-Volatile Organic Compounds, VOCs = Volatile Organic Compounds, CrVI = Hexavalent Chromium, D/F = Dioxins/Furans
Metals = 13 Priority Pollutant Metals [antimony (Sb), arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), selenium (Se), silver (Ag), thallium (Tl), zinc (Zn)] and barium (Ba),
PCBs = Polychlorinated Biphenyl Aroclors, TBT = tributyltin, Conventionals = Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Alkalinity, Ammonia, Dissolved sulfide (H2S), Chloride, Sulfate, Nitrate
6. Samples for dissolved metals analysis will be field filtered
7. Field Parameters: DO = Dissolved Oxygen, Temp = Temperature, ORP = Oxidation Reduction Potential, Cond = Conductivity
8. Field screening for all groundwater and seep samples will include sheen testing and organic vapor evaluation using a photo-ionization detector (PID).
9. All Groundwater monitoring wells will be monitored for four (4) consecutive quarters following RI/FS sampling.

Table 3
Stormwater and Catch Basin Solids Sampling Design

Station ID	Sample Medium	Proposed Coordinates[1,2] Easting (X)	Northing (Y)	Sample Method	Target Sampling Interval[3]	Sample ID[4]	Chemistry[5,6]	Field Parameters[7,8]
DSIP2-STW-01	Stormwater	1267950.56	204461.45	Grab	Within 1 ft of water surface	DSIP2-STW-01-Date	Total and Dissolved Metals, SVOCs, VOCs, PCBs, CrVI, TPH, D/F, TBT	DO, Temp, pH, ORP, Cond, Turbidity
DSIP2-CB-01	Catch Basin Solids	1267954.43	204461.37	Grab	Composite of accumulated sediment thickness	DSIP2-CB-01-Date	Metals, SVOCs, VOCs, PCBs, CrVI, TPH, D/F, TBT, TS, TOC, GS	Field Screening = Sheen Testing and PID Monitoring

Notes:
1. Coordinates will be determined based on finalization of sampling locations.
2. Washington State Plane North, Norht American Datum of 1983 (NAD 83), U.S. Survey Feet
3. ft = foot
4. Date format is MMDDYYYY
5. TPH = Total Petroleum Hydrocarbons (gasoline, diesel, and oil range), SVOCs = semivolatile organic compounds, VOCs = volatile organic compounds, D/F = dioxins/furans
   Metals = 13 Priority Pollutant Metals [antimony (Sb), arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), selenium (Se), silver (Ag), thallium (Tl), zinc (Zn)] and barium (Ba), PCBs = Polychlorinated Biphenyl Aroclors, TBT = tributyltin, TS = total solids, TOC = total organic carbon, GS = grain size
6. Samples for dissolved metals analysis will be field filtered
7. DO = Dissolved Oxygen, Temp = Temperature, ORP = Oxidation Reduction Potential, Cond = Conductivity
8. Field screening for stormwater and catch basin solids samples will include sheen testing and organic vapor evaluation using a photo-ionization detector (PID).

Table 4
Sediment Sampling Design for the Former Marine Railway Area

Station ID	Proposed Coordinates[1,2]		Sample Method	Target Sampling Interval(s)[3,4]	Sample ID	Sediment Testing		Archive
	Easting (X)	Northing (Y)				Chemistry[5]	Physical[6]	
Surface Sediment								
DSIMR-SS-01	1268080.68	204383.20	Grab	0 to 10 cm below mudline	DSIMR-SS-01	SVOCs, VOCs, PCBs, SMS Metals, D/F, Chromium VI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIMR-SS-02	1268080.68	204408.91	Grab	0 to 10 cm below mudline	DSIMR-SS-02	SVOCs, VOCs, PCBs, SMS Metals, D/F, Chromium VI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIMR-SS-03	1268080.68	204437.26	Grab	0 to 10 cm below mudline	DSIMR-SS-03	SVOCs, VOCs, PCBs, SMS Metals, D/F, Chromium VI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIMR-SS-04	1268047.10	204533.50	Grab	0 to 10 cm below mudline	DSIMR-SS-04	SVOCs, VOCs, PCBs, SMS Metals, D/F, Chromium VI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIMR-SS-05	1268026.42	204597.59	Grab	0 to 10 cm below mudline	DSIMR-SS-05	SVOCs, VOCs, PCBs, SMS Metals, D/F, Chromium VI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
Subsurface Sediment								
DSIMR-SB-01	*co-located with DSIMR-SS-01*		Hand Core	Every 2 ft below the mudline to the depth practicable	DSIMR-SB-01-Depth	SVOCs, VOCs, PCBs, SMS Metals, D/F, Chromium VI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIMR-SB-02	*co-located with DSIMR-SS-02*		Hand Core	Every 2 ft below the mudline to the depth practicable	DSIMR-SB-02-Depth	SVOCs, VOCs, PCBs, SMS Metals, D/F, Chromium VI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIMR-SB-03	*co-located with DSIMR-SS-03*		Hand Core	Every 2 ft below the mudline to the depth practicable	DSIMR-SB-03-Depth	SVOCs, VOCs, PCBs, SMS Metals, D/F, Chromium VI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIMR-SB-05	*co-located with DSIMR-SS-05*		Hand Core	Every 2 ft below the mudline to the depth practicable	DSIMR-SB-05-Depth	SVOCs, VOCs, PCBs, SMS Metals, D/F, Chromium VI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen

Notes:

1. Coordinates will be determined based on finalization of sampling locations.
2. Washington State Plane North, North American Datum of 1983 (NAD 83), U.S. Survey Feet
3. cm = centimeters, ft = feet; Subsurface sediment samples will be composited and sampled from every 2-foot interval below the mudline to the depth practicable by the sampling methodology.
4. Subsurface sediment samples will be composited and sampled from every 2-foot interval below the mudline to the depth practicable by the sampling methodlogy.
5. TPH = Total Petroleum Hydrocarbons (gasoline, diesel, and oil range), SVOCs = semivolatile organic compounds, VOCs = volatile organic compounds, CrVI = Hexavalent Chromium, D/F = Dioxins/Furans, SMS Metals = As, Cd, Cr, Cu, Pb, Hg, Ag, Zn, PCBs = Polychlorinated Biphenyl Aroclors, TBT = tributyltin
6. GS = Grain Size, TS = Total Solids, TVS = Total Volatile Solids, TOC = Total Organic Carbon, MC = Moisture Content

Table 5
Surface Sediment Sampling Design: LDW Locations

Station ID	Proposed Coordinates[1,2]		Sample Method	Target Sampling Interval[3]	Sample ID	Surface Sediment Testing		
	Easting (X)	Northing (Y)				Chemistry[4]	Physical[5]	Archive
DSIP2-SS-01	1268347.55	204091.10	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-01	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-02	1268377.91	204253.49	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-02	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-03	1268355.00	204332.32	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-03	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-04	1268312.71	204454.28	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-04	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-05	1268266.08	204586.90	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-05	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-06	1268220.09	204713.80	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-06	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-07	1268163.51	204829.67	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-07	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-08	1268132.00	204932.11	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-08	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-09	1268060.56	205004.68	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-09	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-10	1268035.63	205118.68	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-10	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-11	1267953.70	205001.60	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-11	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-12	1268084.31	204801.97	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-12	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-13	1268108.93	204417.38	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-13	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SS-14	1268117.10	204334.16	Van Veen Grab	0 to 10 cm below mudline	DSIP2-SS-14	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen

Notes:

1. Coordinates will be determined based on finalization of sampling locations.
2. Washington State Plane North, North American Datum of 1983 (NAD 83), U.S. Survey Feet
3. cm = centimeters
4. TPH = Total Petroleum Hydrocarbons (gasoline, diesel, and oil range), SVOCs = semivolatile organic compounds, VOCs = volatile organic compounds, CrVI = Hexavalent Chromium, D/F = Dioxins/Furans, SMS Metals = As, Cd, Cr, Cu, Pb, Hg, Ag, Zn, PCBs = Polychlorinated Biphenyl Aroclors, TBT = tributyltin
5. GS = Grain Size, TS = Total Solids, TVS = Total Volatile Solids, TOC = Total Organic Carbon, MC = Moisture Content

Table 6
Subsurface Sediment Sampling Design: LDW Locations

Station ID	Proposed Coordinates[1,2]		Sample Method	Target Penetration[3]	Target Sampling Interval(s)	Sample ID	Subsurface Sediment Testing		
	Easting (X)	Northing (Y)					Chemistry[4]	Physical[5]	Archive
DSIP2-SB-01	1268347.55	204091.10	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-01-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-02	1268377.91	204253.49	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-02-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-03	1268355.00	204332.32	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-03-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-04	1268312.71	204454.28	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-04-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-05	1268266.08	204586.90	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-05-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-06	1268220.09	204713.80	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-06-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-07	1268163.51	204829.67	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-07-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-08	1268132.00	204932.11	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-08-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-09	1268060.56	205004.68	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-09-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-10	1268035.63	205118.68	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-10-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-11	1267953.70	205001.60	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-11-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-12	1268084.31	204801.97	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-12-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-13	1268108.93	204417.38	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-13-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen
DSIP2-SB-14	1268117.10	204334.16	Vibracore	15-ft below mudline	Sampling at 2 ft intervals based on lithology	DSIP2-SB-14-depth interval	SVOCs, VOCs, PCBs, SMS Metals, D/F, CrVI, bulk/porewater TBT, Pesticides	TS, TOC, TVS, GS, MC	Frozen

Notes:
1. Coordinates will be determined based on finalization of sampling locations and access.
2. Washington State Plane North, North American Datum of 1983 (NAD 83), U.S. Survey Feet
3. ft = feet
4. TPH = Total Petroleum Hydrocarbons (gasoline, diesel, and oil range), SVOCs = semivolatile organic compounds, VOCs = volatile organic compounds, CrVI = Hexavalent Chromium, D/F = Dioxins/Furans, SMS Metals = As, Cd, Cr, Cu, Pb, Hg, Ag, Zn, PCBs = Polychlorinated Biphenyl Aroclors, TBT = tributyltin
5. GS = Grain Size, TS = Total Solids, TVS = Total Volatile Solids, TOC = Total Organic Carbon, MC = Moisture Content

Table 7
Sample Handling Requirements

Parameter	Sample Size	Container Size and Type	Holding Time	Sample Preservation Technique
Soil/Sediment/Solids				
Total solids/total volatile solids	50 g	4-oz Glass	14 days	Cool/4^o C
			6 months	Freeze -18°C
Total organic carbon	50 g	from TS/TVS container	14 days	Cool/4^o C
			6 months	Freeze -18°C
Grain size	300 g	16-oz HDPE	6 months	Cool/4°C
Moisture Content	50 g	4-oz Glass	6 months	Cool/4^o C
Total metals (with Hg)[1]	50 g	4-oz Glass	6 months; 28 days for Hg	Cool/4^o C
			2 years (except Hg)	Freeze -18°C
Hexavalent Chromium	50 g	4-oz Glass	28 days to extraction	Cool/4^o C
			1 week after extraction	
Tributyltin (as ion) in porewater	100 mL porewater	3 x 32-oz Glass	7 days until porewater extraction	Cool/4^o C
			7 days until TBT extraction	
			40 days after extraction	
Bulk Tributyltin/Porewater Tributyltin	150 g	16-oz Glass (bulk) 3 x 32-oz Glass (porewater)	14 days until extraction	Cool/4^o C
			1 year until extraction	Freeze -18°C
			40 days after extraction	Cool/4^o C
VOCs	5 g	3x40-mL VOA vials (Soil)	14 days	Field Preserved-Cool/4^o C
	10 g	2-oz Septa (Sediment)	14 days	Cool/4^o C
SVOCs	150 g	16-oz Glass	14 days until extraction	Cool/4^o C
			1 year until extraction	Freeze -18°C
			40 days after extraction	Cool/4^o C
PCB Aroclors	150 g	16-oz Glass	None	Cool/4^o C
Total petroleum hydrocarbons, gasoline range and BTEX compounds	5 g	3 x 40-mL VOA vials	14 days	Cool/4^o C
TPH, diesel and oil range	150 g	8-oz Glass	14 days until extraction	Cool/4^o C
			1 year until extraction	Freeze -18°C
			40 days after extraction	Cool/4^o C
Pesticides	150 g	8-oz Glass	14 days until extraction	Cool/4^o C
			1 year until extraction	Freeze -18°C
			40 days after extraction	Cool/4^o C
Dioxins/Furans	150 g	8-oz AG	1 year until extraction	Cool/4^o C
Water				
Total Dissolved Solids	500 mL	1L HDPE	7 days	Cool/4^o C
Total Suspended Solids	1000 mL	1L HDPE	7 days	Cool/4^o C
Ammonia	100 mL	500 mL HDPE	28 days	H_2SO_4 to pH < 2/ Cool/4^o C
Sulfide (dissolved, H2S)	100 mL	500 mL HDPE	7 days	Zinc Acetate, Cool/4^o C
Sulfate	100 mL	500 mL HDPE	28 days	Cool/4^o C
Nitrate	100 mL	500 mL HDPE	48 hours	Cool/4^o C
Alkalinity	200 mL	500 mL HDPE	14 days	Cool/4^o C
Dissolved metals (field filtered; with Hg)	500 mL	1L HDPE	6 months; 28 days for Hg	Field Filter, HNO_3 to pH < 2
Total metals (with Hg)	500 mL	1L HDPE	6 months; 28 days for Hg	HNO_3 to pH < 2
Hexavalent Chromium	100 mL	500 mL HDPE	Filter, adjust to pH 9.3 to 9.7 with NaOH or buffer; Cool/4° C	28 days
			No preservation	24 hours
VOCs	40 mL	3 x 40 mL VOA vials	14 days	HCl to pH < 2/ Cool/4^o C
SVOCs	500mL	2 x 500 mL Glass	7 days until extraction	Cool/4^o C
			40 days after extraction	

Table 7
Sample Handling Requirements

Parameter	Sample Size	Container Size and Type	Holding Time	Sample Preservation Technique
PCB Aroclors	500mL	2 x 500 mL Glass	7 days until extraction	Cool/4^{o} C
			40 days after extraction	
TPHs, gasoline range and BTEX compounds	40 mL	3 x 40 mL VOA vials	14 days	HCl to pH < 2/ Cool/4^{o} C
TPH, diesel and oil range	500mL	2 x 500 mL AG	14 days until extraction	Cool/4^{o} C
			40 days after extraction	
Pesticides	500mL	2 x 500 mL Glass	14 days until extraction	Cool/4^{o} C
			40 days after extraction	
Dioxins/Furans	1L	2 x 1L Glass	1 year until extraction	Cool/4^{o} C
			40 days after extraction	

Notes:
1 = All sample containers will have lids with teflon inserts
° C = degree Celsius
AG = amber glass
BTEX = Benzene, Toluene, Ethylbenzene, and Xylene
g = gram
H2SO4 = sulfuric acid
HCl = hydrochloric acid
HDPE = high density polyethylene
HNO3 = nitric acid
L = liter
mL = milliliter
NaOH = sodium hydroxide
oz = ounce
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
SVOC = semivolatile organic compound
TCLP = toxicity characteristic leaching procedure
TDS = total dissolved solids
TPH = total petroleum hydrocarbon
TSS = total suspended solids
TVS = total volatile solids
VOA = volatile organic analysis
VOC = volatile organic compound

FIGURES

AERIAL SOURCE: Google Earth Pro, 2012.

0 2000
Scale in Feet

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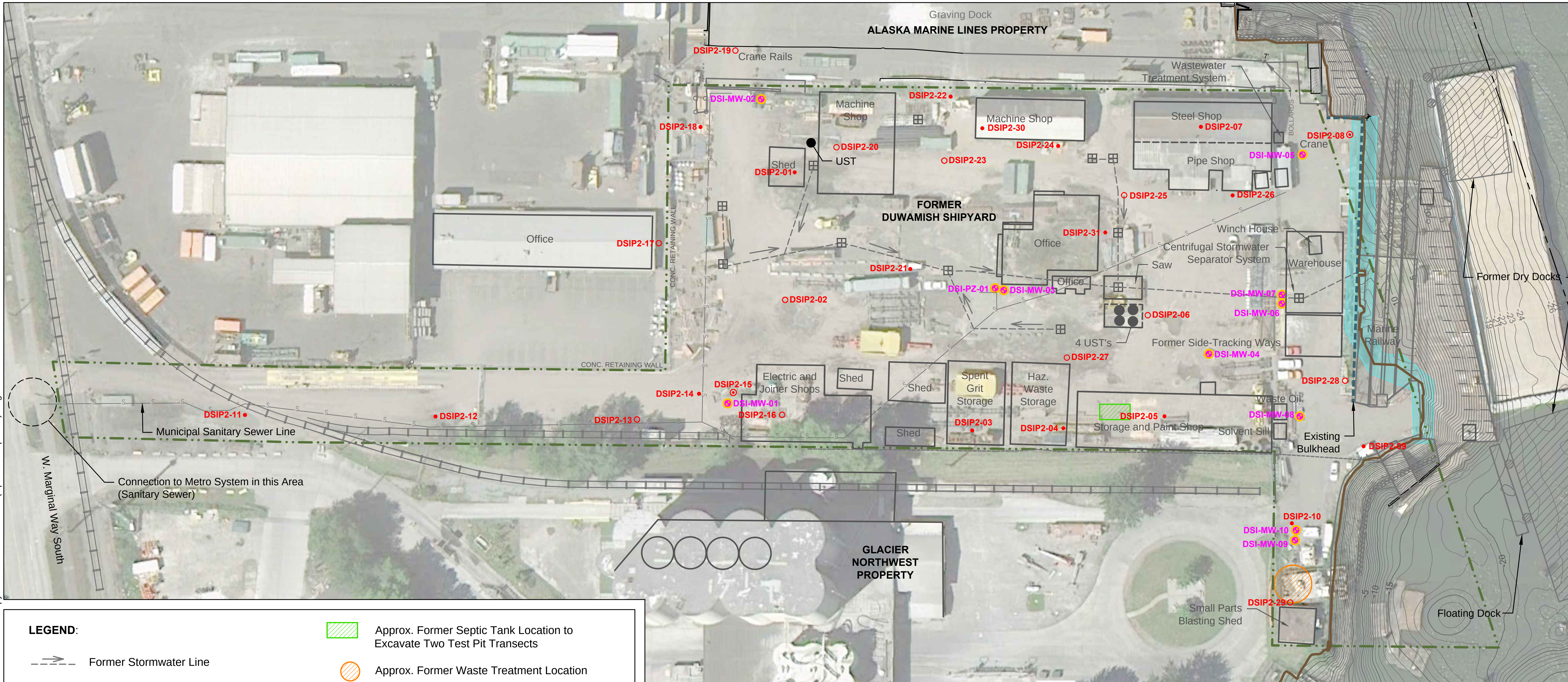
Feb 26, 2013 4:25pm heriksen

Figure 1
Site Vicinity Map
Sampling and Analysis Plan
Duwamish Shipyard, Inc.

ANCHOR QEA



LEGEND:

- Former Stormwater Line
- Municipal Sanitary Sewer Line
- Top of Bank (Approximate)
- Current Property Boundary
- Current Rail Alignment
- Bathymetric Contours in Feet (MLLW)
- Former Catch Basin Location
- Area of Proposed Seep Reconnaissance
- Approx. Former Septic Tank Location to Excavate Two Test Pit Transects
- Approx. Former Waste Treatment Location

2009 UPLAND RI LOCATIONS

- DSI-MW-07 Monitoring Well/Piezometer

PROPOSED SUPPLEMENTAL REMEDIAL INVESTIGATION SAMPLING LOCATIONS

- Re-sample Existing Monitoring Well
- DSIP2-12 Proposed Soil Boring
- DSIP2-13 Proposed Soil Boring - Convert to Shallow Monitoring Well (5-15 feet)
- DSIP2-15 Proposed Soil Boring - Convert to Deep Monitoring Well (18-28 feet)

SURVEY SOURCE: Bathymetric survey by Blue Water, 10/2006. Topographic survey by APS Survey and Mapping, LLC. Underdock survey by AML and DSI, 12/2006.

HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.

VERTICAL DATUM: Mean Lower Low Water (MLLW).

NOTES:

1. Historical operations presented are consistent with the 104e response.
2. Former Glacier NW features taken from Figure 1-2, Glacier Northwest, Inc. - Reichhold, Inc Site (ERM,November, 2010).

0 80
Scale in Feet

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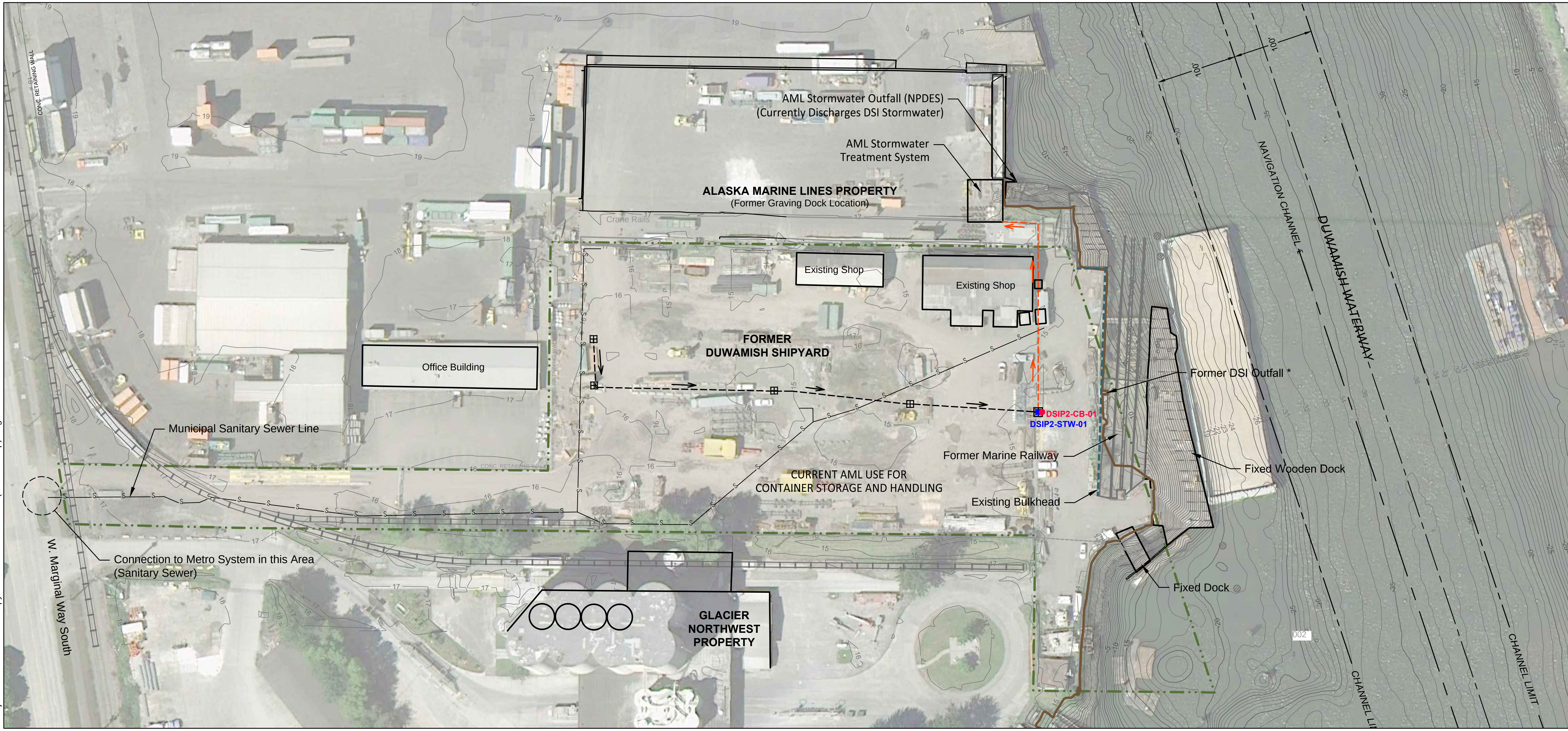
ANCHOR QEA

Figure 2

Proposed Soil, Groundwater, and Seep Sampling Locations

Sampling and Analysis Plan

Duwamish Shipyard, Inc., Seattle, WA



LEGEND:

Existing Stormwater Line	Current Property Boundary
DSI Overland Stormwater Route to AML Treatment System	Existing Bulkhead
Municipal Sanitary Sewer Line	Current Rail Alignment
Top of Bank (Approximate)	Topographic and Bathymetric Contours in Feet (MLLW)
	Catch Basin Location

DSIP2-CB-01 ● Proposed Stormwater Sampling Location

DSIP2-STW-01 ■ Proposed Catch Basin Solids Sampling Location

SURVEY SOURCE: Bathymetric survey by Blue Water, 10/2006. Topographic survey by APS Survey and Mapping, LLC. Underdock survey by AML and DSI, 12/2006.

HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

NOTE:
* DSI stormwater is currently routed to existing AML treatment system prior to discharge at AML outfall.

0 100
Scale in Feet

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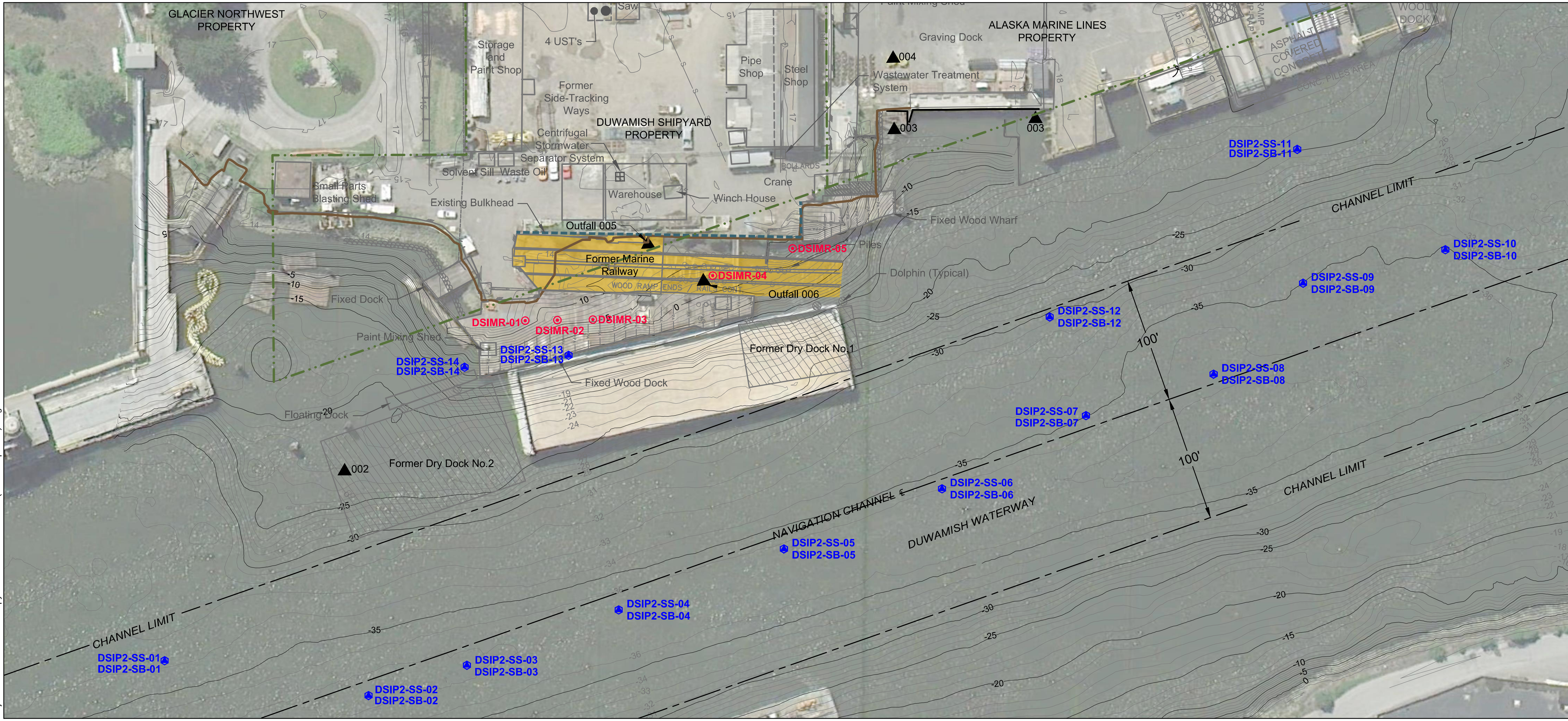
Feb 26, 2013 4:37pm heriksen

ANCHOR QEA

Figure 3
Proposed Stormwater and Catch Basin Solids Sampling Locations
Sampling and Analysis Plan
Duwamish Shipyard, Inc., Seattle, WA



LEGEND:

- Municipal Sanitary Sewer Line
- Existing Bulkhead
- Top of Bank (Approximate)
- Current Property Boundary
- ▲ Former NPDES Outfall
- Topographic and Bathymetric Contours in Feet (MLLW)
- ⊞ Former Catch Basin Location

PROPOSED SUPPLEMENTAL RI SAMPLING LOCATIONS

- DSIMR-03 Proposed Surface and Shallow Subsurface Sediment Sample
- DSIP2-SS-01 Proposed Surface Sediment Grab and Co-Located Sediment Core

SURVEY SOURCE: Bathymetric survey by Blue Water, 10/2006.
Topographic survey by APS Survey and Mapping, LLC.
Underdock survey by AML and DSI, 12/2006.
HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).
NOTES:
1. Building locations shown on this figure represent historical conditions at the DSI property.
2. Previous subsurface core LDW-SC28 is shown in original location. Location reporting was inconsistent in RI.

0 80
Scale in Feet

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Feb 26, 2013 4:36pm heriksen

ANCHOR QEA

Figure 4
Proposed Sediment Sampling Locations
Sampling and Analysis Plan
Duwamish Shipyard, Inc., Seattle, WA

ATTACHMENT 1
FIELD FORMS AND LOGS

Daily Log

ANCHOR QEA

Anchor QEA, LLC
720 Oive Way, Suite 1900
Seattle, Washington 98101
Phone 206.287.9130 Fax 206.287.9131

PROJECT NAME: **DATE:**

SITE ADDRESS: **PERSONNEL:**

WEATHER:	**WIND FROM:**	N	NE	E	SE	S	SW	W	NW	LIGHT	MEDIUM	HEAVY
		SUNNY		CLOUDY		RAIN			?	**TEMPERATURE:**	° F .	° C

[Circle appropriate units]

TIME	COMMENTS

Signature: ____________________

ANCHOR QEA

LOG OF GEOPROBE EXPLORATORY BORING

CLIENT/PROJECT NAME____________________ BORING #__________

PROJECT NUMBER____________________ DATE BEGAN__________

GEOLOGIST/ENGINEER____________________ DATE COMPLETED__________

DRILLING CONTRACTOR____________________ TOTAL DEPTH__________

DRILLING METHOD____________________ SHEET______OF_______

HOLE DIAMETER____________________

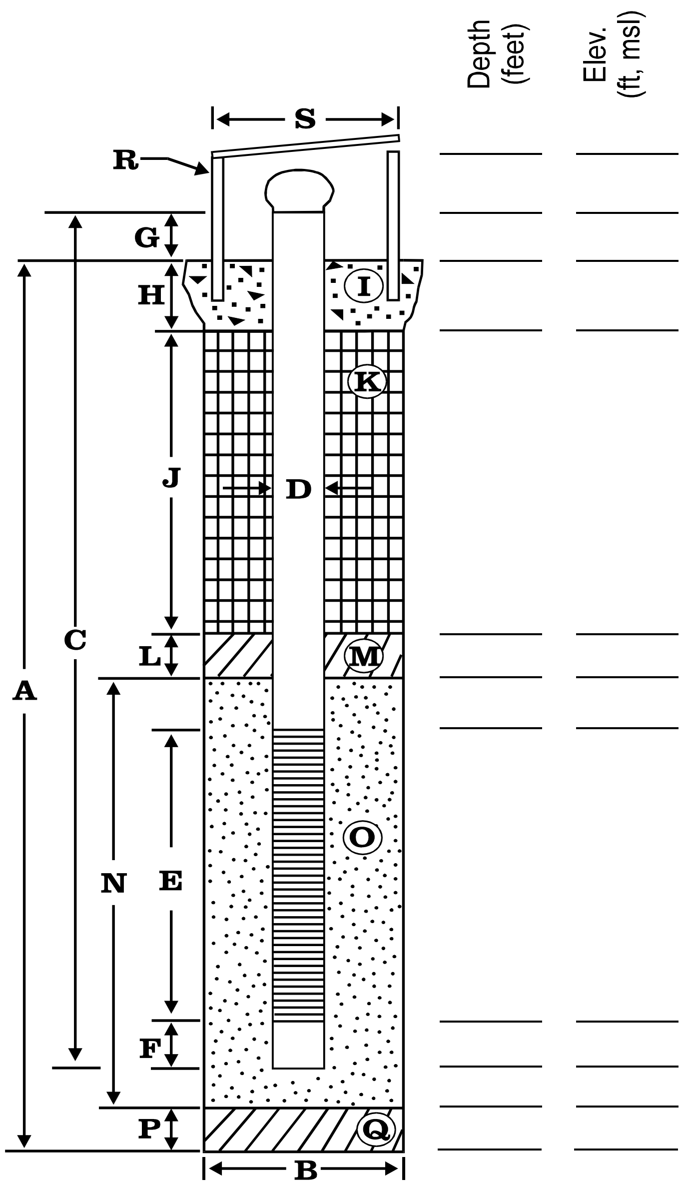
Field location of boring

OTHER*	COMMENTS	SAMPLING DATA						DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
		SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	DRIVE (1-5, 1=easy 5=hard)	DEPTH SAMPLED			
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

Remarks:

WELL DETAILS
ABOVE GOUND MOUNT

Project Number:		Boring/Well No.:	
Client Name:		Top of Casing Elev.:	
Project Name:		Ground Surface Elev.:	
Location:		Installation Date:	
Driller:		Permit/Start Card No.:	



Installed by: ______________________

Reviewed by: ______________________

Date: ______________________

EXPLORATORY BORING

A. Total depth: ________ft.
B. Diameter ________in.
Drilling method: ________

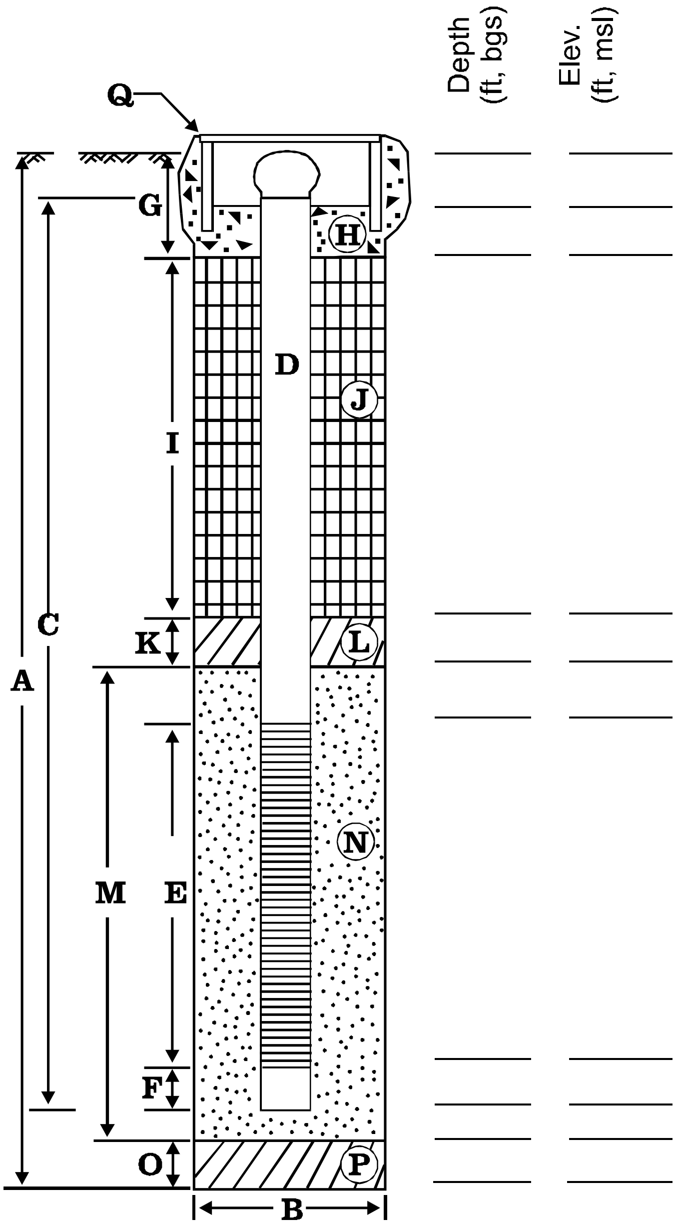
WELL CONSTRUCTION

C. Well casing length: ________ft.
Well casing material: ________
D. Well casing diameter: ________in.
E. Well screen length: ________ft.
Well screen type: ________
Well screen slot size: ________in.
F. Well sump/end cap length: ________ft.
G. Well casing height (stickup): ________ft.
H. Surface seal thickness: ________ft.
I. Surface seal material: ________
J. Annular seal thickness: ________ft.
K. Annular seal material: ________
L. Filter pack seal thickness: ________ft.
M. Filter pack seal material: ________
N. Sand pack thickness: ________ft.
O. Sand pack material: ________
P. Bottom material thickness: ________ft.
Q. Bottom material: ________
R. Protective casing material: ________
Well centralizer depths: ________ft.
S. Protective casing diameter: ________in.

NOTES:

WELL DETAILS
FLUSH MOUNT

Project Number:		Boring/Well No.:	
Client Name:		Top of Casing Elev.:	
Project Name:		Ground Surface Elev.:	
Location:		Installation Date:	
Driller:		Permit/Start Card No.:	



EXPLORATORY BORING

A. Total depth:		ft.
B. Diameter		in.
Drilling method:		

WELL CONSTRUCTION

C. Well casing length:		ft.
Well casing material:		
D. Well casing diameter:		in.
E. Well screen length:		ft.
Well screen type:		
Well screen slot size:		in.
F. Well sump/end cap length:		ft.
G. Surface seal thickness:		ft.
H. Surface seal material:		
I. Annular seal thickness:		ft.
J. Annular seal material:		
K. Filter pack seal thickness:		ft.
L. Filter pack seal material:		
M. Sand pack thickness:		ft.
N. Sand pack material:		
O. Bottom material thickness:		ft.
P. Bottom material:		
Q. Vault box type:		
Well centralizer depths:		ft.

NOTES:

Installed by:

Reviewed by:

Date:

WELL DEVELOPMENT FORM

Project No.	Date:	Well:	
Site Location:	Initial DTB:		Final DTB:
Name:	Initial DTW:		Final DTW:
Development Method:	Pore Volume:		
Total Water Removed:	Casing Diameter:		
Water Contained ? NO	Meter #:		
Estimate of specific capacity or recharge to well:			

Time	Cum. Vol. Removed	Sand/Silt (ml/1000ml)	Temp.	EC	pH	DTW (TOC)	Appearance/Comments

GROUNDWATER SAMPLING DATA SHEET

ANCHOR QEA

720 Olive Way, Suite 1900
Seattle, Washington 98101
Office: 206.287.9130 Fax: 206.287.9131

PROJECT NAME: **WELL ID:**

SITE ADDRESS: **BLIND ID:**

DUP ID: **NA**

WIND FROM:	N	NE	E	SE	S	SW	W	NW	LIGHT	MEDIUM	HEAVY
WEATHER:	SUNNY		CLOUDY		RAIN		?		**TEMPERATURE:**	° F . ° C	

[Circle appropriate units]

HYDROLOGY/LEVEL MEASUREMENTS (Nearest 0.01 ft)

Date	Time	DT-Bottom	DT-Product	DT-Water	DTP-DTW [Product Thickness]	DTB-DTW [Water Column]		Volume (gal) [Water Column x Gal/ft]
/ /	:	.	.	.	.	.	X 1	.
/ /	:	.	.	.	.		X 3	.

Gal/ft = $(dia./2)^2 \times 0.163$	1" =	0.041	2" =	0.163	3" =	0.367	4" =	0.653	6" =	1.469	10" =	4.080	12" =	5.875

§ METHODS: (A) Submersible Pump (B) Peristaltic Pump (C) Disposable Bailer (D) PVC/Teflon Bailer (E) Dedicated Bailer (F) Dedicated Pump (G) Other =

GROUNDWATER SAMPLING DATA (if product is detected, do NOT sample)

Sample Depth: [√ if used]

Bottle Type	Date	Time	Method §	Amount & Volume mL		Preservative [circle]	Ice	Filter	pH	√
VOA Glass	/ /	:		3	40 ml	HCl	YES	NO		
Amber Glass	/ /	:			250, 500, 1L	(None) (HCl) (H_2SO_4)	YES	NO		
White Poly	/ /	:			250, 500, 1L	None	YES	NO	NA	
Yellow Poly	/ /	:			250, 500, 1L	H_2SO_4	YES	NO		
Green Poly	/ /	:			250, 500, 1L	NaOH	YES	NO		
Red Total Poly	/ /	:			250, 500, 1L	HNO_3	YES	NO		
Red Diss. Poly	/ /	:			250, 500, 1L	HNO_3	YES	YES		
	/ /	:			250, 500, 1L		YES			
			Total Bottles (include duplicate count):							

Analysis Allowed per Bottle Type

BOTTLE TYPE	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
VOA - Glass	(8021) (8260B) (BTEX) (NWTPH-Gx)
AMBER - Glass	(PAH) (TPH-HCID) (NWTPH-Dx) (TPH-418.1) (Oil &Grease) (8081A)
WHITE - Poly	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO_3/CO_3) (Cl) (SO_4) (NO_3) (NO_2) (F)
YELLOW - Poly	(COD) (TOC) (Total PO_4) (Total Keldahl Nitrogen) (NH_3) (NO_3/NO_2)
GREEN - Poly	(Cyanide)
RED TOTAL - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
RED DISSOLVED - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silica)

WATER QUALITY DATA

Purge Start Time: : Pump/Bailer Inlet Depth:

Meas. [Casing]	Method § [Select A-G]	Purged (gal) [Cumulative Totals]	pH	E Cond (µS)	°F Temp °C [Circle units]	Other	Diss O_2 (mg/l)	Water Quality [Clarity, Color]
4		.	.		.		.	
3		.	.		.		.	
2		.	.		.		.	
1		.	.		.		.	
0		**0.00**	.		.		.	

SAMPLER:

(PRINTED NAME) (SIGNATURE)

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring ____ Date ____ Sheet ____ of ____
	Job ____ Job No. ____
	Logged By ____ Weather ____
	Drilled By ____
	Drill Type/ Method ____
	Sampling Method
Elevation: Datum:	Bottom of Boring ____ ATD Water Level Depth
Obs. Well Install. Yes No	

SIZE (%)			PID or other	DEPTH		SAMPLE		SAMPLE RECOVERY	Penetration Resistance	DESCRIPTION: Den., moist., color, minor, MAJOR CONSTITUENT, NON-SOIL SUBSTANCES: Odor, staining, sheen, scrag, slag, etc.	REMARKS: Drill action, drill and sample procedures, water conditions, heave, etc.	SUMMARY LOG (Water & Date)
G	S	F										
Max.	Range	Att. Limits		From	To	Type	Number					
								0				
								1				
								2				
								3				
								4				
								5				
								6				
								7				
								8				
								9				
								0				
								1				
								2				
								3				
								4				
								5				
								6				
								7				
								8				
								9				
								0				

Surface Sediment Field Log

ANCHOR QEA

Job:	Station:
Job No:	Date:
Field Staff:	Sample Method: Van Veen Grab
Contractor:	Proposed Coordinates : Lat:
	Long:

Water Height
DTM Depth Sounder: ________

DTM Lead Line: ________

Tide Measurements
Time: ________

Height: ________

Sample Acceptability Criteria:
1) Overlying water is present
2) Water has low turbidity
3) Sampler is not overfilled
4) Surface is flat
5) Desired penetration depth

Mudline Elevation (datum): ________

Notes: ________

Grab #	Time	Confirmed Coordinates (datum)		Sample Accept (Y/N)	Recovery Depth (cm)	Comments: jaws close, good seal, winnowing
		NAD 83 (N)	NAD 83 (W)			

Sample Description: surface cover, (density), moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

Grab Notes: ________

Sample containers: ________

Sediment Core Collection Log

Page __ of __

Job: ______________________ **Station ID:** ______________________

Job No: ______________________ **Attempt No.** ______________________

Field Staff: ______________________ **Date:** ______________________

Contractor: ______________________ **Logged By:** ______________________

Vertical Datum: ______________________ **Horizontal Datum:** ______________________

Field Collection Coordinates:

Lat/Northing: ______________________ Long/Easting: ______________________

A. Water Depth

DTM Depth Sounder: ______________________

DTM Lead Line: ______________________

B. Tide Measurements

Time: ______________________

Height: ______________________

C. Mudline Elevation

______________________ (-A+B=C)

Core Collection Recovery Details:

Core Accepted: Yes / No

Core Tube Length: ______________________

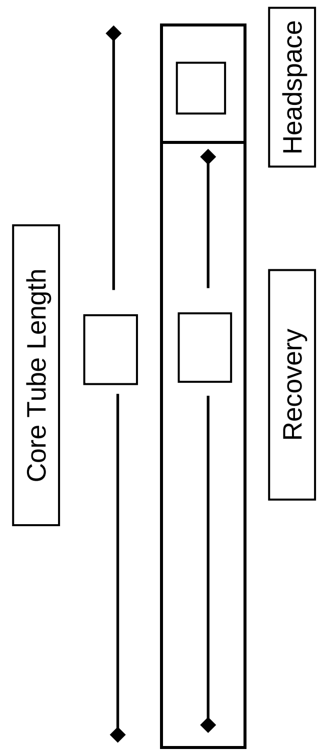
Drive Penetration: ______________________

Headspace Measurement: ______________________

Recovery Measurement: ______________________

Recovery Percentage: ______________________

Total Length of Core To Process: ______________________



Drive Notes:

Core Field Observations and Description:	Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

Samples Collected (i.e. rinsate blank)

Sediment Core Processing Log

COC ID #

ANCHOR QEA

Job:	Date Logged:
Job No.:	Core Pushed By:
Station ID:	Core Logged By:
	Type of Core: ☐ Vibracore ☐ Piston Core ☐ Other
No. of Sections:	Diameter of Core (inches):
Water Depth/Elevation of Core:	Core Quality: ☐ Good ☐ Fair ☐ Poor ☐ Disturbed
Cored Length (feet; from log):	Average % Compaction =
Core Recovery (feet):	Internal Composite Received on:

Theoretical / Depth in ( ) / Actual Core Sections	Size % G	Size % S	Size % F	Summary Sketch	Classification and Remarks (Moisture content, density/consistency/ color, minor contituent, MAJOR constituent, amount, shape of minor constituent, sheen, odor)

ANCHOR QEA

SOIL TEST PIT LOG

CLIENT/PROJECT NAME________________________________ TEST PIT #____________

PROJECT NUMBER________________________________ DATE BEGAN____________

GEOLOGIST________________________________ DATE COMPLETED____________

EXCAVATION CONTRACTOR________________________________ TOTAL DEPTH____________

EXCAVATION METHOD________________________________ SHEET______OF_______

PIT DIAMETER________________________________

Field location of test pit

SAMPLING DATA							
SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	DEPTH SAMPLED (feet)	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
					1		
					2		
					3		
					4		
					5		
					6		
					7		
					8		
					9		
					0		
					1		
					2		
					3		
					4		
					5		
					6		
					7		
					8		
					9		
					0		

Notes:

720 Olive Way, Suite 1900
Seattle, Washington 98101
Phone 206.287.9130
Fax 206.287-9131
www.anchorenv.com

Water Collection Form: Water Quality Monitoring

Station ID:		**Date**	**Time**
Project Name:		**Project Number**	
Coordinates			
Lat/Northing:		Long/Easting	

Weather Observations:

Date and Time rainfall began: _________/_________ Inches of rain in last 24 hours: _____________

Number of dry days prior to sampling: __________

Param. ---Unit--- **Time**	**Temp.** ________	**D.O.** ________	**pH** ________	**Redox** ________	**Turb.** ________	**Cond.** ________	**Salinity** ________	**TDS** ________

Comments:

Recorded by:

720 Olive Way, Suite 1900
Seattle, Washington 98101
Phone 206.287.9130
Fax 206.287.9131
www.anchorqea.com

Water Quality Sample Form

Station ID:		**Date:**	**Time:**
Project Name:		**Project Number:**	
Coordinates: Datum**:**			
Lat/Northing		Long/Easting	
Depth of Sample (LLW):			
Weather Observations:			
Field Parameters			
Temperature	°C	Turbidity	NTU
pH		DO	mg/L
TSS Collected	Y / N		
Evidence of floating or suspended materials:		Y / N	Description:
Evidence of oil/hydrocarbon sheen:		Y / N	Description:
Discoloration and Turbidity:			
	Color:		
	Source:		
	Area:		
	Plume:	Y / N	
Odor	none, slight, moderate, strong H_2S, petroleum, septic		
Volume collected:			

Comments:

TSS samples taken to lab: Date:__________ Time: ____________

Recorded by:

Water Quality Sensor Calibration

Project:	
Project No:	Date:
Field Staff:	Instrument Make/Model:
Sensor Make/Model:	Insrument Serial No:
Sensor Serial No:	Date of Anticipated Deployment:
Calibration Solution Name:	Calibration Solution Concentration:
Calibration Solution Name:	Calibration Solution Concentration:
Calibration Solution Name:	Calibration Solution Concentration:
Start Time:	End Time:

Notes:

ANCHOR QEA

APPENDIX B
QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN
DUWAMISH SHIPYARD, INC.
SEATTLE, WASHINGTON

Prepared for
Washington State Department of Ecology

On Behalf Of
Duwamish Shipyard, Inc.
5658 West Marginal Way SW
Seattle, Washington 98106

Prepared by
Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, Washington 98101

March 2013

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LIST OF ACRONYMS AND ABBREVIATIONS

%R	percent recovery
Anchor QEA	Anchor QEA, LLC
ASTM	American Society for Testing and Materials
CCV	continuing calibration verification
CFR	Code of Federal Regulations
COC	chain-of-custody
DQO	data quality objective
DSI	Duwamish Shipyard, Inc.
Ecology	Washington State Department of Ecology
EIM	Environmental Information Management
EPA	U.S. Environmental Protection Agency
FC	Field Coordinator
GC	gas chromatography
GC/MS	gas chromatography/mass spectrometry
HAZWOPER	Hazardous Waste Operations and Emergency Response
LDC	Laboratory Data Consultants
LOD	Limit of Detection
LOQ	limits of quantitation
MDL	method detection limit
MS	matrix spike
MSD	matrix spike duplicate
MTCA	Model Toxics Control Act
NAD	North American Datum
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety and Health Administration
PQL	practical quantitation limit
PSEP	Puget Sound Estuary Program

QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
RI/FS Work Plan	Remedial Investigation and Feasibility Study Work Plan
RL	reporting limit
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SAPA	Sediment Sampling and Analysis Plan Appendix
SMS	Sediment Management Standards
SOP	standard operating procedure
Supplemental RI Work Plan	Supplemental Remedial Investigation Work Plan

1 INTRODUCTION

This Quality Assurance Project Plan (QAPP) establishes the quality assurance objectives for conducting sampling and evaluation activities described in the Supplemental Remedial Investigation Work Plan (Supplemental RI Work Plan) for Duwamish Shipyard, Inc. (DSI). This QAPP is included as Appendix B to the Supplemental RI Work Plan. The methods and quality assurance procedures described here will be followed by DSI and its contractors during RI data collection activities described in the Supplemental RI Work Plan and Sampling and Analysis Plan (SAP; Appendix A to the Supplemental RI Work Plan).

The goal of the QAPP is to ensure that data of sufficiently high quality are generated to support the project data quality objectives (DQOs). The QAPP will address project management responsibilities, sampling and analytical procedures, assessment and oversight, and data reduction, validation, and reporting.

The QAPP was prepared following Washington State Department of Ecology (Ecology) *Guidance for Preparing Quality Assurance Project Plans for Environmental Studies* (Lombard and Kirchmer 2004) and Ecology's *Sediment Sampling and Analysis Plan Appendix* (SAPA) guidance document (Ecology 2008). Analytical quality assurance/quality control (QA/QC) procedures were also developed based on the analytical protocols and quality assurance guidance of the Puget Sound Estuary Program (PSEP; PSEP 1986, 1997a, 1997b, 1997c), U.S. Environmental Protection Agency's (EPA's) *Test Methods for the Evaluation of Solid Waste: Physical/Chemical Methods, 3rd Edition* (EPA 1986), and the *U.S. EPA Contract Laboratory Program National Functional Guidelines for Data Review* (EPA 1999, 2004).

1.1 Project Overview

A detailed project overview and project figure is provided in the Supplemental RI Work Plan, and supporting field sampling details are provided in the SAP (Appendix A to the Supplemental RI Work Plan). A vicinity map is provided in the SAP as Figure 1.

1.2 Document Organization

This QAPP was prepared in accordance with Ecology guidance for developing QAPPs (Lombard and Kirchmer 2004). Ecology's guidance specifies four groups of information that must be included in a QAPP (Project Management, Data Generation and Acquisition, Assessment and Oversight, and Data Validation and Usability). Each group comprises several QAPP elements. Ecology's guidance provides a suggested outline for the QAPP elements. However, the guidance indicates that certain elements may not be applicable to a given project, and that the elements need not be presented in the order presented in the guidance.

The remainder of this QAPP is organized into the following sections:

- Section 2 – Project Management
- Section 3 – Overview of Data Generation and Acquisition
- Section 4 – Assessments and Response Actions
- Section 5 – Data Validation and Usability
- Section 6 – References

This QAPP is Appendix B to the Supplemental RI Work Plan; the SAP is Appendix A to the Supplemental RI Work Plan and provides details for the sample collection and analysis procedures.

2 PROJECT MANAGEMENT

This section identifies key project personnel, describes the rationale for conducting the investigation studies, identifies the studies to be performed and their respective schedules, outlines project DQOs and criteria, lists training and certification requirements for sampling personnel, and describes documentation and record keeping procedures.

2.1 Project/Task Organization

Responsibilities of the team members, as well as laboratory project managers, are described in the following paragraphs.

Anchor QEA, LLC (Anchor QEA) has the primary role of Project Manager to ensure compliance with the Agreed Order requirements.

The Ecology Project Manager and Sediment Specialist for Ecology will lead technical review of the project and will be responsible for compliance with the Model Toxics Control Act (MTCA) and Ecology's Sediment Management Standards (SMS).

The Anchor QEA Project Manager, David Templeton, will act as the direct line of communication between contractors and DSI, and is responsible for implementing activities described in this QAPP. He will also be responsible for production of work plans, producing all project deliverables, and performing the administrative tasks needed to ensure timely and successful completion of these studies. The project manager will provide the overall programmatic guidance to support staff and will ensure that all documents, procedures, and project activities meet the objectives contained within this QAPP. The project manager will also be responsible for resolving project concerns or conflicts related to technical matters. The project manager will notify DSI of any long-term changes in core personnel.

The Field Coordinators (FCs) are responsible for day-to-day technical and QA/QC oversight. They will ensure that appropriate protocols for sample collection, preservation, and holding times are observed, and will submit environmental samples to the designated laboratories for chemical and physical analyses.

The QA/QC Manager will provide quality assurance oversight for both the field sampling and laboratory programs, ensuring that samples are collected and documented appropriately, coordinating with the analytical laboratories, ensuring data quality, overseeing data validation, and supervising project quality assurance coordination and data validation.

The Data Manager will compile field observations and analytical data into a database, review the data for completeness and consistency, append the database with qualifiers assigned by the data validator, and ensure that the data obtained are in a format suitable for inclusion in the appropriate databases and delivery to Ecology.

The Laboratory Manager will oversee all laboratory operations associated with the receipt of the environmental samples, chemical/physical analyses, and laboratory report preparation for this project. The Laboratory Manager will review all laboratory reports and prepare case narratives describing any anomalies and exceptions that occurred during analysis. Laboratory Data Consultants (LDC) is anticipated to serve as the primary contact to perform all applicable data validation.

The analytical testing laboratory will be responsible for the following:

- Performing the methods outlined in this QAPP, including those methods referenced for each analytical procedure
- Following documentation, custody, and sample logbook procedures
- Implementing QA/QC procedures required by MTCA, PSEP (1986, 1997a, 1997b, 1997c), or other guidelines
- Meeting all reporting and QA/QC requirements
- Delivering electronic data files as specified in this QAPP
- Meeting turnaround times for deliverables as described in this QAPP
- Allowing Ecology and the QA/QC contractor to perform laboratory and data audits

2.2 Problem Definition/Background

Additional data collection requirements at the Site have been directed by Ecology in a December 5, 2012 comment letter (Appendix C to the Supplemental RI Work Plan). The Supplemental RI Work Plan outlines additional investigations that will be performed to address the data gaps required by Ecology. The objectives and background information to address these data gaps are provided in the Supplemental RI Work Plan.

2.3 Project/Task Description and Schedule

Sampling activities described in the SAP (Appendix A to the Supplemental RI Work Plan) will be initiated following Ecology's approval of this QAPP and as outlined in the schedule in the Agreed Order.

2.4 Data Quality Objectives and Criteria

The DQO for this project is to ensure that the data collected are of known and acceptable quality so that the project objectives described in the Supplemental RI Work Plan can be achieved. The quality of the laboratory data is assessed by precision, accuracy, representativeness, comparability, and completeness (the "PARCC" parameters). Definitions of these parameters and the applicable quality control procedures are given below. Applicable quantitative goals for these data quality objectives (DQOs) are listed or referenced in Table 1.

2.4.1 Precision

Precision is the ability of an analytical method or instrument to reproduce its own measurement. It is a measure of the variability, or random error, in sampling, sample handling, and laboratory analysis. The American Society for Testing and Materials (ASTM) recognizes two levels of precision: 1) repeatability—the random error associated with measurements made by a single test operator on identical aliquots of test material in a given laboratory, with the same apparatus, under constant operating conditions; and 2) reproducibility—the random error associated with measurements made by different test operators, in different laboratories, using the same method but different equipment to analyze identical samples of test material (ASTM 2002).

In the laboratory, "within-batch" precision is measured using replicate sample or quality control analyses and is expressed as the relative percent difference (RPD) between the measurements. The "batch-to-batch" precision is determined from the variance observed in the analysis of standard solutions or laboratory control samples from multiple analytical batches.

Field precision will be evaluated by the collection of blind field duplicates for chemistry samples at a frequency of 1 in 20 samples. Field chemistry duplicate precision will be screened against an RPD of 50% for sediment samples. However, no data will be qualified based solely on field homogenization duplicate precision.

Precision measurements can be affected by the nearness of a chemical concentration to the method detection limit (MDL), where the percent error (expressed as RPD) increases. The equation used to express precision is as follows:

$$\text{RPD} = \frac{(C_1 - C_2) \times 100\%}{(C_1 + C_2)/2}$$

where:

RPD	=	relative percent difference
C_1	=	larger of the two observed values
C_2	=	smaller of the two observed values

2.4.2 Accuracy

Accuracy is a measure of the closeness of an individual measurement (or an average of multiple measurements) to the true or expected value. Accuracy is determined by calculating the mean value of results from ongoing analyses of laboratory-fortified blanks, standard reference materials, and standard solutions. In addition, laboratory-fortified (i.e., matrix-spiked) samples are also measured; this indicates the accuracy or bias in the actual sample matrix. Accuracy is expressed as percent recovery (%R) of the measured value, relative to the true or expected value. If a measurement process produces results for which the mean is not the true or expected value, the process is said to be biased. Bias is the systematic error either inherent in a method of analysis (e.g., extraction efficiencies) or caused by an artifact of the measurement system (e.g., contamination). Analytical laboratories utilize several quality control measures to eliminate analytical bias, including systematic analysis of method blanks, laboratory control samples, and independent calibration verification standards. Because bias can be positive or negative, and because several types of bias can occur simultaneously, only the net, or total, bias can be evaluated in a measurement.

Laboratory accuracy will be evaluated against quantitative matrix spike (MS) and surrogate spike recovery performance criteria provided by the laboratory. Accuracy can be expressed as a percentage of the true or reference value, or as a %R in those analyses where reference materials are not available and spiked samples are analyzed. The equation used to express accuracy is as follows:

$$\%R = 100\% \times (S-U)/C_{sa}$$

Where:

%R	=	percent recovery
S	=	measured concentration in the spiked aliquot
U	=	measured concentration in the unspiked aliquot
C_{sa}	=	actual concentration of spike added

Field accuracy will be controlled by adherence to sample collection procedures outlined in the SAP (Appendix A to the Supplemental RI Work Plan).

2.4.3 Bias

Bias is the systematic or persistent distortion of a measurement process that causes errors in one direction. Bias assessments for environmental measurements are made using personnel, equipment, and spiking materials or reference materials as independent as possible from those used in the calibration of the measurement system. When possible, bias assessments should be based on analysis of spiked samples rather than reference materials so that the effect of the matrix on recovery is incorporated into the assessment. A documented spiking protocol and consistency in following that protocol are important to obtaining meaningful data quality estimates.

2.4.4 Representativeness

Representativeness expresses the degree to which data accurately and precisely represent an environmental condition. For the Site, the list of analytes has been identified to provide a comprehensive assessment of the known and potential contaminants.

2.4.5 Comparability

Comparability expresses the confidence with which one dataset can be evaluated in relation to another dataset. For this program, comparability of data will be established through the use of standard analytical methodologies and reporting formats, and of common traceable calibration and reference materials.

2.4.6 Completeness

Completeness is a measure of the amount of data that is determined to be valid in proportion to the amount of data collected. Completeness will be calculated as follows:

$$C = \frac{(\text{Number of acceptable data points}) \times 100}{(\text{Total number of data points})}$$

The DQO for completeness for all components of this project is 90%. Data that have been qualified as estimated because the quality control criteria were not met will be considered valid for the purpose of assessing completeness. Data that have been qualified as rejected will not be considered valid for the purpose of assessing completeness.

2.4.7 Sensitivity

Analytical sensitivities must be consistent with or lower than the regulated criteria values in order to demonstrate compliance with this QAPP. When they are achievable, target detection limits specified will be at least a factor of 2 less than the analyte's corresponding regulated criteria value.

The MDL is defined as the minimum concentration at which a given target analyte can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The Limit of Detection (LOD) is the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a 99% confidence level. Laboratory practical quantitation limits (PQLs), limits of quantitation (LOQ), or reporting limits (RLs) are defined as the lowest level that produces a quantitative result within specified limits of precision and accuracy during routine laboratory operating conditions. Laboratory LODs and LOQs (Tables 3, 4, and 5) will be used to evaluate the method sensitivity and/or applicability prior to the acceptance of a method for this program.

The sample-specific MDL (or LOD) and LOQ (also referred to as the RL) will be reported by the laboratory and will take into account any factors relating to the sample analysis that might decrease or increase the reporting limit (e.g., dilution factor, percent moisture, and sample volume). In the event that the MDL and RL are elevated for a sample due to matrix interferences and subsequent dilution or reduction in the sample aliquot, the data will be evaluated by Anchor QEA and the laboratory to determine if an alternative course of action is required or possible. If this situation cannot be resolved readily (i.e., detection limits less than criteria are achieved), Ecology will be contacted to discuss an acceptable resolution. The sample-specific RL will be the value provided in the project database and subsequent Environmental Information Management (EIM) deliverable.

2.5 Special Training Requirements/Certifications

For sample preparation tasks, it is important that field crews are trained in standardized data collection requirements, so that the data collected are consistent among the field crew. All field crew must be fully trained in the collection and processing of soil and groundwater samples; surface sediment, subsurface vibracore, and other potential sampling methods; installation and monitoring of groundwater wells and piezometers; decontamination protocols; visual inspections; and chain-of-custody (COC) procedures.

In addition, the 29 Code of Federal Regulations (CFR) 1910.120 Occupational Safety and Health Administration (OSHA) regulations require training to provide employees with the knowledge and skills enabling them to perform their jobs safely and with minimum risk to their personal health. All sampling personnel will have completed the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and 8-hour refresher courses, as necessary, to meet the OSHA regulations.

2.6 Documentation and Records

This project will require central project files to be maintained at Anchor QEA. Project records will be stored and maintained in a secure manner. Each project team member is responsible for filing all necessary project information or providing it to the person responsible for the filing system. Individual team members may maintain files for individual tasks, but must provide such files to the central project files upon completion of each task. Hard copy documents will be kept on file at Anchor QEA or at a document storage facility throughout the duration of the project, and all electronic data will be maintained in the database at Anchor QEA.

2.6.1 Field Records

All documents generated during the field effort are controlled documents that become part of the project file.

2.6.1.1 Field Forms

Field team members will keep a daily record of significant events, observations, and measurements on field forms. They will record all field activities on forms specific to the collection activity. The FC will maintain the field forms. The field forms will be the main source of field documentation for all field activities. The on-site field representative will record information pertinent to the investigation program on the field log form. The sampling documentation will contain information on each sample collected and will include, at a minimum, the following information:

- Project name
- Field personnel on site
- Facility visitors
- Weather conditions
- Field observations
- Maps and/or drawings
- Date and time sample collected
- Sampling method and description of activities
- Identification or serial numbers of instruments or equipment used
- Deviations from the QAPP and SAP

- Conferences associated with field sampling activities

Entries for each day will begin on a new form. The person recording information must enter the date and time and initial each entry. Additional specific field reporting requirements and checklists for each study are defined in the SAP (Appendix A to the Supplemental RI Work Plan). In general, sufficient information will be recorded during sampling so that reconstruction of the event can occur without relying on the memory of the field personnel.

The field forms will be on water-resistant, durable paper for adverse field conditions. Notes will be taken in indelible, waterproof blue or black ink. Errors will be corrected by crossing out with a single line, dating, and initialing. Each form will be marked with the project name, number, and date. The field forms will be scanned into Anchor QEA's project file directory as convenient during the sampling event or upon completion of each sampling event.

Sample collection tables will be prepared prior to each sampling program. The checklist will include proposed coordinates of each location, the sampling scheme, and whether any quality control samples are to be collected.

2.6.2 Analytical and Chemistry Records

The laboratory will retain analytical data records. Additionally, Anchor QEA will retain them in its central project files. For all analyses, the data reporting requirements will include those items necessary to complete data validation, including copies of all raw data. The analytical laboratory will be required, where applicable, to report the following:

- **Project Narrative.** This summary, in the form of a cover letter, will discuss problems, if any, encountered during any aspect of analysis. This summary should discuss, but not be limited to, quality control, sample shipment, sample storage, and analytical difficulties. Any problems encountered, actual or perceived, and their resolutions will be documented in as much detail as appropriate.
- **Chain-of-Custody Records.** Legible copies of the COC forms will be provided as part of the data package. This documentation will include the time of receipt and condition of each sample received by the laboratory. Additional internal tracking of

sample custody by the laboratory will also be documented on a sample receipt form. The form must include all sample shipping container temperatures measured at the time of sample receipt.

- **Sample Results.** The data package will summarize the results for each sample analyzed. The summary will include the following information when applicable:
  - Field sample identification code and the corresponding laboratory identification code
  - Sample matrix
  - Date of sample extraction
  - Date and time of analysis
  - Weight and/or volume used for analysis
  - Final dilution volumes or concentration factor for the sample
  - Identification of the instrument used for analysis
  - MDLs
  - Method reporting limits accounting for sample-specific factors (e.g., dilution and total solids)
  - Analytical results with reporting units identified
  - Data qualifiers and their definitions
  - A computer disk with the data in a format specified in advance by Anchor QEA
- **QA/QC Summaries.** This section will contain the results of the laboratory QA/QC procedures. Each QA/QC sample analysis will be documented with the same information required for the sample results. No recovery or blank corrections will be made by the laboratory. The required summaries follow; additional information may be requested:
  - **Calibration Data Summary.** This summary will report the concentrations of the initial calibration and daily calibration standards, and the date and time of analysis. The response factor, percent relative standard deviation, percent difference, and retention time for each analyte will be listed, as appropriate. Results for standards to indicate instrument sensitivity will be documented.
  - **Internal Standard Area Summary.** The stability of internal standard areas will be reported.

- **Method Blank Analysis**. The method blank analyses associated with each sample and the concentration of all compounds of interest identified in these blanks will be reported.
- **Surrogate Spike Recovery**. This will include all surrogate spike recovery data for organic compounds. The name and concentration of all compounds added, percent recoveries, and range of recoveries will be listed.
- **Matrix Spike Recovery.** This will report all MS recovery data for organic and metal compounds. The name and concentration of all compounds added, percent recoveries, and range of recoveries will be listed. The RPD for all duplicate analyses will be included.
- **Matrix Duplicate.** This will include the percent recovery and associated RPD for all matrix duplicate analyses.
- **Laboratory Control Sample.** All laboratory control sample recovery data for organic and metal compounds will be reported. The name and concentration of all compounds added, percent recoveries, and range of recoveries will be listed. The RPD for all duplicate analyses will be included.
- **Relative Retention Time.** This will include a report of the relative retention time of each analyte detected in the samples for both primary and conformational analyses.

- **Original Data.** Legible copies of the original data generated by the laboratory will include the following:
  - Sample extraction, preparation, identification of extraction method used, and cleanup logs
  - Instrument specifications and analysis logs for all instruments used on days of calibration and analysis
  - Calculation worksheets for inorganic analyses
  - Reconstructed ion chromatograms for all samples, standards, blanks, calibrations, spikes, replicates, and reference materials
  - Original printouts of full scan chromatograms and quantitation reports for all gas chromatography (GC) and/or gas chromatography/mass spectrometry (GC/MS) samples, standards, blanks, calibrations, spikes, replicates, and reference materials

- Enhanced spectra of detected compounds with associated best-match spectra for each sample

All instrument data shall be fully restorable at the laboratory from electronic backup. The laboratory will be required to maintain all records relevant to project analyses for a minimum of 5 years. Data validation reports will be maintained in the central project files with the analytical data reports.

2.6.3 Data Reduction

Data reduction is the process by which original data (analytical measurements) are converted or reduced to a specified format or unit to facilitate analysis of the data. Data reduction requires that all aspects of sample preparation that could affect the test result, such as sample volume analyzed or dilutions required, be taken into account in the final result. It is the laboratory analyst's responsibility to reduce the data, which are subjected to further review by the Laboratory Manager, the Project Manager, the QA/QC Manager, and independent reviewers. Data reduction may be performed manually or electronically. If performed electronically, all software used must be demonstrated to be true and free from unacceptable error.

3 OVERVIEW OF DATA GENERATION AND ACQUISITION

The rationale for the sampling design and design assumptions for locating and selecting environmental samples is detailed in the SAP (Appendix A to the Supplemental RI Work Plan). The methods and procedures for collection of field samples are also provided in the SAP.

All sampling will be conducted following standard procedures documented in the SAP (Appendix A to the Supplemental RI Work Plan). In general, all sampling procedures will comply with MTCA and PSEP protocols or other approved sample collection standards established for the study area.

3.1 Analytical Methods

The methods of chemical analysis and associated laboratory sample handling requirements are identified in the SAP (Table 7; Appendix A to the Supplemental RI Work Plan).

In completing chemical analyses for this project, the laboratory is expected to meet the following minimum requirements:

- Adhere to the methods outlined in this QAPP, including methods referenced for each analytical procedure
- Provide a detailed discussion of any modifications made to approved analytical methods
- Deliver Adobe PDF and electronic data as specified
- Meet reporting requirements for deliverables
- Meet turnaround times for deliverables
- Implement QA/QC procedures, including the QAPP data quality requirements, laboratory quality assurance requirements, and performance evaluation testing requirements
- Allow laboratory and data audits to be performed, if deemed necessary

Analytical methods LODs, and LOQs for proposed sample media are presented in Tables 3, 4, and 5. Table 2 presents the field QA/QC samples (i.e., field replicates and rinsate blanks).

3.2 Quality Assurance and Quality Control

Field and laboratory activities must be conducted in such a manner that the results meet specified quality objectives and are fully defensible. Guidance for QA/QC is derived from the protocols developed for the SMS (Ecology 1995), PSEP (1997a, 1997b, 1997c), EPA SW-846 (EPA 1986), the EPA Contract Laboratory Program (EPA 1999, 2004, 2005), and the cited methods.

3.2.1 Field Quality Control

Anchor QEA personnel will identify and label samples in a consistent manner to ensure that field samples are traceable and that labels provide all information necessary for the laboratory to properly conduct required analyses. Samples will be placed in appropriate containers and preserved for shipment to the laboratory.

3.2.1.1 Sample Containers

Sample containers and preservatives will be provided by the laboratory. The laboratory will maintain documentation certifying the cleanliness of bottles and the purity of preservatives provided. Specific container requirements will be subject to the sample design as described in the SAP (Table 7; Appendix A to the Supplemental RI Work Plan).

3.2.1.2 Sample Identification and Labels

Each sample will have an adhesive plastic or waterproof paper label affixed to the container and will be labeled at the time of collection. The following information will be recorded on the container label at the time of collection:

- Project name
- Sample identification
- Date and time of sample collection
- Preservative type (if applicable)
- Analysis to be performed

Samples will be uniquely identified with a sample identification that, at a minimum, specifies sample matrix, sample number, sample location, and type of sample. Specific sample nomenclature is provided in the SAP (Appendix A to the Supplemental RI Work Plan).

3.2.1.3 Sample Custody and Shipping Requirements

Samples are considered to be in one's custody if they are: 1) in the custodian's possession or view; 2) in a secured location (under lock) with restricted access; or 3) in a container that is secured with official seals such that the sample cannot be reached without breaking the seals.

COC procedures will be followed for all samples throughout the collection, handling, and analysis process. The principal document used to track possession and transfer of samples is the COC form. Each sample will be represented on a COC form the day it is collected. All data entries will be made using indelible ink pen. Corrections will be made by drawing a single line through the error, writing in the correct information, then dating and initialing the change. Blank lines or spaces on the COC form will be lined-out, dated, and initialed by the individual maintaining custody.

A COC form will accompany each cooler of samples to the analytical laboratories. Each person who has custody of the samples will sign the COC form and ensure that the samples are not left unattended unless properly secured. Copies of all COC forms will be retained in the project files.

All samples will be shipped to the analytical laboratory no later than the day after collection. Samples collected on Friday may be held until the following Monday for shipment provided that this does not jeopardize any hold time requirements. Specific sample shipping procedures are as follows:

- Each cooler or container containing the samples for analysis will be hand-delivered the day of sample collection or shipped via overnight delivery to the appropriate analytical laboratory. In the event that Saturday delivery is required, the FC will contact the analytical laboratory before 3 p.m. on Friday to ensure that the laboratory is aware of the number of containers shipped and the airbill tracking numbers for those containers. Following each shipment, the FC will call the laboratory to verify the shipment from the day before has been received and is in good condition.

- Coolant ice will be sealed in separate double plastic bags and placed in the shipping containers.
- Individual sample containers will be placed in a sealable plastic bag, packed to prevent breakage, and transported in a sealed ice chest or other suitable container.
- Glass jars will be separated in the shipping container by shock-absorbent material (e.g., bubble wrap) to prevent breakage.
- The shipping containers will be clearly labeled with sufficient information (name of project, time and date container was sealed, person sealing the container, and consultant's office name and address) to enable positive identification.
- The shipping waybill number will be documented on all COC forms accompanying the samples.
- A sealed envelope containing COC forms will be enclosed in a plastic bag and taped to the inside lid of the cooler.
- A minimum of two signed and dated COC seals will be placed on adjacent sides of each cooler prior to shipping.
- Each cooler will be wrapped securely with strapping tape, labeled "Glass – Fragile" and "This End Up," and will be clearly labeled with the laboratory's shipping address and the consultant's return address.

Upon transfer of sample possession to the analytical laboratory, the persons transferring custody of the sample container will sign the COC form. Upon receipt of samples at the laboratory, the shipping container seal will be broken and the receiver will record the condition of the samples on a sample receipt form. COC forms will be used internally in the laboratory to track sample handling and final disposition.

3.2.1.4 Field Quality Assurance Sampling

Field quality assurance procedures will consist of following procedures for acceptable practices for collecting and handling of samples. Adherence to these procedures will be complemented by periodic and routine equipment inspection.

Field quality assurance samples will be collected along with the environmental samples. Field quality assurance samples are useful in identifying possible problems resulting from sample collection or sample processing in the field. The collection of field quality assurance samples includes equipment rinsates, field blanks, and field duplicates. Field quality assurance samples will be collected at a frequency of one per sampling event or 1 in 20 sample locations processed, whichever is more frequent.

Field quality assurance samples will also include the collection of additional sample volume to ensure that the laboratory has sufficient sample volume to run the program-required analytical QA/QC (MS/MS duplicate [MSD]) samples for analysis as specified in Table 2. Additional sample volume to meet this requirement will be collected at a frequency of one per sampling event or 1 in 20 samples processed, whichever is more frequent. The samples designated for MS/MSD analyses should be clearly marked on the COC.

All field quality assurance samples will be documented on the field forms and verified by the QA/QC Manager or designee.

3.2.2 Laboratory Quality Control

Laboratory quality control procedures, where applicable, include initial and continuing instrument calibrations, standard reference materials, laboratory control samples, matrix replicates, MSs, surrogate spikes (for organic analyses), and method blanks. Table 2 lists the frequency of analysis for laboratory QA/QC samples, and Table 1 summarizes the DQOs of solid phase testing for precision, accuracy, and completeness.

An analyst will review the results of the quality control samples from each sample group immediately after a sample group has been analyzed. The quality control sample results will then be evaluated to determine if control limits have been exceeded. If control limits are exceeded in the sample group, the QA/QC Manager will be contacted immediately, and corrective action (e.g., method modifications followed by reprocessing the affected samples) will be initiated prior to processing a subsequent group of samples.

3.2.2.1 Laboratory Instrument Calibration and Frequency

An initial calibration will be performed on each laboratory instrument to be used at the beginning of analyses, after each major interruption to the analytical instrument, and when any ongoing calibration does not meet method control criteria. A calibration verification sample will be analyzed following each initial calibration and will meet method criteria prior to analysis of samples. Continuing calibration verifications (CCV) will be analyzed at required frequencies to track instrument performance. The frequency of CCVs varies with method. For GC/MS methods, one will be analyzed every 12 hours. For GC, metals, and inorganic methods, one will be analyzed for every ten field samples analyzed and at the end of each run. If the ongoing continuing calibration is out of control, the analysis must come to a halt until the source of the control failure is eliminated or reduced to meet control specifications. All project samples analyzed while instrument calibration was out of control will be reanalyzed.

Instrument blanks or continuing calibration blanks provide information on the stability of the baseline established. Continuing calibration blanks will be analyzed immediately prior to CCV at the instrument for each type of applicable analysis.

3.2.2.2 Laboratory Duplicates/Replicates

Analytical duplicates provide information on the precision of the analysis and are useful in assessing potential sample heterogeneity and matrix effects. Analytical duplicates and replicates are subsamples of the original sample that are prepared and analyzed as a separate sample.

3.2.2.3 Matrix Spikes and Matrix Spike Duplicates

Analyses of MS samples provide information on the extraction efficiency of the method on the sample matrix, as well as any interferences introduced by the sample matrix. By performing duplicate MS analyses, information on the precision of the method is also provided for organic analyses.

3.2.2.4 Method Blanks

Method blanks are analyzed to assess possible laboratory contamination at all stages of sample preparation and analysis. The method blank for all analyses must be less than the method reporting limit of any single target analyte or compound. If a laboratory method blank exceeds this criterion for any analyte or compound, and the concentration of the analyte or compound in any of the samples is less than five times the concentration found in the blank (ten times for common contaminants), analyses must stop and the source of contamination must be eliminated or reduced.

3.2.2.5 Laboratory Control Samples

Laboratory control samples are analyzed to assess possible laboratory bias at all stages of sample preparation and analysis. The laboratory control sample is a matrix-dependent spiked sample prepared at the time of sample extraction along with the preparation of the sample and MS. The laboratory control sample will provide information on the accuracy of the analytical process and, when analyzed in duplicate, will provide precision information as well.

3.2.2.6 Laboratory Deliverables

Data packages will be checked for completeness immediately upon receipt from the laboratory to ensure that data and QA/QC information requested in Section 2.6.2 are present.

3.3 Instrument/Equipment Testing, Inspection, and Maintenance Requirements

This section describes procedures for testing, inspection, and maintenance of field and laboratory equipment.

3.3.1 Field Instruments/Equipment

In accordance with the quality assurance program, Anchor QEA shall maintain an inventory of field instruments and equipment. The frequency and types of maintenance will be based on the manufacturer's recommendations and/or previous experience with the equipment.

The Anchor QEA FC will be responsible for the preparation, documentation, and implementation of the preventative maintenance program. The equipment maintenance information will be documented in the instrument's calibration log. The frequency of maintenance is dependent on the type and stability of the equipment, the methods used, the intended use of the equipment, and the recommendations of the manufacturer. Detailed information regarding the calibration and frequency of equipment calibration is provided in specific manufacturer's instruction manuals.

All maintenance records will be verified prior to each sampling event. The FC will be responsible for verifying that required maintenance has been performed prior to using the equipment in the field.

The subcontractor responsible for navigation will confirm proper operation of the navigation equipment daily. This verification may consist of internal diagnostics or visiting a location with known coordinates to confirm the coordinates indicated by the navigation system. No other field equipment requires testing or calibration. The winch line and grab sampler will be inspected daily for fraying, misalignment of jaws, loose connections, and any other applicable mechanical problems. Any problems will be noted in the field logbook and corrected prior to continuing sampling operations.

3.3.2 Laboratory Instruments/Equipment

In accordance with the quality assurance program, the laboratory shall maintain an inventory of instruments and equipment and the frequency of maintenance will be based on the manufacturer's recommendations and previous experience with the equipment.

The laboratory preventative maintenance program, as detailed in the laboratory Quality Assurance Plan, is organized to maintain proper instrument and equipment performance, and to prevent instrument and equipment failure during use. The program considers instrumentation, equipment, and parts that are subject to wear, deterioration, or other changes in operational characteristics; the availability of spare parts; and the frequency at which maintenance is required. Any equipment that has been overloaded, mishandled, gives suspect results, or has been determined to be defective will be taken out of service, tagged with the discrepancy noted, and stored in a designated area until the equipment has been repaired. After repair, the equipment will be tested to ensure that it is in proper operational condition. The client will be promptly notified in writing if defective equipment casts doubt on the validity of analytical data. The client will also be notified immediately regarding any delays due to instrument malfunctions that could impact holding times.

Laboratories will be responsible for the preparation, documentation, and implementation of the preventative maintenance program. All maintenance records will be checked according to the schedule on an annual basis and recorded by the responsible individual. The Laboratory Manager, or designee, shall be responsible for verifying compliance.

3.4 Instrument Calibration

Proper calibration of equipment and instrumentation is an integral part of the process that provides quality data. Instrumentation and equipment used to generate data must be calibrated at a frequency that ensures sufficient and consistent accuracy and reproducibility.

3.4.1 Field Instrument/Equipment Calibration

Field equipment will be calibrated prior to each sampling event according to manufacturer's recommendations using manufacturer's standards. A calibration check will be performed at the end of the day. The equipment, calibration, and maintenance information will be documented in the instrument calibration log. The frequency of calibration is dependent on the type and stability of the equipment, the methods used, the intended use of the equipment, and the recommendations of the manufacturer. Detailed information regarding the calibration and frequency of equipment calibration is provided in specific manufacturer's instruction manuals.

Equipment that fails calibration or becomes inoperable during use will be removed from service and tagged (time and date of action) to prevent inadvertent use. Such equipment will be satisfactorily recalibrated or repaired and tagged (date and time of return to service) prior to use.

3.4.2 Laboratory Instrument/Equipment Calibration

As part of their quality control program, laboratories perform two types of calibrations. A periodic calibration is performed at prescribed intervals (i.e., balances, drying ovens, refrigerators, and thermometers), and operational calibrations are performed daily, at a specified frequency, or prior to analysis (i.e., initial calibrations) according to method requirements. Calibration procedures and frequency are discussed in the laboratory Quality

Assurance Plan. Calibrations are discussed in the laboratory standard operating procedures (SOPs) for analyses.

The Laboratory Manager will be responsible for ensuring that the laboratory instrumentation is calibrated in accordance with specifications. Implementation of the calibration program shall be the responsibility of the respective laboratory Group Supervisors. Recognized procedures (EPA, ASTM, or manufacturer's instructions) shall be used when available.

Physical standards (i.e., weights or certified thermometers) shall be traceable to nationally recognized standards such as the National Institute of Standards and Technology (NIST). Chemical reference standards shall be NIST standard reference materials or vendor-certified materials traceable to these standards.

The calibration requirements for each method and respective corrective actions shall be accessible, either in the laboratory SOPs or the laboratory's Quality Assurance Plan for each instrument or analytical method in use. All calibrations shall be preserved on electronic media.

3.5 Inspection/Acceptance Requirements for Supplies and Consumables

Inspection and acceptance of field supplies, including laboratory-prepared sampling bottles, will be performed by the FC. All primary chemical standards and standard solutions used in this project, either in the field or laboratory, will be traceable to documented, reliable, commercial sources. Standards will be validated to determine their accuracy by comparison with an independent standard. Any impurities found in the standard will be documented.

3.6 Data Management

Field data sheets will be checked for completeness and accuracy by the FC prior to delivery to the Data Manager. All data generated in the field will be documented on hard copy and provided to the Data Manager, who is responsible for the data's entry into the database. All manually entered data will be checked by a second party. Field documentation will be filed in the main project file after data entry and checking are complete.

Laboratory data will be provided to the Data Manager in the EQuIS electronic format. Laboratory data that is electronically provided and loaded into the database will undergo a 10% check against the laboratory hard copy data. Data will be validated or reviewed manually, and qualifiers, if assigned, will be entered manually. The accuracy of all manually entered data will be verified by a second party. Data tables and reports will be exported from EQuIS to MS Excel tables.

4 ASSESSMENTS AND RESPONSE ACTIONS

Once data are received from the laboratory, a number of quality control procedures will be followed to provide an accurate evaluation of the data quality. Specific procedures will be followed to assess data precision, accuracy, and completeness.

4.1 Compliance Assessments

Laboratory and field performance audits consist of on-site reviews of quality assurance systems and equipment for sampling, calibration, and measurement. Laboratory audits will not be conducted as part of this study. However, all laboratory audit reports will be made available to the project QA/QC Manager upon request. The laboratory is required to have written procedures addressing internal QA/QC. These procedures have been submitted and the project QA/QC Manager will review them to ensure compliance with the QAPP. The laboratory must ensure that personnel engaged in sampling and analysis tasks have appropriate training. The laboratory will, as part of the audit process, provide for consultant's review of written details of any and all method modifications planned.

4.2 Response and Corrective Actions

The following sections identify the responsibilities of key project team members and actions to be taken in the event of an error, problem, or non-conformance to protocols identified in this document.

4.2.1 Field Activities

The FC will be responsible for correcting equipment malfunctions during the field sampling effort. The project QA/QC Manager will be responsible for resolving situations identified by the FC that may result in non-compliance with this QAPP. All corrective measures will be immediately documented in the field logbook.

4.2.2 Laboratory

The laboratory is required to comply with its SOPs. The Laboratory Manager will be responsible for ensuring that appropriate corrective actions are initiated as required for conformance with this QAPP. All laboratory personnel will be responsible for reporting problems that may compromise the quality of the data.

The Laboratory Manager will be notified if any quality control sample grossly exceeds the project-specified control limits. The analyst will identify and correct the anomaly before continuing with the sample analysis. If the anomaly cannot be corrected, the Laboratory Manager will document the corrective action taken in a memorandum submitted to the QA/QC Manager within 5 days of the initial notification. A narrative describing the anomaly, the steps taken to identify and correct the anomaly, and the treatment of the relevant sample batch (i.e., recalculation, reanalysis, and re-extraction) will be submitted with the data package in the case narrative.

4.3 Reports to Management

Quality assurance reports to management include verbal status reports, written reports on field sampling activities and laboratory processes, data validation reports, and final project reports. These reports shall be the responsibility of the QA/QC Manager.

The FC will prepare progress reports following each sampling event. The project QA/QC Manager also will prepare progress reports after the sampling is completed and samples have been submitted for analysis, when information is received from the laboratory, and when analysis is complete. The status of the samples and analysis will be indicated with emphasis on any deviations from the QAPP. A data report will be written after validated data are available for each sampling event. These reports will be delivered electronically to the Project Manager.

5 DATA VALIDATION AND USABILITY

This section describes the processes that will be used to review project data quality.

5.1 Data Review, Validation, and Verification

During the validation process, analytical data will be evaluated for method and laboratory quality control compliance, and their validity and applicability for program purposes will be determined. Based on the findings of the validation process, data validation qualifiers may be assigned. The validated project data, including qualifiers, will be entered into the project database, thus enabling this information to be retained or retrieved, as needed.

5.2 Validation and Verification Methods

Data validation includes signed entries by the field and laboratory technicians on field data sheets and laboratory datasheets, respectively; review for completeness and accuracy by the FC and Laboratory Manager; review by the Data Manager for outliers and omissions; and the use of quality control criteria to accept or reject specific data. All data will be entered into the EQuIS database and a raw data file printed. A second data manager or designee will perform a 10% verification of the database raw data file. One hundred percent of manually entered qualifiers will be verified. Any errors found will be corrected on the raw data printout sheet. After the raw data are checked, the top sheet will be marked with the date the checking is completed and the initials of the person doing the checking. Any errors in the raw data file will be corrected and the database established.

All laboratory data will be reviewed and verified to determine whether all DQOs have been met, and that appropriate corrective actions have been taken, when necessary. The project QA/QC Manager or designee will be responsible for the final review of all data generated from analyses of samples.

The first level of review will take place in the laboratory as the data are generated. The laboratory department manager or designee will be responsible for ensuring that the data generated meet minimum QA/QC requirements and that the instruments were operating under acceptable conditions during generation of data. DQOs will also be assessed at this point by comparing the results of quality control measurements with pre-established criteria as a measure of data acceptability.

A full data quality review will be performed by LDC, in accordance with EPA National Functional Guidelines (EPA 1999, 2004, 2005). The data will be evaluated in accordance with this QAPP. All chemical data will be reviewed with regard to the following, as appropriate to the particular analysis:

- Holding times
- Initial calibrations
- Continuing calibrations
- Method blanks
- Surrogate recoveries
- Detection limits
- Reporting limits
- Laboratory control samples
- MS/MSD samples
- Standard reference material results

The results of the data quality review, including text assigning qualifiers in accordance with the EPA National Functional Guidelines (EPA 1999, 2004) and a tabular summary of qualifiers, will be generated by the Data Manager and submitted to the project QA/QC Manager for final review and confirmation of the validity of the data. The QA/QC Manager will submit a copy of the LDC validation report.

5.3 Reconciliation with User Requirements

The QA/QC Manager will review data after each survey to determine if DQOs have been met. If data do not meet the project's specifications, the QA/QC Manager will review the errors and determine if the problem is due to calibration/maintenance, sampling techniques, or other factors and will suggest corrective action. It is expected that the problem would be able to be corrected by retraining, revision of techniques, or replacement of supplies or equipment; if not, the DQOs will be reviewed for feasibility. If specific DQOs are not achievable, the QA/QC Manager will recommend appropriate modifications. Any revisions will require approval by Ecology.

6 REFERENCES

ASTM (American Society for Testing and Materials), 2002. Standard Practices for Use of the Term Precision and Bias in ASTM Test Methods. ASTM 177-90a. ASTM International.

Ecology (Washington State Department of Ecology), 1995. Sediment Management Standards: Chapter 173-204 WAC. December 1995.

Ecology, 2008. Sediment Sampling and Analysis Plan Appendix. Ecology Publication No. 03-09-043. Sediment Source Control Standards User Manual, Washington State Department of Ecology Sediment Management Unit. Revised February 2008.

EPA (U.S. Environmental Protection Agency), 1986. Test Methods for the Evaluation of Solid Waste: Physical/Chemical Methods, 3rd Edition. EPA SW-846, 1986.

EPA, 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. EPA540/R-99/008, October 1999.

EPA, 2004. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. EPA540-R-04-004, October 2004.

EPA, 2005. National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review. OSWER 9240.1-51, EPA-540-R-05-001. September 2005.

Lombard, S.M., and C.J. Kirchmer, 2004. Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies. Washington State Department of Ecology Environmental Assessment Program. July 2004. Publication Number 04-03-030.

PSEP (Puget Sound Estuary Program), 1986. Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound. Prepared for the U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

PSEP, 1997a. Puget Sound Estuary Program: Recommended Guidelines for Sampling Marine Sediment, Water Column, and Tissue in Puget Sound. Prepared for the U.S. Environmental Protection Agency Region 10, and the Puget Sound Water Quality Authority. Puget Sound Water Quality Authority, Olympia, Washington.

PSEP, 1997b. Puget Sound Estuary Program: Recommended Guidelines for Measuring Organic Compounds in Puget Sound Sediment and Tissue Samples. Prepared for the

U.S. Environmental Protection Agency Region 10, and the Puget Sound Water Quality Authority. Puget Sound Water Quality Authority, Olympia, Washington.

PSEP, 1997c. Puget Sound Estuary Program: Recommended Protocols for Measuring Metals in Puget Sound Sediment and Tissue Samples. Prepared for the U.S. Environmental Protection Agency Region 10, and the Puget Sound Water Quality Authority. Puget Sound Water Quality Authority, Olympia, Washington.

TABLES

Table 1
Data Quality Objectives

Parameters	Precision	Accuracy	Completeness
Soil/Sediment Parameters			
Grain size	± 20% RPD	NA	90%
Total solids/Total volatile solids	± 20% RPD	NA	90%
Total organic carbon	± 20% RPD	75-125% R	90%
Metals, Chromium VI	± 20% RPD	75-125% R	90%
Total Petroleum Hydrocarbons	± 35% RPD	50-150% R	90%
Tributyltin	± 35% RPD	50-150% R	90%
SVOCs, PCBs, Pesticides	± 35% RPD	50-150% R	90%
VOCs	± 35% RPD	50-150% R	90%
Dioxins/Furans	± 35% RPD	50-150% R	90%
Water Parameters			
Total dissolved solids/Total suspended solids	± 20% RPD	NA	90%
Ammonia/Alkalinity/Nitrate/Sulfate	± 20% RPD	80-120% R	90%
Metals, Chromium VI	± 20% RPD	80-120% R	90%
Total Petroleum Hydrocarbons	± 30% RPD	60-140% R	90%
Tributyltin	± 30% RPD	60-140% R	90%
SVOCs, PCBs, Pesticides	± 30% RPD	60-140% R	90%
VOCs	± 30% RPD	60-140% R	90%
Dioxins/Furans	± 30% RPD	60-140% R	90%

Notes:
NA = not applicable
PCB = polychlorinated biphenyl
R = Recovery
RPD = Relative percent difference
SVOC = semivolatile organic compound
VOC = volatile organic compound

Table 2
Laboratory and Field Quality Assurance/Quality Control Sample and Analysis Summary

Analysis Type	Field Quality Assurance Samples			Laboratory Quality Control Elements							
	Rinsate Blank	Field Duplicates[1]	Temperature Blank	Initial Calibration[b]	Ongoing Calibration	Replicates	Matrix Spikes	SRM[e]/LCS/ Blank Spike	Matrix Spike Duplicates	Method Blanks	Surrogate Spikes
Grain size	NA	1 per event or 1 per 20 samples	1 per cooler	Each batch [a]	NA	1 per 20 samples	NA	NA	NA	NA	NA
Total solids/Total dissolved solids/Total volatile solids	NA	1 per event or 1 per 20 samples	1 per cooler	Each batch [a]	NA	1 per 20 samples	NA	NA	NA	NA	NA
Total organic carbon	NA	1 per event or 1 per 20 samples	1 per cooler	Daily or each batch	1 per 10 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	NA	1 per 20 samples	NA
Ammonia/Alkalinity/Sulfate/ Nitrate	1 per equipment type	1 per event or 1 per 20 samples	1 per cooler	Daily or each batch	1 per 10 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	NA	1 per 20 samples	NA
Metals (Total and Dissolved), Chromium VI	1 per equipment type	1 per event or 1 per 20 samples	1 per cooler	Daily	1 per 10 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	NA	1 per 20 samples	NA
TPH (Gasoline, Diesel and Oil Range)	1 per equipment type	1 per event or 1 per 20 samples	1 per cooler	As needed [c]	1 per 10 samples	NA	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	Every sample
Tributyltin	1 per equipment type	1 per event or 1 per 20 samples	1 per cooler	As needed [c]	Every 12 hours	NA	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	Every sample
Dioxin/Furans	1 per equipment type	1 per event or 1 per 20 samples	1 per cooler	As needed [c]	Every 12 hours	NA	NA[d]	1 per 20 samples	NA[d]	1 per 20 samples	Every sample
VOCs	1 per equipment type	1 per event or 1 per 20 samples	1 per cooler	As needed [c]	Every 12 hours	NA	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	Every sample
SVOCs, PCBs, Pesticides	1 per equipment type	1 per event or 1 per 20 samples	1 per cooler	As needed [c]	Every 12 hours	NA	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	Every sample

Notes:
a = Calibration and certification of drying ovens and weighing scales are conducted bi-annually.
b = Initial calibration verification and calibration blank must be analyzed at the beginning of each batch.
c = Initial calibrations are considered valid until the ongoing continuing calibration no longer meets method specifications. At that point, a new initial calibration is performed.
d = Isotope dilution required per method.
e = Puget Sound SRM will be analyzed for PCBs and dioxins. An LCS will be analyzed for all other analyses.
EPH = extractable petroleum hydrocarbons
LCS = laboratory control sample
NA = not applicable
PCB = polychlorinated biphenyl
SRM = standard reference materials
SVOC = semivolatile organic compound
TPH = total petroleum hydrocarbons
VOC = volatile organic compound
VPH = volatile petroleum hydrocarbons

Table 3
Soil Analytes, Analytical Methods, and Laboratory Reporting Limits

Parameter	Analytical Method	Method Detection Limit	Limit of Detection	Limit of Quantitation
Conventional and Physical Parameters				
Soil Description and Classification	ASTM D-2488/D-2487	--	--	--
Total Solids (%)	SM2540B	--	--	0.01
Total Organic Carbon (%)	Plumb 1981	--	--	0.02
Total Petroleum Hydrocarbons with Acid and/or Silica Gel Cleanup (mg/kg)				
Gasoline Range Hydrocarbons	NWTPH-Gx	1.66	2.5	5
Diesel Range Hydrocarbons	NWTPH-Dx	1.28	2.5	5
Oil Range Hydrocarbons	NWTPH-Dx	0.665	5	10
Metals (mg/kg)				
Antimony	USEPA 6020A	--	--	0.2
Arsenic	USEPA 6020A	--	--	0.2/0.5
Beryllium	USEPA 6020A	--	--	0.2
Barium	USEPA 6020A	--	--	0.5
Cadmium	USEPA 6020A	--	--	0.1
Chromium	USEPA 6020A	--	--	0.5
Chromium, hexavalent	USEPA 3060A/7196A	--	--	0.1
Copper	USEPA 6020A	--	--	0.5
Lead	USEPA 6020A	--	--	0.1
Mercury	USEPA 7471A	--	--	0.025
Nickel	USEPA 6020A	--	--	0.5
Selenium	USEPA 6020A	--	--	0.5
Silver	USEPA 6020A	--	--	0.2
Thallium	USEPA 6020A	--	--	0.2
Zinc	USEPA 6020A	--	--	4
Tributyltin				
Tributyltin - bulk sample (µg/kg)	Krone/8270D-SIM	1.52	2	4
Tributyltin - pore water (µg/L)	Krone/8270D-SIM	--	--	0.0052
Semivolatile Organic Compounds: Low Level PAH (µg/kg)				
1-Methylnaphthalene	USEPA 8270-SIM	1.71	2.5	5
2-Methylnaphthalene	USEPA 8270-SIM	1.52	2.5	5
Acenaphthene	USEPA 8270-SIM	1.32	2.5	5
Acenaphthylene	USEPA 8270-SIM	1.26	2.5	5
Anthracene	USEPA 8270-SIM	1.46	2.5	5
Benzo(a)anthracene	USEPA 8270-SIM	1.6	2.5	5
Benzo(a)Pyrene	USEPA 8270-SIM	1.75	2.5	5
Benzo(g,h,i)Perylene	USEPA 8270-SIM	3.05	4	5
Benzo(b)fluoranthene	USEPA 8270-SIM	1.90	2.5	5
Benzo(k)fluoranthene	USEPA 8270-SIM	2.05	2.5	5
Benzofluoranthene(s) (total)	USEPA 8270-SIM	2	2.5	5
Chrysene	USEPA 8270-SIM	1.88	2.5	5
Dibenz(a,h)Anthracene	USEPA 8270-SIM	2.38	4	5
Dibenzofuran	USEPA 8270-SIM	1.51	2.5	5
Fluoranthene	USEPA 8270-SIM	1.77	4	5
Fluorene	USEPA 8270-SIM	1.29	2.5	5
Indeno(1,2,3-cd)Pyrene	USEPA 8270-SIM	3.47	4	5
Naphthalene	USEPA 8270-SIM	2.63	5	5
Phenanthrene	USEPA 8270-SIM	1.98	2.5	5
Pyrene	USEPA 8270-SIM	2.22	4	5
Semivolatile Organic Compounds (including Phenols, Phthalates, and Polycyclic Aromatic Hydrocarbons) (µg/kg)				
1,2,4-Trichlorobenzene	USEPA 8270D/SIM	1.86	2.5	5
1,2-Dichlorobenzene	USEPA 8270D/SIM	1.1	2.5	5
1,3-Dichlorobenzene	USEPA 8270D/SIM	1.31	2.5	5
1,4-Dichlorobenzene	USEPA 8270D/SIM	1.19	2.5	5
1-Methylnaphthalene	USEPA 8270D	2.68	10	20
2,2'-oxybis(1-Chloropropane)	USEPA 8270D	3.76	10	20
2,3,4,6-Tetrachlorophenol	USEPA 8270D	4.85	10	20
2,4,5-Trichlorophenol	USEPA 8270D	21.4	50	100
2,4,6-Trichlorophenol	USEPA 8270D	22.4	50	100
2,4-Dichlorophenol	USEPA 8270D	21.5	100	200
2,4-Dimethylphenol	USEPA 8270D/SIM	2.89	10	20
2,4-Dinitrophenol	USEPA 8270D	111	425	850
2,4-Dinitrotoluene	USEPA 8270D	19.5	50	100
2,6-Dinitrotoluene	USEPA 8270D	30.6	50	100
2-Chloronaphthalene	USEPA 8270D	2.64	10	20
2-Chlorophenol	USEPA 8270D	2.39	10	20
2-Methylnaphthalene	USEPA 8270D	3.06	10	20
2-Methylphenol	USEPA 8270D/SIM	1.81	2.5	5
2-Nitroaniline	USEPA 8270D	18.4	50	100
2-Nitrophenol	USEPA 8270D	38.7	50	100
3,3'-Dichlorobenzidine	USEPA 8270D	17.8	75	150
3-Nitroaniline	USEPA 8270D	22.5	50	100
4,6-Dinitro-2-methylphenol	USEPA 8270D	21.2	100	200
4-Bromophenyl-phenylether	USEPA 8270D	5.03	10	20
4-Chloro-3-methylphenol	USEPA 8270D	15.1	50	100
4-Chloroaniline	USEPA 8270D	22.3	135	270
4-Chlorophenyl-phenylether	USEPA 8270D	5.29	10	20

Table 3
Soil Analytes, Analytical Methods, and Laboratory Reporting Limits

Parameter	Analytical Method	Method Detection Limit	Limit of Detection	Limit of Quantitation
4-Methylphenol	USEPA 8270D/SIM	2.52	5	10
4-Nitroaniline	USEPA 8270D	37.9	50	100
4-Nitrophenol	USEPA 8270D	34.7	50	100
Acenaphthene	USEPA 8270D	3.28	10	20
Acenaphthylene	USEPA 8270D	5.71	10	20
Anthracene	USEPA 8270D	4.5	10	20
Benzo(a)anthracene	USEPA 8270D	3.29	10	20
Benzo(a)pyrene	USEPA 8270D	5.45	10	20
Benzo(g,h,i)perylene	USEPA 8270D	4.4	10	20
Benzofluoranthene(s) (Total)	USEPA 8270D	6.67	20	40
Benzoic acid	USEPA 8270D	101	200	400
Benzyl alcohol	USEPA 8270D/SIM	7.04	10	20
Bis(2-Chloroethoxy)methane	USEPA 8270D	2	10	20
Bis(2-Chloroethyl)ether	USEPA 8270D	3.35	10	20
bis(2-Ethylhexyl)phthalate	USEPA 8270D	14.6	20	25
Butylbenzylphthalate	USEPA 8270D/SIM	2.89	5	5
Carbazole	USEPA 8270D	2.69	10	20
Chrysene	USEPA 8270D	3.75	10	20
Dibenzo(a,h)anthracene	USEPA 8270D/SIM	2.02	2.5	5
Dibenzofuran	USEPA 8270D	4.1	10	20
Diethylphthalate	USEPA 8270D/SIM	3.26	5	5
Dimethylphthalate	USEPA 8270D/SIM	1.34	2.5	5
Di-n-butylphthalate	USEPA 8270D	8.16	10	20
Di-n-octylphthalate	USEPA 8270D	5.84	10	20
Fluoranthene	USEPA 8270D	2.91	10	20
Fluorene	USEPA 8270D	4.35	10	20
Hexachlorobenzene	USEPA 8270D/SIM	1.26	2.5	5
Hexachlorobutadiene	USEPA 8270D/SIM	0.96	2.5	5
Hexachlorocyclopentadiene	USEPA 8270D	66.4	200	400
Hexachloroethane	USEPA 8270D	2.94	10	20
Indeno(1,2,3-cd)pyrene	USEPA 8270D	4.68	10	20
Isophorone	USEPA 8270D	2.86	10	20
Naphthalene	USEPA 8270D	2.76	10	20
Nitrobenzene	USEPA 8270D	4.06	10	20
N-Nitroso-di-n-propylamine	USEPA 8270D/SIM	9.48	10	12
N-Nitrosodiphenylamine	USEPA 8270D/SIM	1.38	10	20
Pentachlorophenol	USEPA 8270D/SIM	14.3	25	50
Phenanthrene	USEPA 8270D	3.64	10	20
Phenol	USEPA 8270D/SIM	2.56	5	5
Pyrene	USEPA 8270D	1.94	10	20
Polychlorinated Biphenyl Aroclors (μg/kg)				
Aroclor 1016	USEPA 8082B	0.577	2	4
Aroclor 1221	USEPA 8082B	0.577	2	4
Aroclor 1232	USEPA 8082B	0.577	2	4
Aroclor 1242	USEPA 8082B	0.577	2	4
Aroclor 1248	USEPA 8082B	0.61	2	4
Aroclor 1254	USEPA 8082B	0.61	2	4
Aroclor 1260	USEPA 8082B	0.61	2	4
Volatile Organic Compounds (μg/kg)				
1,1,1,2-Tetrachloroethane	USEPA 8260C	0.233	0.5	1
1,1,1-Trichloroethane	USEPA 8260C	0.226	0.5	1
1,1,2,2-Tetrachloroethane	USEPA 8260C	0.253	0.5	1
1,1,2-Trichloro-1,2,2- Trifluoroethane	USEPA 8260C	0.287	1	2
1,1,2-Trichloroethane	USEPA 8260C	0.286	0.5	1
1,1-Dichloroethane	USEPA 8260C	0.203	0.5	1
1,1-Dichloroethene	USEPA 8260C	0.336	0.5	1
1,1-Dichloropropene	USEPA 8260C	0.312	0.5	1
1,2,3-Trichlorobenzene	USEPA 8260C	0.305	2.5	5
1,2,3-Trichloropropane	USEPA 8260C	0.517	1	2
1,2,4-Trichlorobenzene	USEPA 8260C	0.332	2.5	5
1,2,4-Trimethylbenzene	USEPA 8260C	0.23	0.5	1
1,2-Dibromo-3-Chloropropane	USEPA 8260C	0.586	2.5	5
1,2-Dibromoethane	USEPA 8260C	0.176	0.5	1
1,2-Dichlorobenzene	USEPA 8260C	0.293	0.5	1
1,2-Dichloroethane	USEPA 8260C	0.191	0.5	1
1,2-Dichloropropane	USEPA 8260C	0.162	0.5	1
1,3,5-Trimethylbenzene	USEPA 8260C	0.254	0.5	1
1,3-Dichlorobenzene	USEPA 8260C	0.227	0.5	1
1,3-Dichloropropane	USEPA 8260C	0.209	0.5	1
1,4-Dichlorobenzene	USEPA 8260C	0.232	0.5	1
2,2-Dichloropropane	USEPA 8260C	0.292	0.5	1
2-Butanone	USEPA 8260C	0.513	2.5	5
2-Chloroethyl Vinyl Ether	USEPA 8260C	0.276	2.5	5
2-Chlorotoluene	USEPA 8260C	0.3	0.5	1
2-Hexanone	USEPA 8260C	0.439	2.5	5
4-Chlorotoluene	USEPA 8260C	0.277	0.5	1

Table 3
Soil Analytes, Analytical Methods, and Laboratory Reporting Limits

Parameter	Analytical Method	Method Detection Limit	Limit of Detection	Limit of Quantitation
4-Isopropyl Toluene	USEPA 8260C	0.236	0.5	1
4-Methyl-2-Pentanone	USEPA 8260C	0.42	2.5	5
Acetone	USEPA 8260C	0.482	2.5	5
Acrolein	USEPA 8260C	3.809	25	50
Acrylonitrile	USEPA 8260C	1.026	2.5	5
Benzene	USEPA 8260C/SIM	0.296	0.5	1
Bromobenzene	USEPA 8260C	0.153	0.5	1
Bromochloromethane	USEPA 8260C	0.323	0.5	1
Bromodichloromethane	USEPA 8260C	0.254	0.5	1
Bromoethane	USEPA 8260C	0.44	1	2
Bromoform	USEPA 8260C	0.297	0.5	1
Bromomethane	USEPA 8260C	0.187	0.5	1
Carbon Disulfide	USEPA 8260C	0.559	1	1
Carbon Tetrachloride	USEPA 8260C	0.213	0.5	1
Chlorobenzene	USEPA 8260C	0.219	0.5	1
Chloroethane	USEPA 8260C	0.462	0.5	1
Chloroform	USEPA 8260C	0.234	0.5	1
Chloromethane	USEPA 8260C	0.263	0.5	1
cis-1,2-Dichloroethene (DCE)	USEPA 8260C	0.24	0.5	1
cis-1,3-Dichloropropene	USEPA 8260C	0.226	0.5	1
Dibromochloromethane	USEPA 8260C	0.266	0.5	1
Dibromomethane	USEPA 8260C	0.147	0.5	1
Dichlorodifluoromethane	USEPA 8260C	0.207	0.5	1
Ethyl Benzene	USEPA 8260C/SIM	0.202	0.5	1
Hexachloro-1,3-Butadiene	USEPA 8260C	0.41	2.5	5
Iodomethane (Methyl Iodide)	USEPA 8260C	0.215	0.5	1
Isopropyl Benzene	USEPA 8260C	0.233	0.5	1
m,p-Xylene	USEPA 8260C/SIM	0.392	0.5	1
Methylene Chloride	USEPA 8260C	0.635	1	2
Methyl-t-butyl ether (MTBE)	USEPA 8260C	0.231	0.5	1
Naphthalene	USEPA 8260C	0.429	2.5	5
n-Butylbenzene	USEPA 8260C	0.262	0.5	1
n-Propyl Benzene	USEPA 8260C	0.272	0.5	1
o-Xylene	USEPA 8260C/SIM	0.224	0.5	1
s-Butylbenzene	USEPA 8260C	0.24	0.5	1
Styrene	USEPA 8260C	0.138	0.5	1
t-Butylbenzene	USEPA 8260C	0.306	0.5	1
Tetrachloroethene (PCE)	USEPA 8260C	0.257	0.5	1
Toluene	USEPA 8260C/SIM	0.151	0.5	1
trans-1,2-Dichloroethene	USEPA 8260C	0.266	0.5	1
trans-1,3-Dichloropropene	USEPA 8260C	0.216	0.5	1
trans-1,4-Dichloro-2-Butene	USEPA 8260C	0.437	2.5	5
Trichloroethene (TCE)	USEPA 8260C	0.212	0.5	1
Trichlorofluoromethane	USEPA 8260C	0.266	0.5	1
Vinyl Acetate	USEPA 8260C	0.381	2.5	5
Vinyl Chloride	USEPA 8260C	0.235	0.5	1
Dioxins/Furans (ng/kg)				
2,3,7,8-TCDF	USEPA 1613B	0.23	0.5	1
2,3,7,8-TCDD	USEPA 1613B	0.274	0.5	1
1,2,3,7,8-PeCDF	USEPA 1613B	0.832	2.5	5
2,3,4,7,8-PeCDF	USEPA 1613B	1.076	2.5	5
1,2,3,7,8-PeCDD	USEPA 1613B	0.647	2.5	5
1,2,3,4,7,8-HxCDF	USEPA 1613B	0.991	2.5	5
1,2,3,6,7,8-HxCDF	USEPA 1613B	0.769	2.5	5
2,3,4,6,7,8-HxCDF	USEPA 1613B	0.904	2.5	5
1,2,3,7,8,9-HxCDF	USEPA 1613B	0.857	2.5	5
1,2,3,4,7,8-HxCDD	USEPA 1613B	0.481	2.5	5
1,2,3,6,7,8-HxCDD	USEPA 1613B	0.561	2.5	5
1,2,3,7,8,9-HxCDD	USEPA 1613B	0.886	2.5	5
1,2,3,4,6,7,8-HpCDF	USEPA 1613B	1.165	2.5	5
1,2,3,4,7,8,9-HpCDF	USEPA 1613B	0.688	2.5	5
1,2,3,4,6,7,8-HpCDD	USEPA 1613B	0.828	2.5	5
OCDF	USEPA 1613B	2.176	5	10
OCDD	USEPA 1613B	7.452	5	10
Pesticides (µg/kg)				
alpha-BHC	USEPA 8081B	0.081	0.25	0.5
beta-BHC	USEPA 8081B	0.139	0.25	0.5
gamma-BHC (Lindane)	USEPA 8081B	0.048	0.25	0.5
delta-BHC	USEPA 8081B	0.082	0.25	0.5
Heptachlor	USEPA 8081B	0.132	0.25	0.5
Aldrin	USEPA 8081B	0.055	0.25	0.5
Heptachlor Epoxide	USEPA 8081B	0.085	0.25	0.5
trans-Chlordane (beta-Chlordane, gamma-Chlordane)	USEPA 8081B	0.077	0.25	0.5
cis-Chlordane (alpha-chlordane)	USEPA 8081B	0.051	0.25	0.5
Endosulfan I	USEPA 8081B	0.072	0.25	0.5
4,4'-DDE	USEPA 8081B	0.124	0.5	1

Table 3
Soil Analytes, Analytical Methods, and Laboratory Reporting Limits

Parameter	Analytical Method	Method Detection Limit	Limit of Detection	Limit of Quantitation
Dieldrin	USEPA 8081B	0.1	0.5	1
Endrin	USEPA 8081B	0.215	0.5	1
Endosulfan II	USEPA 8081B	0.116	0.5	1
4,4’-DDD	USEPA 8081B	0.135	0.5	1
Endrin Aldehyde	USEPA 8081B	0.218	0.5	1
4,4’-DDT	USEPA 8081B	0.192	0.5	1
Endosulfan Sulfate	USEPA 8081B	0.192	0.5	1
Endrin Ketone	USEPA 8081B	0.119	0.5	1
Methoxychlor	USEPA 8081B	0.698	2.5	5
Hexachlorobutadiene	USEPA 8081B	0.138	0.5	1
Hexachlorobenzene	USEPA 8081B	0.094	0.5	1

Notes:
Method Detection Limits (MDL) are determined by 40 CFR Part 136 and included for informational purposes.
Limit of Detection (LOD) and Limit of Quantitation (LOQ) values are updated quarterly and are subject to change slightly as new detection and quantitation studies are completed.
With the exception of metals, all detected concentrations between the LOD and LOQ will be reported as estimated.
Non-detected concentrations will be reported at the LOQ.
Final MDL, LOD and LOQ values may differ slightly based on sample dry weight correction, adjustment for sample size and sample dilution due to matrix interference, or non-target analytes.

Table 4
Surface Water, Stormwater, and Groundwater Analytes, Analytical Methods, and Laboratory Reporting Limits

Parameter	Analytical Method	Method Detection Limit	Limit of Detection	Limit of Quantitation
Conventional and Physical Parameters (mg/L)				
Total dissolved solids	SM2540C	--	--	5.0
Total Suspended Solids	SM 2450D	--	--	1.0
Total and dissolved sulfides	USEPA 376.2	--	--	0.05
Chloride	USEPA 300.0	--	--	0.1
Sulfate	USEPA 300.0	--	--	0.1
Nitrate	USEPA 300.0	--	--	0.1
Alkalinity	SM 2320B	--	--	2.0
Conductivity (µS/cm)	120.1	--	--	1.0
Ammonia	USEPA 350.1	--	--	0.1
Total Petroleum Hydrocarbons with Acid and/or Silica Gel Cleanup (mg/L)				
Gasoline Range Hydrocarbons	NWTPH-Gx	0.011	0.015	0.03
Diesel Range Hydrocarbons	NWTPH-Dx	0.022	0.05	0.1
Oil Range Hydrocarbons	NWTPH-Dx	0.044	0.1	0.2
Metals, Total and Dissolved (µg/L)				
Antimony	USEPA 6020A	0.01	0.1	0.2
Arsenic	USEPA 6020A	0.048	0.1	0.2/0.5
Beryllium	USEPA 6020A	0.021	0.1	0.2
Barium	USEPA 6020A	0.02	0.25	0.5
Cadmium	USEPA 6020A	0.01	0.05	0.1
Chromium	USEPA 6020A	0.045	0.25	0.5
Chromium, hexavalent	USEPA 3060A/7196A	--	--	0.04
Copper	USEPA 6020A	0.158	0.25	0.5
Lead	USEPA 6020A	0.046	0.05	0.1
Mercury	USEPA 7471A	0.0069	0.05	0.1
Nickel	USEPA 6020A	0.079	0.25	0.5
Selenium	USEPA 6020A	0.127	0.25	0.5
Silver	USEPA 6020A	0.008	0.1	0.2
Thallium	USEPA 6020A	0.004	0.1	0.2
Zinc	USEPA 6020A	0.497	2	4
Tributyltin				
Tributyltin (µg/L)	Krone/8270D-SIM	0.043	0.096	0.193
Semivolatile Organic Compounds: Low Level PAH (µg/L)				
1-Methylnaphthalene	USEPA 8270D/SIM	0.00088	0.005	0.01
2-Methylnaphthalene	USEPA 8270D/SIM	0.00072	0.005	0.01
Acenaphthene	USEPA 8270D/SIM	0.00083	0.005	0.01
Acenaphthylene	USEPA 8270D/SIM	0.00081	0.005	0.01
Anthracene	USEPA 8270D/SIM	0.00058	0.005	0.01
Benzo(a)anthracene	USEPA 8270D/SIM	0.00127	0.005	0.01
Benzo(a)Pyrene	USEPA 8270D/SIM	0.00114	0.005	0.01
Benzo(g,h,i)Perylene	USEPA 8270D/SIM	0.00187	0.005	0.01
Benzo(b)fluoranthene	USEPA 8270D/SIM	0.00254	0.005	0.01
Benzo(k)fluoranthene	USEPA 8270D/SIM	0.00085	0.005	0.01
Benzofluoranthene(s) (total)	USEPA 8270D/SIM	0.00339	0.005	0.01
Chrysene	USEPA 8270D/SIM	0.00157	0.005	0.01
Dibenz(a,h)Anthracene	USEPA 8270D/SIM	0.00097	0.005	0.01
Dibenzofuran	USEPA 8270D/SIM	0.00094	0.005	0.01
Fluoranthene	USEPA 8270D/SIM	0.00092	0.005	0.01
Fluorene	USEPA 8270D/SIM	0.00141	0.005	0.01
Indeno(1,2,3-cd)Pyrene	USEPA 8270D/SIM	0.00182	0.005	0.01
Naphthalene	USEPA 8270D/SIM	0.00085	0.005	0.01
Phenanthrene	USEPA 8270D/SIM	0.00101	0.005	0.01
Pyrene	USEPA 8270D/SIM	0.0007	0.005	0.01
Semivolatile Organic Compounds (including Phenols, Phthalates, and Polycyclic Aromatic Hydrocarbons) (µg/L)				
1,2,4-Trichlorobenzene	USEPA 8270D	0.495	0.5	1
1,2-Dichlorobenzene	USEPA 8270D	0.436	0.5	1
1,3-Dichlorobenzene	USEPA 8270D	0.499	0.5	1
1,4-Dichlorobenzene	USEPA 8270D	0.47	0.5	1
1-Methylnaphthalene	USEPA 8270D	0.199	0.5	1
2,2'-oxybis(1-Chloropropane)	USEPA 8270D	0.221	0.5	1
2,3,4,6-Tetrachlorophenol	USEPA 8270D	0.153	0.5	1
2,4,5-Trichlorophenol	USEPA 8270D	1.706	2.5	5
2,4,6-Trichlorophenol	USEPA 8270D	1.235	1.5	3
2,4-Dichlorophenol	USEPA 8270D	1.109	1.5	3
2,4-Dimethylphenol	USEPA 8270D	0.627	1.5	3
2,4-Dinitrophenol	USEPA 8270D	5.474	10	20
2,4-Dinitrotoluene	USEPA 8270D	1.277	1.5	3
2,6-Dinitrotoluene	USEPA 8270D	1.3	1.5	3
2-Chloronaphthalene	USEPA 8270D	0.34	0.5	1
2-Chlorophenol	USEPA 8270D	0.246	0.5	1
2-Methylnaphthalene	USEPA 8270D	0.241	0.5	1
2-Methylphenol	USEPA 8270D	0.329	0.5	1
2-Nitroaniline	USEPA 8270D	0.784	1.5	3
2-Nitrophenol	USEPA 8270D	0.979	1.5	3
3,3'-Dichlorobenzidine	USEPA 8270D	1.553	2.5	5
3-Nitroaniline	USEPA 8270D	1.14	1.5	3

Table 4
Surface Water, Stormwater, and Groundwater Analytes, Analytical Methods, and Laboratory Reporting Limits

Parameter	Analytical Method	Method Detection Limit	Limit of Detection	Limit of Quantitation
4,6-Dinitro-2-methylphenol	USEPA 8270D	4.928	5	10
4-Bromophenyl-phenylether	USEPA 8270D	0.262	0.5	1
4-Chloro-3-methylphenol	USEPA 8270D	0.919	1.5	3
4-Chloroaniline	USEPA 8270D	1.733	2.5	5
4-Chlorophenyl-phenylether	USEPA 8270D	0.342	0.5	1
4-Methylphenol	USEPA 8270D	0.536	1	2
4-Nitroaniline	USEPA 8270D	1.366	1.5	3
4-Nitrophenol	USEPA 8270D	2.895	5	10
Acenaphthene	USEPA 8270D	0.347	0.5	1
Acenaphthylene	USEPA 8270D	0.274	0.5	1
Anthracene	USEPA 8270D	0.303	0.5	1
Benzo(a)anthracene	USEPA 8270D	0.373	0.5	1
Benzo(a)pyrene	USEPA 8270D	0.425	0.5	1
Benzo(g,h,i)perylene	USEPA 8270D	0.464	0.5	1
Benzofluoranthene(s) (Total)	USEPA 8270D	2.317	2.5	5
Benzoic acid	USEPA 8270D	8.647	10	20
Benzyl alcohol	USEPA 8270D	0.409	1	2
Bis(2-Chloroethoxy)methane	USEPA 8270D	0.252	0.5	1
Bis(2-Chloroethyl)ether	USEPA 8270D	0.257	0.5	1
bis(2-Ethylhexyl)phthalate	USEPA 8270D	1.05	1.5	3
Butylbenzylphthalate	USEPA 8270D	0.402	0.5	1
Carbazole	USEPA 8270D	0.251	0.5	1
Chrysene	USEPA 8270D	0.397	0.5	1
Dibenzo(a,h)anthracene	USEPA 8270D	0.437	0.5	1
Dibenzofuran	USEPA 8270D	0.198	0.5	1
Diethylphthalate	USEPA 8270D	0.407	0.5	1
Dimethylphthalate	USEPA 8270D	0.264	0.5	1
Di-n-butylphthalate	USEPA 8270D	0.304	0.5	1
Di-n-octylphthalate	USEPA 8270D	0.331	0.5	1
Fluoranthene	USEPA 8270D	0.29	0.5	1
Fluorene	USEPA 8270D	0.266	0.5	1
Hexachlorobenzene	USEPA 8081B	0.0101	0.05	0.1
Hexachlorobutadiene	USEPA 8081B	0.0123	0.05	0.1
Hexachlorocyclopentadiene	USEPA 8270D	1.862	2.5	5
Hexachloroethane	USEPA 8270D	0.61	1	2
Indeno(1,2,3-cd)pyrene	USEPA 8270D	0.435	0.5	1
Isophorone	USEPA 8270D	0.258	0.5	1
Naphthalene	USEPA 8270D	0.326	0.5	1
Nitrobenzene	USEPA 8270D	0.49	0.5	1
N-Nitroso-di-n-propylamine	USEPA 8270D	0.365	0.5	1
N-Nitrosodiphenylamine	USEPA 8270D	0.392	0.5	1
Pentachlorophenol	USEPA 8270D	2.746	5	10
Phenanthrene	USEPA 8270D	0.283	0.5	1
Phenol	USEPA 8270D	0.445	0.5	1
Pyrene	USEPA 8270D	0.379	0.5	1
Polychlorinated Biphenyl Aroclors - Low Level (µg/L)				
Aroclor 1016	USEPA 8082B	0.00248	0.005	0.01
Aroclor 1221	USEPA 8082B	0.00248	0.005	0.01
Aroclor 1232	USEPA 8082B	0.00248	0.005	0.01
Aroclor 1242	USEPA 8082B	0.00248	0.005	0.01
Aroclor 1248	USEPA 8082B	0.00276	0.005	0.01
Aroclor 1254	USEPA 8082B	0.00276	0.005	0.01
Aroclor 1260	USEPA 8082B	0.00276	0.005	0.01
Volatile Organic Compounds - SIM (µg/L)				
1,1,2,2-Tetrachloroethane	USEPA 8260C/SIM	0.00473	0.01	0.02
1,1-Dichloroethene	USEPA 8260C/SIM	0.00459	0.01	0.02
1,2-Dichloroethane	USEPA 8260C/SIM	0.00442	0.01	0.02
Acrylonitrile	USEPA 8260C/SIM	0.0158	0.025	0.05
Benzene	USEPA 8260C/SIM	0.00503	0.01	0.02
cis-1,2-Dichloroethene	USEPA 8260C/SIM	0.00362	0.01	0.02
Tetrachloroethene	USEPA 8260C/SIM	0.00682	0.01	0.02
trans-1,2-Dichloroethene	USEPA 8260C/SIM	0.00506	0.01	0.02
Trichloroethene	USEPA 8260C/SIM	0.00649	0.01	0.02
Vinyl Chloride	USEPA 8260C/SIM	0.00501	0.01	0.02
Volatile Organic Compounds (µg/L)				
1,1,1,2-Tetrachloroethane	USEPA 8260C	0.04	0.1	0.2
1,1,1-Trichloroethane	USEPA 8260C	0.041	0.1	0.2
1,1,2,2-Tetrachloroethane	USEPA 8260C	0.06	0.1	0.2
1,1,2-Trichloro-1,2,2-Trifluoroethane	USEPA 8260C	0.043	0.1	0.2
1,1,2-Trichloroethane	USEPA 8260C	0.129	0.2	0.2
1,1-Dichloroethane	USEPA 8260C	0.053	0.1	0.2
1,1-Dichloroethene	USEPA 8260C	0.054	0.1	0.2
1,1-Dichloropropene	USEPA 8260C	0.034	0.1	0.2
1,2,3-Trichlorobenzene	USEPA 8260C	0.11	0.25	0.5
1,2,3-Trichloropropane	USEPA 8260C	0.131	0.25	0.5
1,2,4-Trichlorobenzene	USEPA 8260C	0.107	0.25	0.5

Table 4
Surface Water, Stormwater, and Groundwater Analytes, Analytical Methods, and Laboratory Reporting Limits

Parameter	Analytical Method	Method Detection Limit	Limit of Detection	Limit of Quantitation
1,2,4-Trimethylbenzene	USEPA 8260C	0.024	0.1	0.2
1,2-Dibromo 3-Chloropropane	USEPA 8260C	0.366	0.5	0.5
1,2-Dibromoethane (Ethylene Dibromide)	USEPA 8260C	0.075	0.1	0.2
1,2-Dichlorobenzene	USEPA 8260C	0.036	0.1	0.2
1,2-Dichloroethane	USEPA 8260C	0.072	0.1	0.2
1,2-Dichloropropane	USEPA 8260C	0.035	0.1	0.2
1,3,5-Trimethyl Benzene	USEPA 8260C	0.015	0.1	0.2
1,3-Dichlorobenzene	USEPA 8260C	0.036	0.1	0.2
1,3-Dichloropropane	USEPA 8260C	0.062	0.1	0.2
1,4-Dichlorobenzene	USEPA 8260C	0.04	0.1	0.2
2,2-Dichloropropane	USEPA 8260C	0.052	0.1	0.2
2-Butanone	USEPA 8260C	0.814	2.5	5
2-Chloro Toluene	USEPA 8260C	0.024	0.1	0.2
2-Chloroethylvinyl Ether	USEPA 8260C	0.25	0.5	1
2-Hexanone	USEPA 8260C	0.902	2.5	5
4-Chloro Toluene	USEPA 8260C	0.016	0.1	0.2
4-Isopropyl Toluene	USEPA 8260C	0.026	0.1	0.2
4-Methyl-2-Pentanone	USEPA 8260C	0.974	2.5	5
Acetone	USEPA 8260C	2.057	2.5	5
Acrolein	USEPA 8260C	2.476	2.5	5
Acrylonitrile	USEPA 8260C	0.604	1	1
Benzene	USEPA 8260C	0.027	0.1	0.2
Bromobenzene	USEPA 8260C	0.06	0.1	0.2
Bromochloromethane	USEPA 8260C	0.061	0.1	0.2
Bromodichloromethane	USEPA 8260C	0.051	0.1	0.2
Bromoethane	USEPA 8260C	0.041	0.1	0.2
Bromoform	USEPA 8260C	0.062	0.1	0.2
Bromomethane	USEPA 8260C	0.252	0.5	1
Carbon Disulfide	USEPA 8260C	0.037	0.1	0.2
Carbon Tetrachloride	USEPA 8260C	0.044	0.1	0.2
Chlorobenzene	USEPA 8260C	0.023	0.1	0.2
Chloroethane	USEPA 8260C	0.086	0.1	0.2
Chloroform	USEPA 8260C	0.027	0.1	0.2
Chloromethane	USEPA 8260C	0.095	0.25	0.5
cis 1,3-dichloropropene	USEPA 8260C	0.061	0.1	0.2
cis-1,2-Dichloroethene	USEPA 8260C	0.043	0.1	0.2
Dibromochloromethane	USEPA 8260C	0.048	0.1	0.2
Dibromomethane	USEPA 8260C	0.145	0.2	0.2
Dichlorodifluoromethane	USEPA 8260C	0.052	0.1	0.2
Ethyl Benzene	USEPA 8260C	0.037	0.1	0.2
Hexachloro-1,3-Butadiene	USEPA 8260C	0.073	0.25	0.5
Iodomethane (Methyl Iodide)	USEPA 8260C	0.227	0.5	1
iso-propyl Benzene	USEPA 8260C	0.021	0.1	0.2
m,p-xylene	USEPA 8260C	0.052	0.2	0.4
Methylene Chloride	USEPA 8260C	0.485	0.5	1
Methyl-tert-butyl ether	USEPA 8260C	0.073	0.25	0.5
Naphthalene	USEPA 8260C	0.118	0.25	0.5
n-Butyl Benzene	USEPA 8260C	0.025	0.1	0.2
n-Propyl Benzene	USEPA 8260C	0.023	0.1	0.2
o-Xylene	USEPA 8260C	0.035	0.1	0.2
sec-Butyl Benzene	USEPA 8260C	0.024	0.1	0.2
Styrene	USEPA 8260C	0.045	0.1	0.2
tert-Butyl Benzene	USEPA 8260C	0.026	0.1	0.2
Tetrachloroethene	USEPA 8260C	0.047	0.1	0.2
Toluene	USEPA 8260C	0.04	0.1	0.2
trans 1,3-Dichloropropene	USEPA 8260C	0.081	0.1	0.2
trans-1,2-Dichloroethene	USEPA 8260C	0.048	0.1	0.2
trans-1,4-Dichloro 2-Butene	USEPA 8260C	0.324	0.5	1
Trichloroethene	USEPA 8260C	0.049	0.1	0.2
Trichlorofluoromethane	USEPA 8260C	0.037	0.1	0.2
Vinyl Acetate	USEPA 8260C	0.069	0.1	0.2
Vinyl Chloride	USEPA 8260C	0.057	0.1	0.2
Dioxins/Furans (µg/L)				
2,3,7,8-TCDF	USEPA 1613B	0.00000203	0.000005	0.00001
2,3,7,8-TCDD	USEPA 1613B	0.00000282	0.000005	0.00001
1,2,3,7,8-PeCDF	USEPA 1613B	0.00000608	0.000025	0.00005
2,3,4,7,8-PeCDF	USEPA 1613B	0.00000769	0.000025	0.00005
1,2,3,7,8-PeCDD	USEPA 1613B	0.00000734	0.000025	0.00005
1,2,3,4,7,8-HxCDF	USEPA 1613B	0.00000727	0.000025	0.00005
1,2,3,6,7,8-HxCDF	USEPA 1613B	0.00000976	0.000025	0.00005
2,3,4,6,7,8-HxCDF	USEPA 1613B	0.00000514	0.000025	0.00005
1,2,3,7,8,9-HxCDF	USEPA 1613B	0.0000036	0.000025	0.00005
1,2,3,4,7,8-HxCDD	USEPA 1613B	0.00000338	0.000025	0.00005
1,2,3,6,7,8-HxCDD	USEPA 1613B	0.00000522	0.000025	0.00005
1,2,3,7,8,9-HxCDD	USEPA 1613B	0.0000045	0.000025	0.00005
1,2,3,4,6,7,8-HpCDF	USEPA 1613B	0.00001028	0.000025	0.00005

Table 4
Surface Water, Stormwater, and Groundwater Analytes, Analytical Methods, and Laboratory Reporting Limits

Parameter	Analytical Method	Method Detection Limit	Limit of Detection	Limit of Quantitation
1,2,3,4,7,8,9-HpCDF	USEPA 1613B	0.00000849	0.000025	0.00005
1,2,3,4,6,7,8-HpCDD	USEPA 1613B	0.0000073	0.000025	0.00005
OCDF	USEPA 1613B	0.0000162	0.00005	0.0001
OCDD	USEPA 1613B	0.0000383	0.00005	0.0001
Pesticides (µg/L)				
alpha-BHC	USEPA 8081B	0.0085	0.025	0.05
beta-BHC	USEPA 8081B	0.0098	0.025	0.05
gamma-BHC (Lindane)	USEPA 8081B	0.0159	0.025	0.05
delta-BHC	USEPA 8081B	0.0087	0.025	0.05
Heptachlor	USEPA 8081B	0.0113	0.025	0.05
Aldrin	USEPA 8081B	0.0103	0.025	0.05
Heptachlor Epoxide	USEPA 8081B	0.0079	0.025	0.05
trans-Chlordane (beta-Chlordane, gamma-Chlordane)	USEPA 8081B	0.0082	0.025	0.05
cis-Chlordane (alpha-chlordane)	USEPA 8081B	0.0082	0.025	0.05
Endosulfan I	USEPA 8081B	0.0089	0.025	0.05
4,4'-DDE	USEPA 8081B	0.0184	0.05	0.1
Dieldrin	USEPA 8081B	0.0168	0.05	0.1
Endrin	USEPA 8081B	0.0167	0.05	0.1
Endosulfan II	USEPA 8081B	0.0139	0.05	0.1
4,4'-DDD	USEPA 8081B	0.0186	0.05	0.1
Endrin Aldehyde	USEPA 8081B	0.0163	0.05	0.1
4,4'-DDT	USEPA 8081B	0.0169	0.05	0.1
Endosulfan Sulfate	USEPA 8081B	0.0235	0.05	0.1
Endrin Ketone	USEPA 8081B	0.0151	0.05	0.1
Methoxychlor	USEPA 8081B	0.0744	0.25	0.5
Hexachlorobutadiene	USEPA 8081B	0.0123	0.05	0.1
Hexachlorobenzene	USEPA 8081B	0.0101	0.05	0.1

Notes:

Method Detection Limits (MDL) are determined by 40 CFR Part 136 and included for informational purposes.

Limit of Detection (LOD) and Limit of Quantitation (LOQ) values are updated quarterly and are subject to change slightly as new detection and quantitation studies are completed.

With the exception of metals, all detected concentrations between the LOD and LOQ will be reported as estimated.

Non-detected concentrations will be reported at the LOQ.

Final MDL, LOD and LOQ values may differ slightly based on sample dry weight correction, adjustment for sample size and sample dilution due to matrix interference, or non-target analytes.

Table 5
Sediment and Catch Basin Solids Analytes, Analytical Methods, and Laboratory Reporting Limits

Parameter	Analytical Method	Method Detection Limit	Limit of Detection	Limit of Quantitation
Conventional and Physical Parameters				
Grain size (%)	ASTM D-422 (with hydrometer)	--	--	--
Total solids (%)	SM2540B	--	--	0.01
Total organic carbon (%)	Plumb, 1981	--	--	0.01
Total volatile solids (%)	PSEP, 1986	--	--	0.01
Metals (mg/kg)				
Arsenic	USEPA 6020A	--	--	0.5
Cadmium	USEPA 6020A	--	--	0.1
Chromium	USEPA 6020A	--	--	0.5
Copper	USEPA 6020A	--	--	0.5
Lead	USEPA 6020A	--	--	0.1
Mercury	USEPA 7471A	--	--	25
Silver	USEPA 6020A	--	--	0.2
Zinc	USEPA 6020A	--	--	4
Tributyltin				
Tributyltin - bulk sample (µg/kg)	Krone/8270D-SIM	1.52	2	4
Tributyltin - pore water (µg/L)	Krone/8270D-SIM	--	--	0.0052
Semivolatile Organic Compounds: Low Level PAH (µg/kg)				
1-Methylnaphthalene	USEPA 8270-SIM	1.71	2.5	5
2-Methylnaphthalene	USEPA 8270-SIM	1.52	2.5	5
Acenaphthene	USEPA 8270-SIM	1.32	2.5	5
Acenaphthylene	USEPA 8270-SIM	1.26	2.5	5
Anthracene	USEPA 8270-SIM	1.46	2.5	5
Benzo(a)anthracene	USEPA 8270-SIM	1.60	2.5	5
Benzo(a)Pyrene	USEPA 8270-SIM	1.75	2.5	5
Benzo(g,h,i)Perylene	USEPA 8270-SIM	3.05	4	5
Benzo(b)fluoranthene	USEPA 8270-SIM	1.90	2.5	5
Benzo(k)fluoranthene	USEPA 8270-SIM	2.05	2.5	5
Benzofluoranthene(s) (total)	USEPA 8270-SIM	2.00	2.5	5
Chrysene	USEPA 8270-SIM	1.88	2.5	5
Dibenz(a,h)Anthracene	USEPA 8270-SIM	2.38	4	5
Dibenzofuran	USEPA 8270-SIM	1.51	2.5	5
Fluoranthene	USEPA 8270-SIM	1.77	4	5
Fluorene	USEPA 8270-SIM	1.29	2.5	5
Indeno(1,2,3-cd)Pyrene	USEPA 8270-SIM	3.47	4	5
Naphthalene	USEPA 8270-SIM	2.63	5	5
Phenanthrene	USEPA 8270-SIM	1.98	2.5	5
Pyrene	USEPA 8270-SIM	2.22	4	5
Semivolatile Organic Compounds (including Phenols, Phthalates, and Polycyclic Aromatic Hydrocarbons) (µg/kg)				
1,2,4-Trichlorobenzene	USEPA 8270D/SIM	1.86	2.5	5
1,2-Dichlorobenzene	USEPA 8270D/SIM	1.1	2.5	5
1,3-Dichlorobenzene	USEPA 8270D/SIM	1.31	2.5	5
1,4-Dichlorobenzene	USEPA 8270D/SIM	1.19	2.5	5
1-Methylnaphthalene	USEPA 8270D	2.68	10	20
2,2'-oxybis(1-Chloropropane)	USEPA 8270D	3.76	10	20
2,3,4,6-Tetrachlorophenol	USEPA 8270D	4.85	10	20
2,4,5-Trichlorophenol	USEPA 8270D	21.4	50	100
2,4,6-Trichlorophenol	USEPA 8270D	22.4	50	100
2,4-Dichlorophenol	USEPA 8270D	21.5	100	200
2,4-Dimethylphenol	USEPA 8270D/SIM	2.89	10	20
2,4-Dinitrophenol	USEPA 8270D	111	425	850
2,4-Dinitrotoluene	USEPA 8270D	19.5	50	100
2,6-Dinitrotoluene	USEPA 8270D	30.6	50	100
2-Chloronaphthalene	USEPA 8270D	2.64	10	20
2-Chlorophenol	USEPA 8270D	2.39	10	20
2-Methylnaphthalene	USEPA 8270D	3.06	10	20
2-Methylphenol	USEPA 8270D/SIM	1.81	2.5	5
2-Nitroaniline	USEPA 8270D	18.4	50	100
2-Nitrophenol	USEPA 8270D	38.7	50	100
3,3'-Dichlorobenzidine	USEPA 8270D	17.8	75	150
3-Nitroaniline	USEPA 8270D	22.5	50	100
4,6-Dinitro-2-methylphenol	USEPA 8270D	21.2	100	200
4-Bromophenyl-phenylether	USEPA 8270D	5.03	10	20
4-Chloro-3-methylphenol	USEPA 8270D	15.1	50	100
4-Chloroaniline	USEPA 8270D	22.3	135	270
4-Chlorophenyl-phenylether	USEPA 8270D	5.29	10	20
4-Methylphenol	USEPA 8270D/SIM	2.52	5	10
4-Nitroaniline	USEPA 8270D	37.9	50	100
4-Nitrophenol	USEPA 8270D	34.7	50	100
Acenaphthene	USEPA 8270D	3.28	10	20
Acenaphthylene	USEPA 8270D	5.71	10	20
Anthracene	USEPA 8270D	4.5	10	20
Benzo(a)anthracene	USEPA 8270D	3.29	10	20
Benzo(a)pyrene	USEPA 8270D	5.45	10	20
Benzo(g,h,i)perylene	USEPA 8270D	4.4	10	20

Table 5
Sediment and Catch Basin Solids Analytes, Analytical Methods, and Laboratory Reporting Limits

Parameter	Analytical Method	Method Detection Limit	Limit of Detection	Limit of Quantitation
Benzofluoranthene(s) (Total)	USEPA 8270D	6.67	20	40
Benzoic acid	USEPA 8270D	101	200	400
Benzyl alcohol	USEPA 8270D/SIM	7.04	10	20
Bis(2-Chloroethoxy)methane	USEPA 8270D	2	10	20
Bis(2-Chloroethyl)ether	USEPA 8270D	3.35	10	20
bis(2-Ethylhexyl)phthalate	USEPA 8270D	14.6	20	25
Butylbenzylphthalate	USEPA 8270D/SIM	2.89	5	5
Carbazole	USEPA 8270D	2.69	10	20
Chrysene	USEPA 8270D	3.75	10	20
Dibenzo(a,h)anthracene	USEPA 8270D/SIM	2.02	2.5	5
Dibenzofuran	USEPA 8270D	4.1	10	20
Diethylphthalate	USEPA 8270D/SIM	3.26	5	5
Dimethylphthalate	USEPA 8270D/SIM	1.34	2.5	5
Di-n-butylphthalate	USEPA 8270D	8.16	10	20
Di-n-octylphthalate	USEPA 8270D	5.84	10	20
Fluoranthene	USEPA 8270D	2.91	10	20
Fluorene	USEPA 8270D	4.35	10	20
Hexachlorobenzene	USEPA 8270D/SIM	1.26	2.5	5
Hexachlorobutadiene	USEPA 8270D/SIM	0.96	2.5	5
Hexachlorocyclopentadiene	USEPA 8270D	66.4	200	400
Hexachloroethane	USEPA 8270D	2.94	10	20
Indeno(1,2,3-cd)pyrene	USEPA 8270D	4.68	10	20
Isophorone	USEPA 8270D	2.86	10	20
Naphthalene	USEPA 8270D	2.76	10	20
Nitrobenzene	USEPA 8270D	4.06	10	20
N-Nitroso-di-n-propylamine	USEPA 8270D/SIM	9.48	10	12
N-Nitrosodiphenylamine	USEPA 8270D/SIM	1.38	10	20
Pentachlorophenol	USEPA 8270D/SIM	14.3	25	50
Phenanthrene	USEPA 8270D	3.64	10	20
Phenol	USEPA 8270D/SIM	2.56	5	5
Pyrene	USEPA 8270D	1.94	10	20
Polychlorinated Biphenyl Aroclors (µg/kg)				
Aroclor 1016	USEPA 8082B	0.577	2	4
Aroclor 1221	USEPA 8082B	0.577	2	4
Aroclor 1232	USEPA 8082B	0.577	2	4
Aroclor 1242	USEPA 8082B	0.577	2	4
Aroclor 1248	USEPA 8082B	0.61	2	4
Aroclor 1254	USEPA 8082B	0.61	2	4
Aroclor 1260	USEPA 8082B	0.61	2	4
Volatile Organic Compounds (µg/kg)				
1,1,1,2-Tetrachloroethane	USEPA 8260C	0.233	0.5	1
1,1,1-Trichloroethane	USEPA 8260C	0.226	0.5	1
1,1,2,2-Tetrachloroethane	USEPA 8260C	0.253	0.5	1
1,1,2-Trichloro-1,2,2- Trifluoroethane	USEPA 8260C	0.287	1	2
1,1,2-Trichloroethane	USEPA 8260C	0.286	0.5	1
1,1-Dichloroethane	USEPA 8260C	0.203	0.5	1
1,1-Dichloroethene	USEPA 8260C	0.336	0.5	1
1,1-Dichloropropene	USEPA 8260C	0.312	0.5	1
1,2,3-Trichlorobenzene	USEPA 8260C	0.305	2.5	5
1,2,3-Trichloropropane	USEPA 8260C	0.517	1	2
1,2,4-Trichlorobenzene	USEPA 8260C	0.332	2.5	5
1,2,4-Trimethylbenzene	USEPA 8260C	0.23	0.5	1
1,2-Dibromo-3-Chloropropane	USEPA 8260C	0.586	2.5	5
1,2-Dibromoethane	USEPA 8260C	0.176	0.5	1
1,2-Dichlorobenzene	USEPA 8260C	0.293	0.5	1
1,2-Dichloroethane	USEPA 8260C	0.191	0.5	1
1,2-Dichloropropane	USEPA 8260C	0.162	0.5	1
1,3,5-Trimethylbenzene	USEPA 8260C	0.254	0.5	1
1,3-Dichlorobenzene	USEPA 8260C	0.227	0.5	1
1,3-Dichloropropane	USEPA 8260C	0.209	0.5	1
1,4-Dichlorobenzene	USEPA 8260C	0.232	0.5	1
2,2-Dichloropropane	USEPA 8260C	0.292	0.5	1
2-Butanone	USEPA 8260C	0.513	2.5	5
2-Chloroethyl Vinyl Ether	USEPA 8260C	0.276	2.5	5
2-Chlorotoluene	USEPA 8260C	0.3	0.5	1
2-Hexanone	USEPA 8260C	0.439	2.5	5
4-Chlorotoluene	USEPA 8260C	0.277	0.5	1
4-Isopropyl Toluene	USEPA 8260C	0.236	0.5	1
4-Methyl-2-Pentanone	USEPA 8260C	0.42	2.5	5
Acetone	USEPA 8260C	0.482	2.5	5
Acrolein	USEPA 8260C	3.809	25	50
Acrylonitrile	USEPA 8260C	1.026	2.5	5
Benzene	USEPA 8260C/SIM	0.296	0.5	1
Bromobenzene	USEPA 8260C	0.153	0.5	1
Bromochloromethane	USEPA 8260C	0.323	0.5	1
Bromodichloromethane	USEPA 8260C	0.254	0.5	1

Table 5
Sediment and Catch Basin Solids Analytes, Analytical Methods, and Laboratory Reporting Limits

Parameter	Analytical Method	Method Detection Limit	Limit of Detection	Limit of Quantitation
Bromoethane	USEPA 8260C	0.44	1	2
Bromoform	USEPA 8260C	0.297	0.5	1
Bromomethane	USEPA 8260C	0.187	0.5	1
Carbon Disulfide	USEPA 8260C	0.559	1	1
Carbon Tetrachloride	USEPA 8260C	0.213	0.5	1
Chlorobenzene	USEPA 8260C	0.219	0.5	1
Chloroethane	USEPA 8260C	0.462	0.5	1
Chloroform	USEPA 8260C	0.234	0.5	1
Chloromethane	USEPA 8260C	0.263	0.5	1
cis-1,2-Dichloroethene	USEPA 8260C	0.24	0.5	1
cis-1,3-Dichloropropene	USEPA 8260C	0.226	0.5	1
Dibromochloromethane	USEPA 8260C	0.266	0.5	1
Dibromomethane	USEPA 8260C	0.147	0.5	1
Dichlorodifluoromethane	USEPA 8260C	0.207	0.5	1
Ethyl Benzene	USEPA 8260C/SIM	0.202	0.5	1
Hexachloro-1,3-Butadiene	USEPA 8260C	0.41	2.5	5
Iodomethane (Methyl Iodide)	USEPA 8260C	0.215	0.5	1
Isopropyl Benzene	USEPA 8260C	0.233	0.5	1
m,p-Xylene	USEPA 8260C/SIM	0.392	0.5	1
Methylene Chloride	USEPA 8260C	0.635	1	2
Methyl-t-butyl ether (MTBE)	USEPA 8260C	0.231	0.5	1
Naphthalene	USEPA 8260C	0.429	2.5	5
n-Butylbenzene	USEPA 8260C	0.262	0.5	1
n-Propyl Benzene	USEPA 8260C	0.272	0.5	1
o-Xylene	USEPA 8260C/SIM	0.224	0.5	1
s-Butylbenzene	USEPA 8260C	0.24	0.5	1
Styrene	USEPA 8260C	0.138	0.5	1
t-Butylbenzene	USEPA 8260C	0.306	0.5	1
Tetrachloroethene	USEPA 8260C	0.257	0.5	1
Toluene	USEPA 8260C/SIM	0.151	0.5	1
trans-1,2-Dichloroethene	USEPA 8260C	0.266	0.5	1
trans-1,3-Dichloropropene	USEPA 8260C	0.216	0.5	1
trans-1,4-Dichloro-2-Butene	USEPA 8260C	0.437	2.5	5
Trichloroethene	USEPA 8260C	0.212	0.5	1
Trichlorofluoromethane	USEPA 8260C	0.266	0.5	1
Vinyl Acetate	USEPA 8260C	0.381	2.5	5
Vinyl Chloride	USEPA 8260C	0.235	0.5	1
Dioxins/Furans (ng/kg)				
2,3,7,8-TCDF	USEPA 1613B	0.23	0.5	1
2,3,7,8-TCDD	USEPA 1613B	0.274	0.5	1
1,2,3,7,8-PeCDF	USEPA 1613B	0.832	2.5	5
2,3,4,7,8-PeCDF	USEPA 1613B	1.076	2.5	5
1,2,3,7,8-PeCDD	USEPA 1613B	0.647	2.5	5
1,2,3,4,7,8-HxCDF	USEPA 1613B	0.991	2.5	5
1,2,3,6,7,8-HxCDF	USEPA 1613B	0.769	2.5	5
2,3,4,6,7,8-HxCDF	USEPA 1613B	0.904	2.5	5
1,2,3,7,8,9-HxCDF	USEPA 1613B	0.857	2.5	5
1,2,3,4,7,8-HxCDD	USEPA 1613B	0.481	2.5	5
1,2,3,6,7,8-HxCDD	USEPA 1613B	0.561	2.5	5
1,2,3,7,8,9-HxCDD	USEPA 1613B	0.886	2.5	5
1,2,3,4,6,7,8-HpCDF	USEPA 1613B	1.165	2.5	5
1,2,3,4,7,8,9-HpCDF	USEPA 1613B	0.688	2.5	5
1,2,3,4,6,7,8-HpCDD	USEPA 1613B	0.828	2.5	5
OCDF	USEPA 1613B	2.176	5	10
OCDD	USEPA 1613B	7.452	5	10

Notes:

Method Detection Limits (MDL) are determined by 40 Code of Federal Regulations (CFR) Part 136 and included for informational purposes.

Limit of Detection (LOD) and Limit of Quantitation (LOQ) values are updated quarterly and are subject to change slightly as new detection and quantitation studies are completed.

With the exception of metals, all detected concentrations between the LOD and LOQ will be reported as estimated.

Non-detected concentrations will be reported at the LOQ.

Final MDL, LOD, and LOQ values may differ slightly based on sample dry weight correction, adjustment for sample size and sample dilution due to matrix interference, or non-target analytes.

µg/kg = micrograms per kilograms

µg/L = micrograms per liter

ng/kg = nanogram per kilogram

ASTM = ASTM International

PAH = polycyclic aromatic hydrocarbons

PSEP = Puget Sound Estuary Program

USEPA = U.S. Environmental Protection Agency

APPENDIX C
COMMENT LETTERS FROM ECOLOGY AND ANCHOR QEA RESPONSES

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office 3190 160th SE Bellevue, Washington 98008-5452 (425) 649-7000

December 5, 2012

Via electronic mail

Mr. Dave Templeton
dtempleton@anchorque.com
Project Coordinator
Anchor QEA
720 Olive Way, Suite 1900
Seattle, Washington 98101

Re: Ecology Comments on Draft Supplemental RI Work Plan received May 2012, prepared by Anchor QEA, LLC (Anchor) for Duwamish Shipyard, Inc. (DSI). Agreed Order No. DE 6735 (AO)

Dear Mr. Templeton:

The Department of Ecology (ECY) has reviewed the Draft Supplemental RI Work Plan (Work Plan) received May 17, 2012. After meetings and follow-up discussions, Ecology is presenting these comments in expectation that an approvable supplemental remedial investigation work plan from DSI will follow.

Ecology and Anchor have met several times in the last two years since the Agreed Order (AO) was signed on September 13, 2010. In addition, on February 4, 2011 Ecology provided comments regarding the Sampling and Analysis Plan that was attached to the AO. These comments were addressed in Appendix B of the Work Plan. However, many of Ecology's February 4, 2011 comments were not incorporated into the Work Plan.

Since the AO was signed, Ecology has approved and DSI implemented Phase 1 sediment sampling. Additionally, Ecology worked with EPA, the U.S. Army, State Fish and Wildlife and DSI to facilitate pile and dolphin maintenance and construction of a temporary dock.

Ecology's general comments on the Work Plan were sent August 9, 2012. In a meeting with Anchor on August 22, Ecology provided rationale for specific additional locations and analysis necessary to define nature and extent of contamination at the site in a spreadsheet titled, Ecology Proposed Changes to DSI 05-17-2012 Work Plan. Required additions to the Work Plan include:

- Investigating stormwater (solids and water) prior to offsite discharge

- Further investigation of the western (railroad tracks) and northeast section the site (near DSI08)

- Determining a plan for sampling sediment in and around the marine railway, and

- Determining extent of identified upland and sediment contamination.

Ecology has determined the additional work is reasonable and necessary in order to determine the nature and extent of contamination at the site. Please see the attachments to this letter that provide specific additional sampling required for an approvable supplemental remedial investigation work plan.

Ecology expects DSI to submit a work plan which has incorporated Ecology's comments and required additions within 30 days of receipt of this letter. Ecology will not approve of a work plan which does not address and incorporate the above referenced additions. Ecology remains committed to working with DSI to fulfill the requirements of the Agreed Order and considers the collection of more data as your similar commitment. Thank you for continuing to work with Ecology on this site.

If you have any questions regarding this letter or the requirements for the supplemental remedial investigation work plan, please contact me at (425) 649-7231 or by e-mail at dort461@ecy.wa.gov.

Sincerely,

Donna Ortiz de Anaya
Environmental Engineer, M.S.
Site Manager
Toxics Cleanup Program

By e-mail

cc: Kim Johannessen, DSI attorney
Ron Timm, Ecology
Maureen Sanchez, Ecology
Matt Woltman, Anchor
Louise Bardy, Ecology
Ivy Anderson, Assistant Attorney General

Here are some general concerns regarding the *Draft Supplemental RI Work Plan* dated May, 2012 prepared by Anchor QEA for the Duwamish Shipyard Site

1) There are no attached QAPP and SAP, so the document is incomplete. The Work Plan references the previous QAPP and SAP, but this is a new document and should stand alone.

2) Standard Method C and Method A are not appropriate screening levels for the Site. According to WAC 173-340-706, Method C cleanup levels are required to be protective of human health (including food chain impacts) and the environment including aquatic life. Therefore, screening levels have to be developed to account for protection of all potential pathways and receptors. The Work Plan states that cleanup levels will be developed during the RI that are protective of human health and ecological receptors. However, this could lead to more stringent CULs than screening levels, and could lead to needing additional data in the middle of the RI. It makes more sense to have more stringent screening levels now to assure that data gaps are appropriately identified so that collection of RI data can be as streamlined as possible.

3) The CSM represented on figures in the work plan is not consistent with the screening levels presented. In the absence of Site-specific screening levels in the Work Plan, Ecology will compare site data to the most stringent screening levels developed for the LDW. Site-specific screening levels should be developed using all available pathways and potential receptors at the Site.

4) Figure 9 must be updated to include known historic structures such as the multiple configurations of the shipyard structures over time (wastewater treatment vault, solvent still location, hazardous waste storage, etc.), the Glacier structures (U.S. Army and Reichhold activities) such as wastewater treatment tank and septic tank. This was previously requested, see Appendix B, question 6. Investigation of potential contaminant releases (US Army-metals including hexavalent chromium, Reichhold-phenols) in these areas must be included.

5) Groundwater Potability. The Work Plan does not include human ingestion of groundwater as a pathway/receptor. It can't be assumed that groundwater at the Site is not potable. Until an argument is made with supporting data necessary to eliminate potable water as a pathway to potential receptors, Ecology must consider this a complete pathway. PLP should consider whether additional groundwater data should be collected to make such an argument per WAC 173-340-720(2).

6) Lateral nature and extent. Based on comparison with stringent screening levels, there are several areas where nature and extent of contamination has not been determined, and additional sampling is required to complete the site characterization. If the PLP is making assumptions regarding the extent of contamination at the site, those assumptions should be clearly stated. In the absence of additional data in certain areas, Ecology would have to assume that contamination extends to the closest sampling locations with concentrations below the screening level. Such assumptions may be adequate for certain wide-spread contaminants like metals and cPAHs in soils, but additional sampling will be required to establish nature and extent in both soil and groundwater in certain areas (for instance chlorinated VOCs near DSI08).

7) Vertical extent. Vertical extent has not been determined Site-wide for several COPCs in both soil and groundwater at the Site based on review of the data compared to stringent LDW screening levels.

8) Future Plans for Site. While the PLP may be assuming that their future plans for the Site including a thick concrete slab and deep sheet pile bulkhead are the remedy for all contamination at the Site, it does not preclude the need to fully characterize the Site. The process of characterizing the Site prior to remedy selection must be followed at this Site, regardless of future construction plans.

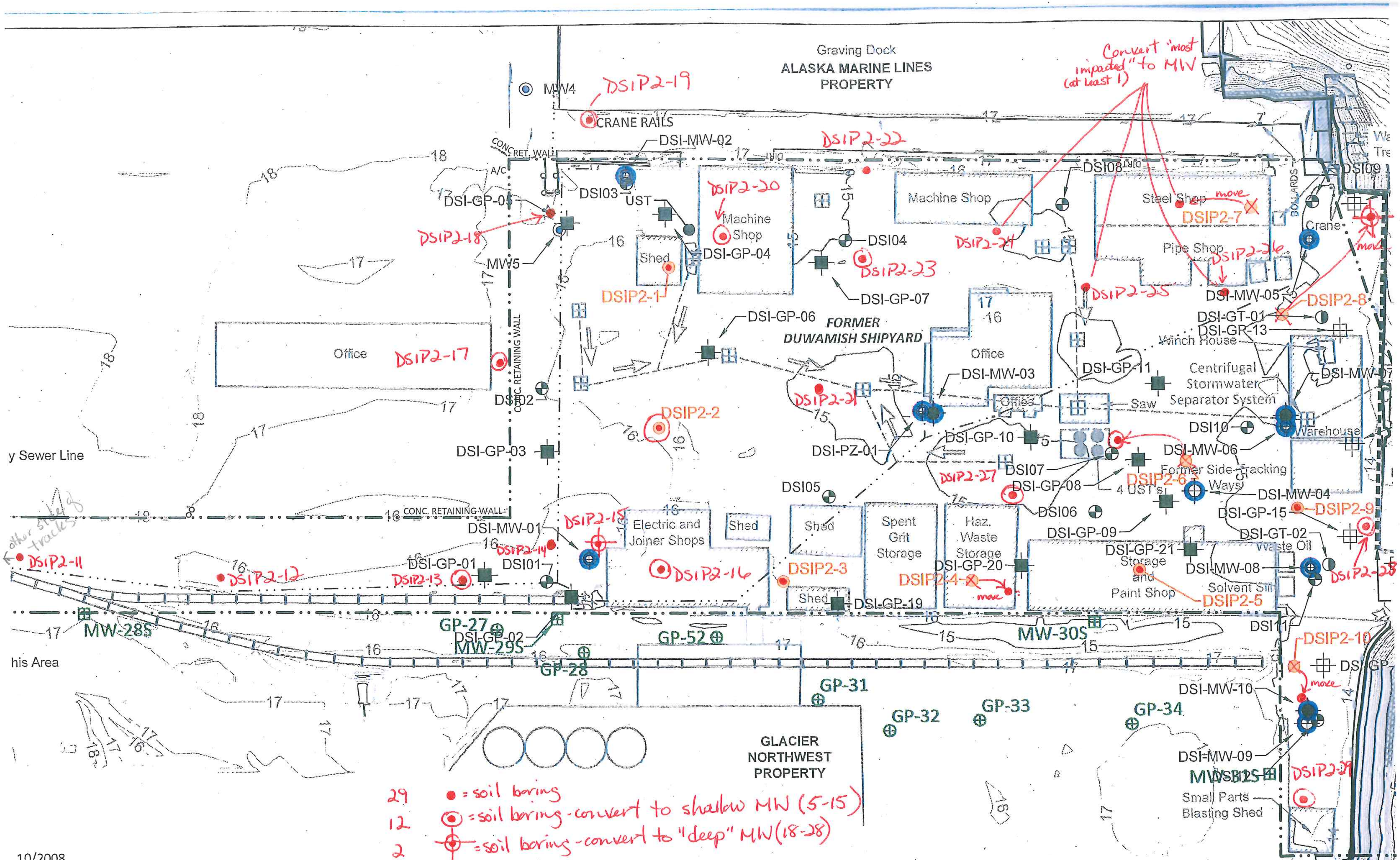
9) ALL analytes by 8270 should be using SIM. Please analyze using SIM for 8260 VOCs (vinyl chloride, PCE, TCE, PCE and TCE daughter products and benzene).

10) Sediment – Lateral extent and depth of contamination have not been defined. Concentrations of both surface and subsurface sediment samples at the edge of the previous sampling exceed SMS and DMMU (TBT). Defining the extent of these contaminants is required.

11) A mini-sonic rig may be helpful to sample the marine railway. Ecology is concerned with the strategy to wait until a future remedial action is taking place and then define extent at that time. It might be helpful to note how DSI plans to sample while implementing an action plan (analysis, etc.).

12) Stormwater-Characterization of stormwater solids (catch basin/pipe solids) is required for the Site.

13) Please present Glacier data for area adjacent to DSI Site (MW28S, MW29S, MW30S) to facilitate our review of data gaps and proposed sampling locations.



10/2008

NOTES:
1. Historical operations presented are consistent with the 104e response.
2. Former Glacier NW features taken from Figure 1-2, Glacier Northwest, Inc. - Reichold

TABLE 1
PLP Response to Ecology Proposed Changes to DSI 05-17-2012 Work Plan
Agreed Order DE-6735
5658 West Marginal Way SW, Seattle, Washington

Site Area	Comment Number	Change Proposed by Ecology	Ecology's Rationale for Request	PLP Rationale for Accepting or Denying Ecology's Request [March 2012]	PLP Comment Response Satisfactory?	Ecology Response/Clarification of Issue and Required Sampling (December 2012)	PLP Response to December 2012 Ecology Comments (March 2013)
General	1	More work to be performed to completely characterize nature and extent of contamination at the site.	See specific rationale related to specific additional sampling requests.	The 2006 and 2009 upland investigations provide a comprehensive evaluation of the Site. Further data will be collected to address Ecology's comments. The details of the sampling plan are included in the Supplemental Remedial Investigation Work Plan (SRIWP), to which these responses to comments are appended as Appendix B.	Partial	While additional sampling was proposed, several specific requests have been ignored. Please also include data collected from Glacier Northwest, Inc. that may be relevent to both Sites or where extent has not been defined. SEE TABLE 2	Additional site-wide sampling has been proposed to comply with all Ecology requirements, per the December 2012 comment letter. All additional sampling locations and analytes specified by Ecology on Table 2 have been incorporated into the revised SRIWP All relevant data collected by Glacier Northwest, Inc. will be reviewed, discussed, and incorporated into development of an approvable draft RI/FS report.
General	2	Thorough historic review was discussed but not demonstrated on maps or contaminant lists	Request made to gain a better understanding of historical operations at the Site	A revised Site map is included in the SRIWP, which includes historical Site operations. These features were also included in the Phase 1 Data Memorandum (Anchor QEA 2011).	Partial	Maps were provided summarizing site historical uses. Although the configuration of the buildings was changed throughout the time and all known configurations with potential COCs should be displayed. Separate maps may be used.	Four additional maps are provided in the revised SRIWP They show all known historical site uses and configurations of buildings from 1941 through development and use of the property.
General	3	Detection limits for some sampled parameters were above Ecology regulations and some data were not considered in the Draft Sampling and Analysis Report	8270C SIM is the analytical method that may detect contaminants at concentrations listed on the Draft LDW Screening Criteria Table. Glacier Northwest, Inc. has collected data on the adjacent Site that may help define extent.	The lowest available detection limit methods were applied in both the 2006 and 2009 investigations. Some samples required laboratory dilutions, which increased reporting limits (RL). Lowest laboratory Practical Quantitation Limits (PQLs) will be applied for all analyses conducted as part of the SRIWP. The Phase 1 Data Memorandum presents Site environmental data collected to date.	No	Some analytes are still being proposed that do not use the methods that provide the lowest available PQLs. Specifically, ALL analytes run using EPA Method 8270C should be run using SIM methodology to obtain lower PQLs. In addition, given the VOCs detected at the site, Ecology requires that PCE and TCE and their daughter products including vinyl chloride and benzene be analyzed using 8260/SIM on soil samples to achieve PQLs consistent with LDW screening levels or Site-specific levels.	The revised QAPP (Appendix B to the SRIWP includes analytical methods for all Site media that provide the lowest available PQLs. As required by Ecology, all analyses performed using EPA Method 8270C will be run using SIM methodology and PCE, TCE, and their daughter products (cis-DCE and VC) and benzene will be analyzed using 8260 SIM in order to achieve the lowest available PQLs.
General	4	Data gaps must be addressed in the next phase of the investigation	See specific rationale related to specific additional sampling requests.	The 2006 and 2009 data have been analyzed and are sufficient to delineate the general nature and extent of chemical concentrations at the Site. However, in order to finalize the Upland Remedial Investigation (RI) dataset based on comments provided by Ecology, additional Site investigation data will be collected, as discussed by area in these responses to comments and as presented in the SRIWP	No	We appreciate the addition of sampling to address data gaps. However, Ecology requires additional sampling that was previously requested. Specific additional sampling requests are listed in location-specific rows below and in Table 2.	Additional site-wide sampling has been proposed to address all data gaps and sampling requirements as directed by Ecology in the December 2012 comments to the draft work plan. Additional data gaps are outlined in Section 5 of the SRIWP. All additional sampling locations and analytes specified by Ecology on Table 2 have been incorporated into the revised SRIWP.
Northeast Nearshore	5	Draft SAP page 6 paragraph 1 notes that Anchor QEA will conduct a survey to confirm the presence of a stormwater vault and an underground former waste water storage tank (UST) in the northeast nearshore area of the property, where there is data available from the 2009 sampling. There is no further report that details or mentions the survey done confirming or denying an underground storage tank. As the southern property line of the current Site sits on what was formerly a leased section of land for Reichhold Chemicals, Inc [Reichhold]. Reichhold was known to have a septic tank in the vicinity of the current DSI property which collected wastes from several buildings in the area, including the laboratory. It is important to sample for known contaminants that drained to the tank, such as: phenols (pentachlorophenol, tetrachlorophenol, trichlorophenols, dichlorophenols, 2-chlorophenol), ammonia, formaldehyde, hydrochloric acid and metals including arsenic, copper, chromium, cadmium, lead, and mercury. State when will this survey take place	Rationale is embedded in comment	A UST is not present in the northeastern portion of the Former Shipyard Nearshore Area. Following review of site development maps, visual inspection of the area, and conversations with DSI staff, it has been determined that this area contained a former wastewater vault that was utilized to support the former drydock operations. The work plan document prepared by consultants for the former Glacier/Reichhold property identified the presence of a septic tank along the southern DSI property boundary that was associated with former U.S. Army and Reichhold operations. The septic tank was attached to drainage lines that serviced washroom and office facilities during the time of U.S. Army operations. These facilities were then converted to laboratories when Reichhold occupied the site. Section 2 of the SRIWP and supporting appendices provide additional information regarding historical operations (U.S. Army and Reichhold) in this area of the Site.	No	The Reichhold wastewater vault and septic tank must be investigated, including sample analysis for COPCs at each area.	The revised SRIWP proposes investigation along the southern DSI property boundary to confirm the location of a historical septic tank possibly located there, and investigation in upland areas where historical USTs potentially remain. If tanks are discovered, soil samples will be collected and analyzed for all Site COCs.

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General	6a	A conceptual site model (CSM) is needed that reviews all historic contaminants and includes locations of known contaminants based on appropriate screening levels. All historic operations have not been completely identified in the Work Plan or Sampling Plan, and the work plan should include a revised history section. All current and former tanks, transformers, laboratories, process buildings, septic tanks, ditches, impoundments, and outfalls should have clear labels on the CSM drawing that describes the types of contaminants used and potential pathways. This includes, but is not limited to, the U.S. Army whetlerite process, which extends into this property and any activities associated with Reichhold such as the treatment tank, septic tank and other underground tanks, ditches or outfall pipe associated with the U.S. Army or Reichhold, given the changes over time with the property boundary. Silver and chromium VI should be added to the chemical of concern [COC] for testing in the northern area	Rationale is embedded in comment	An update to the Preliminary CSM as presented in the RI/FS Work Plan (Anchor QEA 2010) is included in Section 4 of the SRIWP. This updated CSM will be revised based on the evaluation of additional data that will be collected at the Site as part of supplemental RI efforts. The CSM will be presented again in the draft Remedial Investigation and Feasibility Study (RI/FS) Report	Partial	The figures for the CSM appropriately show complete pathways from soil to groundwater to the LDW sediments and surface water. However, receptors noted in the text are not consistent with the CSM figures. Therefore, the CSM must be revised to include all potential pathways and receptors and screening levels should be developed that are protective of all pathways and receptors.	The Preliminary CSM has been revised to include all potential pathways and receptors for contamination exposure at the Site. Revised Preliminary CSM figures also have been developed to incorporate all additional pathways and potential receptors outlined in the text. The draft RI/FS Report will provide an update to the Preliminary CSM, identify remedial action objectives, and propose preliminary cleanup levels that are applicable and relevant to the contaminants identified at the Site.
General	6b	Ecology suggests sampling continues through all visible contamination until confirmation or clean samples can be taken. At least one sample should be taken in the native soil layer. In addition, it may be advisable to collect a final sample below the anticipated final level of contamination.	The Work Plan states the sample depths will be to the "native" layer. Figure 8b, Site Conceptual Model Cross-Section A-A depicts the native layer underlying the permeable silt layer and notes thickness may vary.			Added after PLP comments	All proposed soil sampling will continue through visible contamination until confirmation or clean samples are obtained in order to address Ecology requirements for delineation of nature and extent of contamination at the Site. At least one sample will be collected from the native soil layer, as outlined in the revised SRIWP and SAP.
General	7a	Ecology's goal is to include sampling for the 13 priority metals and include mercury, TBT, and chromium VI	As many metals are associated with this and the adjacent Site to the south, a full suite is necessary including TBT and chromium VI in the areas most likely to be affected.	The 2006 and 2009 RI activities included testing for priority pollutant metals, including mercury and chromium VI. Previous investigation analytical results are included in the Phase 1 Data Memorandum (Anchor QEA 2011). Tributyltin (TBT) will be included in select upland areas as noted in the SRIWP	No	TBT- should be added in areas where known ship repair work was performed. GMW-30 detected TBT at 19 ug/L. Sample for TBT in areas where storage, application and waste were known to occur.	TBT and Chromium VI analyses have been added for sampling at locations where ship repair work is known to have been historically performed and where storage, application and waste were known to occur, as required by Ecology in Table 2 in the December 2012 comments to the draft Work Plan. Analysis of the 13 priority pollutant metals, including mercury, is proposed for all soil and groundwater stations per Ecology testing requirements.
General	7b	Table 9-Supplemental Sampling Design, TBT should be added for sampling locations: • Soil sampling: DSIP2-02, DSIP2-03, DSIP2-04, DSIP2-10, DSIP2-28 and DSIP2-29 and • Groundwater sampling: DSI-MW-05, DSIP2-28 and DSIP2-29	Include areas where ship repair was performed during periods of TBT use.			Added following PLP comments	TBT analysis is proposed for sampling locations at the following areas, as required by Ecology, where ship repair work is known to have been historically performed: Soil stations: DSIP2-02, DSIP2-03, DSIP2-04, DSIP2-04, DSIP2-10, DSIP2-28, and DSIP-29; groundwater stations: DSI-MW-05, DSIP2-28, and DSIP2-29.
General	8	Upland investigation is centered on UST spills and should incorporate COCs within old tracked railway and working area.	A range of COCs were used on the Site from 1940 to 2007 related to shipyard activities. Unknown source for fill will also be investigated.	As discussed in the DSI RI/FS Work Plan (Anchor QEA 2010), side tracking was discontinued in the late 1950s. TBT was not introduced as an antifouling agent until 1972 (Caldwell et al. 1999). Therefore, the old track railway operations (side tracking operations) are unlikely to be a source of TBT. However, TBT will be analyzed in the top two intervals of DSIP2-5, DSIP2-6, DSIP2-9, and DSIP2-10, in addition to a full analysis suite at lowest possible laboratory PQLs.	No	Numerous sheds and hazardous waste storage and paint shops are noted on the map in the old tracking area. The comment was intended to make sure that the RI is not driven primarily by TPH-UST related contamination. The use of the entire site as a shipyard, and specific portions of the site for specific purposes including machine and pipe shops must be considered when identifying potential data gaps for the site and when identifying areas for additional investigation.	Additional investigations are proposed that address all Ecology-identified data gaps (these are discussed in Sections 5 and 6 of the revised SRIWP). All COCs specified by Ecology in the December 2012 comments (Tables 1 and 2) and in subsequent discussions have been added to the proposed analyte lists for all Site media.
General	9	Where exceedences were identified, the Plan should include sampling that would investigate the extent both horizontally and vertically. The vertical extent for soil investigation ended between 5 and 8.5 feet.	Data shows exceedences at depth where the the vertical profile has not been defined.	The 2006 and 2009 dataset has been analyzed and is sufficient to delineate the general nature and extent of chemical concentrations at the Site. However, in order to finalize the RI dataset, and based on comments provided by Ecology, ten additional soil borings will be completed with soil samples proposed for analysis at three depth intervals within each boring (30 total analytical suites). Analytical testing will be conducted using lowest possible laboratory PQLs as described in the SRIWP.	No	We appreciate the addition of sampling to address data gaps. However, Ecology requires additional sampling that was previously requested. The vertical extent has not been adequately characterized. SEE TABLE 2	Additional sampling is proposed to further delineate the vertical and horizontal extent of contamination in upland and aquatic areas of the Site, as required by Ecology. All locations and analytes specified by Ecology in December 2012 comment tables 1 and 2, and in subsequent discussions with Ecology, have been added to the proposed work.

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Site Area	Comment Number	Change Proposed by Ecology	Ecology's Rationale for Request	PLP Rationale for Accepting or Denying Ecology's Request [March 2012]	PLP Comment Response Satisfactory?	Ecology Response/Clarification of Issue and Required Sampling (December 2012)	PLP Response to December 2012 Ecology Comments (March 2013)
General	10	Further investigation should define the extent of contamination using screening levels that are more appropriated for the site, such as the draft LDW screening levels provided by Ecology	Soil screening levels must be established to protect other media at the site, including groundwater, stormwater and sediments.	Consistent with the DSI RI/FS Work Plan, the data collected in the 2006, 2009, and SRIWP will be used to develop RI/FS soil and groundwater screening levels and cleanup levels that are protective of the highest beneficial use at the Site. To date, appropriately conservative screening levels (i.e., Model Toxics Control Act [MTCA] Method A Industrial for soil and Sediment Management Standards [SMS] for sediment) have been used to assist in investigation planning and data collection efforts	NO	Method A and C are not appropriate screening levels given the pathways and receptors present at the site. Please evaluate data compared to LDW Screening levels appropriate for the site.	For the purposes of this SRIWP, upland soil and groundwater data have been preliminarily screened using MTCA Method A and Method C screening levels; however, these preliminary screening levels are not proposed as remediation levels or cleanup levels for the Site. Existing data have been preliminarily screened for the purposes of identifying additional data gaps in soil and groundwater quality that need to be filled as part of completion of supplemental RI investigation activities. Upon completion of the supplemental investigation work, the compiled dataset will be evaluated for Site ARARs, and results of this evaluation will be used to determine applicable screening levels, preliminary cleanup levels, and remedial action levels to support development of the draft RI/FS Report for the Site. All proposed samples will be analyzed using analytical methods that provide the lowest available PQLs (as outlined in the revised QAPP).
Soil Sampling	11	Sample locations for the stormwater reconfiguration project were not included in the report, but had exceedances of TPH-D and priority metals.	Soil samples analyzed from the stormwater reconfiguration project noted 520 mg/kg at DS-001-06152009 for diesel range hydrocarbons. This is above the screening levels of 200 mg/kg. A composite sample taken and analyzed for metals exceeded screening levels for arsenic, barium, lead and mercury. Cadmium, selenium and silver were not detected at screening levels used.	Composite samples collected as part of the stormwater re-configuration were analyzed for re-use and disposal purposes	Partial	Given that there were exceedanced of a composite sample, the areas where the re-configuration occurred need to be shown on a map, so it can be determined if additional sampling is required along the alignment of the trenching.	The updated stormwater reconfiguration is shown on Figure 4 of the SRIWP. Stormwater and catch basin solids sampling is proposed at the final catch basin prior to overland routing of Site stormwater for off-site treatment, as shown on Figure 4.
Railspur	12	The rail spur on the western side of the Site carried materials for both DSI and Reichhold Chemicals, Inc. Sampling should include contaminants used on both sites	Rationale is embedded in comment	Samples analyzed in borings DSI-01 and DSI-12 (2006) included a comprehensive suite of chemicals that may have been used on both Sites (in the Rail Spur, Southern Property, and Parcel D areas). Proposed supplemental soil borings DSIP2-3, DSIP2-4, DSIP2-5, and DSIP2-10 will add to this existing data set and will include analysis for chemicals potentially used at both sites	NO	The comment specifically mentions the western side of the site in the Railspur area. Sampling is required near and west of DSI01/DSI-MW-01.	Per Ecology sampling requirements, supplemental soil and groundwater sampling is proposed for the Rail Spur area to further delineate the horizontal and vertical nature and extent of contamination. Sampling activities will including testing for metals, including arsenic, VOCs, cPAHs, and a full list of Site-wide COCs (summarized in Table 9 of the SRIWP). As required by Ecology, sampling locations have been added near and west of DSI01/DSI-MW-01, including DSIP2-12, DSIP2-13, DSIP2-14, DSIP2-15, and DSIP2-16.
Nearshore	13	TPH contamination was left in place up to 13,000 mg/kg. These exceedences should be evaluated so cleanup is performed in a reasonable time	Rationale is embedded in comment	DSI assumes that this comment is in reference to RI soil sampling station DSI-GP-15. The sample from depth interval 1.5 to 4 feet had a diesel-range hydrocarbon concentration of 9,000 milligrams per kilogram (mg/kg) with a duplicate result of 12,000 mg/kg. Current plans for upland cleanup and Site redevelopment (as part of an upland interim action) include removal of soils in this area. Further collection of soil SRIWP location DSIP2-9 will further refine chemical concentrations in this area	No	The 6-8 foot sample contains diesel and gasoline-range TPH well over screening levels in the sample collected from 6-8 feet. Gas-range TPH was present at the 8-10 foot bgs sample, but diesel was not analyzed. Ecology requires a sample near DIS-GP-15 to establish the vertical extent of contamination at this location.	As required by Ecology, sampling location DSIP2-28 has been added near DSI-GP-15. Proposed analytical testing of soil and groundwater includes TPH in order to establish the vertical extent of TPH contamination at this location.
Railspur & Nearshore	14	Additional metals evaluation is needed west of Rail Spur Area and NE Corner of Site	There are no data points west of DSI GP-01. Railroad tracks in this general area (withing two southern Sites) have observed presence of metals and TPH. An assumption can be made that contaminant metals found east of DSIGP-01 are represented across this western section.	The 2006 and 2009 soil data sufficiently characterize the horizontal extent of soil chemical concentrations at these existing exploration locations. Proposed additional soil samples will be collected as part of the supplemental investigation effort and analyzed for a full suite of chemicals as outlined in the SRIWP throughout the Site area.	No	Additional Samples were not added as requested	Sampling stations DSIP2-11, DSP2-12 and DSIP2-13 have been added west of DSI-GP-01 in the Rail Spur Area and include metals and TPH testing of soil and groundwater, as required by Ecology. In the northeast corner of the Site, stations DSIP2-07 and DSIP2-08 have been added; soil and groundwater testing at these stations include a full list of Site COCs.
Nearshore	15	SVOC evaluations needed at NE and SE corners of site	The northeast corner of the Site housed the Steel shop and historical site plans note building structures changed throughout time. The southeast corner may have contaminants related to PCP manufacturing.		No	Additional Samples locations added, however, vertical extent is still not defined for cPAHs in the southeast corner and metals vertical extent not defined in the northeast corner and at DSI-02. Assumption can be made that cPAHS are prevalent throughout the Site.	Sampling stations DSIP2-09, DSP2-10 and DSIP2-29 have been added in the southeast corner of the Site, stations DSIP2-07 and DSIP2-08 have been added to the northeast corner, and station DSIP2-17 has been added west of DSI-02. These new stations include SVOC testing of soil and groundwater, as required by Ecology comments to the draft Work Plan
Nearshore & UST	16	VOC evaluations needed at Nearshore Area and UST Removal area	Extent has not been defined in these areas.		No	Additional Samples locations added, however, Ecololgy would like vertical extent defined. Assumption can be made that VOC are prevalent throughout the Site.	All additional upland sampling locations required by Ecology per the December 2012 comment transmittal have been included in the proposed work. All proposed Nearshore and UST Removal Area stations include soil and groundwater testing for VOCs in order to define vertical and horizontal extent of VOC contamination.

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General	17a	Sampling did not progress to sufficient vertical extent to define N&E of contamination	While criteria exceedences of many constituents were observed in the upper soil layer, deeper samples denoting extent have not been proposed.		No	There are several locations where vertical extent of one or more constituent was not fully assessed, and proposed sampling will not provide vertical extent across the site. Sufficient sample must be proposed to define vertical extent at each area of interest at the site, and should be conducted at locations of greatest known contamination. SEE TABLE 2	Additional sampling and testing for Site COCs is proposed to further delineate the vertical and horizontal extent of contamination throughout the upland areas of the Site as required by Ecology. All locations and analytes specified by Ecology in December 2012 comment tables 1 and 2, and in subsequent discussions with Ecology, have been added to the proposed work. All soil sampling will advance through visible contamination, with samples collected in both fill and native soil units. As required by Ecology, all exisiting Site monitoring wells will be resampled and all new monitoring wells will be installed at the specific locations and depth ranges indicated by Ecology in the December 2012 comment tables.
General	17b	Although the Ecology table lists vertical extent definition for many specific constituents, vertical definition of SVOC and metals is needed throughout the site.	Nature and extent of metals and SVOCs has not been defined.			Added following PLP comments.	
General	17c	Sample VOCs where indicated for TPH.	Benzene, although not specifically called out on the table is observed with TPH exceedences.			Added following PLP comments.	
Railspur	18a	Further sampling must include identifying nature and extent of potential and known contaminants and bringing the sampling analysis down below the screening levels, where possible. a. Sample for everything at lab PQLs to define horizontal and vertical extent	2006 sampling around the railspur included DSI-01 (down to 6 feet). DSI-01 noted exceedences for metals, PAH and cPAHs and extent should be identified. Detection levels were set too high for some of the metals, Semi-volatile organic compounds, volatile organic compounds and Aroclors. Aroclor1260 was detected in sample DSI-01 over the LDW screening criteria. Sampling did not include pentachlorophenol or other phenols, and TBT, although there were exceedences for acetone which would have been transported along the rails historically. 1,1,1,2-tetrachloroethane was detected above screening levels at 3.7 ug/kg in sample DSI-01. As vinyl chloride was detected at concentrations exceeding screening values, it is important to sample for PCE, TCE and cis-DCE. The 2009 sampling (DSI-GP-01, DSI-MW-01) only included analysis for one parameter, arsenic, and exceedences were noted.	Additional samples will be collected as part of the effort to further characterize chemicals throughout the Site area. All analysis will be conducted at the lowest possible laboratory PQLs and all 2009 groundwater well locations will be re-sampled. See the SRIWP for existing and proposed soil boring locations DSI-MW-01, DSIP2-2, and DSIP2-3.	No	DSIP2-2 and DSIP2-3 are too distant from the area of known high level contamination. Vertical extent must be defined in soil and groundwater near DSI01/DSI-MW-01. Please re-sample DSI-MW-01 as proposed, and install a well in the water-bearing zone immediately underlying the water-bearing zone the DSI-MW-01 is screened in. Sample soil during installation of this new well to determine the vertical extent of COCs over screening levels. Results for samples collected by Glacier must be presented in the Work Plan so Ecology can evaluate where additional shallow wells are needed to evaluate the extent of exceedances (especially Arsenic). Information regarding groundwater gradients should also be presented in the Work Plan to assist with the evaluation of if/where additional monitoring wells are needed.	Additional sampling and testing for all Site COCs are proposed to further delineate the vertical and horizontal extent of contamination throughout the upland areas of the Site, including west of the Rail Spur Area, as required by Ecology. DSI-MW-01 will be resampled and a new deep monitoring well will be installed adjacent to this well (DSIP2-15) to capture the deeper water-bearing zone in this area. Soil samples from DSIP2-15 will be tested for all Site COCs to further delineate the horizontal and vertical extent of contamination. Additional shallow wells required by Ecology in the December 2012 comments have been added to the proposed work. All available and relevant testing results from the Glacier site are included in Appendix G of the revised SRIWP. Figures depicting groundwater gradients for the Site during low and high tide conditions have been added to the revised SRIWP. A discussion of the 2009 transducer study and observed groundwater gradients is included in the revised draft of the SRIWP. The revised QAPP (Appendix B to the SRIWP) includes analytical methods for all Site media that achieve the lowest available PQLs. As required by Ecology, all analyses performed using EPA Method 8270C will be run using SIM methodology and PCE, TCE, and their daughter products (cis-DCE and VC), and benzene will be analyzed using 8260 SIM in order to achieve the lowest available PQLs.
Railspur	18b	Further sampling must include identifying nature and extent of potential and known contaminants and bringing the sampling analysis down below the screening levels, where possible. Groundwater needs to be resampled at DSI-MW-01.	Groundwater – DSI MW-01 was screened from 4.6 to 14.5 feet and noted exceedences for arsenic and vinyl chloride. Chromium VI, lead, and mercury were sampled above detection limits and PAHs and VOAs were detected. Geoprobe sampling noted detections for several metals above screening criteria and some of the volatile organics such as PCE and TCE where the difference is an order of magnitude.		Yes	See comments for 18a. Use SIM methodology for all 8270 parameters, and PCE and TCE and their daughter products including vinyl chloride and benzene be analyzed using 8260/SIM on samples to achieve PQLs consistent with LDW screening levels or Site-specific levels.	
Western	19	Soil - Further sampling should define the extent of contamination in soil	Sampling included 2006 sample DSI-02 (down to 5 feet) and 2009 sample DSI-GP-03. Screening exceedences were noted for 1,2,4-trimethylbenzene from 0-5 feet depth, as well as several metals and semi-volatile organic compounds.	Additional samples will be collected as part of the SRIWP to further characterize chemicals throughout the Site area. The 2009 well locations adequately characterize Site groundwater and will be re-sampled as part of the SRIWP effort. All proposed analyses will be conducted at the lowest possible laboratory PQLs and all 2009 groundwater well locations will be re-sampled. See downgradient groundwater well locations DSI-PZ-01 and DSI-MW-03, and proposed soil boring location DSIP2-2.	No	DSIP2-1 and DSIP2-2 are approximately 80 feet or more from DSI02 and DSI-GP-03, and will therefore not provide meaningful data regarding the N&E near these locations. SEE TABLE 2	New sampling locations (DSIP2-17, DSIP2-18, DSIP2-02, DSIP2-14) have been added in the vicintiy of DSI02 and DSI-GP-03 to comply with Ecology requirements in this area. These additional soil sampling stations will include testing for Site COCs, including SVOCs, VOCs and priority pollutant metals, as required by Ecology and outlined in the December 2012 comment tables.
Western	20	Groundwater - No wells noted in this vicinity, which is along the western boundary of the property border and Site. a. Further sampling should characterize nature and extent.	No wells noted in this Area. Geoprobe DSI-GP-03 was only sampled for arsenic which resulted in an exceedence of the groundwater standard.		No	DSI-PZ-01 is too distant to determine groundwater impacts near DSI02 and DSI-GP-03	As required by Ecology, two monitoring wells (DSIP2-02 and DSIP2-17) have been proposed adjacent to DSI02 and DSI-GP-03 to capture potential groundwater impacts in this area. Soil and groundwater testing at these new monitoring well locations will include SVOCs, VOCs, and priority pollutant metals.
Northwest	21	Soil - Further sampling to define nature and extent is required. Metals and [polycyclic aromatic hydrocarbons] PAHs should be included.	The northwest area included 2006 samples DSI-03 (down to 6.5 feet), MW-04 and MW-05. Sample DSI-03, had noted exceedences for chromium and gasoline range hydrocarbons. Copper was noted at 539 mg/kg and lead at 460 mg/kg. Those were some of the highest numbers for those two analytes for both the 0-3 and 5-6 feet samples. The TPH also exceeded for gasoline and diesel range hydrocarbons. There was no soil data found in the SAP for MW-04 and MW-05. 2009 sampling included DSI-MW-02, DSI-GP-04 and DSI-GP-05 and were only analyzed for TPH.	The 2006 and 2009 soil data sufficiently delineate the horizontal extent of soil chemical concentrations at these existing exploration locations. The 2009 groundwater well locations adequately characterize Site groundwater. All analyses will be conducted at the lowest possible laboratory PQLs and all 2009 well locations will be re-sampled. Additionally, re-sampling of groundwater wells MW4 and MW5 in 2006 bounds the extent of chemical concentrations to the west of MW2. See the groundwater monitoring well location MW-02 and proposed soil boring location DSIP2-1	No	Borings not added. cPAH and Metals are widespread and an assumption can be made they are prevalent throughout horizontally, definitely need to define vertically for metals and cPAHS.	As required by Ecology, four soil sampling locations have been added to the Northwest Area to delineate vertical and horizontal nature and extent of contamination in this area. Soil sampling at proposed locations DSIP2-01, DSIP2-17, DSIP2-18, and DSIP2-19 will include testing for priority pollutant metals and SVOCs. Groundwater sampling at proposed monitoring wells DSIP2-17 and DSIP2-19 and existing monitoring well DSI-MW-02 will also include testing for priority pollutant metals and SVOCs, as specified in Ecology's December comment tables.

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Northwest Area	22	Groundwater - As MW-02 is further east than the other two wells the next phase of the investigation should sample for extent to the west.	In 2009, MW-02 was screened from 5.1 feet to 15 feet and several detections were noted for metals including arsenic, copper, nickel, selenium and zinc all below the LDW screening levels. In 2006 MW4 and MW-5 were sampled from 5-17 feet and 11-16 feet, respectively. Exceedences were noted in MW5 for chromium and copper and lead. DSI-GP-04 and 05 were only tested for total petroleum hydrocarbons.		No	Wells not added--Ecology notes additional concerns, such as TPH in MW-4 and is suggesting an additional well location-SEE TABLE 2	Additional Northwest Area monitoring wells specified by Ecology in the December comment tables (DSIP2-17 and DSIP2-19) are included in the proposed work. Groundwater testing from DSIP2-17 will be used to establish the vertical extent of SVOCs, VOCs, metals. Groundwater testing from DSIP2-19 will be used to establish the vertical extent of TPH and metals and the horizontal extent of TPH, metals, PCBs, and SVOCs.
Central	23	Soil - The sampling plan should include investigation of the nature and extent of the soil contamination in this area, both horizontally and vertically. As vinyl chloride was detected down gradient at concentrations exceeding screening values, it is important to sample for PCE, TCE, and cis-DCE	Central area sampling included 2006 DSI-04, DSI-05 and DSI-08. Values for arsenic are above the total arsenic screening level and values are also high for copper, lead, mercury and zinc. The 0-3 feet sampling range noted detections levels above 5 ug/kg for most of the semi-volatile organic compounds and total PAHs. Volatile organic compound detections were noted for MEK, acetone, benzene, carbon disulfide, methylene chloride, 1,1,1,12-tetrachloroethane and BTEX. A detection of 28 ug/kg was note for 4,4'-DDD at sampling point DSI-05. This exceeded the screening criteria of 3.53E-03 ug/kg. Sampling done in 2009 only included TPH.	Additional samples will be collected as part of the SRIWP effort to further characterize chemicals throughout the Site area. The 2009 groundwater well locations adequately characterize Site groundwater. All analyses will be conducted at the lowest possible laboratory PQLs and all 2009 groundwater monitoring well locations will be re-sampled. See existing down gradient well locations DSI-PZ-01 and DSI-MW-03, and proposed soil boring location DSIP2-2. The northern property boundary is bordered by the former graving dock structure which limits groundwater conductivity to the north. Therefore, DSI-MW-02 and DSI-MW-05 provide adequate groundwater coverage for the northern portion of the property. Chlorinated solvents were analyzed as part of the 2006 soil borings in two intervals at each exploration. None of the 24 soil samples resulted in a detection exceeding MTCA Method A values (one non-detect RL exceeded the MTCA Method A value due to laboratory dilution). A total of 36 Geoprobe® groundwater and monitoring well chlorinated solvent samples have been analyzed	No	Only one boring added in Central Area. Need vertical extent and to investigate DDD near DSI05 and VOCs near the shops and DSI08. SEE TABLE 2	All soil and groundwater sampling locations and analytes required by Ecology in the December 2012 comments have been added to the proposed work. As specified by Ecology, 10 soil stations, including three new monitoring well locations, are proposed for the Central Area to further delineate the vertical and horizontal nature and extent of contamination. Stations have been added near the former machine, steel and pipe shops, and along the northern property as specified by Ecology (e.g., DSIP2-20, DSIP2-21, DSIP2-22, DSIP2-23, DSIP2-24, DSIP2-25, DSIP2-07, and DSIP2-31). As directed by Ecology in the December 2012 comments, soil and groundwater testing will include priority pollutant metals, SVOCs, VOCs, dioxins/furans, and a full list of site-wide COCs, as outlined in Table 9 of the revised SRIWP.
Central	24	Groundwater - GP-07 lies further north and the extent should be investigated as the location is near the northern property boundary	The 2009 sampling included DSI-MW-03 which was screened from 29.9 to 39.9 feet and exceeded screening criteria for arsenic (surface water) and selenium (surface and groundwater). Total metals were not reported. Testing was performed at this deeper well for TCE and PCE above screening levels and they were not detected. DDSI-GP-07 detected vinyl chloride. 2006 sampling efforts were limited to geoprobes and included exceedences for metals and a detection of 1,2 dichloroethene, cis-, a breakdown product from TCE. TCE and PCE were not analyzed. Several exceedences were noted for PAHs in the shallow geoprobes.		No	Concern is for instigation to the north for COCs exceedences noted at DSI-MW-03 and DSI-GP-07. Ecology is suggesting additional well north of DSI-04 to define horizontal extent.	
UST Removal	25a	Soil - DSI-06 is near the area where ships were sidetracked and repaired each year over winter from the early 1940s to the late 1950s. a. This area must be sampled for various constituents related to wood and fiberglass ship repair including TBT, the whole range of metals, and solvents,	2006 sampling included samples DSI-06 (0-6 feet), and DSI-07(0-5 feet). Exceedences noted in the results were for chromium, diesel and gasoline range petroleum hydrocarbons and benzene. Many of the PAHs detected exceed screening criteria which is also true for metals. Additionally, some of the metals, semi-volatiles, volatiles, PCB Aroclors and pesticides were not screened low enough for detection at the Draft LDW ARARs screening levels. 2009 sampling included DSI-MW-04, SDI-GP-08 (2.0-7.5 feet) and DSI-PG-09 (2-10 feet) were screened for TPH and exceeded for both the gasoline and diesel range hydrocarbons with a diesel range value of 2800 mg/kg at DSI-MW-04. DSI-GP-10 (2-7.5 feet) and DSI-GP-11 (1-7.5 feet) exceeded for gasoline range hydrocarbons and were also tested for gasoline range volatile organics that tested above the screening criteria. Detections of benzene and xylene exceeded screening criteria as well.	As discussed in the DSI RI/FS Work Plan (Anchor QEA 2010), side tracking was discontinued in the late 1950s. TBT was not introduced as an antifouling agent until 1972 (Caldwell et al. 1999). Therefore, the old track railway operations (side tracking operations) are an unlikely source of TBT. However, TBT will be analyzed in addition to the full suite of chemicals in the top two intervals of DSIP2-5, DSIP2-6, DSIP2-9, and DSIP2-10, and in the analyses of samples collected from nearshore groundwater wells, as described in the SRIWP. Chlorinated solvents will also be analyzed in each soil boring interval and during re-sampling of the groundwater wells as part of the SRIWP.	Partial	New samples added in the area, but only total PCB analysis. Need Aroclors on Tables 10 and 11. Need to make sure vertical extent is defined near DSI06	As required by Ecology, supplemental soil and groundwater sampling are proposed for the UST Removal Area (DSIP2-06, DSIP2-27, and DSI-MW-04) and will include testing for Site COCs, including TPH, SVOCs, VOCs, and priority pollutant metals, to further delineate the horizontal and vertical nature and extent of contamination in this area. Groundwater from exisiting monitoring well DSI-MW-04 will include testing for PCB Aroclors, pesticides, Chromium VI, and dioxins/furans to comply with Ecology requirements. Soil testing at DSIP2-06 will include testing for PCB Aroclors, TBT, and chromium VI to capture potential contamination resulting from historical Site operations. All samples will be analyzed using analytical methods that achieve the lowest possible PQLs, as outlined in the revised QAPP. SIM methodology will be used for analysis of benzene, PCE, TCE, cis-DCE, and VC in groundwater to achieve the lowest possible PQLs for these analytes.
UST Removal	25b	Soil - DSI-06 is near the area where ships were sidetracked and repaired each year over winter from the early 1940s to the late 1950s. b. As vinyl chloride was detected upgradient at concentrations exceeding screening values, it is important to sample for PCE, TCE and cis-DCE.			No	SEE TABLE 2	
UST Removal	26	Groundwater - Further sampling should define the extent of the detected contaminants and include TBT and solvent related parameters.	Geoprobe sampling noted exceedences related to PAHs at DSI-GP 09 through DSI-GP-11. DSI MW-04, which were screened from 4.6 to 14.2 feet. An exceedence of benzene was noted.		Partial	VOCs have been proposed at all MWs -- need SIM for benzene and for PCE, TCE and daughter products. Need re-sampling of exisiting wells for PAH issue.	

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Former Shipyard Nearshore Area	27	Sampling did not include TBT or pentachlorophenol and these must be included in the sampling plan	2006 sampling included samples DSI-09, DSI-10 and DSI-11 and ranged from 0-5 feet vertically. MTCA A exceedences were noted for arsenic, cadmium, chromium, lead (4940 mg/kg) and as well as gasoline and diesel range hydrocarbons and benzene. Other results that were not highlighted as exceedences but are above the Draft LDW screening criteria are zinc (5840 mg/kg) and copper (3310 mg/kg). Detections were noted above the LDW screening criteria for acetone, benzene and methylene chloride. This area had noted exceedences for vinyl chloride in groundwater. Aroclor 1260 noted a concentration of 35ug/kg, well above LDW screening criteria. 2009 sampling included sampling points DSI-GP-12, DSI-GP-13, DSI-GP-14, DSI-GP-15, DSI-MW-05, and DSI-MW-06. Values for metals noted on the 2009 sampling report were analyzed with detection limits that were too high considering the regulations, such as lead with an estimated (j)value of 492 mg/kg at sample point DSI-GP-12. Exceedences were also noted for gas and diesel related hydrocarbons at 1200 and 9000mg/kg.	As discussed in the DSI RI/FS Work Plan (Anchor QEA 2010), side tracking was discontinued in the late 1950s. TBT was not introduced as an antifouling agent until 1972 (Caldwell et al. 1999). Therefore, the old track railway operations (side tracking operations) are an unlikely source of TBT. However, TBT will be analyzed in addition to the full suite of chemicals in the top two intervals of DSIP2-5, DSIP2-6, DSIP2-9, and DSIP2-10, and in the analyses of samples collected from nearshore groundwater wells, as described in the SRIWP. Chlorinated solvents will also be analyzed in each soil boring interval and during re-sampling of the groundwater wells as part of the SRIWP.	Yes /Partial	Added some locations. Please add TBT to all locations to define. SEE TABLE 2	As required by Ecology, supplemental soil and groundwater sampling proposed for the Former Nearshore Shipyard Area will include TBT, SVOCs (including pentachlorophenol), VOCs (including PCE, TCE, cis-DCE, and vinyl choride), TPH, priority pollutant metals (including barium), and a full list of Site-wide COCs to further delineate the horizontal and verical nature and extent of contamination in this area. As specified by Ecology in the December 2012 comment tables, dioxins/furans will be tested in soil at proposed stations DSIP2-08 and DSIP2-09 and in groundwater samples collected from all existing Site monitoring wells in this area (DSI-MW-05, DSI-MW-06, DSI-MW-07, DSI-MW-08). All samples will be analyzed using analytical methods that achieve the lowest possible PQLs, as outlined in the revised QAPP. SIM methodology will be used for analysis of benzene, chlorinated solvents (PCE, TCE, cis-DCE, VC), and all 8270 analytes (including phenols) in groundwater to achieve the lowest possible PQLs for these analytes.
Former Shipyard Nearshore	28	As a solvent still and hazardous waste storage was located in the general area, it is important to sample for PCE, TCE, cis-DCE, vinyl chloride, and any other identified constituents for former activities			Yes	Ask for SIM for benzene and chlorinated solvents	
Former Shipyard Nearshore	29	Volatile organics, barium, TBT, and any other constituents related to shipyard activities such as paint strippers, primers, antifoulants and constituents in paint used from the 1940s to the 1960s should be listed and sampled			Yes	Parameters added - See table 2 for suggested additional locations	
Former Shipyard Nearshore	30	Due to the sediment sample with high level dioxins/furans, those should be sampled			Yes	D/F added -Ecology will suggest addtitional locations-see table 2	
Former Shipyard Nearshore	31	Groundwater - Sampling should include total metals. Pentachlorophenols and related phenols must be sampled and analyzed	2006 sampling included sampling points DSI-09, DSI-10 and DSI-11 and noted exceedences related to metals, PAHs and detected PCE and vinyl chloride above screening levels. 2009 sampling included monitoring wells DSI-MW-05 and DSI-MW-06 screened from 5.5 to 15 feet and well DSI-MW-07 screened from 30.4 to 40 feet. DSI-MW-05 noted an exceedence for zinc with detections of several dissolved metals (totals not reported) and an exceedence for acenaphene with detections of several PAHs. DSI-MW-07 (deeper well) noted detections for dissolved copper with detection levels above screening levels, and detections of PAHs and dibenzofuran.		Yes	Add SIM for all 8270 analytes including phenols	
Parcel D Nearshore	32	Soil - Other phenols and phthalates should be retested with lower detection limits	Sampling for 2006 in this area consisted of DSI-12 and ranged vertically from 0 to5 feet. For metals, although only cadmium exceeded the MTCA A criteria, most of the metals exceeded the LDW Draft screening criteria. Most of the metals without detections were not analyzed with low enough detection levels. For semi-volatile organics there were exceedences with concentrations orders of magnitude above the LDW Draft screening levels such as benzo(a)pyrene which is six orders of magnitude greater. Aroclor 1260 was tested with at detection level of 29 ug/kg which is too high to evaluate presence or exceedences of applicable criteria. Most of the other samples were analyzed at around 10 ug/kg. Results for cPAHs were also extremely high. Pentachlorophenol was also tested with detection limits above screening levels at 400 and 290 ug/kg with an LDW Draft screening level of 2.55 ug/kg.	As noted previously, TBT will be included as part of SRIWP upland activities. Pursuant to the SRIWP, an additional soil boring will be collected at DSIP2-10 and groundwater re-sampling will be conducted at DSI-MW-09 and DSI-MW-10. The analytical suite by media is presented in the SRIWP and is inclusive of the chemicals listed in the Ecology comments for this site area	Yes/Partial	Proposed DSIP2-10 should be located near DSI12 to get understanding of vertical extent at that location. SIM should be used on all 8270 analytes and on benzene and chlorinated solvents on 8260-see table 2 for suggested locations	As required by Ecology, supplemental soil and groundwater sampling

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Parcel D Nearshore Area	33	The sampling plan should include sampling for volatile organics, metals re-sampled with lower detection limits and including barium and TBT, phenols and phthalates sampled with lower detection limits and dioxins/furans	Samples collected and analyzed in 2009 included DSI-GP-17 and DSI-MW-10 which ranged vertically from 0-8 feet below ground surface. DSI-MW-09 was not sampled; however, it is located very close to DSI-MW-10. Groundwater sampling in this area noted detections in nickel, copper mercury and arsenic and sever PAHs. Metal sampling in 2009 noted exceedences for arsenic, mercury and zinc although many metals ended up with estimated values as the detection limits were too high. No samples were analyzed for volatile organics in the 2009 sampling event, although all of the semi-volatile compound PAHs that were analyzed were detected and many of those at very high concentrations, most of them exceeding MTCA A criteria.	As noted previously, TBT will be included as part of SRIWP upland activities. Pursuant to the SRIWP, an additional soil boring will be collected at DSIP2-10 and groundwater re-sampling will be conducted at DSI-MW-09 and DSI-MW-10. The analytical suite by media is presented in the SRIWP and is inclusive of the chemicals listed in the Ecology comments for this site area	Yes	See Table 2	proposed for the Parcel D Nearshore Area will include two new soil borings (DSIP2-10 and DSIP2-29), a new groundwater monitoring well (DSIP2-29) and sampling from existing Site monitoring wells DSI-MW-09 and DSI-MW-10. As required by Ecology in the December 2012 comments, proposed soil and groundwater testing will include priority pollutant metals (including barium), SVOCs, VOCs, TPH, and TBT at all locations, as well as additional testing for dioxins/furans, chromium VI, pesticides, and PCB Aroclors at soil station DSIP2-10 and monitoring well stations DSI-MW-09 and DSI-MW-10. All metals analyses for groundwater samples will include both total and dissolved fractions. All samples will be analyzed using analytical methods that achieve the lowest possible PQLs, as outlined in the revised QAPP. EPA method 8260-SIM will be used for analyses of chlorinated VOCs and solvents in groundwater.
Parcel D Nearshore	34	Groundwater - Total metals need to be reported and metal screened to appropriate levels and must include TBT	2006 geoprobe sampling noted exceedences for total metals and PAHs with an exceedence noted for benzo(a)anthracene. Total metals need to be reported and metal screened to appropriate levels and must include TBT.		Yes /Partial	TBT sampling in GW limited to 4 wells - Total and dissolved metals are proposed at all locations. Please add TBT to all.	
Parcel D Nearshore	35	Groundwater - PCE should be screened lower to appropriate screening	As chlorinated solvents were detected within the Site and the Human Health/Trbal Fish screening criteria is low, samples must be analyzed to the tenth of a microgram.		Partial	Please use SIM on 8260 for chlorinated VOCs and solvents.	
South Property	36	Soil - This area (south property) should be tested for all contaminants used for vessel repair including metals, VOAs, semi-volatiles, TBT, PCBs, and any constituents which might have been in the chemical formulas for paint strippers, primers, antifoulants, and other hull treatments	Vessels brought up on the marine railway were pulled to side tracking that was not paved for most of the years the facility operated.	Samples analyzed in borings DSI-01 and DSI-12 (2006) included a comprehensive suite of chemicals that may have been used on both Sites (in the Rail Spur, Southern Property, and Parcel D areas). Further soil samples were collected in 2009 for selected parameters at sampling locations DSI-GP-01, DSI-GP-19, DSI-GP-20. Proposed supplemental soil borings DSIP2-3, DSIP2-4, DSIP2-5, and DSIP2-10 resolve any potential data gap in this property area. The analytical suite by media is presented in the SRIWP and is inclusive of the chemicals listed in the Ecology comments for this site area (including select locations for TBT).	Yes	Please include analysis for TBT at DSIP2-3 and DSIP2-4	As required by Ecology, supplemental soil sampling is proposed at three new stations in the South Property Area. Soil testing at these stations will be used to evaluate the potential presence of TBT, PCB Aroclors, TPH, chromium VI, and pesticides, and to define the horizontal and vertical extent of known COCs in this upland area of the Site, including VOCs (e.g., chlorinated solvents), priority pollutant metals (e.g., arsenic), and SVOCs (e.g., PCP), as specified in Ecology comments from December 2012. Additional groundwater samples will be collected from new and exisiting Site monitoring wells immediately adjacent and downgradient of the area (e.g., in the former side-tracking ways) as specified by Ecology in the December 2012 comments. All samples will be analyzed using analytical methods that achieve the lowest possible PQLs, as outlined in the revised QAPP. SIM methodology will be used for analysis of benzene, PCE, TCE, cis-DCE, and VC in groundwater to achieve the lowest
South Property	37	This area has a history of several types of past activities which should be considered prior to sampling and analyzing. Activities that are known to occur in this area include U.S. Army whetlerite gas mask manufacturing, Reichhold, Inc. pentachlorophenol manufacturing and associated septic tank and the Duwamish Shipyard activities	This area was not sampled in 2006. The sampling points in 2009 include DSI-GP-19, DSI-GP-20 and DSI-GP-21 with sampling depths ranging from 0-8 feet. Other rationale is embedded in comment		Yes	See Table 2 for sample locations-Note Glacier borings/wells you intend to use for these locations.	
South Property	38	Volatile organic compounds were not sampled for in this area. As an upgradient well MW-03 included detections in groundwater for toluene, and sampling points DSI-06 and DSI-07 had detections of VOCs, especially benzene at 260 ug/kg, it is important to sample for volatile organic compounds for soils in this area.	Rationale is embedded in comment			See Table 2 for additional sample locations and analytes-Note Glacier borings/wells you intend to use for these locations	

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South Property Area	39	This area must be thoroughly screened for all potential contaminants of concern related to past activities. a. This would include VOAs (PCE, TCE and cis-DCE), TBT and metals screened to a lower detection limit, phenols including pentachlorophenol and breakdown products screened to appropriate detection limits.	Most of the metals that were analyzed at low enough detection limits exceeded screening levels with noted (MTCA A) exceedences for arsenic at DSI-GP-20 and chromium at DSI-GP-21. Detections were noted for petroleum hydrocarbons and PAHs, phthalates, phenols and N-nitrosodiphenylamine at 34 ug/kd with a screening level of 9.5 ug/kg. Bis(2-ethylhexyl)phthalate was detected at 2600 ug/kg at DSI-GP-21.		Yes	See table 2 for requested analytes.	possible PQLs for these analytes. A review of all available testing data from the Glacier property will be completed to evaluate the nature and extent of contamination along the southern property boundary. Groundwater data from Glacier monitoring wells (e.g., MW-29S and MW-30S) and soil data from Glacier geoprobe sampling locations (e.g., GP-28, GP-31, GP-61, GP-64, GP-65, and GP-63) along the property boundary shared with DSI will be evaluated as part of the draft RI/FS report development.
South Property Area	40	Groundwater - A monitoring well should be installed in the area due several known detections in soil and groundwater and potential contaminants from historic uses. a. The well or wells should investigate vertical and lateral extent of contaminants and should include TBT, total and dissolved metals, and solvent and phenol related compounds	No sampling performed in 2006. 2009 sampling included geoprobes DSI-Pg-19, DSI-GP-20 and DSI-PG-21 screened from 4 to 10 feet. This area was not sampled for metals except for arsenic, which was detected above screening levels and included detections for gasoling range hydrocarbons, PAHs, and volatile organic compounds. Exceedences noted benzene at 15 ug/L and benzo(g,h,i)perylene.		No	See table 2 for requested location	
Groundwater - General	41	Vessels brought up on the marine railway were pulled to side tracking that was not paved for most of the years of the facility operation. This area (south property) should be tested for all contaminants used for vessel repair including metals, VOCs, semi-volatiles, PCBs, and pesticides	Rationale is embedded in comment	The location of the permanent wells installed at the Site in 2009 provides adequate spatial coverage to determine the groundwater quality at the Site. These well locations will be re-sampled for a comprehensive analytical suite at the lowest possible laboratory PQLs, as described in the SRIWP. The monitoring well locations representative of this area include DSI-PZ-01, DSI-MW-03, DSI-MW-04, DSI-MW-06, DSI-MW-04, and DSI-MW-08.	No	Borings added, not wells. See table 2 for additional requested locations	
Groundwater General	42	There are not enough shallow wells in the Central Area	Why is there only one peizometer and what type of peizometer was used (pneumatic or strain)? Peizometers should be replaced with monitoring wells that can be used for appropriate contaminant sampling. Since MW-3 is a deeper well, the shallow aquifer in this zone must be characterized	The location of the permanent wells installed at the Site in 2009 and the Geoprobe® groundwater data collected in 2006 provide adequate spatial coverage to determine the groundwater quality at the Site. Therefore, no additional wells will be installed as part of the SRIWP. All 2009 well locations will be re-sampled for a comprehensive analytical suite at the lowest possible laboratory PQLs levels as described in the SRIWP to address these comments	No	Wells not added-See table 2	Three shallow wells have been added to the Central Area, as required by Ecology in the December 2012 comments, and include stations DSIP2-20, DSIP2-23, and DSIP2-25. These new wells will be sampled in addition to the two existing Site monitoring wells in this area, DSI-PZ-01 (shallow), and DSI-MW-03 (deep), in order to fully characterize the shallow water-bearing zone in this area.
Groundwater General	43	Sample upgradient and down gradient of contamination to identify nature and extent. Given the tidal nature of the groundwater, both up gradient and down gradient should be sampled for potential contaminants of concern	Rationale is embedded in comment		No	Wells not added. Ecology whas proposed new well locations-see table 2	Additional Site-wide sampling has been proposed to comply with all Ecology requirements per the December 2012 comment letter. All additional sampling locations, including new permanent groundwater monitoring wells both upgradient and downgradient of known contamination, as specified by Ecology on Table 2, have been incorporated into the revised SRIWP.
Groundwater General	44	We need permanent monitoring wells down gradient and up from sources, as we need to identify the highest concentration of release as part of the nature and extent	Rationale is embedded in comment		No	Wells not added. Ecology whas proposed new well locations-see table 2	
Groundwater General	45	Metals- total metals should be displayed, as groundwater is not measured with dissolved concentrations			Yes	Proposed sampling includes total metals	All groundwater testing proposed in the revised SRIWP will include both total and dissolved metals analyses.
Ground water General	46	Add pentachlorophenol and associated phenols to list of contaminants to analyze	No rational given specifically for this comment, but was provided in other comments		Yes	Added -- make sure SVOCs and at least limited VOCs analyzed using SIM	SVOCs and VOCs will be tested at all groundwater sampling locations. To comply with Ecology requirements, SIM methodology will be used for all SVOCs and VOCs that can be analyzed using this method, as outlined in the revised QAPP (Appendix B to the revised SRIWP).

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Groundwater General	47	Tributyltin should be sampled in groundwater and soil wherever there is potential, such as potential spill areas or areas known to have been used for regular sanding, storage or painting of this contaminant	Rationale is embedded in comment		No	Please add TBT to all Site sampling locations	To comply with Ecology requirements, TBT testing has been added to all soil and groundwater sampling locations.
Groundwater General	48	Add enough parameters to identify salinity—add chloride to all samples unless there is a chlorinated solvent plume; add conductivity and alkalinity to characterize the groundwater	Defining whether the groundwater at this Site is in communication with marine surface water or is separate, perched freshwater aquifer is important. The adjacent Site (to the south) has noted an unconfined perched freshwater aquifer above the confined aquifer noted to be in communication with marine surface water.		Yes	Assuming conductivity will be measured in the field (typical)	Chloride, conductivity, and alkalinity will be tested at all groundwater stations.
Groundwater General	49	Add at least two wells between 15 and 30 feet in order to fully characterize groundwater. Provide a hydrogeologic model that supports the reasoning	30-40 feet deep seems very deep and sampling may miss second aquifer.		No	Wells not added. Ecology whas proposed new well locations-see table 2	Two groundwater monitoring wells (DSIP2-08 and DSIP2-15) screened at 18 to 28 feet have been added as specified by Ecology in Table 2
Groundwater General	50	The deeper aquifers are still showing signs of heavy metal contamination. Some of the chemicals were not analyzed to the screening level. The nature and extent of contamination must be characterized.	Rationale is embedded in comment		Yes	Re-sampling the deep wells	All deep wells will be re-sampled and tested for the full list of Site COCs.
Groundwater General	51	The boundary area to the south, Glacier area showed exceedances for As. This must be characterized for extent	Rationale is embedded in comment		No	No wells added. Please add Glacier data/borings/wells to maps and figures.	New and proposed Glacier soil borings and monitoring wells have been added to maps and figures. All available Glacier data from these stations is included in Appendix G and will be evaluated as part of the draft RI/FS report.
Ground-water General	52	Barium should be added as it is associated with gasoline contamination	Rationale is embedded in comment		Yes	Barium added to analyte list	Barium has been added to the analyte list for all metals testing.
Groundwater General	53	Need well in west section of northwest area to delineate extent relative to adjacent property. A map with recommended groundwater sampling locations can be provided at a later date if that would be helpful.	Rationale is embedded in comment			Ecology will propose new locations. See Table 2 and ECY Proposals Figure 9	Groundwater monitoring well location DSIP2-17 has been added in the west section of the Northwest Area, as required by Ecology.
Stormwater	54a	Besides historic data indicating contaminants in the stormwater related to shipyard activities, there has not been an investigation of nature and extent of contamination in stormwater. This is required as in the past shipyards have continued to discharge pollutants such as metals and oil and grease following closure due to the small particles caught in the interstices of the pavement. The sump in the marine railway should be sampled for solids if DSI has not already done so	Rationale is embedded in comment	The Site stormwater is covered under the Alaska Marine Lines (AML) National Pollutant Discharge Elimination System (NPDES) permit number WA-R001365. The Site stormwater conveyance system was upgraded (including comprehensive cleaning and component upgrades) in 2009 and has been subsequently re-routed (in 2011) to the AML stormwater treatment system. The SRIWP proposed collection of a stormwater sample to characterize the chemical nature of stormwater that is generated on the DSI property, prior to transport to the AML treatment system and discharge at the AML outfall	Partial	Stormwater solids at the last catch basin prior to offsite discharge should be sampled.	To comply with Ecology requirements, stormwater and catch basin solids sampling are proposed at the final catch basin, as shown on Figure 4. Stormwater and catch basin solids will be sampled at the frequency required by Ecology and will include sample testing for all parameters specified by Ecology in Table 2 of the December 2012 comments.
	54b	Stormwater-7 grab samples collected prior to discharging off-property.	The feasibility study will have to consider treatment prior to off property treatment and all long-term treatment will be included in the consent cleanup action plan	Added after PLP comments		See specifics for sampling in table 2	

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Seeps	55	The Site should be inspected for seeps to insure any groundwater flowing through the bank is tested for similar constituents as have been noted in the groundwater or nearshore areas	Rationale is embedded in comment	Current plans for the upland cleanup contemplate the removal of nearshore soil, overwater structures, and nearshore sediments. Existing nearshore groundwater is sufficient for understanding groundwater quality that is discharged to the Lower Duwamish Waterway sediments and surface water	No	The RI must be completed before the FS. Seeps should be identified and sampled according to table 12, and include TBT.	To comply with Ecology requirements, a reconnaissance to identify seeps along the shoreline in this area will be performed as part of supplemental RI activities. Water from discovered seeps, if any, will be collected and submitted for analysis of all Site COCs, including TBT.
Sediment	56	Continue investigation of nature and extent of contamination. Contingency plan may be required for marine railway prior to pulling any materials which could release contaminants	Extensive contamination was observed in sediment and the extent has not been defined. Additionally, the marine railway continues to be a sampling concern.			Added after PLP comments	As required by Ecology, additional sediment sampling will be performed in the former marine railway area and the LDW. A total of 19 stations have been specified by Ecology for both surface and subsurface sediment collection. To comply with Ecology requirements, sediment testing will include SVOCs, VOCs, PCBs, SMS metals, dioxins/furans, chromium VI, bulk/porewater TBT, and pesticides.

1 - Natural Background Soil Metals Concentrations in Washington State, Ecology Toxics Cleanup Program, Publication No. 94-115, October 1994. Puget Sound data set referenced.

Table 2

Duwamish Shipyard, Inc - Ecology Proposed Changes to Sampling Locations and Analysis

Map Location ID	Ecology Rationale for Sampling Location	Convert to Monitoring Well? (Y/N)*	Proposed MW Screen	Rationale for conversion to and sampling Monitoring Well
DSIP2-1	As indicated by PLP; vertical extent of TPH, metals, PCBs, SVOCs and lateral extent of TPH and metals	N	--	
DSIP2-2	As indicated by PLP	Y	5-15	Need MW to determine lateral extent of As, VOC, cPAH
DSIP2-3	As indicated by PLP	N	--	
DSIP2-4 (moved)	As indicated by PLP; vertical extent of VOCs and TPH, and lateral extent of VOCs and metals (zinc)	N	--	
DSIP2-5	As indicated by PLP	N	--	
DSIP2-6 (moved)	As indicated by PLP; vertical extent of VOCs, SVOCs, and TPH	Y	5-15	GW quality in TPH and VOC source area
DSIP2-7 (moved)	As indicated by PLP; horizontal and vertical extent of VOCs near DSI08 and potential source	one near DSI08	5-15	MW to determine if VOCs are present in GW -pick most contaminated out of DSIP-2-7, DSIP2-24, DSIP2-25,DSIP2-26, for conversion to new well
DSIP2-8 (moved)	Vertical and lateral extent of SVOCs and metals	Y	18-28	Vertical extent of metals, VOCs, SVOCs
DSIP2-9	As indicated by PLP	N	--	
DSIP2-10 (moved	Vertical extent of cPAHs, TPH, metals, and VOCs	N	--	
DSIP2-11-new	railroad tracks as potential source	N	--	
DSIP2-12-new	railroad track & boundary issues with Glacier	N	--	
DSIP2-13-new	vertical extent of metals, and SVOCs and lateral extent of metals	Y	5-15	Arsenic extent
DSIP2-14-new	Vertical extent of metals, and SVOCs, lateral extent of VOCs and metals	N	--	
DSIP2-15-new	Vertical extent of metals, and SVOCs, lateral extent of VOCs and metals	Y	18-28	Vertical extent of VOCs and Arsenic in GW
DSIP2-16-new	Lateral extent of VOCs and metals	Y	5-15	Downgradient lateral extent of vinyl chloride
DSIP2-17-new	Vertical extent of SVOCs, VOCs, and metals	Y	5-15	Upgradient Well
DSIP2-18-new	Vertical and lateral extent of metals	N	--	
DSIP2-19-new	Vertical extent of TPH, metals and lateral extent of TPH, metals, PCBs, and SVOCs	Y	5-15	Replace MW4, extent of TPH in GW
DSIP2-20-new	Vertical extent of SVOCs, lateral extent of TPH, VOCs, and PCBs	Y	5-15	Lateral extent of TPH
DSIP2-21-new	Vertical and lateral extent of SVOCs and metals	N	--	
DSIP2-22-new	Metals and SVOCs at northern boundary	N	--	
DSIP2-23-new	location mainly for groundwater extent	Y	5-15	MW to verify GP: vinyl chloride
DSIP2-24-new	Potential source/lateral extent of VOCs	one near DSI08	5-15	determine if GW near machine shops impacted with VOCs; pick most contaminated out of DSIP-2-7, DSIP2-24, DSIP2-25,DSIP2-26, for conversion to new
DSIP2-25-new	Potential source/lateral extent of VOCs and TPH	one near DSI08	5-15	
DSIP2-26-new	Potential source/lateral extent of VOCs and TPH	one near DSI08	5-15	
DSIP2-27-new	Vertical and lateral extent of TPH and VOCs	Y	5-15	Extent of SVOC, VOC, TPH upgradient of DSIO7
DSIP2-28-new	Vertical and lateral extent of SVOCs, TPH, and metals	Y	5-15	Extent of TPH in GW near GP15
DSIP2-29-new	discovery at potential source location and vertical and lateral extent of TPH, VOCs, SVOCs, and metals	Y	5-15	TPH-H,: VOC-H, SVOC-H, metals-H
Stormwater before it leaves the site	Stormwater has the potential to carry site pollutants to neighboring property and the LDW-See stormwater below	7 sample events within the year		Analyze for VOCs, SVOCs, metals, dioxins/furans, SMS, tributyltin
Stormwater-catch basin solids	Solids associated with stormwater can help define source contamination	1 sample at the last DSI catch basin prior to offsite discharge		Analyze for VOCs, SVOCs, metals, dioxins/furans, SMS, tributyltin
Sediment sampling	Definition of nature and extent has not been completed.	include strategy for sampling marine railway		Contingency plan may be necessary for technical reasons.

Soil boring converted to monitoring well
Ecology proposed new sampling point
Ecology proposes moving the original location
PLP Proposed sa Location
V-Vertical; H-Horizontal extent; GP-geoprobe; MW-Monitoring Well
* = If significant contamination is identified by field screening at a location without surrounding MW coverage, conversion to an MW may be warranted.
Note that sufficient vertical delineation for metals and SVOCs is required even if SVOCs and metals are not specifically called out for at a specified location.
All goundwater monitorng wells shall be monitored for four seasons including fall winter spring and summer.

Stormwater sampling-Stormwater grab samples will be collected during the first 2 hours of a qualifying event. Storm events are roughly categorized as a 24-hour period with at least 0.15 inch of rain over a 5 hour period, preceded by at least 24 hours of no more than a trace (0.04 inch) of precipitation. Efforts will be made to sample storm events covering a range of precipitation amounts.
Sediment sampling-

From: Ortiz De Anaya, Donna (ECY) [mailto:DORT461@ECY.WA.GOV]
Sent: Monday, February 11, 2013 1:22 PM
To: Matt Woltman
Subject: ECY Proposed Sediment Sampling

Matt,

Here is a proposal from Ecology to step-out from past sediment sampling. This is not prescriptive and should be altered related to the amount of risk DSI is willing to accept. Ecology has reviewed the present data for contaminant definition both laterally and vertically. Where present sampling identifies exceedences at edges either vertically or laterally, an effort was made to define the extent of contamination through further investigation.

Red crosses have been drawn to note in which direction further sampling is needed. Points should be pushed further into the navigation channel and may cross the channel to define extent. As an example, points east of DSI-SB-15 have been drawn too close to the present point an it is expected they would be moved further into the channel.

Surface and subsurface data was reviewed.

Please contact me if you have any questions related to this figure.

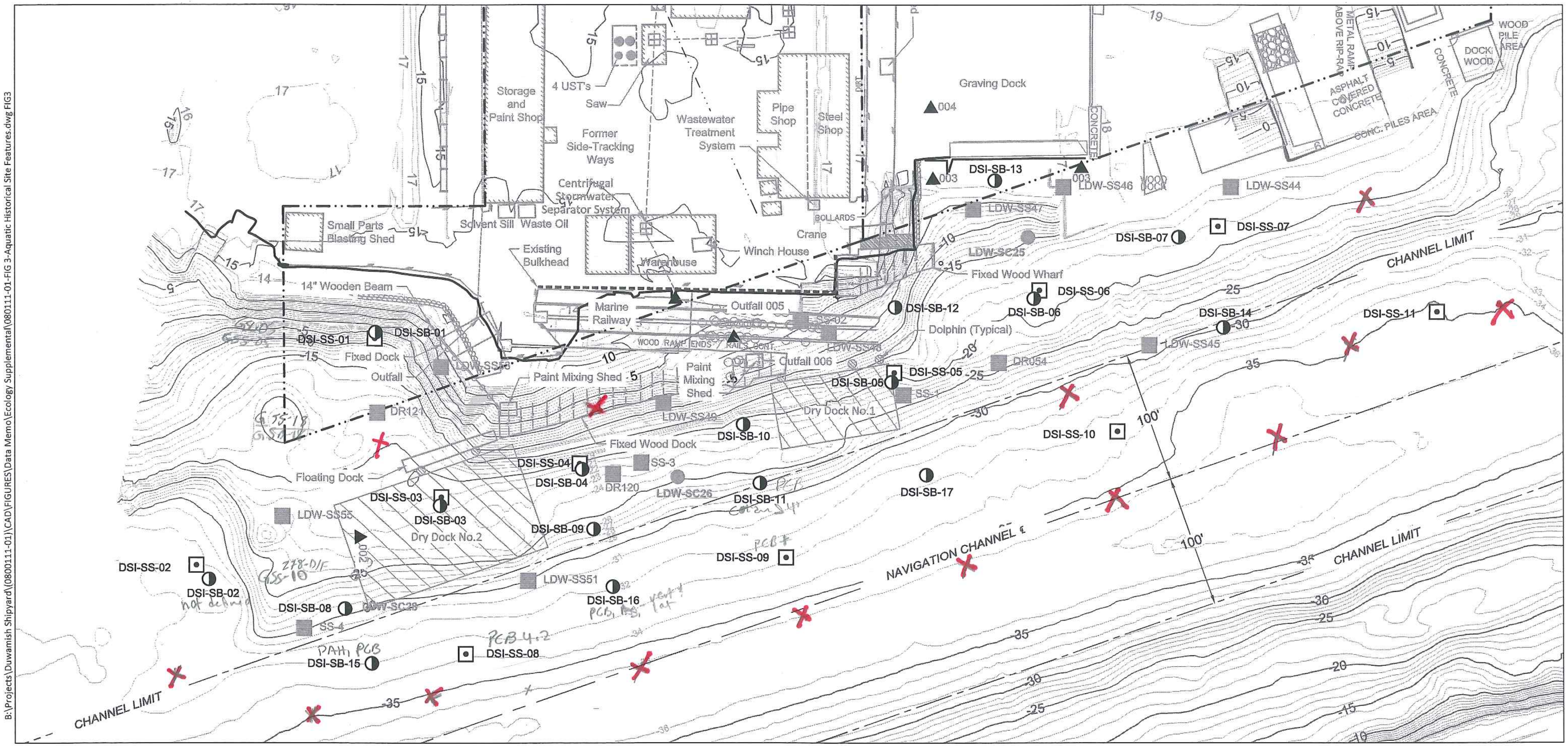
I am hoping to get the QAPP reviewed tomorrow.

Best,

Donna

Donna Ortiz de Anaya l Environmental Engineer l Lower Duwamish Waterway Site Manager l Dept. of Ecology l 425-649-7231 l dort461@ecy.wa.gov l 3190 160th Ave SE, Bellevue, Wa 98008

ECOLOGY UPDATED WITH PROPOSED SEDIMENT SAMPLE POINTS



SURVEY SOURCE: Bathymetric survey by Blue Water, 10/2006
Topographic survey by APS Survey and Mapping, LLC.
Underdock survey by AML and DSI, 12/2006.
HORIZONTAL DATUM: Washington State Plane North, NAD83 Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).
NOTES:
1. Historic operations presented are consistent with the 104e response.
2. Previous subsurface core LDW-SC28 is shown in original location. Location reporting was inconsistent in RI.

X - New Sed Sample

LEGEND:

- Former Stormwater Line
- Municipal Sanitary Sewer Line
- Top of Bank
- Subject Property Boundary
- Former NPDES Outfall
- Topographic and Bathymetric Contours in Feet (MLLW)
- Former Catch Basin Location
- RI Surface Sediment Station
- Previous Surface Sediment Station
- RI Subsurface Sediment Station
- Previous Subsurface Sediment Station

0 75
Scale in Feet

B:\Projects\Duwamish Shipyard\(080111-01)\CAD\FIGURES\Data Memo\Ecology Supplemental\080111-01-FIG 3-Aquatic Historical Site Features.dwg FIG3

Aug 05, 2011 11:55am epipkin

ANCHOR QEA

DRAFT

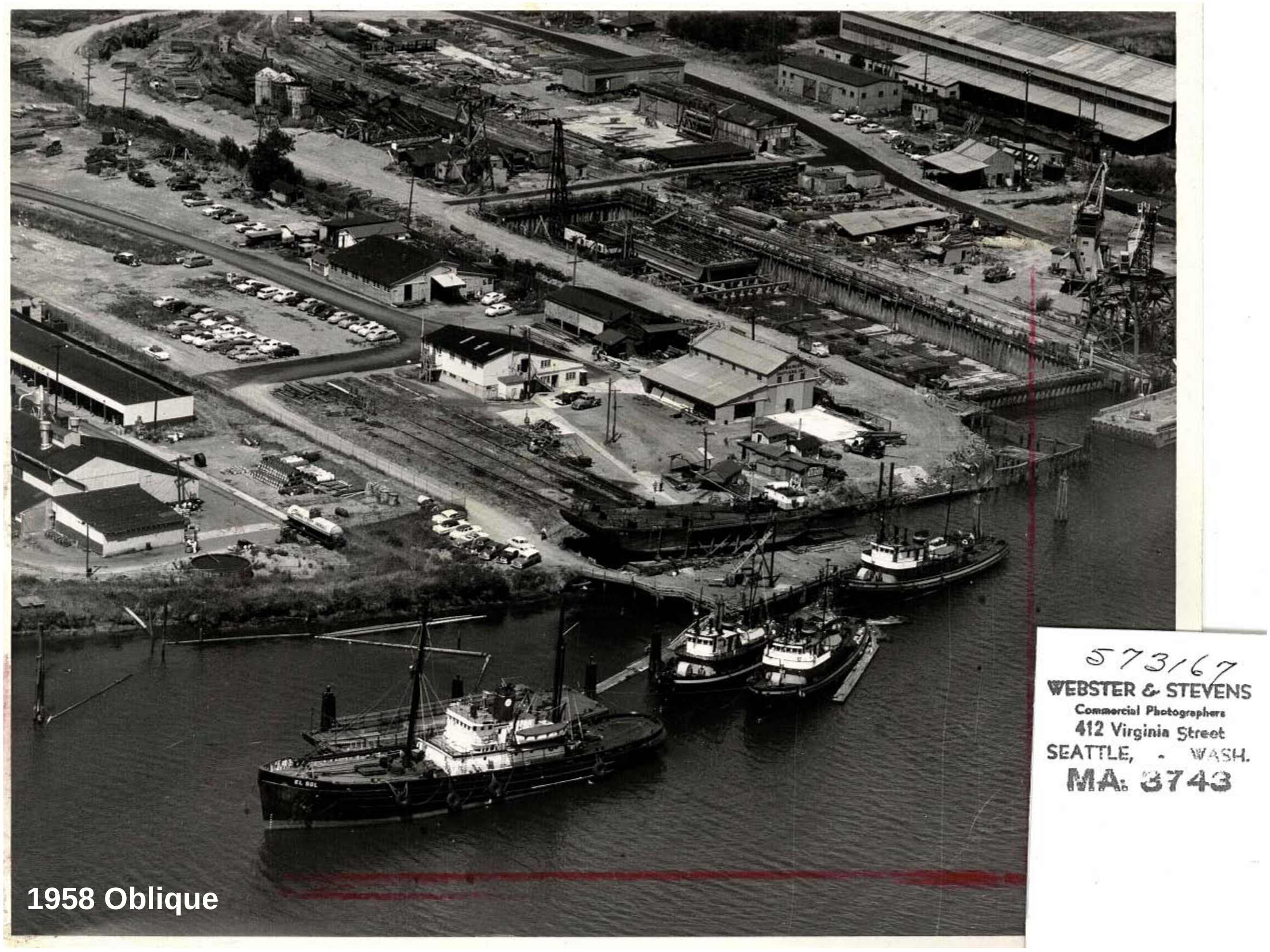
Aquatic Historic Property Operational Features and Existing Sampling Locations
Phase 1 RI Data Memorandum
Duwamish Shipyard, Inc.

APPENDIX D
AERIAL PHOTOGRAPHS


1936 Walker & Associates


1946 Walker & Associates


1956 Walker & Associates



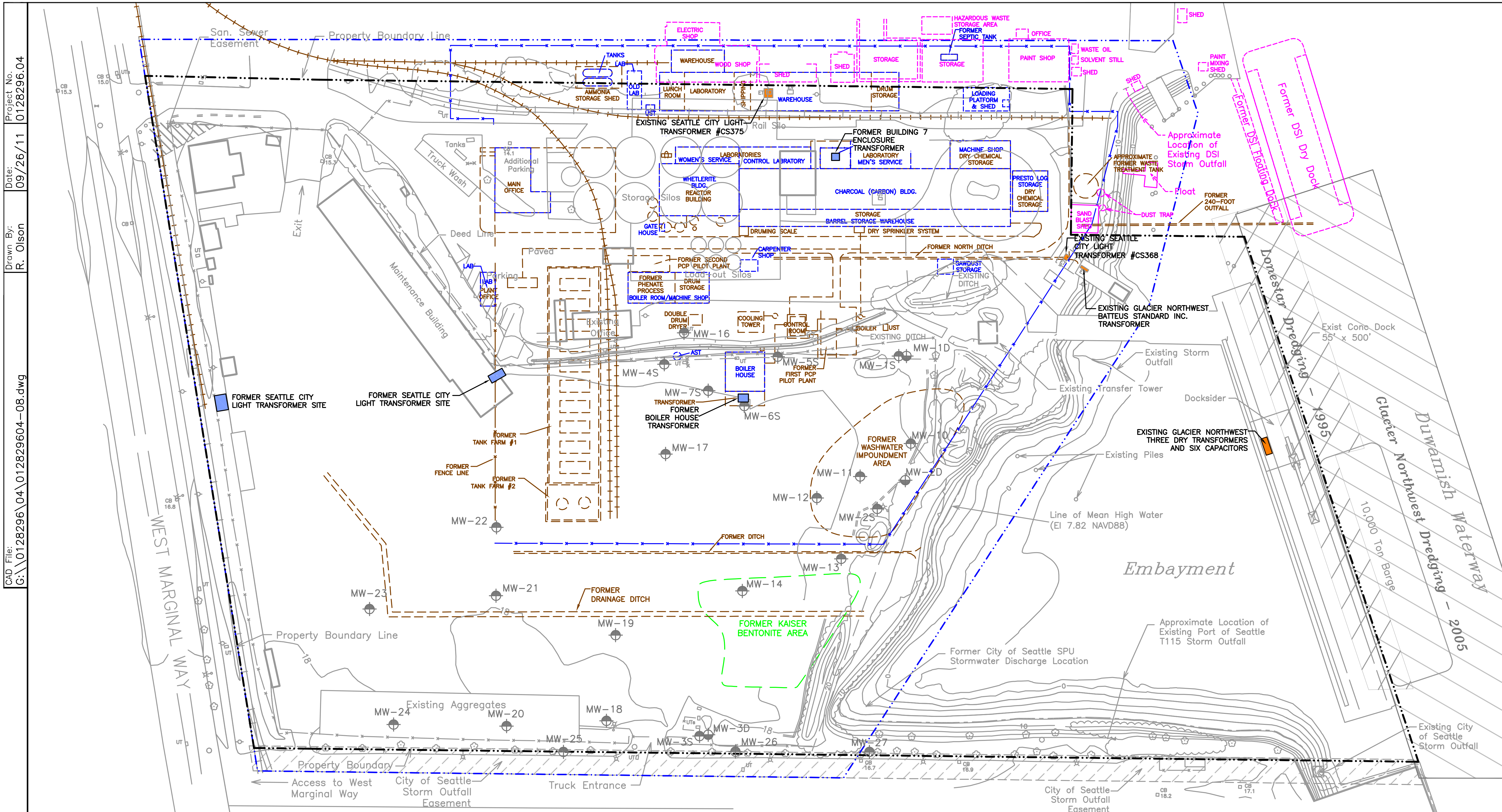
1958 Oblique


1960 Walker & Associates


1969 Walker & Associates


1974 Walker & Associates

APPENDIX E
FIGURE 1-2: FORMER U.S. ARMY AND REICHHOLD OPERATIONS



Existing Monitoring Well Locations

- Shallow Monitoring Well
- Deep Monitoring Well
- Property Line

Features Color Key

BLUE	Former Army Buildings & Features
BROWN	Former Reichhold Features
GREEN	Former Kaiser Bentonite Area
MAGENTA	Duwamish Shipyard Features
GRAY	Existing Buildings & Features

Figure 1-2

Site Plan

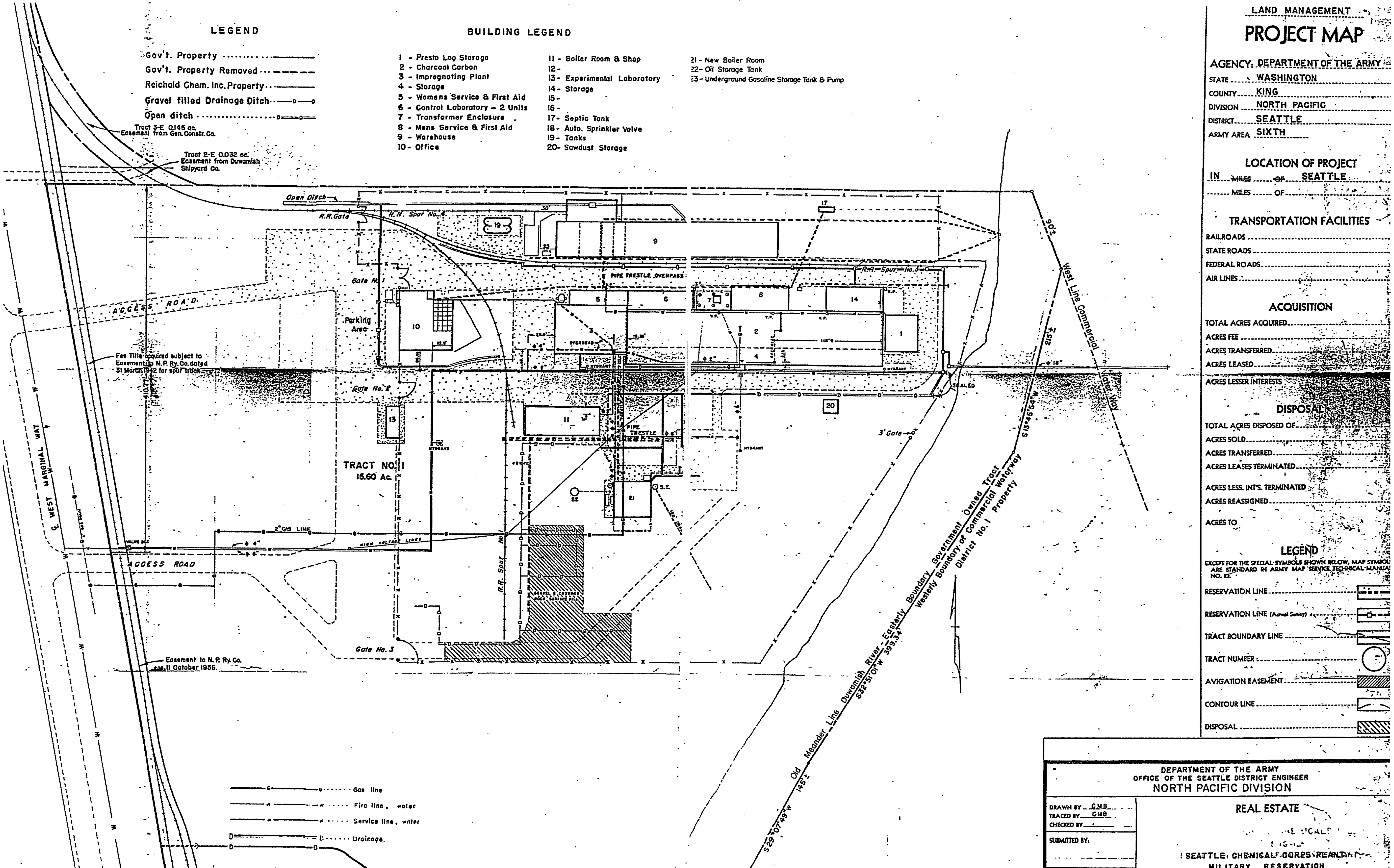
Glacier Northwest, Inc. - Reichhold, Inc. Site

5900 West Marginal Way SW

Seattle, Washington

ERM 09/11

APPENDIX F
1956 U.S. ARMY ESTATE MAP



DATE	REVISIONS	BY
29 Sept. 61	Revised to current status after restoration by lessee.	RCG
29 Sept. 61	Revised Boundary Line per survey data	L.F.
8 Oct. 57	Added gas line. Deleted impounding basin.	
1 Oct. 57	Revise reservation line	HR
6 July 56	Brought up to date	CMB
26 Jan. 56	Condition to date	CMB

APPENDIX G
FORMER GLACIER/REICHHOLD/U.S. ARMY PROPERTY DATA TABLES

Path:Q:\Projects\2012\1296010.01 Ecology Duwamish Glacier\GIS\Events

Basemap and features are from Revised Final RI/FS Workplan (ERM 2012)

Legend

Sample Location

- Existing Soil Boring
- Proposed Soil Boring
- Existing Monitoring Well
- Proposed Monitoring Well
- Approximate Site Boundary

N

0 150 300

Scale: Feet

RI/FS Workplan

The Lower Duwamish Waterway (LDW)
Glacier Northwest Inc - Reichhold Inc, Seattle WA

Proposed Soil Boring and Well Location Map

August 2012

Figure 7

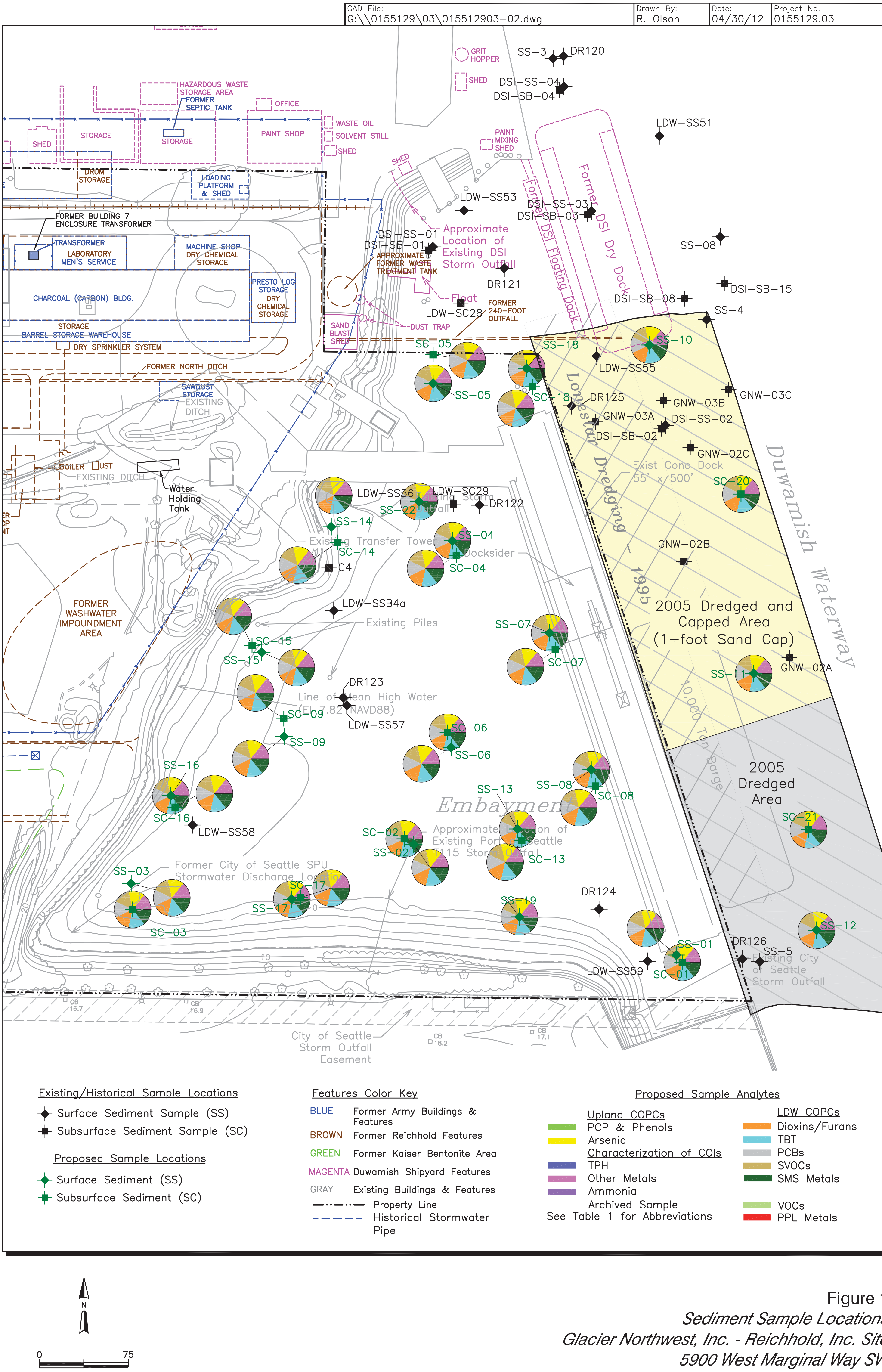


Figure 1
Sediment Sample Locations
Glacier Northwest, Inc. - Reichhold, Inc. Site
5900 West Marginal Way SW
Seattle, Washington

ERM 04/12

Preliminary
Draft

Table 1
Metals in Soil, Fall 2011 Monitoring Well Installation Event

Location ID	Sample Code	Sample ID	Sample Date	Antimony EPA 6010B mg/kg	Arsenic EPA 6020 mg/kg	Beryllium EPA 6010B mg/kg	Cadmium EPA 6020 mg/kg	Chromium EPA 6010B mg/kg	Chromium (VI) EPA 3500CR-D mg/kg	Copper EPA 6010B mg/kg	Lead EPA 6020 mg/kg	Mercury EPA 7471A mg/kg	Nickel EPA 6010B mg/kg	Selenium EPA 6010B mg/kg	Silver EPA 6010B mg/kg	Thallium EPA 6010B mg/kg	TBT Krone1989 µg/kg	Zinc EPA 6010B mg/kg
MW-14D	MW-14D-3-6	MW-14D-3-6	11/14/2011	0.35 UJ	88.2 J	0.011 U	0.2	9.5	na	387 J	4.3	0.03	5	0.71 U	0.033 U	0.58 U	na	99
	MW-14D-6.5-7.5	MW-14D-6.5-7.5	11/14/2011	0.33 UJ	129 J	0.01 U	0.1	8.9	na	326	2.8	0.0011 U	5	0.67 U	0.031 U	0.55 U	na	125
MW-28S	MW-28S-1-2	MW-28S-1-2	11/8/2011	na	67.9	na	na	23.5	na	119 J	na	na	na	na	0.035 U	na	1.6 U	89
	MW-28S-3.5-4	MW-28S-3.5-4	11/8/2011	na	1.7	na	na	11.3	na	10.9 J	na	na	na	na	0.038 U	na	1.6 U	22
MW-29S	MW-29S-0-2	MW-29S-0-2	11/8/2011	na	23.1	na	na	23.4	na	66.7 J	na	na	na	na	0.034 U	na	1.7 U	47
	MW-29S-3-3.5	MW-29S-3-3.5	11/8/2011	na	2.2	na	na	17.1	na	31.6 J	na	na	na	na	0.7	na	1.5 U	25
MW-30S	MW-30S-0-2	MW-30S-0-2	11/8/2011	na	8.5	na	na	40.9	0.03 UJ	88.3 J	na	na	na	na	0.5	na	19	105
	MW-30S-0-2 (dup)	DUP-110811-2	11/8/2011	na	10.2	na	na	39.9	na	81.9 J	na	na	na	na	0.033 U	na	na	108
	MW-30S-3-3.5	MW-30S-3-3.5	11/8/2011	na	1.1	na	na	10.5	0.03 UJ	16.7 J	na	na	na	na	0.034 U	na	1.5 U	23
MW-31S	MW-31S-1-2	MW-31S-1-2	11/8/2011	na	2.2	na	na	21.1	na	14.3 J	na	na	na	na	0.03 U	na	1.5 U	27
	MW-31S-1-2 (dup)	DUP-110811-3	11/8/2011	na	na	na	na	na	na	na	na	na	na	na	na	na	1.5 U	na
	MW-31S-5-6	MW-31S-5-6	11/8/2011	na	4.1	na	na	11.4	na	12.3 J	na	na	na	na	0.038 U	na	1.6 U	26
MW-32D	MW-32D-1.6-3.6	MW-32D-1.6-3.6	11/9/2011	na	53.3 J	na	na	23.7 J	na	75.1 J	na	na	na	na	0.033 U	na	na	62
	MW-32D-1.6-3.6 (dup)	DUP-110911-1	11/9/2011	na	35 J	na	na	33.3 J	na	168 J	na	na	na	na	1.5	na	na	62
	MW-32D-5-7	MW-32D-5-7	11/11/2011	na	1	na	na	9.4	na	7.7	na	na	na	na	0.033 U	na	na	18
MW-32S	MW-32S-1.7-4	MW-32S-1.7-4	11/8/2011	na	21.8 J	na	na	24.6 J	na	69.4 J	na	na	na	na	0.4	na	na	47
	MW-32S-5-7	MW-32S-5-7	11/11/2011	na	1.4 J	na	na	11.2	na	11.4	na	na	na	na	0.036 U	na	na	22
MW-33S	MW-33S-.7-1.3	MW-33S-.7-1.3	11/10/2011	na	1.7	na	na	25.9	na	19.4	na	na	na	na	0.032 U	na	na	32
	MW-33S-4-7	MW-33S-4-7	11/14/2011	na	13.6 J	na	na	10.9	na	31.5	na	na	na	na	0.034 U	na	na	24
MW-34S	MW-34S-1.3-3.2	MW-34S-1.3-3.2	11/9/2011	na	2.7 J	na	na	19.5 J	na	16.2 J	na	na	na	na	0.03 U	na	na	30
	MW-34S-3.8-4.2	MW-34S-3.8-4.2	11/9/2011	na	2.1 J	na	na	13.3 J	na	13 J	na	na	na	na	0.037 U	na	na	23
MW-35S	MW-35S-1.3-3.3	MW-35S-1.3-3.3	11/9/2011	na	5.9	na	na	26.9	na	101	na	na	na	na	0.03 U	na	na	33
	MW-35S-5.7-6.3	MW-35S-5.7-6.3	11/9/2011	na	1.6	na	na	38	na	313	na	na	na	na	0.034 U	na	na	23

Notes and Key:
µg/kg = Micrograms per kilogram
mg/kg = Milligrams per kilogram
dup = Duplicate sample
EPA = United States Environmental Protection Agency analytical method
Krone1989 = TBT-specific analytical method
TBT = Tributyltin

Laboratory Data Qualifiers:
U = Result is ≤ Method Detection Limit (MDL). Result reported as the MDL and is qualified as non detected.

ERM Data Qualifiers:
UJ = Non-detected sample qualified as estimated.
J = Detected sample qualified as estimated.

Preliminary
Draft

Table 2

Polychlorinated Biphenyl Aroclors in Soil, Fall 2011 Monitoring Well Installation Event

Location ID	Sample Code	Sample ID	Sample Date	Aroclor 1016 µg/kg	Aroclor 1221 µg/kg	Aroclor 1232 µg/kg	Aroclor 1242 µg/kg	Aroclor 1248 µg/kg	Aroclor 1254 µg/kg	Aroclor 1260 µg/kg
MW-29S	MW-29S-0-2	MW-29S-0-2	11/8/2011	1.2 U	1.6 U	1.6 U	1.6 U	33	100	1.6 y
	MW-29S-0-2 (dup)	DUP-110811-1	11/8/2011	1.2 U	1.6 U	1.6 U	1.6 U	38	120	1.6 y
	MW-29S-3-3.5	MW-29S-3-3.5	11/8/2011	1.1 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
MW-31S	MW-31S-1-2	MW-31S-1-2	11/8/2011	1.2 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ
	MW-31S-5-6	MW-31S-5-6	11/8/2011	1.2 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U

Notes and Key:

µg/kg = Micrograms per kilogram

All samples analyzed by United States Environmental Protection Agency Method 8082

dup = Duplicate sample

Laboratory Data Qualifiers:

U = Result is ≤ Method Detection Limit (MDL). Result reported as the MDL and is qualified as non detected.

y = The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference.
The Y flag is equivalent to the U flag with a raised reporting limit.

ERM Data Qualifiers:

UJ = Non-detected sample qualified as estimated.

Table 3
Semi-Volatile Organic Compounds in Soil, Fall 2011 Monitoring Well Installation Event

Analyte	Laboratory Analytical Method	Location ID	MW-14D			MW-28S		MW-29S		MW-30S		MW-31S	MW-31S
		Sample Code	MW-14D-3-6	MW-14D-3-6 (dup)	MW-14D-6.5-7.5	MW-28S-1-2	MW-28S-3.5-4	MW-29S-0-2	MW-29S-3-3.5	MW-30S-0-2	MW-30S-3-3.5	MW-31S-1-2	MW-31S-5-6
		Sample ID	MW-14D-3-6	DUP-111411-1	MW-14D-6.5-7.5	MW-28S-1-2	MW-28S-3.5-4	MW-29S-0-2	MW-29S-3-3.5	MW-30S-0-2	MW-30S-3-3.5	MW-31S-1-2	MW-31S-5-6
		Sample Date	11/14/2011	11/14/2011	11/14/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011
Pentachlorophenol	EPA 8270D	µg/kg	43 U	43 U	47 U	270	47 U	79 J	44 U	710 U	46 U	44 UJ	47 U
Phenol	EPA 8270D	µg/kg	7.6 U	7.6 U	8.3 U	26	8.4 U	28 J	12 j	130 U	8.2 U	7.9 UJ	8.4 U
2,3,4,6-Tetrachlorophenol	EPA 8270D	µg/kg	4.3 U	4.3 U	4.7 U	15 j	4.7 U	21 J	4.4 U	71 U	4.6 U	4.4 UJ	4.7 U
2,4,5-Trichlorophenol	EPA 8270D	µg/kg	19 U	19 U	21 U	20 U	21 U	21 UJ	19 U	310 U	20 U	20 UJ	21 U
2,4,6-Trichlorophenol	EPA 8270D	µg/kg	20 U	20 U	22 U	21 U	22 U	22 UJ	20 U	330 U	21 U	20 UJ	22 U
2,4-Dichlorophenol	EPA 8270D	µg/kg	19 U	19 U	21 U	20 U	21 U	21 UJ	20 U	310 U	20 U	20 UJ	21 U
2-Chlorophenol	EPA 8270D	µg/kg	2.1 U	2.1 U	2.3 U	2.2 U	2.3 U	2.3 UJ	2.2 U	35 U	2.3 U	2.2 UJ	2.3 U
1,2,4-Trichlorobenzene	EPA 8270D	µg/kg	3.1 U	3.1 U	3.4 U	3.2 U	3.4 U	na	na	na	na	3.2 U	3.4 U
1,2-Benzphenanthracene	EPA 8270D	µg/kg	13 j	18	3.6 U	200	3.7 U	na	na	na	na	11 j	13 j
1,2-Dichlorobenzene	EPA 8270D	µg/kg	2.2 U	2.2 U	2.4 U	2.3 U	2.4 U	na	na	na	na	2.3 U	2.4 U
1,3-Dichlorobenzene	EPA 8270D	µg/kg	2.3 U	2.3 U	2.5 U	2.4 U	2.6 U	na	na	na	na	2.4 U	2.6 U
1,4-Dichlorobenzene	EPA 8270D	µg/kg	2.5 U	2.5 U	2.8 U	2.6 U	2.8 U	na	na	na	na	2.6 U	2.8 U
1-Methylnaphthalene	EPA 8270D	µg/kg	26	23	2.6 U	50	2.6 U	na	na	na	na	2.5 U	26
2,4-Dimethylphenol	EPA 8270D	µg/kg	3 U	3 U	3.3 U	3.2 U	3.3 U	na	na	na	na	3.2 U	3.4 U
2,4-Dinitrophenol	EPA 8270D	µg/kg	98 U	98 U	110 U	100 U	110 U	na	na	na	na	100 U	110 U
2,4-Dinitrotoluene	EPA 8270D	µg/kg	17 UJ	17 UJ	19 UJ	18 U	19 U	na	na	na	na	18 U	19 U
2,6-Dinitrotoluene	EPA 8270D	µg/kg	27 U	27 U	30 U	28 U	30 U	na	na	na	na	28 U	30 U
2-Chloronaphthalene	EPA 8270D	µg/kg	2.3 U	2.3 U	2.5 U	2.4 U	2.6 U	na	na	na	na	2.4 U	2.6 U
2-Methylnaphthalene	EPA 8270D	µg/kg	12 j	11 j	3 U	92	3 U	na	na	na	na	2.8 U	14 j
2-Methylphenol	EPA 8270D	µg/kg	4.6 U	4.6 U	5.1 U	4.9 U	5.1 U	na	na	na	na	4.8 U	5.1 U
2-Nitroaniline	EPA 8270D	µg/kg	16 U	16 U	18 U	17 U	18 U	na	na	na	na	17 U	18 U
2-Nitrophenol	EPA 8270D	µg/kg	34 U	34 U	37 U	36 U	38 U	na	na	na	na	35 U	38 U
3,3-Dichlorobenzidine	EPA 8270D	µg/kg	16 UJ	16 UJ	17 UJ	16 U	17 U	na	na	na	na	16 U	17 U
3and4-Methylphenol	EPA 8270D	µg/kg	28 j	36	6.4 U	6.1 U	6.5 U	na	na	na	na	6.1 U	6.5 U
3-Nitroaniline	EPA 8270D	µg/kg	20 U	20 U	22 U	21 U	22 U	na	na	na	na	21 U	22 U
4,6-Dinitro-o-cresol	EPA 8270D	µg/kg	19 U	19 U	20 U	20 U	21 U	na	na	na	na	19 U	21 U
4-Bromophenyl Phenyl Ether	EPA 8270D	µg/kg	4.4 U	4.4 U	4.9 U	4.7 U	4.9 U	na	na	na	na	4.6 U	4.9 U
4-Chloro-3-methylphenol	EPA 8270D	µg/kg	13 U	13 U	15 U	14 U	15 U	na	na	na	na	14 U	15 U
4-Chlorophenyl Phenyl Ether	EPA 8270D	µg/kg	4.6 U	4.7 U	5.1 U	4.9 U	5.2 U	na	na	na	na	4.8 U	5.2 U
4-Nitrophenol	EPA 8270D	µg/kg	30 U	31 U	33 U	32 U	34 U	na	na	na	na	32 U	34 U
Acenaphthene	EPA 8270D	µg/kg	2.9 U	2.9 U	3.2 U	3 U	3.2 U	na	na	na	na	3 U	17 j
Acenaphthylene	EPA 8270D	µg/kg	5 U	5 U	5.5 U	60	5.6 U	na	na	na	na	5.2 U	16 j
Anthracene	EPA 8270D	µg/kg	4 U	4 U	4.3 U	33	4.4 U	na	na	na	na	4.1 U	4.4 U
Benzo(a) anthracene	EPA 8270D	µg/kg	2.9 U	11 j	3.2 U	100	3.2 U	na	na	na	na	3 U	3.2 U
Benzo(a) pyrene	EPA 8270D	µg/kg	4.8 U	4.8 U	5.3 U	170	5.3 U	na	na	na	na	5 U	5.3 U
Benzo(g,h,i) perylene	EPA 8270D	µg/kg	3.9 U	3.9 U	4.2 U	85	4.3 U	na	na	na	na	12 j	4.3 U
Benzoic acid	EPA 8270D	µg/kg	89 U	89 U	97 U	93 U	98 U	na	na	na	na	92 U	99 U
Benzyl Alcohol	EPA 8270D	µg/kg	5.4 UJ	5.4 UJ	5.9 UJ	5.6 U	5.9 U	na	na	na	na	5.6 U	5.9 U
Benzyl Butyl Phthalate	EPA 8270D	µg/kg	5.4 U	5.4 U	5.9 U	5.7 U	6 U	na	na	na	na	5.6 U	6 U
Bis(2-chloro-1-methylethyl) ether	EPA 8270D	µg/kg	3.3 U	3.3 U	3.6 U	3.5 U	3.7 U	na	na	na	na	3.4 U	3.7 U
Bis(2-chloroethoxy) methane	EPA 8270D	µg/kg	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	na	na	na	na	1.8 U	2 U
Bis(2-chloroethyl) ether	EPA 8270D	µg/kg	2.9 U	2.9 U	3.2 U	3.1 U	3.3 U	na	na	na	na	3.1 U	3.3 U
Bis(2-ethylhexyl) phthalate	EPA 8270D	µg/kg	98	130	33	81	20 j	na	na	na	na	18 j	14 U
Carbazole	EPA 8270D	µg/kg	2.4 U	2.4 U	2.6 U	12 j	2.6 U	na	na	na	na	2.5 U	2.6 U
Dibenzo(a,h) anthracene	EPA 8270D	µg/kg	3.8 U	3.8 U	4.2 U	19	4.2 U	na	na	na	na	3.9 U	4.2 U
Dibenzofuran	EPA 8270D	µg/kg	3.6 U	3.6 U	4 U	21	4 U	na	na	na	na	3.8 U	11 j
Dibutyl phthalate	EPA 8270D	µg/kg	7.2 U	7.2 U	7.9 U	17 j	8 U	na	na	na	na	7.5 U	8 U
Diethyl Phthalate	EPA 8270D	µg/kg	32 U	32 U	35 U	34 U	36 U	na	na	na	na	33 U	36 U
Dimethyl Phthalate	EPA 8270D	µg/kg	2.5 U	2.6 U	2.8 U	2.7 U	2.8 U	na	na	na	na	2.7 U	2.8 U
Di-n-Octyl Phthalate	EPA 8270D	µg/kg	5.1 U	5.1 U	5.6 U	5.4 U	5.7 U	na	na	na	na	5.3 U	5.7 U
Fluoranthene	EPA 8270D	µg/kg	36	48	2.8 U	140	2.8 U	na	na	na	na	2.7 U	26
Fluorene	EPA 8270D	µg/kg	9.7 j	8.8 j	4.2 U	4 U	4.2 U	na	na	na	na	4 U	4.2 U
Hexachloro-1,3-Butadiene	EPA 8270D	µg/kg	4 U	4 U	4.4 U	4.2 U	4.5 U	na	na	na	na	4.2 U	4.5 U
Hexachlorobenzene	EPA 8270D	µg/kg	3.8 U	3.8 U	4.1 U	4 U	4.2 U	na	na	na	na	3.9 U	4.2 U
Hexachlorocyclopentadiene	EPA 8270D	µg/kg	58 U	58 U	64 U	61 U	65 U	na	na	na	na	61 U	65 U
Hexachloroethane	EPA 8270D	µg/kg	2.6 U	2.6 U	2.8 U	2.7 U	2.9 U	na	na	na	na	2.7 U	2.9 U
Indeno(1,2,3-c,d) pyrene	EPA 8270D	µg/kg	4.1 U	4.1 U	4.5 U	76	4.6 U	na	na	na	na	4.3 U	4.6 U
Isophorone	EPA 8270D	µg/kg	2.5 U	2.5 U	2.8 U	2.6 U	2.8 U	na	na	na	na	2.6 U	2.8 U
Naphthalene	EPA 8270D	µg/kg	19	23	2.7 U	92	2.7 U	na	na	na	na	2.5 U	66
Nitrobenzene	EPA 8270D	µg/kg	3.6 U	3.6 U	3.9 U	3.8 U	4 U	na	na	na	na	3.7 U	4 U
N-nitrosodi-n-propylamine	EPA 8270D	µg/kg	3 U	3 U	3.2 U	3.1 U	3.3 U	na	na	na	na	3.1 U	3.3 U
n-Nitrosodiphenylamine	EPA 8270D	µg/kg	4.7 U	4.7 U	5.2 U	5 U	5.3 U	na	na	na	na	4.9 U	5.3 U
p-Chloroaniline	EPA 8270D	µg/kg	20 U	20 U	22 U	21 U	22 U	na	na	na	na	20 U	22 U
Phenanthrene	EPA 8270D	µg/kg	35	33	3.5 U	100	11 j	na	na	na	na	3.3 U	24
P-Nitroaniline	EPA 8270D	µg/kg	33 U	33 U	37 U	35 U	37 U	na	na	na	na	35 U	37 U
Pyrene	EPA 8270D	µg/kg	34	42	1.9 U	200	1.9 U	na	na	na	na	20	38
Total (B+J+K) Benzofluoranthenes	EPA 8270D	µg/kg	16 j	19	2.7 U	270	2.7 U	na	na	na	na	13 j	14 j
1,2-Benzphenanthracene	EPA 8270D-SIM	µg/kg	14	14	1.9 U	150	1.9 U	na	na	na	na	5.4	9.5
1-Methylnaphthalene	EPA 8270D-SIM	µg/kg	40	24	1.7 U	42	1.7 U	na	na	na	na	1.6 U	25
2-Methylnaphthalene	EPA 8270D-SIM	µg/kg	23	13	1.5 U	69	1.5 U	na	na	na	na	1.4 U	14
Acenaphthene	EPA 8270D-SIM	µg/kg	1.2 U	1.2 U	1.3 U	15 m	1.3 U	na	na	na	na	1.2 U	19
Acenaphthylene	EPA 8270D-SIM	µg/kg	7.7	3.7 j	1.2 U	49	1.2 U	na	na	na	na	1.2 U	12
Anthracene	EPA 8270D-SIM	µg/kg	5.9	3 j	1.4 U	22	1.4 U	na	na	na	na	1.4 U	7.9
Benzo(a) anthracene	EPA 8270D-SIM	µg/kg	10	9.3	1.6 U	92	1.6 U	na	na	na	na	3.4 j	7.2
Benzo(a) pyrene	EPA 8270D-SIM	µg/kg	7.6	6.8	1.7 U	160	1.7 U	na	na	na	na	7.6	7.8
Benzo(g,h,i) perylene	EPA 8270D-SIM	µg/kg	5.7	6.7	3 U	99	3 U	na	na	na	na	4.6 j	6
Dibenzo(a,h) anthracene	EPA 8270D-SIM	µg/kg	2.2 U	2.1 U	2.3 U	33	2.3 U	na	na	na	na	2.2 U	2.3 U
Dibenzofuran	EPA 8270D-SIM	µg/kg	10	5.4	1.5 U	24	1.5 U	na	na	na	na	1.4 U	10
Fluoranthene	EPA 8270D-SIM	µg/kg	42	46	3.4 j	150	3.6 j	na	na	na	na	5.2	24
Fluorene	EPA 8270D-SIM	µg/kg	17	6.9	1.3 U	8.9	1.3 U	na	na	na	na	1.2 U	11
Indeno(1,2,3-c,d) pyrene	EPA 8270D-SIM	µg/kg	4.5 j	4.8	3.4 U	85	3.4 U	na	na	na	na	4 j	4.7 j
Naphthalene	EPA 8270D-SIM	µg/kg	32	22	2.9 j	74	3 j	na	na	na	na	2.5 U	43
Phenanthrene	EPA 8270D-SIM	µg/kg	33	31	2 U	78	2 U	na	na	na	na	1.9 U	21
Pyrene	EPA 8270D-SIM	µg/kg	33	37	2.8 j	170	3.4 j	na	na	na	na	9.8	26
Total (B+J+K) Benzofluoranthenes	EPA 8270D-SIM	µg/kg	19	18	1.8 U	230	1.8 U	na	na	na	na	6.8	16

Notes and Key:
µg/kg = Micrograms per kilogram
dup = Duplicate sample
EPA = United States Environmental Protection Agency analytical method

Laboratory Data Qualifiers:
U = Result is ≤ Method Detection Limit (MDL). Result reported as the MDL and is qualified as non detected.
J = Compound detected at a concentration less than the Reporting Limit but greater than the Method Detection Limit.
M = Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters.

ERM Data Qualifiers:
UJ = Non-detected sample qualified as estimated.
J = Detected sample qualified as estimated.
U = Sample qualified as non-detected.

Notes and Key:
µg/kg = Micrograms
dup = Duplicate sam
EPA = United States

Preliminary
Draft

Table 3
Semi-Volatile Organic Compounds in Soil, Fall 2011 Monitoring Well Installation Event

MW-32D		MW-32S		MW-33S		MW-34S		MW-35S		
MW-32D-1.6-3.6	MW-32D-5-7	MW-32S-1.7-4	MW-32S-5-7	MW-33S-.7-1.3	MW-33S-4-7	MW-34S-1.3-3.2	MW-34S-3.8-4.2	MW-35S-1.3-3.3 (dup)	MW-35S-1.3-3.3	MW-35S-5.7-6.3
MW-32D-1.6-3.6	MW-32D-5-7	MW-32S-1.7-4	MW-32S-5-7	MW-33S-.7-1.3	MW-33S-4-7	MW-34S-1.3-3.2	MW-34S-3.8-4.2	DUP-110911-2	MW-35S-1.3-3.3	MW-35S-5.7-6.3
11/9/2011	11/11/2011	11/8/2011	11/11/2011	11/10/2011	11/14/2011	11/9/2011	11/9/2011	11/9/2011	11/9/2011	11/9/2011
46 U	44 U	45 U	45 U	47 U	47 U	46 U	120 j	45 U	44 U	45 U
34	7.8 U	16 j	8 U	8.3 U	8.4 U	8.2 U	40	8.1 U	7.9 U	28
4.6 U	4.4 U	4.5 U	4.5 U	4.7 U	4.7 U	4.6 U	40	4.5 U	4.4 U	12 j
20 U	19 U	20 U	20 U	21 U	21 U	20 U	20 U	20 U	19 U	20 U
21 U	20 U	21 U	21 U	22 U	22 U	21 U	21 U	21 U	20 U	21 U
20 U	19 U	20 U	20 U	21 U	21 U	20 U	20 U	20 U	20 U	20 U
2.3 U	2.2 U	2.2 U	2.2 U	2.3 U	2.3 U	2.3 U	2.3 U	2.2 U	2.2 U	2.2 U
na	na	3.3 U	3.2 U	na	na	3.3 U	3.3 U	na	na	na
na	na	36	3.5 U	na	na	3.5 U	3.5 U	na	na	na
na	na	2.3 U	2.3 U	na	na	2.4 U	2.4 U	na	na	na
na	na	2.5 U	2.4 U	na	na	2.5 U	2.5 U	na	na	na
na	na	2.7 U	2.6 U	na	na	2.7 U	2.7 U	na	na	na
na	na	14 j	2.5 U	na	na	2.5 U	11 j	na	na	na
na	na	3.2 U	3.2 U	na	na	3.3 U	3.3 U	na	na	na
na	na	100 U	100 U	na	na	100 U	100 U	na	na	na
na	na	18 U	18 U	na	na	18 U	18 U	na	na	na
na	na	29 U	28 U	na	na	29 U	29 U	na	na	na
na	na	2.5 U	2.4 U	na	na	2.5 U	2.5 U	na	na	na
na	na	25	2.8 U	na	na	2.9 U	23	na	na	na
na	na	4.9 U	4.8 U	na	na	5 U	5 U	na	na	na
na	na	17 U	17 U	na	na	17 U	17 U	na	na	na
na	na	36 U	36 U	na	na	37 U	37 U	na	na	na
na	na	17 U	16 U	na	na	17 U	17 U	na	na	na
na	na	66	6.1 U	na	na	6.3 U	6.3 U	na	na	na
na	na	21 U	21 U	na	na	21 U	21 U	na	na	na
na	na	20 U	20 U	na	na	20 U	20 U	na	na	na
na	na	4.7 U	4.6 U	na	na	4.7 U	4.7 U	na	na	na
na	na	14 U	14 U	na	na	14 U	14 U	na	na	na
na	na	4.9 U	4.9 U	na	na	5 U	5 U	na	na	na
na	na	32 U	32 U	na	na	33 U	33 U	na	na	na
na	na	3.1 U	3 U	na	na	3.1 U	3.1 U	na	na	na
na	na	5.3 U	5.3 U	na	na	5.4 U	5.4 U	na	na	na
na	na	16 j	4.1 U	na	na	4.2 U	4.2 U	na	na	na
na	na	24	3 U	na	na	3.1 U	3.1 U	na	na	na
na	na	20	5 U	na	na	5.1 U	5.1 U	na	na	na
na	na	21	4.1 U	na	na	4.2 U	4.2 U	na	na	na
na	na	94 U	93 U	na	na	95 U	95 U	na	na	na
na	na	11 j	5.6 U	na	na	5.7 U	5.7 U	na	na	na
na	na	5.7 U	5.7 U	na	na	5.8 U	5.8 U	na	na	na
na	na	3.5 U	3.5 U	na	na	3.5 U	3.5 U	na	na	na
na	na	1.9 U	1.8 U	na	na	1.9 U	1.9 U	na	na	na
na	na	3.1 U	3.1 U	na	na	3.2 U	3.2 U	na	na	na
na	na	44	51	na	na	16 j	19 j	na	na	na
na	na	2.5 U	2.5 U	na	na	2.5 U	2.5 U	na	na	na
na	na	4 U	4 U	na	na	4.1 U	4.1 U	na	na	na
na	na	19	3.8 U	na	na	3.9 U	3.9 U	na	na	na
na	na	7.6 U	7.5 U	na	na	7.7 U	7.7 U	na	na	na
na	na	34 U	34 U	na	na	35 U	35 U	na	na	na
na	na	2.7 U	2.7 U	na	na	2.7 U	2.7 U	na	na	na
na	na	12 j	5.4 U	na	na	5.5 U	5.5 U	na	na	na
na	na	87	2.7 U	na	na	2.7 U	20	na	na	na
na	na	11 j	4 U	na	na	4.1 U	4.1 U	na	na	na
na	na	4.3 U	4.2 U	na	na	4.3 U	4.3 U	na	na	na
na	na	4 U	4 U	na	na	4 U	4 U	na	na	na
na	na	62 U	61 U	na	na	63 U	63 U	na	na	na
na	na	2.8 U	2.7 U	na	na	2.8 U	2.8 U	na	na	na
na	na	16 j	4.3 U	na	na	4.4 U	4.4 U	na	na	na
na	na	2.7 U	2.6 U	na	na	2.7 U	2.7 U	na	na	na
na	na	60	2.5 U	na	na	2.6 U	37	na	na	na
na	na	3.8 U	3.7 U	na	na	3.8 U	3.8 U	na	na	na
na	na	3.1 U	3.1 U	na	na	3.2 U	3.2 U	na	na	na
na	na	5 U	5 U	na	na	5.1 U	5.1 U	na	na	na
na	na	21 U	21 U	na	na	21 U	21 U	na	na	na
na	na	66	3.4 U	na	na	3.4 U	26	na	na	na
na	na	35 U	35 U	na	na	36 U	36 U	na	na	na
na	na	93	1.8 U	na	na	1.8 U	26	na	na	na
na	na	49	2.5 U	na	na	2.6 U	2.6 U	na	na	na
na	na	33	4.5 j	na	na	1.8 U	2.5 j	na	na	na
na	na	14	1.6 U	na	na	1.6 U	1.6 U	na	na	na
na	na	18	1.5 U	na	na	1.4 U	4.2 j	na	na	na
na	na	11	1.3 U	na	na	1.2 U	1.2 U	na	na	na
na	na	9.2	1.2 U	na	na	1.2 U	1.2 U	na	na	na
na	na	16	1.4 U	na	na	1.4 U	1.4 U	na	na	na
na	na	27	3.1 j	na	na	1.5 U	1.5 U	na	na	na
na	na	31	4.8 j	na	na	1.6 U	1.6 U	na	na	na
na	na	16	4.5 j	na	na	2.9 U	2.9 U	na	na	na
na	na	5	2.3 U	na	na	2.2 U	2.2 U	na	na	na
na	na	18	1.5 U	na	na	1.4 U	3.7 j	na	na	na
na	na	87	4.3 j	na	na	1.7 U	6.3	na	na	na
na	na	13	1.2 U	na	na	1.2 U	4 j	na	na	na
na	na	14	3.7 j	na	na	3.3 U	3.3 U	na	na	na
na	na	42	2.5 U	na	na	2.5 U	6.2	na	na	na
na	na	57	1.9 U	na	na	1.9 U	10	na	na	na
na	na	71	6.5	na	na	2.1 U	4.8	na	na	na
na	na	50	7	na	na	1.7 U	1.7 U	na	na	na

s per kilogram
ple
Environmental Protection Agency analytical method

Laboratory Data Qualifiers:
U = Result is ≤ Method Detection Limit (MDL). Result reported as the MDL and is qualified as non detected.
J = Compound detected at a concentration less than the Reporting Limit but greater than the Method Detection Limit.
M = Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters.

ERM Data Qualifiers:
UJ = Non-detected sample qualified as estimated.
J = Detected sample qualified as estimated.
U = Sample qualified as non-detected.

Table 4

Volatile Organic Compounds in Soil, Fall 2011 Monitoring Well Installation Event

	Location ID	MW-33S		MW-34S		
	Sample Code	MW-33S-1.3	MW-33S-5.5	MW-34S-3	MW-34S-3.8-4.2	MW-34S-3.8-4.2 (dup)
	Sample ID	MW-33S-1.3	MW-33S-5.5	MW-34S-3	MW-34S-3.8-4.2	DUP-110911-3
	Sample Date	11/10/2011	11/14/2011	11/9/2011	11/9/2011	11/9/2011
1,1,1,2-Tetrachloroethane	µg/kg	0.23 U	0.23 U	0.21 U	0.25 U	0.27 U
1,1,1-Trichloroethane	µg/kg	0.23 U	0.22 U	0.21 U	0.25 U	0.26 U
1,1,2,2-Tetrachloroethane	µg/kg	0.25 U	0.24 U	0.23 U	0.28 U	0.29 U
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	µg/kg	0.29 U	0.28 U	0.26 U	0.31 U	0.33 U
1,1,2-Trichloroethane	µg/kg	0.29 U	0.28 U	0.26 U	0.31 U	0.33 U
1,1-Dichloroethane	µg/kg	0.2 U	0.2 UJ	0.19 U	0.22 U	0.24 U
1,1-Dichloroethylene	µg/kg	0.34 U	0.32 U	0.31 U	0.37 U	0.39 U
1,1-Dichloropropene	µg/kg	0.31 U	0.3 U	0.29 U	0.34 U	0.36 U
1,2,3-Trichlorobenzene	µg/kg	0.31 U	0.29 U	0.28 U	0.33 U	0.35 U
1,2,3-Trichloropropane	µg/kg	0.52 U	0.5 U	0.47 U	0.56 U	0.6 U
1,2,4-Trichlorobenzene	µg/kg	0.33 U	0.32 U	0.3 U	0.36 U	0.39 U
1,2,4-Trimethylbenzene	µg/kg	0.23 U	0.22 U	0.21 U	0.25 U	0.27 U
1,2-Dibromo-3-Chloropropane (DBCP)	µg/kg	0.59 U	0.57 U	0.54 U	0.64 U	0.68 U
1,2-Dibromoethane	µg/kg	0.18 U	0.17 U	0.16 U	0.19 U	0.2 U
1,2-Dichlorobenzene	µg/kg	0.29 U	0.28 U	0.27 U	0.32 U	0.34 U
1,2-Dichloroethane	µg/kg	0.19 U	0.18 U	0.17 U	0.21 U	0.22 U
1,2-Dichloropropane	µg/kg	0.16 U	0.16 U	0.15 U	0.18 U	0.19 U
1,3,5-Trimethylbenzene	µg/kg	0.26 U	0.25 U	0.23 U	0.28 U	0.29 U
1,3-Dichlorobenzene	µg/kg	0.23 U	0.22 U	0.21 U	0.25 U	0.26 U
1,3-Dichloropropane	µg/kg	0.21 U	0.2 U	0.19 U	0.23 U	0.24 U
1,4-Dichlorobenzene	µg/kg	0.23 U	0.22 U	0.21 U	0.25 U	0.27 U
1,4-Dichloro-trans-2-butene	µg/kg	0.44 U	0.42 U	0.4 U	0.48 U	0.51 U
2,2-Dichloropropane	µg/kg	0.29 U	0.28 U	0.27 U	0.32 U	0.34 U
2-Butanone (MEK)	µg/kg	0.52 U	0.5 U	0.47 U	3.3 j	0.6 U
2-Chloroethyl Vinyl Ether	µg/kg	0.28 U	0.27 U	0.25 U	0.3 U	0.32 U
2-Chlorotoluene	µg/kg	0.3 U	0.29 U	0.27 U	0.33 U	0.35 U
4-Chlorotoluene	µg/kg	0.28 U	0.27 U	0.25 U	0.3 U	0.32 U
Acetone	µg/kg	2.8 j	21	7.2 U	48	36
Acrolein	µg/kg	3.8 U	3.7 UJ	3.5 UJ	4.2 UJ	4.4 UJ
Acrylonitrile	µg/kg	1 U	1 U	0.94 U	1.1 U	1.2 U
Benzene	µg/kg	0.3 U	0.29 U	0.27 U	0.32 U	0.34 U
Bromobenzene	µg/kg	0.15 U	0.15 U	0.14 U	0.17 U	0.18 U
Bromochloromethane	µg/kg	0.32 U	0.31 U	0.3 U	0.35 U	0.37 U
Bromodichloromethane	µg/kg	0.26 U	0.25 U	0.23 U	0.28 U	0.29 U
Bromoform	µg/kg	0.3 U	0.29 U	0.27 U	0.32 U	0.34 U
Bromomethane	µg/kg	0.19 UJ	0.18 UJ	0.17 UJ	0.2 UJ	0.22 UJ
Carbon Disulfide	µg/kg	0.56 U	1.9	0.51 U	5.7	3.9
Carbon Tetrachloride	µg/kg	0.21 U	0.21 U	0.19 U	0.23 U	0.25 U
Chlorobenzene	µg/kg	0.22 U	0.21 U	0.2 U	0.24 U	0.25 U
Chlorodibromomethane	µg/kg	0.27 U	0.26 U	0.24 U	0.29 U	0.31 U
Chloroethane	µg/kg	0.46 UJ	0.45 UJ	0.42 U	0.5 U	0.54 U
Chloroform	µg/kg	0.24 U	0.23 U	0.21 U	0.26 U	0.27 U
Chloromethane	µg/kg	0.26 UJ	0.25 UJ	0.24 U	0.29 U	0.31 U
cis-1,2-Dichloroethene	µg/kg	0.24 U	0.23 U	0.22 U	0.26 U	0.28 U
cis-1,3-Dichloropropene	µg/kg	0.23 U	0.22 U	0.21 U	0.25 U	0.26 U
Cymene	µg/kg	0.24 U	0.23 U	0.22 U	0.26 U	0.27 U
Dibromomethane	µg/kg	0.15 U	0.14 U	0.13 U	0.16 U	0.17 U
Ethyl bromide	µg/kg	0.44 U	0.43 U	0.4 U	0.48 U	0.51 U
Ethylbenzene	µg/kg	0.2 U	0.2 U	0.18 U	0.22 U	0.23 U
Hexachloro-1,3-Butadiene	µg/kg	0.41 U	0.4 U	0.37 U	0.45 U	0.48 U
Isopropylbenzene (Cumene)	µg/kg	0.23 U	0.23 U	0.21 U	0.25 U	0.27 U
m,p-Xylene	µg/kg	0.39 U	0.38 U	0.36 U	0.43 U	0.45 U
Methyl Iodide	µg/kg	0.22 U	0.21 U	0.2 U	0.23 U	0.25 U
Methyl Isobutyl Ketone	µg/kg	0.42 U	0.41 U	0.38 U	0.46 U	0.49 U
Methyl n-Butyl Ketone	µg/kg	0.44 U	0.42 U	0.4 U	0.48 U	0.51 U
Methylene Chloride	µg/kg	0.64 U	1.5 J	0.58 U	3 U	2.9 U
Methyl-t-butyl ether (MTBE)	µg/kg	0.23 U	0.22 UJ	0.21 UJ	0.25 U	0.27 U
Naphthalene	µg/kg	0.43 U	0.41 U	0.39 U	0.47 U	0.5 U
N-Butylbenzene	µg/kg	0.26 U	0.25 U	0.24 U	0.29 U	0.3 U
n-Propylbenzene	µg/kg	0.27 U	0.26 U	0.25 U	0.3 U	0.32 U
o-Xylene	µg/kg	0.23 U	0.22 U	0.2 U	0.24 U	0.26 U
sec-Butylbenzene	µg/kg	0.24 U	0.23 U	0.22 U	0.26 U	0.28 U
Styrene (Monomer)	µg/kg	0.14 U	0.13 U	0.13 U	0.15 U	0.16 U
tert-Butylbenzene	µg/kg	0.31 U	0.3 U	0.28 U	0.33 U	0.35 U
Tetrachloroethene	µg/kg	0.26 U	0.25 U	0.23 U	0.28 U	0.3 U
Toluene	µg/kg	0.15 U	0.6 j	0.14 U	0.16 U	0.18 U
trans-1,2-Dichloroethene	µg/kg	0.27 U	0.26 U	0.24 U	0.29 U	0.31 U
trans-1,3-Dichloropropene	µg/kg	0.22 U	0.21 U	0.2 U	0.24 U	0.25 U
Trichloroethylene	µg/kg	0.21 U	0.21 U	0.19 U	0.23 U	0.25 U
Trichlorofluoromethane (CFC-11)	µg/kg	0.27 U	0.26 U	0.24 U	0.29 U	0.31 U
Vinyl Acetate	µg/kg	0.38 U	0.37 U	0.35 U	0.42 U	0.44 U
Vinyl Chloride	µg/kg	0.24 U	0.23 U	0.21 U	0.26 U	0.27 U

Notes and Key:
µg/kg = Micrograms per kilogram
All samples analyzed by United States Environmental Protection Agency Method 8260C
dup = Duplicate sample

Laboratory Data Qualifiers:
U = Result is ≤ Method Detection Limit (MDL). Result reported as the MDL and is qualified as non detected.
j = Compound detected at a concentration less than the Reporting Limit but greater than the Method Detection Limit.

ERM Data Qualifiers:
UJ = Non-detected sample qualified as estimated.
J = Detected sample qualified as estimated.
U = Sample qualified as non-detected.

Table 5

Miscellaneous Compounds in Soil, Fall 2011 Monitoring Well Installation Event

Location ID	Sample Code	Sample ID	Sample Date	% Solids EPA 160.3 percent	Ammonia EPA 350.1 mg/kg	TPH-D NWTPHD mg/kg	TPH-MO NWTPHD mg/kg	TPH-G NWTPHG mg/kg
MW-28S	MW-28S-1-2 (dup)	DUP-110811-4	11/8/2011	79.4	1.17	na	na	na
	MW-28S-1-2	MW-28S-1-2	11/8/2011	79.2	0.68	na	na	na
	MW-28S-3.5-4	MW-28S-3.5-4	11/8/2011	77.7	1.22	na	na	na
MW-29S	MW-29S-0-2	MW-29S-0-2	11/8/2011	85.1	0.17 U	na	na	na
	MW-29S-3-3.5	MW-29S-3-3.5	11/8/2011	83.1	13.3	na	na	na
MW-30S	MW-30S-0-2	MW-30S-0-2	11/8/2011	89.5	0.39	na	na	na
	MW-30S-2.8	MW-30S-2.8	11/8/2011	na	na	16000 NJ	14000 NJ	100
	MW-30S-3-3.5	MW-30S-3-3.5	11/8/2011	81.4	2.35	na	na	na
MW-31S	MW-31S-1-2	MW-31S-1-2	11/8/2011	94.9	0.21 U	na	na	na
	MW-31S-5-6	MW-31S-5-6	11/8/2011	79.8	0.12 U	na	na	na
MW-32S	MW-32S-7	MW-32S-7	11/11/2011	na	na	na	na	4 U
MW-34S	MW-34S-1.3-3.2	MW-34S-1.3-3.2	11/9/2011	93.5	1.2	1.4 U	2.6 U	na
	MW-34S-3	MW-34S-3	11/9/2011	na	na	na	na	2.4 U
	MW-34S-3.8-4.2	MW-34S-3.8-4.2	11/9/2011	82	1.93	1.6 U	3 U	3.2 U
	MW-34S-3.8-4.2 (dup)	DUP-110911-3	11/9/2011	na	na	1.6 U	3 U	3 U
MW-35S	MW-35S-1.3-3.3	MW-35S-1.3-3.3	11/9/2011	95.5	0.03 U	5.3 NJ	2.6 U	na
	MW-35S-1.3-3.3 (dup)	DUP-110911-2	11/9/2011	95.8	0.2	na	na	na
	MW-35S-1.7	MW-35S-1.7	11/9/2011	na	na	na	na	2.2 U
	MW-35S-5.7-6.3	MW-35S-5.7-6.3	11/9/2011	82.2	0.19	1.6 U	3 U	na
	MW-35S-6.3	MW-35S-6.3	11/9/2011	na	na	na	na	3.2 U

Notes and Key:

mg/kg = Milligrams per kilogram
dup = Duplicate sample
EPA = United States Environmental Protection Agency analytical method
NWTPH = Northwest TPH analytical method
TPH-D = Total petroleum hydrocarbons as Diesel
TPH-G = Total petroleum hydrocarbons as Gasoline
TPH-MO = Total petroleum hydrocarbons as Motor Oil

Laboratory Data Qualifiers:

U = Result is ≤ Method Detection Limit (MDL). Result reported as the MDL and is qualified as non detected.

ERM Data Qualifiers:

NJ = Estimated value, results of organics or additional hydrocarbons are not identifiable.
U = Sample qualified as non-detected.

Table 6

Dioxins/Furans in Soil, Fall 2011 Monitoring Well Installation Event

Location ID			**MW-34S-3.8-4.2**
Sample Code			**MW-34S**
Sample Date		**TEFs**	**11/9/2011**
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1	0.375 j
Tetrachlorodibenzo-p-dioxin homologs (Total TCDD)	pg/g		7.75
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1	3.8
Pentachlorodibenzo-p-dioxin homologs (Total PeCDD)	pg/g		22.9
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	12.6
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	94.5
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.1	43.5
Hexachlorodibenzo-p-dioxin homologs (Total HxCDD)	pg/g		445
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	0.01	2600
Heptachlorodibenzo-p-dioxin homologs (Total HpCDD)	pg/g		4650
Octachlorodibenzo-p-dioxin (OCDD)	pg/g	0.0003	33200
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.1	2.12
Tetrachlorodibenzofuran homologs (Total TCDF)	pg/g		18.5
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.03	2.44 j
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.3	10.9
Pentachlorodibenzofuran homologs (Total PeCDF)	pg/g		119
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	103
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	15.6
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	8.14
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.1	1.04 j
Hexachlorodibenzofuran homologs (Total HxCDF)	pg/g		528
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	301
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.01	75.5
Heptachlorodibenzofuran homologs (Total HpCDF)	pg/g		1330
Octachlorodibenzofuran (OCDF)	pg/g	0.0003	923
Calculated TEQ (ND=0)	pg/g		75.57
Calculated TEQ (ND=1/2 DL)	pg/g		75.57

Notes and Key:

pg/g = Picograms per gram (1E-12 g/g) equivalent to parts per trillion.

TEQ = Toxicity Equivalency Quotient to 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD). Only positively identified compounds are included in TEQ calculation.

TEF = Toxicity Equivalency Factors (World Health Organization, 2005)

Data Qualifiers:

j = The value reported is below the routine reporting limit and should be considered an estimate; qualifier reported by the Laboratory

Preliminary
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Table 1
Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds
2012 Upland Soil Sampling Event

		Sample Location	**GP-26**					**GP-27**								
		Sample Date	**9/7/2012**	**9/7/2012**	**10/10/2012**	**10/10/2012**	**10/10/2012**	**9/7/2012**	**9/7/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**9/7/2012**
		Sample ID	**GP-26-3.1-3.5**	**GP-26-4-5.1**	**GP-26-5.1-7.1**	**DUP101012-3**	**GP-26-9.1-10.3**	**GP-27-0-2**	**GP-27-2.3-4.3**	**GP-27-4.3-6.3**	**DUP101112-1**	**GP-27-5.3**	**DUP101112-1A**	**GP-27-6.3-8.3**	**GP-27-7.3**	**GP-28-1**
		Sample Depth	**3.1 - 3.5 ft**	**4 - 5.1 ft**	**5.1 - 7.1 ft**	**5.1 - 7.1 ft**	**9.1 - 10.3 ft**	**0 - 2 ft**	**2.3 - 4.3 ft**	**4.3 - 6.3 ft**	**4.3 - 6.3 ft**	**5.3 - 5.3 ft**	**5.3 - 5.3 ft**	**6.3 - 8.3 ft**	**7.3 - 7.3 ft**	**1 - 1 ft**
Metals																
Antimony	EPA200.8	mg/kg			0.2 UJ	0.2 UJ	0.3 UJ			0.2 UJ	0.2 UJ			0.3 UJ		
Arsenic	EPA200.8	mg/kg	**10.1**	**1.1**	**1.7**	**2.1**	**3.4**	**34.4**	**5.8**	**1.5**	**2**			**1.4**		
Barium	EPA200.8/SW6010C	mg/kg														
Beryllium	EPA200.8	mg/kg			0.2 U	0.2 U	0.3 U			0.2 U	0.2 U			0.3 U		
Cadmium	EPA200.8	mg/kg			0.1 U	0.1 U	0.1 U			0.1 U	0.1 U			0.1 U		
Chromium	SW6010C	mg/kg	**18.9**	**11.1**	**10.3**	**10.5**	**13.6**	**27.6**	**14.8**	**11.2**	**11.7**			**9.5**		
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg	0.469 U	0.517 U	**0.505**	**0.505**	**0.978**									
Copper	SW6010C	mg/kg	**35.8**	**8.6**	**10.4** J+	**10.1** J+	**21.9** J+	**107**	**19.3**	**9.3**	**10.5**			**9**		
Lead	EPA200.8	mg/kg			**1.2**	**1.2**	**2.8**			**1.3**	**2.2**			**1.6**		
Mercury	SW7471A	mg/kg			0.02 U	0.03 U	0.03 U			0.02 U	0.03 U			0.03 U		
Nickel	SW6010C	mg/kg			**8**	**8**	**10**			**8**	**9**			**7**		
Selenium	EPA200.8	mg/kg			0.6 U	0.6 U	0.7 U			0.6 U	0.6 U			0.6 U		
Silver	SW6010C	mg/kg	0.3 U	0.4 U	0.4 U	0.4 U	0.4 U	0.3 U	0.4 U	0.4 U	0.4 U			0.4 U		
Thallium	EPA200.8	mg/kg			0.2 U	0.2 U	0.3 U			0.2 U	0.2 U			0.3 U		
Zinc	SW6010C	mg/kg	**37**	**19**	**21**	**21**	**28**	**72**	**41**	**21**	**22**			**19**		
Tributyltin ion	Krone1989	mg/kg						1.6 U	1.5 U	1.5 U	1.5 U			1.6 U		
Ammonia																
Ammonia as Nitrogen	EPA350.1	mg/kg						**0.6**	**11.3**							
Total Petroleum Hydrocarbons																
Gasoline Range Organics	NWTPHG	mg/kg										4.8 U	5.9 U		5 U	3.3 U
Diesel Range Organics	NWTPHD	mg/kg						**15**	**9.6**	5.9 U	7 U			6 U		
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg						**100**	**29**	12 U	14 U			12 U		
PCBs																
Aroclor 1016	SW8082A	ug/kg								0.95 U	1 U			0.96 U		
Aroclor 1221	SW8082A	ug/kg								1.3 U	1.3 U			1.3 U		
Aroclor 1232	SW8082A	ug/kg								1.3 U	1.3 U			1.3 U		
Aroclor 1242	SW8082A	ug/kg								1.3 U	1.3 U			1.3 U		
Aroclor 1248	SW8082A	ug/kg								1.3 U	1.3 U			1.3 U		
Aroclor 1254	SW8082A	ug/kg								1.3 U	1.3 U			1.3 U		
Aroclor 1260	SW8082A	ug/kg								1.3 U	1.3 U			1.3 U		
Conventional Compounds																
Total Solids	SM2540B	%	**84.6**	**77.3**	**77.4**	**78.9**	**73**	**92.9**	**83.9**							
pH	SW9045	pH units			**6.22**	**6.36**	**6.32**			**6.34**	**6.03**			**6.71**		

Table 1

Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds

2012 Upland Soil Sampling Event

		Sample Location	**GP-28**											**GP-29**		
		Sample Date	**9/7/2012**	**9/7/2012**	**9/7/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**
		Sample ID	**GP-28-3**	**GP-28-0-2**	**GP-28-2-4**	**GP-28-4.1-6.1**	**DUP101112-2**	**GP-28-5.1**	**DUP101112-2A**	**GP-28-6.1-8.3**	**DUP101112-3**	**GP-28-7.1**	**DUP101112-3A**	**GP-29-2.9-4.9**	**GP-29-3.9**	**GP-29-4.9-6.9**
		Sample Depth	**3 - 3 ft**	**0 - 2 ft**	**2 - 4 ft**	**4.1 - 6.1 ft**	**4.1 - 6.1 ft**	**5.1 - 5.1 ft**	**5.1 - 5.1 ft**	**6.1 - 8.3 ft**	**6.1 - 8.3 ft**	**7.1 - 7.1 ft**	**7.1 - 7.1 ft**	**2.9 - 4.9 ft**	**3.9 - 3.9 ft**	**4.9 - 6.9 ft**
Metals																
Antimony	EPA200.8	mg/kg				0.2 UJ	0.3 UJ			0.2 UJ	0.2 UJ			0.2 UJ		0.2 UJ
Arsenic	EPA200.8	mg/kg		**16.3**	**4**	**1.9**	**2.2**			**1.9**	**2.1**			**2** J+		**1.4** J+
Barium	EPA200.8/SW6010C	mg/kg				**17.8**	**19.8**			**23.4**	**23.7**					
Beryllium	EPA200.8	mg/kg				0.2 U	0.3 U			0.2 U	0.2 U			0.2 U		0.2 U
Cadmium	EPA200.8	mg/kg				0.1 U	0.1 U			0.1 U	0.1 U			0.1 U		0.1 U
Chromium	SW6010C	mg/kg		**22.1**	**18.6**	**11.2**	**13.4**			**11.2**	**10.1**			**11.8**		**10**
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg														
Copper	SW6010C	mg/kg		**79.4**	**27.9**	**10.1**	**10.8**			**13.2**	**12.4**			**74.2** J+		**7.6** J+
Lead	EPA200.8	mg/kg				**1.5**	**1.9**			**1.6**	**1.7**			**1.5**		**1**
Mercury	SW7471A	mg/kg				0.03 U	0.03 U			0.03 U	0.03 U			0.02 U		0.02 U
Nickel	SW6010C	mg/kg				**7**	**7**			**9**	**7**			**9**		**6**
Selenium	EPA200.8	mg/kg				0.6 U	0.6 U			0.6 U	0.6 U			0.5 U		0.6 U
Silver	SW6010C	mg/kg		0.3 U	0.3 U	0.4 U	0.4 U			0.4 U	0.4 U			0.3 U		0.4 U
Thallium	EPA200.8	mg/kg				0.2 U	0.3 U			0.2 U	0.2 U			0.2 U		0.2 U
Zinc	SW6010C	mg/kg		**55**	**41**	**20**	**20**			**22**	**20**			**24**		**18**
Tributyltin ion	Krone1989	mg/kg		1.5 U	1.7 U	1.5 U	1.6 U			1.6 U	1.6 U					
Ammonia																
Ammonia as Nitrogen	EPA350.1	mg/kg		**0.51**	**10.9**											
Total Petroleum Hydrocarbons																
Gasoline Range Organics	NWTPHG	mg/kg	4 U					4.7 U	9.7 U			5 U	4.9 U		**7.1**	
Diesel Range Organics	NWTPHD	mg/kg		**44**	**14**	5.6 U	6.4 U			6.4 U	6.3 U			5 U		5.7 U
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg		**270**	**36**	11 U	13 U			13 U	13 U			10 U		11 U
PCBs																
Aroclor 1016	SW8082A	ug/kg				0.97 U	0.95 U			0.97 U	0.97 U					
Aroclor 1221	SW8082A	ug/kg				1.3 U	1.3 U			1.3 U	1.3 U					
Aroclor 1232	SW8082A	ug/kg				1.3 U	1.3 U			1.3 U	1.3 U					
Aroclor 1242	SW8082A	ug/kg				1.3 U	1.3 U			1.3 U	1.3 U					
Aroclor 1248	SW8082A	ug/kg				1.3 U	1.3 U			1.3 U	1.3 U					
Aroclor 1254	SW8082A	ug/kg				**4.3**	**6.3**			1.3 U	1.3 U					
Aroclor 1260	SW8082A	ug/kg				1.3 U	1.3 U			1.3 U	1.3 U					
Conventional Compounds																
Total Solids	SM2540B	%		**94.6**	**85.4**											
pH	SW9045	pH units				**7.1**	**6.73**			**7.27**	**6.93**			**7.69**		**7.43**

Table 1

Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds

2012 Upland Soil Sampling Event

		Sample Location						GP-30			GP-31				
		Sample Date	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**9/7/2012**	**9/7/2012**	**10/9/2012**	**9/6/2012**	**9/6/2012**	**9/6/2012**	**10/11/2012**	**10/11/2012**
		Sample ID	**GP-29-5.9**	**GP-29-6.9-8.9**	**GP-29-7.9**	**GP-29-10**	**GP-29-8.9-11.2**	**GP-30-3.3-5.3**	**GP-30-5.3-6.6**	**GP-30-7-9**	**GP-31-3-5**	**DUP-090612-2**	**GP-31-5-5.9**	**GP-31-5.9-7.9**	**GP-31-7.9-9.9**
		Sample Depth	**5.9 - 5.9 ft**	**6.9 - 8.9 ft**	**7.9 - 7.9 ft**	**10 - 10 ft**	**8.9 - 11.2 ft**	**3.3 - 5.3 ft**	**5.3 - 6.6 ft**	**7 - 9 ft**	**3 - 5 ft**	**3 - 5 ft**	**5 - 5.9 ft**	**5.9 - 7.9 ft**	**7.9 - 9.9 ft**
Metals															
Antimony	EPA200.8	mg/kg		0.2 UJ			0.2 UJ			0.2 UJ				0.2 UJ	0.2 UJ
Arsenic	EPA200.8	mg/kg		**1.8** J+			**2.3** J+	**4.7**	**2.3**	**3.8** J+	**1.6**	**1.1**	**1.4**	**2.1**	**1.3**
Barium	EPA200.8/SW6010C	mg/kg													
Beryllium	EPA200.8	mg/kg		0.2 U			0.2 U			0.2 U				0.2 U	0.2 U
Cadmium	EPA200.8	mg/kg		0.1 U			0.1 U			0.1 U				0.1 U	0.1 U
Chromium	SW6010C	mg/kg		**19.2**			**9.2**	**10.4**	**13.8**	**10.1**	**12.8**	**11.2**	**12.3**	**9.4**	**8.8**
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg									0.434 U	0.457 U	0.432 U		
Copper	SW6010C	mg/kg		**21.5** J+			**8.1** J+	**12.6**	**10**	**10.9** J+	**10.7**	**10.5**	**11.6**	**9.3**	**8.7**
Lead	EPA200.8	mg/kg		**1.2**			**1.7**			**3.3**				**1.1**	**1.2**
Mercury	SW7471A	mg/kg		0.02 U			0.02 U			0.02 U				0.03 U	0.02 U
Nickel	SW6010C	mg/kg		**19**			**6**			**8**				**7**	**6**
Selenium	EPA200.8	mg/kg		0.6 U			0.6 U			0.6 U				0.6 U	0.6 U
Silver	SW6010C	mg/kg		0.3 U			0.3 U	0.3 U	0.3 U	0.4 U	0.3 U	0.3 U	0.3 U	0.4 U	0.4 U
Thallium	EPA200.8	mg/kg		0.2 U			0.2 U			0.2 U				0.2 U	0.2 U
Zinc	SW6010C	mg/kg		**25**			**17**	**24**	**24**	**22**	**23**	**24**	**24**	**19**	**17**
Tributyltin ion	Krone1989	mg/kg													
Ammonia															
Ammonia as Nitrogen	EPA350.1	mg/kg						0.11 U	**0.16**		**0.32**	**0.51**	**0.27**		
Total Petroleum Hydrocarbons															
Gasoline Range Organics	NWTPHG	mg/kg	4.6 U		4.5 U	4.6 U									
Diesel Range Organics	NWTPHD	mg/kg		5.4 U			5.9 U				5.3 U	**13**	5.7 U		
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg		11 U			12 U				11 U	10 U	11 U		
PCBs															
Aroclor 1016	SW8082A	ug/kg												0.98 U	0.98 U
Aroclor 1221	SW8082A	ug/kg												1.3 U	1.3 U
Aroclor 1232	SW8082A	ug/kg												1.3 U	1.3 U
Aroclor 1242	SW8082A	ug/kg												1.3 U	1.3 U
Aroclor 1248	SW8082A	ug/kg												1.3 U	1.3 U
Aroclor 1254	SW8082A	ug/kg												1.3 U	1.3 U
Aroclor 1260	SW8082A	ug/kg												1.3 U	1.3 U
Conventional Compounds															
Total Solids	SM2540B	%						**91.2**	**86.4**		**91.9**	**86.2**	**91.8**		
pH	SW9045	pH units		**7.31**			**7.48**			**6.5**				**6.72**	**6.88**

Table 1

Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds

2012 Upland Soil Sampling Event

		Sample Location	GP-32				GP-33			GP-34						
		Sample Date	9/10/2012	9/10/2012	10/11/2012	10/11/2012	9/6/2012	9/6/2012	10/10/2012	9/6/2012	9/6/2012	9/6/2012	10/10/2012	10/10/2012	10/10/2012
		Sample ID	GP-32-0.25-2.25	GP-32-4.1-6.1	GP-32-6.1-8.1	GP-32-8.1-9.1	GP-33-3.25-5.25	GP-33-5.25-5.9	GP-33-5.9-8.3	GP-34-0-2	GP-34-3.25-4.4	GP-34-4.4-6.4	GP-34-6.4-8.4	DUP101012-1	GP-34-8.4-9.4
		Sample Depth	0.25 - 2.25 ft	4.1 - 6.1 ft	6.1 - 8.1 ft	8.1 - 9.1 ft	3.25 - 5.25 ft	5.25 - 5.9 ft	5.9 - 8.3 ft	0 - 2 ft	3.25 - 4.4 ft	4.4 - 6.4 ft	6.4 - 8.4 ft	6.4 - 8.4 ft	8.4 - 9.4 ft
Metals															
Antimony	EPA200.8	mg/kg			0.2 UJ	0.3 UJ			0.2 UJ				0.2 UJ	0.2 UJ	0.3 UJ
Arsenic	EPA200.8	mg/kg	**31.2**	**4.1**	**1**	**3.8**	**3.8**	**3.9**	**1.9**	**23.7**	**4.5**	**2**	**1.2**	**1.1**	**5.6**
Barium	EPA200.8/SW6010C	mg/kg													
Beryllium	EPA200.8	mg/kg			0.2 U	0.3 U			0.2 U				0.2 U	0.2 U	**0.4**
Cadmium	EPA200.8	mg/kg			0.1 U	0.1 U			0.1 U				0.1 U	0.1 U	0.1 U
Chromium	SW6010C	mg/kg	**85.4**	**14.3**	**9.7**	**11.2**	**13.6**	**11.6**	**9.6**	**27.6**	**14.2**	**11.1**	**10.1**	**9.2**	**11.6**
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg			0.487 U	0.497 U									
Copper	SW6010C	mg/kg	**842**	**47.8**	**8.5**	**16.2**	**13.7**	**8.3**	**10.4** J+	**55.1**	**15.4**	**8.9**	**8.9** J+	**7.5** J+	**18.2** J+
Lead	EPA200.8	mg/kg			**0.9**	**4.4**			**1.4**				**1**	**1**	**3.8**
Mercury	SW7471A	mg/kg			0.03 U	**0.04**			0.02 U				0.03 U	**0.19**	0.03 U
Nickel	SW6010C	mg/kg			**8**	**8**			**8**				**5**	**5**	**14**
Selenium	EPA200.8	mg/kg			0.6 U	0.7 U			0.6 U				0.6 U	0.6 U	0.7 U
Silver	SW6010C	mg/kg	**4.9**	0.3 U	0.3 U	0.4 U	0.3 U	0.3 U	0.4 U	0.3 U	0.3 U	0.3 U	0.4 U	0.4 U	0.4 U
Thallium	EPA200.8	mg/kg			0.2 U	0.3 U			0.2 U				0.2 U	0.2 U	0.3 U
Zinc	SW6010C	mg/kg	**93**	**28**	**20**	**25**	**44**	**44**	**23**	**72**	**31**	**21**	**18**	**17**	**30**
Tributyltin ion	Krone1989	mg/kg													
Ammonia															
Ammonia as Nitrogen	EPA350.1	mg/kg	**20.3**	**7.29**			**3.65**	**3.27**		**0.34**	**1.57**	**0.66**			
Total Petroleum Hydrocarbons															
Gasoline Range Organics	NWTPHG	mg/kg													
Diesel Range Organics	NWTPHD	mg/kg					**18**	**12**							
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg					**47**	**12**							
PCBs															
Aroclor 1016	SW8082A	ug/kg	0.97 U	1 U	0.99 U	0.98 U			0.95 U				0.95 U	0.99 U	0.96 U
Aroclor 1221	SW8082A	ug/kg	1.3 U	1.3 U	1.3 U	1.3 U			1.3 U				1.3 U	1.3 U	1.3 U
Aroclor 1232	SW8082A	ug/kg	1.3 U	1.3 U	1.3 U	1.3 U			1.3 U				1.3 U	1.3 U	1.3 U
Aroclor 1242	SW8082A	ug/kg	1.3 U	1.3 U	1.3 U	1.3 U			1.3 U				1.3 U	1.3 U	1.3 U
Aroclor 1248	SW8082A	ug/kg	1.3 U	1.3 U	1.3 U	1.3 U			1.3 U				1.3 U	1.3 U	1.3 U
Aroclor 1254	SW8082A	ug/kg	**20**	**12**	1.3 U	1.3 U			1.3 U				1.3 U	1.3 U	1.3 U
Aroclor 1260	SW8082A	ug/kg	1.3 U	1.3 U	1.3 U	1.3 U			1.3 U				1.3 U	1.3 U	1.3 U
Conventional Compounds															
Total Solids	SM2540B	%	**86.1**	**85.4**	**80.6**	**78**	**91.2**	**84.6**		**96.4**	**85.3**	**90.2**			
pH	SW9045	pH units			**6.69**	**6.87**			**7.26**				**7.08**	**7.1**	**7.1**

Table 1

Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds

2012 Upland Soil Sampling Event

		Sample Location	**GP-36**								**GP-37**				
		Sample Date	**8/30/2012**	**8/30/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**9/10/2012**	**9/10/2012**	**10/8/2012**	**10/8/2012**	**9/10/2012**
		Sample ID	**GP-36-2.6**	**GP-36-2.6-4.6**	**GP-36-7-9**	**GP-36-8**	**GP-36-10**	**GP-36-9-11**	**GP-36-11.5**	**GP-36-11-12**	**GP-37-0-2**	**GP-37-4.4-6.4**	**GP-37-7-9**	**GP-37-9-10**	**GP-38-2.7-4.7**
		Sample Depth	**2.6 - 2.6 ft**	**2.6 - 4.6 ft**	**7 - 9 ft**	**8 - 8 ft**	**10 - 10 ft**	**9 - 11 ft**	**11.5 - 11.5 ft**	**11 - 12 ft**	**0 - 2 ft**	**4.4 - 6.4 ft**	**7 - 9 ft**	**9 - 10 ft**	**2.7 - 4.7 ft**
Metals															
Antimony	EPA200.8	mg/kg			0.2 UJ			0.2 UJ		0.3 UJ			0.2 UJ	0.3 UJ	
Arsenic	EPA200.8	mg/kg		**41.9**	**4.6**			**1.8**		**2.3**	**7.1**	**2.1**	**1.6**	**3.2**	**18.5**
Barium	EPA200.8/SW6010C	mg/kg													
Beryllium	EPA200.8	mg/kg			0.2 U			0.2 U		0.3 U			0.2 U	0.3 U	
Cadmium	EPA200.8	mg/kg			0.1 U			0.1 U		0.1 U			0.1 U	0.1 U	
Chromium	SW6010C	mg/kg			**17**			**9.9**		**10.8**			**10**	**12.1**	
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg													
Copper	SW6010C	mg/kg			**18.3**			**8.5**		**21.3**			**8.8**	**17**	
Lead	EPA200.8	mg/kg			**2.5**			**1**		**2.3**			**1**	**3**	
Mercury	SW7471A	mg/kg			0.03 U			0.02 U		**0.03**			0.03 U	**0.04**	
Nickel	SW6010C	mg/kg			**16**			**8**		**8**			**7**	**9**	
Selenium	EPA200.8	mg/kg			0.6 U			0.6 U		0.6 U			0.6 U	0.7 U	
Silver	SW6010C	mg/kg			0.3 U			0.4 U		0.4 U			0.4 U	0.4 U	
Thallium	EPA200.8	mg/kg			0.2 U			0.2 U		0.3 U			0.2 U	0.3 U	
Zinc	SW6010C	mg/kg			**25**			**20**		**23**			**19**	**25**	
Tributyltin ion	Krone1989	mg/kg													
Ammonia															
Ammonia as Nitrogen	EPA350.1	mg/kg													
Total Petroleum Hydrocarbons															
Gasoline Range Organics	NWTPHG	mg/kg	**110**			7 U	6.6 U		7.5 U						
Diesel Range Organics	NWTPHD	mg/kg		**1600**	6 U			6 U		**6.5**					
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg		**100**	12 U			12 U		13 U					
PCBs															
Aroclor 1016	SW8082A	ug/kg									1 U	0.98 U	0.96 U	0.97 U	0.96 U
Aroclor 1221	SW8082A	ug/kg									1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Aroclor 1232	SW8082A	ug/kg									1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Aroclor 1242	SW8082A	ug/kg									**7.7**	1.3 U	1.3 U	1.3 U	1.3 U
Aroclor 1248	SW8082A	ug/kg									1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Aroclor 1254	SW8082A	ug/kg									**8.8**	1.3 U	1.3 U	1.3 U	**5.8**
Aroclor 1260	SW8082A	ug/kg									1.3 U	1.3 U	1.3 U	1.3 U	**3.9**
Conventional Compounds															
Total Solids	SM2540B	%													
pH	SW9045	pH units			**8.51**			**8.18**		**7.26**			**6.69**	**6.53**	

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Table 1
Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds
2012 Upland Soil Sampling Event

		Sample Location	**GP-38**			**GP-39**				**GP-41**	**GP-44**					
		Sample Date	**9/10/2012**	**10/9/2012**	**10/9/2012**	**8/30/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**9/4/2012**	**9/4/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**
		Sample ID	**GP-38-5-7**	**GP-38-7-9**	**GP-38-9-11**	**GP-39-2.5-4.5**	**GP-39-4.5-6.5**	**GP-39-6.5-8.5**	**GP-39-10.5-11.5**	**GP-41-0-0.16**	**GP-44-2-4.8**	**GP-44-4.8-6.8**	**GP-44-5.8**	**GP-44-6.8-8.8**	**GP-44-7.8**	**GP-44-10**
		Sample Depth	**5 - 7 ft**	**7 - 9 ft**	**9 - 11 ft**	**2.5 - 4.5 ft**	**4.5 - 6.5 ft**	**6.5 - 8.5 ft**	**10.5 - 11.5 ft**	**0 - 0.16 ft**	**2 - 4.8 ft**	**4.8 - 6.8 ft**	**5.8 - 5.8 ft**	**6.8 - 8.8 ft**	**7.8 - 7.8 ft**	**10 - 10 ft**
Metals																
Antimony	EPA200.8	mg/kg		0.2 UJ	0.3 UJ		0.2 UJ	0.2 UJ	0.3 UJ			0.2 UJ		0.2 UJ		
Arsenic	EPA200.8	mg/kg	**3.1**	**2.2** J+	**2.4** J+	**50.3**	**10.2**	**3.1**	**3**	**6.6**	**40.7**	**40.7** J+		**14.4** J+		
Barium	EPA200.8/SW6010C	mg/kg														
Beryllium	EPA200.8	mg/kg		0.2 U	0.3 U		0.2 U	0.2 U	0.3 U			0.2 U		0.2 U		
Cadmium	EPA200.8	mg/kg		0.1 U	0.1 U		0.1 U	0.1 U	0.1 U			0.1 U		0.1 U		
Chromium	SW6010C	mg/kg		**9.7**	**9.8**	**146**	**19.4**	**172**	**268**			**11.3**		**4.9**		
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg				0.486 U										
Copper	SW6010C	mg/kg		**8.6** J+	**13.1** J+	**1410**	**24.9**	**9.8**	**14.3**			**39.4** J+		**9.7** J+		
Lead	EPA200.8	mg/kg		**1**	**1.7**		**2.9**	**1.5**	**2.5**			**6.9**		**1.4**		
Mercury	SW7471A	mg/kg		0.03 U	0.03 U		0.03 U	0.02 U	0.03 U			**0.03**		0.03 U		
Nickel	SW6010C	mg/kg		**7**	**7**		**8**	**7**	**9**			**5**		**1**		
Selenium	EPA200.8	mg/kg		0.6 U	0.7 U		0.6 U	0.5 U	0.7 U			0.5 U		0.6 U		
Silver	SW6010C	mg/kg		0.4 U	0.4 U	**4.8**	0.4 U	0.3 U	0.4 U			0.3 U		0.4 U		
Thallium	EPA200.8	mg/kg		0.2 U	0.3 U		0.2 U	0.2 U	0.3 U			0.2 U		0.2 U		
Zinc	SW6010C	mg/kg		**19**	**20**		**28**	**24**	**25**			**36**		**10**		
Tributyltin ion	Krone1989	mg/kg														
Ammonia																
Ammonia as Nitrogen	EPA350.1	mg/kg														
Total Petroleum Hydrocarbons																
Gasoline Range Organics	NWTPHG	mg/kg											3.6 U		5.6 U	5.1 U
Diesel Range Organics	NWTPHD	mg/kg										**53**		**16**		
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg										**20**		12 U		
PCBs																
Aroclor 1016	SW8082A	ug/kg	0.97 U	0.95 U	0.94 U	1 U	0.96 U	0.92 U	0.94 U							
Aroclor 1221	SW8082A	ug/kg	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.2 U	1.3 U							
Aroclor 1232	SW8082A	ug/kg	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.2 U	1.3 U							
Aroclor 1242	SW8082A	ug/kg	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.2 U	1.3 U							
Aroclor 1248	SW8082A	ug/kg	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.2 U	1.3 U							
Aroclor 1254	SW8082A	ug/kg	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.2 U	1.3 U							
Aroclor 1260	SW8082A	ug/kg	1.3 U	1.3 U	1.3 U	**6.5**	1.3 U	1.2 U	1.3 U							
Conventional Compounds																
Total Solids	SM2540B	%				**81.3**										
pH	SW9045	pH units		**6.56**	**6.59**		**7.17**	**6.87**	**6.66**			**7.53**		**7.54**		

Table 1

Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds

2012 Upland Soil Sampling Event

		Sample Location		**GP-45**							**GP-46**					**GP-47**
		Sample Date	**10/9/2012**	**9/4/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**8/31/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**9/5/2012**
		Sample ID	**GP-44-8.8-11.1**	**GP-45-2-4.25**	**GP-45-4.5-6.5**	**GP-45-5.5**	**GP-45-6.5-8.5**	**GP-45-7.5**	**GP-45-8.5-9.5**	**GP-45-9**	**GP-46-2.5-4.2**	**GP-46-5.2-7.2**	**GP-46-6.2**	**GP-46-7.2-8.7**	**GP-46-8**	**GP-47-0-0.25**
		Sample Depth	**8.8 - 11.1 ft**	**2 - 4.25 ft**	**4.5 - 6.5 ft**	**5.5 - 5.5 ft**	**6.5 - 8.5 ft**	**7.5 - 7.5 ft**	**8.5 - 9.5 ft**	**9 - 9 ft**	**2.5 - 4.2 ft**	**5.2 - 7.2 ft**	**6.2 - 6.2 ft**	**7.2 - 8.7 ft**	**8 - 8 ft**	**0 - 0.25 ft**
Metals																
Antimony	EPA200.8	mg/kg	0.2 UJ		0.2 UJ		0.2 UJ		0.2 UJ			0.2 UJ		0.2 UJ		
Arsenic	EPA200.8	mg/kg	**32.8** J+	**224**	**16.9** J+		**7.9** J+		**4** J+		**23.8**	**6.6** J+		**8.9** J+		**10.6**
Barium	EPA200.8/SW6010C	mg/kg														**28.9**
Beryllium	EPA200.8	mg/kg	0.2 U		0.2 U		0.2 U		0.2 U			0.2 U		0.2 U		
Cadmium	EPA200.8	mg/kg	0.1 U		0.1 U		0.1 U		0.1 U			0.1 U		0.1 U		
Chromium	SW6010C	mg/kg	**3.6** J		**3.2**		**1.3**		**15.7**			**4.8**		**13.9**		**7**
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg														0.41 U
Copper	SW6010C	mg/kg	**17.5** J+		**41.8** J+		**3.4** J+		**20.3** J+			**8.8** J+		**17.3** J+		**276** J
Lead	EPA200.8	mg/kg	**0.9**		**8.3**		**0.3**		**1.9**			**4**		**2.4**		**2.8**
Mercury	SW7471A	mg/kg	0.03 U		**0.03**		0.02 U		0.02 U			0.03 U		0.03 U		**0.05** J+
Nickel	SW6010C	mg/kg	1 U		**2**		1 U		**3**			**1**		**5**		**12**
Selenium	EPA200.8	mg/kg	0.6 U		0.6 U		0.6 U		0.6 U			0.6 U		0.6 U		
Silver	SW6010C	mg/kg	0.4 U		0.3 U		0.4 U		0.3 U			0.3 U		0.4 U		0.7 U
Thallium	EPA200.8	mg/kg	0.2 U		0.2 U		0.2 U		0.2 U			0.2 U		0.2 U		
Zinc	SW6010C	mg/kg	**7** J		**47**		1 U		**9**			**20**		**14**		**54**
Tributyltin ion	Krone1989	mg/kg														1.5 U
Ammonia																
Ammonia as Nitrogen	EPA350.1	mg/kg														
Total Petroleum Hydrocarbons																
Gasoline Range Organics	NWTPHG	mg/kg				4.4 U		4.8 U		4.5 U			3.9 U		4 U	
Diesel Range Organics	NWTPHD	mg/kg	**6.5**		**14**		5.7 U		6.3 U			**9.2**		6.1 U		
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg	12 U		**21**		11 U		**13**			**11**		**14**		
PCBs																
Aroclor 1016	SW8082A	ug/kg														
Aroclor 1221	SW8082A	ug/kg														
Aroclor 1232	SW8082A	ug/kg														
Aroclor 1242	SW8082A	ug/kg														
Aroclor 1248	SW8082A	ug/kg														
Aroclor 1254	SW8082A	ug/kg														
Aroclor 1260	SW8082A	ug/kg														
Conventional Compounds																
Total Solids	SM2540B	%														**96.4**
pH	SW9045	pH units	**7.44**		**8.04**		**7.97**		**7.62**			**7.78**		**7.79**		

Table 1

Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds

2012 Upland Soil Sampling Event

		Sample Location	GP-48	GP-50										
		Sample Date	**9/4/2012**	**9/7/2012**	**9/7/2012**	**9/7/2012**	**9/7/2012**	**9/7/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**9/10/2012**	**9/10/2012**	**9/10/2012**
		Sample ID	**GP-48-0-0.5**	**GP-50-1**	**GP-50-3**	**GP-50-0-2**	**GP-50-3-5.9**	**DUP-090712-1**	**GP-50-5.9-7**	**GP-50-6.9**	**GP-50-7.25**	**GP-50-7-7.75**	**GP-53-4**	**GP-53-3-5**	**GP-53-5**
		Sample Depth	**0 - 0.5 ft**	**1 - 1 ft**	**3 - 3 ft**	**0 - 2 ft**	**3 - 5.9 ft**	**3 - 5.9 ft**	**5.9 - 7 ft**	**6.9 - 6.9 ft**	**7.25 - 7.25 ft**	**7 - 7.75 ft**	**4 - 4 ft**	**3 - 5 ft**	**5 - 5 ft**
Metals															
Antimony	EPA200.8	mg/kg							0.2 UJ			0.3 UJ			
Arsenic	EPA200.8	mg/kg	**13.4**			**29**	**5.3**	**8.3**	**2.7**			**5.3**		**3.4**	
Barium	EPA200.8/SW6010C	mg/kg													
Beryllium	EPA200.8	mg/kg							0.2 U			**0.4**			
Cadmium	EPA200.8	mg/kg							0.1 U			0.1 U			
Chromium	SW6010C	mg/kg	**4**			**25.7**	**9.9**	**8.9**	**10.7**			**14.8**		**10.3**	
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg													
Copper	SW6010C	mg/kg	**168**			**530**	**14.3**	**14.5**	**10.7**			**22.2**		**8.6**	
Lead	EPA200.8	mg/kg							**1.1**			**5.3**			
Mercury	SW7471A	mg/kg							0.03 U			**0.03**			
Nickel	SW6010C	mg/kg							**5**			**18**			
Selenium	EPA200.8	mg/kg							0.6 U			0.7 U			
Silver	SW6010C	mg/kg	1 U			**0.6**	0.3 U	0.3 U	0.4 U			0.4 U		0.3 U	
Thallium	EPA200.8	mg/kg							0.2 U			0.3 U			
Zinc	SW6010C	mg/kg	**30**			**112**	**26**	**25**	**21**			**38**		**18**	
Tributyltin ion	Krone1989	mg/kg													
Ammonia															
Ammonia as Nitrogen	EPA350.1	mg/kg													
Total Petroleum Hydrocarbons															
Gasoline Range Organics	NWTPHG	mg/kg		3.8 U	4.3 U					5.2 U	7.4 U		4.5 U		6.1 U
Diesel Range Organics	NWTPHD	mg/kg				**98**	5.8 U	5.8 U	5.9 U			**10**		6.1 U	
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg				**130**	12 U	12 U	12 U			14 U		12 U	
PCBs															
Aroclor 1016	SW8082A	ug/kg				0.96 U	0.98 U	0.99 U	0.97 U			0.99 U			
Aroclor 1221	SW8082A	ug/kg				1.3 U	1.3 U	1.3 U	1.3 U			1.3 U			
Aroclor 1232	SW8082A	ug/kg				1.3 U	1.3 U	1.3 U	1.3 U			1.3 U			
Aroclor 1242	SW8082A	ug/kg				1.3 U	1.3 U	1.3 U	1.3 U			1.3 U			
Aroclor 1248	SW8082A	ug/kg				1.3 U	1.3 U	1.3 U	1.3 U			1.3 U			
Aroclor 1254	SW8082A	ug/kg				1.3 U	1.3 U	1.3 U	1.3 U			1.3 U			
Aroclor 1260	SW8082A	ug/kg				1.3 U	1.3 U	1.3 U	1.3 U			1.3 U			
Conventional Compounds															
Total Solids	SM2540B	%													
pH	SW9045	pH units							**7.34**			**7.17**			

Table 1

Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds

2012 Upland Soil Sampling Event

		Sample Location	**GP-53**					**GP-55**					**GP-56**			
		Sample Date	**9/10/2012**	**10/10/2012**	**10/10/2012**	**10/10/2012**	**10/10/2012**	**8/31/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**8/30/2012**	**8/30/2012**	**10/10/2012**	**10/10/2012**
		Sample ID	**GP-53-5-5.3**	**GP-53-5.3-7.3**	**GP-53-6.3**	**GP-53-7.3-9.3**	**GP-53-8.3**	**GP-55-2.5-4**	**GP-55-4.4-6.4**	**GP-55-6.4-8.4**	**GP-55-8.4-10.4**	**DUP100812-1**	**GP-56-3.3-3.75**	**DUP-083012-1**	**GP-56-4.2-5.2**	**GP-56-5.2-7.2**
		Sample Depth	**5 - 5.3 ft**	**5.3 - 7.3 ft**	**6.3 - 6.3 ft**	**7.3 - 9.3 ft**	**8.3 - 8.3 ft**	**2.5 - 4 ft**	**4.4 - 6.4 ft**	**6.4 - 8.4 ft**	**8.4 - 10.4 ft**	**8.4 - 10.4 ft**	**3.3 - 3.75 ft**	**3.3 - 3.75 ft**	**4.2 - 5.2 ft**	**5.2 - 7.2 ft**
Metals																
Antimony	EPA200.8	mg/kg		0.3 UJ		0.2 UJ			0.2 UJ	0.2 UJ	0.3 UJ	0.2 UJ			**0.8 J-**	0.2 UJ
Arsenic	EPA200.8	mg/kg	**3**	**4**		**2.4**		**17.5**	**9.7**	**4.3**	**4.4**	**3.6**	**53.8**	**58.7**	**99.7**	**65.8**
Barium	EPA200.8/SW6010C	mg/kg											**27.7**	**26.3**	**7**	**22**
Beryllium	EPA200.8	mg/kg		0.3 U		0.2 U			0.2 U	0.2 U	0.3 U	0.2 U			0.4 U	0.2 U
Cadmium	EPA200.8	mg/kg		0.1 U		0.1 U			0.1 U	0.1 U	0.1 U	0.1 U	**0.2**	**0.2**	0.2 U	0.1 U
Chromium	SW6010C	mg/kg	**11.3**	**10.5**		**8.3**		**15.6**	**9.9**	**9.4**	**14.5**	**12.9**	**29.6**	**31.5**	**4**	**12.6**
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg											0.506 U	0.512 U	0.832 U	**0.75**
Copper	SW6010C	mg/kg	**8.1**	**8.7** J+		**9.4** J+		**435**	**24.7**	**8.1**	**12**	**9.2**	**566**	**573**	**571** J+	**68.4** J+
Lead	EPA200.8	mg/kg		**1.1**		**1.2**			**12.1**	**1.1**	**3.7**	**2.7**	**22.1**	**21.5**	**10.8**	**6.1**
Mercury	SW7471A	mg/kg		0.03 U		**0.03**			**0.02**	0.02 U	0.03 U	0.02 U	**0.12**	**0.12**	0.04 U	0.02 U
Nickel	SW6010C	mg/kg		**9**		**6**			**7**	**6**	**10**	**9**	**7**	**8**	**4**	**5**
Selenium	EPA200.8	mg/kg		0.6 U		0.6 U			0.5 U	0.6 U	0.6 U	0.6 U			1 U	0.6 U
Silver	SW6010C	mg/kg	0.4 U	0.4 U		0.4 U		**0.9**	0.3 U	0.3 U	0.4 U	0.4 U	**4.1**	**4.4**	0.7 U	0.3 U
Thallium	EPA200.8	mg/kg		0.3 U		0.2 U			0.2 U	0.2 U	0.3 U	0.2 U			0.4 U	0.2 U
Zinc	SW6010C	mg/kg	**20**	**20**		**17**		**30**	**23**	**19**	**29**	**27**	**72**	**76**	**78**	**51**
Tributyltin ion	Krone1989	mg/kg														
Ammonia																
Ammonia as Nitrogen	EPA350.1	mg/kg														
Total Petroleum Hydrocarbons																
Gasoline Range Organics	NWTPHG	mg/kg			4.7 U		5.2 U									
Diesel Range Organics	NWTPHD	mg/kg	**11**	5.8 U		6.2 U										
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg	12 U	12 U		12 U										
PCBs																
Aroclor 1016	SW8082A	ug/kg														
Aroclor 1221	SW8082A	ug/kg														
Aroclor 1232	SW8082A	ug/kg														
Aroclor 1242	SW8082A	ug/kg														
Aroclor 1248	SW8082A	ug/kg														
Aroclor 1254	SW8082A	ug/kg														
Aroclor 1260	SW8082A	ug/kg														
Conventional Compounds																
Total Solids	SM2540B	%											**78.1**	**77.2**	**48.1**	**85.3**
pH	SW9045	pH units		**9.43**		**8.86**					**6**	**6.08**			**7.35**	**7.19**

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Table 1

Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds

2012 Upland Soil Sampling Event

		Sample Location		GP-57					GP-58			GP-59				
		Sample Date	10/10/2012	8/31/2012	10/10/2012	10/10/2012	10/10/2012	10/10/2012	8/31/2012	10/8/2012	10/8/2012	8/31/2012	10/10/2012	10/10/2012	10/10/2012	9/6/2012
		Sample ID	GP-56-7.2-9.5	GP-57-1.5-3.5	GP-57-4-6.25	GP-57-6.25-6.8	GP-57-8.8-10.8	GP-57-10.8-12	GP-58-1.75-3.75	GP-58-4.25-6.25	GP-58-8.25-10.5	GP-59-2.3-3.9	GP-59-4.25-6.25	GP-59-8.25-10.25	GP-59-10.25-11.5	GP-61-0-2
		Sample Depth	7.2 - 9.5 ft	1.5 - 3.5 ft	4 - 6.25 ft	6.25 - 6.8 ft	8.8 - 10.8 ft	10.8 - 12 ft	1.75 - 3.75 ft	4.25 - 6.25 ft	8.25 - 10.5 ft	2.3 - 3.9 ft	4.25 - 6.25 ft	8.25 - 10.25 ft	10.25 - 11.5 ft	0 - 2 ft
Metals																
Antimony	EPA200.8	mg/kg	0.3 UJ		0.2 UJ	0.3 UJ	0.2 UJ	0.3 UJ		0.2 UJ	0.3 UJ		0.2 UJ	0.2 UJ	0.3 UJ	
Arsenic	EPA200.8	mg/kg	634 J	6.2	78.7	24	8.4	4	4.6	86.3	203	20.7	33.2	868	3070	8.2
Barium	EPA200.8/SW6010C	mg/kg	21.6	49.8	28.8	67.5	16.1	26.1	9	26	22	39.5	26.6	18.5	45.5	
Beryllium	EPA200.8	mg/kg	0.3 U		0.2 U	0.5	0.2 U	0.3 U		0.2 U	0.3 U		0.2 U	0.2 U	0.7	
Cadmium	EPA200.8	mg/kg	0.1 U	0.1	0.1 U	0.3	0.1 U	0.1 U	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	
Chromium	SW6010C	mg/kg	15.8	25.5	12.7	23.5	10.1	10.4	3	10.2	11.4	32.1	18.6	10.9	20.2	19.9
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg	0.534 U	0.45 U	0.414 U	1	0.497 U	0.965	20.8	0.607	0.503 U	0.424 U	0.758	0.849	0.788	
Copper	SW6010C	mg/kg	133 J+	22.4	22.1 J+	37.9 J+	9 J+	14 J+	14.9	68.8	15.7	39.1	158 J+	31.9 J+	80.3 J+	56.9
Lead	EPA200.8	mg/kg	3.8	26.6	3.9	10	1	2.2	1.9	4.9	3.4	20.3	11.7 J	4.5	11	
Mercury	SW7471A	mg/kg	0.03 U	0.03 U	0.02 U	0.11	0.03 U	0.06 U	0.04 U	0.03	0.03	0.02 U	0.03	0.02 U	0.05	
Nickel	SW6010C	mg/kg	5	30	8	23	7	8	2 U	7	10	39	11	7	21	
Selenium	EPA200.8	mg/kg	0.6 U		0.5 U	0.7 U	0.6 U	0.6 U		0.5 U	0.6 U		0.6 U	0.6 U	0.8 U	
Silver	SW6010C	mg/kg	0.4 U	0.3 U	0.3 U	0.4 U	0.4 U	0.4 U	0.6 U	0.3 U	0.4 U	0.3 U	0.3 U	0.4 U	0.5 U	0.3 U
Thallium	EPA200.8	mg/kg	0.3 U		0.2 U	0.3 U	0.2 U	0.3 U		0.2 U	0.3 U		0.2 U	0.2 U	0.3 U	
Zinc	SW6010C	mg/kg	28	56	31	59	21	23	12	40	63	45	40	89	2080	51
Tributyltin ion	Krone1989	mg/kg														1.5 U
Ammonia																
Ammonia as Nitrogen	EPA350.1	mg/kg														0.15
Total Petroleum Hydrocarbons																
Gasoline Range Organics	NWTPHG	mg/kg														
Diesel Range Organics	NWTPHD	mg/kg														
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg														
PCBs																
Aroclor 1016	SW8082A	ug/kg														
Aroclor 1221	SW8082A	ug/kg														
Aroclor 1232	SW8082A	ug/kg														
Aroclor 1242	SW8082A	ug/kg														
Aroclor 1248	SW8082A	ug/kg														
Aroclor 1254	SW8082A	ug/kg														
Aroclor 1260	SW8082A	ug/kg														
Conventional Compounds																
Total Solids	SM2540B	%	74.9	88.5	96.2	70.8	79.9	74	50.1	90.4	78.2	93.7	82.5	81.9	66	96.4
pH	SW9045	pH units	6.91		6.72	6.72	6.84	7		6.12	6.44		7.22	7.53	6.23	

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Table 1
Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds
2012 Upland Soil Sampling Event

		Sample Location	**GP-61**						**GP-62**							
		Sample Date	**9/6/2012**	**9/6/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**9/5/2012**	**9/5/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**
		Sample ID	**GP-61-2.5-4.5**	**DUP-090612-1**	**GP-61-4.5-7.5**	**GP-61-6**	**GP-61-7.5-8.5**	**GP-61-8**	**GP-62-0-2**	**GP-62-3-5**	**GP-62-5-6.7**	**DUP101212-1**	**GP-62-6.7-7.7**	**DUP101212-2**	**GP-63-4-6**	**DUP101212-3**
		Sample Depth	**2.5 - 4.5 ft**	**2.5 - 4.5 ft**	**4.5 - 7.5 ft**	**6 - 6 ft**	**7.5 - 8.5 ft**	**8 - 8 ft**	**0 - 2 ft**	**3 - 5 ft**	**5 - 6.7 ft**	**5 - 6.7 ft**	**6.7 - 7.7 ft**	**6.7 - 7.7 ft**	**4 - 6 ft**	**4 - 6 ft**
Metals																
Antimony	EPA200.8	mg/kg			0.2 U		0.3 U				0.2 U	0.2 U	0.3 U	0.3 U		
Arsenic	EPA200.8	mg/kg	**3**	**2.8**	**1.5**		**4.7**		**27.8**	**1.3**	**1.6**	**1.6**	**3.8**	**4.3**		
Barium	EPA200.8/SW6010C	mg/kg														
Beryllium	EPA200.8	mg/kg			0.2 U		0.3 U				0.2 U	0.2 U	0.3 U	0.3 U		
Cadmium	EPA200.8	mg/kg			0.1 U		0.1 U				0.1 U	0.1 U	0.1 U	0.1 U		
Chromium	SW6010C	mg/kg	**11.9**	**12.6**	**9.3**		**11.5**		**30.7**	**9.8**	**9.9**	**9.1**	**11.8**	**11.5**		
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg													0.508 U	0.427 U
Copper	SW6010C	mg/kg	**15.1**	**17**	**10.4**		**19.9**		**102**	**8.4**	**8.8**	**8.7**	**15.2**	**16.5**		
Lead	EPA200.8	mg/kg			**1.1**		**6.8**				**1.2**	**1.2**	**2.6**	**3.3**		
Mercury	SW7471A	mg/kg			0.03 U		**0.04**				0.03 U	0.02 U	0.03 U	0.03 U		
Nickel	SW6010C	mg/kg			**6**		**8**				**6**	**5**	**9**	**11**		
Selenium	EPA200.8	mg/kg			0.6 U		0.7 U				0.6 U	0.6 U	0.7 U	0.6 U		
Silver	SW6010C	mg/kg	0.3 U	0.3 U	0.4 U		0.4 U		0.3 U	0.3 U	0.3 U	0.4 U	0.4 U	0.4 U		
Thallium	EPA200.8	mg/kg			0.2 U		0.3 U				0.2 U	0.2 U	0.3 U	0.3 U		
Zinc	SW6010C	mg/kg	**28**	**28**	**19**		**27**		**208**	**22**	**19**	**21**	**30**	**24**		
Tributyltin ion	Krone1989	mg/kg	1.6 U	1.6 U	1.6 U		1.5 U		**8.7**	1.5 U						
Ammonia																
Ammonia as Nitrogen	EPA350.1	mg/kg	0.11 U	0.1 U					**0.15**	**0.12**						
Total Petroleum Hydrocarbons																
Gasoline Range Organics	NWTPHG	mg/kg				4.6 U		6.1 U								
Diesel Range Organics	NWTPHD	mg/kg			6.3 U		7.1 U								**240**	**190**
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg			13 U		**9.8** j								**200**	**170**
PCBs																
Aroclor 1016	SW8082A	ug/kg			0.95 U		1 U				0.96 U	0.92 U	0.96 U	0.97 U		
Aroclor 1221	SW8082A	ug/kg			1.3 U		1.3 U				1.3 U	1.2 U	1.3 U	1.3 U		
Aroclor 1232	SW8082A	ug/kg			1.3 U		1.3 U				1.3 U	1.2 U	1.3 U	1.3 U		
Aroclor 1242	SW8082A	ug/kg			1.3 U		1.3 U				1.3 U	1.2 U	1.3 U	1.3 U		
Aroclor 1248	SW8082A	ug/kg			1.3 U		1.3 U				1.3 U	1.2 U	1.3 U	1.3 U		
Aroclor 1254	SW8082A	ug/kg			1.3 U		1.3 U				1.3 U	1.2 U	1.3 U	1.3 U		
Aroclor 1260	SW8082A	ug/kg			1.3 U		1.3 U				1.3 U	1.2 U	1.3 U	1.3 U		
Conventional Compounds																
Total Solids	SM2540B	%	**93**	**93.1**					**93.6**	**91.5**					**76.9**	**92.9**
pH	SW9045	pH units			**7.31**		**7.48**				**6.59**	**6.64**	**6.34**	**6.98**	**7.79**	**9.28**

Table 1
Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds
2012 Upland Soil Sampling Event

		Sample Location	GP-63						GP-64					
		Sample Date	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**9/5/2012**	**9/5/2012**	**9/5/2012**	**9/5/2012**	**10/12/2012**	**10/12/2012**
		Sample ID	**GP-63-5**	**DUP101212-3A**	**GP-63-6-8**	**GP-63-7**	**GP-63-8-9**	**GP-63-8.5**	**GP-64-1**	**GP-64-0-2**	**GP-64-3.3**	**GP-64-3.3-4.3**	**GP-64-4.3-6**	**GP-64-5.1**
		Sample Depth	**5 - 5 ft**	**5 - 5 ft**	**6 - 8 ft**	**7 - 7 ft**	**8 - 9 ft**	**8.5 - 8.5 ft**	**1 - 1 ft**	**0 - 2 ft**	**3.3 - 3.3 ft**	**3.3 - 4.3 ft**	**4.3 - 6 ft**	**5.1 - 5.1 ft**
Metals														
Antimony	EPA200.8	mg/kg												
Arsenic	EPA200.8	mg/kg												
Barium	EPA200.8/SW6010C	mg/kg												
Beryllium	EPA200.8	mg/kg												
Cadmium	EPA200.8	mg/kg												
Chromium	SW6010C	mg/kg												
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg			0.499 U		0.584 U							
Copper	SW6010C	mg/kg												
Lead	EPA200.8	mg/kg												
Mercury	SW7471A	mg/kg												
Nickel	SW6010C	mg/kg												
Selenium	EPA200.8	mg/kg												
Silver	SW6010C	mg/kg												
Thallium	EPA200.8	mg/kg												
Zinc	SW6010C	mg/kg												
Tributyltin ion	Krone1989	mg/kg											1.5 U	
Ammonia														
Ammonia as Nitrogen	EPA350.1	mg/kg												
Total Petroleum Hydrocarbons														
Gasoline Range Organics	NWTPHG	mg/kg	3.5 U	**4.5**		5 U		7.2 U	3.4 U		4.1 U			5.2 U
Diesel Range Organics	NWTPHD	mg/kg			**240**		6.7 U			**600**		5.6 U	**5.9** j	
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg			**130**		14 U			**480**		11 U	12 U	
PCBs														
Aroclor 1016	SW8082A	ug/kg												
Aroclor 1221	SW8082A	ug/kg												
Aroclor 1232	SW8082A	ug/kg												
Aroclor 1242	SW8082A	ug/kg												
Aroclor 1248	SW8082A	ug/kg												
Aroclor 1254	SW8082A	ug/kg												
Aroclor 1260	SW8082A	ug/kg												
Conventional Compounds														
Total Solids	SM2540B	%			**79.8**		**67.9**							
pH	SW9045	pH units			**7.95**		**6.81**						**7.21**	

Table 1

Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds

2012 Upland Soil Sampling Event

		Sample Location			GP-65						GP-66				MW-23D	
		Sample Date	10/12/2012	10/12/2012	9/5/2012	9/5/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	9/10/2012	9/10/2012	10/11/2012	10/11/2012	9/4/2012	9/4/2012
		Sample ID	GP-64-6.5	GP-64-6-7	GP-65-1.5-3.5	GP-65-2	GP-65-4-6	GP-65-5	GP-65-6.5	GP-65-6-7	GP-66-0.6-2.6	GP-66-3.75-5.75	GP-66-5.75-7.75	GP-66-7.75-8.4	MW-23D-2.75-5.25	DUP-090412-1
		Sample Depth	6.5 - 6.5 ft	6 - 7 ft	1.5 - 3.5 ft	2 - 2 ft	4 - 6 ft	5 - 5 ft	6.5 - 6.5 ft	6 - 7 ft	0.6 - 2.6 ft	3.75 - 5.75 ft	5.75 - 7.75 ft	7.75 - 8.4 ft	2.75 - 5.25 ft	2.75 - 5.25 ft
Metals																
Antimony	EPA200.8	mg/kg											0.2 UJ	0.3 UJ		
Arsenic	EPA200.8	mg/kg									**23.2**	**4.1**	**1**	**5**	**35.8** J	**70.2**
Barium	EPA200.8/SW6010C	mg/kg													**33.7**	**39**
Beryllium	EPA200.8	mg/kg											0.2 U	**0.4**		
Cadmium	EPA200.8	mg/kg											0.1 U	0.1 U		
Chromium	SW6010C	mg/kg									**46.6**	**14.8**	**9.6**	**14**	**22.2**	**25.5**
Hexavalent Chromium	SM3500 CR-D/SW7196A	mg/kg											0.488 U	0.534 U		
Copper	SW6010C	mg/kg									**322**	**124**	**530**	**20.8**	**103**	**244**
Lead	EPA200.8	mg/kg											**0.8**	**6**	**34.3** J-	**30.1**
Mercury	SW7471A	mg/kg											0.02 U	**0.09**	**0.08**	**0.1**
Nickel	SW6010C	mg/kg											**6**	**14**	**9**	**9**
Selenium	EPA200.8	mg/kg											0.6 U	0.7 U		
Silver	SW6010C	mg/kg									**1.4**	0.3 U	0.4 U	0.4 U	**0.7**	**1**
Thallium	EPA200.8	mg/kg											0.2 U	0.3 U		
Zinc	SW6010C	mg/kg									**57**	**27**	**19**	**31**	**44**	**50**
Tributyltin ion	Krone1989	mg/kg		1.5 U									1.5 U	1.6 U		
Ammonia																
Ammonia as Nitrogen	EPA350.1	mg/kg									**0.11**	**8.72**				
Total Petroleum Hydrocarbons																
Gasoline Range Organics	NWTPHG	mg/kg	6.4 U			3.3 U		5.6 U	6.9 U							
Diesel Range Organics	NWTPHD	mg/kg		7 U	**340**		6.2 U			7 U						
Motor Oil Range Organics (C24-C36)	NWTPHD	mg/kg		**14** j	**190**		12 U			14 U						
PCBs																
Aroclor 1016	SW8082A	ug/kg														
Aroclor 1221	SW8082A	ug/kg														
Aroclor 1232	SW8082A	ug/kg														
Aroclor 1242	SW8082A	ug/kg														
Aroclor 1248	SW8082A	ug/kg														
Aroclor 1254	SW8082A	ug/kg														
Aroclor 1260	SW8082A	ug/kg														
Conventional Compounds																
Total Solids	SM2540B	%									**89.3**	**87.7**	**80.1**	**72.3**		
pH	SW9045	pH units		**7.1**						**7.33**			**6.98**	**6.2**		

Table 1
Inorganics, Total Petroleum Hydrocarbons, Polychlorinated Biphenyls, and Conventional Compounds
2012 Upland Soil Sampling Event

Notes and Key:

% = Percent
Bold text indicates that compound was detected.
Cells are left blank where compound was not analyzed
ft = Feet
mg/kg = Milligrams per kilogram
ug/kg = Micrograms per kilogram

Data Qualifiers:

j = The value reported is below the routine reporting limit and should be considered an estimate; qualifier reported by the Laboratory
J = Detected sample result qualified as estimated
J- = Detected sample result qualified as estimated and biased low
J+ = Detected sample result qualified as estimated and biased high
U = Result is ≤ the detection limit. Organic compounds are reported to the Method Detection Limit (MDL) and other parameters are reported to the Reporting Limit (RL).
Result reported as the MDL or RL and is qualified as non detected. If qualified as non-detect due to a detection in associated blank samples, than MDL or RL has been revised, as applicable.
UJ = Nondetected sample result qualified as estimated

Table 2
Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location	GP-26					GP-27					GP-28		
		Sample Date	9/7/2012	9/7/2012	10/10/2012	10/10/2012	10/10/2012	9/7/2012	9/7/2012	10/11/2012	10/11/2012	10/11/2012	9/7/2012	9/7/2012	10/11/2012
		Sample ID	GP-26-3.1-3.5	GP-26-4-5.1	GP-26-5.1-7.1	DUP101012-3	GP-26-9.1-10.3	GP-27-0-2	GP-27-2.3-4.3	GP-27-4.3-6.3	DUP101112-1	GP-27-6.3-8.3	GP-28-0-2	GP-28-2-4	DUP101112-2
		Sample Depth	3.1 - 3.5 ft	4 - 5.1 ft	5.1 - 7.1 ft	5.1 - 7.1 ft	9.1 - 10.3 ft	0 - 2 ft	2.3 - 4.3 ft	4.3 - 6.3 ft	4.3 - 6.3 ft	6.3 - 8.3 ft	0 - 2 ft	2 - 4 ft	4.1 - 6.1 ft
1,2,4-Trichlorobenzene	SW8270D	ug/kg			3.3 U	3.3 U	3.4 U			3.2 U	3.3 U	3.3 U			3.4 U
1,2-Dichlorobenzene	SW8270D	ug/kg			2.4 U	2.4 U	2.5 U			2.3 U	2.4 U	2.3 U			2.5 U
1,3-Dichlorobenzene	SW8270D	ug/kg			2.5 U	2.5 U	2.6 U			2.5 U	2.5 U	2.5 U			2.6 U
1,4-Dichlorobenzene	SW8270D	ug/kg			2.7 U	2.8 U	2.8 U			2.7 U	2.7 U	2.7 U			2.8 U
1-Methylnaphthalene	SW8270D-SIM	ug/kg			1.6 U	1.7 U	**3.2** j			1.6 U	1.6 U	**3.4** j			1.7 U
2,2-Oxybis(1-chloropropane)	SW8270D	ug/kg			3.6 U	3.6 U	3.7 U			3.5 U	3.6 U	3.5 U			3.7 U
2,3,4,6-Tetrachlorophenol	SW8270D	ug/kg	**26**	4.5 U				**65**	**36**				**310**	**60**	
2,4,5-Trichlorophenol	SW8270D	ug/kg	19 U	20 U	20 U	21 U	21 U	21 U	19 U	20 U	20 U	20 U	61 U	20 U	21 U
2,4,6-Trichlorophenol	SW8270D	ug/kg	20 U	21 U	21 U	22 U	22 U	22 U	20 U	21 U	21 U	21 U	64 U	21 U	22 U
2,4-Dichlorophenol	SW8270D	ug/kg	19 U	20 U	20 U	21 U	21 U	21 U	19 U	20 U	21 U	20 U	61 U	20 U	21 U
2,4-Dimethylphenol	SW8270D	ug/kg			3.3 U	3.3 U	3.4 U			3.2 U	3.3 U	3.2 U			3.4 U
2,4-Dinitrophenol	SW8270D	ug/kg			100 U	110 UJ	110 U			100 U	110 U	100 U			110 U
2,4-Dinitrotoluene	SW8270D	ug/kg			18 U	19 U	19 U			18 U	19 U	18 U			19 U
2,6-Dinitrotoluene	SW8270D	ug/kg			29 U	29 U	30 U			29 U	29 U	29 U			30 U
2-Chloronaphthalene	SW8270D	ug/kg			2.5 U	2.5 U	2.6 U			2.5 U	2.5 U	2.5 U			2.6 U
2-Chlorophenol	SW8270D	ug/kg	2.2 U	2.2 U	2.3 U	2.3 U	2.3 U	2.3 U	2.1 U	2.2 U	2.3 U	2.2 U	6.8 U	2.3 U	2.4 U
2-Methylnaphthalene	SW8270D-SIM	ug/kg			1.4 U	1.5 U	**3.6** j			1.4 U	1.4 U	**3.8** j			1.5 U
2-Nitroaniline	SW8270D	ug/kg			17 U	18 U	18 U			17 U	18 U	17 U			18 U
2-Nitrophenol	SW8270D	ug/kg			37 U	37 U	38 U			36 U	37 U	36 U			38 U
3,3'-Dichlorobenzidine (and its salts)	SW8270D	ug/kg			17 U	17 U	17 U			17 U	17 U	17 U			18 U
3-Nitroaniline	SW8270D	ug/kg			21 U	22 U	22 U			21 U	22 U	21 U			22 U
4-Bromophenyl phenyl ether	SW8270D	ug/kg			4.7 U	4.8 U	4.9 U			4.7 U	4.8 U	4.7 U			5 U
4-Chloro-3-methylphenol	SW8270D	ug/kg			14 U	15 U	15 U			14 U	14 U	14 U			15 U
4-Chlorophenyl phenyl ether	SW8270D	ug/kg			5 U	5.1 U	5.2 U			4.9 U	5.1 U	4.9 U			5.2 U
4-Nitrophenol	SW8270D	ug/kg			33 UJ	33 U	34 UJ			32 U	33 U	32 U			34 U
Acenaphthene	SW8270D-SIM	ug/kg			1.2 U	1.3 U	**3.6** j			1.2 U	**2.6** j	**3.1** j			**7**
Acenaphthylene	SW8270D-SIM	ug/kg			1.2 U	1.2 U	1.2 U			1.2 U	1.2 U	1.2 U			1.2 U
Anthracene	SW8270D-SIM	ug/kg			1.4 U	**3.1** j	**4** j			1.4 U	1.4 U	**5.6**			1.4 U
Benzo(a)anthracene	SW8270D-SIM	ug/kg			1.5 U	1.5 U	**4.1** j			1.5 U	1.5 U	**3.4** j			1.6 U
Benzo(a)pyrene	SW8270D-SIM	ug/kg			1.7 U	1.7 U	**4** j			1.6 U	1.6 U	1.6 U			1.7 U
Benzo(g,h,i)perylene	SW8270D-SIM	ug/kg			2.9 U	2.9 U	3 U			2.8 U	2.9 U	2.8 U			3 U
Benzoic acid	SW8270D	ug/kg			95 U	97 UJ	99 U			94 U	97 U	94 U			100 U
Benzyl alcohol	SW8270D	ug/kg			5.8 U	5.9 U	6 U			5.7 UJ	5.8 UJ	5.7 UJ			6 UJ
Benzyl butyl phthalate	SW8270D	ug/kg			5.8 U	5.9 U	6 U			5.7 U	5.9 U	5.7 U			6.1 U
Bis(2-chloroethoxy)methane	SW8270D	ug/kg			1.9 U	1.9 U	2 U			1.9 U	1.9 U	1.9 U			2 U
Bis(2-ethylhexyl)phthalate	SW8270D	ug/kg			27 U	24 U	28 U			14 U	14 U	14 U			27 U
Carbazole	SW8270D	ug/kg			2.5 U	2.6 U	2.6 U			2.5 U	2.6 U	2.5 U			2.7 U
Chrysene	SW8270D-SIM	ug/kg			1.8 U	1.8 U	**4.9**			1.8 U	1.8 U	**4.1** j			**2.6** j
Dibenzo(a,h)anthracene	SW8270D-SIM	ug/kg			2.3 U	2.3 U	2.3 U			2.2 U	2.2 U	2.2 U			2.3 U

Table 2
Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location	**GP-26**					**GP-27**					**GP-28**		
		Sample Date	**9/7/2012**	**9/7/2012**	**10/10/2012**	**10/10/2012**	**10/10/2012**	**9/7/2012**	**9/7/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**9/7/2012**	**9/7/2012**	**10/11/2012**
		Sample ID	**GP-26-3.1-3.5**	**GP-26-4-5.1**	**GP-26-5.1-7.1**	**DUP101012-3**	**GP-26-9.1-10.3**	**GP-27-0-2**	**GP-27-2.3-4.3**	**GP-27-4.3-6.3**	**DUP101112-1**	**GP-27-6.3-8.3**	**GP-28-0-2**	**GP-28-2-4**	**DUP101112-2**
		Sample Depth	**3.1 - 3.5 ft**	**4 - 5.1 ft**	**5.1 - 7.1 ft**	**5.1 - 7.1 ft**	**9.1 - 10.3 ft**	**0 - 2 ft**	**2.3 - 4.3 ft**	**4.3 - 6.3 ft**	**4.3 - 6.3 ft**	**6.3 - 8.3 ft**	**0 - 2 ft**	**2 - 4 ft**	**4.1 - 6.1 ft**
Dibenzofuran	SW8270D-SIM	ug/kg			1.4 U	1.5 U	**4.1** j			1.4 U	1.4 U	**3.2** j			1.5 U
Dibutyl phthalate	SW8270D	ug/kg			7.7 U	7.8 U	8 U			7.6 U	7.8 U	7.6 U			8.1 U
Dichloroethyl ether	SW8270D	ug/kg			3.2 U	3.2 U	3.3 U			3.1 U	3.2 U	3.1 U			3.3 U
Diethyl phthalate	SW8270D	ug/kg			35 U	35 U	36 U			34 U	35 U	34 U			36 U
Dimethylphthalate	SW8270D	ug/kg			2.7 U	2.8 U	2.8 U			2.7 U	2.8 U	2.7 U			2.9 U
Dinitro-o-cresol	SW8270D	ug/kg			20 U	20 UJ	21 U			20 U	20 U	20 U			21 U
Di-n-octyl phthalate	SW8270D	ug/kg			5.5 U	5.6 U	5.7 U			5.4 U	5.6 U	5.5 U			5.8 U
Fluoranthene	SW8270D-SIM	ug/kg			**2.6** j	**5.1**	**16**			**3.6** j	1.7 U	**15**			**5.4**
Fluorene	SW8270D-SIM	ug/kg			1.2 U	1.2 U	**3.7** j			1.2 U	1.2 U	**2.8** j			1.3 U
Hexachlorobenzene	SW8270D	ug/kg			4.1 U	4.1 U	4.2 U			4 U	4.1 U	4 U			4.2 U
Hexachlorobutadiene	SW8270D	ug/kg			4.3 U	4.4 U	4.5 U			4.3 U	4.4 U	4.3 U			4.5 U
Hexachlorocyclopentadiene	SW8270D	ug/kg			63 U	64 U	65 U			62 U	63 U	62 U			66 U
Hexachloroethane	SW8270D	ug/kg			2.8 U	2.8 U	2.9 U			2.7 U	2.8 U	2.7 U			2.9 U
Indeno(1,2,3-cd)pyrene	SW8270D-SIM	ug/kg			3.3 U	3.4 U	3.4 U			3.2 U	3.3 U	3.2 U			3.4 U
Isophorone	SW8270D	ug/kg			2.7 U	2.8 U	2.8 U			2.7 U	2.7 U	2.7 U			2.8 U
Naphthalene	SW8270D-SIM	ug/kg			2.5 U	2.5 U	**4.6** j			**3.3** j	**2.7** j	**2.7** j			**9.8**
Nitrobenzene	SW8270D	ug/kg			3.8 U	3.9 U	4 U			3.8 U	3.9 U	3.8 U			4 U
n-Nitrosodi-n-propylamine	SW8270D	ug/kg			3.2 U	3.2 U	3.3 U			3.1 U	3.2 U	3.1 U			3.3 U
n-Nitrosodiphenylamine	SW8270D	ug/kg			5.1 U	5.2 U	5.3 U			5 U	5.2 U	5 U			5.3 U
o-Cresol	SW8270D	ug/kg			5 U	5 U	5.2 U			4.9 U	5 U	4.9 U			5.2 U
p-Chloroaniline	SW8270D	ug/kg			21 U	21 U	22 U			21 U	21 U	21 U			22 U
p-Cresol	SW8270D	ug/kg			6.3 U	6.4 U	6.5 U			6.2 U	6.3 U	6.2 U			6.5 U
Pentachlorophenol	SW8270D	ug/kg	**150** j	45 U	46 U	47 UJ	48 U	**660**	**340**	45 U	46 U	45 U	**6000**	**640**	48 U
Phenanthrene	SW8270D-SIM	ug/kg			1.9 U	1.9 U	**10**			**4.1** j	**3.9** j	**9.4**			**4.6** j
Phenol	SW8270D	ug/kg	**110**	8 U	8.2 U	8.3 U	8.5 U	**26**	**31**	8.1 UJ	8.3 UJ	8.1 UJ	25 U	**27**	8.5 UJ
p-Nitroaniline	SW8270D	ug/kg			36 U	36 U	37 U			35 U	36 U	35 U			37 U
Pyrene	SW8270D-SIM	ug/kg			**3.3** j	**6**	**13**			**4** j	**2.4** j	**12**			**5.6**
Total (B+J+K) Benzofluoranthenes	SW8270D-SIM	ug/kg			1.8 U	1.8 U	**6.6**			1.7 U	1.7 U	**2.4** j			1.8 U

Table 2
Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location				GP-29					GP-30				GP-31
		Sample Date	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**9/7/2012**	**9/7/2012**	**10/9/2012**	**9/6/2012**	**9/6/2012**	**9/6/2012**
		Sample ID	**DUP101112-3**	**GP-28-4.1-6.1**	**GP-28-6.1-8.3**	**GP-29-2.9-4.9**	**GP-29-4.9-6.9**	**GP-29-6.9-8.9**	**GP-29-8.9-11.2**	**GP-30-3.3-5.3**	**GP-30-5.3-6.6**	**GP-30-7-9**	**GP-31-3-5**	**DUP-090612-2**	**GP-31-5-5.9**
		Sample Depth	**6.1 - 8.3 ft**	**4.1 - 6.1 ft**	**6.1 - 8.3 ft**	**2.9 - 4.9 ft**	**4.9 - 6.9 ft**	**6.9 - 8.9 ft**	**8.9 - 11.2 ft**	**3.3 - 5.3 ft**	**5.3 - 6.6 ft**	**7 - 9 ft**	**3 - 5 ft**	**3 - 5 ft**	**5 - 5.9 ft**
1,2,4-Trichlorobenzene	SW8270D	ug/kg	3.2 U	3.3 U	3.3 U	3.3 U	3.4 U	3.3 U	3.2 U			3.3 U			
1,2-Dichlorobenzene	SW8270D	ug/kg	2.3 U	2.3 U	2.3 U	2.3 U	2.4 U	2.4 U	2.3 U			2.4 U			
1,3-Dichlorobenzene	SW8270D	ug/kg	2.4 U	2.5 U	2.5 U	2.5 U	2.6 U	2.5 U	2.4 U			2.5 U			
1,4-Dichlorobenzene	SW8270D	ug/kg	2.7 U	2.7 U	2.7 U	2.7 U	2.8 U	2.7 U	2.6 U			2.7 U			
1-Methylnaphthalene	SW8270D-SIM	ug/kg	**2.6** j	**4** j	**4.1** j	**2.5** j	1.7 U	1.6 U	**3** j			**3.9** j			
2,2-Oxybis(1-chloropropane)	SW8270D	ug/kg	3.5 U	3.5 U	3.5 U	3.5 U	3.7 U	3.6 U	3.4 U			3.6 U			
2,3,4,6-Tetrachlorophenol	SW8270D	ug/kg								4.6 U	4.7 U		4.8 U	4.8 U	4.7 U
2,4,5-Trichlorophenol	SW8270D	ug/kg	20 U	20 U	20 U	20 U	21 U	20 U	20 U	20 U	21 U	20 U	21 U	21 U	21 U
2,4,6-Trichlorophenol	SW8270D	ug/kg	21 U	21 U	21 U	21 U	22 U	21 U	20 U	21 U	22 U	21 U	22 U	22 U	22 U
2,4-Dichlorophenol	SW8270D	ug/kg	20 U	20 U	20 U	20 U	21 U	20 U	20 U	20 U	21 U	21 U	21 U	21 U	21 U
2,4-Dimethylphenol	SW8270D	ug/kg	3.2 U	3.2 U	3.2 U	3.3 U	3.4 U	3.3 U	3.2 U			3.3 U			
2,4-Dinitrophenol	SW8270D	ug/kg	100 U	100 U	100 U	100 U	110 U	110 U	100 U			110 U			
2,4-Dinitrotoluene	SW8270D	ug/kg	18 U	18 U	18 U	18 U	19 U	19 U	18 U			19 U			
2,6-Dinitrotoluene	SW8270D	ug/kg	28 U	29 U	29 U	29 U	30 U	29 U	28 U			29 U			
2-Chloronaphthalene	SW8270D	ug/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.6 U	2.5 U	2.4 U			2.5 U			
2-Chlorophenol	SW8270D	ug/kg	2.2 U	2.2 U	2.2 U	2.2 U	2.3 U	2.3 U	2.2 U	2.2 U	2.3 U	2.3 U	2.4 U	2.4 U	2.3 U
2-Methylnaphthalene	SW8270D-SIM	ug/kg	1.4 U	**4.7**	**3.9** j	1.4 U	1.5 U	1.4 U	1.4 U			**3.2** j			
2-Nitroaniline	SW8270D	ug/kg	17 U	17 U	17 U	17 U	18 U	18 U	17 U			18 U			
2-Nitrophenol	SW8270D	ug/kg	36 U	36 U	36 U	36 U	38 U	37 U	35 U			37 U			
3,3'-Dichlorobenzidine (and its salts)	SW8270D	ug/kg	17 U	17 UJ	17 UJ	17 U	17 U	17 U	16 U			17 U			
3-Nitroaniline	SW8270D	ug/kg	21 U	21 U	21 U	21 U	22 U	21 U	21 U			22 U			
4-Bromophenyl phenyl ether	SW8270D	ug/kg	4.7 U	4.7 U	4.7 U	4.7 U	4.9 U	4.8 U	4.6 U			4.8 U			
4-Chloro-3-methylphenol	SW8270D	ug/kg	14 U	14 U	14 U	14 U	15 U	14 U	14 U			14 U			
4-Chlorophenyl phenyl ether	SW8270D	ug/kg	4.9 U	5 U	5 U	5 U	5.2 U	5 U	4.8 U			5.1 U			
4-Nitrophenol	SW8270D	ug/kg	32 U	33 U	33 U	33 U	34 U	33 U	32 U			33 U			
Acenaphthene	SW8270D-SIM	ug/kg	**3.6** j	**20**	**4.9**	1.2 U	**5.8**	**6**	**27**			**2.5** j			
Acenaphthylene	SW8270D-SIM	ug/kg	1.1 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.1 U			**2.5** j			
Anthracene	SW8270D-SIM	ug/kg	1.3 U	**16**	1.3 U	1.4 U	1.4 U	1.3 U	1.3 U			**2.6** j			
Benzo(a)anthracene	SW8270D-SIM	ug/kg	1.5 U	**3.7** j	**2.5** j	1.5 U	1.6 U	1.5 U	1.5 U			**2.8** j			
Benzo(a)pyrene	SW8270D-SIM	ug/kg	1.6 U	1.6 U	**2.5** j	1.7 U	1.7 U	1.6 U	1.6 U			**3.8** j			
Benzo(g,h,i)perylene	SW8270D-SIM	ug/kg	2.8 U	2.8 U	2.8 U	2.9 U	3 U	2.8 U	2.8 U			**3.6** j			
Benzoic acid	SW8270D	ug/kg	94 U	95 U	95 U	95 U	98 U	96 U	92 U			97 U			
Benzyl alcohol	SW8270D	ug/kg	5.7 UJ	5.7 U	5.7 U	5.7 U	5.9 U	5.8 U	5.6 U			5.8 U			
Benzyl butyl phthalate	SW8270D	ug/kg	5.7 U	5.8 U	5.8 U	5.8 U	6 U	5.8 U	5.6 U			5.9 U			
Bis(2-chloroethoxy)methane	SW8270D	ug/kg	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U			1.9 U			
Bis(2-ethylhexyl)phthalate	SW8270D	ug/kg	14 U	24 U	25 U	**25** B	14 U	**28** B	13 U			**28** B			
Carbazole	SW8270D	ug/kg	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.6 U	**11** j	2.5 U			2.6 U			
Chrysene	SW8270D-SIM	ug/kg	**2.5** j	**5.4**	**4.1** j	**3.8** j	1.8 U	1.7 U	**2.8** j			**3.8** j			
Dibenzo(a,h)anthracene	SW8270D-SIM	ug/kg	2.2 U	2.2 U	2.2 U	2.3 U	2.3 U	2.2 U	2.2 U			2.2 U			

Table 2

Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location				**GP-29**				**GP-30**			**GP-31**		
		Sample Date	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**9/7/2012**	**9/7/2012**	**10/9/2012**	**9/6/2012**	**9/6/2012**	**9/6/2012**
		Sample ID	**DUP101112-3**	**GP-28-4.1-6.1**	**GP-28-6.1-8.3**	**GP-29-2.9-4.9**	**GP-29-4.9-6.9**	**GP-29-6.9-8.9**	**GP-29-8.9-11.2**	**GP-30-3.3-5.3**	**GP-30-5.3-6.6**	**GP-30-7-9**	**GP-31-3-5**	**DUP-090612-2**	**GP-31-5-5.9**
		Sample Depth	**6.1 - 8.3 ft**	**4.1 - 6.1 ft**	**6.1 - 8.3 ft**	**2.9 - 4.9 ft**	**4.9 - 6.9 ft**	**6.9 - 8.9 ft**	**8.9 - 11.2 ft**	**3.3 - 5.3 ft**	**5.3 - 6.6 ft**	**7 - 9 ft**	**3 - 5 ft**	**3 - 5 ft**	**5 - 5.9 ft**
Dibenzofuran	SW8270D-SIM	ug/kg	1.4 U	**7.7**	**2.4** j	1.4 U	1.5 U	1.4 U	**2.7** j			**4.4** j			
Dibutyl phthalate	SW8270D	ug/kg	7.6 U	7.7 U	7.6 U	7.7 U	8 U	7.8 U	7.5 U			7.8 U			
Dichloroethyl ether	SW8270D	ug/kg	3.1 U	3.1 U	3.1 U	3.1 U	3.3 U	3.2 U	3.1 U			3.2 U			
Diethyl phthalate	SW8270D	ug/kg	34 U	34 U	**50**	34 U	36 U	35 U	33 U			35 U			
Dimethylphthalate	SW8270D	ug/kg	2.7 U	2.7 U	2.7 U	2.7 U	2.8 U	2.8 U	2.7 U			2.8 U			
Dinitro-o-cresol	SW8270D	ug/kg	20 U	20 U	20 U	20 U	21 U	20 U	19 U			20 U			
Di-n-octyl phthalate	SW8270D	ug/kg	5.4 U	5.5 U	5.5 U	5.5 U	5.7 U	5.6 U	5.3 U			5.6 U			
Fluoranthene	SW8270D-SIM	ug/kg	**5.9**	**24**	**10**	**12**	1.7 U	1.6 U	**5.8**			**14**			
Fluorene	SW8270D-SIM	ug/kg	1.2 U	**11**	1.2 U	1.2 U	**3** j	**3.5** j	**4.7**			**3.7** j			
Hexachlorobenzene	SW8270D	ug/kg	4 U	4 U	4 U	4 U	4.2 U	4.1 U	3.9 U			4.1 U			
Hexachlorobutadiene	SW8270D	ug/kg	4.3 U	4.3 U	4.3 U	4.3 U	4.5 U	4.3 U	4.2 U			4.4 U			
Hexachlorocyclopentadiene	SW8270D	ug/kg	62 U	62 U	62 U	62 U	65 U	63 U	61 U			63 U			
Hexachloroethane	SW8270D	ug/kg	2.7 U	2.8 U	2.8 U	2.8 U	2.9 U	2.8 U	2.7 U			2.8 U			
Indeno(1,2,3-cd)pyrene	SW8270D-SIM	ug/kg	3.2 U	3.2 U	3.2 U	3.3 U	3.4 U	3.2 U	3.2 U			3.2 U			
Isophorone	SW8270D	ug/kg	2.7 U	2.7 U	2.7 U	2.7 U	2.8 U	2.7 U	2.6 U			2.7 U			
Naphthalene	SW8270D-SIM	ug/kg	**10**	**10**	**8.9**	**2.9** j	2.6 U	2.4 U	**33**			**13**			
Nitrobenzene	SW8270D	ug/kg	3.8 U	3.8 U	3.8 U	3.8 U	4 U	3.9 U	3.7 U			3.9 U			
n-Nitrosodi-n-propylamine	SW8270D	ug/kg	3.1 U	3.2 U	3.1 U	3.2 U	3.3 U	3.2 U	3.1 U			3.2 U			
n-Nitrosodiphenylamine	SW8270D	ug/kg	5 U	5.1 U	5.1 U	5.1 U	5.3 U	5.1 U	4.9 U			5.2 U			
o-Cresol	SW8270D	ug/kg	4.9 U	4.9 U	4.9 U	4.9 U	5.1 U	5 U	4.8 U			5 U			
p-Chloroaniline	SW8270D	ug/kg	21 U	21 U	21 U	21 U	22 U	21 U	20 U			21 U			
p-Cresol	SW8270D	ug/kg	6.2 U	6.2 U	**13** j	6.2 U	6.5 U	6.3 U	6.1 U			**19** j			
Pentachlorophenol	SW8270D	ug/kg	45 U	45 U	45 U	46 U	47 U	**150** j	**82** j	46 U	47 U	**83** j	48 U	48 U	47 U
Phenanthrene	SW8270D-SIM	ug/kg	**4.9**	**40**	**7.4**	**8.1**	1.9 U	1.8 U	**5**			**14**			
Phenol	SW8270D	ug/kg	8 UJ	8.1 U	8.1 U	**9.4** j	**20**	8.2 U	**40**	8.1 U	8.4 U	**36**	8.6 U	8.5 U	8.4 U
p-Nitroaniline	SW8270D	ug/kg	35 U	36 U	36 U	36 U	37 U	36 U	35 U			36 U			
Pyrene	SW8270D-SIM	ug/kg	**6.7**	**25**	**9.4**	**7.8**	2.2 U	2.1 U	**5.4**			**13**			
Total (B+J+K) Benzofluoranthenes	SW8270D-SIM	ug/kg	1.7 U	1.7 U	**6.1**	1.8 U	1.8 U	1.7 U	1.7 U			**5.6**			

Table 2
Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location			GP-32				GP-33			GP-34			
		Sample Date	10/11/2012	10/11/2012	9/10/2012	9/10/2012	10/11/2012	10/11/2012	9/6/2012	9/6/2012	10/10/2012	9/6/2012	9/6/2012	9/6/2012	10/10/2012
		Sample ID	GP-31-5.9-7.9	GP-31-7.9-9.9	GP-32-0.25-2.25	GP-32-4.1-6.1	GP-32-6.1-8.1	GP-32-8.1-9.1	GP-33-3.25-5.25	GP-33-5.25-5.9	GP-33-5.9-8.3	GP-34-0-2	GP-34-3.25-4.4	GP-34-4.4-6.4	GP-34-6.4-8.4
		Sample Depth	5.9 - 7.9 ft	7.9 - 9.9 ft	0.25 - 2.25 ft	4.1 - 6.1 ft	6.1 - 8.1 ft	8.1 - 9.1 ft	3.25 - 5.25 ft	5.25 - 5.9 ft	5.9 - 8.3 ft	0 - 2 ft	3.25 - 4.4 ft	4.4 - 6.4 ft	6.4 - 8.4 ft
1,2,4-Trichlorobenzene	SW8270D	ug/kg	3.3 U	3.3 U			3.3 U	3.3 U			3.3 U				3.3 U
1,2-Dichlorobenzene	SW8270D	ug/kg	2.4 U	2.4 U			2.4 U	2.4 U			2.4 U				2.4 U
1,3-Dichlorobenzene	SW8270D	ug/kg	2.5 U	2.5 U			2.5 U	2.5 U			2.5 U				2.5 U
1,4-Dichlorobenzene	SW8270D	ug/kg	2.7 U	2.7 U			2.7 U	2.7 U			2.7 U				2.7 U
1-Methylnaphthalene	SW8270D-SIM	ug/kg	**3.3** j	**8.4**			1.6 U	**3.4** j			1.6 U				1.6 U
2,2-Oxybis(1-chloropropane)	SW8270D	ug/kg	3.6 U	3.6 U			3.6 U	3.6 U			3.6 U				3.6 U
2,3,4,6-Tetrachlorophenol	SW8270D	ug/kg			**620**	**22**			4.5 U	4.8 U		**19**	47 U	13 U	
2,4,5-Trichlorophenol	SW8270D	ug/kg	20 U	20 U	**62** j	20 U	21 U	20 U	20 U	21 U	20 U	19 U	210 U	56 U	20 U
2,4,6-Trichlorophenol	SW8270D	ug/kg	21 U	21 U	**290**	21 U	21 U	21 U	21 U	22 U	21 U	20 U	220 U	59 U	21 U
2,4-Dichlorophenol	SW8270D	ug/kg	**32** j	**40** j	**450**	21 U	21 U	20 U	20 U	21 U	20 U	20 U	210 U	56 U	20 U
2,4-Dimethylphenol	SW8270D	ug/kg	3.3 U	3.3 U			3.3 U	3.3 U			3.3 U				3.3 U
2,4-Dinitrophenol	SW8270D	ug/kg	110 U	110 U			110 U	110 U			110 U				110 U
2,4-Dinitrotoluene	SW8270D	ug/kg	19 U	18 U			19 U	18 U			19 U				19 U
2,6-Dinitrotoluene	SW8270D	ug/kg	29 U	29 U			29 U	29 U			29 U				29 U
2-Chloronaphthalene	SW8270D	ug/kg	2.5 U	2.5 U			2.5 U	2.5 U			2.5 U				2.5 U
2-Chlorophenol	SW8270D	ug/kg	2.3 U	2.3 U	**130**	2.3 U	2.3 U	2.3 U	2.2 U	2.4 U	2.3 U	2.2 U	23 U	6.3 U	2.3 U
2-Methylnaphthalene	SW8270D-SIM	ug/kg	**4.3** j	**9.2**			**2.4** j	**2.9** j			1.4 U				**2.6** j
2-Nitroaniline	SW8270D	ug/kg	18 U	17 U			18 U	17 U			17 U				17 U
2-Nitrophenol	SW8270D	ug/kg	37 U	37 U			37 U	37 U			37 U				37 U
3,3'-Dichlorobenzidine (and its salts)	SW8270D	ug/kg	17 UJ	17 UJ			17 UJ	17 UJ			17 U				17 U
3-Nitroaniline	SW8270D	ug/kg	21 U	21 U			22 U	21 U			21 U				21 U
4-Bromophenyl phenyl ether	SW8270D	ug/kg	4.8 U	4.8 U			4.8 U	4.8 U			4.8 U				4.8 U
4-Chloro-3-methylphenol	SW8270D	ug/kg	14 U	14 U			14 U	14 U			14 U				14 U
4-Chlorophenyl phenyl ether	SW8270D	ug/kg	5 U	5 U			5.1 U	5 U			5 U				5 U
4-Nitrophenol	SW8270D	ug/kg	33 U	33 U			33 U	33 U			33 U				33 UJ
Acenaphthene	SW8270D-SIM	ug/kg	1.3 U	**8.3**			**6.2**	**5.4**			**6.2**				1.3 U
Acenaphthylene	SW8270D-SIM	ug/kg	1.2 U	**4.6** j			1.2 U	**4** j			1.2 U				**2.6** j
Anthracene	SW8270D-SIM	ug/kg	1.4 U	**7.8**			**14**	**4.1** j			1.4 U				**3.6** j
Benzo(a)anthracene	SW8270D-SIM	ug/kg	1.5 U	**7.2**			**16**	**4.1** j			1.5 U				**7.6**
Benzo(a)pyrene	SW8270D-SIM	ug/kg	1.7 U	**6**			**3.6** j	**6**			1.6 U				**6.4**
Benzo(g,h,i)perylene	SW8270D-SIM	ug/kg	2.9 U	**7**			2.9 U	**6.4**			2.8 U				**3.8** j
Benzoic acid	SW8270D	ug/kg	96 U	96 U			97 U	96 U			96 U				96 U
Benzyl alcohol	SW8270D	ug/kg	5.8 U	5.8 U			5.8 U	5.8 U			5.8 UJ				5.8 U
Benzyl butyl phthalate	SW8270D	ug/kg	5.9 U	5.8 U			5.9 U	5.8 U			5.8 U				5.8 U
Bis(2-chloroethoxy)methane	SW8270D	ug/kg	1.9 U	1.9 U			1.9 U	1.9 U			1.9 U				1.9 U
Bis(2-ethylhexyl)phthalate	SW8270D	ug/kg	33 U	14 U			14 U	14 U			14 U				24 U
Carbazole	SW8270D	ug/kg	2.6 UJ	2.5 UJ			2.6 UJ	2.5 UJ			2.6 U				2.6 U
Chrysene	SW8270D-SIM	ug/kg	1.8 U	**9.1**			**47**	**6.2**			1.8 U				**8.6**
Dibenzo(a,h)anthracene	SW8270D-SIM	ug/kg	2.3 U	2.2 U			2.3 U	2.3 U			2.2 U				2.3 U

Table 2
Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location			**GP-32**				**GP-33**			**GP-34**			
		Sample Date	**10/11/2012**	**10/11/2012**	**9/10/2012**	**9/10/2012**	**10/11/2012**	**10/11/2012**	**9/6/2012**	**9/6/2012**	**10/10/2012**	**9/6/2012**	**9/6/2012**	**9/6/2012**	**10/10/2012**
		Sample ID	**GP-31-5.9-7.9**	**GP-31-7.9-9.9**	**GP-32-0.25-2.25**	**GP-32-4.1-6.1**	**GP-32-6.1-8.1**	**GP-32-8.1-9.1**	**GP-33-3.25-5.25**	**GP-33-5.25-5.9**	**GP-33-5.9-8.3**	**GP-34-0-2**	**GP-34-3.25-4.4**	**GP-34-4.4-6.4**	**GP-34-6.4-8.4**
		Sample Depth	**5.9 - 7.9 ft**	**7.9 - 9.9 ft**	**0.25 - 2.25 ft**	**4.1 - 6.1 ft**	**6.1 - 8.1 ft**	**8.1 - 9.1 ft**	**3.25 - 5.25 ft**	**5.25 - 5.9 ft**	**5.9 - 8.3 ft**	**0 - 2 ft**	**3.25 - 4.4 ft**	**4.4 - 6.4 ft**	**6.4 - 8.4 ft**
Dibenzofuran	SW8270D-SIM	ug/kg	1.4 U	**7.7**			**4** j	**4.8**			1.4 U				1.5 U
Dibutyl phthalate	SW8270D	ug/kg	7.8 U	7.7 U			7.8 U	7.7 U			7.8 U				7.7 U
Dichloroethyl ether	SW8270D	ug/kg	3.2 U	3.2 U			3.2 U	3.2 U			3.2 U				3.2 U
Diethyl phthalate	SW8270D	ug/kg	35 U	35 U			35 U	35 U			35 U				35 U
Dimethylphthalate	SW8270D	ug/kg	2.8 U	2.7 U			2.8 U	2.7 U			2.8 U				2.8 U
Dinitro-o-cresol	SW8270D	ug/kg	20 U	20 U			20 U	20 U			20 U				20 U
Di-n-octyl phthalate	SW8270D	ug/kg	5.6 U	5.5 U			5.6 U	5.5 U			5.6 U				5.5 U
Fluoranthene	SW8270D-SIM	ug/kg	1.7 U	**36**			**80**	**22**			**2.8** j				**14**
Fluorene	SW8270D-SIM	ug/kg	1.2 U	**6.9**			**6.4**	**4.4** j			**2.5** j				**2.9** j
Hexachlorobenzene	SW8270D	ug/kg	4.1 U	4.1 U			4.1 U	4.1 U			4.1 U				4.1 U
Hexachlorobutadiene	SW8270D	ug/kg	4.4 U	4.3 U			4.4 U	4.3 U			4.3 U				4.3 U
Hexachlorocyclopentadiene	SW8270D	ug/kg	63 U	63 U			64 U	63 U			63 U				63 U
Hexachloroethane	SW8270D	ug/kg	2.8 U	2.8 U			2.8 U	2.8 U			2.8 U				2.8 U
Indeno(1,2,3-cd)pyrene	SW8270D-SIM	ug/kg	3.3 U	**4.5** j			3.3 U	**4.6** j			3.2 U				3.3 U
Isophorone	SW8270D	ug/kg	2.7 U	2.7 U			2.7 U	2.7 U			2.7 U				2.7 U
Naphthalene	SW8270D-SIM	ug/kg	2.5 U	**20**			**5.4**	**18**			**3.6** j				**3.8** j
Nitrobenzene	SW8270D	ug/kg	3.9 U	3.8 U			3.9 U	3.8 U			3.9 U				3.9 U
n-Nitrosodi-n-propylamine	SW8270D	ug/kg	3.2 U	3.2 U			3.2 U	3.2 U			3.2 U				3.2 U
n-Nitrosodiphenylamine	SW8270D	ug/kg	5.1 U	5.1 U			5.2 U	5.1 U			5.1 U				5.1 U
o-Cresol	SW8270D	ug/kg	5 U	5 U			5 U	5 U			5 U				5 U
p-Chloroaniline	SW8270D	ug/kg	21 U	21 U			21 U	21 U			21 U				21 U
p-Cresol	SW8270D	ug/kg	6.3 U	**13** j			6.4 U	**19** j			6.3 U				6.3 U
Pentachlorophenol	SW8270D	ug/kg	**72** j	**190**	**1200**	**58** j	47 U	**49** j	**62** j	48 U	**110** j	**210**	470 U	130 U	46 U
Phenanthrene	SW8270D-SIM	ug/kg	1.9 U	**28**			**55**	**18**			**4.8**				**5.7**
Phenol	SW8270D	ug/kg	**9.5** j	**26**	**230**	**18** j	8.3 U	**26**	**50**	8.5 U	**15** J-	**64**	85 U	23 U	**13** j
p-Nitroaniline	SW8270D	ug/kg	36 U	36 U			36 U	36 U			36 U				36 U
Pyrene	SW8270D-SIM	ug/kg	2.1 U	**32**			**73**	**20**			**3.3** j				**19**
Total (B+J+K) Benzofluoranthenes	SW8270D-SIM	ug/kg	1.8 U	**14**			**16**	**12**			1.7 U				**11**

Table 2
Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location	GP-34		GP-36				GP-39			GP-44			
		Sample Date	**10/10/2012**	**10/10/2012**	**8/30/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**9/4/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**
		Sample ID	**DUP101012-1**	**GP-34-8.4-9.4**	**GP-36-2.6-4.6**	**GP-36-7-9**	**GP-36-9-11**	**GP-36-11-12**	**GP-39-4.5-6.5**	**GP-39-6.5-8.5**	**GP-39-10.5-11.5**	**GP-44-2-4.8**	**GP-44-4.8-6.8**	**GP-44-6.8-8.8**	**GP-44-8.8-11.1**
		Sample Depth	**6.4 - 8.4 ft**	**8.4 - 9.4 ft**	**2.6 - 4.6 ft**	**7 - 9 ft**	**9 - 11 ft**	**11 - 12 ft**	**4.5 - 6.5 ft**	**6.5 - 8.5 ft**	**10.5 - 11.5 ft**	**2 - 4.8 ft**	**4.8 - 6.8 ft**	**6.8 - 8.8 ft**	**8.8 - 11.1 ft**
1,2,4-Trichlorobenzene	SW8270D	ug/kg	3.2 U	3.4 U		3.3 U	3.2 U	3.2 U	3.2 U	3.2 U	3.4 U		3.3 U	3.3 U	3.3 U
1,2-Dichlorobenzene	SW8270D	ug/kg	2.3 U	2.4 U		2.4 U	2.3 U	2.3 U	2.3 U	2.3 U	2.4 U		2.3 U	2.3 U	2.3 U
1,3-Dichlorobenzene	SW8270D	ug/kg	2.4 U	2.6 U		2.5 U	2.5 U	2.4 U	2.4 U	2.4 U	2.5 U		2.5 U	2.5 U	2.5 U
1,4-Dichlorobenzene	SW8270D	ug/kg	2.7 U	2.8 U		2.7 U	2.7 U	2.6 U	2.6 U	2.7 U	2.8 U		2.7 U	2.7 U	2.7 U
1-Methylnaphthalene	SW8270D-SIM	ug/kg	**3** j	**5.2**		1.6 U	1.6 U	**6.5**	**5**	**2.6** j	**11**		**7.3**	1.6 U	1.6 U
2,2-Oxybis(1-chloropropane)	SW8270D	ug/kg	3.5 U	3.7 U		3.6 U	3.5 U	3.5 U	3.5 U	3.5 U	3.6 U		3.5 U	3.5 U	3.5 U
2,3,4,6-Tetrachlorophenol	SW8270D	ug/kg			**13000**							**170**			
2,4,5-Trichlorophenol	SW8270D	ug/kg	20 U	21 U	**200** j	21 U	20 U	20 U	20 U	20 U	**60** j	**23**	**32** j	20 U	**45** j
2,4,6-Trichlorophenol	SW8270D	ug/kg	21 U	22 U	200 U	21 U	21 U	21 U	21 U	21 U	22 U	**49** j	**66** j	**51** j	**97**
2,4-Dichlorophenol	SW8270D	ug/kg	20 U	21 U	190 U	21 U	20 U	20 U	20 U	20 U	**58** j	**150** j	**160** j	**92** j	**340**
2,4-Dimethylphenol	SW8270D	ug/kg	3.2 U	3.4 U		3.3 U	3.2 U	3.2 U	3.2 U	3.2 U	3.3 U		3.2 U	3.2 U	3.2 U
2,4-Dinitrophenol	SW8270D	ug/kg	100 U	110 U		110 U	100 U	100 U	100 U	100 U	110 U		100 U	100 U	100 U
2,4-Dinitrotoluene	SW8270D	ug/kg	18 U	19 U		19 U	18 U	18 U	18 U	18 U	19 U		18 U	18 U	18 U
2,6-Dinitrotoluene	SW8270D	ug/kg	28 U	30 U		29 U	29 U	28 U	28 U	28 U	30 U		29 U	29 U	29 U
2-Chloronaphthalene	SW8270D	ug/kg	2.5 U	2.6 U		2.5 U	2.5 U	2.4 U	2.4 U	2.5 U	2.6 U		2.5 U	2.5 U	2.5 U
2-Chlorophenol	SW8270D	ug/kg	2.2 U	2.3 U	21 U	2.3 U	2.2 U	2.2 U	2.2 U	2.2 U	**140**	**110** j	**110**	2.2 U	**150**
2-Methylnaphthalene	SW8270D-SIM	ug/kg	**2.6** j	**6.5**		1.4 U	1.4 U	**6.9**	**5.3**	**4.3** j	**13**		**11**	1.4 U	1.4 U
2-Nitroaniline	SW8270D	ug/kg	17 U	18 U		18 U	17 U	17 U	17 U	17 U	18 U		17 U	17 U	17 U
2-Nitrophenol	SW8270D	ug/kg	36 U	38 U		37 U	36 U	36 U	36 U	36 U	37 U		36 U	36 U	36 U
3,3'-Dichlorobenzidine (and its salts)	SW8270D	ug/kg	17 U	17 U		17 U	17 U	16 U	16 U	17 U	17 U		17 U	17 U	17 U
3-Nitroaniline	SW8270D	ug/kg	21 U	22 U		22 U	21 U	21 U	21 U	21 U	22 U		21 U	21 U	21 U
4-Bromophenyl phenyl ether	SW8270D	ug/kg	4.7 U	4.9 U		4.8 U	4.7 U	4.6 U	4.7 U	4.7 U	4.9 U		4.7 U	4.7 U	4.7 U
4-Chloro-3-methylphenol	SW8270D	ug/kg	14 U	15 U		14 U	14 U	14 U	14 U	14 U	15 U		14 U	14 U	14 U
4-Chlorophenyl phenyl ether	SW8270D	ug/kg	4.9 U	5.2 U		5.1 UJ	4.9 UJ	4.9 UJ	4.9 UJ	4.9 UJ	5.1 UJ		5 U	5 U	4.9 U
4-Nitrophenol	SW8270D	ug/kg	32 UJ	34 UJ		33 U	32 U	32 U	32 U	32 U	34 U		33 U	33 U	32 U
Acenaphthene	SW8270D-SIM	ug/kg	**4.2** J	**7**		1.2 U	1.2 U	**5.9**	**3.2** j	1.2 U	**8.7**		**5.9**	1.2 U	1.2 U
Acenaphthylene	SW8270D-SIM	ug/kg	**7.2**	**2.8** j		1.2 U	1.2 U	**5.2**	1.2 U	1.2 U	**13**		**2.7** j	1.1 U	1.1 U
Anthracene	SW8270D-SIM	ug/kg	**7.5**	**4** j		1.4 U	1.4 U	**9.6**	**4.7**	1.4 U	**12**		**2.7** j	1.3 U	1.3 U
Benzo(a)anthracene	SW8270D-SIM	ug/kg	**22**	**4.3** j		1.5 U	1.5 U	**10**	**7.8**	1.5 U	**13**		**6.4**	1.5 U	**2.4** j
Benzo(a)pyrene	SW8270D-SIM	ug/kg	**25**	**4.8** j		1.7 U	1.6 U	**9.4**	**6.4**	1.6 U	**20**		**4.7**	1.6 U	**2.4** j
Benzo(g,h,i)perylene	SW8270D-SIM	ug/kg	**12**	**3.4** j		2.9 U	2.9 U	**9.1**	2.9 U	2.8 U	**25**		**4.2** j	2.8 U	**3.1** j
Benzoic acid	SW8270D	ug/kg	94 U	98 U		97 U	94 U	**97** j	93 U	94 U	**190** j		95 U	95 U	**120** j
Benzyl alcohol	SW8270D	ug/kg	5.7 U	5.9 U		5.8 U	5.7 U	5.6 U	5.6 U	5.7 U	5.9 U		5.7 U	5.7 U	5.7 U
Benzyl butyl phthalate	SW8270D	ug/kg	5.7 U	6 U		5.9 U	5.7 U	5.7 U	5.7 U	5.7 U	5.9 U		5.8 U	5.8 U	5.7 U
Bis(2-chloroethoxy)methane	SW8270D	ug/kg	1.9 U	1.9 U		1.9 U	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U		1.9 U	1.9 U	1.9 U
Bis(2-ethylhexyl)phthalate	SW8270D	ug/kg	14 U	14 U		14 U	14 U	13 U	14 U	14 U	14 U		**450** B	**37** B	**34** B
Carbazole	SW8270D	ug/kg	2.5 U	2.6 U		2.6 U	2.5 U	2.5 U	2.5 U	2.5 U	2.6 U		2.5 U	2.5 U	2.5 U
Chrysene	SW8270D-SIM	ug/kg	**28**	**7.1**		1.8 U	1.8 U	**11**	**7.8**	1.7 U	**19**		**12**	1.7 U	**3.6** j
Dibenzo(a,h)anthracene	SW8270D-SIM	ug/kg	**3.3** j	2.3 U		2.3 U	2.2 U	2.2 U	2.2 U	2.2 U	2.3 U		2.2 U	2.2 U	2.2 U

Table 2

Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location	**GP-34**		**GP-36**				**GP-39**			**GP-44**			
		Sample Date	**10/10/2012**	**10/10/2012**	**8/30/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**9/4/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**
		Sample ID	**DUP101012-1**	**GP-34-8.4-9.4**	**GP-36-2.6-4.6**	**GP-36-7-9**	**GP-36-9-11**	**GP-36-11-12**	**GP-39-4.5-6.5**	**GP-39-6.5-8.5**	**GP-39-10.5-11.5**	**GP-44-2-4.8**	**GP-44-4.8-6.8**	**GP-44-6.8-8.8**	**GP-44-8.8-11.1**
		Sample Depth	**6.4 - 8.4 ft**	**8.4 - 9.4 ft**	**2.6 - 4.6 ft**	**7 - 9 ft**	**9 - 11 ft**	**11 - 12 ft**	**4.5 - 6.5 ft**	**6.5 - 8.5 ft**	**10.5 - 11.5 ft**	**2 - 4.8 ft**	**4.8 - 6.8 ft**	**6.8 - 8.8 ft**	**8.8 - 11.1 ft**
Dibenzofuran	SW8270D-SIM	ug/kg	**2.4** j	**4.3** j		1.4 U	1.4 U	**8.4**	**4.9**	1.4 U	**13**		**6.9**	1.4 U	1.4 U
Dibutyl phthalate	SW8270D	ug/kg	7.6 U	8 U		7.8 U	7.6 U	7.5 U	**11** j	7.6 U	7.9 U		7.6 U	7.7 U	7.6 U
Dichloroethyl ether	SW8270D	ug/kg	3.1 U	3.3 U		3.2 U	3.1 U	3.1 U	3.1 U	3.1 U	3.2 U		3.1 U	3.1 U	3.1 U
Diethyl phthalate	SW8270D	ug/kg	34 U	36 U		35 U	34 U	34 U	34 U	34 U	35 U		34 U	34 U	34 U
Dimethylphthalate	SW8270D	ug/kg	2.7 U	2.8 U		2.8 U	2.7 U	2.7 U	2.7 U	2.7 U	2.8 U		2.7 U	2.7 U	2.7 U
Dinitro-o-cresol	SW8270D	ug/kg	20 U	21 U		20 U	20 U	20 U	20 U	20 U	21 U		20 U	20 U	20 U
Di-n-octyl phthalate	SW8270D	ug/kg	5.4 U	5.7 U		5.6 U	5.4 U	5.4 U	5.4 U	5.4 U	5.6 U		**25**	5.5 U	5.5 U
Fluoranthene	SW8270D-SIM	ug/kg	**40**	**20**		1.7 U	1.7 U	**43**	**27**	1.6 U	**70**		**23**	**2.6** j	**9.2**
Fluorene	SW8270D-SIM	ug/kg	**4.7** j	**6.5**		1.2 U	1.2 U	**7.4**	**3.5** j	1.2 U	**10**		**3** j	1.2 U	1.2 U
Hexachlorobenzene	SW8270D	ug/kg	4 U	4.2 U		4.1 U	4 U	4 U	4 U	4 U	4.1 U		4 U	4 U	4 U
Hexachlorobutadiene	SW8270D	ug/kg	4.2 U	4.5 U		4.4 U	4.3 U	4.2 U	4.2 U	4.2 U	4.4 U		4.3 U	4.3 U	4.3 U
Hexachlorocyclopentadiene	SW8270D	ug/kg	62 U	65 U		64 U	62 U	61 U	61 U	62 U	64 U		62 U	62 U	62 U
Hexachloroethane	SW8270D	ug/kg	2.7 U	2.9 U		2.8 U	2.7 U	2.7 U	2.7 U	2.7 U	2.8 U		2.8 U	2.8 U	2.7 U
Indeno(1,2,3-cd)pyrene	SW8270D-SIM	ug/kg	**9.2**	3.4 U		3.3 U	3.3 U	**5.3**	3.2 U	3.2 U	**18**		**3.4** j	3.2 U	3.2 U
Isophorone	SW8270D	ug/kg	2.7 U	2.8 U		2.7 U	2.7 U	2.6 U	2.6 U	2.7 U	2.8 U		2.7 U	2.7 U	2.7 U
Naphthalene	SW8270D-SIM	ug/kg	**5.2**	**15**		2.5 U	2.5 U	**20**	**16**	**7.5**	**56**		**18**	2.4 U	**8.3**
Nitrobenzene	SW8270D	ug/kg	3.8 U	4 U		3.9 U	3.8 U	3.7 U	3.8 U	3.8 U	3.9 U		3.8 U	3.8 U	3.8 U
n-Nitrosodi-n-propylamine	SW8270D	ug/kg	3.1 U	3.3 U		3.2 U	3.1 U	3.1 U	3.1 U	3.1 U	3.2 U		3.1 U	3.2 U	3.1 U
n-Nitrosodiphenylamine	SW8270D	ug/kg	5 U	5.3 U		5.2 U	5 U	5 U	5 U	5 U	5.2 U		5.1 U	5.1 U	5 U
o-Cresol	SW8270D	ug/kg	4.9 U	5.1 U		5 U	4.9 U	**15** j	4.9 U	4.9 U	**13** j		4.9 U	4.9 U	4.9 U
p-Chloroaniline	SW8270D	ug/kg	21 U	22 U		21 U	21 U	21 U	21 U	21 U	22 U		21 U	21 U	21 U
p-Cresol	SW8270D	ug/kg	6.2 U	**25** j		6.4 U	6.2 U	**63**	6.1 U	6.2 U	**77**		**17** j	6.2 U	**20** j
Pentachlorophenol	SW8270D	ug/kg	45 U	47 U	**180000**	47 U	**180** j	45 U	45 U	**48** j	**240**	**2000**	**86000**	**34000**	**2300**
Phenanthrene	SW8270D-SIM	ug/kg	**7.1**	**20**		1.9 U	1.9 U	**27**	**18**	1.8 U	**66**		**22**	**2.4** j	**10**
Phenol	SW8270D	ug/kg	**16** j	**58**	**110** j	8.3 U	**16** j	**200**	8 U	8 U	**870**	**560**	**710**	**28**	**150**
p-Nitroaniline	SW8270D	ug/kg	35 U	37 U		36 U	35 U	35 U	35 U	35 U	37 U		36 U	36 U	35 U
Pyrene	SW8270D-SIM	ug/kg	**66**	**20**		2.1 U	2.1 U	**38**	**23**	2.1 U	**72**		**22**	2 U	**8.8**
Total (B+J+K) Benzofluoranthenes	SW8270D-SIM	ug/kg	**34**	**4** j		1.8 U	1.7 U	**19**	**13**	1.7 U	**39**		**16**	1.7 U	**2.9** j

Table 2

Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location	**GP-45**				**GP-46**			**GP-47**	**GP-48**	**GP-50**			
		Sample Date	**9/4/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**8/31/2012**	**10/9/2012**	**10/9/2012**	**9/5/2012**	**9/4/2012**	**9/7/2012**	**9/7/2012**	**9/7/2012**	**10/11/2012**
		Sample ID	**GP-45-2-4.25**	**GP-45-4.5-6.5**	**GP-45-6.5-8.5**	**GP-45-8.5-9.5**	**GP-46-2.5-4.2**	**GP-46-5.2-7.2**	**GP-46-7.2-8.7**	**GP-47-0-0.25**	**GP-48-0-0.5**	**GP-50-0-2**	**GP-50-3-5.9**	**DUP-090712-1**	**GP-50-5.9-7**
		Sample Depth	**2 - 4.25 ft**	**4.5 - 6.5 ft**	**6.5 - 8.5 ft**	**8.5 - 9.5 ft**	**2.5 - 4.2 ft**	**5.2 - 7.2 ft**	**7.2 - 8.7 ft**	**0 - 0.25 ft**	**0 - 0.5 ft**	**0 - 2 ft**	**3 - 5.9 ft**	**3 - 5.9 ft**	**5.9 - 7 ft**
1,2,4-Trichlorobenzene	SW8270D	ug/kg		10 U	3.2 U	3.4 U		3.2 U	3.4 U						3.3 U
1,2-Dichlorobenzene	SW8270D	ug/kg		7.3 U	2.3 U	2.5 U		2.3 U	2.4 U						2.4 U
1,3-Dichlorobenzene	SW8270D	ug/kg		7.7 U	2.4 U	2.6 U		2.4 U	2.6 U						2.5 U
1,4-Dichlorobenzene	SW8270D	ug/kg		8.4 U	2.6 U	2.8 U		2.6 U	2.8 U						2.7 U
1-Methylnaphthalene	SW8270D-SIM	ug/kg		**5.2**	1.5 U	**5.5**		**7.8**	**5**						**7.2**
2,2-Oxybis(1-chloropropane)	SW8270D	ug/kg		11 U	3.5 U	3.7 U		3.5 U	3.7 U						3.5 U
2,3,4,6-Tetrachlorophenol	SW8270D	ug/kg	**3500**				**1700**			4.3 U	4.4 U	**84**	4.5 U	4.4 U	
2,4,5-Trichlorophenol	SW8270D	ug/kg	**69** j	63 U	20 U	21 U	**270** j	20 U	21 U	19 U	20 U	20 U	20 U	20 U	20 U
2,4,6-Trichlorophenol	SW8270D	ug/kg	**910**	66 U	**21** j	**68** j	**850** j	**180**	**80** j	20 U	20 U	**68** j	21 U	20 U	21 U
2,4-Dichlorophenol	SW8270D	ug/kg	**1800**	63 U	**39** j	**68** j	**420** j	**130** j	**85** j	19 U	20 U	**27** j	20 U	20 U	20 U
2,4-Dimethylphenol	SW8270D	ug/kg		10 U	3.2 U	3.4 U		3.2 U	**9.7** j						3.3 U
2,4-Dinitrophenol	SW8270D	ug/kg		330 U	100 U	110 U		100 U	110 U						100 U
2,4-Dinitrotoluene	SW8270D	ug/kg		57 U	18 U	19 U		18 U	19 U						18 U
2,6-Dinitrotoluene	SW8270D	ug/kg		90 U	28 U	30 U		28 U	30 U						29 U
2-Chloronaphthalene	SW8270D	ug/kg		7.7 U	2.4 U	2.6 U		2.4 U	2.6 U						2.5 U
2-Chlorophenol	SW8270D	ug/kg	**3100**	**100**	2.2 U	**36**	**330**	**60**	2.3 U	2.1 U	2.2 U	2.2 U	2.2 U	2.2 U	2.3 U
2-Methylnaphthalene	SW8270D-SIM	ug/kg		**5.5**	1.3 U	**5.8**		**6**	**4.1** j						1.4 U
2-Nitroaniline	SW8270D	ug/kg		54 U	17 U	18 U		17 U	18 U						17 U
2-Nitrophenol	SW8270D	ug/kg		110 U	36 U	38 U		36 U	38 U						36 U
3,3'-Dichlorobenzidine (and its salts)	SW8270D	ug/kg		52 U	16 U	18 U		16 U	17 U						17 UJ
3-Nitroaniline	SW8270D	ug/kg		66 U	21 U	22 U		21 U	22 U						21 U
4-Bromophenyl phenyl ether	SW8270D	ug/kg		15 U	4.6 U	5 U		4.6 U	4.9 U						4.7 U
4-Chloro-3-methylphenol	SW8270D	ug/kg		44 U	14 U	15 U		14 U	15 U						14 U
4-Chlorophenyl phenyl ether	SW8270D	ug/kg		15 U	4.9 U	5.2 U		4.9 U	5.1 U						5 U
4-Nitrophenol	SW8270D	ug/kg		100 U	32 U	34 U		32 U	34 U						33 U
Acenaphthene	SW8270D-SIM	ug/kg		1.3 U	1.2 U	**3.9** j		**4.9**	1.3 U						1.2 U
Acenaphthylene	SW8270D-SIM	ug/kg		1.2 U	1.1 U	**6.1**		**2.6** j	**2.9** j						1.2 U
Anthracene	SW8270D-SIM	ug/kg		**2.7** j	1.3 U	**4.3** j		**3.8** j	**3.9** j						1.4 U
Benzo(a)anthracene	SW8270D-SIM	ug/kg		**7.3**	1.4 U	**5.1**		**8.8**	**3.2** j						1.5 U
Benzo(a)pyrene	SW8270D-SIM	ug/kg		**7.3**	1.5 U	**7.7**		**8.2**	**4.4** j						1.6 U
Benzo(g,h,i)perylene	SW8270D-SIM	ug/kg		**4.1** j	2.7 U	**9.3**		**4** j	**5.6**						2.9 U
Benzoic acid	SW8270D	ug/kg		300 U	93 U	100 U		93 U	98 U						95 U
Benzyl alcohol	SW8270D	ug/kg		18 U	5.6 U	6 U		5.6 U	5.9 U						5.7 U
Benzyl butyl phthalate	SW8270D	ug/kg		18 U	5.7 U	6.1 U		5.6 U	6 U						5.8 U
Bis(2-chloroethoxy)methane	SW8270D	ug/kg		5.9 U	1.8 U	2 U		1.8 U	1.9 U						1.9 U
Bis(2-ethylhexyl)phthalate	SW8270D	ug/kg		**180** B	**45** B	**70** B		**140** B	14 U						24 U
Carbazole	SW8270D	ug/kg		7.9 U	2.5 U	2.7 U		2.5 U	2.6 U						2.5 UJ
Chrysene	SW8270D-SIM	ug/kg		**11**	1.7 U	**9.2**		**12**	**5.7**						1.8 U
Dibenzo(a,h)anthracene	SW8270D-SIM	ug/kg		2.3 U	2.1 U	2.3 U		2.1 U	2.3 U						2.2 U

Table 2
Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location	GP-45				GP-46			GP-47	GP-48	GP-50			
		Sample Date	9/4/2012	10/9/2012	10/9/2012	10/9/2012	8/31/2012	10/9/2012	10/9/2012	9/5/2012	9/4/2012	9/7/2012	9/7/2012	9/7/2012	10/11/2012
		Sample ID	GP-45-2-4.25	GP-45-4.5-6.5	GP-45-6.5-8.5	GP-45-8.5-9.5	GP-46-2.5-4.2	GP-46-5.2-7.2	GP-46-7.2-8.7	GP-47-0-0.25	GP-48-0-0.5	GP-50-0-2	GP-50-3-5.9	DUP-090712-1	GP-50-5.9-7
		Sample Depth	2 - 4.25 ft	4.5 - 6.5 ft	6.5 - 8.5 ft	8.5 - 9.5 ft	2.5 - 4.2 ft	5.2 - 7.2 ft	7.2 - 8.7 ft	0 - 0.25 ft	0 - 0.5 ft	0 - 2 ft	3 - 5.9 ft	3 - 5.9 ft	5.9 - 7 ft
Dibenzofuran	SW8270D-SIM	ug/kg		**9**	**2.7** j	**15**		**21**	**34**						**19**
Dibutyl phthalate	SW8270D	ug/kg		24 U	7.5 U	8.1 U		7.5 U	7.9 U						7.7 U
Dichloroethyl ether	SW8270D	ug/kg		9.8 U	3.1 U	3.3 U		3.1 U	3.3 U						3.2 U
Diethyl phthalate	SW8270D	ug/kg		110 U	34 U	36 U		34 U	36 U						34 U
Dimethylphthalate	SW8270D	ug/kg		8.5 U	2.7 U	2.9 U		2.7 U	2.8 U						2.7 U
Dinitro-o-cresol	SW8270D	ug/kg		62 U	20 U	21 U		19 U	21 U						20 U
Di-n-octyl phthalate	SW8270D	ug/kg		17 U	5.4 U	5.8 U		5.4 U	5.7 U						5.5 U
Fluoranthene	SW8270D-SIM	ug/kg		**26**	1.6 U	**29**		**29**	**16**						1.7 U
Fluorene	SW8270D-SIM	ug/kg		1.2 U	1.1 U	**4.6** j		**4.9**	**3.2** j						1.2 U
Hexachlorobenzene	SW8270D	ug/kg		**920**	4 U	4.2 U		**16** j	4.2 U						4 U
Hexachlorobutadiene	SW8270D	ug/kg		13 U	4.2 U	4.5 U		4.2 U	4.4 U						4.3 U
Hexachlorocyclopentadiene	SW8270D	ug/kg		190 U	61 U	66 U		61 U	64 U						63 U
Hexachloroethane	SW8270D	ug/kg		8.6 U	2.7 U	2.9 U		2.7 U	2.9 U						2.8 U
Indeno(1,2,3-cd)pyrene	SW8270D-SIM	ug/kg		**3.6** j	3 U	**6.3**		**3.3** j	**4.2** j						3.3 U
Isophorone	SW8270D	ug/kg		8.4 U	2.6 U	2.8 U		2.6 U	2.8 U						2.7 U
Naphthalene	SW8270D-SIM	ug/kg		**10**	2.3 U	**26**		**7.1**	**11**						**3.5** j
Nitrobenzene	SW8270D	ug/kg		12 U	3.7 U	4 U		3.7 U	3.9 U						3.8 U
n-Nitrosodi-n-propylamine	SW8270D	ug/kg		9.8 U	3.1 U	3.3 U		3.1 U	3.3 U						3.2 U
n-Nitrosodiphenylamine	SW8270D	ug/kg		16 U	5 U	5.3 U		4.9 U	5.2 U						5.1 U
o-Cresol	SW8270D	ug/kg		15 U	4.8 U	**15** j		4.8 U	**14** j						4.9 U
p-Chloroaniline	SW8270D	ug/kg		65 U	21 U	22 U		20 U	22 U						21 U
p-Cresol	SW8270D	ug/kg		19 U	6.1 U	**56**		6.1 U	**39**						6.2 U
Pentachlorophenol	SW8270D	ug/kg	**60000**	**3200**	**200**	**82** j	**23000**	**580**	47 U	43 U	44 U	**1000**	45 U	44 U	**120** j
Phenanthrene	SW8270D-SIM	ug/kg		**27**	1.7 U	**29**		**24**	**19**						**3** j
Phenol	SW8270D	ug/kg	**5200**	**91**	8 U	**160**	**2400**	**130**	**220**	7.7 U	7.9 U	**74**	**25**	**24**	**20**
p-Nitroaniline	SW8270D	ug/kg		110 U	35 U	37 U		35 U	37 U						36 U
Pyrene	SW8270D-SIM	ug/kg		**23**	1.9 U	**30**		**26**	**16**						2.1 U
Total (B+J+K) Benzofluoranthenes	SW8270D-SIM	ug/kg		**16**	1.6 U	**17**		**14**	**11**						1.7 U

Table 2
Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location		**GP-53**				**GP-55**							**GP-56**
		Sample Date	**10/11/2012**	**9/10/2012**	**9/10/2012**	**10/10/2012**	**10/10/2012**	**8/31/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**8/30/2012**	**8/30/2012**	**10/10/2012**
		Sample ID	**GP-50-7-7.75**	**GP-53-3-5**	**GP-53-5-5.3**	**GP-53-5.3-7.3**	**GP-53-7.3-9.3**	**GP-55-2.5-4**	**GP-55-4.4-6.4**	**GP-55-6.4-8.4**	**GP-55-8.4-10.4**	**DUP100812-1**	**GP-56-3.3-3.75**	**DUP-083012-1**	**GP-56-4.2-5.2**
		Sample Depth	**7 - 7.75 ft**	**3 - 5 ft**	**5 - 5.3 ft**	**5.3 - 7.3 ft**	**7.3 - 9.3 ft**	**2.5 - 4 ft**	**4.4 - 6.4 ft**	**6.4 - 8.4 ft**	**8.4 - 10.4 ft**	**8.4 - 10.4 ft**	**3.3 - 3.75 ft**	**3.3 - 3.75 ft**	**4.2 - 5.2 ft**
1,2,4-Trichlorobenzene	SW8270D	ug/kg	3.3 U	3.2 U	3.3 U	3.3 U	3.4 U		3.2 U	3.2 U	3.4 U	3.2 U			4.6 U
1,2-Dichlorobenzene	SW8270D	ug/kg	2.4 U	2.3 U	2.4 U	2.4 U	2.4 U		2.3 U	2.3 U	2.4 U	2.3 U			3.3 U
1,3-Dichlorobenzene	SW8270D	ug/kg	2.5 U	2.4 U	2.5 U	2.5 U	2.5 U		2.4 U	2.4 U	2.6 U	2.4 U			3.5 U
1,4-Dichlorobenzene	SW8270D	ug/kg	2.7 U	2.6 U	2.7 U	2.7 U	2.8 U		2.6 U	2.6 U	2.8 U	2.6 U			3.8 U
1-Methylnaphthalene	SW8270D-SIM	ug/kg	**26**	1.6 U	1.6 U	1.6 U	**4.8** j		**5.6**	1.6 U	**2.6** j	**2.3** j			**57**
2,2-Oxybis(1-chloropropane)	SW8270D	ug/kg	3.6 U	3.5 U	3.6 U	3.5 U	3.6 U		3.4 U	3.4 U	3.7 U	3.5 U			5 U
2,3,4,6-Tetrachlorophenol	SW8270D	ug/kg		4.5 U	4.6 U			**1300**					**1300**	**18** j	
2,4,5-Trichlorophenol	SW8270D	ug/kg	**23** j	20 U	20 U	20 U	21 U	**370**	20 U	19 U	21 U	20 U	100 U	20 U	28 U
2,4,6-Trichlorophenol	SW8270D	ug/kg	**46** j	21 U	21 U	21 U	22 U	**260** j	21 U	20 U	22 U	21 U	**390** j	21 U	30 U
2,4-Dichlorophenol	SW8270D	ug/kg	**73** j	20 U	20 U	20 U	21 U	**330** j	20 U	20 U	**26** j	**27** j	**230** j	20 U	28 U
2,4-Dimethylphenol	SW8270D	ug/kg	3.3 U	3.2 U	3.3 U	3.3 U	3.3 U		3.2 U	3.1 U	3.4 U	3.2 U			4.6 U
2,4-Dinitrophenol	SW8270D	ug/kg	110 U	100 U	110 U	100 U	110 U		100 U	100 U	110 U	100 U			150 U
2,4-Dinitrotoluene	SW8270D	ug/kg	19 U	18 U	19 U	18 U	19 U		18 U	18 U	19 U	18 U			26 U
2,6-Dinitrotoluene	SW8270D	ug/kg	29 U	28 U	29 U	29 U	29 U		28 U	28 U	30 U	28 U			40 U
2-Chloronaphthalene	SW8270D	ug/kg	2.5 U	2.4 U	2.5 U	2.5 U	2.5 U		2.4 U	2.4 U	2.6 U	2.4 U			3.5 U
2-Chlorophenol	SW8270D	ug/kg	**59**	2.2 U	2.3 U	2.3 U	2.3 U	**310**	2.2 U	2.2 U	**31**	2.2 U	**96**	2.2 U	3.2 U
2-Methylnaphthalene	SW8270D-SIM	ug/kg	**3.9** j	1.4 U	1.4 U	1.4 U	**4.8**		**5.7**	1.4 U	**2.6** j	**2.8** j			**79**
2-Nitroaniline	SW8270D	ug/kg	17 U	17 U	17 U	17 U	18 U		17 U	17 U	18 U	17 U			24 U
2-Nitrophenol	SW8270D	ug/kg	37 U	36 U	37 U	36 U	37 U		35 U	35 U	38 U	36 U			51 U
3,3'-Dichlorobenzidine (and its salts)	SW8270D	ug/kg	17 UJ	16 U	17 U	17 U	17 U		16 U	16 U	17 U	16 U			23 U
3-Nitroaniline	SW8270D	ug/kg	21 U	21 U	21 U	21 U	22 U		21 U	20 U	22 U	21 U			30 U
4-Bromophenyl phenyl ether	SW8270D	ug/kg	4.8 U	4.6 U	4.8 U	4.7 U	4.8 U		4.6 U	4.6 U	4.9 U	4.6 U			6.6 U
4-Chloro-3-methylphenol	SW8270D	ug/kg	14 U	14 U	14 U	14 U	15 U		14 U	14 U	15 U	14 U			20 U
4-Chlorophenyl phenyl ether	SW8270D	ug/kg	5 U	4.9 U	5 U	5 U	5.1 U		4.8 UJ	4.8 UJ	5.2 UJ	4.9 UJ			7 U
4-Nitrophenol	SW8270D	ug/kg	33 U	32 U	33 U	33 U	33 U		32 U	31 U	34 U	32 U			46 UJ
Acenaphthene	SW8270D-SIM	ug/kg	**3.6** j	1.2 U	1.3 U	1.2 U	**3.2** j		**2.3** j	1.2 U	1.3 U	1.2 U			3.7 U
Acenaphthylene	SW8270D-SIM	ug/kg	**3.1** j	1.2 U	1.2 U	1.2 U	1.2 U		1.1 U	1.2 U	1.2 U	1.1 U			**23**
Anthracene	SW8270D-SIM	ug/kg	**3.2** j	1.4 U	1.4 U	1.4 U	1.4 U		**6**	1.3 U	1.4 U	1.3 U			4.1 U
Benzo(a)anthracene	SW8270D-SIM	ug/kg	**3.2** j	1.5 U	1.5 U	1.5 U	1.6 U		**9.9**	1.5 U	1.6 U	1.4 U			**14** j
Benzo(a)pyrene	SW8270D-SIM	ug/kg	**3.8** j	1.6 U	1.7 U	1.6 U	1.7 U		**7.4**	1.6 U	**2.8** j	1.6 U			**13** j
Benzo(g,h,i)perylene	SW8270D-SIM	ug/kg	**4.6** j	2.8 U	2.9 U	2.8 U	3 U		**5.9**	2.8 U	**4.4** j	**3.4** j			8.5 U
Benzoic acid	SW8270D	ug/kg	**120** j	93 U	96 U	95 U	97 U		93 U	92 U	99 U	93 U			130 U
Benzyl alcohol	SW8270D	ug/kg	5.8 U	5.6 U	5.8 U	5.7 UJ	5.9 UJ		5.6 U	5.5 U	5.9 U	5.6 U			8 U
Benzyl butyl phthalate	SW8270D	ug/kg	5.8 U	5.7 U	5.8 U	5.8 U	5.9 U		5.6 U	5.6 U	6 U	5.7 U			8.1 U
Bis(2-chloroethoxy)methane	SW8270D	ug/kg	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U		1.8 U	1.8 U	2 U	1.8 U			2.6 U
Bis(2-ethylhexyl)phthalate	SW8270D	ug/kg	28 U	35 U	14 U	14 U	14 U		13 U	13 U	14 U	13 U			53 U
Carbazole	SW8270D	ug/kg	2.6 UJ	2.5 U	2.6 U	2.5 U	2.6 U		2.5 U	2.4 U	2.6 U	2.5 U			3.5 U
Chrysene	SW8270D-SIM	ug/kg	**6.5**	1.7 U	1.8 U	1.7 U	1.8 U		**11**	1.7 U	**3.4** j	**2.8** j			**60**
Dibenzo(a,h)anthracene	SW8270D-SIM	ug/kg	2.2 U	2.2 U	2.3 U	2.2 U	2.3 U		2.1 U	2.2 U	2.3 U	2.1 U			6.6 U

Table 2

Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location		**GP-53**				**GP-55**							**GP-56**
		Sample Date	**10/11/2012**	**9/10/2012**	**9/10/2012**	**10/10/2012**	**10/10/2012**	**8/31/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**8/30/2012**	**8/30/2012**	**10/10/2012**
		Sample ID	**GP-50-7-7.75**	**GP-53-3-5**	**GP-53-5-5.3**	**GP-53-5.3-7.3**	**GP-53-7.3-9.3**	**GP-55-2.5-4**	**GP-55-4.4-6.4**	**GP-55-6.4-8.4**	**GP-55-8.4-10.4**	**DUP100812-1**	**GP-56-3.3-3.75**	**DUP-083012-1**	**GP-56-4.2-5.2**
		Sample Depth	**7 - 7.75 ft**	**3 - 5 ft**	**5 - 5.3 ft**	**5.3 - 7.3 ft**	**7.3 - 9.3 ft**	**2.5 - 4 ft**	**4.4 - 6.4 ft**	**6.4 - 8.4 ft**	**8.4 - 10.4 ft**	**8.4 - 10.4 ft**	**3.3 - 3.75 ft**	**3.3 - 3.75 ft**	**4.2 - 5.2 ft**
Dibenzofuran	SW8270D-SIM	ug/kg	**18**	1.4 U	1.4 U	**11**	**2.6** j		**21**	**2.9** j	**2.8** j	**2.7** j			4.2 U
Dibutyl phthalate	SW8270D	ug/kg	7.7 U	7.5 U	7.7 U	7.7 U	7.9 U		7.5 U	7.4 U	8 U	7.5 U			11 U
Dichloroethyl ether	SW8270D	ug/kg	3.2 U	3.1 U	3.2 U	3.2 U	3.2 U		3.1 U	3 U	3.3 U	3.1 U			4.4 U
Diethyl phthalate	SW8270D	ug/kg	35 U	34 U	35 U	34 U	35 U		34 U	33 U	36 U	34 U			48 U
Dimethylphthalate	SW8270D	ug/kg	2.8 U	2.7 U	2.8 U	2.7 U	2.8 U		2.7 U	2.6 U	2.8 U	2.7 U			3.8 U
Dinitro-o-cresol	SW8270D	ug/kg	20 U	20 U	20 U	20 U	20 U		19 U	19 U	21 U	20 U			28 U
Di-n-octyl phthalate	SW8270D	ug/kg	5.5 U	5.4 U	5.5 U	5.5 U	5.6 U		5.4 U	5.3 U	5.7 U	5.4 U			7.7 U
Fluoranthene	SW8270D-SIM	ug/kg	**19**	**3** j	**3.8** j	1.6 U	**6.2**		**40**	1.6 U	**11**	**7.5**			**41**
Fluorene	SW8270D-SIM	ug/kg	**4.4** j	1.2 U	1.2 U	1.2 U	**3** j		**5.7**	1.2 U	1.3 U	1.2 U			3.6 U
Hexachlorobenzene	SW8270D	ug/kg	4.1 U	4 U	4.1 U	4 U	4.1 U		3.9 U	3.9 U	4.2 U	4 U			5.7 U
Hexachlorobutadiene	SW8270D	ug/kg	4.3 U	4.2 U	4.3 U	4.3 U	4.4 U		4.2 U	4.1 U	4.5 U	4.2 U			6 U
Hexachlorocyclopentadiene	SW8270D	ug/kg	63 U	61 U	63 U	63 U	64 U		61 U	60 U	65 U	61 U			88 U
Hexachloroethane	SW8270D	ug/kg	2.8 U	2.7 U	2.8 U	2.8 U	2.8 U		2.7 U	2.7 U	2.9 U	2.7 U			3.9 U
Indeno(1,2,3-cd)pyrene	SW8270D-SIM	ug/kg	**4.2** j	3.2 U	3.3 U	3.2 U	3.4 U		**3.4** j	3.2 U	3.4 U	3.1 U			9.7 U
Isophorone	SW8270D	ug/kg	2.7 U	2.6 U	2.7 U	2.7 U	2.8 U		2.6 U	2.6 U	2.8 U	2.6 U			3.8 U
Naphthalene	SW8270D-SIM	ug/kg	**25**	2.4 U	2.5 U	**2.7** j	**18**		**7.1**	2.4 U	**9.2**	**7.9**			**41**
Nitrobenzene	SW8270D	ug/kg	3.9 U	3.8 U	3.9 U	3.8 U	3.9 U		3.7 U	3.7 U	4 U	3.7 U			5.4 U
n-Nitrosodi-n-propylamine	SW8270D	ug/kg	3.2 U	3.1 U	3.2 U	3.2 U	3.2 U		3.1 U	3 U	3.3 U	3.1 U			4.4 U
n-Nitrosodiphenylamine	SW8270D	ug/kg	5.1 U	5 U	5.1 U	5.1 U	5.2 U		4.9 U	4.9 U	5.3 U	5 U			7.1 U
o-Cresol	SW8270D	ug/kg	5 U	4.9 U	**12** j	**14** j	5.1 U		4.8 U	4.8 U	5.1 U	4.8 U			6.9 U
p-Chloroaniline	SW8270D	ug/kg	21 U	21 U	21 U	21 U	21 U		20 U	20 U	22 U	21 U			29 U
p-Cresol	SW8270D	ug/kg	**17** j	6.1 U	**21** j	6.2 U	6.4 U		6.1 U	6 U	**11** j	6.1 U			**640**
Pentachlorophenol	SW8270D	ug/kg	**170** j	45 U	46 U	46 U	**54** j	**20000**	44 U	44 U	47 U	**55** j	**7700**	**320**	**1300**
Phenanthrene	SW8270D-SIM	ug/kg	**20**	**5.3**	**2.7** j	1.8 U	**8.3**		**32**	1.8 U	**11**	**7.8**			5.5 U
Phenol	SW8270D	ug/kg	**100**	**120**	**280**	**140** J-	**190** J-	**2600**	**17** j	7.8 U	**33**	**30**	**210**	**99**	11 U
p-Nitroaniline	SW8270D	ug/kg	36 U	35 U	36 U	36 U	37 U		35 U	34 U	37 U	35 U			50 U
Pyrene	SW8270D-SIM	ug/kg	**18**	**2.6** j	**3.2** j	2.1 U	**5.4**		**31**	2.1 U	**11**	**7**			**85**
Total (B+J+K) Benzofluoranthenes	SW8270D-SIM	ug/kg	**12**	1.7 U	1.8 U	1.7 U	1.8 U		**15**	1.7 U	**3.4** j	**2.8** j			**15**

Table 2
Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location				GP-58			GP-59					GP-61	
		Sample Date	10/10/2012	10/10/2012	8/31/2012	10/8/2012	10/8/2012	8/31/2012	10/10/2012	10/10/2012	10/10/2012	9/6/2012	9/6/2012	9/6/2012	10/12/2012
		Sample ID	GP-56-5.2-7.2	GP-56-7.2-9.5	GP-58-1.75-3.75	GP-58-4.25-6.25	GP-58-8.25-10.5	GP-59-2.3-3.9	GP-59-4.25-6.25	GP-59-8.25-10.25	GP-59-10.25-11.5	GP-61-0-2	GP-61-2.5-4.5	DUP-090612-1	GP-61-4.5-7.5
		Sample Depth	5.2 - 7.2 ft	7.2 - 9.5 ft	1.75 - 3.75 ft	4.25 - 6.25 ft	8.25 - 10.5 ft	2.3 - 3.9 ft	4.25 - 6.25 ft	8.25 - 10.25 ft	10.25 - 11.5 ft	0 - 2 ft	2.5 - 4.5 ft	2.5 - 4.5 ft	4.5 - 7.5 ft
1,2,4-Trichlorobenzene	SW8270D	ug/kg	10 U	3.2 U		3.2 U	3.4 U		3.4 U	3.2 U	3.3 U				3.3 U
1,2-Dichlorobenzene	SW8270D	ug/kg	7.2 U	2.3 U		2.3 U	2.5 U		2.4 U	2.3 U	2.4 U				2.4 U
1,3-Dichlorobenzene	SW8270D	ug/kg	7.6 U	2.4 U		2.4 U	2.6 U		2.6 U	2.4 U	2.5 U				2.5 U
1,4-Dichlorobenzene	SW8270D	ug/kg	8.2 U	2.6 U		2.6 U	2.8 U		2.8 U	2.7 U	2.7 U				**10** j
1-Methylnaphthalene	SW8270D-SIM	ug/kg	**3.1** j	**3.8** j		**15**	1.6 U		**23**	**4.9**	1.6 U				1.6 U
2,2-Oxybis(1-chloropropane)	SW8270D	ug/kg	11 U	3.5 U		3.5 U	3.7 U		3.7 U	3.5 U	3.6 U				3.6 U
2,3,4,6-Tetrachlorophenol	SW8270D	ug/kg			14 U			**9.1** j				4.6 U	4.8 U	4.8 U	
2,4,5-Trichlorophenol	SW8270D	ug/kg	61 U	**230**	63 U	20 U	21 U	20 U	21 U	20 U	20 U	20 U	21 U	21 U	20 U
2,4,6-Trichlorophenol	SW8270D	ug/kg	64 U	**480**	66 U	21 U	22 U	20 U	22 U	21 U	21 U	21 U	22 U	22 U	**87** j
2,4-Dichlorophenol	SW8270D	ug/kg	62 U	**680**	63 U	20 U	21 U	20 U	21 U	20 U	21 U	20 U	21 U	21 U	**160** j
2,4-Dimethylphenol	SW8270D	ug/kg	9.9 U	3.2 U		3.2 U	3.4 U		3.4 U	3.2 U	3.3 U				3.3 U
2,4-Dinitrophenol	SW8270D	ug/kg	320 U	100 U		100 U	110 U		110 U	100 U	110 U				110 U
2,4-Dinitrotoluene	SW8270D	ug/kg	56 U	18 U		18 U	19 U		19 U	18 U	19 U				19 U
2,6-Dinitrotoluene	SW8270D	ug/kg	88 U	28 U		28 U	30 U		30 U	28 U	29 U				29 U
2-Chloronaphthalene	SW8270D	ug/kg	7.6 U	2.4 U		2.4 U	2.6 U		2.6 U	2.5 U	2.5 U				2.5 U
2-Chlorophenol	SW8270D	ug/kg	6.9 U	**140**	7 U	2.2 U	2.4 U	2.2 U	2.3 U	2.2 U	**510**	2.3 U	2.4 U	2.4 U	2.3 U
2-Methylnaphthalene	SW8270D-SIM	ug/kg	**4.3** j	**3.4** j		**12**	1.4 U		**34**	**7**	**30**				1.4 U
2-Nitroaniline	SW8270D	ug/kg	53 U	17 U		17 U	18 U		18 U	17 U	18 U				18 U
2-Nitrophenol	SW8270D	ug/kg	110 U	36 U		36 U	38 U		38 U	36 U	37 U				37 U
3,3'-Dichlorobenzidine (and its salts)	SW8270D	ug/kg	51 U	16 U		16 U	18 U		17 U	17 U	17 U				17 UJ
3-Nitroaniline	SW8270D	ug/kg	65 U	21 U		21 U	22 U		22 U	21 U	21 U				21 U
4-Bromophenyl phenyl ether	SW8270D	ug/kg	14 U	4.6 U		4.7 U	5 U		4.9 U	4.7 U	4.8 U				4.8 U
4-Chloro-3-methylphenol	SW8270D	ug/kg	43 U	14 U		14 U	15 U		15 U	14 U	14 U				14 U
4-Chlorophenyl phenyl ether	SW8270D	ug/kg	15 U	4.9 U		4.9 UJ	5.2 UJ		5.2 U	4.9 U	5.1 U				5 U
4-Nitrophenol	SW8270D	ug/kg	100 U	32 UJ		32 U	34 U		34 UJ	32 UJ	33 UJ				33 U
Acenaphthene	SW8270D-SIM	ug/kg	1.3 U	**2.5** j		1.2 U	1.3 U		1.3 U	**2.7** j	**37**				1.2 U
Acenaphthylene	SW8270D-SIM	ug/kg	1.2 U	1.2 U		1.1 U	1.2 U		**4.7** j	**3.9** j	**31**				1.2 U
Anthracene	SW8270D-SIM	ug/kg	1.4 U	1.4 U		1.3 U	1.4 U		**4.2** j	**2.8** j	**14**				1.3 U
Benzo(a)anthracene	SW8270D-SIM	ug/kg	1.5 U	**3.3** j		**4.4**	1.5 U		**5.4**	**3.7** j	**13**				1.5 U
Benzo(a)pyrene	SW8270D-SIM	ug/kg	1.7 U	**3.6** j		**3.5** j	1.7 U		**3.7** j	**3.6** j	**13**				1.6 U
Benzo(g,h,i)perylene	SW8270D-SIM	ug/kg	2.9 U	2.8 U		**3.7** j	2.9 U		3 U	2.8 U	**14**				2.8 U
Benzoic acid	SW8270D	ug/kg	290 U	93 U		94 U	100 U		**130** j	94 U	**180** j				96 U
Benzyl alcohol	SW8270D	ug/kg	18 UJ	5.6 U		5.6 U	6 U		5.9 U	5.7 U	5.8 U				5.8 U
Benzyl butyl phthalate	SW8270D	ug/kg	18 U	5.6 U		5.7 U	6.1 U		6 U	5.7 U	5.9 U				5.8 U
Bis(2-chloroethoxy)methane	SW8270D	ug/kg	5.7 U	1.8 U		1.9 U	2 U		2 U	1.9 U	1.9 U				1.9 U
Bis(2-ethylhexyl)phthalate	SW8270D	ug/kg	42 U	13 U		24 U	25 U		25 U	14 U	63 U				24 U
Carbazole	SW8270D	ug/kg	7.7 U	2.5 U		2.5 U	2.7 U		2.6 U	2.5 U	2.6 U				2.6 U
Chrysene	SW8270D-SIM	ug/kg	**2.6** j	**5.4**		**7.7**	**2.7** j		**12**	**4.5** j	**19**				1.7 U
Dibenzo(a,h)anthracene	SW8270D-SIM	ug/kg	2.3 U	2.2 U		2.1 U	2.3 U		2.3 U	2.2 U	**2.4** j				2.2 U

Table 2

Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location				**GP-58**			**GP-59**				**GP-61**		
		Sample Date	**10/10/2012**	**10/10/2012**	**8/31/2012**	**10/8/2012**	**10/8/2012**	**8/31/2012**	**10/10/2012**	**10/10/2012**	**10/10/2012**	**9/6/2012**	**9/6/2012**	**9/6/2012**	**10/12/2012**
		Sample ID	**GP-56-5.2-7.2**	**GP-56-7.2-9.5**	**GP-58-1.75-3.75**	**GP-58-4.25-6.25**	**GP-58-8.25-10.5**	**GP-59-2.3-3.9**	**GP-59-4.25-6.25**	**GP-59-8.25-10.25**	**GP-59-10.25-11.5**	**GP-61-0-2**	**GP-61-2.5-4.5**	**DUP-090612-1**	**GP-61-4.5-7.5**
		Sample Depth	**5.2 - 7.2 ft**	**7.2 - 9.5 ft**	**1.75 - 3.75 ft**	**4.25 - 6.25 ft**	**8.25 - 10.5 ft**	**2.3 - 3.9 ft**	**4.25 - 6.25 ft**	**8.25 - 10.25 ft**	**10.25 - 11.5 ft**	**0 - 2 ft**	**2.5 - 4.5 ft**	**2.5 - 4.5 ft**	**4.5 - 7.5 ft**
Dibenzofuran	SW8270D-SIM	ug/kg	1.4 U	**3.7** j		**4.3** j	1.4 U		**12**	**3.9** j	**27**				1.4 U
Dibutyl phthalate	SW8270D	ug/kg	23 U	7.5 U		7.6 U	8.1 U		8 U	7.6 U	7.8 U				7.8 U
Dichloroethyl ether	SW8270D	ug/kg	9.6 U	3.1 U		3.1 U	3.3 U		3.3 U	3.1 U	3.2 U				3.2 U
Diethyl phthalate	SW8270D	ug/kg	110 U	34 U		34 U	36 U		36 U	34 U	35 U				35 U
Dimethylphthalate	SW8270D	ug/kg	8.3 U	2.7 U		2.7 U	2.9 U		2.8 U	2.7 U	2.8 U				2.8 U
Dinitro-o-cresol	SW8270D	ug/kg	61 U	19 U		20 U	21 U		21 U	20 U	20 U				20 U
Di-n-octyl phthalate	SW8270D	ug/kg	17 U	5.4 U		5.4 U	5.8 U		5.7 U	5.4 U	5.6 U				5.6 U
Fluoranthene	SW8270D-SIM	ug/kg	**3.6** j	**12**		**23**	**8.4**		**22**	**15**	**78**				**2.4** j
Fluorene	SW8270D-SIM	ug/kg	1.2 U	**3.3** j		**2.8** j	1.2 U		**5.8**	**3.7** j	**29**				1.2 U
Hexachlorobenzene	SW8270D	ug/kg	**89**	3.9 U		4 U	4.2 U		4.2 U	4 U	4.1 U				4.1 U
Hexachlorobutadiene	SW8270D	ug/kg	13 U	4.2 U		4.2 U	4.5 U		4.5 U	4.2 U	4.4 U				4.4 U
Hexachlorocyclopentadiene	SW8270D	ug/kg	190 U	61 U		61 U	66 U		65 U	62 U	63 U				63 U
Hexachloroethane	SW8270D	ug/kg	8.4 U	2.7 U		2.7 U	2.9 U		2.9 U	2.7 U	2.8 U				2.8 U
Indeno(1,2,3-cd)pyrene	SW8270D-SIM	ug/kg	3.3 U	3.2 U		3.1 U	3.3 U		3.4 U	3.2 U	**11**				3.2 U
Isophorone	SW8270D	ug/kg	8.2 U	2.6 U		2.6 U	2.8 U		2.8 U	2.7 U	2.7 U				2.7 U
Naphthalene	SW8270D-SIM	ug/kg	**4.3** j	**8.3**		**22**	**4.4** j		**57**	**24**	**160**				2.4 U
Nitrobenzene	SW8270D	ug/kg	12 U	3.7 U		3.8 U	4 U		4 U	3.8 U	3.9 U				3.9 U
n-Nitrosodi-n-propylamine	SW8270D	ug/kg	9.7 U	3.1 U		3.1 U	3.3 U		3.3 U	3.1 U	3.2 U				3.2 U
n-Nitrosodiphenylamine	SW8270D	ug/kg	15 U	5 U		5 U	5.3 U		5.3 U	5 U	5.1 U				5.1 U
o-Cresol	SW8270D	ug/kg	15 U	4.8 U		4.9 U	5.2 U		5.1 U	4.9 U	5 U				5 U
p-Chloroaniline	SW8270D	ug/kg	64 U	20 U		21 U	22 U		22 U	21 U	21 U				21 U
p-Cresol	SW8270D	ug/kg	19 U	**34** j		**67**	**38** j		**390**	**84**	**500**				6.3 U
Pentachlorophenol	SW8270D	ug/kg	**5100**	**18000**	140 U	45 U	48 U	**85** j	**79** j	45 U	46 U	**130** j	48 U	48 U	**880**
Phenanthrene	SW8270D-SIM	ug/kg	**4.4** j	**11**		**21**	**6**		**37**	**18**	**94**				1.8 U
Phenol	SW8270D	ug/kg	25 UJ	**96**	**840**	8 U	**12** j	**43**	**210**	8 U	**110**	8.2 U	8.5 U	8.5 U	**40**
p-Nitroaniline	SW8270D	ug/kg	110 U	35 U		35 U	37 U		37 U	35 U	36 U				36 UJ
Pyrene	SW8270D-SIM	ug/kg	**3.9** j	**12**		**17**	**7.4**		**21**	**14**	**76**				**2.9** j
Total (B+J+K) Benzofluoranthenes	SW8270D-SIM	ug/kg	1.8 U	**3.9** j		**11**	1.8 U		**12**	**6.9**	**29**				1.7 U

Table 2
Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location		**GP-62**						**GP-63**				**GP-64**	
		Sample Date	**10/12/2012**	**9/5/2012**	**9/5/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**
		Sample ID	**GP-61-7.5-8.5**	**GP-62-0-2**	**GP-62-3-5**	**GP-62-5-6.7**	**DUP101212-1**	**GP-62-6.7-7.7**	**DUP101212-2**	**GP-63-4-6**	**DUP101212-3**	**GP-63-6-8**	**GP-63-8-9**	**GP-64-4.3-6**	**GP-64-6-7**
		Sample Depth	**7.5 - 8.5 ft**	**0 - 2 ft**	**3 - 5 ft**	**5 - 6.7 ft**	**5 - 6.7 ft**	**6.7 - 7.7 ft**	**6.7 - 7.7 ft**	**4 - 6 ft**	**4 - 6 ft**	**6 - 8 ft**	**8 - 9 ft**	**4.3 - 6 ft**	**6 - 7 ft**
1,2,4-Trichlorobenzene	SW8270D	ug/kg	3.3 U			3.2 U	3.2 U	3.2 U	3.4 U	19 U	20 U	10 U	3.3 U	3.3 U	3.2 U
1,2-Dichlorobenzene	SW8270D	ug/kg	2.4 U			2.3 U	2.3 U	2.3 U	2.5 U	14 U	14 U	7.2 U	2.4 U	2.3 U	2.3 U
1,3-Dichlorobenzene	SW8270D	ug/kg	2.5 U			2.4 U	2.4 U	2.4 U	2.6 U	15 U	15 U	7.6 U	2.5 U	2.5 U	2.5 U
1,4-Dichlorobenzene	SW8270D	ug/kg	2.7 U			2.6 U	2.6 U	2.7 U	2.8 U	16 U	17 U	8.2 U	2.7 U	2.7 U	2.7 U
1-Methylnaphthalene	SW8270D-SIM	ug/kg	**6.7**			**4.9**	**4.6** j	**18**	**10**	**120**	**140**	**210**	**10**	**8.7**	**8.4**
2,2-Oxybis(1-chloropropane)	SW8270D	ug/kg	3.5 U			3.5 U	3.5 U	3.5 U	3.7 U	21 U	22 U	11 U	3.5 U	3.5 U	3.5 U
2,3,4,6-Tetrachlorophenol	SW8270D	ug/kg		28 U	4.4 U										
2,4,5-Trichlorophenol	SW8270D	ug/kg	**25** j	130 U	20 U	20 U	20 U	20 U	21 U	120 U	120 U	62 U	20 U	20 U	20 U
2,4,6-Trichlorophenol	SW8270D	ug/kg	**67** j	130 U	21 U	21 U	21 U	21 U	22 U	120 U	130 U	64 U	21 U	21 U	21 U
2,4-Dichlorophenol	SW8270D	ug/kg	**260**	130 U	20 U	20 U	20 U	20 U	21 U	120 U	120 U	62 U	20 U	20 U	**30** j
2,4-Dimethylphenol	SW8270D	ug/kg	3.3 U			3.2 U	3.2 U	3.2 U	3.4 U	19 U	20 U	10 U	3.3 U	3.2 U	3.2 U
2,4-Dinitrophenol	SW8270D	ug/kg	100 U			100 U	100 U	100 U	110 U	620 U	640 U	320 U	100 U	100 U	100 U
2,4-Dinitrotoluene	SW8270D	ug/kg	18 U			18 U	18 U	18 U	19 U	110 U	110 U	56 U	18 U	18 U	18 U
2,6-Dinitrotoluene	SW8270D	ug/kg	29 U			28 U	28 U	28 U	30 U	170 U	180 U	88 U	29 U	29 U	29 U
2-Chloronaphthalene	SW8270D	ug/kg	2.5 U			2.4 U	2.4 U	2.5 U	2.6 U	15 U	15 U	7.6 U	2.5 U	2.5 U	2.5 U
2-Chlorophenol	SW8270D	ug/kg	**88**	14 U	2.2 U	2.2 U	2.2 U	2.2 U	2.4 U	13 U	14 U	6.9 U	2.3 U	2.2 U	**49**
2-Methylnaphthalene	SW8270D-SIM	ug/kg	**6.7**			**4.5** j	**5**	**8.4**	**4.5** j	**220**	**210**	**230**	**6.7**	**12**	**7.6**
2-Nitroaniline	SW8270D	ug/kg	17 U			17 U	17 U	17 U	18 U	100 U	110 U	53 U	17 U	17 U	17 U
2-Nitrophenol	SW8270D	ug/kg	36 U			36 U	36 U	36 U	38 U	210 U	220 U	110 U	36 U	36 U	36 U
3,3'-Dichlorobenzidine (and its salts)	SW8270D	ug/kg	17 UJ			16 UJ	16 UJ	17 UJ	18 UJ	99 U	100 U	51 U	17 U	17 UJ	17 U
3-Nitroaniline	SW8270D	ug/kg	21 U			21 U	21 U	21 U	22 U	120 U	130 U	65 U	21 U	21 U	21 U
4-Bromophenyl phenyl ether	SW8270D	ug/kg	4.7 U			4.6 U	4.6 U	4.7 U	5 U	28 U	29 U	14 U	4.7 U	4.7 U	4.7 U
4-Chloro-3-methylphenol	SW8270D	ug/kg	14 U			14 U	14 U	14 U	15 U	84 U	87 U	43 U	14 U	14 U	14 U
4-Chlorophenyl phenyl ether	SW8270D	ug/kg	5 U			4.9 U	4.9 U	4.9 U	5.2 U	29 U	31 U	15 U	5 U	5 U	4.9 U
4-Nitrophenol	SW8270D	ug/kg	33 U			32 U	32 U	32 U	34 U	190 U	200 U	100 U	33 U	32 U	32 U
Acenaphthene	SW8270D-SIM	ug/kg	**7.2**			**3.7** j	**4.4** j	**20**	**15**	**60**	**58**	**260**	**6.4**	**16**	**20**
Acenaphthylene	SW8270D-SIM	ug/kg	**5.1**			**6.1**	**3.9** j	**7.3**	**4.9** j	**960**	**1500**	**440**	**2.4** j	**25**	**7.4**
Anthracene	SW8270D-SIM	ug/kg	**8.7**			**3** j	**2.7** j	**6.9**	**4.8** j	**300**	**340**	**430**	**3.1** j	**19**	**7.6**
Benzo(a)anthracene	SW8270D-SIM	ug/kg	**9.1**			**8.5**	**5.9**	**4.4** j	1.6 U	**2300**	**2800**	**860**	**3.8** j	**73**	**7.5**
Benzo(a)pyrene	SW8270D-SIM	ug/kg	**8.8**			**15**	**8.8**	**4.5** j	1.7 U	**4700**	**6600**	**1300**	**5.2**	**90**	**7.6**
Benzo(g,h,i)perylene	SW8270D-SIM	ug/kg	**9.2**			**11**	**5.4**	**7.5**	3 U	**2700**	**3900**	**630**	**5.2**	**50**	**8.1**
Benzoic acid	SW8270D	ug/kg	**180** j			93 U	93 U	94 U	99 U	560 U	580 U	290 U	95 U	95 U	**130** j
Benzyl alcohol	SW8270D	ug/kg	5.7 U			5.6 U	5.6 U	5.7 U	6 U	34 U	35 U	18 U	5.7 U	**44**	5.7 U
Benzyl butyl phthalate	SW8270D	ug/kg	5.8 U			5.7 U	5.6 U	5.7 U	6 U	34 U	36 U	18 U	5.8 U	5.7 U	5.7 U
Bis(2-chloroethoxy)methane	SW8270D	ug/kg	1.9 U			1.8 U	1.8 U	1.9 U	2 U	11 U	12 U	5.8 U	1.9 U	1.9 U	1.9 U
Bis(2-ethylhexyl)phthalate	SW8270D	ug/kg	24 U			23 U	23 U	23 U	25 U	81 U	85 U	42 U	14 U	23 U	23 U
Carbazole	SW8270D	ug/kg	2.5 U			2.5 U	2.5 U	2.5 U	**16** j	**100** j	**93** j	**60**	2.5 U	2.5 U	2.5 U
Chrysene	SW8270D-SIM	ug/kg	**9.6**			**14**	**11**	**7.3**	**3.2** j	**3900**	**5000**	**1300**	**6.2**	**110**	**10**
Dibenzo(a,h)anthracene	SW8270D-SIM	ug/kg	2.2 U			**3.5** j	2.2 U	2.2 U	2.3 U	**720**	**870**	**180**	2.2 U	**13**	2.2 U

Table 2

Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location		GP-62						GP-63				GP-64	
		Sample Date	10/12/2012	9/5/2012	9/5/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012
		Sample ID	GP-61-7.5-8.5	GP-62-0-2	GP-62-3-5	GP-62-5-6.7	DUP101212-1	GP-62-6.7-7.7	DUP101212-2	GP-63-4-6	DUP101212-3	GP-63-6-8	GP-63-8-9	GP-64-4.3-6	GP-64-6-7
		Sample Depth	7.5 - 8.5 ft	0 - 2 ft	3 - 5 ft	5 - 6.7 ft	5 - 6.7 ft	6.7 - 7.7 ft	6.7 - 7.7 ft	4 - 6 ft	4 - 6 ft	6 - 8 ft	8 - 9 ft	4.3 - 6 ft	6 - 7 ft
Dibenzofuran	SW8270D-SIM	ug/kg	**8.8**			1.4 U	1.4 U	**6.3**	**3.8** j	**51**	**100**	**96**	**4.4** j	**5.6**	**6.8**
Dibutyl phthalate	SW8270D	ug/kg	7.7 U			7.5 U	7.5 U	7.6 U	8 U	45 U	47 U	23 U	7.7 U	7.6 U	7.6 U
Dichloroethyl ether	SW8270D	ug/kg	3.2 U			3.1 U	3.1 U	3.1 U	3.3 U	19 U	19 U	9.6 U	3.2 U	3.1 U	3.1 U
Diethyl phthalate	SW8270D	ug/kg	34 U			34 U	34 U	34 U	36 U	200 U	210 U	110 U	34 U	34 U	34 U
Dimethylphthalate	SW8270D	ug/kg	2.7 U			2.7 U	2.7 U	2.7 U	2.9 U	16 U	17 U	8.3 U	2.7 U	2.7 U	2.7 U
Dinitro-o-cresol	SW8270D	ug/kg	20 U			20 U	20 U	20 U	21 U	120 U	120 U	61 U	20 U	20 U	20 U
Di-n-octyl phthalate	SW8270D	ug/kg	5.5 U			5.4 U	5.4 U	5.4 U	5.7 U	32 U	34 U	17 U	5.5 U	5.5 U	5.5 U
Fluoranthene	SW8270D-SIM	ug/kg	**41**			**11**	**9.8**	**22**	**9.1**	**2200**	**3400**	**1700**	**12**	**120**	**31**
Fluorene	SW8270D-SIM	ug/kg	**7.6**			**3.8** j	**4.2** j	**15**	**11**	**110**	**140**	**370**	**3** j	**11**	**9.4**
Hexachlorobenzene	SW8270D	ug/kg	4 U			4 U	3.9 U	4 U	4.2 U	24 U	25 U	12 U	4 U	4 U	4 U
Hexachlorobutadiene	SW8270D	ug/kg	4.3 U			4.2 U	4.2 U	4.3 U	4.5 U	25 U	26 U	13 U	4.3 U	4.3 U	4.3 U
Hexachlorocyclopentadiene	SW8270D	ug/kg	63 U			61 U	61 U	62 U	65 U	370 U	380 U	190 U	63 U	62 U	62 U
Hexachloroethane	SW8270D	ug/kg	2.8 U			2.7 U	2.7 U	2.7 U	2.9 U	16 U	17 U	8.5 U	2.8 U	2.8 U	2.7 U
Indeno(1,2,3-cd)pyrene	SW8270D-SIM	ug/kg	**5.3**			**8.6**	**4.5** j	**5**	3.4 U	**2100**	**3300**	**540**	3.2 U	**39**	**5.5**
Isophorone	SW8270D	ug/kg	2.7 U			2.6 U	2.6 U	2.7 U	2.8 U	16 U	17 U	8.2 U	2.7 U	2.7 U	2.7 U
Naphthalene	SW8270D-SIM	ug/kg	**21**			**10**	**11**	**48**	**23**	**280**	**310**	**220**	**8.3**	**17**	**22**
Nitrobenzene	SW8270D	ug/kg	3.8 U			3.7 U	3.7 U	3.8 U	4 U	23 U	24 U	12 U	3.8 U	3.8 U	3.8 U
n-Nitrosodi-n-propylamine	SW8270D	ug/kg	3.2 U			3.1 U	3.1 U	3.1 U	3.3 U	19 U	19 U	9.7 U	3.2 U	3.1 U	3.1 U
n-Nitrosodiphenylamine	SW8270D	ug/kg	5.1 U			5 U	5 U	5 U	5.3 U	30 U	31 U	16 U	5.1 U	5 U	5 U
o-Cresol	SW8270D	ug/kg	4.9 U			4.8 U	4.8 U	4.9 U	5.2 U	29 U	30 U	15 U	4.9 U	4.9 U	4.9 U
p-Chloroaniline	SW8270D	ug/kg	21 U			21 U	21 U	21 U	22 U	120 U	130 U	64 U	21 U	21 U	21 U
p-Cresol	SW8270D	ug/kg	**19** j			6.1 U	6.1 U	**14** j	6.5 U	37 U	38 U	19 U	**17** j	6.2 U	**37**
Pentachlorophenol	SW8270D	ug/kg	**430**	280 U	44 U	45 U	45 U	**70** j	48 U	**280** j	280 U	140 U	**120** j	**59** j	**150** j
Phenanthrene	SW8270D-SIM	ug/kg	**27**			**3.9** j	**5.1**	**26**	**12**	**260**	**260**	**1400**	**12**	**34**	**29**
Phenol	SW8270D	ug/kg	**48**	51 U	7.9 U	8 U	8 U	8.1 U	**14** j	48 U	50 U	25 U	**28**	**10** j	**54**
p-Nitroaniline	SW8270D	ug/kg	36 UJ			35 UJ	35 UJ	35 UJ	37 UJ	210 U	220 U	110 U	36 U	35 UJ	35 U
Pyrene	SW8270D-SIM	ug/kg	**34**			**24**	**20**	**25**	**8.9**	**6100**	**7600**	**2700**	**13**	**200**	**30**
Total (B+J+K) Benzofluoranthenes	SW8270D-SIM	ug/kg	**18**			**20**	**14**	**11**	1.8 U	**5200**	**7300**	**1400**	**8.9**	**110**	**16**

Table 2

Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location	GP-65		GP-66			
		Sample Date	**10/12/2012**	**10/12/2012**	**9/10/2012**	**9/10/2012**	**10/11/2012**	**10/11/2012**
		Sample ID	**GP-65-4-6**	**GP-65-6-7**	**GP-66-0.6-2.6**	**GP-66-3.75-5.75**	**GP-66-5.75-7.75**	**GP-66-7.75-8.4**
		Sample Depth	**4 - 6 ft**	**6 - 7 ft**	**0.6 - 2.6 ft**	**3.75 - 5.75 ft**	**5.75 - 7.75 ft**	**7.75 - 8.4 ft**
1,2,4-Trichlorobenzene	SW8270D	ug/kg	3.3 U	3.2 U			3.3 U	3.3 U
1,2-Dichlorobenzene	SW8270D	ug/kg	2.4 U	2.3 U			2.4 U	2.4 U
1,3-Dichlorobenzene	SW8270D	ug/kg	2.5 U	2.4 U			2.5 U	2.5 U
1,4-Dichlorobenzene	SW8270D	ug/kg	2.7 U	2.6 U			2.7 U	2.8 U
1-Methylnaphthalene	SW8270D-SIM	ug/kg	**5.4**	**6**			1.6 U	**9.8**
2,2-Oxybis(1-chloropropane)	SW8270D	ug/kg	3.6 U	3.5 U			3.6 U	3.6 U
2,3,4,6-Tetrachlorophenol	SW8270D	ug/kg			**48**	4.6 U		
2,4,5-Trichlorophenol	SW8270D	ug/kg	20 U	20 U	20 U	20 U	20 U	21 U
2,4,6-Trichlorophenol	SW8270D	ug/kg	21 U	**42** j	**32** j	21 U	21 U	**33** j
2,4-Dichlorophenol	SW8270D	ug/kg	21 U	**120** j	20 U	20 U	20 U	**120** j
2,4-Dimethylphenol	SW8270D	ug/kg	3.3 U	3.2 U			3.3 U	3.3 U
2,4-Dinitrophenol	SW8270D	ug/kg	110 U	100 U			110 U	110 U
2,4-Dinitrotoluene	SW8270D	ug/kg	19 U	18 U			19 U	19 U
2,6-Dinitrotoluene	SW8270D	ug/kg	29 U	28 U			29 U	29 U
2-Chloronaphthalene	SW8270D	ug/kg	2.5 U	2.4 U			2.5 U	2.5 U
2-Chlorophenol	SW8270D	ug/kg	2.3 U	**18**	2.2 U	2.2 U	2.3 U	**78**
2-Methylnaphthalene	SW8270D-SIM	ug/kg	**2.4** j	**6.7**			1.4 U	**8.5**
2-Nitroaniline	SW8270D	ug/kg	18 U	17 U			17 U	18 U
2-Nitrophenol	SW8270D	ug/kg	37 U	36 U			37 U	37 U
3,3'-Dichlorobenzidine (and its salts)	SW8270D	ug/kg	17 U	16 U			17 UJ	17 UJ
3-Nitroaniline	SW8270D	ug/kg	22 U	21 U			21 U	22 U
4-Bromophenyl phenyl ether	SW8270D	ug/kg	4.8 U	4.6 U			4.8 U	4.8 U
4-Chloro-3-methylphenol	SW8270D	ug/kg	14 U	14 U			14 U	15 U
4-Chlorophenyl phenyl ether	SW8270D	ug/kg	5.1 U	4.9 U			5 U	5.1 U
4-Nitrophenol	SW8270D	ug/kg	33 U	32 U			33 U	33 U
Acenaphthene	SW8270D-SIM	ug/kg	**6.1**	**8.6**			1.2 U	**6.6**
Acenaphthylene	SW8270D-SIM	ug/kg	**4.7** j	**2.8** j			1.2 U	**6.7**
Anthracene	SW8270D-SIM	ug/kg	1.4 U	**6.5**			1.4 U	**7.2**
Benzo(a)anthracene	SW8270D-SIM	ug/kg	**7.5**	**6.9**			1.5 U	**6.8**
Benzo(a)pyrene	SW8270D-SIM	ug/kg	**12**	**6.3**			1.6 U	**8.4**
Benzo(g,h,i)perylene	SW8270D-SIM	ug/kg	**7**	**6.2**			2.9 U	**9.8**
Benzoic acid	SW8270D	ug/kg	97 U	**110** j			96 U	**180** j
Benzyl alcohol	SW8270D	ug/kg	5.8 U	5.6 U			5.8 U	5.9 U
Benzyl butyl phthalate	SW8270D	ug/kg	5.9 U	5.6 U			5.8 U	5.9 U
Bis(2-chloroethoxy)methane	SW8270D	ug/kg	1.9 U	1.8 U			1.9 U	1.9 U
Bis(2-ethylhexyl)phthalate	SW8270D	ug/kg	24 U	23 U			14 U	14 U
Carbazole	SW8270D	ug/kg	2.6 U	2.5 U			2.6 UJ	2.6 UJ
Chrysene	SW8270D-SIM	ug/kg	**11**	**8**			1.8 U	**10**
Dibenzo(a,h)anthracene	SW8270D-SIM	ug/kg	**3.3** j	2.2 U			2.2 U	2.3 U

Table 2
Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

			GP-65		GP-66			
		Sample Location	**GP-65**		**GP-66**			
		Sample Date	**10/12/2012**	**10/12/2012**	**9/10/2012**	**9/10/2012**	**10/11/2012**	**10/11/2012**
		Sample ID	**GP-65-4-6**	**GP-65-6-7**	**GP-66-0.6-2.6**	**GP-66-3.75-5.75**	**GP-66-5.75-7.75**	**GP-66-7.75-8.4**
		Sample Depth	**4 - 6 ft**	**6 - 7 ft**	**0.6 - 2.6 ft**	**3.75 - 5.75 ft**	**5.75 - 7.75 ft**	**7.75 - 8.4 ft**
Dibenzofuran	SW8270D-SIM	ug/kg	1.4 U	**6**			1.4 U	**9.4**
Dibutyl phthalate	SW8270D	ug/kg	7.8 U	7.5 U			7.8 U	7.9 U
Dichloroethyl ether	SW8270D	ug/kg	3.2 U	3.1 U			3.2 U	3.2 U
Diethyl phthalate	SW8270D	ug/kg	35 U	34 U			35 U	35 U
Dimethylphthalate	SW8270D	ug/kg	2.8 U	2.7 U			2.8 U	2.8 U
Dinitro-o-cresol	SW8270D	ug/kg	20 U	20 U			20 U	20 U
Di-n-octyl phthalate	SW8270D	ug/kg	5.6 U	5.4 U			5.6 U	5.6 U
Fluoranthene	SW8270D-SIM	ug/kg	**14**	**31**			1.7 U	**38**
Fluorene	SW8270D-SIM	ug/kg	**2.6** j	**8.2**			1.2 U	**8.4**
Hexachlorobenzene	SW8270D	ug/kg	4.1 U	3.9 U			4.1 U	4.1 U
Hexachlorobutadiene	SW8270D	ug/kg	4.4 U	4.2 U			4.3 U	4.4 U
Hexachlorocyclopentadiene	SW8270D	ug/kg	64 U	61 U			63 U	64 U
Hexachloroethane	SW8270D	ug/kg	2.8 U	2.7 U			2.8 U	2.8 U
Indeno(1,2,3-cd)pyrene	SW8270D-SIM	ug/kg	**5.5**	**4.9**			3.3 U	**7.2**
Isophorone	SW8270D	ug/kg	2.7 U	2.6 U			2.7 U	2.8 U
Naphthalene	SW8270D-SIM	ug/kg	**5.5**	**20**			2.5 U	**32**
Nitrobenzene	SW8270D	ug/kg	3.9 U	3.7 U			3.9 U	3.9 U
n-Nitrosodi-n-propylamine	SW8270D	ug/kg	3.2 U	3.1 U			3.2 U	3.2 U
n-Nitrosodiphenylamine	SW8270D	ug/kg	5.2 U	5 U			5.1 U	5.2 U
o-Cresol	SW8270D	ug/kg	5 U	4.8 U			5 U	5.1 U
p-Chloroaniline	SW8270D	ug/kg	21 U	21 U			21 U	21 U
p-Cresol	SW8270D	ug/kg	6.3 U	**18** j			6.3 U	**28** j
Pentachlorophenol	SW8270D	ug/kg	**50** j	**680**	**270**	46 U	46 U	**77** j
Phenanthrene	SW8270D-SIM	ug/kg	**5.2**	**20**			**2.9** j	**35**
Phenol	SW8270D	ug/kg	8.3 U	**54**	**21**	8.1 U	8.2 U	**130**
p-Nitroaniline	SW8270D	ug/kg	36 U	35 U			36 U	36 U
Pyrene	SW8270D-SIM	ug/kg	**24**	**26**			2.1 U	**36**
Total (B+J+K) Benzofluoranthenes	SW8270D-SIM	ug/kg	**15**	**14**			1.7 U	**22**

Table 2
Semi-volatile Organic Compounds, 2012 Upland Soil Sampling Event

Notes and Key:

% = Percent

Bold text indicates that compound was detected.

Cells are left blank where compound was not analyzed

ft = Feet

mg/kg = Milligrams per kilogram

ug/kg = Micrograms per kilogram

Data Qualifiers:

j = The value reported is below the routine reporting limit and should be considered an estimate; qualifier reported by the Laboratory
J = Detected sample result qualified as estimated

J- = Detected sample result qualified as estimated and biased low

J+ = Detected sample result qualified as estimated and biased high

U = Result is ≤ the detection limit. Organic compounds are reported to the Method Detection Limit (MDL) and other parameters are reported to the Reporting Limit (RL). Result reported as the MDL or RL and is qualified as non detected. If qualified as non-detect due to a detection in associated blank samples, than MDL or RL has been revised, as applicable.
UJ = Nondetected sample result qualified as estimated

Table 3
Volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location	**GP-27**			**GP-28**				**GP-29**				
		Sample Date	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/8/2012**
		Sample ID	**GP-27-5.3**	**DUP101112-1A**	**GP-27-7.3**	**GP-28-5.1**	**DUP101112-2A**	**GP-28-7.1**	**DUP101112-3A**	**GP-29-3.9**	**GP-29-5.9**	**GP-29-7.9**	**GP-29-10**	**GP-36-8**
		Sample Depth	**5.3 - 5.3 ft**	**5.3 - 5.3 ft**	**7.3 - 7.3 ft**	**5.1 - 5.1 ft**	**5.1 - 5.1 ft**	**7.1 - 7.1 ft**	**7.1 - 7.1 ft**	**3.9 - 3.9 ft**	**5.9 - 5.9 ft**	**7.9 - 7.9 ft**	**10 - 10 ft**	**8 - 8 ft**
1,1,1,2-Tetrachloroethane	SW8260C	ug/kg												
1,1,1-Trichloroethane	SW8260C	ug/kg												
1,1,2,2-Tetrachloroethane	SW8260C	ug/kg												
1,1,2-Trichloroethane	SW8260C	ug/kg												
1,1-Dichloroethane	SW8260C	ug/kg												
1,1-Dichloroethene	SW8260C	ug/kg												
1,1-Dichloropropene	SW8260C	ug/kg												
1,2,3-Trichlorobenzene	SW8260C	ug/kg												
1,2,3-Trichloropropane	SW8260C	ug/kg												
1,2,4-Trichlorobenzene	SW8260C	ug/kg												
1,2,4-Trimethylbenzene	SW8260C	ug/kg												
1,2-Dibromo-3-chloropropane	SW8260C	ug/kg												
1,2-Dichlorobenzene	SW8260C	ug/kg												
1,2-Dichloroethane	SW8260C	ug/kg												
1,2-Dichloropropane	SW8260C	ug/kg												
1,3,5-Trimethylbenzene	SW8260C	ug/kg												
1,3-Dichlorobenzene	SW8260C	ug/kg												
1,3-Dichloropropane	SW8260C	ug/kg												
1,4-Dichlorobenzene	SW8260C	ug/kg												
2,2-Dichloropropane	SW8260C	ug/kg												
2-Butanone	SW8260C	ug/kg												
2-Chloroethyl vinyl ether	SW8260C	ug/kg												
2-Hexanone	SW8260C	ug/kg												
2-Phenylbutane	SW8260C	ug/kg												
4-Chlorotoluene	SW8260C	ug/kg												
4-Methyl-2-pentanone	SW8260C	ug/kg												
Acetone	SW8260C	ug/kg												
Acrolein	SW8260C	ug/kg												
Acrylonitrile	SW8260C	ug/kg												
Benzene	SW8260C	ug/kg	0.7 U	0.7 U	0.7 U	**13**	**12**	0.7 U	0.7 U	0.7 U	0.7 U	0.8 U	0.7 U	1.1 U
Bromobenzene	SW8260C	ug/kg												
Bromodichloromethane	SW8260C	ug/kg												
Bromoform	SW8260C	ug/kg												
Carbon disulfide	SW8260C	ug/kg												
Carbon tetrachloride	SW8260C	ug/kg												
Chlorobenzene	SW8260C	ug/kg												
Chlorobromomethane	SW8260C	ug/kg												
Chloroethane	SW8260C	ug/kg												
Chloroform	SW8260C	ug/kg												

Table 3

Volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location	**GP-27**			**GP-28**				**GP-29**				
		Sample Date	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/11/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/8/2012**
		Sample ID	**GP-27-5.3**	**DUP101112-1A**	**GP-27-7.3**	**GP-28-5.1**	**DUP101112-2A**	**GP-28-7.1**	**DUP101112-3A**	**GP-29-3.9**	**GP-29-5.9**	**GP-29-7.9**	**GP-29-10**	**GP-36-8**
		Sample Depth	**5.3 - 5.3 ft**	**5.3 - 5.3 ft**	**7.3 - 7.3 ft**	**5.1 - 5.1 ft**	**5.1 - 5.1 ft**	**7.1 - 7.1 ft**	**7.1 - 7.1 ft**	**3.9 - 3.9 ft**	**5.9 - 5.9 ft**	**7.9 - 7.9 ft**	**10 - 10 ft**	**8 - 8 ft**
cis-1,2-Dichloroethene	SW8260C	ug/kg												
cis-1,3-Dichloropropene	SW8260C	ug/kg												
Cumene	SW8260C	ug/kg												
Cymene	SW8260C	ug/kg												
Dibromochloromethane	SW8260C	ug/kg												
Dibromomethane	SW8260C	ug/kg												
Ethyl bromide	SW8260C	ug/kg												
Ethylbenzene	SW8260C	ug/kg	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.8 U	0.7 U	1.1 U
Ethylene dibromide	SW8260C	ug/kg												
Freon 11	SW8260C	ug/kg												
Freon 113	SW8260C	ug/kg												
Hexachlorobutadiene	SW8260C	ug/kg												
m,p Xylenes	SW8260C	ug/kg	0.7 U	0.7 U	0.7 U	**0.5** j	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.8 U	0.7 U	1.1 U
Methyl bromide	SW8260C	ug/kg												
Methyl chloride	SW8260C	ug/kg												
Methyl iodide	SW8260C	ug/kg												
Methyl tert-butyl ether	SW8260C	ug/kg												
Methylene chloride	SW8260C	ug/kg												
Naphthalene	SW8260C	ug/kg												
n-Butylbenzene	SW8260C	ug/kg												
n-Propylbenzene	SW8260C	ug/kg												
o-Chlorotoluene	SW8260C	ug/kg												
o-Xylene	SW8260C	ug/kg	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.8 U	0.7 U	1.1 U
Styrene	SW8260C	ug/kg												
Tert-Butylbenzene	SW8260C	ug/kg												
Tetrachloroethene	SW8260C	ug/kg												
Toluene	SW8260C	ug/kg	0.7 U	0.7 U	0.7 U	**0.7**	**0.4** j	0.7 U	0.7 U	0.7 U	0.7 U	0.8 U	0.7 U	1.1 U
trans-1,2-Dichloroethene	SW8260C	ug/kg												
trans-1,3-Dichloropropene	SW8260C	ug/kg												
trans-1,4-Dichlorobutene	SW8260C	ug/kg												
Trichloroethene	SW8260C	ug/kg												
Vinyl acetate	SW8260C	ug/kg												
Vinyl chloride	SW8260C	ug/kg												

Table 3
Volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location	GP-36		GP-39			GP-44			GP-45			GP-46
		Sample Date	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**
		Sample ID	**GP-36-10**	**GP-36-11.5**	**GP-39-5.5**	**GP-39-7.5**	**GP-39-11**	**GP-44-5.8**	**GP-44-7.8**	**GP-44-10**	**GP-45-5.5**	**GP-45-7.5**	**GP-45-9**	**GP-46-6.2**
		Sample Depth	**10 - 10 ft**	**11.5 - 11.5 ft**	**5.5 - 5.5 ft**	**7.5 - 7.5 ft**	**11 - 11 ft**	**5.8 - 5.8 ft**	**7.8 - 7.8 ft**	**10 - 10 ft**	**5.5 - 5.5 ft**	**7.5 - 7.5 ft**	**9 - 9 ft**	**6.2 - 6.2 ft**
1,1,1,2-Tetrachloroethane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,1,1-Trichloroethane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,1,2,2-Tetrachloroethane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,1,2-Trichloroethane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,1-Dichloroethane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,1-Dichloroethene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,1-Dichloropropene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,2,3-Trichlorobenzene	SW8260C	ug/kg			4 U	3.4 U	4.1 U							
1,2,3-Trichloropropane	SW8260C	ug/kg			1.6 U	1.3 U	1.6 U							
1,2,4-Trichlorobenzene	SW8260C	ug/kg			4 U	3.4 U	4.1 U							
1,2,4-Trimethylbenzene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,2-Dibromo-3-chloropropane	SW8260C	ug/kg			4 U	3.4 U	4.1 U							
1,2-Dichlorobenzene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,2-Dichloroethane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,2-Dichloropropane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,3,5-Trimethylbenzene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,3-Dichlorobenzene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,3-Dichloropropane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
1,4-Dichlorobenzene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
2,2-Dichloropropane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
2-Butanone	SW8260C	ug/kg			4 U	3.4 U	**2.5** j							
2-Chloroethyl vinyl ether	SW8260C	ug/kg			4 U	3.4 U	4.1 U							
2-Hexanone	SW8260C	ug/kg			4 U	3.4 U	4.1 U							
2-Phenylbutane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
4-Chlorotoluene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
4-Methyl-2-pentanone	SW8260C	ug/kg			4 U	3.4 U	4.1 U							
Acetone	SW8260C	ug/kg			6 U	9 U	**17** B							
Acrolein	SW8260C	ug/kg			40 U	34 U	41 U							
Acrylonitrile	SW8260C	ug/kg			4 U	3.4 U	4.1 U							
Benzene	SW8260C	ug/kg	0.9 U	1 U	**0.6** j	**1.2**	0.8 U	0.6 U	0.8 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Bromobenzene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Bromodichloromethane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Bromoform	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Carbon disulfide	SW8260C	ug/kg			0.8 U	**4.9**	**58**							
Carbon tetrachloride	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Chlorobenzene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Chlorobromomethane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Chloroethane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Chloroform	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							

Table 3
Volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location	**GP-36**		**GP-39**			**GP-44**			**GP-45**			**GP-46**
		Sample Date	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/8/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**	**10/9/2012**
		Sample ID	**GP-36-10**	**GP-36-11.5**	**GP-39-5.5**	**GP-39-7.5**	**GP-39-11**	**GP-44-5.8**	**GP-44-7.8**	**GP-44-10**	**GP-45-5.5**	**GP-45-7.5**	**GP-45-9**	**GP-46-6.2**
		Sample Depth	**10 - 10 ft**	**11.5 - 11.5 ft**	**5.5 - 5.5 ft**	**7.5 - 7.5 ft**	**11 - 11 ft**	**5.8 - 5.8 ft**	**7.8 - 7.8 ft**	**10 - 10 ft**	**5.5 - 5.5 ft**	**7.5 - 7.5 ft**	**9 - 9 ft**	**6.2 - 6.2 ft**
cis-1,2-Dichloroethene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
cis-1,3-Dichloropropene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Cumene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Cymene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Dibromochloromethane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Dibromomethane	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Ethyl bromide	SW8260C	ug/kg			1.6 U	1.3 U	1.6 U							
Ethylbenzene	SW8260C	ug/kg	0.9 U	1 U	0.8 U	0.7 U	0.8 U	0.6 U	0.8 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Ethylene dibromide	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Freon 11	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Freon 113	SW8260C	ug/kg			1.6 U	1.3 U	1.6 U							
Hexachlorobutadiene	SW8260C	ug/kg			4 U	3.4 U	4.1 U							
m,p Xylenes	SW8260C	ug/kg	0.9 U	1 U	0.8 U	0.7 U	0.8 U	0.6 U	0.8 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Methyl bromide	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Methyl chloride	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Methyl iodide	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Methyl tert-butyl ether	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Methylene chloride	SW8260C	ug/kg			2.2 U	1.3 U	1.9 U							
Naphthalene	SW8260C	ug/kg			4 UJ	3.4 UJ	4.1 UJ							
n-Butylbenzene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
n-Propylbenzene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
o-Chlorotoluene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
o-Xylene	SW8260C	ug/kg	0.9 U	1 U	0.8 U	0.7 U	0.8 U	0.6 U	0.8 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Styrene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Tert-Butylbenzene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Tetrachloroethene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Toluene	SW8260C	ug/kg	0.9 U	1 U	0.8 U	0.7 U	0.8 U	0.6 U	0.8 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
trans-1,2-Dichloroethene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
trans-1,3-Dichloropropene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
trans-1,4-Dichlorobutene	SW8260C	ug/kg			4 U	3.4 U	4.1 U							
Trichloroethene	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							
Vinyl acetate	SW8260C	ug/kg			4 U	3.4 U	4.1 U							
Vinyl chloride	SW8260C	ug/kg			0.8 U	0.7 U	0.8 U							

Table 3
Volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location		GP-50		GP-53				GP-61		GP-62		
		Sample Date	**10/9/2012**	**10/11/2012**	**10/11/2012**	**9/10/2012**	**9/10/2012**	**10/10/2012**	**10/10/2012**	**10/12/2012**	**10/12/2012**	**9/5/2012**	**9/5/2012**	**10/12/2012**
		Sample ID	**GP-46-8**	**GP-50-6.9**	**GP-50-7.25**	**GP-53-4**	**GP-53-5**	**GP-53-6.3**	**GP-53-8.3**	**GP-61-6**	**GP-61-8**	**GP-62-1**	**GP-62-4**	**GP-62-5.8**
		Sample Depth	**8 - 8 ft**	**6.9 - 6.9 ft**	**7.25 - 7.25 ft**	**4 - 4 ft**	**5 - 5 ft**	**6.3 - 6.3 ft**	**8.3 - 8.3 ft**	**6 - 6 ft**	**8 - 8 ft**	**1 - 1 ft**	**4 - 4 ft**	**5.8 - 5.8 ft**
1,1,1,2-Tetrachloroethane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,1,1-Trichloroethane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,1,2,2-Tetrachloroethane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,1,2-Trichloroethane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,1-Dichloroethane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,1-Dichloroethene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,1-Dichloropropene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,2,3-Trichlorobenzene	SW8260C	ug/kg				4.2 UJ	4.3 UJ	3.5 U	3.7 U	3.2 U	3.3 U	3.2 U	3.3 U	3.3 U
1,2,3-Trichloropropane	SW8260C	ug/kg				1.7 U	1.7 U	1.4 U	1.5 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
1,2,4-Trichlorobenzene	SW8260C	ug/kg				4.2 U	4.3 U	3.5 U	3.7 U	3.2 U	3.3 U	3.2 U	3.3 U	3.3 U
1,2,4-Trimethylbenzene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	**0.7** j	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,2-Dibromo-3-chloropropane	SW8260C	ug/kg				4.2 U	4.3 U	3.5 U	3.7 U	3.2 U	3.3 U	3.2 U	3.3 U	3.3 U
1,2-Dichlorobenzene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,2-Dichloroethane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,2-Dichloropropane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,3,5-Trimethylbenzene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,3-Dichlorobenzene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,3-Dichloropropane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
1,4-Dichlorobenzene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
2,2-Dichloropropane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
2-Butanone	SW8260C	ug/kg				4.2 U	4.3 U	3.5 U	3.7 U	3.2 U	3.3 U	**3.1** j	3.3 U	3.3 U
2-Chloroethyl vinyl ether	SW8260C	ug/kg				4.2 U	4.3 U	3.5 U	3.7 U	3.2 U	3.3 U	3.2 U	3.3 U	3.3 U
2-Hexanone	SW8260C	ug/kg				4.2 U	4.3 U	3.5 U	3.7 U	3.2 U	3.3 U	3.2 U	3.3 U	3.3 U
2-Phenylbutane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
4-Chlorotoluene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
4-Methyl-2-pentanone	SW8260C	ug/kg				4.2 U	4.3 U	3.5 U	3.7 U	3.2 U	3.3 U	3.2 U	3.3 U	3.3 U
Acetone	SW8260C	ug/kg				**11**	**10**	5.2 U	11 U	6.5 U	11 U	**52**	**11**	5 U
Acrolein	SW8260C	ug/kg				42 U	43 U	35 U	37 U	32 U	33 U	32 U	33 U	33 U
Acrylonitrile	SW8260C	ug/kg				4.2 U	4.3 U	3.5 U	3.7 U	3.2 U	3.3 U	3.2 U	3.3 U	3.3 U
Benzene	SW8260C	ug/kg	**0.5** j	0.7 U	**0.7** j	0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	**4.2**	0.7 U	0.7 U
Bromobenzene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Bromodichloromethane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Bromoform	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Carbon disulfide	SW8260C	ug/kg				**0.6** j	**1.8**	**11**	**27**	**9.1**	**2**	0.6 U	0.7 U	0.7 U
Carbon tetrachloride	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Chlorobenzene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Chlorobromomethane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Chloroethane	SW8260C	ug/kg				0.8 UJ	0.9 UJ	0.7 U	0.7 U	0.6 U	0.7 U	0.6 UJ	0.7 UJ	0.7 U
Chloroform	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	**0.8**	0.7 U	0.7 U

Table 3
Volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location		GP-50		GP-53				GP-61		GP-62		
		Sample Date	**10/9/2012**	**10/11/2012**	**10/11/2012**	**9/10/2012**	**9/10/2012**	**10/10/2012**	**10/10/2012**	**10/12/2012**	**10/12/2012**	**9/5/2012**	**9/5/2012**	**10/12/2012**
		Sample ID	**GP-46-8**	**GP-50-6.9**	**GP-50-7.25**	**GP-53-4**	**GP-53-5**	**GP-53-6.3**	**GP-53-8.3**	**GP-61-6**	**GP-61-8**	**GP-62-1**	**GP-62-4**	**GP-62-5.8**
		Sample Depth	**8 - 8 ft**	**6.9 - 6.9 ft**	**7.25 - 7.25 ft**	**4 - 4 ft**	**5 - 5 ft**	**6.3 - 6.3 ft**	**8.3 - 8.3 ft**	**6 - 6 ft**	**8 - 8 ft**	**1 - 1 ft**	**4 - 4 ft**	**5.8 - 5.8 ft**
cis-1,2-Dichloroethene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
cis-1,3-Dichloropropene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Cumene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Cymene	SW8260C	ug/kg				0.8 U	0.9 U	**0.4** j	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Dibromochloromethane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Dibromomethane	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Ethyl bromide	SW8260C	ug/kg				1.7 U	1.7 U	1.4 U	1.5 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Ethylbenzene	SW8260C	ug/kg	0.6 U	0.7 U	0.9 U	0.8 U	0.9 U	**0.6** j	**0.8**	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Ethylene dibromide	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	**0.4** j	0.7 U	0.6 U	0.7 U	0.7 U
Freon 11	SW8260C	ug/kg				0.8 UJ	0.9 UJ	0.7 U	0.7 U	0.6 U	0.7 U	0.6 UJ	0.7 UJ	0.7 U
Freon 113	SW8260C	ug/kg				1.7 U	1.7 U	1.4 U	1.5 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Hexachlorobutadiene	SW8260C	ug/kg				4.2 UJ	4.3 UJ	3.5 U	3.7 U	3.2 U	3.3 U	3.2 U	3.3 U	3.3 U
m,p Xylenes	SW8260C	ug/kg	0.6 U	0.7 U	0.9 U	0.8 U	0.9 U	0.7 U	**0.4** j	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Methyl bromide	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Methyl chloride	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	**0.3** j	0.7 U	0.7 U
Methyl iodide	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Methyl tert-butyl ether	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Methylene chloride	SW8260C	ug/kg				1.9 U	2.1 U	1.4 U	2 U	1.4 U	1.3 U	1.3 U	1.6 U	2.6 U
Naphthalene	SW8260C	ug/kg				4.2 U	4.3 U	3.5 U	**0.7** j	3.2 U	3.3 U	3.2 U	3.3 U	3.3 U
n-Butylbenzene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
n-Propylbenzene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
o-Chlorotoluene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
o-Xylene	SW8260C	ug/kg	0.6 U	0.7 U	0.9 U	0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Styrene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Tert-Butylbenzene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Tetrachloroethene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Toluene	SW8260C	ug/kg	0.6 U	0.7 U	0.9 U	0.8 U	0.9 U	**0.4** j	**0.5** j	0.6 U	0.7 U	**0.6**	0.7 U	0.7 U
trans-1,2-Dichloroethene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
trans-1,3-Dichloropropene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
trans-1,4-Dichlorobutene	SW8260C	ug/kg				4.2 U	4.3 U	3.5 U	3.7 U	3.2 U	3.3 U	3.2 U	3.3 U	3.3 U
Trichloroethene	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U
Vinyl acetate	SW8260C	ug/kg				4.2 U	4.3 U	3.5 U	3.7 U	3.2 U	3.3 U	3.2 U	3.3 U	3.3 U
Vinyl chloride	SW8260C	ug/kg				0.8 U	0.9 U	0.7 U	0.7 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U

Table 3
Volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location				GP-63				GP-64		GP-65	
		Sample Date	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012	10/12/2012
		Sample ID	DUP101212-1A	GP-62-7.2	DUP101212-2A	GP-63-5	DUP101212-3A	GP-63-7	GP-63-8.5	GP-64-5.1	GP-64-6.5	GP-65-5	GP-65-6.5
		Sample Depth	5.8 - 5.8 ft	7.2 - 7.2 ft	7.2 - 7.2 ft	5 - 5 ft	5 - 5 ft	7 - 7 ft	8.5 - 8.5 ft	5.1 - 5.1 ft	6.5 - 6.5 ft	5 - 5 ft	6.5 - 6.5 ft
1,1,1,2-Tetrachloroethane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,1,1-Trichloroethane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,1,2,2-Tetrachloroethane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,1,2-Trichloroethane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,1-Dichloroethane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,1-Dichloroethene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,1-Dichloropropene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,2,3-Trichlorobenzene	SW8260C	ug/kg	2.9 U	3.9 U	4.1 U	3 U	4 U	3.5 U	4.1 U	3.5 U	4.7 U	3.9 U	3.8 U
1,2,3-Trichloropropane	SW8260C	ug/kg	1.2 U	1.6 U	1.6 U	1.2 U	1.6 U	1.4 U	1.6 U	1.4 U	1.9 U	1.6 U	1.5 U
1,2,4-Trichlorobenzene	SW8260C	ug/kg	2.9 U	3.9 U	4.1 U	3 U	4 U	3.5 U	4.1 U	3.5 U	4.7 U	3.9 U	3.8 U
1,2,4-Trimethylbenzene	SW8260C	ug/kg	0.6 U	**0.4** j	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,2-Dibromo-3-chloropropane	SW8260C	ug/kg	2.9 U	3.9 U	4.1 U	3 U	4 U	3.5 U	4.1 U	3.5 U	4.7 U	3.9 U	3.8 U
1,2-Dichlorobenzene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,2-Dichloroethane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,2-Dichloropropane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,3,5-Trimethylbenzene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,3-Dichlorobenzene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,3-Dichloropropane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
1,4-Dichlorobenzene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
2,2-Dichloropropane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
2-Butanone	SW8260C	ug/kg	2.9 U	**12**	**6.8**	3 U	4 U	3.5 U	**2.6** j	3.5 U	**8.4**	3.9 U	**2.3** j
2-Chloroethyl vinyl ether	SW8260C	ug/kg	2.9 U	3.9 U	4.1 U	3 U	4 U	3.5 U	4.1 U	3.5 U	4.7 U	3.9 U	3.8 U
2-Hexanone	SW8260C	ug/kg	2.9 U	3.9 U	4.1 U	3 U	4 U	3.5 U	4.1 U	3.5 U	4.7 U	3.9 U	3.8 U
2-Phenylbutane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
4-Chlorotoluene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
4-Methyl-2-pentanone	SW8260C	ug/kg	2.9 U	3.9 U	4.1 U	3 U	4 U	3.5 U	4.1 U	3.5 U	4.7 U	3.9 U	3.8 U
Acetone	SW8260C	ug/kg	5.3 U	**69** B	**37** B	14 U	4 U	6.8 U	21 U	8.1 U	**53** B	17 U	15 U
Acrolein	SW8260C	ug/kg	29 U	39 U	41 U	30 U	40 U	35 U	41 U	35 U	47 U	39 U	38 U
Acrylonitrile	SW8260C	ug/kg	2.9 U	3.9 U	4.1 U	3 U	4 U	3.5 U	4.1 U	3.5 U	4.7 U	3.9 U	3.8 U
Benzene	SW8260C	ug/kg	0.6 U	**0.6** j	0.8 U	0.6 U	**0.5** j	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Bromobenzene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Bromodichloromethane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Bromoform	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Carbon disulfide	SW8260C	ug/kg	**2.5**	**4.2**	**2.4**	0.6 U	0.8 U	**3.4**	**3.6**	**11**	**13**	**7.4**	**9**
Carbon tetrachloride	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Chlorobenzene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Chlorobromomethane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Chloroethane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Chloroform	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U

Table 3

Volatile Organic Compounds, 2012 Upland Soil Sampling Event

		Sample Location				GP-63				GP-64		GP-65	
		Sample Date	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**	**10/12/2012**
		Sample ID	**DUP101212-1A**	**GP-62-7.2**	**DUP101212-2A**	**GP-63-5**	**DUP101212-3A**	**GP-63-7**	**GP-63-8.5**	**GP-64-5.1**	**GP-64-6.5**	**GP-65-5**	**GP-65-6.5**
		Sample Depth	**5.8 - 5.8 ft**	**7.2 - 7.2 ft**	**7.2 - 7.2 ft**	**5 - 5 ft**	**5 - 5 ft**	**7 - 7 ft**	**8.5 - 8.5 ft**	**5.1 - 5.1 ft**	**6.5 - 6.5 ft**	**5 - 5 ft**	**6.5 - 6.5 ft**
cis-1,2-Dichloroethene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
cis-1,3-Dichloropropene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Cumene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Cymene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Dibromochloromethane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Dibromomethane	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Ethyl bromide	SW8260C	ug/kg	1.2 U	1.6 U	1.6 U	1.2 U	1.6 U	1.4 U	1.6 U	1.4 U	1.9 U	1.6 U	1.5 U
Ethylbenzene	SW8260C	ug/kg	0.6 U	**0.6** j	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Ethylene dibromide	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	**0.4** j	0.8 U	**0.4** j	0.9 U	**0.5** j	0.8 U
Freon 11	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Freon 113	SW8260C	ug/kg	1.2 U	1.6 U	1.6 U	1.2 U	1.6 U	1.4 U	1.6 U	1.4 U	1.9 U	1.6 U	1.5 U
Hexachlorobutadiene	SW8260C	ug/kg	2.9 U	3.9 U	4.1 U	3 U	4 U	3.5 U	4.1 U	3.5 U	4.7 U	3.9 U	3.8 U
m,p Xylenes	SW8260C	ug/kg	0.6 U	**2.9**	**1.1**	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Methyl bromide	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	**0.8** j	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Methyl chloride	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Methyl iodide	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	**2.5**	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Methyl tert-butyl ether	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Methylene chloride	SW8260C	ug/kg	2 U	2.1 U	1.9 U	1.3 U	1.7 U	1.8 U	1.6 U	1.8 U	1.9 U	1.8 U	1.5 U
Naphthalene	SW8260C	ug/kg	2.9 U	**1.2** j	4.1 U	3 U	**0.8** j	**1.5** j	4.1 U	3.5 U	4.7 U	3.9 U	3.8 U
n-Butylbenzene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
n-Propylbenzene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
o-Chlorotoluene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
o-Xylene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Styrene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Tert-Butylbenzene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Tetrachloroethene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Toluene	SW8260C	ug/kg	0.6 U	**0.5** j	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
trans-1,2-Dichloroethene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
trans-1,3-Dichloropropene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
trans-1,4-Dichlorobutene	SW8260C	ug/kg	2.9 U	3.9 U	4.1 U	3 U	4 U	3.5 U	4.1 U	3.5 U	4.7 U	3.9 U	3.8 U
Trichloroethene	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U
Vinyl acetate	SW8260C	ug/kg	2.9 U	3.9 U	4.1 U	3 U	4 U	3.5 U	4.1 U	3.5 U	4.7 U	3.9 U	3.8 U
Vinyl chloride	SW8260C	ug/kg	0.6 U	0.8 U	0.8 U	0.6 U	0.8 U	0.7 U	0.8 U	0.7 U	0.9 U	0.8 U	0.8 U

Table 3
Volatile Organic Compounds, 2012 Upland Soil Sampling Event

Notes and Key:

% = Percent

Bold text indicates that compound was detected.

Cells are left blank where compound was not analyzed

ft = Feet

mg/kg = Milligrams per kilogram

ug/kg = Micrograms per kilogram

Data Qualifiers:

j = The value reported is below the routine reporting limit and should be considered an estimate; qualifier reported by the Laboratory

J = Detected sample result qualified as estimated

J- = Detected sample result qualified as estimated and biased low

J+ = Detected sample result qualified as estimated and biased high

U = Result is ≤ the detection limit. Organic compounds are reported to the Method Detection Limit (MDL) and other parameters are reported to the Reporting Limit (RL).
Result reported as the MDL or RL and is qualified as non detected. If qualified as non-detect due to a detection in associated blank samples, than MDL or RL has been revised, as applicable.

UJ = Nondetected sample result qualified as estimated

Preliminary
Draft

Table 4
Dioxins and Furans, 2012 Upland Soil Sampling Event

Sample Location				GP-29	GP-29	GP-29	GP-29	GP-30	GP-34	GP-34	GP-34	GP-44	GP-44	GP-44
Sample Date				10/9/2012	10/9/2012	10/9/2012	10/9/2012	10/9/2012	10/10/2012	10/10/2012	10/10/2012	10/9/2012	10/9/2012	10/9/2012
Sample ID				GP-29-2.9-4.9	GP-29-4.9-6.9	GP-29-6.9-8.9	GP-29-8.9-11.2	GP-30-7-9	GP-34-6.4-8.4	DUP101012-1	GP-34-8.4-9.4	GP-44-4.8-6.8	GP-44-6.8-8.8	GP-44-8.8-11.1
Sample Depth			TEFs	2.9 - 4.9 ft	4.9 - 6.9 ft	6.9 - 8.9 ft	8.9 - 11.2 ft	7 - 9 ft	6.4 - 8.4 ft	6.4 - 8.4 ft	8.4 - 9.4 ft	4.8 - 6.8 ft	6.8 - 8.8 ft	8.8 - 11.1 ft
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	MLA-017R20	pg/g	1	0.219 U	0.127 U	0.282 U	0.23 U	0.285 U	0.288 U	0.256 U	0.257 U	11.3 J+	0.245 U	0.344 U
Tetrachlorodibenzo-p-dioxin homologs (Total TCDD)	MLA-017R20	pg/g		0.149	0.127 U	0.128	0.554	1.5	0.133	0.588	1.14	3010	0.331	2.33
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	MLA-017R20	pg/g	1	0.096 U	0.185 U	0.108 U	0.104 U	0.109 U	0.129 J+	0.106 U	0.1 U	36.7 J+	0.111 U	0.18 J+
Pentachlorodibenzo-p-dioxin homologs (Total PeCDD)	MLA-017R20	pg/g		0.796	0.185 U	0.396	0.104 U	0.479	0.129	0.195	0.503	448	0.111 U	2.15
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	MLA-017R20	pg/g	0.1	0.179 J+	0.139 U	0.125 U	0.137 J+	0.102 U	0.214 J+	0.212 U	0.1 U	93.5 J+	0.182 U	0.28 J+
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	MLA-017R20	pg/g	0.1	1.76 J+	0.335 U	0.509 J+	0.342 J+	0.191 J+	0.838 U	1.49 J+	0.12 U	536 J+	1.21 J+	1.31 J+
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	MLA-017R20	pg/g	0.1	0.442 J+	0.229 U	0.25 U	0.327 J+	0.197 U	0.565 U	0.503 U	0.192 U	170 J+	0.348 J+	0.73 J+
Hexachlorodibenzo-p-dioxin homologs (Total HxCDD)	MLA-017R20	pg/g		9.15	2.86	1.42	4.61	0.191	2.09	2.44	1.1	2000	2.22	5.42
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	MLA-017R20	pg/g	0.01	52.7	9.02 j	14.2	8.15 j	3.81 j	22	41.7	1.51 U	15000	23.1	31.7
Heptachlorodibenzo-p-dioxin homologs (Total HpCDD)	MLA-017R20	pg/g		95.2	17.8	27.8	17.4	9.34	38.9	73.3	3.86	26500	38.2	58.8
Octachlorodibenzo-p-dioxin (OCDD)	MLA-017R20	pg/g	0.0003	688	676	989	124	144	323	1230	39.2 U	1260000	510	1970
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	MLA-017R20	pg/g	0.1	0.13 U	0.501 U	0.108 U	0.104 U	0.188 j	0.107 U	0.119 U	0.282 j	7.46	0.137 U	0.548 j
Tetrachlorodibenzofuran homologs (Total TCDF)	MLA-017R20	pg/g		1.29	0.107 U	0.808	0.38	2.74	0.107 U	0.106 U	4.31	216	5.56	10.7
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	MLA-017R20	pg/g	0.03	0.302 J+	0.141 U	0.108 U	0.104 U	0.102 U	0.13 U	0.139 J+	0.1 U	35.3 J+	0.106 U	0.243 J+
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	MLA-017R20	pg/g	0.3	0.912 U	0.241 U	0.32 U	0.287 U	0.249 U	0.55 U	0.833 U	0.242 U	144 J+	0.387 U	0.608 U
Pentachlorodibenzofuran homologs (Total PeCDF)	MLA-017R20	pg/g		11.6	1.47	2.3	1.59	0.546	3.88	6.48	0.147	1870	3.15	4.44
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	MLA-017R20	pg/g	0.1	6.65 j	0.582 j	1.09 j	0.671 U	0.233 j	2.89 j	6.56 j	0.112 U	1630	2.03 j	2.55 j
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	MLA-017R20	pg/g	0.1	1.02 J+	0.155 U	0.21 U	0.159 U	0.102 U	0.568 J+	0.974 U	0.1 U	261 J+	0.439 J+	0.566 J+
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	MLA-017R20	pg/g	0.1	0.422 U	0.288 U	0.108 U	0.104 U	0.102 U	0.224 J+	0.384 J+	0.1 U	86.5 J+	0.181 U	0.234 J+
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	MLA-017R20	pg/g	0.1	0.106 U	0.11 U	0.125 U	0.104 U	0.102 U	0.107 U	0.106 U	0.1 U	15.4 J+	0.105 U	0.104 U
Hexachlorodibenzofuran homologs (Total HxCDF)	MLA-017R20	pg/g		46.7	4.09	8.03	3.71	1.56	17.3	32.5	0.1 U	10900	16.4	17.2
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	MLA-017R20	pg/g	0.01	22.4	2.22 j	3.91 j	1.73 j	0.815 U	8.71 j	18.2	0.16 U	5200	10 j	10 j
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	MLA-017R20	pg/g	0.01	3.02 J+	0.225 J+	0.567 J+	0.327 U	0.187 J+	1.33 J+	3.4 J+	0.1 U	840 J+	1.89 J+	1.71 J+
Heptachlorodibenzofuran homologs (Total HpCDF)	MLA-017R20	pg/g		107	2.44	15.1	6.78	2.87	38.4	74.7	0.1 U	22500	42.4	42.7
Octachlorodibenzofuran (OCDF)	MLA-017R20	pg/g	0.0003	62.1	6.69 j	11.6 j	3.71 j	4.2 j	23	42.8	0.443 U	17800	25.9	34.2
Calculated TEQ (ND=0)	MLA-017R20	pg/g		2.02039	0.377657	0.64685	0.217713	0.14563	0.9428	1.86241	0.0282	965.985	0.91337	1.84445
Calculated TEQ (ND=1/2 DL)	MLA-017R20	pg/g		2.34759	0.659772	0.93777	0.488058	0.415835	1.2521	2.26406	0.300496	965.985	1.18126	2.11285

Table 4
Dioxins and Furans, 2012 Upland Soil Sampling Event

		Sample Location	GP-45	GP-45	GP-45	GP-46	GP-46	GP-55	GP-55	GP-55	GP-55	GP-55
		Sample Date	10/9/2012	10/9/2012	10/9/2012	10/9/2012	10/9/2012	8/31/2012	10/8/2012	10/8/2012	10/8/2012	10/8/2012
		Sample ID	GP-45-4.5-6.5	GP-45-6.5-8.5	GP-45-8.5-9.5	GP-46-5.2-7.2	GP-46-7.2-8.7	GP-55-2.5-4	GP-55-4.4-6.4	GP-55-6.4-8.4	GP-55-8.4-10.4	DUP100812-1
		Sample Depth	4.5 - 6.5 ft	6.5 - 8.5 ft	8.5 - 9.5 ft	5.2 - 7.2 ft	7.2 - 8.7 ft	2.5 - 4 ft	4.4 - 6.4 ft	6.4 - 8.4 ft	8.4 - 10.4 ft	8.4 - 10.4 ft
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	MLA-017R20	pg/g	10.8 J+	0.272 U	0.3 U	3.38 J+	0.279 U	2.61	0.943 J+	0.222 U	0.274 U	0.282 U
Tetrachlorodibenzo-p-dioxin homologs (Total TCDD)	MLA-017R20	pg/g	439	0.161	0.481	42.4	0.271	336	78.6	0.095 U	1.19	2.18
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	MLA-017R20	pg/g	32.3 J+	0.105 U	0.108 U	26.7 J+	0.097 U	10.8	3.51 J+	0.095 U	0.099 U	0.1 U
Pentachlorodibenzo-p-dioxin homologs (Total PeCDD)	MLA-017R20	pg/g	1250	0.105 U	0.108 U	110	0.448	10800	59.8	0.095 U	0.099 U	0.246
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	MLA-017R20	pg/g	57.5 J+	0.105 U	0.108 U	39.1 J+	0.097 U	18	7.38 J+	0.095 U	0.099 U	0.1 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	MLA-017R20	pg/g	786 J+	0.195 U	0.108 U	223 J+	0.182 J+	871	32 J+	0.095 U	0.158 J+	0.174 J+
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	MLA-017R20	pg/g	149 J+	0.129 U	0.108 U	87.5 J+	0.199 J+	244	19.4 J+	0.095 U	0.197 U	0.197 J+
Hexachlorodibenzo-p-dioxin homologs (Total HxCDD)	MLA-017R20	pg/g	2410	1.07	0.174	820	0.381	10400	187	0.468	0.581	1.22
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	MLA-017R20	pg/g	22200	5.38 j	1.31 U	5570	3.54 j	2160	1200	1.46 U	3.5 j	3.59 U
Heptachlorodibenzo-p-dioxin homologs (Total HpCDD)	MLA-017R20	pg/g	38900	12.8	2.33	9990	7.1	4650	2380	3.17	7.64	3.81
Octachlorodibenzo-p-dioxin (OCDD)	MLA-017R20	pg/g	3450000	377	49.2 U	279000	157	320000	171000	46.4 U	273	304
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	MLA-017R20	pg/g	7.76	0.235 U	0.294 j	4.48	0.347 j	4.3	0.771 j	0.095 U	0.26 j	0.21 U
Tetrachlorodibenzofuran homologs (Total TCDF)	MLA-017R20	pg/g	169	3.56	3.05	625	6.42	105	14.5	0.095 U	5.65	2.69
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	MLA-017R20	pg/g	37.3 J+	0.105 U	0.108 U	19.9 J+	0.119 U	4.37 j	1.42 J+	0.095 U	0.136 J+	0.13 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	MLA-017R20	pg/g	150 J+	0.265 U	0.229 U	61.1 J+	0.291 U	12.2	5.38 J+	0.173 U	0.344 U	0.309 U
Pentachlorodibenzofuran homologs (Total PeCDF)	MLA-017R20	pg/g	2500	0.7	0.498	1290	0.909	163	71.7	0.173	1.18	0.752
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	MLA-017R20	pg/g	3110	0.331 j	0.108 U	997	0.412 j	72.5	38	0.095 U	0.187 j	0.285 j
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	MLA-017R20	pg/g	505 J+	0.105 U	0.108 U	158 J+	0.144 U	17.8	7.49 J+	0.095 U	0.099 U	0.1 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	MLA-017R20	pg/g	174 J+	0.105 U	0.108 U	61.9 J+	0.097 U	8.1	3.36 J+	0.095 U	0.099 U	0.1 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	MLA-017R20	pg/g	25.5 J+	0.105 U	0.108 U	8.42 J+	0.097 U	1.12 j	0.542 J+	0.095 U	0.099 U	0.1 U
Hexachlorodibenzofuran homologs (Total HxCDF)	MLA-017R20	pg/g	20100	1.68	0.108 U	5670	1.31	481	230	0.109	0.575	1.01
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	MLA-017R20	pg/g	15900	0.984 j	0.238 U	3280	1.22 j	493	156	0.179 U	0.357 j	0.53 j
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	MLA-017R20	pg/g	1450 J+	0.183 J+	0.108 U	426 J+	0.21 J+	51.8 j	24 J+	0.095 U	0.119 J+	0.1 U
Heptachlorodibenzofuran homologs (Total HpCDF)	MLA-017R20	pg/g	43900	2.99	0.446	11400	3.79	1100	467	0.095 U	1.1	0.53
Octachlorodibenzofuran (OCDF)	MLA-017R20	pg/g	122000	3.55 j	0.745 U	4640	2.58 U	8690	2000	0.912 U	2.87 j	3.68 j
Calculated TEQ (ND=0)	MLA-017R20	pg/g	2037.795	0.212735	0.0294	384.799	0.2108	266.5381	82.7039	0	0.187101	0.163204
Calculated TEQ (ND=1/2 DL)	MLA-017R20	pg/g	2037.795	0.49151	0.322942	384.799	0.466372	266.5381	82.7039	0.239642	0.454851	0.451454

Table 4
Dioxins and Furans
2012 Upland Soil Sampling Event

Notes and Key:
Bold text indicates that compound was detected.
Cells are left blank where compound was not analyzed
ft = Feet
pg/g = Picograms per gram

Data Qualifiers:
j = The value reported is below the routine reporting limit and should be considered an estimate; qualifier reported by the Laboratory.
J+ = Detected sample result qualified as estimated and biased high
U = Result is ≤ the Method Detection Limit (MDL). Result reported as the MDL and is qualified as non detected. If qualified as non-detect due to a detection in associated blank samples, than MDL has been revised, as applicable.

Preliminary
Draft

Table 1

Groundwater Sampling Parameters, Fall 2011 Groundwater Sampling Event

Location ID			Site COPCs		Characterization of COIs					Adjacent Site COIs								Water Quality Parameters/General Chemistry													Characterization of COIs		Sediment and Adjacent Site COPCs				Field Measurements[2]
				Metals																																	
Analyte			Phenol/ Chlorinated Phenols	As*	Cr*	Cu*	Ag*	Zn*	Cr VI*	Sb*	Be*	Cd*#	Pb*#	Ni*	Se*	Tl*	Hg*#	Ca	K	Mg	Na	Al*	Fe*	Mn*	Anions Cl, SO_4, NO_3, PO_4	TOX	TOC	TSS	Hardness	Alkalinity	Ammonia	TPH	TBT	Dioxins/ Furans	VOCs	SVOCs	
Method	Sample Date	Sample ID	USEPA 8270D	USEPA 6010B/6020					USEPA 7196A	USEPA 6010B/6020							USEPA 7470A	USEPA 6010B/6020							USEPA 300.0/ SM 4500	USEPA 9020	USEPA 9060	SM 2450D	USEPA 6010B	SM 2320B	USEPA 350.1	NWTPH-Dx, Gx	Krone 1989	AXYS MLA-017R20	USEPA 8260C	USEPA 8270D/ 8270-SIM	Various
MW-1S	11/29/2011	MW-1S-112911	X	X	X	X	X	X	X																							X					X
MW-1S (dup)	11/29/2011	DUP-112911-1		X																																	
MW-1D	11/29/2011	MW-1D-112911	X	X																																	X
MW-2S	11/30/2011	MW-2S-113011	X	X																																	X
MW-2D	11/30/2011	MW-2D-113011	X	X																																	X
MW-3S	12/1/2011	MW-3S-120111	X	X	X	X	X	X		X	X	X	X	X	X	X	X																				X
MS/MSD	12/1/2011	MW-3S-120111		X	X	X	X	X		X	X	X	X	X	X	X	X																				
MW-3D	12/1/2011	MW-3D-120111	X	X	X	X	X	X																													X
MW-4S	11/28/2011	MW-04S-112811	X	X																															X		X
MW-4S (dup)	11/28/2011	DUP-112811-1	X																																		
MW-5S	12/1/2011	MW-5S-120111	X	X																																	X
MW-6S	11/30/2011	MW-6S-113011	X	X																																	X
MW-7S	11/29/2011	MW-7S-112911	X	X																								X						X			X
MW-7S (dup)	11/29/2011	DUP-112911-2	X																															X			
MW-10	11/29/2011	MW-10-112911	X	X																								X						X			X
MW-11	12/1/2011	MW-11-120111	X	X																																	X
MW-12	12/1/2011	MW-12-120111	X	X																																	X
MW-13	11/29/2011	MW-13-112911	X	X																								X						X	X		X
MW-13 (dup)	11/29/2011	DUP-112911-3	X																																		
MS/MSD	11/29/2011	MW-13-112911	X																															X			
MW-14	12/2/2011	MW-14-120211	X	X	X	X	X	X																													X
MW-14 (dup)	12/2/2011	DUP-120211-1		X																																	
MW-14	12/2/2011	MW-14-120211	X																																		
MW-14D	12/2/2011	MW-14D-120211		X	X	X	X	X										X	X	X	X	X	X	X	X	X	X	X	X	X						X	X
MS/MSD	12/2/2011	MW-14D-120211																X	X	X	X	X	X	X													
MW-16	12/6/2011	MW-16-120611	X	X																															X		X
MW-17	11/28/2011	MW-17-112811	X	X																																	X
MW-18	11/30/2011	MW-18-113011	X	X	X	X	X	X		X	X	X	X	X	X	X	X																				X
MW-18 (dup)	11/30/2011	DUP-113011-2			X	X	X	X		X	X	X	X	X	X	X	X																				
MW-19	12/1/2011	MW-19-120111	X	X																																	X
MW-20	11/30/2011	MW-20-113011	X	X	X	X	X	X		X	X	X	X	X	X	X	X																				X
MW-21	11/30/2011	MW-21-113011	X	X																																	X
MW-21 (dup)	11/30/2011	DUP-113011-1		X																																	
MW-22	11/28/2011	MW-22-112811	X	X																																	X
MS/MSD	11/28/2011	MW-22-112811		X																																	
MW-23	11/28/2011	MW-23-112811	X	X																																	X
MW-24	11/30/2011	MW-24-113011	X	X	X	X	X	X		X	X	X	X	X	X	X	X																				X
MW-26	12/1/2011	MW-26-120111	X	X	X	X	X	X		X	X	X	X	X	X	X	X																				X
MW-27	12/1/2011	MW-27-120111	X	X	X	X	X	X		X	X	X	X	X	X	X	X																				X
MW-28S	12/2/2011	MW-28S-120211		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
MW-28S (dup)	12/2/2011	DUP-120211-2																																	X		
MS/MSD	12/2/2011	MW-28S-120211																													X						
MW-29S	12/2/2011	MW-29S-120211		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
MW-29S (dup)	12/2/2011	DUP-120211-3		X																																X	
MS/MSD	12/2/2011	MW-29S-120211																															X				
MW-30S	12/5/2011	MW-30S-120511		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
MW-30S (dup)	12/5/2011	DUP-120511-1																														NWTPH-Dx	X				
MS/MSD	12/5/2011	MW-30S-120511																																		X	
MW-31S	12/5/2011	MW-31S-120511		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
MW-31S (dup)	12/5/2011	DUP-120511-2			X	X	X	X										X	X	X	X	X	X	X								NWTPH-Gx					
MS/MSD	12/5/2011	MW-31S-120511							X																										X		
MW-32S	12/6/2011	MW-32S-120611		X	X	X	X	X										X	X	X	X	X	X	X	X	X	X	X	X	X						X	X
MW-33S	12/5/2011	MW-33S-120511		X	X	X	X	X										X	X	X	X	X	X	X	X	X	X	X	X	X						X	X
MW-33S (dup)	12/5/2011	DUP-120511-3																																		X	
MW-34S	12/6/2011	MW-34S-120611		X	X	X	X	X	X									X	X	X	X	X	X	X	X	X	X	X	X	X	X					X	X
MW-34S (dup)	12/6/2011	DUP-120611-1							X																						X						
MW-35S	12/6/2011	MW-35S-120611		X	X	X	X	X										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X
		Total	31	41	21	21	21	21	5	12	12	12	12	12	12	12	12	11	11	11	11	11	11	11	9	9	9	12	9	9	8	8	6	5	9	12	35

Notes:
- Field measurements include: ferrous iron, sulfide, dissolved oxygen, temperature, pH, oxidation reduction potential, specific conductivity, and turbidity.

* = Collect total (unfiltered) and dissolved (filtered) metals samples
\# - Cd, Pb and Hg metals also grouped in Sediment Management Standards constituent list.
AXYS = AXYS Lab-Specific Method
COI = Constituent of Interest
COPC = Constituent of Potential Concern
dup = Duplicate sample
MS/MSD = Matrix Spike/Matrix Spike Duplicate
SIM = Selective Ion Method for polycyclic aromatic hydrocarbons
TSS = Total Suspended Solids
USEPA = United States Environmental Protection Agency

Analytes Key

Al	Aluminum	Ni	Nickel
Sb	Antimony	PO4	Phosphorus as Total Phosphate
As	Arsenic	K	Potassium
Be	Beryllium	Se	Selenium
Cd	Cadmium	SVOC	Semi-volatile Organic Compounds
Ca	Calcium	Ag	Silver
Cl	Chloride	Na	Sodium
Cr	Chromium	SO4	Sulfate
Cu	Copper	Tl	Thallium
Cr VI	Hexavalent Ch	TOC	Total Organic Carbon
Fe	Iron	TOX	Total Organic Halides
Pb	Lead	TPH	Total Petroleum Hydrocarbons
Mg	Magnesium	TSS	Total Suspended Solids
Mn	Manganese	TBT	Tributyltin
Hg	Mercury	VOC	Volatile Organic Compounds
NO3	Nitrate	Zn	Zinc

Table 2
Groundwater Level Measurement, Fall 2011 Groundwater Sampling Events

Well ID	Measuring Point Elevation *ft-amsl*	Northings	Eastings	Date	Time	Depth to Groundwater *ft-toc*	Groundwater Elevation *ft-amsl*
MW-01S	17.69	204056.54384	1267772.56387	3/23/2009	8:28	6.49	11.20
				6/25/2009	10:06	8.52	9.17
				10/7/2009	9:21	9.37	8.32
				1/28/2010	9:41	6.24	11.45
				4/26/2010	7:44	6.84	10.85
				8/5/2010	9:05	8.89	8.80
				10/25/2010	8:12	5.83	11.87
				4/25/2011	7:52	6.83	10.86
				7/14/2011	8:21	8.63	9.06
				11/28/2011	7:22	5.51	12.18
MW-01D	17.16	204056.58750	1267780.48417	3/23/2009	8:30	12.02	5.14
				6/25/2009	10:37	13.22	3.94
				10/7/2009	9:22	11.15	6.01
				1/28/2010	9:37	10.48	6.68
				4/26/2010	7:38	12.43	4.73
				8/5/2010	9:00	15.86	1.30
				10/25/2010	8:18	10.07	7.09
				4/25/2011	7:55	11.78	5.38
				7/14/2011	8:24	13.45	3.71
				11/28/2011	7:20	10.38	6.78
MW-02S	17.42	203897.54374	1267750.17664	3/23/2009	8:32	6.82	10.60
				6/25/2009	11:03	8.39	9.03
				10/7/2009	10:42	9.26	8.16
				1/28/2010	10:44	6.41	11.01
				4/26/2010	8:51	6.94	10.48
				8/5/2010	9:40	8.72	8.70
				10/25/2010	8:54	6.40	11.02
				4/25/2011	8:20	6.87	10.55
				7/14/2011	8:48	8.48	8.94
				11/28/2011	7:40	6.30	11.12
MW-02D	17.43	203927.36169	1267779.32250	3/23/2009	8:36	12.43	5.00
				6/25/2009	11:01	14.70	2.73
				10/7/2009	10:46	11.71	5.72
				1/28/2010	10:29	10.68	6.75
				4/26/2010	8:18	13.96	3.47
				8/5/2010	9:35	15.83	1.60
				10/25/2010	8:50	10.31	7.12
				4/25/2011	8:17	11.99	5.44
				7/14/2011	8:44	14.79	2.64
				11/28/2011	7:38	10.40	7.03
MW-03S	19.62	203661.20996	1267565.26400	3/23/2009	8:50	10.71	8.91
				6/25/2009	11:19	11.22	8.40
				10/7/2009	11:03	12.20	7.42
				1/28/2010	12:31	9.84	9.78
				4/26/2010	10:09	10.89	8.73
				8/5/2010	10:57	11.80	7.82
				10/25/2010	10:45	11.77	7.85
				4/25/2011	9:17	10.51	9.11
				7/14/2011	9:47	11.51	8.11
				11/28/2011	8:08	11.64	7.98
MW-03D	19.51	203662.55602	1267574.28418	3/23/2009	8:52	14.23	5.28
				6/25/2009	11:22	15.21	4.30
				10/7/2009	11:03	14.20	5.31
				1/28/2010	12:34	12.49	7.02
				4/26/2010	10:13	15.75	3.76
				8/5/2010	11:00	15.94	3.57
				10/25/2010	10:48	13.23	6.28
				4/25/2011	9:14	13.70	5.81
				7/14/2011	9:44	15.75	3.76
				11/28/2011	8:11	13.42	6.09
MW-04S	18.81	204047.96657	1267528.70925	3/23/2009	8:16	7.09	11.72
				6/25/2009	10:21	9.09	9.72
				10/7/2009	9:04	9.86	8.95
				1/28/2010	10:04	6.64	12.17
				4/26/2010	8:06	7.17	11.64
				8/5/2010	9:18	9.49	9.32
				10/25/2010	8:34	5.88	12.93
				4/25/2011	9:50	6.80	12.01
				7/14/2011	10:15	9.17	9.64
				11/28/2011	9:14	6.04	12.77
MW-05S	18.42	204055.92275	1267646.61849	3/23/2009	8:25	6.87	11.55
				6/25/2009	10:11	8.93	9.49
				10/7/2009	9:16	9.71	8.71
				1/28/2010	9:47	6.57	11.85
				4/26/2010	7:47	7.04	11.38
				8/5/2010	10:02	6.31	12.11
				10/25/2010	8:23	5.98	12.44
				4/25/2011	9:24	7.01	11.41

Table 2

Groundwater Level Measurement, Fall 2011 Groundwater Sampling Events

Well ID	Measuring Point Elevation *ft-amsl*	Northings	Eastings	Date	Time	Depth to Groundwater *ft-toc*	Groundwater Elevation *ft-amsl*
				7/14/2011	9:56	9.02	9.40
				11/28/2011	8:32	6.04	12.38
MW-06S	18.50	204004.58908	1267611.92486	3/23/2009	8:23	6.98	11.52
				6/25/2009	10:15	8.90	9.60
				10/7/2009	9:12	9.73	8.77
				1/28/2010	9:58	6.60	11.90
				4/26/2010	8:01	7.11	11.39
				8/5/2010	9:09	9.29	9.21
				10/25/2010	8:27	6.75	11.75
				4/25/2011	9:30	7.05	11.45
				7/14/2011	10:02	8.99	9.51
				11/28/2011	8:36	6.37	12.13
MW-07S	18.50	204020.49534	1267574.41961	3/23/2009	8:18	6.90	11.60
				6/25/2009	10:18	8.81	9.69
				10/7/2009	9:09	9.64	8.86
				1/28/2010	9:54	6.47	12.03
				4/26/2010	7:56	6.98	11.52
				8/5/2010	9:14	9.21	9.29
				10/25/2010	8:29	6.31	12.19
				4/25/2011	9:35	6.84	11.66
				7/14/2011	10:22	8.91	9.59
				11/28/2011	9:10	6.18	12.32
MW-10	15.51	203965.45545	1267785.06206	3/23/2009	8:33	4.74	10.77
				6/25/2009	10:56	6.49	9.02
				10/7/2009	10:37	7.33	8.18
				1/28/2010	10:38	4.32	11.19
				4/26/2010	8:31	4.82	10.69
				8/5/2010	9:30	6.81	8.70
				10/25/2010	8:43	2.51	13.00
				4/25/2011	8:10	4.87	10.64
				7/14/2011	8:37	6.57	8.94
				11/28/2011	7:30	2.91	12.60
MW-11	15.34	203931.25080	1267732.36107	3/23/2009	8:40	4.49	10.85
				6/25/2009	10:47	6.19	9.15
				10/7/2009	10:29	7.05	8.29
				1/28/2010	10:21	3.47	11.87
				4/26/2010	8:39	4.59	10.75
				8/5/2010	9:57	6.49	8.85
				10/25/2010	*	*	*
				4/25/2011	8:56	4.56	10.78
				7/14/2011	9:28	6.23	9.11
				11/28/2011	8:28	3.95	11.39
MW-12	15.92	203908.83835	1267687.31078	3/23/2009	8:05	4.84	11.08
				6/25/2009	10:33	6.39	9.53
				10/7/2009	10:26	7.36	8.56
				1/28/2010	10:55	4.35	11.57
				4/26/2010	8:59	4.91	11.01
				8/5/2010	9:49	6.79	9.13
				10/25/2010	9:34	5.33	10.59
				4/25/2011	9:00	4.83	11.09
				7/14/2011	9:33	6.50	9.42
				11/28/2011	8:24	4.63	11.29
MW-13	15.95	203845.60548	1267712.70978	3/23/2009	8:44	5.43	10.52
				6/25/2009	11:07	6.67	9.28
				10/7/2009	10:46	7.64	8.31
				1/28/2010	11:27	4.62	11.33
				4/26/2010	8:56	5.45	10.50
				8/5/2010	9:45	7.04	8.91
				10/25/2010	9:29	5.83	10.12
				4/25/2011	8:26	5.28	10.67
				7/14/2011	8:53	6.77	9.18
				11/28/2011	7:44	5.58	10.37

Table 2

Groundwater Level Measurement, Fall 2011 Groundwater Sampling Events

Well ID	Measuring Point Elevation *ft-amsl*	Northings	Eastings	Date	Time	Depth to Groundwater *ft-toc*	Groundwater Elevation *ft-amsl*
MW-14	16.38	203812.11685	1267609.88790	3/23/2009	8:48	6.09	10.29
				6/25/2009	11:14	7.08	9.30
				10/7/2009	10:51	8.07	8.31
				1/28/2010	11:10	5.40	10.98
				4/26/2010	9:04	6.05	10.33
				8/5/2010	9:52	7.45	8.93
				10/25/2010	9:40	7.04	9.34
				4/25/2011	9:10	5.79	10.59
				7/14/2011	9:38	7.18	9.20
				11/28/2011	8:18	6.81	9.57
MW-14D	16.48	203810.58000	1267604.15700	11/28/2011	8:15	10.13	6.35
MW-16	13.80	204080.65296	1267549.20703	3/23/2009	9:51	2.09	11.71
				6/25/2009	9:54	4.08	9.72
				10/7/2009	9:34	4.82	8.98
				1/28/2010	9:25	1.64	12.16
				4/26/2010	7:28	2.19	11.61
				8/5/2010	8:47	4.47	9.33
				10/25/2010	11:23	0.82	12.98
				4/25/2011	9:42	1.75	12.05
				7/14/2011	10:10	4.15	9.65
				11/28/2011	9:19	1.02	12.78
MW-17	16.24	203954.60493	1267530.00292	3/23/2009	7:59	4.92	11.32
				6/25/2009	10:27	6.53	9.71
				10/7/2009	8:57	7.42	8.82
				1/28/2010	10:12	4.40	11.84
				4/26/2010	9:14	4.90	11.34
				8/5/2010	10:09	6.93	9.31
				10/25/2010	9:44	5.05	11.19
				4/25/2011	9:55	4.73	11.51
				7/14/2011	10:32	6.62	9.62
				11/28/2011	8:40	4.69	11.55
MW-18	17.21	203677.06233	1267468.56680	3/23/2009	8:56	6.97	10.24
				6/25/2009	11:27	8.71	8.50
				10/7/2009	11:11	9.72	7.49
				1/28/2010	12:26	7.41	9.80
				4/26/2010	10:05	8.38	8.83
				8/5/2010	10:43	9.32	7.89
				10/25/2010	10:41	6.61	10.60
				4/25/2011	10:13	7.95	9.26
				7/14/2011	10:47	8.96	8.25
				11/28/2011	9:00	7.10	10.11
MW-19	16.84	203766.18777	1267478.08281	3/23/2009	9:01	7.04	9.80
				6/25/2009	12:17	7.75	9.09
				10/7/2009	10:56	8.73	8.11
				1/28/2010	12:40	6.26	10.58
				4/26/2010	9:43	7.03	9.81
				8/5/2010	10:37	8.17	8.67
				10/25/2010	11:05	8.08	8.76
				4/25/2011	10:04	6.71	10.13
				7/14/2011	10:39	7.89	8.95
				11/28/2011	8:55	8.04	8.80
MW-20	17.46	203671.59840	1267364.59998	3/23/2009	9:05	8.21	9.25
				6/25/2009	11:55	8.75	8.71
				10/7/2009	11:19	9.84	7.62
				1/28/2010	12:18	7.37	10.09
				4/26/2010	9:58	8.44	9.02
				8/5/2010	10:54	9.41	8.05
				10/25/2010	10:35	9.30	8.16
				4/25/2011	10:19	7.95	9.51
				7/14/2011	10:54	8.93	8.53
				11/28/2011	9:04	9.02	8.44
MW-21	17.22	203807.20569	1267353.70698	3/23/2009	9:15	7.04	10.18
				6/25/2009	11:33	7.78	9.44
				10/7/2009	11:45	8.75	8.47
				1/28/2010	12:01	6.25	10.97
				4/26/2010	9:35	6.95	10.27
				8/5/2010	10:22	8.19	9.03
				10/25/2010	10:00	8.07	9.15
				4/25/2011	10:26	6.63	10.59
				7/14/2011	11:00	7.88	9.34
				11/28/2011	9:42	7.99	9.23

Table 2
Groundwater Level Measurement, Fall 2011 Groundwater Sampling Events

Well ID	Measuring Point Elevation *ft-amsl*	Northings	Eastings	Date	Time	Depth to Groundwater *ft-toc*	Groundwater Elevation *ft-amsl*
MW-22	16.79	203878.42265	1267354.09852	3/23/2009	9:22	6.11	10.68
				6/25/2009	12:03	7.12	9.67
				10/7/2009	8:45	8.04	8.75
				1/28/2010	11:41	5.39	11.40
				4/26/2010	9:21	5.96	10.83
				8/5/2010	10:15	7.76	9.03
				10/25/2010	9:52	6.96	9.83
				4/25/2011	10:34	5.70	11.09
				7/14/2011	11:07	7.18	9.61
				11/28/2011	9:36	6.76	10.03
MW-23	16.72	203793.38141	1267222.11951	3/23/2009	9:40	6.41	10.31
				6/25/2009	11:45	7.10	9.62
				10/7/2009	11:38	8.13	8.59
				1/28/2010	11:49	5.65	11.07
				4/26/2010	9:28	6.34	10.38
				8/5/2010	10:29	7.52	9.20
				10/25/2010	10:09	7.52	9.20
				4/25/2011	10:46	5.98	10.74
				7/14/2011	11:16	7.21	9.51
				11/28/2011	9:53	7.40	9.32
MW-24	16.78	203673.20066	1267247.14526	3/23/2009	9:09	7.87	8.91
				6/25/2009	11:39	8.42	8.37
				10/7/2009	11:31	9.50	7.28
				1/28/2010	12:12	7.05	9.73
				4/26/2010	9:51	8.07	8.71
				8/5/2010	10:49	9.04	7.74
				10/25/2010	10:18	8.95	7.83
				4/25/2011	10:40	7.58	9.20
				7/14/2011	11:22	8.57	8.21
				11/28/2011	9:48	8.73	8.05
MW-26	16.62	203644.99716	1267602.70357	3/23/2009	10:03	8.01	8.61
				6/25/2009	12:37	8.50	8.13
				10/7/2009	10:16	9.45	7.17
				1/28/2010	13:02	7.15	9.47
				4/26/2010	10:39	8.22	8.40
				8/5/2010	11:13	9.15	7.47
				10/25/2010	10:53	8.95	7.67
				4/25/2011	8:36	7.82	8.80
				7/14/2011	9:09	8.76	7.86
				11/28/2011	8:00	8.83	7.79
MW-27	16.58	203644.72154	1267742.00960	3/23/2009	10:12	11.54	5.04
				6/25/2009	12:44	11.26	5.32
				10/7/2009	10:10	12.12	4.46
				1/28/2010	12:58	10.15	6.43
				4/26/2010	10:35	11.81	4.77
				8/5/2010	11:09	12.33	4.25
				10/25/2010	10:59	10.92	5.66
				4/25/2011	8:47	11.13	5.45
				7/14/2011	9:15	11.26	5.32
				11/28/2011	7:55	11.24	5.34
MW-28S	14.41	204331.27100	1267205.03200	11/28/2011	10:06	1.96	14.62
MW-29S	13.06	204330.02400	1267507.11700	11/28/2011	9:30	0.85	15.73
MW-30S	12.15	204324.18200	1267832.08300	11/28/2011	7:01	2.27	14.31
MW-31S	14.15	204239.86200	1267927.96400	11/28/2011	7:05	4.62	11.96
MW-32S	15.35	204071.09300	1267150.05800	11/28/2011	10:02	4.07	12.51
MW-32D	15.46	204074.00500	1267148.30900	11/28/2011	9:58	9.80	6.78
MW-33S	15.00	204024.70900	1267862.87400	11/28/2011	7:16	4.23	12.35
MW-34S	13.93	204116.60400	1267597.09600	11/28/2011	9:23	1.35	15.23
MW-35S	14.06	204167.25400	1267892.28800	11/28/2011	7:11	3.92	12.66

Notes:
ft-amsl = feet above mean sea level
ft-toc = feet below measuring point
* = Well could not be accessed due to recharging water in the well monument.

Preliminary Draft

Table 3

Field Parameter Values, Fall 2011 Groundwater Sampling Event

Location	Sample Date	Sample Time	Depth to Water (ft btoc)	Ferrous Iron (mg/L)	Sulfide (mg/L)	Temperature (°C)	pH	EC (µS/cm)	D.O. (mg/L)	Redox Potential (mV)	Salinity (ppt)	Turbidity (ntu)
MW-1D	11/29/2011	6:26	12.23	1.34	0.11	8.28	6.71	759	1.00	-92	0.4	1.4
MW-2D	11/30/2011	7:03	12.85	2.30	0.05	11.56	6.22	1240	1.19	-70	0.6	1.0
MW-3D	12/1/2011	8:08	15.13	8.20	0.08	9.28	6.31	1730	0.77	-58	0.9	0.2
MW-14D	12/2/2011	8:53	11.66	6.95	0.11	10.44	6.34	1020	1.17	-76	0.5	6.4
MW-1S	11/29/2011	7:12	5.83	0.96	0.02	9.67	6.24	403	0.99	70	0.2	1.0
MW-2S	11/30/2011	7:42	6.71	0.54	0.23	10.34	6.27	478	0.93	-16	0.2	1.0
MW-3S	12/1/2011	7:07	11.64	3.08	0.23	9.91	6.26	596	0.80	-75	0.3	0.9
MW-4S	11/28/2011	12:11	6.04	0.00	0.00	9.49	6.70	309	4.84	77	0.1	0.8
MW-5S	12/1/2011	12:35	6.73	0.00	0.00	9.24	5.86	183	1.22	147	0.1	1.2
MW-6S	11/30/2011	12:25	6.85	0.16	0.04	10.62	6.16	607	0.97	22	0.3	8.0
MW-7S	11/29/2011	8:21	6.32	4.25	0.07	10.86	6.42	598	1.49	-21	0.3	1.0
MW-10	11/29/2011	10:50	3.17	0.35	0.39	8.08	7.27	352	1.34	-76	0.2	0.9
MW-11	12/1/2011	13:10	4.44	0.11	0.03	9.20	6.45	287	11.17	135	0.1	2.4
MW-12	12/1/2011	13:47	4.93	1.94	0.00	10.61	5.76	361	1.30	105	0.2	2.6
MW-13	11/29/2011	12:25	5.52	1.73	0.04	10.36	6.31	869	1.08	-14	0.4	1.0
MW-14	12/2/2011	7:33	6.64	15.70	0.00	11.90	6.12	769	1.14	-72	0.4	0.4
MW-16	12/6/2011	11:09	2.68	2.48	0.06	8.41	5.88	444	0.79	40	0.2	9.9
MW-17	11/28/2011	11:17	4.69	2.50	0.50	12.99	6.75	343	1.19	-126	0.2	0.6
MW-18	11/30/2011	11:27	8.55	0.20	0.66	10.57	6.57	419	1.04	-50	0.2	2.4
MW-19	12/1/2011	14:29	7.85	11.40	0.01	11.36	6.37	439	1.00	-53	0.2	0.8
MW-20	11/30/2011	10:04	8.98	5.08	0.19	12.50	6.30	517	0.84	-75	0.2	1.1
MW-21	11/30/2011	9:17	7.88	2.38	0.16	12.05	6.26	434	0.99	-53	0.2	1.0
MW-22	11/28/2011	13:21	6.76	1.43	0.10	12.15	6.54	421	1.02	-92	0.2	4.3
MW-23	11/28/2011	14:22	7.40	1.90	0.02	13.40	6.54	730	1.28	-65	0.4	1.4
MW-24	11/30/2011	8:32	8.67	2.74	0.23	11.59	6.03	563	1.04	-26	0.3	1.0
MW-26	12/1/2011	10:12	8.89	27.25	0.20	12.42	6.27	801	0.73	-77	0.4	0.8
MW-27	12/1/2011	9:28	12.27	4.05	0.00	12.08	6.46	14800	0.55	-22	8.5(4)	0.0
MW-28S	12/2/2011	11:55	2.82	6.80	0.01	10.49	6.22	621	0.98	-8	0.3	7.2
MW-29S	12/2/2011	13:47	1.81	10.25	0.03	9.11	6.37	640	0.95	-56	0.3	4.9
MW-30S	12/5/2011	8:13	2.94	8.20	0.06	11.27	6.48	429	0.82	-59	0.2	1.0
MW-31S	12/5/2011	10:41	8.63	0.60	0.00	10.27	6.48	388	1.22	2	0.2	6.8
MW-32S	12/6/2011	16:12	4.57	9.95	0.00	12.60	6.31	654	0.93	-74	0.3	0.1

Preliminary Draft

Table 3

Field Parameter Values, Fall 2011 Groundwater Sampling Event

Location	Sample Date	Sample Time	Depth to Water (ft btoc)	Ferrous Iron (mg/L)	Sulfide (mg/L)	Temperature (°C)	pH	EC (µS/cm)	D.O. (mg/L)	Redox Potential (mV)	Salinity (ppt)	Turbidity (ntu)
MW-33S	12/5/2011	13:53	8.00	5.55	0.06	10.66	7.24	516	0.72	-196	0.2	4.4
MW-34S	12/6/2011	7:07	2.86	0.15	0.01	7.99	6.36	243	5.77	158	0.1	6.6
MW-35S	12/6/2011	8:33	4.93	2.55	0.02	8.96	6.28	286	1.21	-12	0.1	2.2

Notes:

°C = degrees Celsius
D.O. = dissolved oxygen
EC = electrical conductivity
ft btoc = feet below top of casing
mg/L = milligrams per liter
N/A = data not recorded
mV = millivolts
ntu = nephelometric turbidity units
ppt = parts per trillion
µS/cm = microsiemens per centimeter

Table 4
Metals in Groundwater, Fall 2011 Groundwater Sampling Event

			Characterization of COIs											Adjacent Site COIs				
Location ID	Sample Date	Sample ID	Arsenic D ug/l	Arsenic T ug/l	Chromium D ug/l	Chromium T ug/l	Chromium (VI) D mg/l	Copper D ug/l	Copper T ug/l	Silver D ug/l	Silver T ug/l	Zinc D ug/l	Zinc T ug/l	Antimony D ug/l	Antimony T ug/l	Beryllium D ug/l	Beryllium T ug/l	Cadmium D ug/l
MW-1S	11/29/2011	MW-1S-112911	**14.9**	**16.1**	**1**	1.9 U	0.003 UJ	**2**	**7**	0.43 U	0.43 U	**70**	**70**	na	na	na	na	na
MW-1S (dup)	11/29/2011	DUP-112911-1	**13**	**15.4**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-1D	11/29/2011	MW-1D-112911	**8**	**9.2**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-2S	11/30/2011	MW-2S-113011	**499**	**462**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-2D	11/30/2011	MW-2D-113011	**36.6**	**34.3**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-3S	12/1/2011	MW-3S-120111	**412**	**414**	0.11 U	0.11 U	na	0.92 U	**2**	0.43 UJ	0.43 U	1.4 U	1.4 U	6.3 U	6.3 U	0.021 U	0.021 U	0.01 U
MW-3D	12/1/2011	MW-3D-120111	**35.8**	**34.8**	**4**	5 U	na	0.92 U	0.92 U	0.43 U	0.43 U	1.4 U	1.4 U	na	na	na	na	na
MW-4S	11/28/2011	MW-04S-112811	**42.7 J**	**44.7**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-5S	12/1/2011	MW-5S-120111	**7.4**	**7.2**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-6S	11/30/2011	MW-6S-113011	**27.9**	**29**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-7S	11/29/2011	MW-7S-112911	**22**	**22.6**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-10	11/29/2011	MW-10-112911	**22.4**	**23.8**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-11	12/1/2011	MW-11-120111	**97.7**	**97.6**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-12	12/1/2011	MW-12-120111	**116**	**123**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-13	11/29/2011	MW-13-112911	**963**	**1010**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-14	12/2/2011	MW-14-120211	**935**	**933**	0.11 U	0.11 U	na	0.92 U	**9**	0.43 U	0.43 U	1.4 U	1.4 U	na	na	na	na	na
MW-14 (dup)	12/2/2011	DUP-120211-1	**892**	**858**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-14D	12/2/2011	MW-14D-120211	**390**	**427**	**9**	**13**	na	0.92 U	**4**	0.43 U	0.43 U	1.4 U	1.4 U	na	na	na	na	na
MW-16	12/6/2011	MW-16-120611	**11.7**	**13.3**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-17	11/28/2011	MW-17-112811	**47.5 J**	**49.8**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-18	11/30/2011	MW-18-113011	**4**	**3.6**	0.045 U	0.045 U	na	0.92 U	0.92 U	0.43 UJ	0.43 U	1.4 U	1.4 U	6.3 U	6.3 U	0.021 U	0.021 U	0.01 U
MW-18 (dup)	11/30/2011	DUP-113011-2	na	na	0.045 U	**0.5**	na	0.92 U	0.92 U	0.43 U	0.43 U	1.4 U	1.4 U	6.3 U	6.3 U	0.021 U	0.021 U	0.01 U
MW-19	12/1/2011	MW-19-120111	**420**	**402**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-20	11/30/2011	MW-20-113011	**2600**	**2770**	0.045 U	0.045 U	na	0.92 U	**3**	0.43 UJ	0.43 U	1.4 U	1.4 U	6.3 U	6.3 U	0.021 U	0.021 U	0.01 U
MW-21	11/30/2011	MW-21-113011	**1850**	**1870**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-21 (dup)	11/30/2011	DUP-113011-1	**1800**	**1820**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-22	11/28/2011	MW-22-112811	**7.9 J**	**7.9**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-23	11/28/2011	MW-23-112811	**2.9**	**2.7**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-24	11/30/2011	MW-24-113011	**0.2**	0.048 U	0.045 U	0.11 U	na	0.92 U	0.92 U	0.43 UJ	0.43 U	1.4 U	1.4 U	6.3 U	6.3 U	0.021 U	0.021 U	0.01 U
MW-26	12/1/2011	MW-26-120111	**448**	**432**	0.22 U	2 U	na	0.92 U	**4**	0.43 UJ	0.43 U	1.4 U	1.4 U	6.3 U	6.3 U	0.021 U	0.021 U	0.01 U
MW-27	12/1/2011	MW-27-120111	**13**	**13**	0.11 U	2 U	na	0.92 U	**3**	0.43 UJ	0.43 U	1.4 U	1.4 U	6.3 U	6.3 U	0.052 U	0.052 U	0.025 U
MW-28S	12/2/2011	MW-28S-120211	**11.9**	**11.2**	0.045 U	0.11 U	na	0.92 U	0.92 U	0.43 U	0.43 U	1.4 U	1.4 U	6.3 U	6.3 U	0.021 U	0.021 U	0.01 U
MW-29S	12/2/2011	MW-29S-120211	**2.4**	**2.5**	0.11 U	0.11 U	na	**3**	0.92 U	0.43 U	0.43 U	1.4 U	1.4 U	6.3 U	6.3 U	0.021 U	0.021 U	0.01 U
MW-29S (dup)	12/2/2011	DUP-120211-3	**2.5**	**2.6**	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-30S	12/5/2011	MW-30S-120511	**9.2**	**8.5**	0.11 U	0.11 U	na	0.92 U	0.92 U	0.43 U	0.43 U	1.4 U	1.4 U	6.3 U	6.3 U	0.021 U	0.021 U	0.01 U
MW-30S (dup)	12/5/2011	DUP-120511-1	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-31S	12/5/2011	MW-31S-120511	**2.2**	**2.2**	0.045 U	**1.1**	0.003 U	0.92 U	0.92 U	0.43 U	0.43 U	1.4 U	1.4 U	6.3 U	6.3 U	0.021 U	0.021 U	0.01 U
MW-31S (dup)	12/5/2011	DUP-120511-2	na	na	**0.7**	0.045 U	na	0.92 U	0.92 U	0.43 U	0.43 U	1.4 U	1.4 U	na	na	na	na	na
MW-32S	12/6/2011	MW-32S-120611	**2.1**	**2.2**	**0.8**	0.045 U	na	0.92 U	0.92 U	0.43 U	0.43 U	1.4 U	1.4 U	na	na	na	na	na
MW-33S	12/5/2011	MW-33S-120511	**257**	**299**	**4**	**6**	na	**3**	**138**	0.43 U	0.43 U	1.4 U	1.4 U	na	na	na	na	na
MW-34S	12/6/2011	MW-34S-120611	**2**	**2.2**	0.045 U	0.045 U	0.003 U	**3**	**3**	0.43 U	0.43 U	1.4 U	1.4 U	na	na	na	na	na
MW-34S (dup)	12/6/2011	DUP-120611-1	na	na	na	na	0.003 U	na	na	na	na	na	na	na	na	na	na	na
MW-35S	12/6/2011	MW-35S-120611	**1.3**	**1.4**	0.045 U	0.045 U	na	0.92 U	**3**	0.43 U	0.43 U	1.4 U	1.4 U	na	na	na	na	na

Table 4
Metals in Groundwater, Fall 2011 Groundwater Sampling Event

			Adjacent Site COIs (cont.)									Water Quality Parameters									
Cadmium T ug/l	Lead D ug/l	Lead T ug/l	Mercury D ug/l	Mercury T ug/l	Nickel D ug/l	Nickel T ug/l	Selenium D ug/l	Selenium T ug/l	Thallium D ug/l	Thallium T ug/l	Tributyltin T ug/l	Aluminum D ug/l	Aluminum T ug/l	Calcium T ug/l	Iron D ug/l	Iron T ug/l	Magnesium T ug/l	Manganese D ug/l	Manganese T ug/l	Potassium T ug/l	Sodium T ug/l
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
0.01 U	0.046 U	0.046 U	0.0069 U	0.0069 U	**0.9**	**1**	0.13 U	0.13 U	0.004 U	0.004 U	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	**240**	**560**	**20400**	**9230**	**9600**	**12500**	**412**	**413**	**14800**	**161000**
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
0.01 U	0.046 U	0.046 U	0.0069 U	0.0069 U	**0.6**	**0.7**	0.13 U	0.13 U	0.004 U	0.004 U	na	na	na	na	na	na	na	na	na	na	na
0.01 U	0.046 U	0.046 U	0.0069 U	0.0069 U	0.079 U	**0.7**	0.13 U	0.13 U	0.004 U	0.004 U	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
0.2	0.046 U	0.046 U	0.0069 U	0.0069 U	**0.5**	**1.5**	0.13 U	0.13 U	0.004 U	0.004 U	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
0.01 U	0.046 U	0.046 U	0.0069 U	0.0069 U	**0.7**	**1.1**	0.13 U	0.13 U	0.004 U	0.004 U	na	na	na	na	na	na	na	na	na	na	na
0.01 U	0.046 U	0.046 U	0.0069 U	0.0069 U	**1.8**	**1.9**	0.13 U	0.13 U	0.004 U	0.004 U	na	na	na	na	na	na	na	na	na	na	na
0.025 U	0.12 U	0.12 U	0.0069 U	0.0069 U	**8**	**8**	**7**	**6**	0.01 U	0.01 U	na	na	na	na	na	na	na	na	na	na	na
0.01 U	0.046 U	0.046 U	0.0069 U	0.0069 U	**1.9**	**1.8**	0.13 U	0.13 U	0.004 U	0.004 U	0.002 U	7.6 U	7.6 U	**76500**	**7020**	**6940**	**7230**	**587**	**583**	**6640**	**21500**
0.01 U	0.046 U	0.046 U	0.0069 U	0.0069 U	**0.7**	**0.7**	0.13 U	0.13 U	0.004 U	0.004 U	0.002 U	7.6 U	7.6 U	**54300**	**11600**	**11600**	**13400**	**631**	**629**	**9380**	**30700**
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
0.01 U	0.046 U	0.046 U	0.0069 U	0.0069 U	**1.1**	**0.9**	0.13 U	0.13 U	0.004 U	0.004 U	0.002 U	7.6 U	7.6 U	**56000**	**8300**	**8280**	**11100**	**448**	**441**	**7930**	**13800**
na	na	na	na	na	na	na	na	na	na	na	0.002 U	na	na	na	na	na	na	na	na	na	na
0.01 U	0.046 U	0.046 U	0.0069 U	0.0069 U	**1**	**1.7**	0.13 U	0.13 U	0.004 U	0.004 U	0.002 U	7.6 U	**50**	**53800**	**2500**	**2440**	**4020**	**114**	**112**	**4440**	**4360**
na	na	na	na	na	na	na	na	na	na	na	na	7.6 U	**60**	**55600**	**2500**	**2420**	**4180**	**117**	**113**	**4590**	**4410**
na	na	na	na	na	na	na	na	na	na	na	na	7.6 U	7.6 U	**33000**	**19400**	**19100**	**26600**	**821**	**819**	**20500**	**32300**
na	na	na	na	na	na	na	na	na	na	na	na	**90**	**450**	**31200**	**7760**	**8650**	**3890**	**269**	**278**	**20200**	**44800**
na	na	na	na	na	na	na	na	na	na	na	na	7.6 U	**290**	**35900**	7.5 U	**140**	**1680**	**7**	**9**	**1390**	**4330**
na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na	7.6 U	7.6 U	**43000**	**3940**	**4060**	**2720**	**121**	**124**	**2760**	**5580**

Notes and Key:
ug/L = Micrograms per liter
mg/L = Milligrams per liter
D = Dissolved
dup = Duplicate sample
na = Not analyzed
T = Total
Bold text indicates that compound was detected.

Data Qualifiers:
J = The detected results are qualified as estimated in accordance with USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999 or USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.
U = Result is ≤ Method Detection Limit (MDL). Result reported as the MDL and is qualified as non detected. If qualified as non-detect due to a detection in associated blank samples, than MDL has been revised.
UJ = The non detected results are qualified as estimated in accordance with USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999 or USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.

Preliminary
Draft

Table 5

Semi-Volatile Organic Compounds in Groundwater, Fall 2011 Groundwater Sampling Event

		Location ID	MW-1S	MW-1D	MW-2S	MW-2D	MW-3S	MW-3D	MW-4S	MW-4S (dup)	MW-5S	MW-6S	MW-7S	MW-7S (dup)	MW-10	MW-11
		Sample Code	11/29/2011	11/29/2011	11/30/2011	11/30/2011	12/1/2011	12/1/2011	11/28/2011	11/28/2011	12/1/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	12/1/2011
		Sample Date	MW-1S-112911	IW-1D-1129 1D-1	MW-2S-113011	MW-2D-113011	MW-3S-120111	MW-3D-120111	MW-04S-112811	DUP-112811-1	MW-5S-120111	MW-6S-113011	MW-7S-112911	DUP-112911-2	MW-10-112911	MW-11-120111
2,3,4,6-Tetrachlorophenol	SW8270D	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**18**	**11**	**1.2**	0.5 U
2,4,5-Trichlorophenol	SW8270D	ug/l	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
2,4,6-Trichlorophenol	SW8270D	ug/l	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
2,4-Dichlorophenol	SW8270D	ug/l	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
2-Chlorophenol	SW8270D	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Pentachlorophenol	SW8270D	ug/l	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	**370**	**240**	**15**	2.4 U
Phenol	SW8270D	ug/l	0.5 U	**2.5**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,2-Benzphenanthracene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,2-Dichlorobenzene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,3-Dichlorobenzene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,4-Dichlorobenzene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1-Methylnaphthalene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
2,4-Dimethylphenol	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
2,4-Dinitrophenol	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
2,4-Dinitrotoluene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
2,6-Dinitrotoluene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
2-Chloronaphthalene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
2-Methylnaphthalene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
2-Methylphenol	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
2-Nitroaniline	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
2-Nitrophenol	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
3,3-Dichlorobenzidine	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
3and4-Methylphenol	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
3-Nitroaniline	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
4,6-Dinitro-o-cresol	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
4-Bromophenyl Phenyl Ether	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
4-Chloro-3-methylphenol	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
4-Chlorophenyl Phenyl Ether	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
4-Nitrophenol	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Acenaphthene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Acenaphthylene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Anthracene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Benzo(a) anthracene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Benzo(a) pyrene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Benzo(g,h,i) perylene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Benzoic acid	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Benzyl Alcohol	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Benzyl Butyl Phthalate	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Bis(2-chloro-1-methylethyl) ether	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Bis(2-chloroethoxy) methane	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Bis(2-chloroethyl) ether	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Bis(2-ethylhexyl) phthalate	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Carbazole	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Dibenzo(a,h) anthracene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Dibenzofuran	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Dibutyl phthalate	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Diethyl Phthalate	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Dimethyl Phthalate	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na

Table 5

Semi-Volatile Organic Compounds in Groundwater, Fall 2011 Groundwater Sampling Event

		Location ID	MW-1S	MW-1D	MW-2S	MW-2D	MW-3S	MW-3D	MW-4S	MW-4S (dup)	MW-5S	MW-6S	MW-7S	MW-7S (dup)	MW-10	MW-11
		Sample Code	11/29/2011	11/29/2011	11/30/2011	11/30/2011	12/1/2011	12/1/2011	11/28/2011	11/28/2011	12/1/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	12/1/2011
		Sample Date	MW-1S-112911	IW-1D-11291D-1	MW-2S-113011	MW-2D-113011	MW-3S-120111	MW-3D-120111	MW-04S-112811	DUP-112811-1	MW-5S-120111	MW-6S-113011	MW-7S-112911	DUP-112911-2	MW-10-112911	MW-11-120111
Di-n-Octyl Phthalate	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Fluoranthene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Fluorene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Hexachloro-1,3-Butadiene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Hexachlorobenzene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Hexachlorocyclopentadiene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Hexachloroethane	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Indeno(1,2,3-c,d) pyrene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Isophorone	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Naphthalene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Nitrobenzene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
N-nitrosodi-n-propylamine	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
n-Nitrosodiphenylamine	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
p-Chloroaniline	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Phenanthrene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
P-Nitroaniline	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Pyrene	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Total (B+J+K) Benzofluoranthenes	SW8270D	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1,2-Benzphenanthracene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
1-Methylnaphthalene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
2-Methylnaphthalene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Acenaphthene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Acenaphthylene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Anthracene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Benzo(a) anthracene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Benzo(a) pyrene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Benzo(g,h,i) perylene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Dibenzo(a,h) anthracene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Dibenzofuran	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Fluoranthene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Fluorene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Indeno(1,2,3-c,d) pyrene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Naphthalene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Phenanthrene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Pyrene	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Total (B+J+K) Benzofluoranthenes	SW8270D-SIM	ug/l	na	na	na	na	na	na	na	na	na	na	na	na	na	na

Notes and Key:

ug/L = Micrograms per liter
dup = Duplicate Sample
na = Not analyzed
Bold text indicates that compound was detected.

Data Qualifiers:

j = The value reported is below the routine reporting limit and should be considered an estimate; qualifier reported by the Laboratory.
U = Result is ≤ M,ethod Detection Limit (MDL). Result reported as the MDL and is qualified as non detected.
If qualified as non-detect due to a detection in associated blank samples, than MDL has been revised.
UJ = The non detected results are qualified as estimated in accordance with USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999 or USEPA Contract Laboratory Program National Functional Guidelines

Preliminary
Draft

Table 5

Semi-Volatile Organic Compounds in Groundwater, Fall 2011 Groundwater Sampling Event

		Location ID	MW-12	MW-13	MW-13 (dup)	MW-14	MW-14D	MW-16	MW-17	MW-18	MW-19	MW-20	MW-21	MW-22
		Sample Code	12/1/2011	11/29/2011	11/29/2011	12/2/2011	12/2/2011	12/6/2011	11/28/2011	11/30/2011	12/1/2011	11/30/2011	11/30/2011	11/28/2011
		Sample Date	MW-12-120111	MW-13-112911	DUP-112911-3	MW-14-120211	MW-14D-120211	MW-16-120611	MW-17-112811	MW-18-113011	MW-19-120111	MW-20-113011	MW-21-113011	MW-22-112811
2,3,4,6-Tetrachlorophenol	SW8270D	ug/l	0.5 U	**9.6**	**11**	0.5 U	0.5 U	**2.2**	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2,4,5-Trichlorophenol	SW8270D	ug/l	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 UJ	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
2,4,6-Trichlorophenol	SW8270D	ug/l	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 UJ	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
2,4-Dichlorophenol	SW8270D	ug/l	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 UJ	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
2-Chlorophenol	SW8270D	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Pentachlorophenol	SW8270D	ug/l	2.4 U	**100**	**98**	2.4 U	2.4 U	**24**	2.4 UJ	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Phenol	SW8270D	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	SW8270D	ug/l	na	na	na	na	0.4 U	na	na	na	na	na	na	na
1,2-Benzphenanthracene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
1,2-Dichlorobenzene	SW8270D	ug/l	na	na	na	na	0.4 U	na	na	na	na	na	na	na
1,3-Dichlorobenzene	SW8270D	ug/l	na	na	na	na	0.4 U	na	na	na	na	na	na	na
1,4-Dichlorobenzene	SW8270D	ug/l	na	na	na	na	0.4 U	na	na	na	na	na	na	na
1-Methylnaphthalene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
2,4-Dimethylphenol	SW8270D	ug/l	na	na	na	na	0.4 U	na	na	na	na	na	na	na
2,4-Dinitrophenol	SW8270D	ug/l	na	na	na	na	3.5 U	na	na	na	na	na	na	na
2,4-Dinitrotoluene	SW8270D	ug/l	na	na	na	na	2.5 U	na	na	na	na	na	na	na
2,6-Dinitrotoluene	SW8270D	ug/l	na	na	na	na	2.4 U	na	na	na	na	na	na	na
2-Chloronaphthalene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
2-Methylnaphthalene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
2-Methylphenol	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
2-Nitroaniline	SW8270D	ug/l	na	na	na	na	2.6 U	na	na	na	na	na	na	na
2-Nitrophenol	SW8270D	ug/l	na	na	na	na	2 U	na	na	na	na	na	na	na
3,3-Dichlorobenzidine	SW8270D	ug/l	na	na	na	na	1.5 U	na	na	na	na	na	na	na
3and4-Methylphenol	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
3-Nitroaniline	SW8270D	ug/l	na	na	na	na	2.3 U	na	na	na	na	na	na	na
4,6-Dinitro-o-cresol	SW8270D	ug/l	na	na	na	na	3.1 U	na	na	na	na	na	na	na
4-Bromophenyl Phenyl Ether	SW8270D	ug/l	na	na	na	na	0.4 U	na	na	na	na	na	na	na
4-Chloro-3-methylphenol	SW8270D	ug/l	na	na	na	na	2.4 U	na	na	na	na	na	na	na
4-Chlorophenyl Phenyl Ether	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
4-Nitrophenol	SW8270D	ug/l	na	na	na	na	2.6 U	na	na	na	na	na	na	na
Acenaphthene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Acenaphthylene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Anthracene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Benzo(a) anthracene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Benzo(a) pyrene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Benzo(g,h,i) perylene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Benzoic acid	SW8270D	ug/l	na	na	na	na	5.1 U	na	na	na	na	na	na	na
Benzyl Alcohol	SW8270D	ug/l	na	na	na	na	2 U	na	na	na	na	na	na	na
Benzyl Butyl Phthalate	SW8270D	ug/l	na	na	na	na	0.6 U	na	na	na	na	na	na	na
Bis(2-chloro-1-methylethyl) ether	SW8270D	ug/l	na	na	na	na	0.6 U	na	na	na	na	na	na	na
Bis(2-chloroethoxy) methane	SW8270D	ug/l	na	na	na	na	0.6 U	na	na	na	na	na	na	na
Bis(2-chloroethyl) ether	SW8270D	ug/l	na	na	na	na	0.6 U	na	na	na	na	na	na	na
Bis(2-ethylhexyl) phthalate	SW8270D	ug/l	na	na	na	na	1 U	na	na	na	na	na	na	na
Carbazole	SW8270D	ug/l	na	na	na	na	0.3 U	na	na	na	na	na	na	na
Dibenzo(a,h) anthracene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Dibenzofuran	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Dibutyl phthalate	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Diethyl Phthalate	SW8270D	ug/l	na	na	na	na	0.6 U	na	na	na	na	na	na	na
Dimethyl Phthalate	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na

Table 5

Semi-Volatile Organic Compounds in Groundwater, Fall 2011 Groundwater Sampling Event

		Location ID	MW-12	MW-13	MW-13 (dup)	MW-14	MW-14D	MW-16	MW-17	MW-18	MW-19	MW-20	MW-21	MW-22
		Sample Code	12/1/2011	11/29/2011	11/29/2011	12/2/2011	12/2/2011	12/6/2011	11/28/2011	11/30/2011	12/1/2011	11/30/2011	11/30/2011	11/28/2011
		Sample Date	MW-12-120111	MW-13-112911	DUP-112911-3	MW-14-120211	MW-14D-120211	MW-16-120611	MW-17-112811	MW-18-113011	MW-19-120111	MW-20-113011	MW-21-113011	MW-22-112811
Di-n-Octyl Phthalate	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Fluoranthene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Fluorene	SW8270D	ug/l	na	na	na	na	0.6 U	na	na	na	na	na	na	na
Hexachloro-1,3-Butadiene	SW8270D	ug/l	na	na	na	na	0.3 U	na	na	na	na	na	na	na
Hexachlorobenzene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Hexachlorocyclopentadiene	SW8270D	ug/l	na	na	na	na	1.2 U	na	na	na	na	na	na	na
Hexachloroethane	SW8270D	ug/l	na	na	na	na	0.4 U	na	na	na	na	na	na	na
Indeno(1,2,3-c,d) pyrene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Isophorone	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Naphthalene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Nitrobenzene	SW8270D	ug/l	na	na	na	na	0.6 U	na	na	na	na	na	na	na
N-nitrosodi-n-propylamine	SW8270D	ug/l	na	na	na	na	0.6 U	na	na	na	na	na	na	na
n-Nitrosodiphenylamine	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
p-Chloroaniline	SW8270D	ug/l	na	na	na	na	2.6 U	na	na	na	na	na	na	na
Phenanthrene	SW8270D	ug/l	na	na	na	na	0.6 U	na	na	na	na	na	na	na
P-Nitroaniline	SW8270D	ug/l	na	na	na	na	2.2 U	na	na	na	na	na	na	na
Pyrene	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
Total (B+J+K) Benzofluoranthenes	SW8270D	ug/l	na	na	na	na	0.5 U	na	na	na	na	na	na	na
1,2-Benzphenanthracene	SW8270D-SIM	ug/l	na	na	na	na	0.026 U	na	na	na	na	na	na	na
1-Methylnaphthalene	SW8270D-SIM	ug/l	na	na	na	na	0.016 U	na	na	na	na	na	na	na
2-Methylnaphthalene	SW8270D-SIM	ug/l	na	na	na	na	0.02 U	na	na	na	na	na	na	na
Acenaphthene	SW8270D-SIM	ug/l	na	na	na	na	0.015 U	na	na	na	na	na	na	na
Acenaphthylene	SW8270D-SIM	ug/l	na	na	na	na	0.024 U	na	na	na	na	na	na	na
Anthracene	SW8270D-SIM	ug/l	na	na	na	na	0.025 U	na	na	na	na	na	na	na
Benzo(a) anthracene	SW8270D-SIM	ug/l	na	na	na	na	0.023 U	na	na	na	na	na	na	na
Benzo(a) pyrene	SW8270D-SIM	ug/l	na	na	na	na	0.059 U	na	na	na	na	na	na	na
Benzo(g,h,i) perylene	SW8270D-SIM	ug/l	na	na	na	na	0.03 U	na	na	na	na	na	na	na
Dibenzo(a,h) anthracene	SW8270D-SIM	ug/l	na	na	na	na	0.042 U	na	na	na	na	na	na	na
Dibenzofuran	SW8270D-SIM	ug/l	na	na	na	na	0.016 U	na	na	na	na	na	na	na
Fluoranthene	SW8270D-SIM	ug/l	na	na	na	na	0.021 U	na	na	na	na	na	na	na
Fluorene	SW8270D-SIM	ug/l	na	na	na	na	0.019 U	na	na	na	na	na	na	na
Indeno(1,2,3-c,d) pyrene	SW8270D-SIM	ug/l	na	na	na	na	0.029 U	na	na	na	na	na	na	na
Naphthalene	SW8270D-SIM	ug/l	na	na	na	na	0.02 U	na	na	na	na	na	na	na
Phenanthrene	SW8270D-SIM	ug/l	na	na	na	na	0.026 U	na	na	na	na	na	na	na
Pyrene	SW8270D-SIM	ug/l	na	na	na	na	0.028 U	na	na	na	na	na	na	na
Total (B+J+K) Benzofluoranthenes	SW8270D-SIM	ug/l	na	na	na	na	0.1 U	na	na	na	na	na	na	na

Table 5

Semi-Volatile Organic Compounds in Groundwater, Fall 2011 Groundwater Sampling Event

		Location ID	MW-23	MW-24	MW-26	MW-27	MW-28S	MW-29S	MW-29S (dup)	MW-30S	MW-31S	MW-32S	MW-33S	MW-33S (dup)	MW-34S	MW-35S
		Sample Code	11/28/2011	11/30/2011	12/1/2011	12/1/2011	12/2/2011	12/2/2011	12/2/2011	12/5/2011	12/5/2011	12/6/2011	12/5/2011	12/5/2011	12/6/2011	12/6/2011
		Sample Date	MW-23-112811	MW-24-113011	MW-26-120111	MW-27-120111	MW-28S-120211	MW-29S-120211	DUP-120211-3	MW-30S-120511	MW-31S-120511	MW-32S-120611	MW-33S-120511	DUP-120511-3	MW-34S-120611	MW-35S-120611
2,3,4,6-Tetrachlorophenol	SW8270D	ug/l	0.5 U	0.5 U	**21**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2,4,5-Trichlorophenol	SW8270D	ug/l	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
2,4,6-Trichlorophenol	SW8270D	ug/l	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
2,4-Dichlorophenol	SW8270D	ug/l	2.6 U	2.6 U	**21**	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
2-Chlorophenol	SW8270D	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Pentachlorophenol	SW8270D	ug/l	2.4 U	2.4 U	**96**	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Phenol	SW8270D	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**2.1**	**1.1**	0.5 U	**2.3**	**2**	0.5 U	**8.8**
1,2,4-Trichlorobenzene	SW8270D	ug/l	na	na	na	na	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2-Benzphenanthracene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	SW8270D	ug/l	na	na	na	na	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,3-Dichlorobenzene	SW8270D	ug/l	na	na	na	na	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,4-Dichlorobenzene	SW8270D	ug/l	na	na	na	na	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1-Methylnaphthalene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2,4-Dimethylphenol	SW8270D	ug/l	na	na	na	na	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2,4-Dinitrophenol	SW8270D	ug/l	na	na	na	na	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
2,4-Dinitrotoluene	SW8270D	ug/l	na	na	na	na	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2,6-Dinitrotoluene	SW8270D	ug/l	na	na	na	na	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
2-Chloronaphthalene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Methylnaphthalene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Methylphenol	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Nitroaniline	SW8270D	ug/l	na	na	na	na	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
2-Nitrophenol	SW8270D	ug/l	na	na	na	na	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
3,3-Dichlorobenzidine	SW8270D	ug/l	na	na	na	na	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
3and4-Methylphenol	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
3-Nitroaniline	SW8270D	ug/l	na	na	na	na	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
4,6-Dinitro-o-cresol	SW8270D	ug/l	na	na	na	na	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U
4-Bromophenyl Phenyl Ether	SW8270D	ug/l	na	na	na	na	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-Chloro-3-methylphenol	SW8270D	ug/l	na	na	na	na	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
4-Chlorophenyl Phenyl Ether	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Nitrophenol	SW8270D	ug/l	na	na	na	na	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Acenaphthene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acenaphthylene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Anthracene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzo(a) anthracene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzo(a) pyrene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzo(g,h,i) perylene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzoic acid	SW8270D	ug/l	na	na	na	na	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U
Benzyl Alcohol	SW8270D	ug/l	na	na	na	na	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Benzyl Butyl Phthalate	SW8270D	ug/l	na	na	na	na	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Bis(2-chloro-1-methylethyl) ether	SW8270D	ug/l	na	na	na	na	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Bis(2-chloroethoxy) methane	SW8270D	ug/l	na	na	na	na	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Bis(2-chloroethyl) ether	SW8270D	ug/l	na	na	na	na	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Bis(2-ethylhexyl) phthalate	SW8270D	ug/l	na	na	na	na	1 U	1 U	1 U	1 U	1 U	1 U	2.4 U	1.4 U	1 U	1 U
Carbazole	SW8270D	ug/l	na	na	na	na	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Dibenzo(a,h) anthracene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibenzofuran	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibutyl phthalate	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Diethyl Phthalate	SW8270D	ug/l	na	na	na	na	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Dimethyl Phthalate	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table 5

Semi-Volatile Organic Compounds in Groundwater, Fall 2011 Groundwater Sampling Event

		Location ID	MW-23	MW-24	MW-26	MW-27	MW-28S	MW-29S	MW-29S (dup)	MW-30S	MW-31S	MW-32S	MW-33S	MW-33S (dup)	MW-34S	MW-35S
		Sample Code	11/28/2011	11/30/2011	12/1/2011	12/1/2011	12/2/2011	12/2/2011	12/2/2011	12/5/2011	12/5/2011	12/6/2011	12/5/2011	12/5/2011	12/6/2011	12/6/2011
		Sample Date	MW-23-112811	MW-24-113011	MW-26-120111	MW-27-120111	MW-28S-120211	MW-29S-120211	DUP-120211-3	MW-30S-120511	MW-31S-120511	MW-32S-120611	MW-33S-120511	DUP-120511-3	MW-34S-120611	MW-35S-120611
Di-n-Octyl Phthalate	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Fluoranthene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Fluorene	SW8270D	ug/l	na	na	na	na	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Hexachloro-1,3-Butadiene	SW8270D	ug/l	na	na	na	na	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Hexachlorobenzene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Hexachlorocyclopentadiene	SW8270D	ug/l	na	na	na	na	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Hexachloroethane	SW8270D	ug/l	na	na	na	na	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Indeno(1,2,3-c,d) pyrene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isophorone	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Naphthalene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Nitrobenzene	SW8270D	ug/l	na	na	na	na	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
N-nitrosodi-n-propylamine	SW8270D	ug/l	na	na	na	na	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
n-Nitrosodiphenylamine	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
p-Chloroaniline	SW8270D	ug/l	na	na	na	na	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Phenanthrene	SW8270D	ug/l	na	na	na	na	0.6 U	0.6 U	0.6 U	**0.7** j	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
P-Nitroaniline	SW8270D	ug/l	na	na	na	na	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Pyrene	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Total (B+J+K) Benzofluoranthenes	SW8270D	ug/l	na	na	na	na	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Benzphenanthracene	SW8270D-SIM	ug/l	na	na	na	na	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U
1-Methylnaphthalene	SW8270D-SIM	ug/l	na	na	na	na	0.016 U	0.016 U	0.016 U	**0.06** j	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	**0.08** j
2-Methylnaphthalene	SW8270D-SIM	ug/l	na	na	na	na	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acenaphthene	SW8270D-SIM	ug/l	na	na	na	na	0.015 U	0.015 U	0.015 U	**0.22**	0.015 U	0.015 U	**0.05** j	**0.06** j	0.015 U	0.015 U
Acenaphthylene	SW8270D-SIM	ug/l	na	na	na	na	0.024 U	0.024 U	0.024 U	**0.09** j	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U
Anthracene	SW8270D-SIM	ug/l	na	na	na	na	0.025 U	0.025 U	0.025 U	**0.08** j	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Benzo(a) anthracene	SW8270D-SIM	ug/l	na	na	na	na	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U
Benzo(a) pyrene	SW8270D-SIM	ug/l	na	na	na	na	0.059 U	0.059 U	0.059 U	0.059 U	0.059 U	0.059 U	0.059 U	0.059 U	0.059 U	0.059 U
Benzo(g,h,i) perylene	SW8270D-SIM	ug/l	na	na	na	na	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Dibenzo(a,h) anthracene	SW8270D-SIM	ug/l	na	na	na	na	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U
Dibenzofuran	SW8270D-SIM	ug/l	na	na	na	na	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	**0.36**
Fluoranthene	SW8270D-SIM	ug/l	na	na	na	na	0.021 U	0.021 U	0.021 U	**0.24**	**0.06** j	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
Fluorene	SW8270D-SIM	ug/l	na	na	na	na	0.019 U	0.019 U	0.019 U	**0.17**	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
Indeno(1,2,3-c,d) pyrene	SW8270D-SIM	ug/l	na	na	na	na	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U
Naphthalene	SW8270D-SIM	ug/l	na	na	na	na	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	**0.08** j	**0.07** j	0.02 U	**0.08** j
Phenanthrene	SW8270D-SIM	ug/l	na	na	na	na	0.026 U	0.026 U	0.026 U	**0.44**	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U
Pyrene	SW8270D-SIM	ug/l	na	na	na	na	0.028 U	0.028 U	0.028 U	**0.31**	**0.08** j	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
Total (B+J+K) Benzofluoranthenes	SW8270D-SIM	ug/l	na	na	na	na	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U

Notes and Key:

ug/L = Micrograms per liter
dup = Duplicate Sample
na = Not analyzed
Bold text indicates that compound was detected.

Data Qualifiers:

j = The value reported is below the routine reporting limit and should be considered an estimate; qualifier reported by the Laboratory.
U = Result is ≤ M,ethod Detection Limit (MDL). Result reported as the MDL and is qualified as non detected.
If qualified as non-detect due to a detection in associated blank samples, than MDL has been revised.
UJ = The non detected results are qualified as estimated in accordance with USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999 or USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.

Table 6

Volatile Organic Compounds in Groundwater, Fall 2011 Groundwater Sampling Event

Location ID		MW-4S	MW-13	MW-16	MW-28S	MW-28S (dup)	MW-29S	MW-30S	MW-31S
Sample Code		11/28/2011	11/29/2011	12/6/2011	12/2/2011	12/2/2011	12/2/2011	12/5/2011	12/5/2011
Sample Date		MW-04S-112811	MW-13-112911	MW-16-120611	MW-28S-120211	DUP-120211-2	MW-29S-120211	MW-30S-120511	MW-31S-120511
1,1,1,2-Tetrachloroethane	ug/l	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
1,1,1-Trichloroethane	ug/l	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
1,1,2,2-Tetrachloroethane	ug/l	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	ug/l	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
1,1,2-Trichloroethane	ug/l	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
1,1-Dichloroethane	ug/l	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	**0.2** j	0.05 U	0.05 U
1,1-Dichloroethylene	ug/l	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
1,1-Dichloropropene	ug/l	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
1,2,3-Trichlorobenzene	ug/l	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
1,2,3-Trichloropropane	ug/l	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
1,2,4-Trichlorobenzene	ug/l	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
1,2,4-Trimethylbenzene	ug/l	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
1,2-Dibromo-3-Chloropropane (DBCP)	ug/l	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,2-Dibromoethane	ug/l	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
1,2-Dichlorobenzene	ug/l	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
1,2-Dichloroethane	ug/l	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
1,2-Dichloropropane	ug/l	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
1,3,5-Trimethylbenzene	ug/l	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
1,3-Dichlorobenzene	ug/l	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
1,3-Dichloropropane	ug/l	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
1,4-Dichlorobenzene	ug/l	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
1,4-Dichloro-trans-2-butene	ug/l	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
2,2-Dichloropropane	ug/l	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
2-Butanone (MEK)	ug/l	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
2-Chloroethyl Vinyl Ether	ug/l	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
2-Chlorotoluene	ug/l	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
4-Chlorotoluene	ug/l	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
Acetone	ug/l	0.72 U	0.72 U	5.1 U	5 U	5 U	5.1 U	0.72 U	0.72 U
Acrolein	ug/l	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
Acrylonitrile	ug/l	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Benzene	ug/l	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Bromobenzene	ug/l	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Bromochloromethane	ug/l	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
Bromodichloromethane	ug/l	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Bromoform	ug/l	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
Bromomethane	ug/l	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Carbon Disulfide	ug/l	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
Carbon Tetrachloride	ug/l	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
Chlorobenzene	ug/l	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Chlorodibromomethane	ug/l	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
Chloroethane	ug/l	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Chloroform	ug/l	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
Chloromethane	ug/l	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
cis-1,2-Dichloroethene	ug/l	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
cis-1,3-Dichloropropene	ug/l	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Cymene	ug/l	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U

Table 6

Volatile Organic Compounds in Groundwater, Fall 2011 Groundwater Sampling Event

	Location ID	MW-4S	MW-13	MW-16	MW-28S	MW-28S (dup)	MW-29S	MW-30S	MW-31S
	Sample Code	**11/28/2011**	**11/29/2011**	**12/6/2011**	**12/2/2011**	**12/2/2011**	**12/2/2011**	**12/5/2011**	**12/5/2011**
	Sample Date	**MW-04S-112811**	**MW-13-112911**	**MW-16-120611**	**MW-28S-120211**	**DUP-120211-2**	**MW-29S-120211**	**MW-30S-120511**	**MW-31S-120511**
Dibromomethane	ug/l	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
Ethyl bromide	ug/l	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
Ethylbenzene	ug/l	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
Hexachloro-1,3-Butadiene	ug/l	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Isopropylbenzene (Cumene)	ug/l	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
m&p-xylene	ug/l	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Methyl Iodide	ug/l	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Methyl Isobutyl Ketone	ug/l	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Methyl n-Butyl Ketone	ug/l	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Methylene Chloride	ug/l	0.39 U	0.39 U	0.5 U	0.39 U	0.39 U	0.5 U	0.39 U	0.39 U
Methyl-t-butyl ether (MTBE)	ug/l	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Naphthalene	ug/l	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
N-Butylbenzene	ug/l	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
n-Propylbenzene	ug/l	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
o-Xylene	ug/l	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
sec-Butylbenzene	ug/l	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
Styrene (Monomer)	ug/l	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
tert-Butylbenzene	ug/l	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Tetrachloroethene	ug/l	0.09 U	0.09 U	0.09 U	**0.2** j	**0.2**	0.09 U	**0.2**	0.09 U
Toluene	ug/l	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
trans-1,2-Dichloroethene	ug/l	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
trans-1,3-Dichloropropene	ug/l	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Trichloroethylene	ug/l	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
Trichlorofluoromethane (CFC-11)	ug/l	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
Vinyl Acetate	ug/l	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
Vinyl Chloride	ug/l	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U

Notes and Key:

ug/L = Micrograms per liter

dup = Duplicate Sample

Bold text indicates that compound was detected.

Data Qualifiers:

j = The value reported is below the routine reporting limit and should be considered an estimate; qualifier reported by the Laboratory.

U = Result is ≤ M,ethod Detection Limit (MDL). Result reported as the MDL and is qualified as non detected. If qualified as non-detect due to a detection in associated blank samples, than MDL has been revised.

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Table 7

Dioxin/Furans in Groundwater, Fall 2011 Groundwater Sampling Event

Location ID			MW-7S	MW-7S (dup)	MW-10	MW-13
Sample Code			11/29/2011	11/29/2011	11/29/2011	11/29/2011
Sample Date		TEFs	MW-7S-112911	DUP-112911-2	MW-10-112911	MW-13-112911
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/l	1	0.598 U	0.554 U	0.879 U	0.633 U
Tetrachlorodibenzo-p-dioxin homologs (Total TCDD)	pg/l		**4.69**	**7.68**	0.567 U	**0.634** *
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/l	1	0.598 U	0.554 U	0.567 U	0.561 U
Pentachlorodibenzo-p-dioxin homologs (Total PeCDD)	pg/l		0.598 U	0.554 U	0.567 U	0.561 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/l	0.1	0.598 U	0.554 U	0.567 U	0.561 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/l	0.1	0.598 U	0.554 U	1.14 U	0.716 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/l	0.1	0.598 U	0.554 U	0.704 U	0.561 U
Hexachlorodibenzo-p-dioxin homologs (Total HxCDD)	pg/l		0.598 U	**2.52**	**2.74** *	**1.15**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/l	0.01	5.28 U	**17.7** j	**16.9** j	**20.2** j
Heptachlorodibenzo-p-dioxin homologs (Total HpCDD)	pg/l		**4.5**	**39.1**	**28.2**	**40.2**
Octachlorodibenzo-p-dioxin (OCDD)	pg/l	0.0003	**140**	**1100**	**369**	**3110**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/l	0.1	0.598 U	0.554 U	0.567 U	0.561 U
Tetrachlorodibenzofuran homologs (Total TCDF)	pg/l		**5.15**	**7.49**	**1.29**	0.561 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/l	0.03	0.598 U	0.554 U	0.567 U	0.561 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/l	0.3	0.598 U	0.554 U	0.624 U	0.561 U
Pentachlorodibenzofuran homologs (Total PeCDF)	pg/l		0.598 U	0.554 U	**1.7**	0.561 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/l	0.1	0.598 U	0.554 U	3.88 U	0.561 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/l	0.1	0.598 U	0.554 U	**0.719** j	0.561 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/l	0.1	0.598 U	0.554 U	0.567 U	0.561 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/l	0.1	0.598 U	0.554 U	0.567 U	0.561 U
Hexachlorodibenzofuran homologs (Total HxCDF)	pg/l		**0.882**	0.554 U	**12.6**	**2.77**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/l	0.01	1.79 U	1.56 U	**11.1** j	**6.37** j
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/l	0.01	0.703 U	0.917 U	1.68 U	1.21 U
Heptachlorodibenzofuran homologs (Total HpCDF)	pg/l		**3.89** *	0.917 U	**33**	**16**
Octachlorodibenzofuran (OCDF)	pg/l	0.0003	5.8 U	7.36 U	17 U	**81** j
Calculated TEQ (ND=0)	pg/l		**0.042**	**0.507**	**0.463**	**1.223**
Calculated TEQ (ND=1/2 DL)	pg/l		**1.02**	**1.39**	**1.70**	**2.15**

Notes and Key:

dup = Duplicate Sample

pg/L = Picograms per liter (1E-12 g/L) equivalent to parts per quadrillion.

TEQ = Toxicity Equivalency Quotient to 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD). Only positively identified compounds are included in TEQ calculation.

TEF = Toxicity Equivalency Factors (World Health Organization, 2005)

Bold text indicates that compound was detected.

Data Qualifiers:

j = The value reported is below the routine reporting limit and should be considered an estimate; qualifier reported by the Laboratory.

U = Result is ≤ Reporting Limit (RL). Result reported as the MDL and is qualified as non detected. If qualified as non-detect due to a detection in associated blank samples, than RL has been revised.

* = May be biased high; associated congeners were U-qualified due to detections in the laboratory blank

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Table 8

Total Petroleum Hydrocarbons and Water Quality/General Chemistry Parameters in Groundwater, Fall 2011 Groundwater Sampling Event

			Total Petroleum Hydrocarbons			Water Quality Parameters												
Location ID	Sample Date	Sample ID	TPH as Diesel mg/l	TPH as Motor Oil mg/l	TPH as Gasoline mg/l	Chloride mg/l	Nitrate mg/l	Sulfate mg/l	Ammonia mg/l	Alkalinity, Bicarbonate (as CaCO3) mg/l	Alkalinity, Carbonate (as CaCO3) mg/l	Alkalinity, Hydroxide (as CaCO3) mg/l	Alkalinity, Total (as CaCO3) mg/l	Total Suspended Solids mg/l	Phosphorus T mg/l	Hardness T mg/l	TOC mg/l	TOX ug/l
MW-1S	11/29/2011	MW-1S-112911	**0.19**	0.04 U	**0.03** NJ	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-7S	11/29/2011	MW-7S-112911	na	na	na	na	na	na	na	na	na	na	na	**6.6**	na	na	na	na
MW-10	11/29/2011	MW-10-112911	na	na	na	na	na	na	na	na	na	na	na	1.1 U	na	na	na	na
MW-13	11/29/2011	MW-13-112911	na	na	na	na	na	na	na	na	na	na	na	**3.3**	na	na	na	na
MW-14D	12/2/2011	MW-14D-120211	na	na	na	**39.9**	0.007 U	**0.1**	na	**432**	1 U	1 U	**432**	**1.7**	**0.047**	**100**	**28.5**	**24**
MW-28S	12/2/2011	MW-28S-120211	0.02 U	0.04 U	0.03 U	**10.6**	0.007 U	**13.4**	**0.36**	**253**	1 U	1 U	**253**	**12.7**	**0.234**	**220**	**7.59**	**8** j
MW-29S	12/2/2011	MW-29S-120211	**0.11** NJ	0.04 U	0.03 U	**51.1**	0.007 U	**11.6**	**1.82**	**191**	1 U	1 U	**191**	**22.6**	**0.768**	**190**	**6.15**	**5** j
MW-30S	12/5/2011	MW-30S-120511	**0.23** NJ	0.04 U	0.03 U	**6.7**	**0.2**	**1.8**	**2.06**	**216**	1 U	1 U	**216**	**8.2**	**1.22** J	**190**	**4.74**	4 U
MW-30S (dup)	12/5/2011	DUP-120511-1	**0.23** NJ	0.04 U	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-31S	12/5/2011	MW-31S-120511	**0.27** NJ	0.04 U	0.03 U	**3.5**	**0.2**	**19.4**	**0.471**	**141**	1 U	1 U	**141**	**1.2**	**0.384** J	**150**	**3.6**	**6** j
MW-31S (dup)	12/5/2011	DUP-120511-2	na	na	0.03 U	na	na	na	na	na	na	na	na	na	na	na	na	na
MW-32S	12/6/2011	MW-32S-120611	na	na	na	**7.8**	0.007 U	**0.7**	na	**291**	1 U	1 U	**291**	**31.8**	**1.23**	**190**	**8.79**	**5** j
MW-33S	12/5/2011	MW-33S-120511	na	na	na	**3.5**	0.007 U	**0.4**	na	**218**	1 U	1 U	**218**	**15**	**2.6** J	**94**	**10.4**	**7** j
MW-34S	12/6/2011	MW-34S-120611	na	na	na	**2.3**	**0.4**	**9.4**	**0.04**	**93.4**	1 U	1 U	**93.4**	**1.9**	**0.192**	**97**	**2.34**	**6** j
MW-34S (dup)	12/6/2011	DUP-120611-1	na	na	na	na	na	na	**0.074**	na	na	na	na	na	na	na	na	na
MW-35S	12/6/2011	MW-35S-120611	**2**	0.04 U	0.03 U	**3.4**	0.007 U	**1.5**	**0.207**	**121**	1 U	1 U	**121**	**2.3**	**0.252**	**120**	**2.68**	4 U

Notes and Key:

ug/L = Micrograms per liter
CaCO3 = Calcium carbonate
D = Dissolved
dup = Duplicate sample
mg/L = Milligrams per liter
na = Not analyzed
T = Total
TPH = Total petroleum hydrocarbons
Bold text indicates that compound was detected.

Data Qualifiers:

J = The detected results are qualified as estimated in accordance with USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999 or USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.
U = Result is ≤ M,ethod Detection Limit (MDL). Result reported as the MDL and is qualified as non detected. If qualified as non-detect due to a detection in associated blank samples, than MDL has been revised.
NJ = Estimated value - chromatogram did not resemble the standard hydrocarbon pattern

Table 9

Constituents Detected in Groundwater, Fall 2011 Groundwater Sampling Event

Location ID	Sample Date	Sample ID	Arsenic D ug/l	Arsenic T ug/l	Chromium D ug/l	Chromium T ug/l	Copper D ug/l	Copper T ug/l
MW-1S	11/29/2011	MW-1S-112911	14.9	16.1	1	1.9 U	2	7
MW-1S (dup)	11/29/2011	DUP-112911-1	13	15.4	na	na	na	na
MW-1D	11/29/2011	MW-1D-112911	8	9.2	na	na	na	na
MW-2S	11/30/2011	MW-2S-113011	499	462	na	na	na	na
MW-2D	11/30/2011	MW-2D-113011	36.6	34.3	na	na	na	na
MW-3S	12/1/2011	MW-3S-120111	412	414	0.11 U	0.11 U	0.92 U	2
MW-3D	12/1/2011	MW-3D-120111	35.8	34.8	4	5 U	0.92 U	0.92 U
MW-4S	11/28/2011	MW-04S-112811	42.7 J	44.7	na	na	na	na
MW-4S (dup)	11/28/2011	DUP-112811-1	na	na	na	na	na	na
MW-5S	12/1/2011	MW-5S-120111	7.4	7.2	na	na	na	na
MW-6S	11/30/2011	MW-6S-113011	27.9	29	na	na	na	na
MW-7S	11/29/2011	MW-7S-112911	22	22.6	na	na	na	na
MW-7S (dup)	11/29/2011	DUP-112911-2	na	na	na	na	na	na
MW-10	11/29/2011	MW-10-112911	22.4	23.8	na	na	na	na
MW-11	12/1/2011	MW-11-120111	97.7	97.6	na	na	na	na
MW-12	12/1/2011	MW-12-120111	116	123	na	na	na	na
MW-13	11/29/2011	MW-13-112911	963	1010	na	na	na	na
MW-13 (dup)	11/29/2011	DUP-112911-3	na	na	na	na	na	na
MW-14	12/2/2011	MW-14-120211	935	933	0.11 U	0.11 U	0.92 U	9
MW-14 (dup)	12/2/2011	DUP-120211-1	892	858	na	na	na	na
MW-14D	12/2/2011	MW-14D-120211	390	427	9	13	0.92 U	4
MW-16	12/6/2011	MW-16-120611	11.7	13.3	na	na	na	na
MW-17	11/28/2011	MW-17-112811	47.5 J	49.8	na	na	na	na
MW-18	11/30/2011	MW-18-113011	4	3.6	0.045 U	0.045 U	0.92 U	0.92 U
MW-18 (dup)	11/30/2011	DUP-113011-2	na	na	0.045 U	0.5	0.92 U	0.92 U
MW-19	12/1/2011	MW-19-120111	420	402	na	na	na	na
MW-20	11/30/2011	MW-20-113011	2600	2770	0.045 U	0.045 U	0.92 U	3
MW-21	11/30/2011	MW-21-113011	1850	1870	na	na	na	na
MW-21 (dup)	11/30/2011	DUP-113011-1	1800	1820	na	na	na	na
MW-22	11/28/2011	MW-22-112811	7.9 J	7.9	na	na	na	na
MW-23	11/28/2011	MW-23-112811	2.9	2.7	na	na	na	na
MW-24	11/30/2011	MW-24-113011	0.2	0.048 U	0.045 U	0.11 U	0.92 U	0.92 U
MW-26	12/1/2011	MW-26-120111	448	432	0.22 U	2 U	0.92 U	4
MW-27	12/1/2011	MW-27-120111	13	13	0.11 U	2 U	0.92 U	3
MW-28S	12/2/2011	MW-28S-120211	11.9	11.2	0.045 U	0.11 U	0.92 U	0.92 U
MW-28S (dup)	12/2/2011	DUP-120211-2	na	na	na	na	na	na
MW-29S	12/2/2011	MW-29S-120211	2.4	2.5	0.11 U	0.11 U	3	0.92 U
MW-29S (dup)	12/2/2011	DUP-120211-3	2.5	2.6	na	na	na	na
MW-30S	12/5/2011	MW-30S-120511	9.2	8.5	0.11 U	0.11 U	0.92 U	0.92 U
MW-30S (dup)	12/5/2011	DUP-120511-1	na	na	na	na	na	na
MW-31S	12/5/2011	MW-31S-120511	2.2	2.2	0.045 U	1.1	0.92 U	0.92 U
MW-31S (dup)	12/5/2011	DUP-120511-2	na	na	0.7	0.045 U	0.92 U	0.92 U
MW-32S	12/6/2011	MW-32S-120611	2.1	2.2	0.8	0.045 U	0.92 U	0.92 U
MW-33S	12/5/2011	MW-33S-120511	257	299	4	6	3	138
MW-33S (dup)	12/5/2011	DUP-120511-3	na	na	na	na	na	na
MW-34S	12/6/2011	MW-34S-120611	2	2.2	0.045 U	0.045 U	3	3
MW-34S (dup)	12/6/2011	DUP-120611-1	na	na	na	na	na	na
MW-35S	12/6/2011	MW-35S-120611	1.3	1.4	0.045 U	0.045 U	0.92 U	3
Maximum Detected Concentrations			2600	2770	9	13	3	138
Method B			0.058 ca	0.058 ca	50 a	50 a	640 nc	640 nc
Method C			0.58 ca	0.58 ca	50 a	50 a	1,400 nc	1,400 nc
SW-AL			36	36	NP	NP	3.1	3.1
SW-HH			0.14	0.14	NP	NP	NP	NP

Table 9
Constituents Detected in Groundwater, Fall 2011 Groundwater Sampling Event

Inorganic Compounds							
Zinc D ug/l	**Zinc T ug/l**	**Cadmium T ug/l**	**Nickel D ug/l**	**Nickel T ug/l**	**Selenium D ug/l**	**Selenium T ug/l**	**Ammonia N mg/l**
70	**70**	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
1.4 U	1.4 U	0.01 U	**0.9**	**1**	0.13 U	0.13 U	na
1.4 U	1.4 U	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
1.4 U	1.4 U	na	na	na	na	na	na
na	na	na	na	na	na	na	na
1.4 U	1.4 U	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
1.4 U	1.4 U	0.01 U	**0.6**	**0.7**	0.13 U	0.13 U	na
1.4 U	1.4 U	0.01 U	0.079 U	**0.7**	0.13 U	0.13 U	na
na	na	na	na	na	na	na	na
1.4 U	1.4 U	**0.2**	**0.5**	**1.5**	0.13 U	0.13 U	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
1.4 U	1.4 U	0.01 U	**0.7**	**1.1**	0.13 U	0.13 U	na
1.4 U	1.4 U	0.01 U	**1.8**	**1.9**	0.13 U	0.13 U	na
1.4 U	1.4 U	0.025 U	**8**	**8**	**7**	**6**	na
1.4 U	1.4 U	0.01 U	**1.9**	**1.8**	0.13 U	0.13 U	**0.36**
na	na	na	na	na	na	na	na
1.4 U	1.4 U	0.01 U	**0.7**	**0.7**	0.13 U	0.13 U	**1.82**
na	na	na	na	na	na	na	na
1.4 U	1.4 U	0.01 U	**1.1**	**0.9**	0.13 U	0.13 U	**2.06**
na	na	na	na	na	na	na	na
1.4 U	1.4 U	0.01 U	**1**	**1.7**	0.13 U	0.13 U	**0.471**
1.4 U	1.4 U	na	na	na	na	na	na
1.4 U	1.4 U	na	na	na	na	na	na
1.4 U	1.4 U	na	na	na	na	na	na
na	na	na	na	na	na	na	na
1.4 U	1.4 U	na	na	na	na	na	**0.04**
na	na	na	na	na	na	na	**0.074**
1.4 U	1.4 U	na	na	na	na	na	**0.207**
70	**70**	**0.2**	**8**	**8**	**7**	**6**	**2.06**
4,800 nc	**4,800** nc	**16** nc	**320** nc	**320** nc	**80** nc	**80** nc	**NP**
10,500 nc	**10,500** nc	**35** nc	**700** nc	**700** nc	**175** nc	**175** nc	**NP**
81	**81**	**8.8**	**8.2**	**8.2**	**71**	**71**	**NP**
26,000	**26,000**	**NP**	**4600**	**4600**	**4200**	**4200**	**NP**

Table 9

Constituents Detected in Groundwater, Fall 2011 Groundwater Sampling Event

Volatile Organic Compounds		Semi-Volatile Organic Compounds					
1,1-Dichloroethane ug/l	**Tetrachloroethene ug/l**	**2,3,4,6-Tetrachlorophenol ug/l**	**2,4-Dichlorophenol ug/l**	**Pentachlorophenol ug/l**	**Phenanthrene ug/l**	**Phenol ug/l**	**1-Methylnaphthalene (SIM) ug/l**
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	na	na	na	na	na	na
na	na	0.5 U	2.6 U	2.4 U	na	**2.5**	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
0.05 U	0.09 U	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	**18**	2.6 U	**370**	na	0.5 U	na
na	na	**11**	2.6 U	**240**	na	0.5 U	na
na	na	**1.2**	2.6 U	**15**	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
0.05 U	0.09 U	**9.6**	2.6 U	**100**	na	0.5 U	na
na	na	**11**	2.6 U	**98**	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	na	na	na	na	na	na
na	na	0.5 U	2.6 U	2.4 U	0.6 U	0.5 U	0.016 U
0.05 U	0.09 U	**2.2**	2.6 U	**24**	na	0.5 U	na
na	na	0.5 UJ	2.6 UJ	2.4 UJ	na	0.5 UJ	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	na	na	na	na	na	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	na	na	na	na	na	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
na	na	**21**	**21**	**96**	na	0.5 U	na
na	na	0.5 U	2.6 U	2.4 U	na	0.5 U	na
0.05 U	**0.2** j	0.5 U	2.6 U	2.4 U	0.6 U	0.5 U	0.016 U
0.05 U	**0.2**	na	na	na	na	na	na
0.2 j	0.09 U	0.5 U	2.6 U	2.4 U	0.6 U	0.5 U	0.016 U
na	na	0.5 U	2.6 U	2.4 U	0.6 U	0.5 U	0.016 U
0.05 U	**0.2**	0.5 U	2.6 U	2.4 U	**0.7** j	**2.1**	**0.06** j
na	na	na	na	na	na	na	na
0.05 U	0.09 U	0.5 U	2.6 U	2.4 U	0.6 U	**1.1**	0.016 U
na	na	na	na	na	na	na	na
na	na	0.5 U	2.6 U	2.4 U	0.6 U	0.5 U	0.016 U
na	na	0.5 U	2.6 U	2.4 U	0.6 U	**2.3**	0.016 U
na	na	0.5 U	2.6 U	2.4 U	0.6 U	**2**	0.016 U
na	na	0.5 U	2.6 U	2.4 U	0.6 U	0.5 U	0.016 U
na	na	na	na	na	na	na	na
na	na	0.5 U	2.6 U	2.4 U	0.6 U	**8.8**	**0.08** j
0.2	**0.2**	**21**	**21**	**370**	**0.7**	**8.8**	**0.08**
1600 nc	**80** nc	**480** nc	**24** nc	**0.219** ca	**NP**	**2400** nc	**1.51** ca
3500 nc	**175** nc	**1,050** nc	**52.5** nc	**2.19** ca	**NP**	**5250** nc	**15.1** ca
NP	**NP**	**NP**	**NP**	**7.9**	**NP**	**NP**	**NP**
NP	**3.3**	**NP**	**290**	**3**	**NP**	**1700000**	**NP**

Table 9
Constituents Detected in Groundwater, Fall 2011 Groundwater Sampling Event

Semi-Volatile Organic Compounds								
Acenaphthene (SIM) ug/l	**Acenaphthylene (SIM) ug/l**	**Anthracene (SIM) ug/l**	**Dibenzofuran (SIM) ug/l**	**Fluoranthene (SIM) ug/l**	**Fluorene (SIM) ug/l**	**Naphthalene (SIM) ug/l**	**Phenanthrene (SIM) ug/l**	**Pyrene (SIM) ug/l**
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
0.02 U	0.024 U	0.025 U	0.016 U	0.021 U	0.019 U	0.02 U	0.026 U	0.028 U
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na
0.02 U	0.024 U	0.025 U	0.016 U	0.021 U	0.019 U	0.02 U	0.026 U	0.028 U
na	na	na	na	na	na	na	na	na
0.02 U	0.024 U	0.025 U	0.016 U	0.021 U	0.019 U	0.02 U	0.026 U	0.028 U
0.02 U	0.024 U	0.025 U	0.016 U	0.021 U	0.019 U	0.02 U	0.026 U	0.028 U
0.22	**0.09** j	**0.08** j	0.016 U	**0.24**	**0.17**	0.02 U	**0.44**	**0.31**
na	na	na	na	na	na	na	na	na
0.02 U	0.024 U	0.025 U	0.016 U	**0.06** j	0.019 U	0.02 U	0.026 U	**0.08** j
na	na	na	na	na	na	na	na	na
0.02 U	0.024 U	0.025 U	0.016 U	0.021 U	0.019 U	0.02 U	0.026 U	0.028 U
0.05 j	0.024 U	0.025 U	0.016 U	0.021 U	0.019 U	**0.08** j	0.026 U	0.028 U
0.06 j	0.024 U	0.025 U	0.016 U	0.021 U	0.019 U	**0.07** j	0.026 U	0.028 U
0.02 U	0.024 U	0.025 U	0.016 U	0.021 U	0.019 U	0.02 U	0.026 U	0.028 U
na	na	na	na	na	na	na	na	na
0.02 U	0.024 U	0.025 U	**0.36**	0.021 U	0.019 U	**0.08** j	0.026 U	0.028 U
0.22	**0.09**	**0.08**	**0.36**	**0.24**	**0.17**	**0.08**	**0.44**	**0.31**
960 nc	**NP**	**4800** nc	**16** nc	**640** nc	**640** nc	**160** nc	**NP**	**480** nc
2100 nc	**NP**	**10500** nc	**35** nc	**1400** nc	**1400** nc	**350** nc	**NP**	**1050** nc
NP	**NP**	**NP**	**NP**	**NP**	**NP**	**NP**	**NP**	**NP**
990	**NP**	**40000**	**NP**	**140**	**5300**	**NP**	**NP**	**4000**

Table 9
Constituents Detected in Groundwater, Fall 2011 Groundwater Sampling Event

TPH							
TPH as Diesel mg/l	**TPH as Gasoline mg/l**	**Total TCDD pg/l**	**Total HxCDD pg/l**	**1,2,3,4,6,7,8-HpCDD pg/l**	**Total HpCDD pg/l**	**OCDD pg/l**	**Total TCDF pg/l**
0.19	**0.03** NJ	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	**4.69**	0.598 U	5.28 U	**4.5**	**140**	**5.15**
na	na	**7.68**	**2.52**	**17.7** j	**39.1**	**1100**	**7.49**
na	na	0.567 U	**2.74** *	**16.9** j	**28.2**	**369**	**1.29**
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	**0.634** *	**1.15**	**20.2** j	**40.2**	**3110**	0.561 U
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
0.02 U	0.03 U	na	na	na	na	na	na
na	na	na	na	na	na	na	na
0.11 NJ	0.03 U	na	na	na	na	na	na
na	na	na	na	na	na	na	na
0.23 NJ	0.03 U	na	na	na	na	na	na
0.23 NJ	na	na	na	na	na	na	na
0.27 NJ	0.03 U	na	na	na	na	na	na
na	0.03 U	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
2	0.03 U	na	na	na	na	na	na
2.00	**0.03**	**7.68**	**2.7**	**20.2**	**40.2**	**3110**	**7.5**
0.5 a	**1** a	**NP**	**NP**	**NP**	**NP**	**NP**	**NP**
NP	**NP**	**NP**	**NP**	**NP**	**NP**	**NP**	**NP**
NP	**NP**	**NP**	**NP**	**NP**	**NP**	**NP**	**NP**
NP	**NP**	**NP**	**NP**	**NP**	**NP**	**NP**	**NP**

Table 9
Constituents Detected in Groundwater, Fall 2011 Groundwater Sampling Event

Dioxin/Furans							
Total PeCDF pg/l	**1,2,3,6,7,8-HxCDF pg/l**	**Total HxCDF pg/l**	**1,2,3,4,6,7,8-HpCDF pg/l**	**Total HpCDF pg/l**	**OCDF pg/l**	**Calculated TEQ (ND =0) pg/l**	**Calculated TEQ (ND =1/2dl) pg/l**
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
0.598 U	0.598 U	**0.882**	1.79 U	**3.89** *	5.8 U	**0.042**	**1.02**
0.554 U	0.554 U	0.554 U	1.56 U	0.917 U	7.36 U	**0.507**	**1.39**
1.7	**0.719** j	**12.6**	**11.1** j	**33**	17 U	**0.463**	**1.70**
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
0.561 U	0.561 U	**2.77**	**6.37** j	**16**	**81** j	**1.223**	**2.15**
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na
1.7	**0.719**	**12.6**	**11.1**	**33.0**	**81**	**1.22**	**2.2**
NP	**NP**	**NP**	**NP**	**NP**	**NP**	**0.58** ca	**0.58** ca
NP	**NP**	**NP**	**NP**	**NP**	**NP**	**5.8** ca	**5.8** ca
NP	**NP**	**NP**	**NP**	**NP**	**NP**	**NP**	**NP**
NP	**NP**	**NP**	**NP**	**NP**	**NP**	**0.0051**	**0.0051**

Table 9
Constituents Detected in Groundwater, Fall 2011 Groundwater Sampling Event

Notes and Key:
1/2dl = One-half the detection limit
D = Dissolved
dup = Duplicate sample
mg/L = Milligrams per liter
ND = Non-detect values calculation method
NP = No Cleanup level provided. The screening levels were obtained from Ecology's online Cleanup Levels and Risk Calculation (CLARC) website.
pg/L = Picograms per liter
T = Total
TPH-d = Total petroleum hydrocarbons as diesel
ug/L = Micrograms per liter
HpCDF = Heptachlorodibenzofuran
HxCDF = Hexachlorodibenzofuran
OCDD = Octachlorodibenzo-p-dioxin
OCDF =Octachlorodibenzofuran
ca = carcinogen
nc = non-carinogen
Method B = State of Washington Model Toxics Control Act Method B Screening Level. Level provided is the lowest of the carcinogenic and non-carcinogenic.
Method C = State of Washington Model Toxics Control Act Method C Screening Level
SW-AL = • Water Quality Criteria for chronic exposure of aquatic life from Washington Administrative Code (WAC) 173-201A.
SW-HH = • Water Quality Criteria for human health in marine environments from the Federal Clean Water Act (WAC not established).
a = State of Washington Model Toxics Control Act Method A Screening Level, no Method B or C screening level available.
Bold text indicates that compound was detected.
Shaded cells indicate values that exceed the Method B or Method A as noted (a).
Boxed cells indicate values that exceed the Method C.
Hatched cells indicate value exceeds Surface Water, Water Quality Criteria - Aquatic Life - Marine/Chronic - Clean Water Act (SW-AL)
Underlined text indicate values exceed Surface Water, Water Quality Criteria - Human Health – Marine – Clean Water Act (SW-HH)

Data Qualifiers:
j = The value reported is below the routine reporting limit and should be considered an estimate; qualifier reported by the Laboratory.

J = The detected results are qualified as estimated in accordance with USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999 or USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.
U = Result is ≤ M,ethod Detection Limit (MDL). Result reported as the MDL and is qualified as non detected. If qualified as non-detect due to a detection in associated blank samples, than MDL has been revised.
NJ = Estimated value - chromatogram did not resemble the standard hydrocarbon pattern

UJ = The non detected results are qualified as estimated in accordance with USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999 or USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.
* = May be biased high; associated congeners were U-qualified due to detections in the laboratory blank

Table A

Summary of Dioxins/Furans Groundwater Sampling Intervals

Well ID	Top of Casing Elevation (ft amsl)	Well Diameter (in)	Well Screen Depth (ft bgs)	Well Total Depth (ft toc)	D/F Tubing Intake Below Top of Casing (ft toc)	D/F Tubing Intake Below Ground Surface (ft bgs)	D/F Tubing Intake Elevation (ft amsl)
MW-7 S*	18.5	2	5 -10	10	7.75	5.25	10.75
MW-10	15.51	2	3 – 10	10	4.75	4.75	10.76
MW-13	15.95	2	4.5 - 11.5	11.5	7.25	7.25	8.7

Notes and Key:

Well screen depth and total depth obtained from well construction logs.

ID = Well Identification

in = inches

ft bgs = Feet below ground surface

ft toc = Feet below top of casing

* = MW-7S completed with an approximate 2.5ft stickup

D/F = dioxins/furans

amsl = Above Mean Sea Level