APPENDIX A

Summary of Previous Environmental Investigations and Documents, Brief Descriptions of Previous Investigations, and Data Tables Summarizing Previous Investigation Results

SUMMARY OF PREVIOUS INVESTIGATIONS

ENVIRONMENTAL INVESTIGATIONS

This Appendix provides brief descriptions of the previous environmental investigations conducted at the North Marina Area, which includes the Ameron/Hulbert Site and areas west and south of the Site. Information included in this appendix was also presented in the Interim Action Report (Landau Associates 2010). Figures A-1 through A-13 showing the site characterization sampling locations by parameter and tables A-1 through A-18 summarizing the site characterization analytical data are also included in this appendix.

Preliminary Environmental Audit and Supplemental Site Investigation, Jensen Reynolds Property (ECI 1987, 1988)

Investigation of the former Jenson Reynolds leasehold was performed by ECI in 1987 and 1988 for the Hulbert Mill Company. During these investigations, ECI noted numerous areas of drum storage with evidence of spills and leaks onto the ground, outdoor metal paint chip accumulations, and an area in Investigation Area I covered with discolored soil potentially caused by paint overspray and blasting sand.

Two samples of the discolored soil in Area I were collected and tested during the 1987 investigation. Sample ECI-G-1 was collected from an area exhibiting reported petroleum hydrocarbon spillage from drums in the western portion of leasehold, and was tested for polychlorinated biphenyls (PCBs) and selected metals, but not petroleum hydrocarbons. The sample did not exhibit detectable concentrations of PCBs and copper was the only metal exhibiting an elevated concentration (111 mg/kg). Sample ECI-G-2 was collected from an area along the eastern leasehold boundary exhibiting the presence of black sand blast grit. This material was tested for lead, arsenic, and petroleum hydrocarbons (oil and grease), and exhibited elevated concentrations of 1,300 mg/kg, 3,000 mg/kg and 17,700 mg/kg, respectively.

During the 1988 Supplemental Investigation, some of the previously identified issues had been cleaned up, but new potential issues were identified including additional piles of blasting sand, piles of paint chips and discolored soil, and construction debris. ECI sampled and tested the blasting sand for E.P. Toxicity for a number of metals (arsenic, barium, cadmium, copper, chromium, lead, mercury, nickel, selenium, silver, and zinc) and the dangerous waste criteria were not exceeded for any of the analytes. The blasting sand was not tested for total metals. The metal paint chips were sampled and analyzed for total lead, arsenic, and zinc, and were found to have a lead concentration above state background levels, although the concentration is well below current MTCA cleanup levels. Based on the results, ECI recommended testing for lead leaching and disposing of the chips at an appropriate offsite facility.

Report on Investigations Conducted at Ameron (Centrecon) Plant (PSM International 1989)

In 1989, as part of Ameron's due diligence in purchasing the assets of the current operator in Area G of the Site, Ameron hired PSM International to conduct an environmental audit. The PSM work identified and evaluated the soil and groundwater conditions associated with the removal of a diesel tank and the sediment and surface water quality associated with process wastewater ponds. The UST was located on the west side of the Ameron storage/laboratory building and was removed in December 1988. In January 1989, PSM, in conjunction with its subconsultant Sweet Edwards/EMCON, conducted an investigation of soil and groundwater in the former UST vicinity to evaluate whether residual contamination associated with the former UST was present.

One boring was advanced at the center of the UST excavation area (SEE-EC-1) to a total depth of 9 ft, to test soil down into the water table. Three other borings were completed around the former tank location and monitoring wells were installed in these borings. One well was installed as close as possible to the filling area of the tank (SEE-EC-2), one downgradient (west) of the tank to evaluate potential migration of contaminants (SEE-EC-3), and one upgradient to establish background conditions (SEE-EC-4). Soil samples were taken at multiple depths from each boring and groundwater samples were taken from wells screened from 2 to 12 ft below ground surface (BGS).

A total of 19 soil samples and 3 groundwater samples were tested for TPH by EPA Method 418.1 and benzene, ethylbenzene, toluene and xylene (BTEX) by EPA Method 8020 and 8015-modified. The results for all samples were either below reporting limits or below applicable regulatory criteria, indicating no apparent impacts from the UST. There was also no indication of contamination observed during the field activities.

At the same time as the UST investigation, PSM also investigated environmental conditions associated with an unlined settling pond located north of the laboratory building, near the fenceline west of the manufacturing building. The pond was made of bermed earth and reportedly collected water from a settling basin adjacent to the east of the pole-polishing building. The pond water was observed to be in an overflow condition, with a light to medium emerald green color, and no odor.

Two surface water samples and one sediment sample were collected. Both a filtered (PS-1/2) and an unfiltered (PS-3) water sample were collected from the pond. The sediment sample (PS-1/PS-2) was collected at a depth of 0 to 0.2 ft below the bottom. The water samples were tested for total and dissolved metals (arsenic, barium, cadmium, chromium, lead, mercury, silver, thallium, and zinc). The sediment sample was tested for metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc); EP Toxicity metals, and what appeared to be similar to the Synthetic Precipitation Leaching Procedure (SPLP) test (24-hour acetic acid leach test). Pond sediment results indicate that none of the metals concentrations were elevated, and pond surface water quality results were not elevated except for copper at 10 micrograms per liter (µg/L). However, a high water pH of 11.5 was present in the water sample.

Environmental Engineering Services, Proposed MSRC Facility (Hart Crowser 1991)

Hart Crowser performed a preliminary environmental assessment and conducted a limited testing program to identify significant environmental issues that might affect a property transfer. The historical assessment they conducted was discussed previously. The report indicated that unresolved issues following Hart Crowser's environmental assessment were limited to follow up groundwater quality testing based on elevated total metals concentrations, soil staining near drum storage areas, and sandblasting sand and sludge spread randomly around the leasehold.

Hart Crowser installed four monitoring wells and one soil boring: two wells were installed in Area I (HC-MW02 and HC-MW03) and two in Area J (HC-MW01 and HC-MW04). The additional soil boring was drilled in the southwest corner of Area I. Soil samples were taken during boring advancement and water samples were taken after the wells were developed.

Hart Crowser interpreted the soil to be hydraulic fill. Their chemical laboratory analyses indicated identifiable concentrations of fuel and oil-related compounds in soil from HC-MW-2 and tetrachloroethylene was detected in one sample from HC-MW-4. However, all detections are below the cleanup screening levels.

Soil and groundwater samples were analyzed by Hart Crowser's FAST laboratory using screening techniques and laboratory methods and quality assurance procedures that were not well documented in the report. These analytical results are presented in the tables, but should be considered estimates. Soil samples were tested for some analytes that are not commonly analyzed for environmental characterization purposes, such as aluminum, iron, and sulfur. Analytes that are not typical environmental parameters, and were not tested for during other environmental Site investigations, are not reported in the data tables.

The groundwater samples were tested for total metals, petroleum hydrocarbons, and volatile organic carbons (VOCs), but only the complete results for VOCs were contained in the copy of the Hart Crowser report available during preparation of this report. Results for VOCs were all below the laboratory detection limit. The report text indicates that the highest metals concentrations were in the water sample taken from HC-MW03, where total chromium and lead were at concentrations of 200 µg/L and 100 µg/L, respectively. However, these were screening level analyses and because the samples were analyzed for total metals, the concentrations were likely affected by particulates entrained in the samples. Hart Crowser recommended that additional sampling and analyses for groundwater be conducted, which was performed by Kleinfelder for the Port in 1992.

Groundwater Sampling and Analysis, Former Hulbert Mill Company (Kleinfelder 1991, 1992)

In 1991 Kleinfelder was hired by the Port to perform a Phase 1 ESA, to conduct report reviews of the Phase 1 ESAs being completed by others, and to conduct follow-up sampling of groundwater wells installed by Hart Crowser. The groundwater sampling was conducted in 1992 for total and dissolved metals, total fuel hydrocarbons, and purgable chlorinated solvents. No fuel hydrocarbons or chlorinated solvents were detected, but all samples had elevated concentrations of total arsenic, copper, and lead, which may result from particulates present in the unfiltered samples. Samples from all monitoring wells except HC-MW04 also contained elevated dissolved copper concentrations ranging from 12 to 38 µg/L. Dissolved copper was not detected in the sample from HC-MW04; however, the laboratory reported an elevated reporting limit of 20 µg/L.

Phase 2 ESA, Hulbert Mill Property (ECI 1992) and Additional Site Observations and Testing, Hulbert Mill Property (AGI 1992)

A Phase II ESA was conducted in 1991/1992 to address concerns identified during the Kleinfelder Phase I ESA. The initial activities associated with the Phase II ESA were conducted by ECI (1992) and the investigation was completed by AGI (1992). The purpose of the Phase II ESA was to evaluate recognized environmental conditions identified in the 1991 Phase I ESA (Kleinfelder 1991) and included investigation of groundwater, surface water, soil, and marine sediment quality.

The portion of the Phase II ESA conducted by ECI included:

- The collection of five surface soil samples for laboratory analyses
- Excavating 19 test pits at 4 locations identified in the 1991 Kleinfelder Phase I ESA
- The installation of three groundwater monitoring wells (ECI-MW-1, ECI-MW-2, ECI-MW-3)
- The collection and analysis of samples of the stormwater discharge and sediment at the stormwater outfall in the northwest corner of Area I
- The collection and analysis of a sample a sump located in the Ameron manufacturing building.

In 1992, AGI conducted additional sampling, testing, and clarifications of issues identified by ECI in the 1991 Phase II Site Assessment performed at the Hulbert Mill property. Their assessments addressed:

- Site operations at Ameron to evaluate the potential for dichloroethane to occur in groundwater pumped from their manufacturing building basin
- Additional groundwater sampling in ECI well MW-2 west of the Ameron pole finishing and dry storage building
- Sampling in Area I to address sandblasting material deposits and the soil landfarming stockpile

- Stormwater quality at the 12th Street outfall
- The content and condition of drums located between Ameron's pole polishing and pole finishing buildings.

In AGI's opinion, the drums stored on the Ameron leasehold did not represent an environmental risk. AGI also noted that all structures and features associated with Commercial Steel Fabricators' work had been removed from the site, and that much of the area had been freshly graded and a new base rock layer had been placed. They also noted that a landfarming operation for petroleum-contaminated soil lined with plastic sheeting and bermed with straw bales was located in the northeast corner of the Site.

The ECI/AGI Phase II ESA activities and analytical results are presented in the following subsections by media (i.e., groundwater, stormwater, sediment, and soil).

Groundwater Investigation

The ECI 1991 groundwater investigation included the installation and sampling of three monitoring wells (ECI-MW-1 through MW-3). The AGI groundwater investigation included re-sampling ECI-MW-2

Monitoring Well ECI-MW-1 was installed downgradient to the three former USTs removed in 1991 in the southwest corner of Area M and a groundwater sample was tested for the full suite of TPH analyses and BTEX. ECI-MW-2 was installed in the northern portion of Area M, just west of the Ameron pole finishing building and a groundwater sample was tested for VOCs. ECI-MW-3 was installed downgradient to a filled-in indoor sump, that was formerly used to collect substances related to the paint stripping being performed in the area, and a groundwater sample was tested for VOCs. Later, AGI collected and tested an additional groundwater sample from ECI-MW-2 (AGI-MW-2) for total and dissolved metals. Results exhibited a concentration of dissolved arsenic slightly above the cleanup screening level (7.5 µg/L). Although elevated concentrations of other metals (i.e., arsenic, copper, lead, mercury, nickel, and zinc) were detected in the "total metals" analyses, the elevated concentrations are likely the result of particulates entrained in the water samples, as the dissolved metals data from the same well did not detect these other metals.

Stormwater and Sediment Investigations

A stormwater discharge sample (ECI-Area-R) was collected by ECI from the outfall in the northeast corner of the 12th Street Channel. The sample was collected to evaluate stormwater quality based on observations of darkened sediment at the outfall during the 1991 Phase I ESA. The sample was analyzed for VOCs, semivolatile organic compounds (SVOCs); pesticides; PCBs; and priority pollutant metals. Trace levels of chloroform and acetone were detected in the stormwater sample; in a later stormwater sample collected by AGI (Sample R), chloroform was still detected, but not acetone. Although cleanup levels were not developed for either compound, AGI concluded that concentrations were low enough not to be considered an environmental threat, based on drinking water standards.

ECI collected a sediment sample below the outfall from the intertidal zone at the same time as the stormwater outfall sample was collected (also labeled ECI-Area-R). The sample had elevated concentrations of arsenic and zinc. Also, total recoverable petroleum hydrocarbons (TRPH) were measured at 2,100 mg/kg (dry weight), which may be a concern in sediment.

A water sample was collected from the sump located in the Ameron manufacturing building (ECI-D-1). The sample was taken directly from the discharge pipe that leads from the sump into the northern settling basin, and was tested for VOCs and total metals. Another water sample was collected 2 days later (ECI-Area-D) and analyzed for dissolved metals. The total copper concentration in Sample ECI-D-1 was elevated (14 µg/L), although this may be due to particulates entrained on the water sample. Dissolved copper was not detected (Area D), although the reporting limit (10 µg/L) was relatively high. No VOCs were detected at high concentrations, although a trace amount (1 µg/L) of 1,2-dichloroethane (1,2-DCA) was detected in Sample ECI-D-1. A follow up sample collected by AGI (AGI-D-1) did not contain 1,2-DCA or other VOCs above the laboratory reporting limits.

Soil Investigations

The 1991 ECI Phase II ESA conducted for the Hulbert Mill Company included the collection of 5 surface soil samples and the excavation of 19 test pits. The investigation resulted in analytical data for Investigation Areas G, I, J, and M. Eight test pits (ECI-TP-1 through ECI-TP-8) were excavated in the northwest corner of Area G to determine the extent and nature of the fill material. A 3-ft high wall of 12-inch by 12-inch treated timbers was found at ECI-TP-6. Blasting sand, ranging from 6 inches to 2-ft thick, was found at the surface at three of the test pits (ECI-TP-2, ECI-TP-7, and ECI-TP-8). Samples were collected from test pits TP-2 (ECI-TP-2), TP-3 (ECI-TP-3), and TP-5 (ECI-TP-5), as well as a surface sample of the blasting sand (ECI-Area F). The test pit and sandblast grit samples were tested for metals; the concentrations for all metals were below the cleanup screening levels, except for the copper concentration in ECI-Area-F, which slightly exceeded the copper cleanup screening level protective of groundwater.

A soil sample (ECI-B-1) was collected to the east of the Ameron manufacturing building where a drum storage area with soil staining was observed during the Kleinfelder Phase I ESA. The sample was tested for TPH by EPA Method 418.1 and the concentration 7,160 mg/kg) was significantly above applicable regulatory criteria.

Petroleum oil staining was observed off the northwest corner of the polishing building and was sampled by ECI (ECI-H-I) for TPH by EPA Method 418.1. The sample exhibited an elevated TPH concentration (1,400 mg/kg) that exceeded the cleanup level applicable at that time (200 mg.kg), but is below the current TPH cleanup level (2,000 mg/kg).

A surface soil sample was taken under a discharge pipe for the secondary containment of a discharge tank located between the Collins Building and the adjacent warehouse to the east in Area M. The sample (ECI-M-1) was analyzed for petroleum hydrocarbons; concentrations were well below the cleanup screening levels.

An area north of the former smoke shack, in the western portion of Area M, was investigated to evaluate possible contamination from waste paint and stained soil previously observed during the Kleinfelder Phase I ESA. Two surface samples (ECI-N-1 and ECI-N-2) were collected and analyzed for VOCs, BTEX and TPH. VOCs and BTEX were not detected in either sample and, although the petroleum hydrocarbon concentration in ECI-N-1 (310 mg/kg) slightly exceeded the cleanup levels used at the time of the report (200 mg/kg), the concentration is well below the current cleanup screening levels for petroleum hydrocarbons.

The quality of soil used to fill three former concrete settling basins, located on the southwest side of the main Ameron building, was investigated with two test pits (J-1 and J-2). The fill was found to be comprised of mostly silty sand, although some blasting sand, concrete dust, and possible steel shot indicated by iron staining were observed in test pit J-2. A sample (ECI-J-2) was taken from J-2, which included the blasting sand and tested for total metals and TCLP metals. Analytical results indicated concentrations above cleanup screening levels for arsenic (40 mg/kg) and copper (514 mg/kg).

Several test pits were excavated in Area I (then referred to as Area Q) to evaluate the soil staining, paint chips, and blasting sand observed during the Kleinfelder Phase I ESA. Three test pits (ECI-Q-5, ECI-Q-7, ECI-Q-8) exhibited a fragmented, soft, brick-like material of various colors within the top foot of soil. Two of the test pits (ECI-Q-6 and ECI-Q-7) revealed a 6-inch layer of black blasting sand within the top foot; a sample of the blasting sand was collected from test pit ECI-Q-6. Samples from 1 to 2 ft BGS were taken from test pits ECI-Q-1 and ECI-Q-5, and a sample from 5 ft BGS was taken from ECI-Q-8. All samples were tested for metals, TPH (EPA Methods 3550/8015 modified), and VOCs. VOCs were not detected in any samples. Although ECI-Q-1 slightly exceeded the cleanup level for petroleum hydrocarbons applicable at the time of the report, none of the samples exceeded current petroleum hydrocarbon cleanup levels. The sample of blasting sand (ECI-Q-6) exhibited highly elevated concentrations of copper (1,410 mg/kg) and lead (1,350 mg/kg). In addition, a concentration of antimony (58 mg/kg) from sample ECI-Q-6 was moderately elevated.

A test pit (ECI-K-1) was excavated on the west side of the Ameron spray booth to evaluate the sandblast grit that was observed in this area during the Kleinfelder Phase I ESA. A mixture of fill material and blasting sand was observed to a depth of 4 ft BGS, and a soil sample (Area K was collected from about 4 ft depth and tested for metals and TCLP. Although the TCLP results showed the metals do not readily leach from the soil, the sample exhibited elevated concentrations of antimony (106 mg/kg), arsenic (144 mg/kg), copper (398 mg/kg), and lead (304 mg/kg).

A 96-hour bioassay test was conducted using the black blasting sand from Area I and all of the fish survived the test.

Test Pit Exploration, MSRC Property (Kleinfelder 1993c)

In May 1993, Kleinfelder performed an investigation of the MSRC area to provide information regarding the nature and extent of possible sand-blast waste materials in an area potentially affected by the adjacent Ameron sandblast waste disposal practices. Four test pits and two surface samples were collected in the north part of Area J. Three of the test pits (TP03, TP01, and TP02) were excavated along the east side of the MSRC fenceline, in an area bordering the Ameron leasehold. These test pits encountered a heterogeneous fill consisting of brick, wood fragments, and concrete rubble, but did not identify any sandblast waste materials.

A fourth test pit (TP05) was located along the western border of the MSRC property. That test pit encountered a 2- to 3-inch layer of green sand, described as sandblast waste, which they indicated to be of an unknown origin (Kleinfelder 1993c). Soil samples collected from TP03 and TP05 had slightly elevated copper concentrations of 55 mg/kg and 65 mg/kg, respectively.

In addition, two surface samples were collected (SS01 and SS02) along the Ameron fenceline. One of the two samples indicated highly elevated concentrations of antimony (580 mg/kg), arsenic (1,600 mg/kg), copper (1,800 mg/kg), and lead (1,400 mg/kg). The other surface soil sample did not exceed any of the cleanup criteria.

Independent Cleanup Action Report, Area West of MSRC (Kleinfelder 1993b)

In 1993, a buried concrete structure was discovered during the construction of a drainage swale associated with the partially built MSRC building. The buried concrete structure, located outside the west wall of the southern half of the MSRC building, was filled with wood waste, soil, and what appeared to have been drums containing oil. Free product was found inside the structure. Representative samples of the contaminated soil were collected for laboratory analysis and later used for waste profiling (KFI-WP01 through KFI-WP04 and KFI-WP-COMP). The composite sample, KF-WP-COMP, was tested for diesel-range petroleum hydrocarbons, PCBs, TCLP Metals, SVOCs, and VOCs. PCBs, TCLP metals, SVOCs, and VOCs were either not detected or were present at concentrations well below the cleanup levels. All of the waste profile samples exhibited elevated concentrations of diesel-range petroleum hydrocarbons, and two of the samples collected from the excavation (KFI-SS11 and KFI-SS17) also had elevated concentrations of oil-range petroleum hydrocarbons. Diesel-range petroleum hydrocarbon exceedance of the cleanup screening level ranged from 3,700 to 63,000 mg/kg, and oil-range organics exceedances ranged from 10,060 to 52,000 mg/kg. Free product and the highest petroleum-contaminated soil concentrations were found inside the concrete structure, while outside the structure concentrations were several orders-of-magnitude lower.

Phase II ESA (Landau Associates 2004)

A Phase II ESA (Landau Associates 2004) was conducted in 2003 and early 2004 to provide initial characterization of the environmental conditions across the North Marina Area. The intent of the investigation was to evaluate locations where hazardous substances may have been released based on the understanding of present and historical potential sources of contamination. Sample locations and testing parameters were selected to determine whether soil or groundwater contamination had resulted from potential sources and activities identified as “high risk issues” in the Phase I ESA (Landau Associates 2001). A total of 30 soil and 45 groundwater samples were collected and tested during the Phase II ESA. Of these samples, 6 soil and 8 groundwater samples were collected within the Site boundaries.

The soil samples were collected using surface sampling methods and direct-push drilling techniques. Groundwater samples were collected from direct-push borings and newly constructed monitoring wells using low-flow groundwater sampling techniques. Sampling locations and analyses were selected based on former Site uses and features, and field screening results. Samples were tested for the following parameters:

- **Soil samples**: TPH (NWTPH-Dx, NWTPH-Gx); metals (arsenic, cadmium, chromium, copper, lead, mercury, silver, zinc); PCBs; cPAHs; and/or BTEX.
- **Groundwater Samples**: TPH; dissolved metals (arsenic, cadmium, chromium, copper, lead, mercury, silver, zinc); BTEX; cPAHs; SVOCs and/or VOCs.

Sampling locations and analysis were selected during the Phase II ESA based on locations of high or moderate risk Site uses identified during the Phase I ESA. The areas of concern identified at the Site included:

- Area “g” - comprised on the Ameron leasehold where an UST was reportedly removed and chemical products (some of which include waste oil, diesel, concrete-release agents, flammable liquids, and spray sealant) were used and stored. This area was also the location of a historical fire that destroyed the former Hulbert wood products mill.

- Area "i" - which was the location of soil landfarming for remediation of petroleum-impacted soil removed for Site UST closures conducted in the early 1990s. This area also contained a soil stockpile near the northeast corner, and the area was generally elevated above surrounding grades, indicating that significant filling had occurred in this area..
- Area "j" - which included the MSRC building, where an independent cleanup action had been conducted to address a buried concrete structure containing petroleum wastes. This area also contained a UST previously used by the Port for fueling and waste oil storage that was removed from the approximate location of the buried concrete structure prior to the independent cleanup action conducted at this location.

In general, less investigation activity was focused on Area G and the northern portion of Area M because these areas were under long-term lease and not subject to redevelopment as soon as other portions of the North Marina Area.

The six soil and eight groundwater samples taken at the Site included one sample each from locations G-3 and G-2. The other four soil samples were taken at locations I-3, and composite samples I-X, I-Y, and I-Z. The other six groundwater samples were taken at locations G-1, P-10, P11, P12, J-1, and J-2; note that the monitoring well P-10 was installed in boring G-2. G-3 was sampled to investigate previous mill activities and test for residual cPAHs from the mill fire. Soil sample PZ-10 and water sample G-2 were taken while installing well P10, which was placed to investigate possible releases from a previously removed UST, and from chemical storage and use in the area. The UST location was unknown at the time and the exploration was placed about 250 ft south of the actual UST location. A water sample from boring G-1 was taken for the same purpose.

Sample I-X was a composite sample taken to characterize a discolored (multicolored) material encountered in Area I, and sample I-Y was taken underneath the discolored soil. Nineteen borings were subsequently completed to delineate the extent of the multi-colored material (SS-1 through SS-19), although no samples were collected from these borings for chemical analyses. Samples I-3 and I-Z were taken as composites of the area reportedly used historically for soil stockpiling.

Monitoring Wells P11 and P12 were installed in the west-central portion of Area I to investigate the area used historically for soil stockpiling, petroleum hydrocarbon-contaminated soil landfarming, and filling downgradient of the former saw mill. Groundwater sampling locations J-1 and J-2 were located to test groundwater downgradient (west) of the former concrete vault encountered during construction of the MSRC building in 1993 and the reported location of a 1980s UST removal, respectively; it was subsequently determined that the former concrete vault was located about 80 ft south of J-1, in the vicinity of J-2.

Based on the results of the Phase II ESA and historical Site uses, concentrations of several metals (arsenic, chromium, lead, and zinc); cPAHs; and TPH in soil and/or groundwater were identified as constituents of concern (COCs) for the North Marina Area, including the Site. As such, analytical testing of soil and groundwater during subsequent North Marina Area investigations focused primarily on these analytical parameters. Other data groups such as SVOCs and VOCs were also tested during subsequent investigations, but to a lesser degree.

Data Gaps Investigation (DGI) (Landau Associates 2005a)

The DGI was conducted in late 2004 and early 2005 to fill the data gaps in Site characterization data that remained following the Phase II ESA (Landau Associates 2005a). The DGI scope was subdivided into two broad elements: 1) general characterization to provide sufficient data to delineate the extent of contamination throughout Site areas that were not evaluated during the Phase II ESA and did not have identified environmental concerns, and 2) focused investigation to better delineate contamination in affected areas identified during the Phase II ESA. Boring locations were labeled with the investigation area designation first, followed by "GC" or "FA" to designate the boring as a general characterization or focus area location, followed by a unique sequential number (e.g., J-FA-2).

A total of 21 direct-push borings were completed at the Site during the DGI conducted in late 2004 through early 2005, and 25 soil samples and 8 groundwater samples were collected for analysis. The soil samples were collected using direct-push drilling techniques. Groundwater samples were collected from direct-push borings and monitoring wells using low-flow groundwater sampling techniques.

A total of 13 general characterization soil sample locations were tested within or just outside the Site boundary. The uppermost sample interval from each general characterization location was tested for constituents detected above the interim action cleanup levels during the Phase II ESA, including selected metals (arsenic, cadmium, copper, lead, mercury, and zinc); cPAHs; and petroleum hydrocarbons (i.e., NWTPH-Dx and NWTPH-Gx). Petroleum hydrocarbon testing was conducted by initially analyzing the sample for hydrocarbon identification (HCID) with follow-up testing for specific hydrocarbon ranges detected by the HCID analysis. The vertical extent of soil contamination was evaluated at each location by testing the deeper samples if the uppermost sample exceeded the interim action cleanup screening level established for each constituent.

Two Site locations were subjected to a focused investigation during the DGI; former USTs located in Areas J and M. Two borings (J-FA-1 and J-FA-2) were advanced in the immediate vicinity of the reported location of the former Port used oil UST near the southwest corner of the MSRC building to verify previous investigation results. Two borings (M-FA-1 and M-FA-2) were also advanced in the southwest corner of Area M to evaluate environmental conditions in the vicinity of three former gasoline and diesel USTs removed from this area. The borings in both areas were advanced to a total depth of 12 ft BGS and the capillary fringe soil and groundwater samples were tested for TPH-HCID. Field screening and observations during boring advancement did not indicate the presence of petroleum hydrocarbon contamination in any boring samples. Diesel- and oil-range petroleum hydrocarbons were detected in J-FA-1 in the vicinity of the former Port used oil UST at concentrations of 46 mg/kg and 540 mg/kg, respectively. No petroleum detections were indicated in samples from the 1991 UST removal location.

Area I was not further characterized during the DGI because it was anticipated to be used as an area to contain contaminated soil from other areas as part of the Craftsman District development (Landau Associates 2005a). Investigation Area G and the northern portion of Area M were not further evaluated due to their long-term lease status, although three borings (G-GC-1, G-GC-2 and G-GC-3) were completed in the southern portion of Area G in anticipation of an Ameron lease boundary modification.

Supplemental Data Gaps Investigation

The supplemental DGI was conducted in late 2005 to better delineate the extent of contamination identified during the previous Phase II ESA and DGI. Three specific areas within the Site boundary were investigated as part of the supplemental DGI, as discussed below.

Area I

Investigation Area I had not been fully characterized during the DGI because soil contamination in this area was originally planned for consolidation and containment of contaminated soil as part of the Craftsman District redevelopment. Previous investigations in Area I had been focused on the delineation of 1) a soil stockpile located in the northeast corner of the property containing elevated arsenic and lead, and 2) a discrete layer of discolored, odorous material encountered near the center of the property containing elevated arsenic. When it was determined that planned finished grades within the Craftsman District were too low to allow containment of contaminated soil in this area, a supplemental characterization was conducted to provide a similar level of environmental characterization as that accomplished for other portions of the North Marina Area.

A total of 30 soil explorations (I-GC-1 through I-GC-26 and I-GC-1a through I-GC-1c, were completed in Investigation Area I as part of additional characterization for the Craftsman District redevelopment area. All soil samples were tested for metals, most samples were tested for cPAHs and petroleum hydrocarbons, and a number of samples were tested for SVOCs. Similar to previous Landau Associates investigations, analytical testing was initiated by testing the surface soil sample (0 to 0.5 ft) and samples were tested progressively deeper if an interim action cleanup level was exceeded.

The additional delineation confirmed the presence of elevated cPAHs, arsenic, and copper concentrations in shallow soil in the eastern and western portions of Area I, and elevated lead along the eastern side. Shallow soil in the central portion of Area I generally did not exhibit elevated concentrations of metals or cPAHs. The maximum concentration of petroleum hydrocarbons detected in any of the Area I samples tested was 1,200 mg/kg and 960 mg/kg for diesel- and oil-range petroleum hydrocarbons, respectively, in the sample collected from I-GC-24 in the northeast corner of Area I.

The elevated arsenic, copper, and cPAHs present in the eastern and western portions of Area I were primarily encountered in the upper 0.5 ft, which generally consisted of a road base trafficking layer. Contamination extended below the trafficking layer, to a depth of up to 2 ft, at about 30 percent of these exceedance locations. The trafficking layer did not exhibit elevated metals or cPAHs concentrations in the 13 surface soil samples collected from the central portion of Area I.

Borings advanced within the central and northeastern portion of Area I encountered the discolored, odiferous material identified during the Phase II ESA. The material was assumed to be contaminated based on the results of the Phase II ESA, so testing during the supplemental DGI was primarily focused on testing the material above and below the discolored material. However, a composite sample of the discolored material was collected from 1.2 ft to 6.0 ft at I-GC-24 and exhibited elevated concentrations of arsenic and lead. The discolored material was described as green, pink, red, orange, gray, and white silt with clay with a strong odor on the I-GC-24 boring log. The boring logs for explorations in the central portion of the site (I-GC-5, I-GC-6, I-GC-8, and I-GC-9) described the material as a sandy silt with gravel, but exhibiting similar colors to those present at I-GC-24.

Area J

During the DGI, motor-oil range petroleum hydrocarbons were detected in J-GC-1 and arsenic was detected in J-GC-4 at elevated concentrations. As with Area I, the area had not been fully characterized because of an earlier plan to consolidate and contain contaminated soil in this area. With the change to commercial development, additional investigation was deemed needed to provide a similar level of characterization as that accomplished for other portions of the site.

Within the northeast portion of Investigation Area J, 10 explorations were conducted: J-GC-5 through J-GC-10 and J-GC -6b through J-GC-6e. The GC-5 through GC-10 series was conducted to evaluate deeper soil conditions and the presence of debris and/or contamination. The J-GC-6 series were installed to better delineate an area of construction debris encountered in J-GC-6. The explorations were used to visually identify the limits of the debris and samples were not collected for chemical analyses. The construction debris was encountered from approximately 2 to 17 ft BGS.

Supplemental explorations J-GC-4b and J-GC-4c were conducted to better delineate the extent of elevated arsenic concentrations in the vicinity of location J-GC-4 encountered in the uppermost sample (30 mg/kg) during the DGI. Arsenic was not detected at elevated concentrations in samples collected from either of the supplemental explorations.

Area M-2

During the DGI, the soil sample collected from the 0 to 0.5 ft depth interval at location M-2 contained a total cPAHs concentration above the interim action cleanup level of 140 µg/kg. Two additional explorations (M-2B and M-2C) were completed to better delineate the extent of elevated cPAHs concentrations in this area. No cPAHs were detected above the laboratory reporting limits in either AC sample.

Early Action Design Characterization (Landau Associates 2005d)

Additional characterization was conducted for the uplands at the head of the 12th Street Channel in August 2005 to support the planned development of the 12th Street Yacht Basin (Landau Associates 2005d). Yacht Basin construction was to include an esplanade (a paved walkway) along the shoreline and new travel lift piers at the southwest corner of the channel to support the planned Craftsman District development. Construction was limited to within 50 ft of the shoreline and soil samples were collected from nine locations (I-GC-15 through I-GC-23) to evaluate soil quality within the planned work area and to provide the data needed to design an interim action for any contamination encountered during the investigation.

Similar to previous investigations, the surface soil sample from each location was initially tested and progressively deeper samples were tested at locations that exhibited concentrations of COCs above the interim action cleanup levels. Initial samples at each location were tested for metals, cPAHs, petroleum hydrocarbons, and SVOCs. Arsenic concentrations exceeded the interim action cleanup levels in shallow soil at six locations and cPAHs exceeded the interim action cleanup level at two locations, all fronting on the head of the channel to the north of the existing pier.

Interim Action Design Characterization (Landau Associates 2005c)

Additional characterization was performed at multiple Site areas in Spring 2006 to provide additional delineation for design of the interim action. A total of 30 soil samples were collected within the Site from affected areas encountered during previous investigations. The additional delineation samples were tested only for the constituent(s) that exceeded their respective interim action cleanup levels within the identified cleanup area. In general, additional delineation samples were labeled to indicate the location being delineated and the direction from the subject locations where the sample was collected. For example, Sample M-2.1S was the first (and only) additional delineation sample collected to the south of Location M-2. Similarly, Sample I-GC-2.3W was the third sample collected to the west of Location I-GC-2. Samples were collected from the following areas:

- **Investigation Area M - M-2 vicinity:** In early March 2006, two borings (M-2.1W and M-2.1S) were sampled and analyzed for cPAHs in the vicinity of M-2. The results showed no detections of cPAHs above the laboratory reporting limits.

- **Investigation Area I, surface samples:** In March 2006, 30 surface soil samples from the locations listed below were collected to further delineate the extent of either arsenic or cPAHs contamination in Investigation Area I. The explorations followed the naming convention described above, and included the following exploration locations:

  I-GC-11.1E
  I-GC-11.1N
  I-GC-11.1S
  I-GC-11.1W
  I-GC-11.2N
  I-GC-12.1E
  I-GC-12.1S
  I-GC-12.1W
  I-GC-12.2E
  I-GC-12.2S
  I-GC-12.3S
  I-GC-12.4S
  I-GC-12.4S.1E
  I-GC-12.4S.2E
  I-GC-12.5S
  I-GC-12.6S
  I-GC-12.6S.1E
  I-GC-12.6S.1W
  I-GC-1A.1W
  I-GC-1B.1S
  I-GC-1B.1W
  I-GC-2.1N
  I-GC-2.1S
  I-GC-2.1SW
  I-GC-2.1W
  I-GC-2.2W
  I-GC-2.3W
  I-GC-2.4W
  I-GC-24.1W
  I-GC-24.2W
  I-GC-24.3W
  I-GC-24.4W
  I-GC-24.2W.1S
  I-GC-24.4W
  I-GC-24.3W.1S

  Soil samples were collected and analyzed from most locations for metals, and to a lesser extent for cPAHs and petroleum hydrocarbons. Soil samples were not collected from a number of the explorations in the vicinity of the I-GC-24 because the area was primarily delineated based on the visual observation of multi-colored silt-size material with a strong odor.

- **Investigation Area I, northeast corner:** In late April 2006, a series of eight test pits (I-TP-1 through I-TP-8) were completed within an area previously characterized as a soil stockpile (Landau Associates 2006c) and sampled during the Phase II ESA (composite sample I-Z). Samples collected from these test pits were analyzed for metals and diesel- and oil-range petroleum hydrocarbons. Elevated concentrations of arsenic up to 122 mg/kg were present in samples collected from test pits I-TP-1, I-TP-5, I-TP-6, and I-TP-8. The detected concentrations of petroleum hydrocarbons were all well below the interim action cleanup levels.

- **Investigation Area I, central area:** In early May 2006, another series of borings (I2-1 through I2-10) were completed in the central part of Area I. The samples were analyzed for metals, cPAHs, and petroleum hydrocarbons to further delineate the nature and extent of contamination associated with the discolored material present in this area. The material was characterized in the field as exhibiting multiple colors and a concrete odor was noted in seven of these samples; one sample, I2-2, was characterized as looking like concrete waste. The analytical results showed that none of the samples had levels of cPAHs or petroleum hydrocarbons above the interim action cleanup levels, although petroleum hydrocarbon concentrations as high as 1,800 mg/kg were detected. Arsenic concentrations exceeded the interim action cleanup level in all ten test pits.

- **Investigation Area G, northwest corner:** This area was investigated when it became apparent that the construction of the planned Bayside Marine building immediately to the west would require construction activities in this portion of the Ameron leasehold. In late April 2006, eight test pits were completed within an area of elevated grades in the northwest corner of Area G. One soil sample was collected from each test pit (G1-TP-1 through G1-TP-8) and analyzed for metals and diesel- and motor oil- range petroleum hydrocarbons. Concentrations in all but one sample (G-TP-3) exceeded the interim action cleanup level for arsenic, and the concentration in the sample from test pit G-TP-5 also exceeded the interim action cleanup level for lead. There were no exceedances of the cleanup screening levels for total petroleum hydrocarbons and extractable organic halides (EOX) were not detected in any sample.

- **Investigation Area J, northeast corner:** Five soil samples from four additional locations in the vicinity of J-GC-6 (J-GC-6f through J-GC-6i) were collected to better characterize soil quality in the area characterized as buried construction debris (Laudau Associates 2006c). The samples were tested for metals and cPAHs. One of the samples (J-GC-6h) exhibited an elevated arsenic concentration (34 mg/kg) and J-GC-6i exhibited an elevated concentration of cPAHs (0.56 mg/kg). Note that documentation of the specific locations for these supplemental explorations is not available.

Additional Characterization During Interim Action Implementations (Landau Associates 2008b)

Twenty-four soil samples were collected from Areas I-1, I-2, I-3, I-4, I-5, and G-1 during interim action implementation to characterize materials being removed as part of the interim action and to evaluate whether materials observed at the excavation limits that exhibited unusual characteristics (odor, color, and/or consistency) exceeded the interim action cleanup levels (Landau Associates 2008b). Additional characterization (AC) samples collected during interim action implementation were labeled with the interim action cleanup area designation, followed by the ”AC” identifier and a sequential number. For example, sample I5-AC-5 was the 5th AC sample collected during interim action implementation from Area I-5. All AC samples were tested for heavy metals, and most samples were also tested for TBT and pH. A limited number of samples were also tested for cPAHs, petroleum hydrocarbons, VOCs, and/or SVOCs.

In most cases, these AC samples exhibited unusual odors, colors, and/or consistency. Many of the samples exhibited unusual colors (red, green, brown or white) and, in some cases, had a concrete-like odor. Although this multi-colored concrete-like material exhibited cohesive strength markedly greater than soil, it was not as strong as concrete. Three samples (G1-AC-3, G1-AC-4, and G1-AC-5) of a soft, grey clay-type material that exhibited a concrete odor were collected from an area exhibiting desiccation cracks. Some samples consisted of black sand that appeared to be sandblast grit. Because two samples were inadvertently labeled I2-AC-1 in the field, the first of these samples collected was re-labeled I2-AC-1A so that each sample had a unique identifier.

The analytical results for most AC samples, along with observations made during the interim action, were previously reported (Landau Associates 2008b). Almost all “AC” samples exhibited elevated concentrations of arsenic. Samples of the multi-colored concrete waste material and the grey clay-type material exhibited moderately to highly elevated pH. Only one sample (I1-AC-1), a composite sample of the stockpiled material in Area I-1, detected TBT. The lack of detectable concentrations of TBT in the remainder of these samples suggests that the concrete-like waste materials and sandblasting waste may not be related to marine maintenance activities. The high pH of the apparent concrete waste material supports the conclusion that it is a concrete-related material.

Craftsman District Sewer System Excavation

On May 23, 2007, petroleum hydrocarbon product was observed floating on the water surface in an excavation trench for the sanitary sewer line being installed as part of the Craftsman District construction. The observed floating product was located to the north of the covered work area at the north end of the MSRC building. Steel cable, concrete, and brick were observed in the excavation, similar to the materials previously observed in the vicinity of exploration J-6 to the east of the MSRC covered work area.

A product sample (J-MSRC) was obtained from the excavation and submitted for analytical testing for TPH-Dx, TPH-HCID, SVOCs, and PCBs on a 24-hour turnaround. Although the product was a liquid collected from the water surface, it is reported in solid units (mg/kg) as is common practice for free product samples. The product sample exhibited highly elevated concentrations of diesel-range petroleum hydrocarbons (390,000 mg/kg) and oil-range petroleum hydrocarbons (410,000 mg/kg), and a moderate concentration of cPAHs (0.69 mg/kg). No other constituents were reported above the laboratory reporting limits.

Based on the product analytical results, the excavation was continued and excavated material was stockpiled for additional testing. Additional product was observed as the excavation continued, and appeared to emanate from beneath a buried pile cap that presumably supported a historic structure at the Site. All visual evidence of product was removed from the excavation water surface with absorbent pads. A total of eight soil samples (J-MSRC-E, J-MSRC-W, J-MSRC-S, J-MSRC-N, J-MSRC-B, J-MSRC-M052907, J-MSRC-N052907, and J-MSRC-S052907) were collected from various sidewalls and the excavation bottom during excavation over the next 5 days and were tested for TPH-HCID, with follow up testing for TPH-Dx. All samples exhibited concentrations below 1,000 mg/kg for each petroleum hydrocarbon range.

Three samples of the excavated stockpile material (J-MSRC-SP1, J-MSRC-SP2, and J-MSRC-SP3) were also analyzed for NWTPH-HCID and NWTPH-Dx. Similar to the excavation samples, the stockpile samples also exhibited TPH concentrations below 1,000 mg/kg and the material was transported to the Waste Management solid waste landfill in Arlington, Oregon for disposal.

Ameron Oil-Affected Area Investigation (Landau Associates 2005b)

Limited characterization activities were conducted at a location on the north fenceline of the Ameron leasehold after Ameron encountered apparent petroleum hydrocarbon contamination during repair of the storm drain trunk line in 2004 (Landau Associates 2005b). The trunk line conveys stormwater from the Ameron leasehold and the adjacent properties to the north to an outfall in the northeast corner of the 12th Street Yacht Basin.

One soil sample was collected in November 2004 from a soil stockpile created from affected soil excavated during the storm line repair, and was analyzed for NWTPH-HCID with follow-up NWTPH-Dx, VOCs, SVOCs, and PCBs analyses. Eight borings (G-FA-1 through G-FA-8) were completed during a subsequent Geoprobe™ investigation conducted in January 2005 in the vicinity of the excavation to delineate the extent of petroleum-affected soil and groundwater associated with the conditions observed in November 2004. The borings were installed at depths ranging from 8 to 12 ft BGS, and soil samples collected from three of the borings (G-FA-4, G-FA-5, and G-FA-8) were analyzed for metals, VOCs, SVOCs and/or petroleum hydrocarbons. Groundwater samples were collected from borings G-FA-4 and G-FA-7, and were analyzed for VOCs, SVOCs, and dissolved metals.

The soil stockpile sample exhibited concentrations of cPAHs above cleanup screening levels identified as part of the Ameron Oil-Affected Area Investigation, but concentrations of petroleum hydrocarbons in the diesel and oil ranges below cleanup screening levels. Moderate concentrations of copper and zinc exceeded MTCA cleanup levels based on protection of surface water, but metals cleanup levels based on direct contact were not exceeded. The stockpiled soil was used by Ameron to backfill the excavation.

The two groundwater samples had concentrations of dissolved arsenic up to 10 ug/L, in slight exceedance of cleanup screening levels, and one of the groundwater samples (G-FA-7) exhibited a concentration above cleanup screening levels of bis(2-ethylhexyl) phthalate (BEHP), which is a common laboratory contaminant. One soil sample identified as green sand with crushed concrete and a petroleum/concrete odor (G-FA-4) exhibited elevated concentrations of arsenic (80 mg/kg), detectable concentrations of several petroleum hydrocarbon-related VOCs, and trace concentrations of tetrachloroethylene (PCE) and 1,1,1-TCA. The other soil samples analyzed from this location did not contain elevated levels of arsenic, but did contain copper at concentrations of 37 to 47 mg/kg (samples G-FA-4 and G-FA-5, respectively).

The investigation results indicated that the apparent petroleum hydrocarbon contamination was either very localized around the stormwater line break or originated on the property to the north and only extended a short distance onto the Ameron leasehold. It was also noted that the discolored material encountered at a number of locations and characterized as an apparent concrete waste material was not bounded during the investigation.

MARINE SEDIMENT INVESTIGATIONS

Three sediment quality investigations were conducted in the 12th Street Channel in advance of it being redeveloped into the 12th Street Yacht Basin to evaluate the sediment quality for open water disposal under the Puget Sound Dredge Disposal Analysis (PSDDA) program. These investigations were:

- *Subsurface Exploration and Engineering Report, William Hulbert Marina Site. Everett, Washington.* RZA for William Hulbert (February 1988)
- *Sampling and Analysis Report for Characterization, Proposed 12th Street Marina, Everett, Washington.* Prepared by Rittenhouse-Zeman & Associates (RZA) for the Hulbert Mill Company (March 1991)
- *Puget Sound Dredged Disposal Analysis, Full Characterization for the 12th Street Marina.* Prepared by Pentec Environmental for the Port of Everett (February 1, 2001).

Additionally, a sediment quality sample was collected in the 12th Street Yacht Basin to evaluate sediment quality as part of the evaluation of Port Gardner Bay under the Puget Sound Initiative (PSI; SAIC 2009).

With the exception of the recent sample collected under the PSI, the sediment quality data were not collected using the methods and procedures specified under the SMS. However, the data are still of value in assessing general sediment quality and are summarized below, discussed in the context of the PSDDA evaluation.

In preparation for the planning and construction of the 12th Street Yacht Basin, several characterization studies of the tidelands were performed. In 1988, Layton and Sell, Inc., P.S. (LSI) collected 15 surface core samples to evaluate the top 2 ft of sediment over the area that was being considered for development of a new marina by the Hulbert Mill Company (LSI 1988). From the most visually affected cores, two composite samples (LS-Comp-A and LS-Comp-B) were prepared and analyzed according to the PSDDA testing procedures at that the time. The nickel concentrations in sample LS-COMP-A and sample LS-COMP-B slightly exceeded the PSDDA screening level for nickel. The lead concentration in sample LS-COMP-B also slightly exceeded the PSDDA screening level for lead. No other analytes exceeded the PSDDA screening levels.

The PSDDA characterization was continued by RZA in 1990. Eight composite samples were collected from 13 borings: four composites derivedfrom the top 4 ft of the sediment cores, and four derived from the interval from 4 ft to the bottom of the planned dredge prisms. Eight discrete samples were selected for sampling to account for volatile loss in the composite samples. The discrete samples yielded no detections for VOCs. In the composite samples, some PSDDA screening level exceedances occurred for cadmium, mercury, silver, and phthalates, and, because of these exceedances, bioassay testing was also performed. Several samples had high mortality rates for the amphipod bioassay test.

In 2001, Pentec Environmental completed a full characterization of the dredge footprint for the planned 12th Street Yacht Basin (Pentec 2001). For the study, Pentec subdivided the sediment in the 12th Street Channel into eight Dredged Material Management Units (DMMUs). Fourteen sediment cores were taken over the area, and the core subsections were composited into eight samples, one to represent each DMMU. Three of the composite samples (CM-1, CM-2, and CM-3) derived from the upper portions of the cores represent the surface DMMUs, while the other five (CM-4 through CM-8) derived from the deeper portions of the cores represent the subsurface DMMUs. According to the Pentec report for the 12th Street Marina, there were no exceedances of the PSDDA screening levels, bioaccumulation triggers, or maximum levels for sediments collected from the proposed Port 12th Street marina dredging project.

One surface sediment sample (A2-13) was collected from near the center of the 12th Street Yacht Basin during the Port Gardner Bay bay-wide study conducted under the PSI (SAIC 2009). The sample was tested for a number of chemical parameters, consisting of SMS parameters (SVOCs, metals, and PCBs); tributyl tin (TBT); and conventional parameters. The sample was also submitted for bioassay analysis. None of chemical parameters exceeded applicable criteria. The sample passed three of the four bioassay analyses, but failed the larval development bioassay. However, a number of problems occurred during the performance of the failed bioassay test, and the data do not appear to be indicative of a sediment quality issue.

Legend

●	Soil Sample Locations Analyzed for SVOCs
⌐¬	G - Area Designation
▭	Approximate North Marina Ameron/Hulbert Site Boundary

0 140 280
Scale in Feet

Data Source: 6/19/2002 Google Earth Image

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

North Marina Ameron/Hulbert Site
RI/FS Report
Port of Everett, Washington

Soil Characterization Sample Locations Analyzed for SVOCs

Figure
A-1

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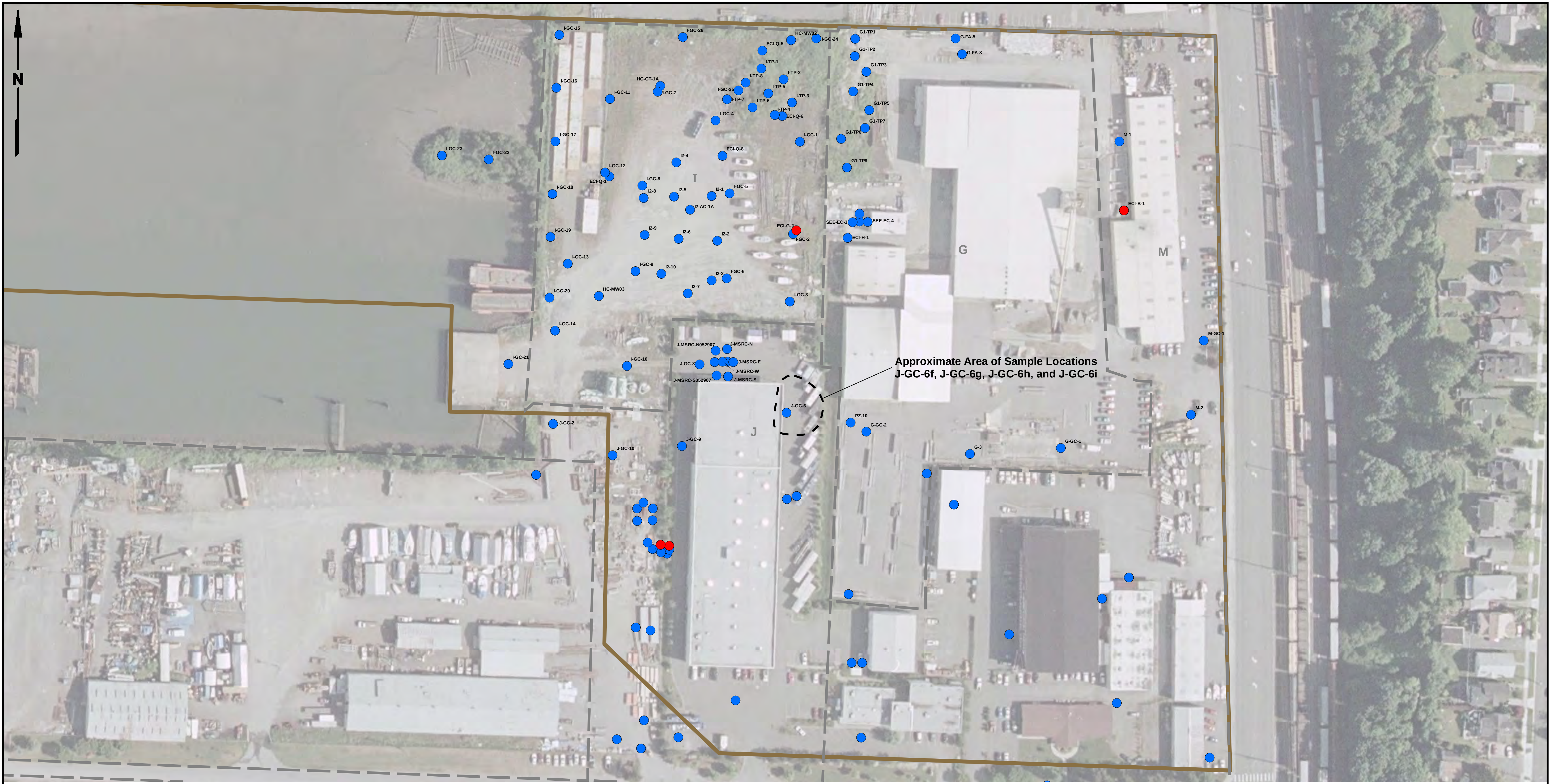

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Legend

🔴	Soil Sample Exceeds Cleanup Screening Level for TPH
🔵	Soil Sample Locations Analyzed for TPH
G	Area Designation
▭	Approximate North Marina Ameron/Hulbert Site Boundary

0 140 280

Scale in Feet

Data Source: 6/19/2002 Google Earth Image

Note

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North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Soil Characterization Sample Locations Analyzed for TPH

Figure
A-2

Legend

●	Soil Sample Locations Analyzed for VOCs
⊏⊐	G - Area Designation
▭	Approximate North Marina Ameron/Hulbert Site Boundary

0 140 280
Scale in Feet

Note
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Data Source: 6/19/2002 Google Earth Image

Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\A-3 SoilVOCs.mxd 5/19/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet

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North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Soil Characterization Sample Locations Analyzed for VOCs

Figure
A-3

Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\A-4 GWVOCs.mxd 5/19/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet

Legend

● Groundwater Sample Exceeds Cleanup Screening Level for VOCs

● Groundwater Sample Locations Analyzed for VOCs

G - Area Designation

Approximate North Marina Ameron/Hulbert Site Boundary

0 140 280

Scale in Feet

Note

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Data Source: 6/19/2002 Google Earth Image

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RI/FS Work Plan
Port of Everett, Washington

Groundwater Characterization Sample Locations Analyzed for VOCs

Figure
A-4

Legend

🟥 Groundwater Sample Exceeds Cleanup Screening Level for SVOCs

● Groundwater Sample Locations Analyzed for SVOCs

G - Area Designation

Approximate North Marina Ameron/Hulbert Site Boundary

0 140 280

Scale in Feet

Data Source: 6/19/2002 Google Earth Image

Note
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RI/FS Work Plan
Port of Everett, Washington

Groundwater Characterization Sample Locations Analyzed for SVOCs

Figure
A-5

Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\A-6 GWTPH.mxd 5/19/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet

Legend

● Groundwater Sample Locations Analyzed for TPH

▭ G - Area Designation

▭ Approximate North Marina Ameron/Hulbert Site Boundary

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 140 280

Scale in Feet

Data Source: 6/19/2002 Google Earth Image

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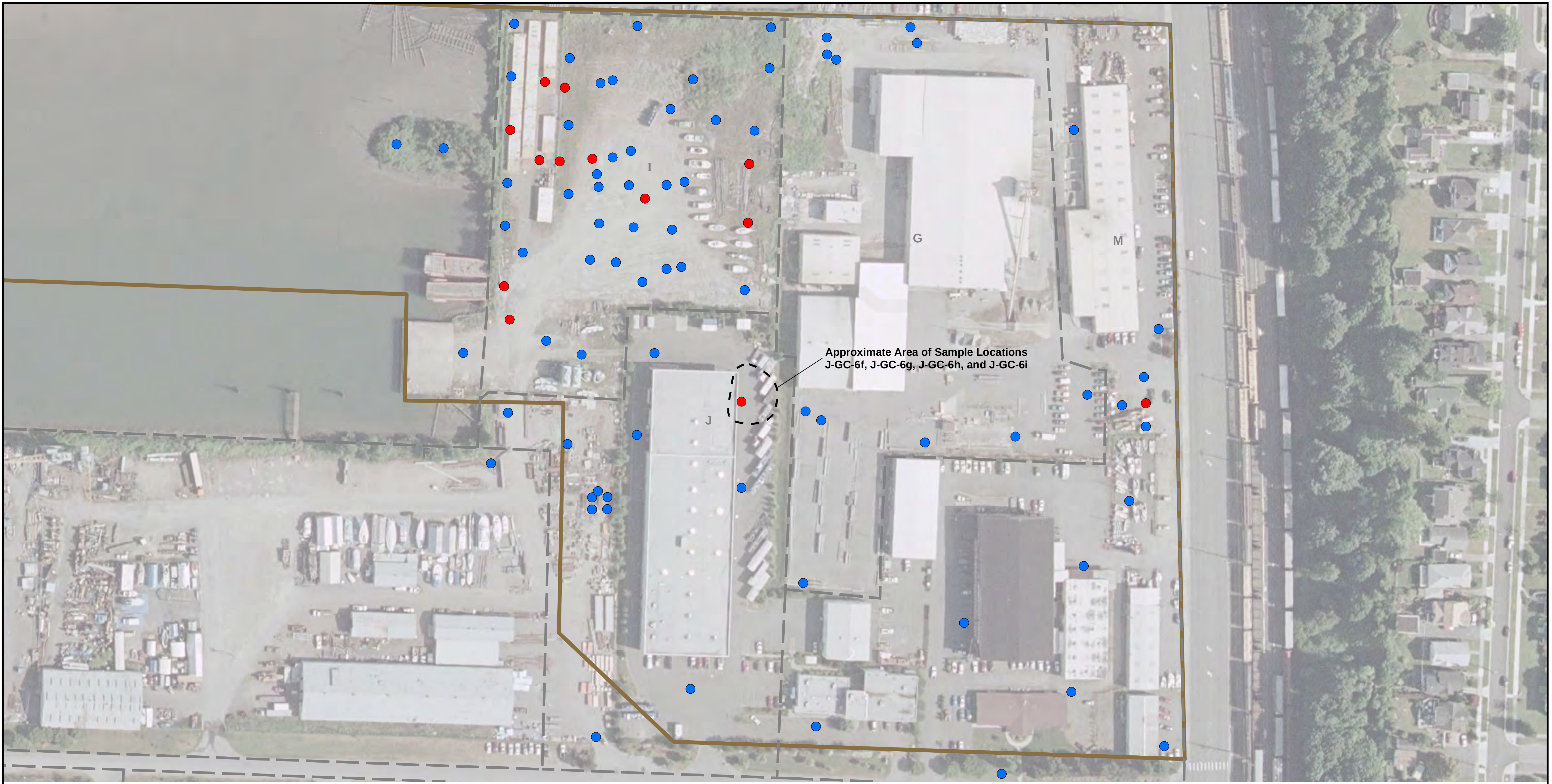
North Marina Ameron/Hulbert Site RI/FS Work Plan Port of Everett, Washington	**Groundwater Characterization Sample Locations Analyzed for TPH**	Figure A-6



Legend

● Soil Sample Exceeds Cleanup Screening Level for CPAH's

● Soil Sample Locations Analyzed for cPAH's

▭ G - Area Designation

▭ Approximate North Marina Ameron/Hulbert Site Boundary

0 140 280
Scale in Feet

Data Source: 6/19/2002 Google Earth Image

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Soil Characterization Sample Locations Analyzed for cPAH's

Figure
A-7

Legend

● Groundwater Sample Locations Analyzed for cPAH's

▭ G - Area Designation

▭ Approximate North Marina Ameron/Hulbert Site Boundary

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 140 280

Scale in Feet

Data Source: 6/19/2002 Google Earth Image

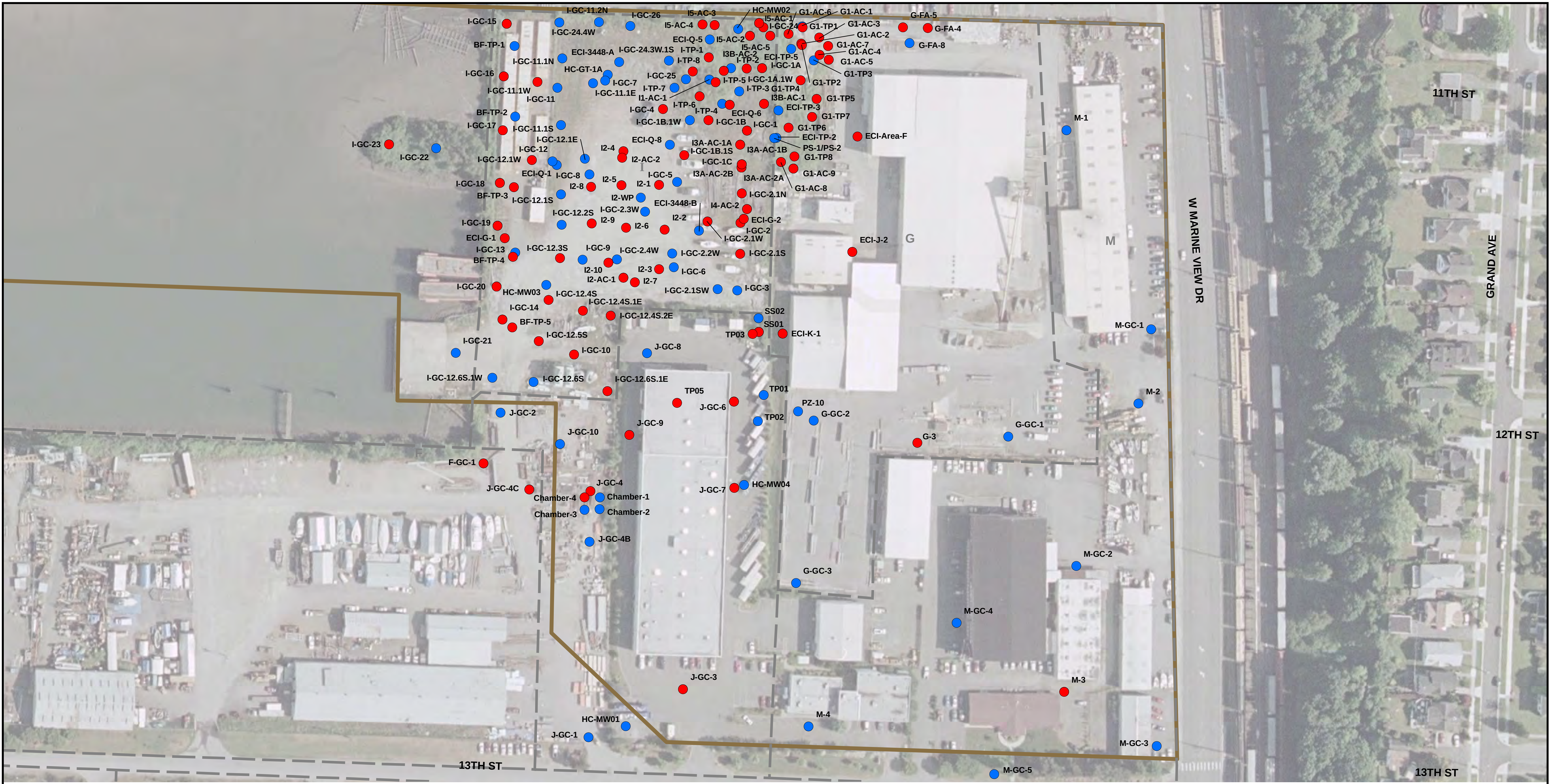
North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Groundwater Characterization Sample Locations Analyzed for cPAH's

Figure
A-8

LANDAU ASSOCIATES

Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\A-8 GWcPAH.mxd 5/19/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet



Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\A-9 SoilMetalsCombined (2).mxd 5/19/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet

Legend

- 🔴 Soil Sample Exceeds Cleanup Screening Level for Metals
- 🔵 Soil Sample Locations Analyzed for Metals
- ⌜⌟ G - Area Designation
- ▭ Approximate North Marina Ameron/Hulbert Site Boundary

0 140 280
Scale in Feet

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Source: 6/19/2002 Google Earth Image

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North Marina Ameron/Hulbert Site RI/FS Work Plan Port of Everett, Washington	**Soil Characterization Sample Locations Analyzed for Metals**	Figure A-9

Legend

● Groundwater Sample Exceeds Cleanup Screening Level for Metals

● Groundwater Sample Locations Analyzed for Metals

G - Area Designation

Approximate North Marina Ameron/Hulbert Site Boundary

0 140 280

Scale in Feet

Data Source: 6/19/2002 Google Earth Image

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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LANDAU ASSOCIATES

North Marina Ameron/Hulbert Site RI/FS Work Plan Port of Everett, Washington	**Groundwater Characterization Sample Locations Analyzed for Metals**	Figure A-10

Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\Old\A-11 SoilPCBs.mxd 5/19/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet

Legend

● Soil Sample Locations Analyzed for PCBs

G - Area Designation

Approximate North Marina Ameron/Hulbert Site Boundary

0 140 280

Scale in Feet

Data Source: 6/19/2002 Google Earth Image

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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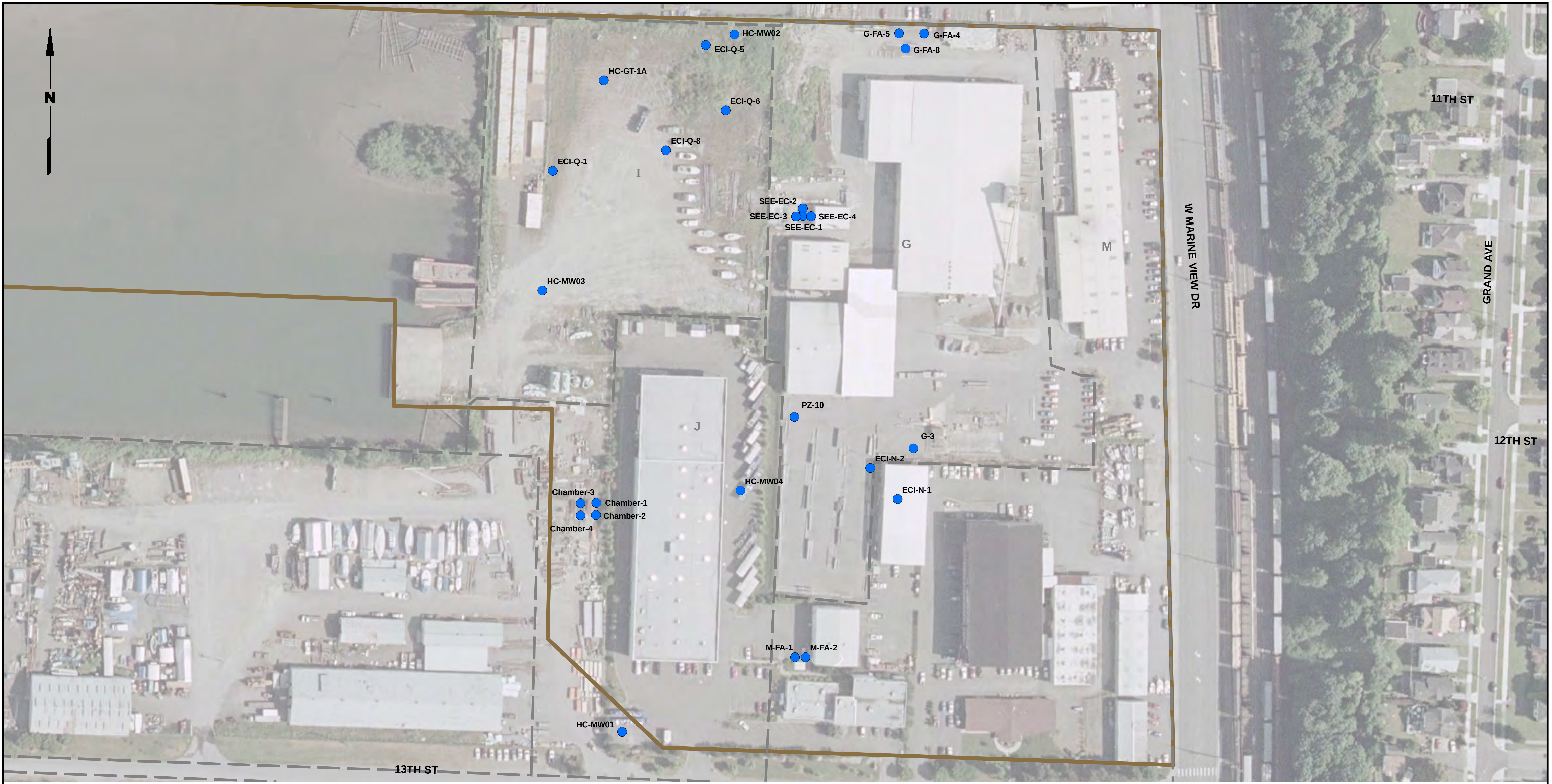
North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Soil Characterization Sample Locations Analyzed for PCBs

Figure
A-11



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Legend

●	Soil Sample Locations Analyzed for BTEX
⬚	G - Area Designation
▭	Approximate North Marina Ameron/Hulbert Site Boundary

0 140 280

Scale in Feet

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Source: 6/19/2002 Google Earth Image

LANDAU ASSOCIATES

North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Soil Characterization Sample Locations Analyzed for BTEX

Figure
A-12

Legend

● Groundwater Sample Locations Analyzed for BTEX

G - Area Designation

Approximate North Marina Ameron/Hulbert Site Boundary

<u>Note</u>
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 140 280

Scale in Feet

Data Source: 6/19/2002 Google Earth Image

North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Groundwater Characterization Sample Locations Analyzed for BTEX

Figure
A-13

LANDAU ASSOCIATES

Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\Old\A-13 GWBTEX.mxd 5/19/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet

TABLE A-1
METALS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name	Depth Range	Date Collected	Area ID (b)	Sample Type	Metals (mg/kg) SW6000-7000 Series													
					Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
				Cleanup Screening Levels (a)	32	20	1650	160	80	120000	36/3000	250	24	1600	400	400	5.9	24000
F-GC-1	(0-0.5)	1/14/2005	F	Boring		12			0.2 U		83.3 J	14	0.04 U					105 J
J-GC-4C	(0-0.5)	7/14/2005	F	Boring		19			0.2 U		56.8	18	0.05 U					181
ECI-Area-F		10/7/1991	G	Blasting Sand	10 U	7		1 U	1 U	1210	37	20 U	0.2 U	940	1 U	2	1 U	172
ECI-J-2	(3-3)	10/7/1991	G	Test Pit	100 U	40		10 U	12 U	377	514	200 U	0.2 U	281	1 U	20 U	1 U	722
ECI-K-1	(4-4)	10/7/1991	G	Test Pit	106	144		1 U	3	481	398	304	20 U	1120	1 U	2	1 U	1180
ECI-TP-2	(5-5)	10/7/1991	G	Test Pit	10 U	5 U		1 U	1 U	26	18	20 U	0.2 U	27	1 U	2 U	1 U	36
ECI-TP-3	(7-7)	10/7/1991	G	Test Pit	10 U	5 U		1 U	1 U	35	26	20 U	0.2 U	35	1 U	2 U	1 U	48
ECI-TP-5	(9-9)	10/7/1991	G	Test Pit	10 U	5 U		1 U	1 U	28	28	20 U	0.2 U	22	1 U	2 U	1 U	36
G1A-100507-AC-1		10/5/2007	G	Stock Pile		5 U			0.2 U	677	8.8	2	0.05 U					37
G1A-100907-STK-1		10/9/2007	G	Stock Pile		1750 J	117		1 U	61		1400	0.04 U		30 U	3		
G1A-101607-STK-2		10/16/2007	G	Stock Pile		840	182		1 U	44		1040	0.04 U		30 U	2		
G1-AC-1		6/22/2006	G	Surface Soil		20	73.9		0.6 U	133		11	0.06 U		10 U	0.9 U		
G1-AC-2		6/22/2006	G	Surface Soil		70	97		1 U	107	48	50	0.09		20 U	1 U		167
G1-AC-3		6/22/2006	G	Surface Soil		80	151		1 U	97		70	0.09 U		30 U	2 U		
G1-AC-4		6/22/2006	G	Surface Soil		90	159		1 U	221		70	0.1 U		30 U	2 U		
G1-AC-5		6/22/2006	G	Surface Soil		120	147		1 U	97	215 J	100	0.1 U		30 U	2 U		962 J
G1-AC-6		6/26/2006	G	Surface Soil		80	88		0.8 U	74		64	0.06 U		20 U	1 U		
G1-AC-7		6/27/2006	G	Surface Soil		280	60		1 U	427	263 J	180	0.04 U		20 U	1 U		695 J
G1-AC-8		6/27/2006	G	Surface Soil		720	315		3	38		1940	0.04 U		50 U	4		
G1-AC-9		6/23/2006	G	Surface Soil		6650			8	135	3010	4150	0.04 U					15400
G1-TP1	(0-4)	4/25/2006	G	Test Pit		103	67.5		0.3 U	54.8		73	0.11		7 U	0.4 U		
G1-TP2	(0-6)	4/25/2006	G	Test Pit		28	57.8		0.2 U	83.2		35	0.07		6 U	0.3 U		
G1-TP3	(0-5)	4/25/2006	G	Test Pit		14	32.1		0.2 U	34.4		10	0.05 U		6 U	0.4 U		
G1-TP4	(0-6)	4/25/2006	G	Test Pit		353	49		0.4	64.3		196	0.04 U		6 U	0.4 U		
G1-TP5	(0-5)	4/25/2006	G	Test Pit		1540	81.6		2.6	82		1060	0.04		10 U	1.9		
G1-TP6	(0-4)	4/25/2006	G	Test Pit		86	65.6		0.2 U	43.2		98	0.05 U		5 U	0.3 U		
G1-TP7	(0-5)	4/25/2006	G	Test Pit		37	35.1		0.3 U	39.7		23	0.05 U		6 U	0.4 U		
G1-TP8	(0-5)	4/25/2006	G	Test Pit		30	54.5		0.2 U	27.4		19	0.05 U		6 U	0.4 U		
G-3	(3-3)	2/11/2004	G	Boring		10.2			25.2	63.6	60.0	49	0.37			0.4 U		130
G-FA-4	(2-2.5)	1/20/2005	G	Boring		80			2 U		47	50	0.08 U					157
G-FA-5	(8-8.5)	1/20/2005	G	Boring		13			0.3 U		37.1	19	0.06 U					85
G-FA-8	(4-4.5)	1/20/2005	G	Boring		15			0.2 U		32.8	13	0.05 U					61.2
G-GC-1	(1.5-2)	3/2/2005	G	Boring		6			0.2 U		24	10	0.05 U					46.6
G-GC-2	(1.4-1.9)	3/2/2005	G	Boring		6			0.2 U		17.8	5	0.04 U					39.9
G-GC-3	(1-1.5)	3/2/2005	G	Boring		6			0.2		18.3	6	0.05 U					39
PS-1/PS-2		1/25/1989	G	Pond Sample	5 U	2.4	47.4	0.1 U	0.1 U	8.9	13	1.1	0.05 U	13	0.05 U	0.2 U	1 U	35.7
PZ-10 (c)	(3-3)	2/11/2004	G	Boring		6.3			0.2 U	31.3	22.1	8	0.07			0.3 U		52.1
STOCKPILE		11/12/2004	G	Stock Pile		13.9					119	97.5						199
ECI-3448-A		11/7/1988	I	Surface Soil		0.1 U	0.6		0.1 U	0.1 U	0.6	0.1 U	0.05 U	0.1 U	0.1 U	0.1 U		1.1
ECI-3448-B		11/7/1988	I	Surface Soil		4.8				47.6		57						
ECI-G-1 (d)	(0-0.5)	7/9/1987	I	Surface Soil			145			1 U	111	6		1 U		1 U		289
ECI-G-2	(0-0.5)	7/9/1987	I	Surface Soil		3000						1300						
ECI-Q-1	(1-2)	10/7/1991	I	Test Pit	10 U	5		1 U	1 U	27	20	20 U	0.2 U	33	1 U	2 U	1 U	50
ECI-Q-5	(1-2)	10/7/1991	I	Test Pit	10 U	5 U		1 U	1 U	22	12	20 U	0.2 U	29	1 U	2 U	1 U	33
ECI-Q-6	(0-1)	10/7/1991	I	Test Pit	58	5 U		1 U	3	7	1410	1350	0.2 U	10 U	2	7	1 U	4520
ECI-Q-8	(5-5)	10/7/1991	I	Test Pit	10 U	5 U		1 U	1 U	29	20	20 U	0.2 U	30	1 U	2 U	1 U	40
HC-GT-1A		11/7/1991	I	Boring					1.0 U	14	20	5.0 U		15				26

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METALS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

					Metals (mg/kg) SW6000-7000 Series													
Sample Name	Depth Range	Date Collected	Area ID (b)	Sample Type	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
				Cleanup Screening Levels (a)	**32**	**20**	**1650**	**160**	**80**	**120000**	**36/3000**	**250**	**24**	**1600**	**400**	**400**	**5.9**	**24000**
HC-MW02 (e)	(2.5-4)	11/6/1991	I	Boring					1.0 U	9	16	5.0 U		12				31
HC-MW02 (e,f)	(12.5-14)	11/6/1991	I	Boring	10 U	12 U			1.0 U	71	24 J	13	10 U	36	5 U	10 U		52
HC-MW03 (e,f)	(5-6.5)	11/7/1991	I	Boring	10 U	12 U			1.0 U	83	22	6 U	10 U	19	5 U	10 U		30
HC-MW03 (e)	(10-11.5)	11/7/1991	I	Boring					1.0 U	15	19	5 U		13				24
I1-AC-1		6/21/2006	I	Surface Soil		16	56.1		0.2 U	35.3		57	0.37		5 U	0.3 U		
I2-AC-1		7/13/2006	I	Excavation		240	79		2 U	46	212	130	0.07 U		40 U	2 U		475
I2-AC-2		7/13/2006	I	Excavation		20	73		0.8 U	36	67.6	28	0.08 U		20 U	1 U		129
I2-1	(1-1.5)	5/8/2006	I	Boring		197	59.2		0.3	32.6		141	0.04 U		6 U	0.4 U		
I2-2	(1-2.25)	5/8/2006	I	Boring		130	79		0.7 U	42		56	0.07 U		20 U	1 U		
I2-3	(0.5-2.5)	5/8/2006	I	Boring		180	111		2 U	52		100	0.07 U		40 U	3 U		
I2-4	(1.4-2.4)	5/8/2006	I	Boring		70	69		0.8 U	37		47	0.06 U		20 U	1 U		
I2-5	(1.3-2.5)	5/8/2006	I	Boring		90	88		0.8 U	41		58	0.06 U		20 U	1 U		
I2-6	(1.5-2.2)	5/8/2006	I	Boring		130	112		0.8 U	40		71	0.06 U		20 U	1 U		
I2-7	(1.7-2.8)	5/8/2006	I	Boring		120	121		2 U	44		60	0.18		40 U	3 U		
I2-8	(1.5-3.3)	5/8/2006	I	Boring		100	101		0.7 U	61		70	0.08		20 U	1 U		
I2-9	(1.7-3.3)	5/8/2006	I	Boring		90	81		0.7 U	38		55	0.07 U		20 U	1 U		
I2-10	(1.5-2.5)	5/8/2006	I	Boring		44	54.8		0.2 U	33.6		32	0.05 U		6 U	0.3 U		
I-3		2/12/2004	I	Boring		6.2			0.2 U	32.7	21.1	6	0.06			0.4 U		44.3
I3A-AC-1A		6/29/2006	I	Surface Soil		4290	299		7	78		3230	0.04 U		50 U	6		
I3A-AC-1B		6/29/2006	I	Surface Soil		11	26.4		0.2 U	28.9		6	0.05		5 U	0.3 U		
I3A-AC-2A		6/30/2006	I	Surface Soil		5060			9	73	2920	3550	0.04 U					10600
I3A-AC-2B		6/30/2006	I	Surface Soil		7			0.2 U	22.6	8.7	2 U	0.05 U					31.2
I3B-AC-1		7/7/2006	I	Surface Soil		380	390		3	25	1890	1890	0.04 U		50 U	3		6600
I3B-AC-2		7/7/2006	I	Surface Soil		1800	166		3	54	1400	1450	0.04 U		20 U	4		4210
I4-AC-2		7/12/2006	I	Surface Soil		2080	418		5	73	2700	2830	0.04 U		50 U	5		8800
I5-AC-1		6/27/2006	I	Surface Soil		400	89.5		1.1	41	498	407	0.05 U		20 U	1.6		1100
I5-AC-2		6/28/2006	I	Surface Soil		1970	103		7	64	3170 J	2270	0.05 U		30 U	15		5810 J
I5-AC-3		6/28/2006	I	Surface Soil		1780	90		6	58		2090	0.05 U		30 U	8		
I5-AC-4		6/28/2006	I	Surface Soil		90	104		1.2	36		68	0.07 U		20 U	1 U		
I5-AC-5		7/14/2006	I	Surface Soil		2210	94		7	74	3430	2390	0.04 U		20 U	9		5820
I-GC-1	(0-0.5)	7/14/2005	I	Boring		1440			2.1		954	1070	0.05 U					3100
I-GC-1	(1-2)	7/14/2005	I	Boring		3690			7		2790	2560	0.04 U					7030
I-GC-1	(2-3)	7/14/2005	I	Boring		11			0.2 U		26	4	0.05 UJ					46.9
I-GC-1A	(0-0.5)	10/19/2005	I	Boring		640			1.5		447	459	0.05 U					1410
I-GC-1A	(1-2)	10/18/2005	I	Boring		9			0.2 U		25	7	0.05 U					45.5
I-GC-1A.1W		4/25/2006	I	Surface Soil		50												
I-GC-1B	(0-0.5)	10/19/2005	I	Boring		130			0.5 U		112	91	0.04 U					295
I-GC-1B	(1-2)	10/18/2005	I	Boring		8			0.2 U		14.3	4	0.05 U					37.4
I-GC-1B.1S	(0-0.5)	3/1/2006	I	Surface Soil		53												
I-GC-1B.1W	(0-0.5)	3/1/2006	I	Surface Soil		10												
I-GC-1C	(0-0.5)	10/19/2005	I	Boring		1640			4		1140	1310	0.05 U					3650
I-GC-1C	(1-2)	10/18/2005	I	Boring		380			1.2		410	360	0.06 U					923
I-GC-1C	(2-3)	10/18/2005	I	Boring		10			0.2		17.5	5	0.06 U					53.9
I-GC-2	(0-0.5)	7/14/2005	I	Boring		130			0.5 U		193	94	0.05 U					252
I-GC-2	(1-2)	7/14/2005	I	Boring		9			0.2 U		27	10	0.05 U					44.4
I-GC-2.1N	(0-0.5)	3/1/2006	I	Surface Soil		90												
I-GC-2.1S	(0-0.5)	3/1/2006	I	Surface Soil		21												
I-GC-2.1SW	(0-0.5)	3/27/2006	I	Surface Soil		8												

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INTERIM ACTION REPORT - AMERON HULBERT SITE
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					Metals (mg/kg) SW6000-7000 Series													
					Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
				Cleanup Screening Levels (a)	**32**	**20**	**1650**	**160**	**80**	**120000**	**36/3000**	**250**	**24**	**1600**	**400**	**400**	**5.9**	**24000**
Sample Name	Depth Range	Date Collected	Area ID (b)	Sample Type														
I-GC-2.1W	(0-0.5)	3/1/2006	I	Surface Soil		30												
I-GC-2.2W	(0-0.5)	3/29/2006	I	Surface Soil		12												
I-GC-2.3W	(0-0.5)	3/29/2006	I	Surface Soil		7												
I-GC-2.4W	(0-0.5)	3/29/2006	I	Surface Soil		14												
I-GC-3	(0-0.5)	7/14/2005	I	Boring		6			0.2 U		27.1	18	0.05					56.8
I-GC-4	(0-0.5)	7/14/2005	I	Boring		7			0.2 U		39.5	15	0.05					65.6
I-GC-5	(3-3.5)	7/14/2005	I	Boring		6			0.2 U		29.2	7	0.09					52.4
I-GC-6	(3.5-4)	7/14/2005	I	Boring		7			0.2 U		26.9	4	0.05 U					43.9
I-GC-7	(0-0.5)	7/14/2005	I	Boring		5 U			0.2 U		27	11	0.05 U					54.6
I-GC-8	(3.5-4)	7/14/2005	I	Boring		9			0.2 U		29	5	0.06 U					52
I-GC-9	(3.5-4)	7/14/2005	I	Boring		10			0.2 U		33.8	6	0.07					56
I-GC-10	(0-0.5)	7/14/2005	I	Boring		19			0.2 U		46.9	32	0.06					149
I-GC-11	(0-0.5)	7/14/2005	I	Boring		11			0.2 U		26.9	10	0.04 U					55.3
I-GC-11.1E	(0-0.5)	3/1/2006	I	Surface Soil		6												
I-GC-11.1N	(0-0.5)	3/1/2006	I	Surface Soil		9												
I-GC-11.1S	(0.75-1.25)	3/1/2006	I	Surface Soil		10												
I-GC-11.1W	(0-0.5)	3/1/2006	I	Surface Soil		50												
I-GC-11.2N	(0-0.5)	3/1/2006	I	Surface Soil		16												
I-GC-12	(0-0.5)	7/14/2005	I	Boring		10			0.2 U		23.9	32	0.04 U					127
I-GC-12.1E	(0-0.5)	3/1/2006	I	Surface Soil		10												
I-GC-12.1S	(0.75-1.25)	3/1/2006	I	Hand Auger		14												
I-GC-12.1W	(0-0.5)	3/1/2006	I	Surface Soil		48												
I-GC-12.2S	(0.25-0.75)	3/1/2006	I	Surface Soil		17												
I-GC-12.3S	(0-0.5)	3/1/2006	I	Surface Soil		41												
I-GC-12.4S	(0.25-0.75)	3/1/2006	I	Surface Soil		40												
I-GC-12.4S.1E	(0-0.5)	3/27/2006	I	Surface Soil		30												
I-GC-12.4S.2E	(0-0.5)	3/27/2006	I	Surface Soil		27												
I-GC-12.5S	(0.5-1)	3/1/2006	I	Surface Soil		29												
I-GC-12.6S	(0-0.5)	3/27/2006	I	Surface Soil		5												
I-GC-12.6S.1E	(0-0.5)	3/27/2006	I	Surface Soil		34												
I-GC-12.6S.1W	(0-0.5)	3/27/2006	I	Surface Soil		15												
I-GC-13	(0-0.5)	7/14/2005	I	Boring		15			0.2 U		22.2	12	0.04 U					55
I-GC-14	(0-0.5)	7/14/2005	I	Boring		50			0.5 U		167 J	45	0.05 U					354
I-GC-14	(1-2)	7/14/2005	I	Boring		5 U			0.2 U		15.6	2	0.05 U					30.6
I-GC-15	(0-0.5)	8/22/2005	I	Hand Auger		40			0.5 U		26	9	0.05 U					76
I-GC-15	(1-2)	8/22/2005	I	Hand Auger		32			0.4		50.3	29	0.06 U					360
I-GC-15	(2-3)	8/22/2005	I	Hand Auger		11			0.3 U		33.3	21	0.07					76.3
I-GC-16	(0-0.5)	8/22/2005	I	Hand Auger		50			0.5 U		65.5	17	0.04 U					433
I-GC-16	(1-2)	8/22/2005	I	Hand Auger		7			0.2 U		16.8	3	0.05 U					39.8
I-GC-17	(0-0.5)	8/22/2005	I	Hand Auger		34			0.2 U		20	15	0.04					81.5
I-GC-17	(1-2)	8/22/2005	I	Hand Auger		10			0.2 U		21.6	4	0.05 U					42.3
I-GC-18	(0-0.5)	8/22/2005	I	Hand Auger		35			0.2 U		26.3	16	0.04 U					148
I-GC-18	(1-2)	8/22/2005	I	Hand Auger		45			0.2 U		38.4	33	0.05 U					96.1
I-GC-18	(2-3)	8/22/2005	I	Hand Auger		9			0.2 U		15.9	3	0.05					36.6
I-GC-19	(0-0.5)	8/22/2005	I	Hand Auger		31			0.2 U		37.6	18	0.12					700
I-GC-19	(1-2)	8/22/2005	I	Hand Auger		18			0.2 U		53.2	11	0.11					121
I-GC-20	(0-0.5)	8/22/2005	I	Hand Auger		38			0.2 U		40.6	13	0.06					128
I-GC-20	(1-2)	8/22/2005	I	Hand Auger		8			0.2 U		26.2	4	0.04 U					44.3

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					Metals (mg/kg) SW6000-7000 Series													
					Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
				Cleanup Screening Levels (a)	**32**	**20**	**1650**	**160**	**80**	**120000**	**36/3000**	**250**	**24**	**1600**	**400**	**400**	**5.9**	**24000**
Sample Name	Depth Range	Date Collected	Area ID (b)	Sample Type														
I-GC-21	(0-0.5)	8/22/2005	I	Hand Auger		10			0.2 U		34.9	29	0.05					96.9
I-GC-22	(0-0.5)	8/22/2005	I	Hand Auger		9			0.2 U		25.4	9	0.07					49.6
I-GC-23	(0-0.5)	8/22/2005	I	Hand Auger		10			0.4		43.5	12	0.1					53.8
I-GC-24	(1.2-6)	10/19/2005	I	Boring		105			1		166	61	0.08 U					537
I-GC-24	(6.5-7.5)	10/19/2005	I	Boring		20			0.2		33.2	9	0.06 U					43.7
I-GC-24	(7.5-8)	10/18/2005	I	Boring		11			0.2 U		22	7	0.11					42.4
I-GC-24.3W.1S	(0-0.5)	3/1/2006	I	Surface Soil		6												
I-GC-24.4W	(0-0.5)	3/1/2006	I	Surface Soil		10												
I-GC-25	(0.5-1)	10/19/2005	I	Boring		9			0.2		19.9	6	0.05 U					35.4
I-GC-26	(0-0.5)	10/19/2005	I	Boring		13			0.2		31.2	9	0.05 U					50.6
I-TP-1	(0-3)	4/25/2006	I	Test Pit		22	71.8		0.2 U	28.1		14	0.05 U		5 U	0.3 U		
I-TP-2	(0-2.5)	4/25/2006	I	Test Pit		18	45.5		0.2 U	39		27	0.06		6 U	0.4 U		
I-TP-3	(0-4)	4/25/2006	I	Test Pit		13	42		0.2 U	31.8		16	0.14		5 U	0.3 U		
I-TP-4	(0-3)	4/25/2006	I	Test Pit		10	26.9		0.2 U	30.8		7	0.05		6 U	0.3 U		
I-TP-5	(0-5)	4/25/2006	I	Test Pit		122	25.4		0.2 U	28.3		76	0.05		6 U	0.4 U		
I-TP-6	(0-4)	4/25/2006	I	Test Pit		24	42		0.2 U	29.4		48	0.2		5 U	0.3 U		
I-TP-7	(0-4)	4/25/2006	I	Test Pit		15	45.1		0.2 U	30		30	0.3		5 U	0.3 U		
I-TP-8	(0-4)	4/25/2006	I	Test Pit		30	28.1		0.2 U	29.6		50	0.06		6 U	0.3 U		
IW-11		1/5/2006	I	Surface Soil		28												
IW-13		3/1/2006	I	Surface Soil		39												
IW-14		3/1/2006	I	Surface Soil		20												
I-X		2/12/2004	I	Boring		60	76.1		0.4	41.4		41	0.07 U		9 U	0.5 U		
I-Y		2/12/2004	I	Boring		5.3	71.6		0.2 U	33.2		6	0.05		6 U	0.3 U		
I-Z		2/12/2004	I	Surface Soil		240			0.7	56	868	280	0.83			0.8 U		863
Chamber-1		8/11/2006	J	Excavation		5			0.2 U	26.4	15.6	4	0.05 U					39.6
Chamber-2		8/11/2006	J	Excavation		6 U			0.2 U	30	15.3	4	0.05 U					38.4
Chamber-3		8/11/2006	J	Excavation		8 U			2	40.6	38.7	54	22.8					288
Chamber-4		8/11/2006	J	Excavation		7 U			0.5	22.8	24.5	25	11.9					235
HC-MW01 (e,f)	(5-6.5)	11/6/1991	J	Boring	10 U	12 U			4 U	78	14	5.0 U	10 U	22	5 U	10 U		25
HC-MW01 (e)	(7.5-9)	11/6/1991	J	Boring					1 U	8	11	5.0 U		10				16
HC-MW04 (e)	(5-6.5)	11/7/1991	J	Boring					1 U	10	15	5.0 U		12				22
HC-MW04 (e)	(20-21.5)	11/7/1991	J	Boring					1 U	13	21	5.0 U		18				27
J-GC-1	(0.5-1)	1/14/2005	J	Boring		8			0.2 U		19.7	6	0.05 U					69.6
J-GC-2	(0-0.5)	3/2/2005	J	Boring		5 U			0.2 U		18.2	4	0.04 U					34
J-GC-3	(0-0.5)	3/2/2005	J	Boring		14			0.3		287	23	0.05 U					339
J-GC-4	(1.5-2)	3/3/2005	J	Boring		30			0.5 U		31.8	42	0.08					77
J-GC-4	(2.5-3.5)	3/3/2005	J	Boring		7												
J-GC-4	(3.5-4.5)	3/3/2005	J	Boring		8												
J-GC-4B	(0-0.5)	7/14/2005	J	Boring		5 U			0.2 U		16.6	4	0.05 U					34.7
J-GC-6	(1.1-1.6)	7/15/2005	J	Boring		27			0.2 U		43.8	56	0.06					104
J-GC-6	(2.1-3.1)	7/15/2005	J	Boring		20 U			0.6 U		80.7	42	0.06 U					76
J-GC-6	(2-2.7)	7/15/2005	J	Boring		20 U			0.6 U		80.2	55	0.05 U					69
J-GC-6f	(0.7-1.1)	2/6/2006	J	Boring		9			0.2 U		26.2	9	0.11					51.3
J-GC-6g	(1-1.5)	2/6/2006	J	Boring		11			0.2 U		41.9	30	0.1					75.4
J-GC-6h	(1-1.5)	2/6/2006	J	Boring		34			0.2 U		48.7	31	0.07					90.1
J-GC-6i	(1-1.5)	2/6/2006	J	Boring		9			0.2 U		29.4	46	0.05 U					70.7
J-GC-6i	(3.2-4)	2/6/2006	J	Boring		20 U			0.6 U		99.4	142	0.05 U					109
J-GC-7	(0.7-1.2)	7/15/2005	J	Boring		12			0.2 U		36.3	40	0.07					70.1

TABLE A-1
METALS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
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					Metals (mg/kg) SW6000-7000 Series													
					Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
				Cleanup Screening Levels (a)	**32**	**20**	**1650**	**160**	**80**	**120000**	**36/3000**	**250**	**24**	**1600**	**400**	**400**	**5.9**	**24000**
Sample Name	Depth Range	Date Collected	Area ID (b)	Sample Type														
J-GC-8	(2.1-2.6)	7/15/2005	J	Boring		9			0.2 U		32	5	0.06 U					53.2
J-GC-9	(1.4-1.9)	7/15/2005	J	Boring		12			0.2 U		37.6	16	0.09					84.5
J-GC-10	(0-0.5)	7/14/2005	J	Boring		12			0.2 U		33.7	13	0.05 U					89
SS01	(0.5-0.5)	5/20/1993	J	Surface Soil	580	1600		0.45	1.5 U	84	1800	1400	0.11 U	48	0.89	0.3 U	0.45	6200
SS02	(0.5-0.5)	5/20/1993	J	Surface Soil	2.8 U	11		0.28 U	1.4 U	25	30	11	0.11 U	28	0.29 U	1.4 U	0.29 U	130
TP01	(1-1)	5/20/1993	J	Test Pit	2.7 U	14		0.27 U	1.3 U	20	24	150	0.1 U	24	0.27 U	1.3 U	0.27 U	62
TP01	(3-3)	5/20/1993	J	Test Pit	3.1 U	6.9		0.31 U	1.5 U	19	22	22	0.12 U	23	0.32 U	1.5 U	0.32 U	57
TP02	(2-2)	5/20/1993	J	Test Pit	2.9 U	4		0.29 U	1.4 U	20	9.5	2.6	0.11 U	26	0.3 U	1.4 U	0.3 U	30
TP03	(0.5-0.5)	5/20/1993	J	Test Pit	8.2	13		0.26 U	1.3 U	25	55	42	0.11 U	23	0.27 U	1.3 U	0.27 U	110
TP05	(0.5-0.5)	5/20/1993	J	Test Pit	8.5	20		0.26 U	2.6 U	1200	65	150	0.1 U	560	0.26 U	6.5 U	0.26 U	910
TP05	(1-1)	5/20/1993	J	Test Pit	2.8 U	5.3		0.28 U	1.4 U	25	15	2.7	0.11 U	23	0.27 U	1.4 U	0.27 U	36
M-1	(0.3-0.8)	1/18/2005	M	Boring		5 U			0.2 U		14.1	7	0.04 U					32.5
M-2	(1.5-2)	1/18/2005	M	Boring		5 U			0.3		23.2	47	0.05 U					118
M-3	(0-0.5)	1/18/2005	M	Boring		14			0.2 U		85.3	184	0.05 U					106
M-4	(0.8-1.3)	1/17/2005	M	Boring		6			0.2 U		16.4	6	0.05 U					36.2
M-GC-1	(1.6-2.1)	3/3/2005	M	Boring		5 U			0.2 U		17.6	28	0.06					60.8
M-GC-2	(1.5-2)	3/2/2005	M	Boring		5			0.3		18.7	5	0.04 U					33.6
M-GC-3	(1-1.5)	3/3/2005	M	Boring		5 U			0.2 U		10.7	2	0.05 U					20.4
M-GC-4	(1.5-2)	3/2/2005	M	Boring		8			0.2 U		23.2	28	0.05 U					78.5
M-GC-5	(1-1.5)	3/2/2005	M	Boring		5 U			0.2 U		15.4	3	0.05 U					33.3

U = the analyte was not detected in the sample at the given reporting limit.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
Shaded cells indicate an exceedance of the lowest site cleanup level.

(a) Development of the cleanup levels is presented in Table 9 of the work plan.
(b) Refers to the Investigation Area.
(c) PZ-10 is located at P-10. PZ-10 was taken during the drilling for the P-10 monitoring well.
(d) Sample was also analyzed for aluminum, boron, calcium, iron, magnesium, silicon, sodium, and tin. Results were below the detection limit for magnesium, and tin. Results were not reported because they are not considered a concern for the Site.
(e) Analysis of the sample were performed using X-Ray Florescence Spectrometry (XRF) or Flame Atomic Absorption (FAA). Quantitations are estimates, compound identifications are tentative.
(f) Samples were also analyzed for Aluminum, Iron, Manganese, and Sulfur. Results are not reported because these metals are not considered a concern for the Site. See Hart Crowser 1991, Appendix C for full results. Both XRF and FAA were used for this sample, the highest result for detects is reported. If the constituent was not detected using either method, the lowest detection limit is reported.

TABLE A-2
PETROLEUM HYDROCARBONS AND BTEX IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
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Sample Name	Depth Range	Date Collected	Area ID	Sample Type	NWTPH-Dx (mg/kg)			NWTPH-G (mg/kg)	BTEX (mg/kg) Method 8020/8015/8021/8260						NWTPH-HCID / Hydrocarbon Scan (mg/kg)					
					Diesel-Range Organics	Lube Oil	Mineral Oil	Gasoline-Range Organics	Benzene	Toluene	Ethylbenzene	m, p-Xylene	o-Xylene	Xylenes, Total	Diesel	Lube Oil	Gasoline-Range Organics	Jet Fuel	Kerosene	Mineral Spirits
				Cleanup Screening Levels (a)	2000	2000	4000	100 / 30 (d)	0.29	110	18	15	150	15	2000	2000	100 / 30 (e)			
F-GC-1	(0-0.5)	1/14/2005	F	Boring	53 U	110 U											21 U			
ECI-H-1		10/7/1991	G	Surface Soil	1400															
ECI-N-2		10/7/1991	G	Surface Soil	61				0.005 U	0.005 U	0.005 U			0.005 U						
G1-TP1	(0-4)	4/25/2006	G	Test Pit	180	110														
G1-TP2	(0-6)	4/25/2006	G	Test Pit	92	97														
G1-TP3	(0-5)	4/25/2006	G	Test Pit	98	15														
G1-TP4	(0-6)	4/25/2006	G	Test Pit	17	45														
G1-TP5	(0-5)	4/25/2006	G	Test Pit	12	21														
G1-TP6	(0-4)	4/25/2006	G	Test Pit	5.5 U	16														
G1-TP7	(0-5)	4/25/2006	G	Test Pit	7.6	18														
G1-TP8	(0-5)	4/25/2006	G	Test Pit	32	91														
G-3	(3-3)	2/11/2004	G	Boring	13	62		6.7 UJ	0.033 U	0.033 U	0.033 U	0.067 U	0.033 U	0.130 U						
G-FA-4	(2-2.5)	1/20/2005	G	Boring					0.0012 U	0.18	0.41 ES	1.3 ES	0.94 ES							
G-FA-5	(8-8.5)	1/20/2005	G	Boring	120	57			0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0009 U							
G-FA-8	(4-4.5)	1/20/2005	G	Boring	5 U	10 U			0.0008 U	0.0008 U	0.0008 U	0.0011	0.0008 U							
G-GC-1	(1.5-2)	3/2/2005	G	Boring											50 U	100 U	20 U			
G-GC-2	(1.4-1.9)	3/2/2005	G	Boring											50 U	100 U	20 U			
G-GC-3	(1-1.5)	3/2/2005	G	Boring											50 U	100 U	20 U			
PZ-10 (b)	(3-3)	2/11/2008	G	Boring	5.0 U	10 U		6.6 UJ	0.033 U	0.033 U	0.033 U	0.066 U	0.033 U	0.130 U						
SEE-EC-1	(1-1.5)	1/11/1989	G	Boring	10 U				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-1	(3-4.5)	1/11/1989	G	Boring	19				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-1	(5-6.5)	1/11/1989	G	Boring	86				0.005 U	0.01 U	0.01 U			0.028						
SEE-EC-1	(7.5-9)	1/11/1989	G	Boring	22				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-2	(1-2.5)	1/11/1989	G	Monitoring Well	10 U				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-2	(12-13.5)	1/11/1989	G	Monitoring Well	10 U				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-2	(3-4.5)	1/11/1989	G	Monitoring Well	39				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-2	(5-6.5)	1/11/1989	G	Monitoring Well	22				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-2	(7.5-9)	1/11/1989	G	Monitoring Well	43				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-3	(10-11.5)	1/11/1989	G	Monitoring Well	10 U				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-3	(12.5-14)	1/11/1989	G	Monitoring Well	10 U				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-3	(2-3.5)	1/11/1989	G	Monitoring Well	27				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-3	(5-6.5)	1/11/1989	G	Monitoring Well	10 U				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-3	(7.5-9)	1/11/1989	G	Monitoring Well	10 U				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-4	(10-11.5)	1/11/1989	G	Monitoring Well	10 U				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-4	(12.5-14)	1/11/1989	G	Monitoring Well	10 U				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-4	(2-3.5)	1/11/1989	G	Monitoring Well	10 U				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-4	(5-6.5)	1/11/1989	G	Monitoring Well	10 U				0.005 U	0.01 U	0.01 U			0.01 U						
SEE-EC-4	(7.5-9)	1/11/1989	G	Monitoring Well	10 U				0.005 U	0.01 U	0.01 U			0.01 U						
STOCKPILE		11/12/2004	G	Stock Pile	110 J	190 J									70 J	140 J	28 UJ			
ECI-G-2	(0-0.5)	7/9/1987	I	Surface Soil		17700														
ECI-Q-1	(1-2)	10/7/1991	I	Test Pit	10 U	230		10 U	0.005 U	0.005 U	0.005 U			0.005 U			10 U	10 U	10 U	10 U
ECI-Q-5	(1-2)	10/7/1991	I	Test Pit	10 U	50		10 U	0.005 U	0.005 U	0.005 U			0.005 U			10 U	10 U	10 U	10 U
ECI-Q-6	(0-1)	10/7/1991	I	Test Pit	20	60		10 U	0.005 U	0.005 U	0.005 U			0.005 U			10 U	10 U	10 U	10 U
ECI-Q-8	(5-5)	10/7/1991	I	Test Pit	10 U	100		10 U	0.005 U	0.005 U	0.005 U			0.005 U			10 U	10 U	10 U	10 U
HC-GT-1A (c)		11/7/1991	I	Boring					0.05 U	0.05 U	0.05 U			0.05 U	10 U	10 U	10 U		10 U	10 U
HC-MW02 (c)	(2.5-4)	11/6/1991	I	Boring					0.29	0.62	0.055			0.29	23	10 U	10 U		10 U	10 U
HC-MW02 (c)	(12.5-14)	11/6/1991	I	Boring					0.05 U	0.05 U	0.05 U			0.05 U	10 U	40	10 U		10 U	10 U
HC-MW03 (c)	(5-6.5)	11/7/1991	I	Boring					0.05 U	0.05 U	0.05 U			0.05 U	10 U	10 U	10 U		10 U	10 U
HC-MW03 (c)	(10-11.5)	11/7/1991	I	Boring					0.05 U	0.05 U	0.05 U			0.05 U	10 U	10 U	10 U		10 U	10 U
I2-AC-1A		7/12/2006	I	Excavation	52	74														
I2-1	(1-1.5)	5/8/2006	I	Boring	85	1000									58	120	23 U			
I2-2	(1-2.25)	5/8/2006	I	Boring	1200	220									76	150	30 U			
I2-3	(0.5-2.5)	5/8/2006	I	Boring	1800	300									80	160 U	32 U			
I2-4	(1.4-2.4)	5/8/2006	I	Boring	1100	200									73	150 U	29 U			
I2-5	(1.3-2.5)	5/8/2006	I	Boring	1300	220									70	140 U	28 U			
I2-6	(1.5-2.2)	5/8/2006	I	Boring	1700	270									79	160 U	31 U			
I2-7	(1.7-2.8)	5/8/2006	I	Boring	1800	570									87	180	35 U			
I2-8	(1.5-3.3)	5/8/2006	I	Boring	1100	240									70	140	28 U			
I2-9	(1.7-3.3)	5/8/2006	I	Boring	1300	200									77	150	31 U			
I2-10	(1.5-2.5)	5/8/2006	I	Boring	260	77									60	120 U	24 U			
I-3		2/12/2004	I	Boring	19	34														
I-GC-1	(0-0.5)	7/14/2005	I	Boring											50 U	100 U	20 U			

TABLE A-2
PETROLEUM HYDROCARBONS AND BTEX IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
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					NWTPH-Dx (mg/kg)			NWTPH-G (mg/kg)	BTEX (mg/kg) Method 8020/8015/8021/8260						NWTPH-HCID / Hydrocarbon Scan (mg/kg)					
					Diesel-Range Organics	Lube Oil	Mineral Oil	Gasoline-Range Organics	Benzene	Toluene	Ethylbenzene	m, p-Xylene	o-Xylene	Xylenes, Total	Diesel	Lube Oil	Gasoline-Range Organics	Jet Fuel	Kerosene	Mineral Spirits
				Cleanup Screening Levels (a)	2000	2000	4000	100 / 30 (d)	0.29	110	18	15	150	15	2000	2000	100 / 30 (e)			
Sample Name	Depth Range	Date Collected	Area ID	Sample Type																
I-GC-2	(0-0.5)	7/14/2005	I	Boring	17	69	59								50 U	100	20 U			
I-GC-3	(0-0.5)	7/14/2005	I	Boring											50 U	100 U	20 U			
I-GC-4	(0-0.5)	7/14/2005	I	Boring	9.5	63	53								50 U	100	20 U			
I-GC-5	(3-3.5)	7/14/2005	I	Boring											50 U	100 U	20 U			
I-GC-6	(3.5-4)	7/14/2005	I	Boring	13	130	110								50 U	100	20 U			
I-GC-7	(0-0.5)	7/14/2005	I	Boring											50 U	100 U	20 U			
I-GC-8	(3.5-4)	7/14/2005	I	Boring											50 U	100 U	20 U			
I-GC-9	(3.5-4)	7/14/2005	I	Boring											50 U	100 U	20 U			
I-GC-10	(0-0.5)	7/14/2005	I	Boring	23	120	100								50 U	100	20 U			
I-GC-11	(0-0.5)	7/14/2005	I	Boring											50 U	100 U	20 U			
I-GC-12	(0-0.5)	7/14/2005	I	Boring	52	280	240								50	100	20 U			
I-GC-13	(0-0.5)	7/14/2005	I	Boring	17	110	91								50 U	100	20 U			
I-GC-14	(0-0.5)	7/14/2005	I	Boring	17	72	61								50 U	100	20 U			
I-GC-15	(0-0.5)	8/22/2005	I	Hand Auger											50 U	100 U	20 U			
I-GC-16	(0-0.5)	8/22/2005	I	Hand Auger	250	630									50	100	20 U			
I-GC-17	(0-0.5)	8/22/2005	I	Hand Auger											50 U	100 U	20 U			
I-GC-18	(0-0.5)	8/22/2005	I	Hand Auger	110	210									50	100	20 U			
I-GC-19	(0-0.5)	8/22/2005	I	Hand Auger											50 U	100 U	20 U			
I-GC-20	(0-0.5)	8/22/2005	I	Hand Auger	24	79									50 U	100	20 U			
I-GC-21	(0-0.5)	8/22/2005	I	Hand Auger	60	160									50	100	20 U			
I-GC-22	(0-0.5)	8/22/2005	I	Hand Auger											50 U	100 U	20 U			
I-GC-23	(0-0.5)	8/22/2005	I	Hand Auger	24	58									50	100	20 U			
I-GC-24	(1.2-6)	10/19/2005	I	Boring	1200	960									52	100	21			
I-GC-24	(6.5-7.5)	10/19/2005	I	Boring											50 U	100 U	20 U			
I-GC-25	(0.5-1)	10/19/2005	I	Boring											50 U	100 U	20 U			
I-GC-26	(0-0.5)	10/19/2005	I	Boring											50 U	100 U	20 U			
I-TP-1	(0-3)	4/25/2006	I	Test Pit	13	110														
I-TP-2	(0-2.5)	4/25/2006	I	Test Pit	11	38														
I-TP-3	(0-4)	4/25/2006	I	Test Pit	8.2	44														
I-TP-4	(0-3)	4/25/2006	I	Test Pit	5.9 U	15														
I-TP-5	(0-5)	4/25/2006	I	Test Pit	10	24														
I-TP-6	(0-4)	4/25/2006	I	Test Pit	12	58														
I-TP-7	(0-4)	4/25/2006	I	Test Pit	11	55														
I-TP-8	(0-4)	4/25/2006	I	Test Pit	14	56														
IW-11		1/5/2006	I	Surface Soil	34	81														
IW-13		3/1/2006	I	Surface Soil	37 J	100 J														
IW-14		3/1/2006	I	Surface Soil	45 J	63 J														
I-X		2/12/2004	I	Boring	0.94	150														
I-Y		2/12/2004	I	Boring	7	10 U														
I-Z		2/12/2004	I	Surface Soil	5 U	14														
Chamber-1		8/11/2006	J	Excavation	5.5 U	11 U			0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U							
Chamber-2		8/11/2006	J	Excavation	5.6 U	11 U			0.0088 U	0.0088 U	0.0088 U	0.0088 U	0.0088 U							
Chamber-3		8/11/2006	J	Excavation	190	1100			0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.0022 U							
Chamber-4		8/11/2006	J	Excavation	180	720			0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U							
HC-MW01 (c)	(5-6.5)	11/6/1991	J	Boring					0.05 U	0.05 U	0.05 U			0.05 U	10 U	10 U	10 U		10 U	10 U
HC-MW01 (c)	(7.5-9)	11/6/1991	J	Boring					0.05 U	0.05 U	0.05 U			0.05 U	10 U	10 U	10 U		10 U	10 U
HC-MW04 (c)	(5-6.5)	11/7/1991	J	Boring					0.05 U	0.05 U	0.05 U			0.05 U	10 U	10 U	10 U		10 U	10 U
HC-MW04 (c)	(20-21.5)	11/7/1991	J	Boring					0.05 U	0.097	0.15			0.26	10 U	10 U	10 U		10 U	10 U
J-FA-1	(4-5)	1/17/2005	J	Boring											60 U	120 U	24 U			
J-FA-2	(4-5)	1/17/2005	J	Boring	46 J	540									56	110	22 U			
J-GC-1	(0.5-1)	1/14/2005	J	Boring	310	3.7									52	100	21 U			
J-GC-1	(1.5-2.5)	1/14/2005	J	Boring	5 UJ	10 UJ														
J-GC-1B	(0.9-1.4)	7/14/2005	J	Boring	5.3 U	11 U														
J-GC-1C	(0.7-1.2)	7/14/2005	J	Boring	5.3 U	11 U														
J-GC-2	(0-0.5)	3/2/2005	J	Boring											50 U	100 U	20 U			
J-GC-3	(0-0.5)	3/2/2005	J	Boring											50 U	100 U	20 U			
J-GC-4	(1.5-2)	3/3/2005	J	Boring											50 U	100 U	20 U			
J-GC-6	(1.1-1.6)	7/15/2005	J	Boring	82	130									50 U	100	20 U			
J-GC-7	(0.7-1.2)	7/15/2005	J	Boring											50 U	100 U	20 U			
J-GC-8	(2.1-2.6)	7/15/2005	J	Boring											50 U	100 U	20 U			
J-GC-9	(1.4-1.9)	7/15/2005	J	Boring	26	140									50 U	100	20 U			
J-GC-10	(0-0.5)	7/14/2005	J	Boring											50 U	100 U	20 U			

TABLE A-2
PETROLEUM HYDROCARBONS AND BTEX IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

					NWTPH-Dx (mg/kg)			NWTPH-G (mg/kg)	BTEX (mg/kg) Method 8020/8015/8021/8260						NWTPH-HCID / Hydrocarbon Scan (mg/kg)					
Sample Name	Depth Range	Date Collected	Area ID	Sample Type	Diesel-Range Organics	Lube Oil	Mineral Oil	Gasoline-Range Organics	Benzene	Toluene	Ethylbenzene	m, p-Xylene	o-Xylene	Xylenes, Total	Diesel	Lube Oil	Gasoline-Range Organics	Jet Fuel	Kerosene	Mineral Spirits
				Cleanup Screening Levels (a)	**2000**	**2000**	**4000**	**100 / 30 (d)**	**0.29**	**110**	**18**	**15**	**150**	**15**	**2000**	**2000**	**100 / 30 (e)**			
J-MSRC		5/23/2007	J	Excavation	390000	410000									500	1000	200 U			
J-MSRC-B		5/24/2007	J	Excavation	690	770									50	100	20 U			
J-MSRC-E		5/24/2007	J	Excavation	25 U	50 U									50 U	100 U	20 U			
J-MSRC-M052907		5/29/2007	J	Excavation	25 U	50 U									50	100	20 U			
J-MSRC-N		5/24/2007	J	Excavation	190	200									50	100	20 U			
J-MSRC-N052907		5/29/2007	J	Excavation	440	460									50	100	20 U			
J-MSRC-S		5/24/2007	J	Excavation	60	110									50	100	20 U			
J-MSRC-S052907		5/29/2007	J	Excavation	25 U	50 U									50	100	20 U			
J-MSRC-SP1		5/24/2007	J	Excavation	580	720									50	100	20 U			
J-MSRC-SP2		5/24/2007	J	Excavation	140	190									50	100	20 U			
J-MSRC-SP3		5/24/2007	J	Excavation	190	200									50	100	20 U			
J-MSRC-W		5/24/2007	J	Excavation	450	480									50	100	20 U			
KFI-SS02	(8-8)	10/1/1993	J	Excavation	73	870														
KFI-SS04	(6-6)	10/1/1993	J	Excavation	470	400														
KFI-SS07	(7-7)	10/1/1993	J	Excavation	230	1700														
KFI-SS11	(4-4)	10/20/1993	J	Excavation		52000														
KFI-SS12	(8-8)	10/20/1993	J	Excavation	145	460														
KFI-SS14	(14-14)	10/20/1993	J	Excavation	216	1660														
KFI-SS17	(14-14)	10/20/1993	J	Excavation		10060														
KFI-SS22	(19-19)	10/20/1993	J	Excavation	10 U	435														
KFI-WP01		9/30/1993	J	Stock Pile	6000															
KFI-WP02		9/30/1993	J	Stock Pile	14000															
KFI-WP03		9/30/1993	J	Stock Pile	15000															
KFI-WP04		9/30/1993	J	Stock Pile	13000															
KFI-WP-A		10/1/1993	J	Stock Pile	570	1300														
KFI-WP-B		10/1/1993	J	Stock Pile	390	770														
KFI-WP-C		10/1/1993	J	Stock Pile	130	280														
KFI-WP-Comp		9/30/1993	J	Stock Pile	3700				0.07 U	0.07 U	0.2			2.3						
KFI-WP-D		10/1/1993	J	Stock Pile	480	1500														
ECI-B-1		10/7/1991	M	Surface Soil	7160															
ECI-M-1		9/24/1991	M	Surface Soil	10 U	79		10 U									10 U			
ECI-N-1		10/7/1991	M	Surface Soil	310				0.005 U	0.005 U	0.005 U			0.005 U						
M-1	(0.3-0.8)	1/18/2005	M	Boring	53 U	110 U											21 U			
M-2	(1.5-2)	1/18/2005	M	Boring	58 U	120 U											23 U			
M-3	(0-0.5)	1/18/2005	M	Boring	58 U	120 U											23 U			
M-4	(0.8-1.3)	1/17/2005	M	Boring	53 UJ	110 UJ											21 UJ			
M-FA-1	(3.5-4)	1/17/2005	M	Boring	5 U	10 U		2.7 U	0.0068 U	0.014 U	0.014 U	0.027 U	0.014 U	0.054 U						
M-FA-2	(3.5-4)	1/17/2005	M	Boring	5 U	10 U		3.4 U	0.0085 U	0.017 U	0.017 U	0.034 U	0.017 U	0.068 U						
M-GC-1	(1.6-2.1)	3/3/2005	M	Boring	50 U	100 U											20 U			
M-GC-2	(1.5-2)	3/2/2005	M	Boring	50 U	100 U											20 U			
M-GC-3	(1-1.5)	3/3/2005	M	Boring	50 U	100 U											20 U			
M-GC-4	(1.5-2)	3/2/2005	M	Boring	50 U	100 U											20 U			
M-GC-5	(1-1.5)	3/2/2005	M	Boring	50 U	100 U											20 U			
CSP-1		10/20/1993		Stock Pile	10 U	67														
CSP-2		10/20/1993		Stock Pile	1050	1960														
CSP-3		10/20/1993		Stock Pile	1060	1990														
CSP-4		10/20/1993		Stock Pile	90	60														

U = the analyte was not detected in the sample at the given reporting limit.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
ES = The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
Shaded cells indicate an exceedance of the site cleanup levels.

(a) Development of the cleanup levels is presented in Table 9 of the work plan.
(b) PZ-10 is located at P-10. PZ-10 was taken during the drilling for the P-10 monitoring well.
(c) Analysis of the sample were performed using screening techniques. Quantitations are estimates, compound identifications are tentative.
(d) Cleanup Level is 30 if benzene is present.

TABLE A-3
PETROLEUM HYDROCARBONS AND BTEX IN CHARACTERIZATION WATER SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

					NWTPH-Dx (µg/L)		**NWTPH-G (µg/L)**	**BTEX (µg/L) EPA 8020/8021/8240/8260**						**NWTPH-HCID/ Hydrocarbon Scan**					
					Diesel-Range Organics	Lube Oil	Gasoline-Range Organics	Benzene	Ethylbenzene	Toluene	m, p-Xylene	o-Xylene	Xylenes, Total	Diesel-Range Organics	Lube Oil	Gasoline-Range Organics	Jet Fuel	Kerosene	Mineral Spirits
				Cleanup Screening Levels (a)	**500**	**500**	**800**	**51**	**2100**	**15000**	**1600**	**16000**	**1600**	**500**	**500**	**800**			
Sample Name	Depth Range	Date Collected	Area ID	Sample Type															
ECI-AGI-D-1		6/23/1992	G	Concrete Settling Basin Sump				1 U	1 U	1 U			1 U						
ECI-D-1		10/7/1991	G	Concrete Settling Basin Sump				1 U	1 U	1 U			1 U						
ECI-MW-2		10/7/1991	G	Monitoring Well				1 U	1 U	1 U			1 U						
G-1		12/22/2003	G	Boring	250 U	500 U	250 U	0.2 U	0.2 U	0.2 U	0.4 U	0.2 U							
G-2		12/22/2003	G	Boring	250 U	500 U	250 U	0.2 U	0.2 U	0.4	0.4 U	0.2 U							
G-3		2/11/2004	G	Boring				0.2 U	0.2 U	0.2 U	0.4 U	0.2 U							
G-FA-4		1/20/2005	G	Boring	250 U	500 U		1 U	4.3	1.1	17	4.1							
G-FA-7		1/20/2005	G	Boring	250 U	500 U		1 U	1 U	1 U	1 U	1 U							
SEE-EC-2	(2-12)	1/12/1989	G	Monitoring Well	10 U			0.5 U	0.5 U	9.1			3.1						
SEE-EC-3	(2-12)	1/12/1989	G	Monitoring Well	10 U			0.5 U	0.5 U	0.6			2.3						
SEE-EC-4	(2-12)	1/12/1989	G	Monitoring Well	10 U			0.5 U	0.5 U	0.67			0.72						
HC-MW02	(7-16)	7/10/1992	I	Monitoring Well				1 U	1 U	1 U			1 U						
HC-MW03	(5-15)	7/10/1992	I	Monitoring Well				1 U	1 U	1 U			1 U						
P11		2/19/2004	I	Monitoring Well	250 U	500 U	250 U	0.2 U	0.2 U	0.2 U	0.4 U	0.2 U							
P12		2/19/2004	I	Monitoring Well	250 U	500 U	250 U	0.2 U	0.2 U	0.2 U	0.4 U	0.2 U							
HC-MW01	(5-15)	7/10/1992	J	Monitoring Well				1 U	1 U	1 U			1 U						
HC-MW04	(5-15)	7/10/1992	J	Monitoring Well				1 U	1 U	1 U			1 U						
J-1		2/12/2004	J	Boring	250 U	500 U	250 U	0.2 U	0.2 U	1.6	0.4 U	0.2 U							
J-2		2/12/2004	J	Boring	250 U	500 U	250 U	0.2 U	0.2 U	2.3	0.4 U	0.2 U							
J-FA-1		1/17/2005	J	Boring										630 U	630 U	250 U			
J-FA-2		1/17/2005	J	Boring										630 U	630 U	250 U			
ECI-MW-1		10/7/1991	M	Monitoring Well			500 U	5 U	10 U	10 U			10 U	50 U	50 U	50 U	50 U	50 U	50 U
ECI-MW-3		10/7/1991	M	Monitoring Well				1 U	1 U	1 U			1 U						
M-1		1/18/2005	M	Boring				1 U	1 U	1 U	1 U	1 U		630 U	630 U	250 U			
M-2		1/18/2005	M	Boring				1 U	1 U	1 U	1 U	1 U		630 U	630 U	250 U			
M-3		1/18/2005	M	Boring				6.4	1 U	1 U	1 U	1 U		630 U	630 U	250 U			
M-4		1/17/2005	M	Boring				1 U	1 U	1 U	1 U	1 U		630 U	630 U	250 U			
M-FA-1		1/17/2005	M	Boring	250 U	500 U	250 U	1 U	1 U	1 U	1 U	1 U	2 U						
M-FA-2		1/17/2005	M	Boring	250 U	500 U	250 U	1 U	1 U	1 U	1 U	1 U	2 U						

U = the analyte was not detected in the sample at the given reporting limit.

(a) Development of the cleanup levels is presented in Table 8 of the work plan.

TABLE A-4
METALS IN CHARACTERIZATION WATER SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE PORT OF EVERETT, WASHINGTON

	Area ID:	G	G	G	G	G	G	G	G	G	I	I	I
	Sample Name:	AGI-MW-2	ECI-Area-D	ECI-D-1	G-3	G-FA-4	G-FA-7	P10	PS-1/2	PS-3	HC-MW02	HC-MW03	P11
	Depth Range:										(7-16)	(5-15)	
	Date Collected:	6/30/1992	10/9/1991	10/7/1991	2/11/2004	1/20/2005	1/20/2005	2/18/2004	1/19/1989	1/19/1989	7/10/1992	7/10/1992	2/19/2004
	Sample Type:	Monitoring Well	Concrete Settling Basin Sump	Concrete Settling Basin Sump	Boring	Boring	Boring	Monitoring Well	Pond Sample	Pond Sample	Monitoring Well	Monitoring Well	Monitoring Well
	Cleanup Screening Levels (a)												
DISSOLVED METALS (µg/L)													
SW6000-7000 Series													
Antimony	640	5 U	50 U						500 U		10 U	10 U	
Arsenic	5	7.5	5 U		1 U	8	10	4	10 U		10 U	10 U	1 U
Beryllium	273	5 U	5 U						10 U		10 U	10 U	
Cadmium	8.8	0.2 U	3 U		2 U	0.2 U	0.2 U	2 U	1 U		0.4 U	0.4 U	2 U
Chromium	240000	10 U	7		5 U			5 U	11		20 U	20 U	5 U
Cobalt									10 U				
Copper	2.4	10 U	10 U		2 U	0.6	0.5 U	2 U	10		12	38	2 U
Lead	8.1	3 U	2 U		1 U	1 U	1 U	1 U	5 U		6.6	6 U	1 U
Mercury	0.1	0.2 U	0.5 U		0.1 U	0.1 U	0.1 U	0.1 U	1 U		0.2 U	0.2 U	0.1 U
Molybdenum									500 U				
Nickel	50	10 U	20 U						10 U		20 U	20 U	
Selenium	0.5	5 U	5 U						10 U		10 U	10 U	
Silver	5.4	5 U	10 U		3 U			3 U	10 U		10 U	10 U	3 U
Thallium	0.5	5 U	5 U						100 U		10 U	10 U	
Vanadium									500 U				
Zinc	81	10 U	10 U		6 U	4 U	4 U	6 U	10 U		12	12	6 U
TOTAL METALS (µg/L)													
SW6000-7000 Series													
Antimony	640	5 U		50 U						500 U	10 U	10 U	
Arsenic	5	87		5 U						10 U	15	26	
Beryllium	273	5 U		5 U						10 U	10 U	10 U	
Cadmium	8.8	2.3		3 U						6	0.4 U	1	
Chromium	240000	320		6						13	13	54	
Cobalt										10 U			
Copper	2.4	400		14						10	28	78	
Lead	8.1	190		2 U						120	26	30	
Mercury	0.1	0.68		0.5 U						1 U	0.2 U	0.2 U	
Molybdenum										500 U			
Nickel	50	380		20 U						10 U	20 U	50	
Selenium	0.5	5 U		5 U						10 U	10 U	10 U	
Silver	5.4	5 U		10 U						10 U	10 U	10 U	
Thallium	0.5	5 U		5 U						100 U	10 U	10 U	
Vanadium										500 U			
Zinc	81	750		10 U						10 U	48	100	

TABLE A-4
METALS IN CHARACTERIZATION WATER SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE PORT OF EVERETT, WASHINGTON

	Area ID:	I	J	J	J	J	M	M	M	M
	Sample Name:	P12	HC-MW01	HC-MW04	J-1	J-2	M-1	M-2	M-3	M-4
	Depth Range:		(5-15)	(5-15)						
	Date Collected:	2/19/2004	7/10/1992	7/10/1992	2/12/2004	2/12/2004	1/18/2005	1/18/2005	1/18/2005	1/17/2005
	Sample Type:	Monitoring Well	Monitoring Well	Monitoring Well	Boring	Boring	Boring	Boring	Boring	Boring
	Cleanup Screening Levels (a)									
DISSOLVED METALS (µg/L)										
SW6000-7000 Series										
Antimony	640		10 U	10 U						
Arsenic	5	2	10 U	10 U	2	6	1.8	14	0.8	2.3
Beryllium	273		10 U	10 U						
Cadmium	8.8	2 U	0.4 U	0.4 U	2 U	2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	240000	5 U	20 U	20 U	5 U	5 U				
Cobalt										
Copper	2.4	2 U	12	20 U	4	2 U	0.7	0.6	0.5 U	0.5 U
Lead	8.1	1 U	6 U	6 U	1 U	1 U	1 U	1 U	1 U	1 U
Mercury	0.1	0.1 U	0.2 U	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Molybdenum										
Nickel	50		20 U	20 U						
Selenium	0.5		10 U	10 U						
Silver	5.4	3 U	10 U	10 U	3 U	3 U				
Thallium	0.5		10 U	10 U						
Vanadium										
Zinc	81	6 U	16	12	6 U	6 U	4 U	4 U	4 U	4 U
TOTAL METALS (µg/L)										
SW6000-7000 Series										
Antimony	640		10 U	10 U						
Arsenic	5		16	15						
Beryllium	273		10 U	10 U						
Cadmium	8.8		4.4	4.5						
Chromium	240000		31	30						
Cobalt										
Copper	2.4		51	68						
Lead	8.1		16	20						
Mercury	0.1		0.2 U	0.2 U						
Molybdenum										
Nickel	50		36	30						
Selenium	0.5		10 U	10 U						
Silver	5.4		10 U	10 U						
Thallium	0.5		10 U	10 U						
Vanadium										
Zinc	81		84	77						

U = the analyte was not detected in the sample at the given reporting limit.

Shaded cells indicate an exceedance of the site cleanup levels.

(a) Development of the cleanup levels is presented in Table 8 of the work plan.

TABLE A-5
VOCS IN CHARACTERIZATION WATER SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE,
PORT OF EVERETT, WASHINGTON

Area ID:		G	G	G	G	G	G	G	G	I	I	I	I	I
Sample Name:		AGI-D-1	ECI-D-1	ECI-MW-2	G-1	G-2	G-3	G-FA-4	G-FA-7	HC-MW02	HC-MW02	HC-MW03	HC-MW03	P11
Depth Range:											(7-16)		(5-15)	
Date Collected:		6/23/1992	10/7/1991	10/7/1991	12/22/2003	12/22/2003	2/11/2004	1/20/2005	1/20/2005	11/8/1991	7/10/1992	11/8/2009	7/10/1992	2/19/2004
Sample Type:	**Cleanup Screening Levels (a)**	Concrete Settling Basin Sump	Concrete Settling Basin Sump	Monitoring Well	Boring	Boring	Boring	Boring	Boring	Monitoring Well	Monitoring Well	Monitoring Well	Monitoring Well	Monitoring Well
VOCs (µg/L)														
EPA Method 8260														
1,1,1,2-Tetrachloroethane					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
1,1,1-Trichloroethane	420000	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
1,1,2,2-Tetrachloroethane		1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	5 U	1 U	5 U	1 U	0.2 U
1,1,2-Trichloro-1,2,2-trifluoroethane					0.2 U	0.2 U	0.2 U	2 U	2 U					0.2 U
1,1,2-Trichloroethane		1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
1,1-Dichloroethane	800	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	5 U	1 U	5 U	1 U	0.2 U
1,1-Dichloroethene		1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	5 U	1 U	5 U	1 U	0.2 U
1,1-Dichloropropene					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
1,2,3-Trichlorobenzene					0.5 U	0.5 U	0.5 U	5 U	5 U					0.5 U
1,2,3-Trichloropropane					0.5 U	0.5 U	0.5 U	2 U	2 U					0.5 U
1,2,4-Trichlorobenzene					0.5 U	0.5 U	0.5 U	5 U	5 U					0.5 U
1,2,4-Trimethylbenzene	400				0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
1,2-Dibromo-3-chloropropane					2 U	2 U	2 U	5 U	5 U					2 U
1,2-Dichlorobenzene			1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
1,2-Dichloroethane	1600	1 U	1	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	5 U	1 U	5 U	1 U	0.2 U
1,2-Dichloroethene		1 U									1 U		1 U	
1,2-Dichloropropane		1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	5 U	1 U	5 U	1 U	0.2 U
1,3,5-Trimethylbenzene	400				0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
1,3-Dichlorobenzene			1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
1,3-Dichloropropane					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
1,4-Dichlorobenzene			1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
2,2-Dichloropropane					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
2-Butanone		10 U	10 U	10 U	1 U	1 U	1 U	5 U	5 U		10 U		10 U	1 U
2-Chloroethylvinylether			10 U	10 U	0.5 U	0.5 U	0.5 U	5 U	5 U					0.5 U
2-Chlorotoluene					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
2-Hexanone		10 U	10 U	10 U	1 U	1 U	1 U	5 U	5 U		10 U		10 U	1 U
4-Chlorotoluene					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
4-Isopropyltoluene					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
4-Methyl-2-Pentanone (MIBK)		10 U	10 U	10 U	1 U	1 U	1 U	5 U	5 U		10 U		10 U	1 U
Acetone	800	10 U	20 U	20 U	2.8	1 U	1 U	5 U	5 U		10 U		10 U	1 U
Acrolein					5 U	5 U	5 U	50 U	50 U					5 U
Acrylonitrile					1 U	1 U	1 U	5 U	5 U					1 U
Benzene	51	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U		1 U		1 U	0.2 U
Bromobenzene					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
Bromochloromethane					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
Bromodichloromethane		1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	5 U	1 U	5 U	1 U	0.2 U
Bromoethane					0.2 U	0.2 U	0.2 U	2 U	2 U					0.2 U
Bromoform		5 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	5 U	5 U	5 U	5 U	0.2 U
Bromomethane		10 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U		10 U		10 U	0.2 U
Carbon Disulfide	800	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
Carbon Tetrachloride		1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
Chlorobenzene		1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	5 U	1 U	5 U	1 U	0.2 U
Chloroethane	15	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U		1 U		1 U	0.2 U
Chloroform	470	1 U	4	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
Chloromethane		10 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U		10 U		10 U	0.2 U
cis-1,2-Dichloroethene	70		1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
cis-1,3-Dichloropropene		1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	5 U	1 U	5 U	1 U	0.2 U
Dibromochloromethane		1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	5 U	1 U	5 U	1 U	0.2 U
Dibromomethane					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U

TABLE A-5
VOCS IN CHARACTERIZATION WATER SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE,
PORT OF EVERETT, WASHINGTON

	Area ID:	G	G	G	G	G	G	G	G	I	I	I	I	I
	Sample Name:	AGI-D-1	ECI-D-1	ECI-MW-2	G-1	G-2	G-3	G-FA-4	G-FA-7	HC-MW02	HC-MW02	HC-MW03	HC-MW03	P11
	Depth Range:										(7-16)		(5-15)	
	Date Collected:	6/23/1992	10/7/1991	10/7/1991	12/22/2003	12/22/2003	2/11/2004	1/20/2005	1/20/2005	11/8/1991	7/10/1992	11/8/2009	7/10/1992	2/19/2004
	Sample Type:	Concrete Settling Basin Sump	Concrete Settling Basin Sump	Monitoring Well	Boring	Boring	Boring	Boring	Boring	Monitoring Well	Monitoring Well	Monitoring Well	Monitoring Well	Monitoring Well
	Cleanup Screening Levels (a)													
Ethylbenzene	2100	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	4.3	1 U		1 U		1 U	0.2 U
Ethylene Dibromide					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
Hexachlorobutadiene					0.5 U	0.5 U	0.5 U	5 U	5 U					0.5 U
Isopropylbenzene					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
m, p-Xylene	1600				0.4 U	0.4 U	0.4 U	17	1 U					0.4 U
Methyl Iodide					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
Methylene Chloride	590	5 U	10 U	10 U	0.3 U	0.3 U	0.3 U	2 U	2 U	5 U	5 U	5 U	5 U	0.3 U
Naphthalene	4900				0.5 U	0.5 U	0.5 U	5 U	5 U					0.5 U
n-Butylbenzene					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
n-Propylbenzene					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
o-Xylene	16000				0.2 U	0.2 U	0.2 U	4.1	1 U					0.2 U
sec-Butylbenzene					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
Styrene		1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U		1 U		1 U	0.2 U
tert-Butylbenzene					0.2 U	0.2 U	0.2 U	1 U	1 U					0.2 U
Tetrachloroethene		1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
Toluene	15000	1 U	1 U	1 U	0.2 U	0.4	0.2 U	1.1	1 U		1 U		1 U	0.2 U
trans-1,2-Dichloroethene	10000		1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	5 U		5 U		0.2 U
trans-1,3-Dichloropropene		1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U		1 U		1 U	0.2 U
trans-1,4-Dichloro-2-butene					1 U	1 U	1 U	5 U	5 U					1 U
Trichloroethene	30	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
Trichlorofluoromethane			1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U		1 U		0.2 U
Trichlorotrifluoroethane			10 U	10 U										
Vinyl Acetate		10 U	10 U	10 U	0.2 U	0.2 U	0.2 U	5 U	5 U		10 U		10 U	0.2 U
Vinyl Chloride	2.4	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U		1 U		1 U	0.2 U

TABLE A-5
VOCS IN CHARACTERIZATION WATER SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE,
PORT OF EVERETT, WASHINGTON

Area ID:		I	J	J	J	J	J	J	M	M	M	M	M
Sample Name:		P12	HC-MW01	HC-MW01	HC-MW04	HC-MW04	J-1	J-2	ECI-MW-3	M-1	M-2	M-3	M-4
Depth Range:				(5-15)		(5-15)							
Date Collected:		2/19/2004	11/8/1991	7/10/1992	11/8/1991	7/10/1992	2/12/2004	2/12/2004	10/7/1991	1/18/2005	1/18/2005	1/18/2005	1/17/2005
Sample Type:		Monitoring Well	Monitoring Well	Monitoring Well	Monitoring Well	Monitoring Well	Boring	Boring	Monitoring Well	Boring	Boring	Boring	Boring
	Cleanup Screening Levels (a)												
VOCs (µg/L)													
EPA Method 8260													
1,1,1,2-Tetrachloroethane		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	420000	0.2 U	1 U	1 U	1 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane		0.2 U	5 U	1 U	5 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-trifluoroethane		0.2 U					0.2 U	0.2 U		2 U	2 U	2 U	2 U
1,1,2-Trichloroethane		0.2 U	1 U	1 U	1 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	800	0.2 U	5 U	1 U	5 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene		0.2 U	5 U	1 U	5 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene		0.5 U					0.5 U	0.5 U		5 U	5 U	5 U	5 U
1,2,3-Trichloropropane		0.5 U					0.5 U	0.5 U		2 U	2 U	2 U	2 U
1,2,4-Trichlorobenzene		0.5 U					0.5 U	0.5 U		5 U	5 U	5 U	5 U
1,2,4-Trimethylbenzene	400	0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane		2 U					2 U	2 U		5 U	5 U	5 U	5 U
1,2-Dichlorobenzene		0.2 U					0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1600	0.2 U	5 U	1 U	5 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethene				1 U		1 U							
1,2-Dichloropropane		0.2 U	5 U	1 U	5 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	400	0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
1,3-Dichlorobenzene		0.2 U					0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
1,4-Dichlorobenzene		0.2 U					0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
2-Butanone		1 U		10 U		10 U	1 U	1 U	10 U	5 U	5 U	5 U	5 U
2-Chloroethylvinylether		0.5 U					0.5 U	0.5 U	10 U	5 U	5 U	5 U	5 U
2-Chlorotoluene		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
2-Hexanone		1 U		10 U		10 U	1 U	1 U	10 U	5 U	5 U	5 U	5 U
4-Chlorotoluene		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
4-Isopropyltoluene		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
4-Methyl-2-Pentanone (MIBK)		1 U		10 U		10 U	1 U	1 U	10 U	5 U	5 U	5 U	5 U
Acetone	800	3.7		10 U		10 U	1 U	1 U	20 U	5 U	5 U	5 U	5 U
Acrolein		5 U					5 U	5 U		50 U	50 U	50 U	50 U
Acrylonitrile		1 U					1 U	1 U		5 U	5 U	5 U	5 U
Benzene	51	0.2 U		1 U		1 U	0.2 U	0.2 U	1 U	1 U	1 U	6.4	1 U
Bromobenzene		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
Bromochloromethane		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
Bromodichloromethane		0.2 U	5 U	1 U	5 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Bromoethane		0.2 U					0.2 U	0.2 U		2 U	2 U	2 U	2 U
Bromoform		0.2 U	5 U	5 U	5 U	5 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Bromomethane		0.2 U		10 U		10 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	800	0.2 U					0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride		0.2 U	1 U	1 U	1 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene		0.2 U	5 U	1 U	5 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	15	0.2 U		1 U		1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Chloroform	470	0.2 U	1 U	1 U	1 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Chloromethane		0.2 U		10 U		10 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	0.2 U					0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene		0.2 U	5 U	1 U	5 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane		0.2 U	5 U	1 U	5 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U

TABLE A-5
VOCS IN CHARACTERIZATION WATER SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE,
PORT OF EVERETT, WASHINGTON

Area ID:		I	J	J	J	J	J	J	M	M	M	M	M
Sample Name:		P12	HC-MW01	HC-MW01	HC-MW04	HC-MW04	J-1	J-2	ECI-MW-3	M-1	M-2	M-3	M-4
Depth Range:				(5-15)		(5-15)							
Date Collected:		2/19/2004	11/8/1991	7/10/1992	11/8/1991	7/10/1992	2/12/2004	2/12/2004	10/7/1991	1/18/2005	1/18/2005	1/18/2005	1/17/2005
Sample Type:	**Cleanup Screening Levels (a)**	Monitoring Well	Monitoring Well	Monitoring Well	Monitoring Well	Monitoring Well	Boring	Boring	Monitoring Well	Boring	Boring	Boring	Boring
Ethylbenzene	2100	0.2 U		1 U		1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Ethylene Dibromide		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
Hexachlorobutadiene		0.5 U					0.5 U	0.5 U		5 U	5 U	5 U	5 U
Isopropylbenzene		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
m, p-Xylene	1600	0.4 U					0.4 U	0.4 U		1 U	1 U	1 U	1 U
Methyl Iodide		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
Methylene Chloride	590	0.3 U	5 U	5 U	5 U	5 U	0.3 U	0.3 U	10 U	2 U	2 U	2 U	2 U
Naphthalene	4900	0.5 U					0.5 U	0.5 U		5 U	5 U	5 U	5 U
n-Butylbenzene		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
n-Propylbenzene		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
o-Xylene	16000	0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
sec-Butylbenzene		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
Styrene		0.2 U		1 U		1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene		0.2 U					0.2 U	0.2 U		1 U	1 U	1 U	1 U
Tetrachloroethene		0.2 U	1 U	1 U	1 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Toluene	15000	0.2 U		1 U		1 U	1.6	2.3	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	10000	0.2 U	5 U		5 U		0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene		0.2 U		1 U		1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
trans-1,4-Dichloro-2-butene		1 U					1 U	1 U		5 U	5 U	5 U	5 U
Trichloroethene	30	0.2 U	1 U	1 U	1 U	1 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane		0.2 U	1 U		1 U		0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U
Trichlorotrifluoroethane									10 U				
Vinyl Acetate		0.2 U		10 U		10 U	0.2 U	0.2 U	10 U	5 U	5 U	5 U	5 U
Vinyl Chloride	2.4	0.2 U		1 U		1 U	0.2 U	0.2 U	1 U	1 U	1 U	13	1 U

U = the analyte was not detected in the sample at the given reporting limit.
Shaded cells indicate an exceedance of the site cleanup levels.

(b) Development of the cleanup levels is presented in Table 8 of the work plan.

TABLE A-6
STORMWATER SAMPLE RESULTS
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Area ID:		G	G	M		
Sample Name:		CB-2	CB-3	CB-1	ECI-Area-R	R
Date Collected:		3/26/2008	3/26/2008	3/26/2008	10/9/1991	6/23/1992
Sample Type:		Stormwater Catch Basin	Stormwater Catch Basin	Stormwater Catch Basin	Storm Water Outfall	Storm Water Outfall
	Ecology Industrial Stormwater General Permit Criteria					
TOTAL METALS (µg/L)						
Method 6010/7470/200.8						
Antimony		50 U	50 U	50 U	50 U	
Arsenic		1.1	8.5	12.3	6	
Beryllium		1 U	1 U	1 U	5 U	
Cadmium		2 U	2 U	2 U	3 U	
Chromium		5 U	68	24	5	
Copper	149	9	36	25	11	
Lead	159	5	8	13	2	
Mercury		0.10 U	0.10 U	0.10 U	0.5 U	
Nickel		10 U	30	10	20 U	
Selenium		0.5 U	0.5 U	0.7	5 U	
Silver		3 U	3 U	3 U	10 U	
Thallium		0.2 U	0.2 U	0.2 U	5 U	
Zinc	372	250	3,230	330	43	
DISSOLVED METALS (µg/L)						
Method 6010/7470/200.8						
Antimony		50 U	50 U	50 U		
Arsenic		0.3	2.1	11		
Beryllium		1 U	1 U	1 U		
Cadmium		2 U	2 U	2 U		
Chromium		5 U	5 U	12		
Copper	149	2 U	2 U	22		
Lead	159	5	1 U	24		
Mercury		0.10 U	0.10 U	0.10 U		
Nickel		10 U	10 U	10 U		
Selenium		0.5 U	0.5 U	0.5 U		
Silver		3 U	3 U	3 U		
Thallium		0.2 U	0.2 U	0.2 U		
Zinc	372	100	1,640	380		
SVOCs (µg/L)						
SW8260						
N-nitrosodimethylamine					10 U	
Aniline					40 U	
Bis-(2-Chloroethyl) Ether					10 U	
1,2-Dichlorobenzene					10 U	
1,3-Dichlorobenzene					10 U	
1,4-Dichlorobenzene					10 U	
2,2'-Oxybis(1-Chloropropane)					10 U	
N-Nitroso-di-n-propylamine					10 U	
Hexachloroethane					10 U	
Nitrobenzene					10 U	
Isophorone					10 U	
bis(2-Chloroethoxy) Methane					10 U	
1,2,3-Trichlorobenzene					10 U	
Naphthalene					10 U	
4-Chloroaniline					10 U	
Hexachlorobutadiene					10 U	
2-Methylnaphthalene					10 U	
Hexachlorocyclopentadiene					20 U	
2-Chloronaphthalene					10 U	
2-Nitroaniline					40 U	
Dimethylphthalate					10 U	
Acenaphthylene					10 U	
3-Nitroaniline					40 U	
Acenaphthene					10 U	
Dibenzofuran					10 U	
2,4-Dinitrotoluene					10 U	
Phenol					10 U	
2-Chlorophenol					10 U	
Benzyl Alcohol					10 U	
2-Methylphenol					10 U	
3- and 4-Methylphenol					10 U	
2-Nitrophenol					10 U	
2,4-Dimethylphenol					10 U	
Benzoic Acid					100 U	
2,6-Dinitrotoluene					10 U	
Diethylphthalate					10 U	
4-Chlorophenyl-phenylether					10 U	
Fluorene					10 U	
4-Nitroaniline					40 U	
N-Nitrosodiphenylamine					10 U	

TABLE A-6
STORMWATER SAMPLE RESULTS
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Area ID:		G	G	M		
Sample Name:		CB-2	CB-3	CB-1	ECI-Area-R	R
Date Collected:		3/26/2008	3/26/2008	3/26/2008	10/9/1991	6/23/1992
Sample Type:		Stormwater Catch Basin	Stormwater Catch Basin	Stormwater Catch Basin	Storm Water Outfall	Storm Water Outfall
	Ecology Industrial Stormwater General Permit Criteria					
4-Bromophenyl-phenylether					10 U	
Hexachlorobenzene					10 U	
Phenanthrene					10 U	
Anthracene					10 U	
Di-n-Butylphthalate					10 U	
Fluoranthene					10 U	
Pyrene					10 U	
Benzyl butyl phthalate					10 U	
3,3'-Dichlorobenzidine					40 U	
Benzo(a)anthracene					10 U	
Bis(2-ethylhexyl)phthalate					10 U	
Chrysene					10 U	
Di-n-octyl phthalate					10 U	
Benzo(b)fluoranthene					10 U	
Benzo(k)fluoranthene					10 U	
Benzo(a)Pyrene					10 U	
Indeno(1,2,3-cd)pyrene					10 U	
Dibenz(a,h)anthracene					10 U	
Benzo(g,h,i)perylene					10 U	
2,4-Dichlorophenol					10 U	
4-Chloro-3-methylphenol					10 U	
2,4,6-Trichlorophenol					10 U	
2,4,5-Trichlorophenol					10 U	
2,4-Dinitrophenol					100 U	
4-Nitrophenol					100 U	
4,6-Dinitro-2-Methylphenol					40 U	
Pentachlorophenol					60 U	
VOCs (µg/L)						
SW8260						
Bromomethane					1 U	10 U
Carbon Disulfide					1 U	1 U
1,1,1-Trichloroethane					1 U	1 U
1,1,2,2-Tetrachloroethane					1 U	1 U
1,1,2-Trichloroethane					1 U	1 U
1,1-Dichloroethane					1 U	1 U
1,1-Dichloroethene					1 U	1 U
1,2-Dichlorobenzene					1 U	
1,2-Dichloroethane					1 U	1 U
1,2-Dichloroethene						1 U
1,2-Dichloropropane					1 U	1 U
1,3-Dichlorobenzene					1 U	
1,4-Dichlorobenzene					1 U	
2-Butanone					10 U	10 U
2-Chloroethylvinylether					10 U	
2-Hexanone					10 U	10 U
4-Methyl-2-Pentanone (MIBK)					10 U	10 U
Acetone					51	10 U
Benzene					1 U	1 U
Bromodichloromethane					1 U	1 U
Bromoform					1 U	5 U
Bromomethane					1 U	
Carbon Disulfide					1 U	
Carbon Tetrachloride					1 U	1 U
Chlorobenzene					1 U	1 U
chloroethane					1 U	1 U
Chloroform					10	10
chloromethane					1 U	10 U
cis-1,2-Dichloroethene					1 U	
cis-1,3-Dichloropropene					1 U	1 U
Dibromochloromethane					1 U	1 U
Ethylbenzene					1 U	1 U
Methylene Chloride					10 U	5 U
styrene					1 U	1 U
Tetrachloroethene					1 U	1 U
Toluene					1 U	1 U
trans-1,2-Dichloroethene					1 U	
trans-1,3-Dichloropropene					1 U	1 U
Trichloroethene					1 U	1 U
Trichlorofluoromethane					1 U	
Trichlorotrifluoroethane					10 U	
vinyl acetate					10 U	10 U
vinyl chloride					1 U	1 U
Xylenes, Total					1 U	1 U
Naphthalene						

TABLE A-6
STORMWATER SAMPLE RESULTS
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Area ID:		G	G	M		
Sample Name:		CB-2	CB-3	CB-1	ECI-Area-R	R
Date Collected:		3/26/2008	3/26/2008	3/26/2008	10/9/1991	6/23/1992
Sample Type:		Stormwater Catch Basin	Stormwater Catch Basin	Stormwater Catch Basin	Storm Water Outfall	Storm Water Outfall
	Ecology Industrial Stormwater General Permit Criteria					
PCBs and Pesticides (µg/L)						
Alpha-BHC					0.04 U	
Gamma-BHC					0.04 U	
Beta-BHC					0.1 U	
Heptachlor					0.04 U	
Delta-BHC					0.04 U	
Aldrin					0.04 U	
Heptachlor Epoxide					0.04 U	
EndoSulfan I					0.04 U	
4,4'-DDE					0.04 U	
Dieldrin					0.04 U	
Endrin					0.04 U	
4,4'-DDD					0.04 U	
Endrin Aldehyde					0.04 U	
Endosulfan Sulfate					0.04 U	
Methoxychlor					0.1 U	
Toxaphene					1 U	
Chlordane					0.5 U	
Aroclor 1016					0.2 U	
Aroclor 1221					0.2 U	
Aroclor 1232					0.2 U	
Aroclor 1242					0.2 U	
Aroclor 1248					0.2 U	
Aroclor 1254					0.2 U	
Aroclor 1260					0.2 U	
INORGANICS (SU)						
Method 150.1						
pH	5- 10 (acceptable range)	7.05	7.00	6.92		

U = the analyte was not detected in the sample at the given reporting limit.

Shaded cells indicate an exceedance of the site cleanup levels.

TABLE A-7
VOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Area ID:		I	I	I	I	I	I	I	I	I	I	I	J	J	J	J	J
Sample Name:		ECI-Q-1	ECI-Q-5	ECI-Q-6	ECI-Q-8	HC-GT-1A (b)	HC-MW-2 (b)	HC-MW-2 (b)	HC-MW-3 (b)	HC-MW-3 (b)	I-X	I-Y	Chamber-1	Chamber-2	Chamber-3	Chamber-4	HC-MW-1 (b)
Depth Range:		(1-2)	(1-2)	(0-1)	(5-5)		(2.5-4)	(12.5-14)	(5-6.5)	(10-11.5)							(5-6.5)
Date Collected:		10/7/1991	10/7/1991	10/7/1991	10/7/1991	11/7/1991	11/6/1991	11/6/1991	11/7/1991	11/7/1991	2/12/2004	2/12/2004	8/11/2006	8/11/2006	8/11/2006	8/11/2006	11/6/1991
Sample Type:		Test Pit	Test Pit	Test Pit	Test Pit	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Excavation	Excavation	Excavation	Excavation	Boring
	Cleanup Screening Levels (a)																
VOCs (mg/kg)																	
EPA Method 8260																	
1,1,1,2-Tetrachloroethane													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
1,1,1-Trichloroethane	3400	0.005 U	0.005 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.05 U
1,1,2,2-Tetrachloroethane		0.005 U	0.005 U	0.005 U	0.005 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.25 U
1,1,2-Trichloro-1,2,2-trifluoroethane													0.0021 U	0.018 U	0.0045 U	0.0034 U	
1,1,2-Trichloroethane		0.005 U	0.005 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.05 U
1,1-Dichloroethane	4.3	0.005 U	0.005 U	0.005 U	0.005 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.25 U
1,1-Dichloroethene		0.005 U	0.005 U	0.005 U	0.005 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.25 U
1,1-Dichloropropene													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
1,2,3-Trichlorobenzene													0.0053 U	0.044 U	0.011 U	0.0086 U	
1,2,3-Trichloropropane													0.0021 U	0.018 U	0.0045 U	0.0034 U	
1,2,4-Trichlorobenzene											0.14 U	0.081 U					
1,2,4-Trimethylbenzene	4000												0.0011 U	0.0088 U	0.0034	0.0017 U	
1,2-Dibromo-3-chloropropane													0.0053 U	0.044 U	0.011 U	0.0086 U	
1,2-Dichlorobenzene		0.005 U	0.005 U	0.005 U	0.005 U						0.14 U	0.081 U					
1,2-Dichloroethane		0.005 U	0.005 U	0.005 U	0.005 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.25 U
1,2-Dichloropropane		0.005 U	0.005 U	0.005 U	0.005 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.25 U
1,3,5-Trimethylbenzene	4000												0.0011 U	0.0088 U	0.0022 U	0.0017 U	
1,3-Dichlorobenzene		0.005 U	0.005 U	0.005 U	0.005 U						0.14 U	0.081 U					
1,3-Dichloropropane													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
1,4-Dichlorobenzene		0.005 U	0.005 U	0.005 U	0.005 U						0.14 U	0.081 U					
2,2-Dichloropropane													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
2-Butanone	48000	0.01 U	0.01 U	0.01 U	0.01 U								0.0053 U	0.044 U	0.011 U	0.0086 U	
2-Chloroethylvinylether		0.01 U	0.01 U	0.01 U	0.01 U								0.0053 U	0.044 U	0.011 U	0.0086 U	
2-Chlorotoluene													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
2-Hexanone		0.01 U	0.01 U	0.01 U	0.01 U								0.0053 U	0.044 U	0.011 U	0.0086 U	
4-Chlorotoluene													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
4-Isopropyltoluene													0.0011 U	0.0088 U	0.05	0.0018	
4-Methyl-2-Pentanone (MIBK)		0.01 U	0.01 U	0.01 U	0.01 U								0.0053 U	0.044 U	0.011 U	0.0086 U	
Acetone	3.2	0.05 U	0.05 U	0.05 U	0.05 U								0.027	0.06	0.03	0.013	
Acrolein													0.053 U	0.44 U	0.11 U	0.086 U	
Acrylonitrile													0.0053 U	0.044 U	0.011 U	0.0086 U	
Benzene	0.29	0.005 U	0.005 U	0.005 U	0.005 U										0.0022 U		
Bromobenzene													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
Bromochloromethane													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
Bromodichloromethane		0.005 U	0.005 U	0.005 U	0.005 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.25 U
Bromoethane													0.0021 U	0.018 U	0.0045 U	0.0034 U	
Bromoform		0.005 U	0.005 U	0.005 U	0.005 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.25 U
Bromomethane		0.005 U	0.005 U	0.005 U	0.005 U								0.0011 U	0.0088 U	0.0022 U	0.0017 U	
Carbon Disulfide		0.005 U	0.005 U	0.005 U	0.005 U								0.0011 U	0.0088 U	0.0022 U	0.0017 U	
Carbon Tetrachloride		0.005 U	0.005 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.05 U
Chlorobenzene		0.005 U	0.005 U	0.005 U	0.005 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.25 U
Chloroethane		0.005 U	0.005 U	0.005 U	0.005 U								0.0011 U	0.0088 U	0.0022 U	0.0017 U	
Chloroform		0.005 U	0.005 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.05 U
Chloromethane		0.005 U	0.005 U	0.005 U	0.005 U								0.0011 U	0.0088 U	0.0022 U	0.0017 U	
cis-1,2-Dichloroethene		0.005 U	0.005 U	0.005 U	0.005 U								0.0011 U	0.0088 U	0.0022 U	0.0017 U	
cis-1,3-Dichloropropene		0.005 U	0.005 U	0.005 U	0.005 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.25 U
Dibromochloromethane		0.005 U	0.005 U	0.005 U	0.005 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.25 U
Dibromomethane																	
Ethylbenzene	18	0.005 U	0.005 U	0.005 U	0.005 U										0.0022 U		
Ethylene Dibromide													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
Hexachlorobutadiene											0.27 U	0.16 U					
Isopropylbenzene	8000												0.0011 U	0.0088 U	0.0037	0.0017 U	
m, p-Xylene	15														0.0022 U		
Methyl Iodide													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
Methylene Chloride		0.1 U	0.1 U	0.1 U	0.1 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.0021 U	0.018 U	0.01	0.0034 U	0.25 U
Naphthalene	140										0.24	0.081 U					
n-Butylbenzene													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
n-Propylbenzene													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
o-Xylene	150														0.0022 U		

TABLE A-7
VOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Area ID:		I	I	I	I	I	I	I	I	I	I	I	J	J	J	J	J
Sample Name:		**ECI-Q-1**	**ECI-Q-5**	**ECI-Q-6**	**ECI-Q-8**	**HC-GT-1A (b)**	**HC-MW-2 (b)**	**HC-MW-2 (b)**	**HC-MW-3 (b)**	**HC-MW-3 (b)**	**I-X**	**I-Y**	**Chamber-1**	**Chamber-2**	**Chamber-3**	**Chamber-4**	**HC-MW-1 (b)**
Depth Range:		(1-2)	(1-2)	(0-1)	(5-5)		(2.5-4)	(12.5-14)	(5-6.5)	(10-11.5)							(5-6.5)
Date Collected:		10/7/1991	10/7/1991	10/7/1991	10/7/1991	11/7/1991	11/6/1991	11/6/1991	11/7/1991	11/7/1991	2/12/2004	2/12/2004	8/11/2006	8/11/2006	8/11/2006	8/11/2006	11/6/1991
Sample Type:		Test Pit	Test Pit	Test Pit	Test Pit	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Excavation	Excavation	Excavation	Excavation	Boring
	Cleanup Screening Levels (a)																
sec-Butylbenzene													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
Styrene		0.005 U	0.005 U	0.005 U	0.005 U								0.0011 U	0.0088 U	0.0022 U	0.0017 U	
tert-Butylbenzene													0.0011 U	0.0088 U	0.0022 U	0.0017 U	
Tetrachloroethene	1.9	0.005 U	0.005 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.05 U
Toluene	110	0.005 U	0.005 U	0.005 U	0.005 U										0.0022 U		
trans-1,2-Dichloroethene		0.005 U	0.005 U	0.005 U	0.005 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.25 U
trans-1,3-Dichloropropene		0.005 U	0.005 U	0.005 U	0.005 U								0.0011 U	0.0088 U	0.0022 U	0.0017 U	
trans-1,4-Dichloro-2-butene													0.0053 U	0.044 U	0.011 U	0.0086 U	
Trichloroethene	0.2	0.005 U	0.005 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.05 U
Trichlorofluoromethane		0.005 U	0.005 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.0011 U	0.0088 U	0.0022 U	0.0017 U	0.05 U
Trichlorotrifluoroethane		0.01 U	0.01 U	0.01 U	0.01 U												
Vinyl Acetate		0.01 U	0.01 U	0.01 U	0.01 U								0.0053 U	0.044 U	0.011 U	0.0086 U	
Vinyl Chloride		0.005 U	0.005 U	0.005 U	0.005 U								0.0011 U	0.0088 U	0.0022 U	0.0017 U	

TABLE A-7
VOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Area ID:		J	J	J	J	J	G	G	G	G	G	G	G	G	M	M	M
Sample Name:		**HC-MW-1 (b)**	**HC-MW-4 (b)**	**HC-MW-4 (b)**	**J-MSRC**	**KFI-WP-Comp**	**ECI-N-2**	**G1-AC-3**	**G1-AC-4**	**G1-AC-5**	**G-FA-4**	**G-FA-5**	**G-FA-8**	**STOCKPILE**	**ECI-N-1**	**M-FA-1**	**M-FA-2**
Depth Range:		(7.5-9)	(5-6.5)	(20-21.5)							(2-2.5)	(8-8.5)	(4-4.5)			(3.5-4)	(3.5-4)
Date Collected:		11/6/1991	11/7/1991	11/7/1991	5/23/2007	9/30/1993	10/7/1991	6/22/2006	6/22/2006	6/22/2006	1/20/2005	1/20/2005	1/20/2005	11/12/2004	10/7/1991	1/17/2005	1/17/2005
Sample Type:		Boring	Boring	Boring	Excavation	Stock Pile	Surface Soil	Surface Soil	Surface Soil	Surface Soil	Boring	Boring	Boring	Stock Pile	Surface Soil	Boring	Boring
	Cleanup Screening Levels (a)																
VOCs (mg/kg)																	
EPA Method 8260																	
1,1,1,2-Tetrachloroethane											0.0012 U	0.0009 U	0.0008 U				
1,1,1-Trichloroethane	3400	0.05 U	0.05 U	0.05 U		0.07 U	0.005 U				0.003	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
1,1,2,2-Tetrachloroethane		0.25 U	0.25 U	0.25 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
1,1,2-Trichloro-1,2,2-trifluoroethane											0.0024 U	0.0017 U	0.0016 U				
1,1,2-Trichloroethane		0.05 U	0.05 U	0.05 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
1,1-Dichloroethane	4.3	0.25 U	0.25 U	0.25 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
1,1-Dichloroethene		0.25 U	0.25 U	0.25 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
1,1-Dichloropropene											0.0012 U	0.0009 U	0.0008 U				
1,2,3-Trichlorobenzene											0.0059 U	0.0044 U	0.0039 U				
1,2,3-Trichloropropane											0.0024 U	0.0017 U	0.0016 U				
1,2,4-Trichlorobenzene					50 U	2.3 U		0.066 U	0.076 U	0.064 U	0.0059 U	0.0044 U	0.0039 U				
1,2,4-Trimethylbenzene	4000										0.3 ES	0.0009 U	0.0008 U				
1,2-Dibromo-3-chloropropane											0.0059 U	0.0044 U	0.0039 U				
1,2-Dichlorobenzene					50 U	2.3 U	0.005 U	0.066 U	0.076 U	0.064 U	0.0012 U	0.0009 U	0.0008 U		0.005 U		
1,2-Dichloroethane		0.25 U	0.25 U	0.25 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
1,2-Dichloropropane		0.25 U	0.25 U	0.25 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
1,3,5-Trimethylbenzene	4000										0.3 ES	0.0009 U	0.0008 U				
1,3-Dichlorobenzene					50 U	2.3 U	0.005 U	0.066 U	0.076 U	0.064 U	0.0012 U	0.0009 U	0.0008 U		0.005 U		
1,3-Dichloropropane											0.0012 U	0.0009 U	0.0008 U				
1,4-Dichlorobenzene					50 U	2.3 U	0.005 U	0.066 U	0.076 U	0.064 U	0.0012 U	0.0009 U	0.0008 U		0.005 U		
2,2-Dichloropropane											0.0012 U	0.0009 U	0.0008 U				
2-Butanone	48000					0.7 U	0.01 U				0.028	0.0044 U	0.0039 U	0.014 UJ	0.01 U		
2-Chloroethylvinylether							0.01 U				0.0059 U	0.0044 U	0.0039 U		0.01 U		
2-Chlorotoluene											0.0012 U	0.0009 U	0.0008 U				
2-Hexanone						0.7 U	0.01 U				0.0059 U	0.0044 U	0.0039 U	0.014 UJ	0.01 U		
4-Chlorotoluene											0.0012 U	0.0009 U	0.0008 U				
4-Isopropyltoluene											0.0012 U	0.0009 U	0.0008 U				
4-Methyl-2-Pentanone (MIBK)						0.7 U	0.01 U				0.0059 U	0.0044 U	0.0039 U	0.014 UJ	0.01 U		
Acetone	3.2					2.3 B	0.05 U				0.3	0.0044 U	0.0077	0.014 UJ	0.05 U		
Acrolein											0.059 U	0.044 U	0.039 U				
Acrylonitrile											0.0059 U	0.0044 U	0.0039 U				
Benzene	0.29					0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U	0.0068 U	0.0085 U
Bromobenzene											0.0012 U	0.0009 U	0.0008 U				
Bromochloromethane											0.0012 U	0.0009 U	0.0008 U				
Bromodichloromethane		0.25 U	0.25 U	0.25 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Bromoethane											0.0024 U	0.0017 U	0.0016 U				
Bromoform		0.25 U	0.25 U	0.25 U		0.35 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Bromomethane						0.7 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Carbon Disulfide						0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Carbon Tetrachloride		0.05 U	0.05 U	0.05 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Chlorobenzene		0.25 U	0.25 U	0.25 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Chloroethane						0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Chloroform		0.05 U	0.05 U	0.05 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Chloromethane						0.7 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
cis-1,2-Dichloroethene							0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
cis-1,3-Dichloropropene		0.25 U	0.25 U	0.25 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Dibromochloromethane		0.25 U	0.25 U	0.25 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Dibromomethane											0.0012 U	0.0009 U	0.0008 U				
Ethylbenzene	18					0.2	0.005 U				0.41 ES	0.0009 U	0.0008 U	0.004 UJ	0.005 U	0.014 U	0.017 U
Ethylene Dibromide											0.0012 U	0.0009 U	0.0008 U				
Hexachlorobutadiene					50 U	2.3 U		0.066 U	0.076 U	0.064 U	0.0059 U	0.0044 U	0.0039 U				
Isopropylbenzene	8000										0.17	0.0009 U	0.0008 U				
m, p-Xylene	15										1.3 ES	0.0009 U	0.0011	0.004 UJ		0.027 U	0.034 U
Methyl Iodide											0.0012 U	0.0009 U	0.0008 U				
Methylene Chloride		0.25 U	0.25 U	0.25 U		0.35 U	0.1 U				0.0024 U	0.0017 U	0.0016 U	0.28 J	0.1 U		
Naphthalene	140				50 U	1.8 J		0.066 U	0.076 U	0.064 U	0.024	0.0044	0.0039 U				
n-Butylbenzene											0.0051	0.0009 U	0.0008 U				
n-Propylbenzene											0.19	0.0009 U	0.0008 U				
o-Xylene	150										0.94 ES	0.0009 U	0.0008 U	0.004 UJ		0.014 U	0.017 U

TABLE A-7
VOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Area ID:		J	J	J	J	J	G	G	G	G	G	G	G	G	M	M	M
Sample Name:		**HC-MW-1 (b)**	**HC-MW-4 (b)**	**HC-MW-4 (b)**	**J-MSRC**	**KFI-WP-Comp**	**ECI-N-2**	**G1-AC-3**	**G1-AC-4**	**G1-AC-5**	**G-FA-4**	**G-FA-5**	**G-FA-8**	**STOCKPILE**	**ECI-N-1**	**M-FA-1**	**M-FA-2**
Depth Range:		(7.5-9)	(5-6.5)	(20-21.5)							(2-2.5)	(8-8.5)	(4-4.5)			(3.5-4)	(3.5-4)
Date Collected:		11/6/1991	11/7/1991	11/7/1991	5/23/2007	9/30/1993	10/7/1991	6/22/2006	6/22/2006	6/22/2006	1/20/2005	1/20/2005	1/20/2005	11/12/2004	10/7/1991	1/17/2005	1/17/2005
Sample Type:		Boring	Boring	Boring	Excavation	Stock Pile	Surface Soil	Surface Soil	Surface Soil	Surface Soil	Boring	Boring	Boring	Stock Pile	Surface Soil	Boring	Boring
	Cleanup Screening Levels (a)																
sec-Butylbenzene											0.0012 U	0.0009 U	0.0008 U				
Styrene						0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
tert-Butylbenzene											0.0012 U	0.0009 U	0.0008 U				
Tetrachloroethene	1.9	0.05 U	0.05 U	0.079		0.07 U	0.005 U				0.0019	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Toluene	110					0.07 U	0.005 U				0.18	0.0009 U	0.0008 U	0.004 UJ	0.005 U	0.014 U	0.017 U
trans-1,2-Dichloroethene		0.25 U	0.25 U	0.25 U			0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
trans-1,3-Dichloropropene						0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
trans-1,4-Dichloro-2-butene											0.0059 U	0.0044 U	0.0039 U				
Trichloroethene	0.2	0.05 U	0.05 U	0.05 U		0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Trichlorofluoromethane		0.05 U	0.05 U	0.05 U			0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		
Trichlorotrifluoroethane							0.01 U								0.01 U		
Vinyl Acetate						0.7 U	0.01 U				0.0059 U	0.0044 U	0.0039 U		0.01 U		
Vinyl Chloride						0.07 U	0.005 U				0.0012 U	0.0009 U	0.0008 U	0.004 UJ	0.005 U		

U = the analyte was not detected in the sample at the given reporting limit.
ES = The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.
This value is considered an estimate.

(a) Development of the cleanup levels is presented in Table 9 of the work plan.
(b) Analysis of the sample were performed using screening techniques. Quantitations are estimates, compound identifications are tentative.

TABLE A-8
METAL LEACHATE IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

					Metal Leachate (mg/L) SW6000-7000 TCLP										
Sample Name	Depth Range	Date Collected	Area ID	Sample Type	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
ECI-Area-F		10/7/1991	G	Blasting Sand				0.03	0.04			0.97			1.39
ECI-J-2	(3-3)	10/7/1991	G	Test Pit				0.03	0.02			0.04			0.11
ECI-K-1	(4-4)	10/7/1991	G	Test Pit	0.1 U			0.01 U	0.37			0.21			0.86
G1A-100507-AC-1		10/5/2007	G	Stock Pile	0.2 U					0.1 U					
G1A-100907-STK-1		10/9/2007	G	Stock Pile	0.6					0.6					
G1A-101607-STK-2		10/16/2007	G	Stock Pile	0.2 U					0.3					
G1-TP4	(0-6)	4/25/2006	G	Test Pit	0.2 U	0.13	0.01 U	0.02 U		0.1 U	0.0001 U		0.2 U	0.02 U	
G1-TP5	(0-5)	4/25/2006	G	Test Pit	1	0.43	0.01	0.02 U		0.6	0.0001 U		0.2 U	0.02 U	
ECI-Q-6	(0-1)	10/7/1991	I	Test Pit					8.11	2.9		0.03			13.4
I2-WP	(1.5-2.5)	5/8/2006	I	Boring	0.2 U	0.36	0.01 U	0.07		0.1 U	0.0001 U		0.2 U	0.02 U	
I-GC-1	(0-0.5)	7/15/2005	I	Boring	0.7					0.3					
I-GC-1	(1-2)	7/14/2005	I	Boring	1					2.3					
I-GC-1C	(0-0.5)	10/19/2005	I	Boring	0.6					0.2					
I-TP-5	(0-5)	4/25/2006	I	Test Pit	0.2 U	0.04	0.01 U	0.02 U		0.1 U	0.0001 U		0.2 U	0.02 U	
Chamber-1		8/11/2006	J	Excavation	0.2 U	0.07	0.01 U	0.02 U		0.1 U	0.0001 U		0.2 U	0.02 U	
Chamber-2		8/11/2006	J	Excavation	0.2 U	0.06	0.01 U	0.02 U		0.1 U	0.0001 U		0.2 U	0.02 U	
Chamber-3		8/11/2006	J	Excavation	0.2 U	0.28	0.01 U	0.02 U		0.1 U	0.0001 U		0.2 U	0.02 U	
Chamber-4		8/11/2006	J	Excavation	0.2 U	0.25	0.01 U	0.02 U		0.1 U	0.0001 U		0.2 U	0.02 U	
KFI-WP-Comp		9/30/1993	J	Stock Pile	0.05 U	1.1	0.005 U	0.01 U		0.042	0.0002 U		0.05 U	0.005 U	

U = the analyte was not detected in the sample at the given reporting limit.

TABLE A-9
cPAHs IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

					cPAHs (mg/kg) SW8270/8270SIM							
					Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	cPAH TEQ
				Cleanup Screening Levels (a)		**0.14**						**0.14**
Sample Name	Depth Range	Date Collected	Area ID	Sample Type								
F-GC-1	(0-0.5)	1/14/2005	F	Boring	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U	0.07 U
G1A-100507-AC-1		10/5/2007	G	Stock Pile	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
G1A-100907-STK-1		10/9/2007	G	Stock Pile	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
G1A-101607-STK-2		10/16/2007	G	Stock Pile	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
G1-AC-3		6/22/2006	G	Surface Soil	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
G1-AC-4		6/22/2006	G	Surface Soil	0.076 U	0.076 U	0.076 U	0.076 U	0.076 U	0.076 U	0.076 U	0.076 U
G1-AC-5		6/22/2006	G	Surface Soil	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
G-3	(3-3)	2/11/2004	G	Boring	0.051	0.047	0.063	0.052	0.071	0.0095 U	0.032	0.0675
G-FA-5	(8-8.5)	1/20/2005	G	Boring	0.069	0.079	0.066 U	0.066 U	0.14	0.066 U	0.066 U	0.0873
G-FA-8	(4-4.5)	1/20/2005	G	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
G-GC-1	(1.5-2)	3/2/2005	G	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
G-GC-2	(1.4-1.9)	3/2/2005	G	Boring	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U
G-GC-3	(1-1.5)	3/2/2005	G	Boring	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U
M-2C	(1-1.5)	7/15/2005	G	Boring	0.065 U	0.085	0.068	0.069	0.087	0.065 U	0.065 U	0.09957
PZ-10 (b)	(3-3)	2/11/2004	G	Boring	0.011	0.0093	0.0098	0.0098	0.019	0.0072 U	0.0072 U	0.0126
I2-AC-1A		7/12/2006	I	Excavation	0.15	0.16	0.22	0.13	0.21	0.062 U	0.062 U	0.2121
I2-1	(1-1.5)	5/8/2006	I	Boring	0.065 U	0.065 U	0.12	0.065 U	0.17	0.065 U	0.065 U	0.0137
I2-2	(1-2.25)	5/8/2006	I	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
I2-3	(0.5-2.5)	5/8/2006	I	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
I2-4	(1.4-2.4)	5/8/2006	I	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
I2-5	(1.3-2.5)	5/8/2006	I	Boring	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U
I2-6	(1.5-2.2)	5/8/2006	I	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
I2-7	(1.7-2.8)	5/8/2006	I	Boring	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U
I2-8	(1.5-3.3)	5/8/2006	I	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
I2-9	(1.7-3.3)	5/8/2006	I	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
I2-10	(1.5-2.5)	5/8/2006	I	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
I-3		2/12/2004	I	Boring	0.019	0.019	0.04	0.028	0.04	0.0084 U	0.013	0.0294
I-GC-1	(0-0.5)	7/14/2005	I	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
I-GC-1A	(0-0.5)	10/19/2005	I	Boring	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U
I-GC-1B	(0-0.5)	10/19/2005	I	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
I-GC-1C	(0-0.5)	10/19/2005	I	Boring	0.13	0.093	0.16	0.18	0.36	0.066 U	0.074	0.151
I-GC-1C	(1-2)	10/18/2005	I	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
I-GC-2	(0-0.5)	7/14/2005	I	Boring	0.084	0.11	0.26	0.14	0.23	0.062 U	0.062 U	0.1607
I-GC-2	(1-2)	7/14/2005	I	Boring	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
I-GC-3	(0-0.5)	7/14/2005	I	Boring	0.065 U	0.068	0.083	0.065 U	0.08	0.065 U	0.065 U	0.0771
I-GC-4	(0-0.5)	7/14/2005	I	Boring	0.064 U	0.079	0.077	0.064 U	0.07	0.064 U	0.064 U	0.0874
I-GC-4	(1-2)	7/14/2005	I	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
I-GC-5	(3-3.5)	7/14/2005	I	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
I-GC-6	(3.5-4)	7/14/2005	I	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
I-GC-7	(0-0.5)	7/14/2005	I	Boring	0.063 U	0.063 U	0.085	0.063 U	0.076	0.063 U	0.063 U	0.00926
I-GC-8	(3.5-4)	7/14/2005	I	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
I-GC-9	(3.5-4)	7/14/2005	I	Boring	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U
I-GC-10	(0-0.5)	7/14/2005	I	Boring	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
I-GC-11	(0-0.5)	7/14/2005	I	Boring	0.13	0.23	0.35	0.16	0.26	0.064 U	0.11	0.3076
I-GC-11	(1-2)	7/14/2005	I	Boring	0.32	0.48	0.71	0.48	0.7	0.073	0.23	0.6683
I-GC-11	(2-3)	7/14/2005	I	Boring	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
I-GC-11.1E	(0-0.5)	3/1/2006	I	Surface Soil	0.085	0.09	0.19	0.11	0.17	0.064 U	0.064 U	0.1302

TABLE A-9
cPAHs IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

					cPAHs (mg/kg) SW8270/8270SIM							
					Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	cPAH TEQ
			Cleanup Screening Levels (a)			**0.14**						**0.14**
Sample Name	Depth Range	Date Collected	Area ID	Sample Type								
I-GC-11.1N	(0-0.5)	3/1/2006	I	Surface Soil	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
I-GC-11.1S	(0.75-1.25)	3/1/2006	I	Surface Soil	0.075	0.097	0.19	0.083	0.3	0.064 U	0.064 U	0.1348
I-GC-11.1W	(0-0.5)	3/1/2006	I	Surface Soil	0.16	0.14	0.2	0.11	0.28	0.065 U	0.065 U	0.1898
I-GC-12	(0-0.5)	7/14/2005	I	Boring	0.29	0.41	0.62	0.34	1.1	0.081	0.22	0.5761
I-GC-12	(1-2)	7/14/2005	I	Boring	0.074	0.075	0.076	0.086	0.079	0.066 U	0.066 U	0.09939
I-GC-12.1E	(0-0.5)	3/1/2006	I	Surface Soil	0.13	0.12	0.21	0.1	0.28	0.064 U	0.067	0.1735
I-GC-12.1S	(0.75-1.25)	3/1/2006	I	Hand Auger	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
I-GC-12.1W	(0-0.5)	3/1/2006	I	Surface Soil	0.11	0.13	0.13	0.096	0.14	0.065 U	0.072	0.1722
I-GC-12.2E	(0-0.5)	3/10/2006	I	Surface Soil	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U
I-GC-12.5S	(0.5-1)	3/1/2006	I	Surface Soil	0.064 U	0.064 U	0.087	0.064 U	0.076	0.064 U	0.064 U	0.00946
I-GC-13	(0-0.5)	7/14/2005	I	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
I-GC-14	(0-0.5)	7/14/2005	I	Boring	0.077	0.097	0.21	0.099	0.18	0.065 U	0.1	0.1474
I-GC-14	(1-2)	7/14/2005	I	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
I-GC-15	(0-0.5)	8/22/2005	I	Hand Auger	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
I-GC-16	(0-0.5)	8/22/2005	I	Hand Auger	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
I-GC-17	(0-0.5)	8/22/2005	I	Hand Auger	0.12	0.16	0.15	0.072	0.13	0.066 U	0.13	0.2085
I-GC-17	(1-2)	8/22/2005	I	Hand Auger	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U
I-GC-18	(0-0.5)	8/22/2005	I	Hand Auger	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
I-GC-19	(0-0.5)	8/22/2005	I	Hand Auger	0.066 U	0.066 U	0.094	0.066 U	0.078	0.066 U	0.066 U	0.01018
I-GC-20	(0-0.5)	8/22/2005	I	Hand Auger	0.34	0.53	1.1	0.59	0.97	0.12	0.39	0.7937
I-GC-20	(1-2)	8/22/2005	I	Hand Auger	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
I-GC-21	(0-0.5)	8/22/2005	I	Hand Auger	0.064 U	0.064 U	0.065	0.064 U	0.064 U	0.064 U	0.064 U	0.0065
I-GC-22	(0-0.5)	8/22/2005	I	Hand Auger	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
I-GC-23	(0-0.5)	8/22/2005	I	Hand Auger	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
I-GC-24	(1.2-6)	10/19/2005	I	Boring	0.065 U	0.065 U	0.065 U	0.065 U	0.078	0.065 U	0.065 U	0.00078
I-GC-24	(6.5-7.5)	10/19/2005	I	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
I-GC-25	(0.5-1)	10/19/2005	I	Boring	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U
I-GC-26	(0-0.5)	10/19/2005	I	Boring	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
I-X		2/12/2004	I	Boring	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
I-Y		2/12/2004	I	Boring	0.081 U	0.081 U	0.081 U	0.081 U	0.081 U	0.081 U	0.081 U	0.081 U
I-Z		2/12/2004	I	Surface Soil	0.021	0.017	0.028	0.015	0.031	0.0087 U	0.01	0.02471
Chamber-1		8/11/2006	J	Excavation	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
Chamber-2		8/11/2006	J	Excavation	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
Chamber-3		8/11/2006	J	Excavation	0.066 U	0.066 U	0.077	0.066 U	0.094	0.066 U	0.066 U	0.0086
Chamber-4		8/11/2006	J	Excavation	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
J-GC-1 (c)	(0.5-1)	1/14/2005	J	Boring	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
J-GC-1 (c)	(0.5-1)	1/14/2005	J	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.074	0.066 U	0.066 U	0.00074
J-GC-2	(0-0.5)	3/2/2005	J	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
J-GC-3	(0-0.5)	3/2/2005	J	Boring	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
J-GC-4	(1.5-2)	3/3/2005	J	Boring	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
J-GC-6	(1.1-1.6)	7/15/2005	J	Boring	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
J-GC-6	(2-2.7)	7/15/2005	J	Boring	0.38 J	0.38 J	0.31 J	0.38 J	0.35 J	0.064 UJ	0.15 J	0.5055 J
J-GC-6	(3.1-4.1)	7/15/2005	J	Boring	0.064 UJ	0.064 UJ	0.064 UJ	0.064 UJ	0.064 UJ	0.064 UJ	0.064 UJ	0.064 UJ
J-GC-6f	(0.7-1.1)	2/6/2006	J	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
J-GC-6g	(1-1.5)	2/6/2006	J	Boring	0.09	0.098	0.078	0.087	0.11	0.065 U	0.072	0.1318
J-GC-6h	(1-1.5)	2/6/2006	J	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.069	0.064 U	0.064 U	0.00069
J-GC-6i	(1-1.5)	2/6/2006	J	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U

TABLE A-9
cPAHs IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
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					cPAHs (mg/kg) SW8270/8270SIM							
					Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	cPAH TEQ
				Cleanup Screening Levels (a)		**0.14**						**0.14**
Sample Name	Depth Range	Date Collected	Area ID	Sample Type								
J-GC-6i	(3.2-4)	2/6/2006	J	Boring	0.3	0.39	0.37	0.37	0.47	0.077	0.27	0.5565
J-GC-7	(0.7-1.2)	7/15/2005	J	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
J-GC-8	(2.1-2.6)	7/15/2005	J	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
J-GC-9	(1.4-1.9)	7/15/2005	J	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
J-GC-10	(0-0.5)	7/14/2005	J	Boring	0.064 U	0.064 U	0.069	0.064 U	0.064 U	0.064 U	0.064 U	0.0069
J-MSRC		5/23/2007	J	Excavation	50 U	50 U	50 U	50 U	69	50 U	50 U	0.69
KFI-WP-Comp		9/30/1993	J	Stock Pile	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
M-1	(0.3-0.8)	1/18/2005	M	Boring	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U
M-2	(1.5-2)	1/18/2005	M	Boring	0.13	0.18	0.12	0.12	0.21	0.064	0.095	0.235
M-2	(2-3)	1/18/2005	M	Boring	0.064 UJ	0.064 UJ	0.064 UJ	0.064 UJ	0.064 UJ	0.064 UJ	0.064 UJ	0.064 UJ
M-2.1S	(1-1.5)	3/1/2006	M	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
M-2.1W	(1-1.5)	3/1/2006	M	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
M-2B	(1-1.5)	7/15/2005	M	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
M-2D	(0.9-1.4)	7/15/2005	M	Boring	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
M-3	(0-0.5)	1/18/2005	M	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
M-4	(0.8-1.3)	1/17/2005	M	Boring	0.062 UJ	0.062 UJ	0.062 UJ	0.062 UJ	0.062 UJ	0.062 UJ	0.062 UJ	0.062 UJ
M-GC-1	(1.6-2.1)	3/3/2005	M	Boring	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U
M-GC-2	(1.5-2)	3/2/2005	M	Boring	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U
M-GC-3	(1-1.5)	3/3/2005	M	Boring	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
M-GC-4	(1.5-2)	3/2/2005	M	Boring	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U
M-GC-5	(1-1.5)	3/2/2005	M	Boring	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U

U = the analyte was not detected in the sample at the given reporting limit.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
Shaded cells indicate an exceedance of the site cleanup levels.

(a) Development of the cleanup levels is presented in Table 9 of the work plan.
(b) PZ-10 is located at P-10. PZ-10 was taken during the drilling for the P-10 monitoring well.
(c) Sample analyzed using both EPA Method 8270SIM and standard EPA Method 8270.
Lower reporting limits achieved using EPA Method 8270SIM.

TABLE A-10
TRIBUTYL TINS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
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					Tributyl Tins (mg/kg) KRONE 1989					
Sample Name	Depth Range	Date Collected	Area ID	Sample Type	Butyl Tin Ion	Butyl Tin Trichloride	Dibutyl Tin Dichloride	Dibutyl Tin Ion	Tributyl Tin Chloride	Tributyl Tin Ion
				Cleanup Screening Levels (a)						**7**
F-GC-1	(0-0.5)	1/14/2005	F	Boring		0.01	0.038		0.069	
G1-AC-1		6/22/2006	G	Surface Soil	0.0039 U			0.0055 U		0.0037 U
G1-AC-2		6/22/2006	G	Surface Soil	0.0039 U			0.0056 U		0.0037 U
G1-AC-5		6/22/2006	G	Surface Soil	0.004 UJ			0.0057 UJ		0.0038 UJ
G1-AC-7		6/27/2006	G	Surface Soil	0.0038 UJ			0.0054 UJ		0.0036 UJ
G1-AC-8		6/27/2006	G	Surface Soil	0.0038 U			0.0054 U		0.0036 U
G1-AC-9		6/23/2006	G	Surface Soil	0.0037 U			0.0053 U		0.0035 U
I1-AC-1		6/21/2006	I	Surface Soil	0.093			0.3		0.95
I2-AC-1		7/13/2006	I	Excavation	0.0041 U			0.0058 U		0.0038 U
I2-AC-2		7/13/2006	I	Excavation	0.0039 U			0.0056 U		0.0037 U
I3A-AC-1A		6/29/2006	I	Surface Soil	0.004 U			0.0057 U		0.0038 U
I3A-AC-1B		6/29/2006	I	Surface Soil	0.004 U			0.0057 U		0.0038 U
I3A-AC-2A		6/30/2006	I	Surface Soil	0.0038 U			0.0054 U		0.0036 U
I3A-AC-2B		6/30/2006	I	Surface Soil	0.0041 U			0.0058 U		0.0038 U
I3B-AC-1		7/7/2006	I	Surface Soil	0.0038 U			0.0054 U		0.0036 U
I3B-AC-2		7/7/2006	I	Surface Soil	0.004 U			0.0057 U		0.0038 U
I4-AC-2		7/12/2006	I	Surface Soil	0.0038 U			0.0053 U		0.0036 U
I5-AC-2		6/28/2006	I	Surface Soil	0.0039 U			0.0056 U		0.0037 U
I5-AC-4		6/28/2006	I	Surface Soil	0.0039 U			0.0055 U		0.0037 U
I5-AC-5		7/14/2006	I	Surface Soil	0.0039 U			0.0056 U		0.0037 U

U = the analyte was not detected in the sample at the given reporting limit.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.

(a) Development of the cleanup levels is presented in Table 9 of the work plan.

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	F	G	G	G	G	G	G	G	G	G	G	G	G	G	I	I	I	I
	Sample Name:	F-GC-1	ECI-N-2	G1A-100507-AC-1	G1-AC-3	G1-AC-4	G1-AC-5	G-FA-4	G-FA-5	G-FA-8	G-GC-1	G-GC-2	G-GC-3	M-2C	STOCKPILE	ECI-Q-1	ECI-Q-5	ECI-Q-6	ECI-Q-8
	Depth Range:	(0-0.5)						(2-2.5)	(8-8.5)	(4-4.5)	(1.5-2)	(1.4-1.9)	(1-1.5)	(1-1.5)		(1-2)	(1-2)	(0-1)	(5-5)
	Date Collected:	1/14/2005	10/7/1991	10/5/2007	6/22/2006	6/22/2006	6/22/2006	1/20/2005	1/20/2005	1/20/2005	3/2/2005	3/2/2005	3/2/2005	7/15/2005	11/12/2004	10/7/1991	10/7/1991	10/7/1991	10/7/1991
	Sample Type:	Boring	Surface Soil	Excavation	Surface Soil	Surface Soil	Surface Soil	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Stock Pile	Test Pit	Test Pit	Test Pit	Test Pit
	Cleanup Levels (b)																		
SVOCs (mg/kg)																			
EPA Method 8270/8270SIM																			
1,2,4-Trichlorobenzene					0.066 U	0.076 U	0.064 U	0.0059 U	0.066 U	0.064 U					0.470 UJ				
1,2-Dichlorobenzene			0.005 U		0.066 U	0.076 U	0.064 U	0.0012 U	0.066 U	0.064 U					0.470 UJ	0.005 U	0.005 U	0.005 U	0.005 U
1,3-Dichlorobenzene			0.005 U		0.066 U	0.076 U	0.064 U	0.0012 U	0.066 U	0.064 U					0.470 UJ	0.005 U	0.005 U	0.005 U	0.005 U
1,4-Dichlorobenzene			0.005 U		0.066 U	0.076 U	0.064 U	0.0012 U	0.066 U	0.064 U					0.470 UJ	0.005 U	0.005 U	0.005 U	0.005 U
1-Methylnaphthalene	24														0.470 UJ				
2,2'-Oxybis(1-Chloropropane)					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U									
2,3,4,6-Tetrachlorophenol																			
2,4,5-Trichlorophenol					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U									
2,4,6-Trichlorophenol					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.470 UJ				
2,4-Dichlorophenol					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.470 UJ				
2,4-Dimethylphenol					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
2,4-Dinitrophenol					0.66 U	0.76 U	0.64 U		0.66 U	0.64 U					0.470 UJ				
2,4-Dinitrotoluene					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.940 UJ				
2,6-Dichlorophenol															0.470 UJ				
2,6-Dinitrotoluene					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U									
2-Chloronaphthalene					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
2-Chlorophenol					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
2-Methylnaphthalene	320				0.16	0.18	0.5		0.066 U	0.064 U					0.470 UJ				
2-Methylphenol					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
2-Nitroaniline					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.470 UJ				
2-Nitrophenol					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.470 UJ				
3,3'-Dichlorobenzidine					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.470 UJ				
3-Nitroaniline					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.470 UJ				
4,6-Dinitro-2-Methylphenol					0.66 U	0.76 U	0.64 U		0.66 U	0.64 U					0.470 UJ				
4-Bromophenyl-Phenylether					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
4-Chloro-3-Methylphenol					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.470 UJ				
4-Chloroaniline					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.470 UJ				
4-Chlorophenyl-Phenylether					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
4-Methylphenol	--				0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
4-Nitroaniline					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.470 UJ				
4-Nitrophenol					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.470 UJ				
Acenaphthene	66				0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
Acenaphthylene					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
Aniline															0.470 UJ				
Anthracene	12000				0.066 U	0.076 U	0.064 U		0.066 U	0.064 U									
Azobenzene															0.470 UJ				
Benzidine																			
Benzo(a)anthracene		0.07 U		0.066 U	0.066 U	0.076 U	0.064 U		0.069	0.064 U	0.064 U	0.062 U	0.062 U	0.065 U					
Benzo(a)pyrene	0.14	0.07 U		0.066 U	0.066 U	0.076 U	0.064 U		0.079	0.064 U	0.064 U	0.062 U	0.062 U	0.085	0.640 J				
Benzo(b)fluoranthene		0.07 U		0.066 U	0.066 U	0.076 U	0.064 U		0.066 U	0.064 U	0.064 U	0.062 U	0.062 U	0.068	0.570 J				
Benzo(g,h,i)perylene					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.660 J				
Benzo(k)fluoranthene		0.07 U		0.066 U	0.066 U	0.076 U	0.064 U		0.066 U	0.064 U	0.064 U	0.062 U	0.062 U	0.069	0.470 UJ				
Benzoic Acid	320000				0.66 U	0.76 U	0.65 U		0.66 U	0.64 U					0.470 UJ				
Benzyl Alcohol					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					1.200 J				
Benzyl butyl phthalate					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
bis(2-Chloroethoxy) Methane					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
Bis-(2-Chloroethyl) Ether					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
Bis(2-Ethylhexyl)Phthalate	4.9				0.35	0.96	1.2		0.19	0.064 U					0.470 UJ				
Carbazole	50				0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
Chrysene		0.07 U		0.066 U	0.066 U	0.076 U	0.064 U		0.14	0.064 U	0.064 U	0.062 U	0.062 U	0.087	0.470 UJ				
Dibenz(a,h)anthracene		0.07 U		0.066 U	0.066 U	0.076 U	0.064 U		0.066 U	0.064 U	0.064 U	0.062 U	0.062 U	0.065 U	0.730 J				
Dibenzofuran	160				0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
Diethylphthalate					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
Dimethylphthalate					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
Di-N-Butylphthalate					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
Di-n-Octyl phthalate	1600				0.066 U	0.076 U	0.075		0.066 U	0.064 U					0.470 UJ				
Fluoranthene	89				0.066 U	0.076 U	0.099		0.17	0.064 U					0.470 UJ				
Fluorene	553				0.066 U	0.08	0.099		0.066 U	0.064 U					1.400 J				
Hexachlorobenzene					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
Hexachlorobutadiene					0.066 U	0.076 U	0.064 U	0.0059 U	0.066 U	0.064 U					0.470 UJ				

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	F	G	G	G	G	G	G	G	G	G	G	G	G	G	I	I	I	I
	Sample Name:	F-GC-1	ECI-N-2	G1A-100507-AC-1	G1-AC-3	G1-AC-4	G1-AC-5	G-FA-4	G-FA-5	G-FA-8	G-GC-1	G-GC-2	G-GC-3	M-2C	STOCKPILE	ECI-Q-1	ECI-Q-5	ECI-Q-6	ECI-Q-8
	Depth Range:	(0-0.5)						(2-2.5)	(8-8.5)	(4-4.5)	(1.5-2)	(1.4-1.9)	(1-1.5)	(1-1.5)		(1-2)	(1-2)	(0-1)	(5-5)
	Date Collected:	1/14/2005	10/7/1991	10/5/2007	6/22/2006	6/22/2006	6/22/2006	1/20/2005	1/20/2005	1/20/2005	3/2/2005	3/2/2005	3/2/2005	7/15/2005	11/12/2004	10/7/1991	10/7/1991	10/7/1991	10/7/1991
	Sample Type:	Boring	Surface Soil	Excavation	Surface Soil	Surface Soil	Surface Soil	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Stock Pile	Test Pit	Test Pit	Test Pit	Test Pit
	Cleanup Levels (b)																		
Hexachlorocyclopentadiene					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.470 UJ				
Hexachloroethane					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
Indeno(1,2,3-cd)pyrene		0.07 U		0.066 U	0.066 U	0.076 U	0.064 U		0.066 U	0.064 U	0.064 U	0.062 U	0.062 U	0.065 U	0.470 UJ				
Isophorone					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
Naphthalene	140				0.066 U	0.076 U	0.064 U	0.024	0.08	0.064 U					0.470 UJ				
Nitrobenzene					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					0.470 UJ				
N-Nitrosodimethylamine															0.470 UJ				
N-Nitroso-Di-N-Propylamine					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U									
N-Nitrosodiphenylamine					0.074 U	0.11 U	0.15 U		0.066 U	0.064 U					0.470 UJ				
Pentachlorophenol					0.33 U	0.38 U	0.32 U		0.33 U	0.32 U					0.470 UJ				
Phenanthrene	12000				0.27	0.31	0.48		0.21	0.064 U					0.470 UJ				
Phenol					0.066 U	0.076 U	0.064 U		0.066 U	0.064 U					1.300 J				
Pyrene	2400				0.066 U	0.076 U	0.091		0.18	0.064 U					0.470 UJ				
Pyridine															1.200 J				

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Area ID:		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Sample Name:		I2-1	I2-2	I2-3	I2-4	I2-5	I2-6	I2-7	I2-8	I2-9	I2-10	I-3	I-GC-1	I-GC-1A	I-GC-1B	I-GC-1C	I-GC-1C	I-GC-2	I-GC-2	I-GC-3
Depth Range:		(1-1.5)	(1-2.25)	(0.5-2.5)	(1.4-2.4)	(1.3-2.5)	(1.5-2.2)	(1.7-2.8)	(1.5-3.3)	(1.7-3.3)	(1.5-2.5)		(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(1-2)	(0-0.5)	(1-2)	(0-0.5)
Date Collected:		5/8/2006	5/8/2006	5/8/2006	5/8/2006	5/8/2006	5/8/2006	5/8/2006	5/8/2006	5/8/2006	5/8/2006	2/12/2004	7/14/2005	10/19/2005	10/19/2005	10/19/2005	10/18/2005	7/14/2005	7/14/2005	7/14/2005
Sample Type:		Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring
	Cleanup Levels (b)																			
SVOCs (mg/kg)																				
EPA Method 8270/8270SIM																				
1,2,4-Trichlorobenzene																				
1,2-Dichlorobenzene																				
1,3-Dichlorobenzene																				
1,4-Dichlorobenzene																				
1-Methylnaphthalene	24																			
2,2'-Oxybis(1-Chloropropane)																				
2,3,4,6-Tetrachlorophenol																				
2,4,5-Trichlorophenol																				
2,4,6-Trichlorophenol																				
2,4-Dichlorophenol																				
2,4-Dimethylphenol																				
2,4-Dinitrophenol																				
2,4-Dinitrotoluene																				
2,6-Dichlorophenol																				
2,6-Dinitrotoluene																				
2-Chloronaphthalene																				
2-Chlorophenol																				
2-Methylnaphthalene	320																			
2-Methylphenol																				
2-Nitroaniline																				
2-Nitrophenol																				
3,3'-Dichlorobenzidine																				
3-Nitroaniline																				
4,6-Dinitro-2-Methylphenol																				
4-Bromophenyl-Phenylether																				
4-Chloro-3-Methylphenol																				
4-Chloroaniline																				
4-Chlorophenyl-Phenylether																				
4-Methylphenol	--																			
4-Nitroaniline																				
4-Nitrophenol																				
Acenaphthene	66																			
Acenaphthylene																				
Aniline																				
Anthracene	12000																			
Azobenzene																				
Benzidine																				
Benzo(a)anthracene		0.065 U	0.066 U	0.066 U	0.066 U	0.067 U	0.066 U	0.067 U	0.064 U	0.064 U	0.064 U	0.019	0.066 U	0.061 U	0.066 U	0.13	0.064 U	0.084	0.065 U	0.065 U
Benzo(a)pyrene	0.14	0.065 U	0.066 U	0.066 U	0.066 U	0.067 U	0.066 U	0.067 U	0.064 U	0.064 U	0.064 U	0.019	0.066 U	0.061 U	0.066 U	0.093	0.064 U	0.11	0.065 U	0.068
Benzo(b)fluoranthene		0.12	0.066 U	0.066 U	0.066 U	0.067 U	0.066 U	0.067 U	0.064 U	0.064 U	0.064 U	0.04	0.066 U	0.061 U	0.066 U	0.16	0.064 U	0.26	0.065 U	0.083
Benzo(g,h,i)perylene																				
Benzo(k)fluoranthene		0.065 U	0.066 U	0.066 U	0.066 U	0.067 U	0.066 U	0.067 U	0.064 U	0.064 U	0.064 U	0.028	0.066 U	0.061 U	0.066 U	0.18	0.064 U	0.14	0.065 U	0.065 U
Benzoic Acid	320000																			
Benzyl Alcohol																				
Benzyl butyl phthalate																				
bis(2-Chloroethoxy) Methane																				
Bis-(2-Chloroethyl) Ether																				
Bis(2-Ethylhexyl)Phthalate	4.9																			
Carbazole	50																			
Chrysene		0.17	0.066 U	0.066 U	0.066 U	0.067 U	0.066 U	0.067 U	0.064 U	0.064 U	0.064 U	0.04	0.066 U	0.061 U	0.066 U	0.36	0.064 U	0.23	0.065 U	0.08
Dibenz(a,h)anthracene		0.065 U	0.066 U	0.066 U	0.066 U	0.067 U	0.066 U	0.067 U	0.064 U	0.064 U	0.064 U	0.0084 U	0.066 U	0.061 U	0.066 U	0.066 U	0.064 U	0.062 U	0.065 U	0.065 U
Dibenzofuran	160																			
Diethylphthalate																				
Dimethylphthalate																				
Di-N-Butylphthalate																				
Di-n-Octyl phthalate	1600																			
Fluoranthene	89																			
Fluorene	553																			
Hexachlorobenzene																				
Hexachlorobutadiene																				

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
	Sample Name:	I2-1	I2-2	I2-3	I2-4	I2-5	I2-6	I2-7	I2-8	I2-9	I2-10	I-3	I-GC-1	I-GC-1A	I-GC-1B	I-GC-1C	I-GC-1C	I-GC-2	I-GC-2	I-GC-3
	Depth Range:	(1-1.5)	(1-2.25)	(0.5-2.5)	(1.4-2.4)	(1.3-2.5)	(1.5-2.2)	(1.7-2.8)	(1.5-3.3)	(1.7-3.3)	(1.5-2.5)		(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(1-2)	(0-0.5)	(1-2)	(0-0.5)
	Date Collected:	5/8/2006	5/8/2006	5/8/2006	5/8/2006	5/8/2006	5/8/2006	5/8/2006	5/8/2006	5/8/2006	5/8/2006	2/12/2004	7/14/2005	10/19/2005	10/19/2005	10/19/2005	10/18/2005	7/14/2005	7/14/2005	7/14/2005
	Sample Type:	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring
	Cleanup Levels (b)																			
Hexachlorocyclopentadiene																				
Hexachloroethane																				
Indeno(1,2,3-cd)pyrene		0.065 U	0.066 U	0.066 U	0.066 U	0.067 U	0.066 U	0.067 U	0.064 U	0.064 U	0.064 U	0.013	0.066 U	0.061 U	0.066 U	0.074	0.064 U	0.062 U	0.065 U	0.065 U
Isophorone																				
Naphthalene	140																			
Nitrobenzene																				
N-Nitrosodimethylamine																				
N-Nitroso-Di-N-Propylamine																				
N-Nitrosodiphenylamine																				
Pentachlorophenol																				
Phenanthrene	12000																			
Phenol																				
Pyrene	2400																			
Pyridine																				

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Area ID:		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Sample Name:		I-GC-4	I-GC-4	I-GC-5	I-GC-6	I-GC-7	I-GC-8	I-GC-9	I-GC-10	I-GC-11	I-GC-11	I-GC-11	I-GC-11.1E	I-GC-11.1N	I-GC-11.1S	I-GC-11.1W	I-GC-12	I-GC-12	I-GC-12.1E	I-GC-12.1S
Depth Range:		(0-0.5)	(1-2)	(3-3.5)	(3.5-4)	(0-0.5)	(3.5-4)	(3.5-4)	(0-0.5)	(0-0.5)	(1-2)	(2-3)	(0-0.5)	(0-0.5)	(0.75-1.25)	(0-0.5)	(0-0.5)	(1-2)	(0-0.5)	(0.75-1.25)
Date Collected:		7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	3/1/2006	3/1/2006	3/1/2006	3/1/2006	7/14/2005	7/14/2005	3/1/2006	3/1/2006
Sample Type:	Cleanup Levels (b)	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Surface Soil	Surface Soil	Surface Soil	Surface Soil	Boring	Boring	Surface Soil	Hand Auger
SVOCs (mg/kg)																				
EPA Method 8270/8270SIM																				
1,2,4-Trichlorobenzene																				
1,2-Dichlorobenzene																				
1,3-Dichlorobenzene																				
1,4-Dichlorobenzene																				
1-Methylnaphthalene	24																			
2,2'-Oxybis(1-Chloropropane)																				
2,3,4,6-Tetrachlorophenol																				
2,4,5-Trichlorophenol																				
2,4,6-Trichlorophenol																				
2,4-Dichlorophenol																				
2,4-Dimethylphenol																				
2,4-Dinitrophenol																				
2,4-Dinitrotoluene																				
2,6-Dichlorophenol																				
2,6-Dinitrotoluene																				
2-Chloronaphthalene																				
2-Chlorophenol																				
2-Methylnaphthalene	320																			
2-Methylphenol																				
2-Nitroaniline																				
2-Nitrophenol																				
3,3'-Dichlorobenzidine																				
3-Nitroaniline																				
4,6-Dinitro-2-Methylphenol																				
4-Bromophenyl-Phenylether																				
4-Chloro-3-Methylphenol																				
4-Chloroaniline																				
4-Chlorophenyl-Phenylether																				
4-Methylphenol	--																			
4-Nitroaniline																				
4-Nitrophenol																				
Acenaphthene	66																			
Acenaphthylene																				
Aniline																				
Anthracene	12000																			
Azobenzene																				
Benzidine																				
Benzo(a)anthracene		0.064 U	0.064 U	0.066 U	0.064 U	0.063 U	0.066 U	0.067 U	0.065 U	0.13	0.32	0.065 U	0.085	0.065 U	0.075	0.16	0.29	0.074	0.13	0.064 U
Benzo(a)pyrene	0.14	0.079	0.064 U	0.066 U	0.064 U	0.063 U	0.066 U	0.067 U	0.065 U	0.23	0.48	0.065 U	0.09	0.065 U	0.097	0.14	0.41	0.075	0.12	0.064 U
Benzo(b)fluoranthene		0.077	0.064 U	0.066 U	0.064 U	0.085	0.066 U	0.067 U	0.065 U	0.35	0.71	0.065 U	0.19	0.065 U	0.19	0.2	0.62	0.076	0.21	0.064 U
Benzo(g,h,i)perylene																				
Benzo(k)fluoranthene		0.064 U	0.064 U	0.066 U	0.064 U	0.063 U	0.066 U	0.067 U	0.065 U	0.16	0.48	0.065 U	0.11	0.065 U	0.083	0.11	0.34	0.086	0.1	0.064 U
Benzoic Acid	320000																			
Benzyl Alcohol																				
Benzyl butyl phthalate																				
bis(2-Chloroethoxy) Methane																				
Bis-(2-Chloroethyl) Ether																				
Bis(2-Ethylhexyl)Phthalate	4.9																			
Carbazole	50																			
Chrysene		0.07	0.064 U	0.066 U	0.064 U	0.076	0.066 U	0.067 U	0.065 U	0.26	0.7	0.065 U	0.17	0.065 U	0.3	0.28	1.1	0.079	0.28	0.064 U
Dibenz(a,h)anthracene		0.064 U	0.064 U	0.066 U	0.064 U	0.063 U	0.066 U	0.067 U	0.065 U	0.064 U	0.073	0.065 U	0.064 U	0.065 U	0.064 U	0.065 U	0.081	0.066 U	0.064 U	0.064 U
Dibenzofuran	160																			
Diethylphthalate																				
Dimethylphthalate																				
Di-N-Butylphthalate																				
Di-n-Octyl phthalate	1600																			
Fluoranthene	89																			
Fluorene	553																			
Hexachlorobenzene																				
Hexachlorobutadiene																				

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
	Sample Name:	I-GC-4	I-GC-4	I-GC-5	I-GC-6	I-GC-7	I-GC-8	I-GC-9	I-GC-10	I-GC-11	I-GC-11	I-GC-11	I-GC-11.1E	I-GC-11.1N	I-GC-11.1S	I-GC-11.1W	I-GC-12	I-GC-12	I-GC-12.1E	I-GC-12.1S
	Depth Range:	(0-0.5)	(1-2)	(3-3.5)	(3.5-4)	(0-0.5)	(3.5-4)	(3.5-4)	(0-0.5)	(0-0.5)	(1-2)	(2-3)	(0-0.5)	(0-0.5)	(0.75-1.25)	(0-0.5)	(0-0.5)	(1-2)	(0-0.5)	(0.75-1.25)
	Date Collected:	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	7/14/2005	3/1/2006	3/1/2006	3/1/2006	3/1/2006	7/14/2005	7/14/2005	3/1/2006	3/1/2006
	Sample Type:	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Surface Soil	Surface Soil	Surface Soil	Surface Soil	Boring	Boring	Surface Soil	Hand Auger
	Cleanup Levels (b)																			
Hexachlorocyclopentadiene																				
Hexachloroethane																				
Indeno(1,2,3-cd)pyrene		0.064 U	0.064 U	0.066 U	0.064 U	0.063 U	0.066 U	0.067 U	0.065 U	0.11	0.23	0.065 U	0.064 U	0.065 U	0.064 U	0.065 U	0.22	0.066 U	0.067	0.064 U
Isophorone																				
Naphthalene	140																			
Nitrobenzene																				
N-Nitrosodimethylamine																				
N-Nitroso-Di-N-Propylamine																				
N-Nitrosodiphenylamine																				
Pentachlorophenol																				
Phenanthrene	12000																			
Phenol																				
Pyrene	2400																			
Pyridine																				

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Area ID:		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Sample Name:		I-GC-12.1W	I-GC-12.2E	I-GC-12.5S	I-GC-13	I-GC-14	I-GC-14	I-GC-15	I-GC-16	I-GC-17	I-GC-17	I-GC-18	I-GC-19	I-GC-20	I-GC-20	I-GC-21	I-GC-22	I-GC-23
Depth Range:		(0-0.5)	(0-0.5)	(0.5-1)	(0-0.5)	(0-0.5)	(1-2)	(0-0.5)	(0-0.5)	(0-0.5)	(1-2)	(0-0.5)	(0-0.5)	(0-0.5)	(1-2)	(0-0.5)	(0-0.5)	(0-0.5)
Date Collected:		3/1/2006	3/10/2006	3/1/2006	7/14/2005	7/14/2005	7/14/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005
Sample Type:		Surface Soil	Surface Soil	Surface Soil	Boring	Boring	Boring	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger
	Cleanup Levels (b)																	
SVOCs (mg/kg)																		
EPA Method 8270/8270SIM																		
1,2,4-Trichlorobenzene																		
1,2-Dichlorobenzene																		
1,3-Dichlorobenzene																		
1,4-Dichlorobenzene																		
1-Methylnaphthalene	24																	
2,2'-Oxybis(1-Chloropropane)																		
2,3,4,6-Tetrachlorophenol																		
2,4,5-Trichlorophenol																		
2,4,6-Trichlorophenol																		
2,4-Dichlorophenol																		
2,4-Dimethylphenol																		
2,4-Dinitrophenol																		
2,4-Dinitrotoluene																		
2,6-Dichlorophenol																		
2,6-Dinitrotoluene																		
2-Chloronaphthalene																		
2-Chlorophenol																		
2-Methylnaphthalene	320																	
2-Methylphenol																		
2-Nitroaniline																		
2-Nitrophenol																		
3,3'-Dichlorobenzidine																		
3-Nitroaniline																		
4,6-Dinitro-2-Methylphenol																		
4-Bromophenyl-Phenylether																		
4-Chloro-3-Methylphenol																		
4-Chloroaniline																		
4-Chlorophenyl-Phenylether																		
4-Methylphenol	--																	
4-Nitroaniline																		
4-Nitrophenol																		
Acenaphthene	66																	
Acenaphthylene																		
Aniline																		
Anthracene	12000																	
Azobenzene																		
Benzidine																		
Benzo(a)anthracene		0.11	0.063 U	0.064 U	0.066 U	0.077	0.064 U	0.066 U	0.064 U	0.12	0.063 U	0.066 U	0.066 U	0.34	0.064 U	0.064 U	0.066 U	0.064 U
Benzo(a)pyrene	0.14	0.13	0.063 U	0.064 U	0.066 U	0.097	0.064 U	0.066 U	0.064 U	0.16	0.063 U	0.066 U	0.066 U	0.53	0.064 U	0.064 U	0.066 U	0.064 U
Benzo(b)fluoranthene		0.13	0.063 U	0.087	0.066 U	0.21	0.064 U	0.066 U	0.064 U	0.15	0.063 U	0.066 U	0.094	1.1	0.064 U	0.065	0.066 U	0.064 U
Benzo(g,h,i)perylene																		
Benzo(k)fluoranthene		0.096	0.063 U	0.064 U	0.066 U	0.099	0.064 U	0.066 U	0.064 U	0.072	0.063 U	0.066 U	0.066 U	0.59	0.064 U	0.064 U	0.066 U	0.064 U
Benzoic Acid	320000																	
Benzyl Alcohol																		
Benzyl butyl phthalate																		
bis(2-Chloroethoxy) Methane																		
Bis-(2-Chloroethyl) Ether																		
Bis(2-Ethylhexyl)Phthalate	4.9																	
Carbazole	50																	
Chrysene		0.14	0.063 U	0.076	0.066 U	0.18	0.064 U	0.066 U	0.064 U	0.13	0.063 U	0.066 U	0.078	0.97	0.064 U	0.064 U	0.066 U	0.064 U
Dibenz(a,h)anthracene		0.065 U	0.063 U	0.064 U	0.066 U	0.065 U	0.064 U	0.066 U	0.064 U	0.066 U	0.063 U	0.066 U	0.066 U	0.12	0.064 U	0.064 U	0.066 U	0.064 U
Dibenzofuran	160																	
Diethylphthalate																		
Dimethylphthalate																		
Di-N-Butylphthalate																		
Di-n-Octyl phthalate	1600																	
Fluoranthene	89																	
Fluorene	553																	
Hexachlorobenzene																		
Hexachlorobutadiene																		

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
	Sample Name:	I-GC-12.1W	I-GC-12.2E	I-GC-12.5S	I-GC-13	I-GC-14	I-GC-14	I-GC-15	I-GC-16	I-GC-17	I-GC-17	I-GC-18	I-GC-19	I-GC-20	I-GC-20	I-GC-21	I-GC-22	I-GC-23
	Depth Range:	(0-0.5)	(0-0.5)	(0.5-1)	(0-0.5)	(0-0.5)	(1-2)	(0-0.5)	(0-0.5)	(0-0.5)	(1-2)	(0-0.5)	(0-0.5)	(0-0.5)	(1-2)	(0-0.5)	(0-0.5)	(0-0.5)
	Date Collected:	3/1/2006	3/10/2006	3/1/2006	7/14/2005	7/14/2005	7/14/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005	8/22/2005
	Sample Type:	Surface Soil	Surface Soil	Surface Soil	Boring	Boring	Boring	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger
	Cleanup Levels (b)																	
Hexachlorocyclopentadiene																		
Hexachloroethane																		
Indeno(1,2,3-cd)pyrene		0.072	0.063 U	0.064 U	0.066 U	0.1	0.064 U	0.066 U	0.064 U	0.13	0.063 U	0.066 U	0.066 U	0.39	0.064 U	0.064 U	0.066 U	0.064 U
Isophorone																		
Naphthalene	140																	
Nitrobenzene																		
N-Nitrosodimethylamine																		
N-Nitroso-Di-N-Propylamine																		
N-Nitrosodiphenylamine																		
Pentachlorophenol																		
Phenanthrene	12000																	
Phenol																		
Pyrene	2400																	
Pyridine																		

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	I	I	I	I	I	I	I	J	J	J	J	J	J	J	J	J	J	J
	Sample Name:	I-GC-24	I-GC-24	I-GC-25	I-GC-26	I-X	I-Y	I-Z	Chamber-1	Chamber-2	Chamber-3	Chamber-4	J-GC-1 (a)	J-GC-1 (a)	J-GC-2	J-GC-3	J-GC-4	J-GC-6	J-GC-6
	Depth Range:	(1.2-6)	(6.5-7.5)	(0.5-1)	(0-0.5)								(0.5-1)	(0.5-1)	(0-0.5)	(0-0.5)	(1.5-2)	(1.1-1.6)	(2-2.7)
	Date Collected:	10/19/2005	10/19/2005	10/19/2005	10/19/2005	2/12/2004	2/12/2004	2/12/2004	8/11/2006	8/11/2006	8/11/2006	8/11/2006	1/14/2005	1/14/2005	3/2/2005	3/2/2005	3/3/2005	7/15/2005	7/15/2005
	Sample Type:	Boring	Boring	Boring	Boring	Boring	Boring	Surface Soil	Excavation	Excavation	Excavation	Excavation	Boring	Boring	Boring	Boring	Boring	Boring	Boring
	Cleanup Levels (b)																		
SVOCs (mg/kg)																			
EPA Method 8270/8270SIM																			
1,2,4-Trichlorobenzene						0.14 U	0.081 U												
1,2-Dichlorobenzene						0.14 U	0.081 U												
1,3-Dichlorobenzene						0.14 U	0.081 U												
1,4-Dichlorobenzene						0.14 U	0.081 U												
1-Methylnaphthalene	24																		
2,2'-Oxybis(1-Chloropropane)						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
2,3,4,6-Tetrachlorophenol																			
2,4,5-Trichlorophenol						0.68 U	0.41 U		0.32 U	0.33 U	0.33 U	0.33 U							
2,4,6-Trichlorophenol						0.68 U	0.41 U		0.32 U	0.33 U	0.33 U	0.33 U							
2,4-Dichlorophenol						0.41 U	0.24 U		0.32 U	0.33 U	0.33 U	0.33 U							
2,4-Dimethylphenol						0.41 U	0.24 U		0.065 U	0.066 U	0.066 U	0.066 U							
2,4-Dinitrophenol						1.4 U	0.81 U		0.65 U	0.66 U	0.66 U	0.66 U							
2,4-Dinitrotoluene						0.68 U	0.41 U		0.32 U	0.33 U	0.33 U	0.33 U							
2,6-Dichlorophenol																			
2,6-Dinitrotoluene						0.68 U	0.41 U		0.32 U	0.33 U	0.33 U	0.33 U							
2-Chloronaphthalene						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
2-Chlorophenol						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
2-Methylnaphthalene	320					2.4	0.081 U		0.13	0.61	0.066 U	0.066 U							
2-Methylphenol						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
2-Nitroaniline						0.68 U	0.41 U		0.32 U	0.33 U	0.33 U	0.33 U							
2-Nitrophenol						0.68 U	0.41 U		0.32 U	0.33 U	0.33 U	0.33 U							
3,3'-Dichlorobenzidine						0.68 U	0.41 U		0.32 U	0.33 U	0.33 U	0.33 U							
3-Nitroaniline						0.82 U	0.49 U		0.32 U	0.33 U	0.33 U	0.33 U							
4,6-Dinitro-2-Methylphenol						1.4 U	0.81 U		0.65 U	0.66 U	0.66 U	0.66 U							
4-Bromophenyl-Phenylether						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
4-Chloro-3-Methylphenol						0.27 U	0.16 U		0.32 U	0.33 U	0.33 U	0.33 U							
4-Chloroaniline						0.41 U	0.24 U		0.32 U	0.33 U	0.33 U	0.33 U							
4-Chlorophenyl-Phenylether						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
4-Methylphenol	--					0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
4-Nitroaniline						0.68 U	0.41 U		0.32 U	0.33 U	0.33 U	0.33 U							
4-Nitrophenol						0.68 U	0.41 U		0.32 U	0.33 U	0.33 U	0.33 U							
Acenaphthene	66					0.14 U	0.081 U		0.065 U	0.15	0.066 U	0.066 U							
Acenaphthylene						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
Aniline																			
Anthracene	12000					0.14 U	0.081 U		0.065 U	0.066 U	0.097	0.066 U							
Azobenzene																			
Benzidine																			
Benzo(a)anthracene		0.065 U	0.064 U	0.062 U	0.06 U	0.14 U	0.081 U	0.021					0.13 U	0.066 U	0.064 U	0.065 U	0.065 U	0.065 U	0.38 J
Benzo(a)pyrene	0.14	0.065 U	0.064 U	0.062 U	0.06 U	0.14 U	0.081 U	0.017					0.13 U	0.066 U	0.064 U	0.065 U	0.065 U	0.065 U	0.38 J
Benzo(b)fluoranthene		0.065 U	0.064 U	0.062 U	0.06 U	0.14 U	0.081 U	0.028					0.13 U	0.066 U	0.064 U	0.065 U	0.065 U	0.065 U	0.31 J
Benzo(g,h,i)perylene						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.095 U							
Benzo(k)fluoranthene		0.065 U	0.064 U	0.062 U	0.06 U	0.14 U	0.081 U	0.015					0.13 U	0.066 U	0.064 U	0.065 U	0.065 U	0.065 U	0.38 J
Benzoic Acid	320000					1.4 U	0.81 U		0.65 U	0.66 U	0.66 U	0.66 U							
Benzyl Alcohol						0.68 U	0.41 U		0.32 U	0.33 U	0.33 U	0.33 U							
Benzyl butyl phthalate						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
bis(2-Chloroethoxy) Methane						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
Bis-(2-Chloroethyl) Ether						0.27 U	0.16 U		0.065 U	0.066 U	0.066 U	0.066 U							
Bis(2-Ethylhexyl)Phthalate	4.9					0.14 U	0.081 U		0.065 U	0.066 U	0.15	0.072							
Carbazole	50					0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
Chrysene		0.078	0.064 U	0.062 U	0.06 U	0.14 U	0.081 U	0.031					0.13 U	0.74	0.064 U	0.065 U	0.065 U	0.065 U	0.35 J
Dibenz(a,h)anthracene		0.065 U	0.064 U	0.062 U	0.06 U	0.14 U	0.081 U	0.0087 U					0.13 U	0.066 U	0.064 U	0.065 U	0.065 U	0.065 U	0.064 UJ
Dibenzofuran	160					0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
Diethylphthalate						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
Dimethylphthalate						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
Di-N-Butylphthalate						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
Di-n-Octyl phthalate	1600					0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
Fluoranthene	89					0.14 U	0.081 U		0.065 U	0.066 U	0.099	0.091							
Fluorene	553					0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
Hexachlorobenzene						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
Hexachlorobutadiene						0.27 U	0.16 U												

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	I	I	I	I	I	I	I	J	J	J	J	J	J	J	J	J	J	J
	Sample Name:	I-GC-24	I-GC-24	I-GC-25	I-GC-26	I-X	I-Y	I-Z	Chamber-1	Chamber-2	Chamber-3	Chamber-4	J-GC-1 (a)	J-GC-1 (a)	J-GC-2	J-GC-3	J-GC-4	J-GC-6	J-GC-6
	Depth Range:	(1.2-6)	(6.5-7.5)	(0.5-1)	(0-0.5)								(0.5-1)	(0.5-1)	(0-0.5)	(0-0.5)	(1.5-2)	(1.1-1.6)	(2-2.7)
	Date Collected:	10/19/2005	10/19/2005	10/19/2005	10/19/2005	2/12/2004	2/12/2004	2/12/2004	8/11/2006	8/11/2006	8/11/2006	8/11/2006	1/14/2005	1/14/2005	3/2/2005	3/2/2005	3/3/2005	7/15/2005	7/15/2005
	Sample Type:	Boring	Boring	Boring	Boring	Boring	Boring	Surface Soil	Excavation	Excavation	Excavation	Excavation	Boring	Boring	Boring	Boring	Boring	Boring	Boring
	Cleanup Levels (b)																		
Hexachlorocyclopentadiene						0.68 U	0.41 U		0.32 U	0.33 U	0.33 U	0.33 U							
Hexachloroethane						0.27 U	0.16 U		0.065 U	0.066 U	0.066 U	0.066 U							
Indeno(1,2,3-cd)pyrene		0.065 U	0.064 U	0.062 U	0.06 U	0.14 U	0.081 U	0.01					0.13 U	0.066 U	0.064 U	0.065 U	0.065 U	0.065 U	0.15 J
Isophorone						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
Naphthalene	140					0.24	0.081 U												
Nitrobenzene						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
N-Nitrosodimethylamine																			
N-Nitroso-Di-N-Propylamine						0.27 U	0.16 U		0.32 U	0.33 U	0.33 U	0.33 U							
N-Nitrosodiphenylamine						0.14 U	0.081 U		0.065 U	0.066 U	0.066 U	0.066 U							
Pentachlorophenol						0.68 U	0.41 U		0.32 U	0.33 U	0.33 U	0.33 U							
Phenanthrene	12000					1.2	0.081 U		0.065 U	0.066 U	0.076	0.11							
Phenol						0.27 U	0.16 U		0.065 U	0.066 U	0.066 U	0.066 U							
Pyrene	2400					0.16	0.081 U		0.065 U	0.066 U	0.07	0.082							
Pyridine																			

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Area ID:		J	J	J	J	J	J	J	M	M	M	M	M	M	M	M	M	M	M	M
Sample Name:		J-GC-6	J-GC-7	J-GC-8	J-GC-9	J-GC-10	J-MSRC	KFI-WP-Comp	ECI-N-1	M-1	M-2	M-2	M-2B	M-2D	M-2.1S	M-2.1W	M-3	M-4	M-GC-1	M-GC-2
Depth Range:		(3.1-4.1)	(0.7-1.2)	(2.1-2.6)	(1.4-1.9)	(0-0.5)				(0.3-0.8)	(1.5-2)	(2-3)	(1-1.5)	(0.9-1.4)	(1-1.5)	(1-1.5)	(0-0.5)	(0.8-1.3)	(1.6-2.1)	(1.5-2)
Date Collected:		7/15/2005	7/15/2005	7/15/2005	7/15/2005	7/14/2005	5/23/2007	9/30/1993	10/7/1991	1/18/2005	1/18/2005	1/18/2005	7/15/2005	7/15/2005	3/1/2006	3/1/2006	1/18/2005	1/17/2005	3/3/2005	3/2/2005
Sample Type:		Boring	Boring	Boring	Boring	Boring	Excavation	Stock Pile	Surface Soil	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring
	Cleanup Levels (b)																			
SVOCs (mg/kg)																				
EPA Method 8270/8270SIM																				
1,2,4-Trichlorobenzene							50 U	2.3 U												
1,2-Dichlorobenzene							50 U	2.3 U	0.005 U											
1,3-Dichlorobenzene							50 U	2.3 U	0.005 U											
1,4-Dichlorobenzene							50 U	2.3 U	0.005 U											
1-Methylnaphthalene	24						50 U													
2,2'-Oxybis(1-Chloropropane)							50 U	2.3 U												
2,3,4,6-Tetrachlorophenol							125 U													
2,4,5-Trichlorophenol							50 U	12 U												
2,4,6-Trichlorophenol							50 U	2.3 U												
2,4-Dichlorophenol							50 U	2.3 U												
2,4-Dimethylphenol							50 U	2.3 U												
2,4-Dinitrophenol							250 U	12 U												
2,4-Dinitrotoluene							125 U	2.3 U												
2,6-Dichlorophenol							50 U													
2,6-Dinitrotoluene							125 U	2.3 U												
2-Chloronaphthalene							50 U	2.3 U												
2-Chlorophenol							50 U	2.3 U												
2-Methylnaphthalene	320						50 U	8.8												
2-Methylphenol							50 U	2.3 U												
2-Nitroaniline							125 U	12 U												
2-Nitrophenol							125 U	2.3 U												
3,3'-Dichlorobenzidine							50 U	4.8 U												
3-Nitroaniline							125 U	12 U												
4,6-Dinitro-2-Methylphenol							125 U	12 U												
4-Bromophenyl-Phenylether							50 U	2.3 U												
4-Chloro-3-Methylphenol							50 U	2.3 U												
4-Chloroaniline							50 U	2.3 U												
4-Chlorophenyl-Phenylether							50 U	2.3 U												
4-Methylphenol	--						50 U	2.3 U												
4-Nitroaniline							125 U	12 U												
4-Nitrophenol							250 U	12 U												
Acenaphthene	66						50 U	2.3 U												
Acenaphthylene							50 U	2.3 U												
Aniline							50 U	2.3 U												
Anthracene	12000						50 U	2.3 U												
Azobenzene							50 U													
Benzidine								23 U												
Benzo(a)anthracene		0.064 UJ	0.066 U	0.066 U	0.064 U	0.064 U	50 U	2.3 U		0.066 U	0.13	0.064 UJ	0.064 U	0.065 U	0.064 U	0.064 U	0.064 U	0.062 UJ	0.063 U	0.062 U
Benzo(a)pyrene	0.14	0.064 UJ	0.066 U	0.066 U	0.064 U	0.064 U	50 U	2.3 U		0.066 U	0.18	0.064 UJ	0.064 U	0.065 U	0.064 U	0.064 U	0.064 U	0.062 UJ	0.063 U	0.062 U
Benzo(b)fluoranthene		0.064 UJ	0.066 U	0.066 U	0.064 U	0.069	50 U	2.3 U		0.066 U	0.12	0.064 UJ	0.064 U	0.065 U	0.064 U	0.064 U	0.064 U	0.062 UJ	0.063 U	0.062 U
Benzo(g,h,i)perylene							50 U	2.3 U												
Benzo(k)fluoranthene		0.064 UJ	0.066 U	0.066 U	0.064 U	0.064 U	50 U	2.3 U		0.066 U	0.12	0.064 UJ	0.064 U	0.065 U	0.064 U	0.064 U	0.064 U	0.062 UJ	0.063 U	0.062 U
Benzoic Acid	320000						500 U	12 U												
Benzyl Alcohol							50 U	2.3 U												
Benzyl butyl phthalate							50 U	2.3 U												
bis(2-Chloroethoxy) Methane							50 U	2.3 U												
Bis-(2-Chloroethyl) Ether							50 U	2.3 U												
Bis(2-Ethylhexyl)Phthalate	4.9						65 U	1.4 J												
Carbazole	50						50 U													
Chrysene		0.064 UJ	0.066 U	0.066 U	0.064 U	0.064 U	69	2.3 U		0.066 U	0.21	0.064 UJ	0.064 U	0.065 U	0.064 U	0.064 U	0.064 U	0.062 UJ	0.063 U	0.062 U
Dibenz(a,h)anthracene		0.064 UJ	0.066 U	0.066 U	0.064 U	0.064 U	50 U	2.3 U		0.066 U	0.064	0.064 UJ	0.064 U	0.065 U	0.064 U	0.064 U	0.064 U	0.062 UJ	0.063 U	0.062 U
Dibenzofuran	160						50 U	2.3 U												
Diethylphthalate							50 U	2.3 U												
Dimethylphthalate							50 U	2.3 U												
Di-N-Butylphthalate							65 U	2.3 U												
Di-n-Octyl phthalate	1600						50 U	2.3 U												
Fluoranthene	89						50 U	2.3 U												
Fluorene	553						50 U	1.6 J												
Hexachlorobenzene							50 U	2.3 U												
Hexachlorobutadiene							50 U	2.3 U												

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	J	J	J	J	J	J	J	M	M	M	M	M	M	M	M	M	M	M	M
	Sample Name:	J-GC-6	J-GC-7	J-GC-8	J-GC-9	J-GC-10	J-MSRC	KFI-WP-Comp	ECI-N-1	M-1	M-2	M-2	M-2B	M-2D	M-2.1S	M-2.1W	M-3	M-4	M-GC-1	M-GC-2
	Depth Range:	(3.1-4.1)	(0.7-1.2)	(2.1-2.6)	(1.4-1.9)	(0-0.5)				(0.3-0.8)	(1.5-2)	(2-3)	(1-1.5)	(0.9-1.4)	(1-1.5)	(1-1.5)	(0-0.5)	(0.8-1.3)	(1.6-2.1)	(1.5-2)
	Date Collected:	7/15/2005	7/15/2005	7/15/2005	7/15/2005	7/14/2005	5/23/2007	9/30/1993	10/7/1991	1/18/2005	1/18/2005	1/18/2005	7/15/2005	7/15/2005	3/1/2006	3/1/2006	1/18/2005	1/17/2005	3/3/2005	3/2/2005
	Sample Type:	Boring	Boring	Boring	Boring	Boring	Excavation	Stock Pile	Surface Soil	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Boring
	Cleanup Levels (b)																			
Hexachlorocyclopentadiene							250 U	2.3 U												
Hexachloroethane							50 U	2.3 U												
Indeno(1,2,3-cd)pyrene		0.064 UJ	0.066 U	0.066 U	0.064 U	0.064 U	50 U	2.3 U		0.066 U	0.095	0.064 UJ	0.064 U	0.065 U	0.064 U	0.064 U	0.064 U	0.062 UJ	0.063 U	0.062 U
Isophorone							50 U	2.3 U												
Naphthalene	140						50 U	1.8 J												
Nitrobenzene							50 U	2.3 U												
N-Nitrosodimethylamine							50 U	2.3 U												
N-Nitroso-Di-N-Propylamine							50 U	2.3 U												
N-Nitrosodiphenylamine							250 U	2.3 U												
Pentachlorophenol							250 U	2.3 U												
Phenanthrene	12000						50 U	3.4												
Phenol							50 U	2.3 U												
Pyrene	2400						84	2.3 U												
Pyridine							100 U													

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	M	M	M
	Sample Name:	M-GC-3	M-GC-4	M-GC-5
	Depth Range:	(1-1.5)	(1.5-2)	(1-1.5)
	Date Collected:	3/3/2005	3/2/2005	3/2/2005
	Sample Type:	Boring	Boring	Boring
	Cleanup Levels (b)			
SVOCs (mg/kg)				
EPA Method 8270/8270SIM				
1,2,4-Trichlorobenzene				
1,2-Dichlorobenzene				
1,3-Dichlorobenzene				
1,4-Dichlorobenzene				
1-Methylnaphthalene	24			
2,2'-Oxybis(1-Chloropropane)				
2,3,4,6-Tetrachlorophenol				
2,4,5-Trichlorophenol				
2,4,6-Trichlorophenol				
2,4-Dichlorophenol				
2,4-Dimethylphenol				
2,4-Dinitrophenol				
2,4-Dinitrotoluene				
2,6-Dichlorophenol				
2,6-Dinitrotoluene				
2-Chloronaphthalene				
2-Chlorophenol				
2-Methylnaphthalene	320			
2-Methylphenol				
2-Nitroaniline				
2-Nitrophenol				
3,3'-Dichlorobenzidine				
3-Nitroaniline				
4,6-Dinitro-2-Methylphenol				
4-Bromophenyl-Phenylether				
4-Chloro-3-Methylphenol				
4-Chloroaniline				
4-Chlorophenyl-Phenylether				
4-Methylphenol	--			
4-Nitroaniline				
4-Nitrophenol				
Acenaphthene	66			
Acenaphthylene				
Aniline				
Anthracene	12000			
Azobenzene				
Benzidine				
Benzo(a)anthracene		0.065 U	0.065 U	0.064 U
Benzo(a)pyrene	0.14	0.065 U	0.065 U	0.064 U
Benzo(b)fluoranthene		0.065 U	0.065 U	0.064 U
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene		0.065 U	0.065 U	0.064 U
Benzoic Acid	320000			
Benzyl Alcohol				
Benzyl butyl phthalate				
bis(2-Chloroethoxy) Methane				
Bis-(2-Chloroethyl) Ether				
Bis(2-Ethylhexyl)Phthalate	4.9			
Carbazole	50			
Chrysene		0.065 U	0.065 U	0.064 U
Dibenz(a,h)anthracene		0.065 U	0.065 U	0.064 U
Dibenzofuran	160			
Diethylphthalate				
Dimethylphthalate				
Di-N-Butylphthalate				
Di-n-Octyl phthalate	1600			
Fluoranthene	89			
Fluorene	553			
Hexachlorobenzene				
Hexachlorobutadiene				

TABLE A-11
SVOCS IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	M	M	M
	Sample Name:	M-GC-3	M-GC-4	M-GC-5
	Depth Range:	(1-1.5)	(1.5-2)	(1-1.5)
	Date Collected:	3/3/2005	3/2/2005	3/2/2005
	Sample Type:	Boring	Boring	Boring
	Cleanup Levels (b)			
Hexachlorocyclopentadiene				
Hexachloroethane				
Indeno(1,2,3-cd)pyrene		0.065 U	0.065 U	0.064 U
Isophorone				
Naphthalene	140			
Nitrobenzene				
N-Nitrosodimethylamine				
N-Nitroso-Di-N-Propylamine				
N-Nitrosodiphenylamine				
Pentachlorophenol				
Phenanthrene	12000			
Phenol				
Pyrene	2400			
Pyridine				

U = the analyte was not detected in the sample at the given reporting limit.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
Shaded cells indicate an exceedance of the site cleanup levels.

(a) Sample analyzed using both EPA Method 8270SIM and standard EPA Method 8270. Lower reporting limits achieved using EPA Method 8270SIM.
(b) Development of the cleanup levels is presented in Table 9 of the work plan.

TABLE A-12
PCBs in CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	G	G	G	J	J	J	J	J	J	J	J	J	I	I	I	I
	Sample Name:	G-3	PZ-10 (a)	STOCKPILE	Chamber-1	Chamber-2	Chamber-3	Chamber-4	J-MSRC	KFI-WP01	KFI-WP02	KFI-WP03	KFI-WP04	ECI-G-1	I-X	I-Y	I2-WP
	Depth Range:	(3-3)	(3-3)											(0-0.5)			(1.5-2.5)
	Date Collected:	2/11/2004	2/11/2004	11/12/2004	8/11/2006	8/11/2006	8/11/2006	8/11/2006	5/23/2007	9/30/1993	9/30/1993	9/30/1993	9/30/1993	7/9/1987	2/12/2004	2/12/2004	5/8/2006
	Sample Type:	Boring	Boring	Stock Pile	Excavation	Excavation	Excavation	Excavation	Excavation	Stock Pile	Stock Pile	Stock Pile	Stock Pile	Surface Soil	Boring	Boring	boring
	Cleanup Screening Levels (b)																
PCBs (mg/kg) SW8082																	
Aroclor 1016		0.047 U	0.036 UJ	0.024 UJ	0.033 U	0.032 U	0.033 U	0.032 U	0.1 U	1.4 U	2.8 U	1.5 U	2.4 U		0.067 U	0.04 U	0.033 U
Aroclor 1221		0.047 U	0.036 U	0.024 UJ	0.033 U	0.032 U	0.033 U	0.032 U	0.1 U	1.4 U	2.8 U	1.5 U	2.4 U		0.067 U	0.04 U	0.033 U
Aroclor 1232		0.047 U	0.036 U	0.024 UJ	0.033 U	0.032 U	0.033 U	0.032 U	0.1 U	1.4 U	2.8 U	1.5 U	2.4 U		0.067 U	0.04 U	0.033 U
Aroclor 1242		0.047 U	0.036 U	0.024 UJ	0.033 U	0.032 U	0.033 U	0.032 U	0.1 U	1.4 U	2.8 U	1.5 U	2.4 U		0.067 U	0.04 U	0.033 U
Aroclor 1248		0.047 U	0.036 U	0.095 J	0.033 U	0.032 U	0.033 U	0.032 U	0.1 U	1.4 U	2.8 U	1.5 U	2.4 U		0.067 U	0.04 U	0.033 U
Aroclor 1254	1	0.110	0.036 U	0.14 J	0.033 U	0.032 U	0.033 U	0.032 U	0.1 U	1.4 U	2.8 U	1.5 U	2.4 U		0.067 U	0.04 U	0.033 U
Aroclor 1260		0.094 U	0.036 U	0.061 J	0.033 U	0.032 U	0.033 U	0.032 U	0.1 U	1.4 U	2.8 U	1.5 U	2.4 U		0.067 U	0.04 U	0.033 U
Total PCBs	1	0.110	0.036 U	0.296	0.033 U	0.032 U	0.033 U	0.032 U	0.1 U	1.4 U	2.8 U	1.5 U	2.4 U	1 U	0.067 U	0.04 U	0.033 U

U = the analyte was not detected in the sample at the given reporting limit.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
Shaded cells indicate an exceedance of the site cleanup levels.

(a) PZ-10 is located at P-10. PZ-10 was taken during the drilling for the P-10 monitoring well.
(b) Development of the cleanup levels is presented in Table 9 of the work plan.

TABLE A-13
cPAHs IN CHARACTERIZATION WATER SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

				cPAHs (µg/L) SW8270/8270SIM							
				Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	cPAH TEQ
			Cleanup Screening Levels (a)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Sample Name	Date Collected	Area ID	Sample Type								
G-1	12/22/2003	G	Boring	0.019	0.018	0.012	0.012	0.025	0.011 U	0.011 U	0.02255
G-2	12/22/2003	G	Boring	0.042	0.052	0.034	0.034	0.059	0.012	0.031	0.06789
G-3	2/11/2004	G	Boring	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
G-FA-4 (b)	1/20/2005	G	Boring	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	1/20/2005	G	Boring	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
G-FA-7(b)	1/20/2005	G	Boring	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	1/20/2005	G	Boring	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
P10	2/18/2004	G	Monitoring Well	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
P11	2/19/2004	I	Monitoring Well	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
P12	2/19/2004	I	Monitoring Well	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
J-1	2/12/2004	J	Boring	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
J-2	2/12/2004	J	Boring	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U

U = the analyte was not detected in the sample at the given reporting limit.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.

(a) Development of the cleanup levels is presented in Table 8 of the work plan.
(b) Sample analyzed using both EPA Method 8270SIM and standard EPA Method 8270. Lower reporting limits achieved using EPA Method 8270SIM.

TABLE A-14
SVOCS IN CHARACTERIZATION GROUNDWATER SAMPLES
INTERIM ACTION REPORT -
AMERON HULBERT SITE ORT OF EVERETT, WASHINGTON

Area ID:		G	G	G	G	G	G	G	G	G	G	I	I	J	J
Sample Name:		ECI-D-1	ECI-MW-2	G-1	G-2	G-3	G-FA-4 (a)	G-FA-4 (a)	G-FA-7 (a)	G-FA-7 (a)	P10	P11	P12	J-1	J-2
Date Collected:		10/7/1991	10/7/1991	12/22/2003	12/22/2003	2/11/2004	1/20/2005	1/20/2005	1/20/2005	1/20/2005	2/18/2004	2/19/2004	2/19/2004	2/12/2004	2/12/2004
Sample Type:		Concrete Settling Basin Sump	Monitoring Well	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Monitoring Well	Monitoring Well	Monitoring Well	Boring	Boring
	Cleanup Screening Levels (b)														
SVOCs (µg/L)															
EPA Method 8270/8270SIM															
1,2,4-Trichlorobenzene				0.5 U	0.5 U	1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
1,2-Dichlorobenzene		1 U	1 U	0.2 U	0.2 U	1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
1,3-Dichlorobenzene		1 U	1 U	0.2 U	0.2 U	1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
1,4-Dichlorobenzene		1 U	1 U	0.2 U	0.2 U	1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
2,2'-Oxybis(1-Chloropropane)						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
2,4,5-Trichlorophenol						5.6 U	5 U		5 U			5.2 U	5.3 U	5.6 U	5.5 U
2,4,6-Trichlorophenol						5.6 U	5 U		5 U			5.2 U	5.3 U	5.6 U	5.5 U
2,4-Dichlorophenol						3.4 U	5 U		5 U			3.1 U	3.2 U	3.3 U	3.3 U
2,4-Dimethylphenol						3.4 U	1 U		1 U			3.1 U	3.2 U	3.3 U	3.3 U
2,4-Dinitrophenol						28 U	10 U		10 U			26 U	26 U	28 U	27 U
2,4-Dinitrotoluene						5.6 U	5 U		5 U			5.2 U	5.3 U	5.6 U	5.5 U
2,6-Dinitrotoluene						5.6 U	5 U		5 U			5.2 U	5.3 U	5.6 U	5.5 U
2-Chloronaphthalene						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
2-Chlorophenol						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
2-Methylnaphthalene	--					1.1 U	1.5		1 U			1 U	1.1 U	1.1 U	1.1 U
2-Methylphenol						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
2-Nitroaniline						5.6 U	5 U		5 U			5.2 U	5.3 U	5.6 U	5.5 U
2-Nitrophenol						5.6 U	5 U		5 U			5.2 U	5.3 U	5.6 U	5.5 U
3,3'-Dichlorobenzidine						5.6 U	5 U		5 U			5.2 U	5.3 U	5.6 U	5.5 U
3-Nitroaniline						6.7 U	5 U		5 U			6.2 U	6.3 U	6.7 U	6.6 U
4,6-Dinitro-2-Methylphenol						17 U	10 U		10 U			16 U	16 U	17 U	16 U
4-Bromophenyl-phenylether						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
4-Chloro-3-methylphenol						2.2 U	5 U		5 U			2.1 U	2.1 U	2.2 U	2.2 U
4-Chloroaniline						3.4 U	5 U		5 U			3.1 U	3.2 U	3.3 U	3.3 U
4-Chlorophenyl-phenylether						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
4-Methylphenol						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
4-Nitroaniline						5.6 U	5 U		5 U			5.2 U	5.3 U	5.6 U	5.5 U
4-Nitrophenol						5.6 U	5 U		5 U			5.2 U	5.3 U	5.6 U	5.5 U
Acenaphthene						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Acenaphthylene						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Anthracene						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Benzo(a)anthracene	0.1			0.019	0.042	1.1 U	1 U	0.1 U	1 U	0.1 U	0.01 UJ	1 U	1.1 U	1.1 U	1.1 U
Benzo(a)pyrene	0.1			0.018	0.052	1.1 U	1 U	0.1 U	1 U	0.1 U	0.01 UJ	1 U	1.1 U	1.1 U	1.1 U
Benzo(b)fluoranthene	0.1			0.012	0.034	1.1 U	1 U	0.1 U	1 U	0.1 U	0.01 UJ	1 U	1.1 U	1.1 U	1.1 U
Benzo(g,h,i)perylene						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Benzo(k)fluoranthene	0.1			0.012	0.034	1.1 U	1 U	0.1 U	1 U	0.1 U	0.01 UJ	1 U	1.1 U	1.1 U	1.1 U
Benzoic Acid						11 U	10 U		10 U			10 U	11 U	11 U	11 U
Benzyl Alcohol						5.6 U	5 U		5 U			5.2 U	5.3 U	5.6 U	5.5 U
Benzyl butyl phthalate						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
bis(2-Chloroethoxy) Methane						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Bis-(2-Chloroethyl) Ether						2.2 U	1 U		1 U			2.1 U	2.1 U	2.2 U	2.2 U
bis(2-Ethylhexyl)phthalate	2.2					1.1 U	2.2 U		26			1 U	1.1 U	1.1 U	1.1 U
Carbazole						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Chrysene	0.1			0.025	0.059	1.1 U	1 U	0.1 U	1 U	0.1 U	0.01 UJ	1 U	1.1 U	1.1 U	1.1 U
Dibenz(a,h)anthracene	0.1			0.011 U	0.012	1.1 U	1 U	0.1 U	1 U	0.1 U	0.01 UJ	1 U	1.1 U	1.1 U	1.1 U
Dibenzofuran						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Diethylphthalate						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Dimethylphthalate						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Di-n-Butylphthalate						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Di-n-Octyl phthalate						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Fluoranthene						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Fluorene						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Hexachlorobenzene						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Hexachlorobutadiene				0.5 U	0.5 U	2.2 U	1 U		1 U			2.1 U	2.1 U	2.2 U	2.2 U
Hexachlorocyclopentadiene						5.6 U	5 U		5 U			5.2 U	5.3 U	5.6 U	5.5 U

TABLE A-14
SVOCS IN CHARACTERIZATION GROUNDWATER SAMPLES
INTERIM ACTION REPORT -
AMERON HULBERT SITE ORT OF EVERETT, WASHINGTON

Area ID:		G	G	G	G	G	G	G	G	G	G	I	I	J	J
Sample Name:		ECI-D-1	ECI-MW-2	G-1	G-2	G-3	G-FA-4 (a)	G-FA-4 (a)	G-FA-7 (a)	G-FA-7 (a)	P10	P11	P12	J-1	J-2
Date Collected:		10/7/1991	10/7/1991	12/22/2003	12/22/2003	2/11/2004	1/20/2005	1/20/2005	1/20/2005	1/20/2005	2/18/2004	2/19/2004	2/19/2004	2/12/2004	2/12/2004
Sample Type:		Concrete Settling Basin Sump	Monitoring Well	Boring	Boring	Boring	Boring	Boring	Boring	Boring	Monitoring Well	Monitoring Well	Monitoring Well	Boring	Boring
	Cleanup Screening Levels (b)														
Hexachloroethane						2.2 U	1 U		1 U			2.1 U	2.1 U	2.2 U	2.2 U
Indeno(1,2,3-cd)pyrene	0.1			0.011 U	0.031	1.1 U	1 U	0.1 U	1 U	0.1 U	0.01 UJ	1 U	1.1 U	1.1 U	1.1 U
Isophorone						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Naphthalene	4900			0.5 U	0.5 U	1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Nitrobenzene						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
N-Nitroso-Di-N-Propylamine						2.2 U	5 U		5 U			2.1 U	2.1 U	2.2 U	2.2 U
N-Nitrosodiphenylamine						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Pentachlorophenol						5.6 U	5 U		5 U			5.2 U	5.3 U	5.6 U	5.5 U
Phenanthrene						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U
Phenol						2.2 U	1 U		1 U			2.1 U	2.1 U	2.2 U	2.2 U
Pyrene						1.1 U	1 U		1 U			1 U	1.1 U	1.1 U	1.1 U

TABLE A-14
SVOCS IN CHARACTERIZATION GROUNDWATER SAMPLES
INTERIM ACTION REPORT -
AMERON HULBERT SITE ORT OF EVERETT, WASHINGTON

	Area ID:	M	M	M	M	M
	Sample Name:	ECI-MW-3	M-1	M-2	M-3	M-4
	Date Collected:	10/7/1991	1/18/2005	1/18/2005	1/18/2005	1/17/2005
	Sample Type:	Monitoring Well	Boring	Boring	Boring	Boring
	Cleanup Screening Levels (b)					
SVOCs (µg/L)						
EPA Method 8270/8270SIM						
1,2,4-Trichlorobenzene			5 U	5 U	5 U	5 U
1,2-Dichlorobenzene		1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene		1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene		1 U	1 U	1 U	1 U	1 U
2,2'-Oxybis(1-Chloropropane)						
2,4,5-Trichlorophenol						
2,4,6-Trichlorophenol						
2,4-Dichlorophenol						
2,4-Dimethylphenol						
2,4-Dinitrophenol						
2,4-Dinitrotoluene						
2,6-Dinitrotoluene						
2-Chloronaphthalene						
2-Chlorophenol						
2-Methylnaphthalene	--					
2-Methylphenol						
2-Nitroaniline						
2-Nitrophenol						
3,3'-Dichlorobenzidine						
3-Nitroaniline						
4,6-Dinitro-2-Methylphenol						
4-Bromophenyl-phenylether						
4-Chloro-3-methylphenol						
4-Chloroaniline						
4-Chlorophenyl-phenylether						
4-Methylphenol						
4-Nitroaniline						
4-Nitrophenol						
Acenaphthene						
Acenaphthylene						
Anthracene						
Benzo(a)anthracene	0.1					
Benzo(a)pyrene	0.1					
Benzo(b)fluoranthene	0.1					
Benzo(g,h,i)perylene						
Benzo(k)fluoranthene	0.1					
Benzoic Acid						
Benzyl Alcohol						
Benzyl butyl phthalate						
bis(2-Chloroethoxy) Methane						
Bis-(2-Chloroethyl) Ether						
bis(2-Ethylhexyl)phthalate	2.2					
Carbazole						
Chrysene	0.1					
Dibenz(a,h)anthracene	0.1					
Dibenzofuran						
Diethylphthalate						
Dimethylphthalate						
Di-n-Butylphthalate						
Di-n-Octyl phthalate						
Fluoranthene						
Fluorene						
Hexachlorobenzene						
Hexachlorobutadiene			5 U	5 U	5 U	5 U
Hexachlorocyclopentadiene						

TABLE A-14
SVOCS IN CHARACTERIZATION GROUNDWATER SAMPLES
INTERIM ACTION REPORT -
AMERON HULBERT SITE ORT OF EVERETT, WASHINGTON

	Area ID:	M	M	M	M	M
	Sample Name:	ECI-MW-3	M-1	M-2	M-3	M-4
	Date Collected:	10/7/1991	1/18/2005	1/18/2005	1/18/2005	1/17/2005
	Sample Type:	Monitoring Well	Boring	Boring	Boring	Boring
	Cleanup Screening Levels (b)					
Hexachloroethane						
Indeno(1,2,3-cd)pyrene	0.1					
Isophorone						
Naphthalene	4900		5 U	5 U	5 U	5 U
Nitrobenzene						
N-Nitroso-Di-N-Propylamine						
N-Nitrosodiphenylamine						
Pentachlorophenol						
Phenanthrene						
Phenol						
Pyrene						

U = the analyte was not detected in the sample at the given reporting limit.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.

(a) Sample analyzed using both EPA Method 8270SIM and standard EPA Method 8270;
Lower reporting limits achieved using EPA Method 8270SIM
(b) Development of the cleanup levels is presented in Table 8 of the work plan.

TABLE A-15
CATCH BASIN SEDIMENT SAMPLE RESULTS
INTERIM ACTION REPORT - AMERON HULBERT SITE PORT OF EVERETT, WASHINGTON

			Area ID:	G
			Sample Name:	CB-3
			Date Collected:	3/26/2008
			Sample Type:	Stormwater Catch Basin
		SMS Crieria		
	TCLP (a)	SQS (b)	CSL (c)	
TOTAL METALS (mg/kg)				
Method 6010/7470/200.8				
Antimony				300
Arsenic		57	93	1,700
Beryllium		--	--	0.4
Cadmium		5.1	6.7	10.2
Chromium		260	270	338
Copper		390	390	1,700
Lead		450	530	1,510
Mercury		0.41	0.59	0.08
Nickel		--	--	185
Selenium		--	--	1.3
Silver		6.1	6.1	3
Thallium		--	--	0.7
Zinc		410	960	8,110
TCLP METALS (mg/L)				
Method 6010B				
Arsenic	5.0			2.0
Lead	5.0			0.6
SEMIVOLATILES (µg/kg)				
SW8270				
Phenol				260 U
Bis-(2-Chloroethyl) Ether				260 U
2-Chlorophenol				260 U
1,3-Dichlorobenzene				260 U
1,4-Dichlorobenzene				260 U
Benzyl Alcohol				1,300 U
1,2-Dichlorobenzene				260 U
2-Methylphenol				260 U
2,2'-Oxybis(1-Chloropropane)				260 U
4-Methylphenol				260 U
N-Nitroso-Di-N-Propylamine				1,300 U
Hexachloroethane				260 U
Nitrobenzene				260 U
Isophorone				260 U
2-Nitrophenol				1,300 U
2,4-Dimethylphenol				260 U
Benzoic Acid				2,600 U
bis(2-Chloroethoxy) Methane				260 U
2,4-Dichlorophenol				1,300 U
1,2,4-Trichlorobenzene				260 U
Naphthalene				260 U
4-Chloroaniline				1,300 U
Hexachlorobutadiene				260 U
4-Chloro-3-methylphenol				1,300 U
2-Methylnaphthalene				260 U
Hexachlorocyclopentadiene				1,300 U
2,4,6-Trichlorophenol				1,300 U
2,4,5-Trichlorophenol				1,300 U
2-Chloronaphthalene				260 U

TABLE A-15
CATCH BASIN SEDIMENT SAMPLE RESULTS
INTERIM ACTION REPORT - AMERON HULBERT SITE PORT OF EVERETT, WASHINGTON

			Area ID:	G
			Sample Name:	CB-3
			Date Collected:	3/26/2008
			Sample Type:	Stormwater Catch Basin
		SMS Crieria		
	TCLP (a)	SQS (b)	CSL (c)	
2-Nitroaniline				1,300 U
Dimethylphthalate				260 U
Acenaphthylene				260 U
3-Nitroaniline				1,300 U
Acenaphthene				260 U
2,4-Dinitrophenol				2,600 U
4-Nitrophenol				1,300 U
Dibenzofuran				260 U
2,6-Dinitrotoluene				1,300 U
2,4-Dinitrotoluene				1,300 U
Diethylphthalate				260 U
4-Chlorophenyl-phenylether				260 U
Fluorene				260 U
4-Nitroaniline				1,300 U
4,6-Dinitro-2-Methylphenol				2,600 U
N-Nitrosodiphenylamine				260 U
4-Bromophenyl-phenylether				260 U
Hexachlorobenzene				260 U
Pentachlorophenol				1,300 U
Phenanthrene		100000	480000	340
Carbazole				260 U
Anthracene				260 U
Di-n-Butylphthalate				260 U
Fluoranthene		160000	1200000	440
Pyrene		1000000	1400000	510
Butylbenzylphthalate				260 U
3,3'-Dichlorobenzidine				1,300 U
Benzo(a)anthracene				260 U
bis(2-Ethylhexyl)phthalate		47000	78000	10,000
Chrysene		110000	460000	280
Di-n-Octyl phthalate		58000	4500000	700
Benzo(b)fluoranthene		230000	450000	270
Benzo(k)fluoranthene				260 U
Benzo(a)pyrene				260 U
Indeno(1,2,3-cd)pyrene				260 U
Dibenz(a,h)anthracene				260 U
Benzo(g,h,i)perylene				260 U
1-Methylnaphthalene				260 U
NWTPH-DxSG (mg/kg)				
Diesel-Range Hydrocarbons		--	--	1,800
Motor Oil		--	--	3,000

Shaded value indicates exceedance of SQS
Boxed value indicates exceedance of CSL
U = the analyte was not detected in the sample at the given reporting limit.

(a) TCLP Dangerous Waste Criteria. Maximum concentration of contaminants for the toxicity characteristics as set forth in WAC 173-303-090.
(b) SMS Sediment Quality Standard (Chapter 173-204 WAC).
(c) CSL Cleanup Screening Level (Chapter 173-204 WAC).

TABLE A-16
FAILED COMPLIANCE MONITORING SAMPLE RESULTS - REPRESENTING SOIL REMOVED
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	G		G	
	Sample Name:	G1-B4		G1-B9	
	Depth Range:				
	Date Collected:	6/30/2006		9/19/2006	
	Sample Type:	Excavation		Excavation	
	Cleanup Levels (a)				
NWTPH-Dx (mg/kg)					
Diesel-Range Organics	2000	19			
Lube Oil	2000	43			
Metals (mg/kg)					
SW6000-7000 Series					
Arsenic	20	430		64	
Barium	1650				
Cadmium	80	1.1		0.4	
Chromium	120000	47		34.3	
Copper	36	454		70.5	
Lead	250	400		61	
Mercury	24	0.05	U	0.04	U
Selenium	400				
Silver	400				
Zinc	24000	1360		215	
cPAHs (mg/kg)					
8270/8270SIM					
Benzo(a)anthracene		0.065	U		
Benzo(a)pyrene	0.14	0.065	U		
Benzo(b)fluoranthene		0.065	U		
Benzo(k)fluoranthene		0.065	U		
Chrysene		0.07			
Dibenz(a,h)anthracene		0.065	U		
Indeno(1,2,3-cd)pyrene		0.065	U		
cPAH TEQ	0.14	0.0007			

TABLE A-16
FAILED COMPLIANCE MONITORING SAMPLE RESULTS - REPRESENTING SOIL REMOVED
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Area ID:		I	I	I	I	I	I	I
Sample Name:		I-11-A	I1-B1	I1-B2	I2-B11	I2-S10	I2-S5	I3A-B1
Depth Range:		(1.5-1.75)						
Date Collected:		10/7/2005	7/11/2006	7/11/2006	9/15/2006	9/15/2006	10/2/2006	7/5/2006
Sample Type:		Excavation	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation
	Cleanup Levels (a)							
Metals (mg/kg)								
SW6000-7000 Series								
Arsenic	20	22	80	210	75	36	39	1930
Barium	1650							
Cadmium	80	0.2	0.5 U	0.5	0.7	0.2 U	0.4	4
Chromium	120000		36	39	76.7	23.5	32.3	57
Copper	36	47.3	277	220	190	62.8	44.2	1410
Lead	250	37	69	139	103	42	17	1490
Mercury	24	0.06	0.29	0.17	0.19	0.05 U	0.06	0.04 U
Selenium	400							
Silver	400							
Zinc	24000	128	560	714	719	152	120	4200
cPAHs (mg/kg)								
8270/8270SIM								
Benzo(a)anthracene		0.065 U						0.22
Benzo(a)pyrene	0.14	0.065 U						0.26
Benzo(b)fluoranthene		0.065 U						0.42
Benzo(k)fluoranthene		0.065 U						0.35
Chrysene		0.065 U						0.42
Dibenz(a,h)anthracene		0.065 U						0.064 U
Indeno(1,2,3-cd)pyrene		0.065 U						0.2
cPAH TEQ	0.14	0.065 U						0.3832

TABLE A-16
FAILED COMPLIANCE MONITORING SAMPLE RESULTS - REPRESENTING SOIL REMOVED
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	I	I	I	I	I
	Sample Name:	I3A-S1	I3A-S2	I3B-B3	I4-S2	I5-B2
	Depth Range:					
	Date Collected:	7/18/2006	7/18/2006	7/7/2006	7/28/2006	6/29/2006
	Sample Type:	Excavation	Excavation	Excavation	Excavation	Excavation
	Cleanup Levels (a)					
Metals (mg/kg)						
SW6000-7000 Series						
Arsenic	20	48.6	63	60	26	94
Barium	1650					
Cadmium	80	0.5 U	0.5 U	0.3	0.2 U	0.2 U
Chromium	120000	26	26	23.8	31.3	29.8
Copper	36	77	61	109	143	54.4
Lead	250	32	46	88	39	8
Mercury	24	0.05 U	0.04 U	0.04 U	0.32	0.05
Selenium	400					
Silver	400					
Zinc	24000	160	180	311	100	51.2
cPAHs (mg/kg)						
8270/8270SIM						
Benzo(a)anthracene		0.065 U	0.066 U	0.063 U	0.13	
Benzo(a)pyrene	0.14	0.13	0.066 U	0.063 U	0.09	
Benzo(b)fluoranthene		0.17	0.066 U	0.063 U	0.19	
Benzo(k)fluoranthene		0.13	0.066 U	0.063 U	0.19	
Chrysene		0.18	0.066 U	0.063 U	0.33	
Dibenz(a,h)anthracene		0.097	0.066 U	0.063 U	0.064 U	
Indeno(1,2,3-cd)pyrene		0.37	0.066 U	0.063 U	0.094	
cPAH TEQ	0.14	0.2085	0.066 U	0.063 U	0.1537	

TABLE A-16
FAILED COMPLIANCE MONITORING SAMPLE RESULTS - REPRESENTING SOIL REMOVED
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	I	I	I	I	I	I	I	I	I
	Sample Name:	I5-S1	I5-S2	I5-S3	I5-S3A	I5-S3B	I5-S3C	I5-S3E	I5-S3F	I6-B6
	Depth Range:									
	Date Collected:	6/29/2006	6/29/2006	6/29/2006	7/17/2006	7/26/2006	7/26/2006	8/22/2006	8/22/2006	7/28/2006
	Sample Type:	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation
	Cleanup Levels (a)									
Metals (mg/kg)										
SW6000-7000 Series										
Arsenic	20	1610	70	330	95.2	125	510	80	23	24
Barium	1650									
Cadmium	80	2.8	0.2 U	0.9	0.5	0.3	1.1	0.5 U	0.2 U	0.2 U
Chromium	120000	54	28.9	41	31	29.4	41	29	32.2	32
Copper	36	1180	69.4	260	155	133	476	982	89	24.7
Lead	250	1310	60	228	75	99	402	100	13	5
Mercury	24	0.05 U	0.06	0.05 U	0.05 U	0.05	0.04 U	0.07	0.05 U	0.04
Selenium	400									
Silver	400									
Zinc	24000	3770	214	662	260	287	1060	1210	162	43.7
cPAHs (mg/kg)										
8270/8270SIM										
Benzo(a)anthracene										0.065 U
Benzo(a)pyrene	0.14									0.065 U
Benzo(b)fluoranthene										0.065 U
Benzo(k)fluoranthene										0.065 U
Chrysene										0.065 U
Dibenz(a,h)anthracene										0.065 U
Indeno(1,2,3-cd)pyrene										0.065 U
cPAH TEQ	0.14									0.065 U
Tributyl Tins (mg/kg)										
KRONE 1989										
Butyl Tin Ion								0.0039 UJ		
Dibutyl Tin Ion								0.0088 J		
Tributyl Tin Ion	7							0.014 J		

TABLE A-16
FAILED COMPLIANCE MONITORING SAMPLE RESULTS - REPRESENTING SOIL REMOVED
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	I	I	I	I	I	I	I	I	I
	Sample Name:	I6-B16	I6-S1	I6-S4	I6-S4A	I6-S5	I6-S5A	I6-S9	I7-B1	I7-S1
	Depth Range:									
	Date Collected:	9/22/2006	7/28/2006	7/28/2006	8/9/2006	7/28/2006	8/9/2006	7/28/2006	7/31/2006	7/31/2006
	Sample Type:	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation
	Cleanup Levels (a)									
Metals (mg/kg)										
SW6000-7000 Series										
Arsenic	20	41	20	12	7	87	10	20	50	40
Barium	1650									
Cadmium	80	0.2 U	0.2 U	0.4	0.2 U	0.8	0.2 U	0.2 U	0.5 U	0.5 U
Chromium	120000	22.7	30.9	42.6	25.2	30.5	27.9	38.6	20	40
Copper	36	12.1	43.5	38	16	220	39.9	22	53.8	133
Lead	250	4	24	34	13	86	133	20	5 U	103
Mercury	24	0.04 U	0.05	0.06	0.04 U	0.11	0.05 U	0.04 U	0.04 U	0.6
Selenium	400									
Silver	400									
Zinc	24000	33.7	130	107	45.3	658	452	130	47	533
cPAHs (mg/kg)										
8270/8270SIM										
Benzo(a)anthracene		0.066 U	7.8	0.097	0.12	0.15	0.27	0.48		
Benzo(a)pyrene	0.14	0.066 U	5.1	0.14	0.14	0.21	0.25	0.49		
Benzo(b)fluoranthene		0.066 U	6	0.13	0.18	0.29	0.34	0.47		
Benzo(k)fluoranthene		0.066 U	6	0.13	0.16	0.29	0.25	0.47		
Chrysene		0.066 U	15	0.18	0.22	0.25	0.36	1		
Dibenz(a,h)anthracene		0.066 U	0.92	0.065 U	0.065 U	0.065 U	0.066 U	0.12		
Indeno(1,2,3-cd)pyrene		0.066 U	1.9	0.11	0.081	0.087	0.092	0.28		
cPAH TEQ	0.14	0.066 U	7.512	0.1885	0.1963	0.2942	0.3488	0.682		
Tributyl Tins (mg/kg)										
KRONE 1989										
Butyl Tin Ion										
Dibutyl Tin Ion										
Tributyl Tin Ion	7									

TABLE A-16
FAILED COMPLIANCE MONITORING SAMPLE RESULTS - REPRESENTING SOIL REMOVED
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	I	I	I	I	I	I	I	I	I
	Sample Name:	I7-S1A	I7-S3	I7-S4	I7-S4A	I7-S6	I7-S6A	I7-S6B	I-9-D	I-9-E
	Depth Range:								(1.5-2)	(1.5-2)
	Date Collected:	8/9/2006	7/31/2006	7/31/2006	8/9/2006	7/31/2006	8/22/2006	10/3/2006	10/7/2005	10/7/2005
	Sample Type:	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation	Excavation
	Cleanup Levels (a)									
Metals (mg/kg)										
SW6000-7000 Series										
Arsenic	20	90	30	30	250 U	52	29	100	98	24
Barium	1650									
Cadmium	80	0.5 U	0.5 U	0.5 U	10 U	0.2 U	0.2	0.7	0.6	0.2 U
Chromium	120000	38	35	45	50	23.2	34.4	24		
Copper	36	138	53.6	104	163000	34.4	62	57.9	455	31.6
Lead	250	87	29	57	100 U	19	37	40	96	15
Mercury	24	0.05	0.04 U	0.04	0.04 U	0.04 U	0.04 U	0.05 U	0.06 U	0.05 U
Selenium	400									
Silver	400									
Zinc	24000	571	172	321	320	104	155	190	286	73.7
cPAHs (mg/kg)										
8270/8270SIM										
Benzo(a)anthracene									0.066 U	0.063 U
Benzo(a)pyrene	0.14								0.066 U	0.063 U
Benzo(b)fluoranthene									0.066 U	0.063 U
Benzo(k)fluoranthene									0.066 U	0.063 U
Chrysene									0.066 U	0.063 U
Dibenz(a,h)anthracene									0.066 U	0.063 U
Indeno(1,2,3-cd)pyrene									0.066 U	0.063 U
cPAH TEQ	0.14								0.066 U	0.063 U
Tributyl Tins (mg/kg)										
KRONE 1989										
Butyl Tin Ion										
Dibutyl Tin Ion										
Tributyl Tin Ion	7									

TABLE A-16
FAILED COMPLIANCE MONITORING SAMPLE RESULTS - REPRESENTING SOIL REMOVED
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	J
	Sample Name:	J1-B4
	Depth Range:	
	Date Collected:	8/2/2006
	Sample Type:	Excavation
	Cleanup Levels (a)	
Metals (mg/kg)		
SW6000-7000 Series		
Arsenic	20	10
Barium	1650	
Cadmium	80	0.6
Chromium	120000	21
Copper	36	42
Lead	250	50
Mercury	24	3.4
Selenium	400	
Silver	400	
Zinc	24000	153

U = the analyte was not detected in the sample at the given reporting limit.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
Shaded cells indicate an exceedance of the site cleanup levels.

(a) Development of the cleanup levels is presented in Table 9 of the work plan.

TABLE A-17
pH IN CHARACTERIZATION AND WASTE PROFILE SOIL SAMPLES
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name	Date Collected	Area ID	Sample Type	pH (SU) EPA 150.1
			Cleanup Screening Levels (a)	
G1-AC-1	6/22/2006	G	Surface Soil	12.29
G1-AC-2	6/22/2006	G	Surface Soil	12.35
G1-AC-3	6/22/2006	G	Surface Soil	12.33
G1-AC-4	6/22/2006	G	Surface Soil	11.56
G1-AC-5	6/22/2006	G	Surface Soil	12.18
G1-AC-6	6/26/2006	G	Surface Soil	11.94
G1-AC-7	6/27/2006	G	Surface Soil	8.06
G1-AC-9	6/23/2006	G	Surface Soil	8.39
I1-AC-1	6/21/2006	I	Surface Soil	7.22
I2-AC-1	7/13/2006	I	excavation	12.35
I2-AC-2	7/13/2006	I	excavation	12.31
I3B-AC-1	7/7/2006	I	Surface Soil	8.70
I3B-AC-2	7/7/2006	I	Surface Soil	7.99
I4-AC-2	7/12/2006	I	Surface Soil	7.79
I5-AC-4	6/28/2006	I	Surface Soil	8.38
I5-AC-5	7/14/2006	I	Surface Soil	7.61
I5-AC-1	6/27/2006	I	Surface Soil	12.27

(a) Development of the cleanup levels is presented in Table 9 of the work plan.

TABLE A-18
BACKFILL SOIL SAMPLE RESULTS
INTERIM ACTION REPORT - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Area ID:	I	I	I	I	I
	Sample Name:	BF-TP-1	BF-TP-2	BF-TP-3	BF-TP-4	BF-TP-5
	Date Collected:	10/23/2006	10/23/2006	10/23/2006	10/23/2006	10/23/2006
	Sample Type:	Backfill	Backfill	Backfill	Backfill	Backfill
	Cleanup Screening Levels (a)					
TOTAL METALS (mg/kg)						
Method 200.8						
Arsenic	20	7.2	9.1	54.8	126	61.3

Shaded cells indicate an exceedance of the site cleanup levels.

(a) Development of the cleanup levels is presented in Table 9 of the work plan.

Summary of Previous Environmental Investigations and Documents

SUMMARY OF PREVIOUS ENVIRONMENTAL INVESTIGATIONS AND DOCUMENTS

This following is a list of documents previously prepared for the North Marina Area or the Site and submitted to Ecology.

AGI. 1992. *Additional Site Observations and Testing, Hulbert Mill Property, 13th Street and West Marine View Drive.* Prepared for Mr.William Hulbert. August 19.

ECI. 1992. *Phase 2 ESA, Hulbert Mill Property, Everett, WA.* Prepared for Mr.William Hulbert. February 7.

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ECI. 1988. *Supplemental Site Investigation, Jensen Reynolds Property, 1105 13th Street, Everett, Washington (Re-addressed to William Hulbert January 5, 1990).* Conducted for The Hulbert Mill Company. Earth Consultants, Inc. December 6.

ECI. 1987. *Preliminary Environmental Audit, Jensen Reynolds Property, 1105 13th Street, Everett, Washington (Re-addressed to William Hulbert January 5, 1990).* Conducted for The Hulbert Mill Company. Earth Consultants, Inc. July 14.

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Landau Associates. 2006b. Technical Memorandum to Joe Hickey, Washington State Department of Ecology re: *Cleanup Action Plan Addendum, Port of Everett, Washingto*n. Prepared by Landau Associates. September 25.

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Landau Associates. 2005a. Ecology Review Draft, Data Gaps Investigation, North Marina Redevelopment Site, Everett, Washington. Prepared for the Port of Everett. May 13.

Landau Associates. 2005b. *Sampling and Analysis Plan, Comprehensive Investigation of Affected Soil for Offsite Disposal, North Marina Redevelopment Area, Port of Everett, Washington.* Prepared for The Port of Everett. November 10

Landau Associates. 2005c. *Final Work Plan, Data Gaps Investigation, North Marina Redevelopment Area, Port of Everett, Washington*. Prepared for Port of Everett. January 5.

Landau Associates. 2005d. *Draft Compliance Monitoring Plan, 12th Street Marina Project, North Marina Area, Everett, Washington*. Prepared for the Port of Everett. October 4.

Landau Associates. 2004. *Phase II Environmental Site Assessment Report, North Marina Area, Port of Everett, Everett, Washington.* April 13.

Landau Associates. 2001. *Phase I Environmental Site Assessment Report, North Marina Redevelopment Project, Port of Everett, Everett, Washington.* November 28.

Layton & Sell. 1988. Letter Report to Jim Thornton, Washington State Department of Ecology and John Malek, U.S. Environmental Protection Agency, re: *Hulbert Mill Company, Everett, Washington, Dredged Sediments Sampling and Analysis Program*. February 15.

Pentec. 2001. *Puget Sound Dredged Disposal Analysis, Full Characterization for the 12th Street Marina.* Prepared for the Port of Everett. Pentec Environmental. February 1.

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APPENDIX B

Site Historical Development Analysis

Historical Site Development Analysis
North Marina Ameron/Hulbert Site
Everett, Washington

prepared for:

The North Marina Ameron/Hulbert Site PLP Group

May 11, 2010

Pinnacle GeoSciences

HISTORICAL SITE DEVELOPMENT ANALYSIS
NORTH MARINA AMERON/HULBERT SITE
EVERETT, WASHINGTON

FOR

THE NORTH MARINA AMERON/HULBERT SITE PLP GROUP

MAY 11, 2010

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HISTORICAL SITE DEVELOPMENT ANALYSIS
NORTH MARINA AMERON/HULBERT SITE
EVERETT, WASHINGTON
FOR
THE NORTH MARINA AMERON/HULBERT SITE PLP GROUP

MAY 11, 2010

1.0 INTRODUCTION

This report summarizes Pinnacle GeoSciences' historical site development analysis of the North Marina Ameron/Hulbert site in Everett, Washington. The upland portion of the site consists entirely of fill soils placed over the past century. The site was originally occupied by a sawmill, a shingle mill, and a casket manufacturing business. Its use has changed over the years and it is now occupied by industrial and commercial businesses. The site has undergone several episodes of significant fill placement and a number of episodes of localized fill placement events. Not all historic site development is well documented so evidence of many past activities is inferred from interpretation of aerial photographs.

The purpose of this study is to assist the PLP Group (the Port of Everett, Ameron and Hulbert), and their respective consultants, the PLP Consultants (Landau Associates, Aspect Consulting and Pacific Groundwater Group) in understanding the history and progressive development of the site, particularly as it may relate to contamination concerns.

The site is presently under an Agreed Order with Ecology and further site evaluation is planned. The Agreed Order defines the currently estimated limits of the site although the site boundary will ultimately be determined based on where hazardous substances have come to be located.

2.0 SCOPE OF SERVICES

2.1 PURPOSE

The purpose of this study is to assist the PLP Group (The North Marina Ameron/Hulbert Site PLP Group) in understanding the site development history and past activities that may have contributed to contamination issues documented at the site. The PLP Group consists of The Port of Everett, Ameron Corporation and the Hulbert Trust. These three entities are represented by their respective consultants Landau Associates, Aspect Consulting, and Pacific Groundwater Group which are collectively referred to as the PLP Consultants. This study does not address or examine evidence of contamination directly (such as analytical data) but rather is intended to identify past practices and activities that may have contributed to the presence of contaminants at the site.

2.2 SCOPE

The scope of services for this study is clearly set forth in our contract and is repeated below with one correction referencing a portion of Area G. Our scope of services completed includes:

> *The purpose of this historical analysis is to define the Site development history with emphasis on potential sources of contamination and Site filling history. The work will be used by a group of Site potentially liable parties (PLPs) and is to be conducted in an unbiased manner. We anticipate that the historical review will consist of reviewing available aerial photographs, historical fire insurance maps, topographic maps, city or county maps and street directories, U.S. Army Corps of Engineers (ACOE) records, and other historical documents and records to assess past uses of, and the history of fill activities at, the Site and on adjacent properties, from current conditions back to the Site's first developed use. Selected areas of interest to the PLPs include:*
>
> ***Site Filling History**: Identify time periods when Site filling and earth moving activities occurred including an assessment of the potential sources of fill. In addition to general Site filling history, Site filling within the following time periods is of particular interest:*
>
> - *Prior to construction of the concrete products manufacturing facility in the northeast portion of the Site (circa 1972)*
> - *Between 1972 and 1988*
> - *Between 1991 and 2006.*
>
> ***Summary of Site Uses and Potential Releases**: Identify and summarize past operators on the Site including the following information about each: name, location on the Site, nature of operations, time period on the Site, and manner through which it ceased operations on the Site (i.e., closed, changed or sold business). Identify any activities, structures, or other features that may have resulted in the release of hazardous substances at the Site (e.g., fuel tanks, boilers, transformers, stained soil, ponds, drums, fuel pumps, wood treating, other manufacturing, etc.)*

Areas of Known Contamination: *Identify activities (including history of any filling) in specific areas where the PLPs have identified contamination. The area designations (i.e., Areas G, I, J, and M) are provided in Exhibit A to the Agreed Order. The specific items of interest include:*

- *When the fence separating Areas I and G was constructed*
- *When fill was placed in Area I and the ~~northeast~~ northwest corner of Area G that resulted in the ground surface in these areas increasing to elevations significantly greater than adjacent grades to the east.*
- *When the landfarming area in the northeast corner of Area I was created, when it was decommissioned, and where the treated soil was placed (if discernable from aerial photographs).*
- *When construction debris was placed as fill in Area J-3 and the source and nature of the buried structures found in western portion of Area J*
- *Activities or structures along the north boundary of Area G that could have caused the petroleum hydrocarbon and polychlorinated biphenyls (PCB) contamination identified in this area (See 2005 Landau Associates document below)*
- *Whether the operations in Areas G or I extended across the Site boundary to the north at any time during the Site operational history and, vice versa, whether operations to the north extended onto Areas G or I and may have impacted these areas*
- *Whether operations in Areas J, I, or M extended across the Site boundaries to the south or southwest at any time during the Site operational history and, vice versa, whether the operations to the south or southwest of Areas J, I, or M extended across the Site boundaries and impacted these areas.*

This report is organized consistent with the structure of the Scope of Services cited above.

2.3 COMMENTS ABOUT DATA COLLECTION

A number of documents were provided to us at the onset of this study by the PLP Consultants. As our review progressed we identified several additional studies referenced in the documents provided and we requested those documents. Aerial photographs were provided to us in paper and digital form by Landau Associates and Pacific Groundwater Group. All paper aerial photographs have been scanned and digitized and are included in Appendix A – Aerial Photographs.

Shortly after we began our review we were provided the opportunity to review and request copies from a considerable repository of pertinent information (title and lease records, photographs, aerial photography and engineering drawings) at Nadler's offices (The Nadler Law Group, PLLC). We understand that Nadler also provided copies of all information we requested to the PLP Consultants.

Part of our scope of services was to obtain additional aerial photography. We obtained a considerable number of additional aerial photographs including photographs to complete stereo pairs with photographs already in the collection. When we first discussed this project with the PLP Group we contacted various aerial photograph providers to confirm costs and responsiveness. We were informed (in December 2009) that WSDOT (Washington State Department of Transportation) was the repository for DNR (Washington Department of Natural Resources) photographs and that requests for photographs from both agencies could be made through the WSDOT. Our requests for aerial photographs were delayed because of the considerable amount of supplemental aerial photography and other pertinent documents from Nadler that we needed to review before finalizing our requests. Once we did request photography, we initially found WSDOT to be non-responsive. When they finally did respond they informed us that as of the end of 2009 the custody of the DNR photography reverted back to DNR. DNR informed us that they didn't have the resources to respond to our request for photographs. We informed the PLP Group of this as it occurred. Fortunately, through the combined resources of AeroMetric (formerly Walker & Associates) and the Corps of Engineers we were able to obtain most of the aerial photography coverage we had previously identified as being useful to support this project.

We reviewed the aerial photography in digital format. This allowed us to adjust contrast and other image settings to enhance features not readily visible in the original image. We did not apply modifications to any images that would alter or change the image content.

The combined sets of aerial photographs provided extensive stereo coverage of the site. We prepared over 25 stereo image sets spanning 1947 through 2006 and numerous additional stereo pair enlargements of specific areas. Some people find it difficult to view stereo pairs so viewing of the stereo pairs may not be accessible to all reviewers of this report. Because of this we have not included stereo imagery in any of the report figures. The stereo image PDFs are included in Appendix A – Aerial Photography.

2.4 COMMENTS ABOUT FIGURES

Nearly all figures in this report employ aerial photography for the underlying image. Because of the photographic process, there is parallax in all images which can cause distortion of scale, particularly when the area viewed is at the edge of the image. Because of this inherent distortion, all locations shown should be considered to be approximate. Furthermore, the site plans provided in various reports do not always precisely agree with respect to the boundary of the site subject to the Agreed Order or the boundaries of the "Areas" within it. When an overlay showing boundaries is included as part of a graphic, it is based on the site definition as presented in Exhibit A – Figure 8 of the Agreed Order. Figure 1 shows a reduced copy of this exhibit which formed the basis for our reference to areas of the site.

All of the figures employ the use of color to convey information. Only figures viewed in color (on paper or digitally) should be relied upon when using this report.

2.5 REFERENCES TO FEATURES

This report refers to site features using their most recent or current names. For example the "Collins Building" refers to that structure even though in the past it may have been referred to otherwise. Likewise, the "Ameron Building" refers to the large building constructed by Centrecon beginning in 1972.

3.0 SITE FILLING AND PAVING HISTORY

3.1 LARGE-SCALE FILLING

This section discusses large-scale filling events at the site which can be documented or supported by aerial photograph interpretation or other records. Small-scale filling and temporary stockpiling is discussed to a lesser extent in this section, and in greater detail in the "Areas of Known Contamination" section of this report.

3.1.1 Original Shoreline

The earliest photographic documentation of the site reviewed showed that the initial shoreline in the vicinity of the site was immediately west of the current rail alignment to the east of the site. The entire site is constructed on tidelands. Photographs from the 1920s clearly show that the high water line was immediately west of the mainline rail alignment at the foot of the bluff, and that the road that was the predecessor of Marine View Drive and all buildings and facilities west of the road were constructed on pilings. The body of historic aerial photographs for the site and vicinity show that the intertidal zone extended west to what is currently the western end of the piers at the north and south of the site.

An undated photograph, circa the mid-1930s or later, shows that little or no large-scale filling had occurred at those portions of the site occupied by the shingle mill, the southern lumber sheds, and the planing mill through at least the 1930s.

3.1.2 Pre-1947 Filling

The earliest document we reviewed showing development on the site is the 1914 Sanborn Map. The site was first occupied by the Fred K. Baker Company's Shingle Mill which later became the William Hulbert Mill Company's Saw, Planing and Shingle Mill. William Hulbert was the son-in-law of Fred Baker. The mill grew in size through additions, until the 1960s when it was demolished. The early filling of the site was related to its use in lumber milling. Figure 2 shows the locations of mill structures interpreted from Sanborn Maps and Figure 3 shows those locations with respect to current site features.

A photograph from the mid 1930s (shown in part in Figure 11) shows small-scale, non-systematic filling around the bases of the smokestack and refuse burner with several different materials, including a very dark, comparatively fine-grained material, and a lighter-colored rubble material with pieces visible up to 1 or 2 feet in diameter. A square feature is visible at the base of the water tower with a smooth upper surface about 8 feet below dock level, probably a concrete pile cap. Four smaller concrete footings are visible on top of this structure, each supporting one leg of the water tower (Figure 11).

The November 28, 2001 Phase I ESA prepared by Landau Associates cites the Port of Everett, 1995 with the following: "In 1944, 40 acres of the 14th Street Pier were filled in by the Port." We did not observe evidence of this large scale of filling in the 1947 aerial photographs, and believe that the 1944 date is erroneous and should have read "In 1947," as discussed in the next section. Fill is visible in the 1947 aerial photographs along the eastern boundary of the site extending about 330 feet west of the main rail alignment, about to the east wall of the Collins Building. This westward extension of fill into the intertidal zone also corresponds to the alignment of a rail spur that enters the property from the north and extends onto the subject property. This filled area covers the eastern portion of Area M and a small portion on the east side of Area G. The western boundary of this fill area is shown in Figure 4. We found no information as to when the pre-1947 fill was placed other than that it occurred after the photograph dated to the mid 1930s discussed above, nor any information as to whether the fill was placed in a single filling event or multiple events.

A 1944 Corps of Engineers photomosaic map we reviewed is based upon a July 1941 aerial photograph. Because of the scale of the map, the resolution at the subject site is poor. Despite the poor resolution, it seems to show that the easternmost fill is in place at the time of the 1941 photograph. The information we reviewed suggests it is likely that this fill was primarily of dredge fill rather than imported upland fill or debris generated on site, but this could not be confirmed. This interpretation is supported by our observation that there was no nearby source of upland fill evident in the general area of the site and that the one boring log from this area that we reviewed (Earth Consultants: ECI-MW-3) identifies the deeper soils as dredge material covered by four feet of non-dredge fill. A Landau Associates site plan shows additional explorations in this area which may provide further information about fill conditions, these are exploration numbers M-1, M-2, M-2B, M-2C and M-GC-1. Boring logs for these explorations were not included in the information we reviewed.

Review of the 1947 stereo pair of aerial photographs suggests that the upper several feet of fill (thickness based on boring log ECI-MW-3) was placed after the 1947 photograph, at a significantly later date than the dredge fill.

A small, irregularly shaped area of debris and granular fill is visible around the bases of the Hulbert Mill smokestack, the refuse burner and the water tower in the 1947 photographs. A very similar accumulation of fill is evident in the same photograph at the base of the refuse burner at the mill to the north of the subject site. This fill is also clearly visible in the photograph from the mid 1930s (see Figure 11). This fill may be comprised, in part, by bottom ash from the refuse burner. Refuse burners were primarily used for burning sawdust, bark, edgings and other wood debris associated with milling operations.

3.1.3 1947 to 1955 Filling Events

Two significant filling events occurred during this time period – the 1947-1953 dredge filling of the North Marina Peninsula area and the structural fill encompassing parts of Areas J, M and G placed in 1955.

Dredge Filling of the North Marina Peninsula Area. Hart Crowser stated that "in 1947, a sheetpile wall was constructed to form the fill area south of the mill." This sheetpile wall is visible in the 1947 aerial photographs. It encompasses the area of the North Marina

Peninsula as shown in Figure 1. The calculated area enclosed by the sheetpile wall is approximately 40 acres, and in our opinion corresponds to Landau's reference to filling in 1944 mentioned in the previous section. The completed fill can be seen distinctly in two 1953 oblique aerial photographs. We discovered no other information that indicated more precisely when the fill occurred. The filled area encompassed the remainder of Area M, the southern portion of Area G, the southern majority of Area J, and the remainder of the North Marina Peninsula which is not within the site boundaries, as shown in Figure 4.

Additional 1953 and 1954 oblique aerial photographs show the North Marina Peninsula fill area and also show that the majority of the mill facilities and the Collins Building are still supported on pilings and that filling is not completed to final (present) grade. The photographs suggest that the surface elevation of the North Marina Peninsula dredge fill at this time was about 3 to 5 feet below floor grades of the Collins Building and the decking surrounding the mill structures. The extent of the 1947 to 1953 fill area is readily visible in the 1955 aerial photograph.

Dredge fill drains, dewaters and consolidates after it is placed. This consolidation or settling can take place over several years. Dredge fill can be placed under pile-supported buildings and docks using hydraulic placement methods, but voids tend to form beneath the structures as the hydraulic fill consolidates and settles. We would expect that there would always be a void beneath the pile-supported structures after placement of fill.

Two oblique 1953 photographs both show 13th Street completed on the fill area, but it appears as if the majority of the 1947 to 1953 fill area may be several feet lower than the 13th Street grade. This is likely because of consolidation of the fill. The fill has some minor vegetation on it.

Structural Fill Encompassing Parts of Areas J, M and G. By 1953 an area immediately west of the Collins Building, comprising small portions of Areas M and G, and most of Area J, appears to be graded differently than other parts of the 1947 to 1953 dredge fill. In 1953 aerial photographs a non-dredge fill soil importing operation is also evident at the end of the North Marina Peninsula, at the end of 13th street. It consisted of barges loaded with soil, a conveyor system for unloading the barges, and facilities for loading fill into trucks.

By 1955, the area west of the Collins Building has been filled and graded. This area, identified as the "Structural Fill" in the 1955 aerial photograph in Figure 4 encompasses an area that is slightly larger than the area visible in the 1953 oblique aerial photographs, and marks are visible that suggest that active filling and grading may still be ongoing (Figure 4). The west side of this fill area is formed by a sharp line on the 1955 aerial photographs which may be a wall several feet high. Later aerial photographs, such as the 1989 oblique air photo, show this wall. Exhibit A – Figure 7 of the Agreed Order identifies this newly filled area west of the Collins Building as a "Sawdust/Wood Chip Pile." Based on our review of a stereo pair of aerial photographs and other aerial photography we believe this feature is inconsistent with the sawdust pile interpretation, and interpret this feature to be a structural fill. The walls bounding this fill establish the final grade.

Exploration logs from six soil borings in the 1947 to 1953 fill area (Earth Consultants: ECI-MW-1; Hart Crowser: HC-MW-1 & HC-MW-4; and Landau Associates P10, J-1 & J-2) indicate non-dredge fill extending from near the current surface to depths of 2 to 5 feet, and dredge fill extending from the base of the non-dredge fill to the maximum depth explored of 16 feet. Both the upper non-dredge fill unit and the deeper dredge fill unit were fairly consistent in nature between borings. This tends to indicate large-scale filling events rather than multiple small-scale events.

Other Fill (1947-1955). A 1953 oblique photograph shows limited filling between the saw mill and the shingle mill, and possibly beneath these structures, but the fill was significantly below final grade. This fill area is shown in Figure 4. We could not identify the source of this fill material. The 1953 oblique photograph also shows continued filling with waste materials southwest of the smokestack and refuse burner.

3.1.4 1955 to 1965 Filling

The 1961 aerial photograph shows most of Area G has been filled by this period, as shown in Figure 4. No other aerial photographs show this area in the intervening period between 1955 and 1961 at useful resolution. The aerial photograph did not provide any insight into whether this fill was placed in a large-scale filling event or several smaller-scale events. In the 1955 air photo, most of Area G was covered by mill buildings or docks which were originally supported on pilings. These buildings were still visible in the 1956 air photo, although not at a useful resolution. The 1961 aerial photograph is the first photograph with the buildings and docks removed, and showing fill at their location. The fill visible in the 1961 aerial photographs could have been placed after the buildings and docks were removed, or it could have been hydraulically placed beneath the pile-supported buildings and docks while they were still in existence. The additional area identified as being filled during this period includes the area that burned in a mill fire in 1956. The fire encompassed the lumber docks, lumber sheds, two planing mills and part of the kiln. The actual sawmill and shingle mill were not destroyed by the fire. Close examination of the 1961 aerial photograph suggests that the fire consumed nearly all the structural elements where it occurred, possibly even including the decking on the docks. This area appears to be filled in the 1961 photograph, although not up to the final grade, and it is not clear how close to the west end of the lumber storage docks the fill extended. Photographs from the 1920s and 1930s show that this filling did not occur before the mill was constructed. It is unknown whether this fill was placed hydraulically under the docks while they existed, or if it was placed after the fire. The 1953 oblique photographs show that there is no fill visible under the western end of the lumber storage docks. There are no records of the placement of this fill. Our review of exploration logs in the area of the mill fire did not identify evidence of a burn or ash layer.

The 1961 aerial photograph shows a bulkhead on the north side of Area G, the north side of the eastern third of Area I, and along the west side of the former dock frontage. The bulkhead generally follows the alignment of the lumber storage docks that burned in 1956. The 1961 aerial photograph shows the bulkhead piles extend into the air at varying lengths. This is typical for an area where piling may have been recently driven and not yet cut off to a finished level. A rough count of the piling suggests that there were about twice the number of piling along the western face of the bulkhead as there were for the prior dock structure. A 1992 test pit next to the bulkhead reported the presence of 12"x12" treated wood which we interpret as lagging that was used to construct the bulkhead. This information suggests that the bulkhead and subsequent fill was likely constructed some time after the mill fire and before 1961.

The fill behind the bulkhead extends westward approximately to the western boundary of Area G. It is not clear in the 1961 aerial photograph whether the surface visible between the western boundary of Area G and the western bulkhead is dock or fill.

Two 1965 aerial photographs show that all of the lumber docks have definitely been removed, and the filled area has extended westward across almost all of Area G, into the northeast portion of Area I, and slightly further in the north end of Area J as shown in Figure 4. It is not clear in the 1961 photograph whether all of this area was filled by that time. The bulkhead discussed in the second paragraph of this section is more distinctly visible in these photographs. The sawmill, shingle mill and remaining kilns have been demolished since the 1961 aerial photograph. The portion of Area G beneath the east end of the recently demolished sawmill building is only partially filled; the surface of the fill is not up to the grade behind the bulkhead.

Exploration logs from test pits and borings in this area (Earth Consultants ECI-MW-2, ECI-K-1, ECI-J-1, ECI-J-2 and ECI-TP-1 through ECI-TP-8) apparently indicate a fairly homogenous non-dredge fill unit in these explorations extending to a depth of about 11 feet below current surface, and dredge fill beneath the upper non-dredge fill unit. The upper non-dredge fill unit contained significant wood and concrete debris in localized areas. Localized inconsistencies in soil type were present in several of the test pits. One exploration near the northern boundary of Area G (Earth Consultants ECI-TP-6) exposed a vertical wall of treated 12-inch by 12-inch timber extending to the base of the test pit at 8 feet below current grade. This wall may be the bulkhead behind which the fill was placed, as visible in the 1961 aerial photograph. In our experience, timbers and pilings of the time period when the wall was constructed were oftentimes untreated cedar, although frequently mistaken as treated.

3.1.5 1973 Filling Events

Two large filling events affecting the subject site occurred in 1973. A large, engineered dredge spoil fill encompassed most of Area I, parts of Areas J and G, and extended onto the property to the north. A separate filling event over a large part of the North Marina Peninsula extended onto the western part of Area J.

Three 1973 aerial photographs show a large-scale filling event occurring over the entirety of Area I, small portions of Areas G and J, and onto the adjacent property to the north of the site, as shown in Figure 4. Two of the photographs show fill being hydraulically placed on Area I and the northern portion of Area J. Records indicate that this dredge fill was spoils from the "12th Street Channel" dredging project, authorized by the Army Corps of Engineers in February 1972. Design drawings for the fill show the filled area to be identical to the filled area visible in the 1973 aerial photograph as discussed above. The source of the material was approximately 176,000 cubic yards of dredge spoils generated by dredging a channel westward from the southern portion of Area I and the northern portion of Area J. The design drawings indicate that the dredge fill was held behind a shore dike which was constructed along the west side of the fill. A berm was constructed around the north, east and south sides of the area to be filled. A drawing dated January 2, 1973 and stamped "As Built" indicates that the top of the dike was about 14 to 16 feet above MLLW (Mean Lower Low Water), the top of the dredge fill was about 19 feet above MLLW, and the bottom of the dredged channel was 20 feet below MLLW. The January 2, 1973 drawing shows an "exist. timber bulkhead" corresponding to the wall visible in the 1965 aerial photographs discussed above. The January 2, 1973 drawing labels the area behind the "exist. timber bulkhead" (within Area I) as "borrow area for north dike," and states that the northern half of the shore dike is constructed from this soil, while the southern half of the shore dike is constructed of "imported quarry waste." The northern dike extends onto the property to the north. The January 2, 1973 drawing also shows that the surface elevation of the 1973 fill was as much as 5 to 7 feet higher than the ground surface of Area G to the east, probably to allow for substantial dewatering and settlement of the dredge fill.

The September 1973 aerial photographs show that the 1973 dredge fill in Area I was hydraulically placed. The surface of the fill is higher in the northern portion of Area I, and lower in the southern portion of Area I where ponded water is visible.

A 1974 stereo pair of photographs shows the hydraulically placed portion of the 1973 fill dewatering and apparently consolidating, with the dewatering water causing visible sedimentation in the 12th Street channel at the approximate location of the current barge dock.

The 1973 as-built drawing does not show an engineered dike on the eastern side of the dredge fill. Aerial photographs show a significant berm on the east side of the fill with a maximum elevation exceeding the height of the fill. This berm extends onto Area G. We could not ascertain the source of the fill used to construct this berm.

A photograph from 1973 or early 1974 shows fill on the north half of the North Marina Peninsula to the southwest of the site and a small portion of Area J placed by end dump truck, and small localized areas of end dump piles are visible elsewhere in the hydraulically filled area.

Exploration logs for numerous test pits and borings in the area filled in 1973 (Earth Consultants ECI-Q-1 through ECI-Q-8, Hart Crowser HC-MW-3 and Landau Associates P11 & P12) indicate that the soils observed in the explorations consisted of an upper unit extending from the current surface to a depth of 1.5 to 3 feet below grade consisting of fill with wood, brick and shells, with an underlying unit of dredge fill extending from the base of the upper fill unit to at least 16 feet, the maximum depth explored. The upper unit was not homogenous. We interpret that this lower dredge fill unit is the 1973 dredge fill and that the upper unit was placed later as generally described in the next section of this report.

3.1.6 1974 to 1982 Filling

The berm around the eastern portion of the 1973 fill remains readily visible in all photographs through a 1981 aerial photograph. The dredge fill has consolidated and settled, leaving the berm as an elevated soil structure separating the active Centrecon facility from the log sorting operations to the west.

A 1976 stereo pair of photographs also show that the southern 120 feet of Area I, adjacent to the barge wharf, has been graded and paved. We do not have documentation of this feature being constructed so it is unclear whether a structural fill underlies the pavement.

This pavement is the extension of the fill and final grading of the eastern part of the North Marina Peninsula and appears to be constructed for the use of tenants southwest of the subject site. A trench is visible excavated on the east and north sides of this paved area, with trench spoils stockpiled along its length. The trench appears to be a drainage ditch which slopes to and discharges to a point at the northern edge of the dock structure. This trench and associated stockpiles are visible in aerial photographs until 1981, and then have been filled by 1982. This feature acts as a barrier to most vehicular traffic between the paved area east of the dock and Area I until it is filled and graded in 1982 with one exception. There appears to be a lightly used unpaved roadway along the top of the former berm, providing access between the site to the southwest and the Centrecon site. This roadway is most clearly seen in the 1977 oblique photograph.

The majority of the 1973 fill area continues to be occupied by log storage in the 1976, 1977 and 1978 photographs. Accumulation of wood debris appears to be developing.

1979 aerial photographs show that the majority of the logs in the 1973 fill area of Area I have been removed. However, a log pile at the northeastern corner of Area I remains. A network of roads that were originally used to access the log piles remain and the locations formerly occupied by log piles appear to contain some slash, debris and vegetation. The major road access to Area I at this time appears to be from across the northern property line, although a possible road access may be present from Area G to Area I. At this time, any previous access from the southwest to Area I is blocked. Bright white soil patches are evident in three parts of Area I, two in the south central portion and one in the northeast part of Area I. The northeastern white soil patch was first visible in the 1978 aerial photograph.

Two 1980 aerial photographs show significant active regrading and some possible filling occurring in the northern part of Area J. It appears that Area I and the northern part of Area J is being regraded for a change in use. There are piles of slash that have been consolidated and most of area I shows evidence of recent grading but not necessarily the placement of additional fill. A pile of metal pipes is present at the northeastern corner of Area I, at the location of a former log pile and miscellaneous equipment and debris remain at the northwestern edge of Area I in a location that has not been graded.

A large area of the previously described bright white-colored material is visible near the middle of Area I, and several smaller areas of light-colored material are visible on the west side of Area G, west of Centrecon's polishing building. The patch of light-colored material on Area I appears to have been pushed into a 125 by 50 foot stockpile with earth moving equipment. This pile is several feet high. There are features suggesting that this white-colored material may emerge from a westward draining pipe from the Centrecon polishing building. Road access to the fill area on Area I appears to be predominantly from across the northern property line of Area I, but a possible minor road access also is visible from Area G to Area I west of the Centrecon building.

Significant filling along the north side of Area G with what appears to be concrete debris is visible in the photographs. This is discussed in greater detail in Section 5.5 of this report.

Very similar conditions are visible in the 1981 aerial photograph except that the road access between Area I and the property to the north has been eliminated with the construction of a barrier along the entire northern property line of Area I. The resolution of the 1981 aerial photograph is not adequate to see whether active grading is occurring on Area I.

Two 1982 aerial photographs show that Area I has been graded flat and appears to be at roughly similar grade as Area J and about two feet higher than the paved portion of Area G. The ground surface is covered with a uniform, light colored fill. Exploration logs show the fill to be a gravel fill which is generally 0.5 to 1.0 feet in thickness. No signs remain of the eastern berm around the 1973 fill except for a remnant mound on the northwest corner of Area G (Area G-1). A settling pond has been constructed on this berm remnant. This is discussed in more detail in section 5.2.3.

3.1.7 Post-1982 Fill

After 1982 there was no wide-spread filling on the subject property.We reviewed three survey drawings of Areas G and I that provided elevation data. These drawings were dated 1985, 1987 and 2004. We compared surface elevations in these three drawings, which suggest that the ground surface topography in Areas G and I has not changed significantly from 1985 to 2004. Furthermore, based on aerial photographs, it appears that the surface elevation in Area I illustrated in the 1985 and 1987 surveys is very similar to the final elevation of Area I in 1982 as discussed above.

Absolute comparison of elevations was not possible since the 2004 drawing represented elevations with contours and the others showed spot elevations. Generally, all three of these drawings show the ground surface of Area I to be about 1 to 2 feet higher in elevation than the paved ground surface in Area G on the west side of the Ameron Building. The 1985 and 1987 survey drawings do not document the presence of the one or more small stockpiles which the 2004 survey drawing documents in Area I. The 1985 survey shows the small mound and associated pond on Area G-1 which is mentioned in the previous section and discussed in more detail in Section 5.2.3 of this report

The 1985 and 2004 surveys appear to use similar datums, while the 1987 survey appears to use a datum that is approximately 6 feet lower. The 2004 and 1987 surveys are shown on Figure 5. The 1987 elevations in the figure have been adjusted by adding 6.0 feet to the mapped value shown in parenthesis so they can be generally compared to the 2004 survey. The 1985 survey is not shown on Figure 5 because its results are very similar those shown in the 1987 survey except for the small mound in Area G-1.

3.2 OFF-SITE FILLING

The property to the north of the site was filled independently of the subject site with the exception of the 1973 dredge fill which extended well on to the property to the north. An area of the property to the north of the site was filled extending approximately 400 feet west of the mainline rail alignment at some time between the early 1930s and 1947, similar to the first fill described on the subject site.

In the mid-1960s the area to the north was partially filled. The fill supported an access road that started just north of the northeastern corner of Area G and headed W-NW toward the refuse burner at the mill. The irregular shape, color and texture of this fill suggests an irregular surface created by multiple small-scale filling events. The zone just north of the property line was not filled and remained an incised drainage between the properties.

When the large dredge fill was constructed in 1973 it appears that its northern margin was excavated to augment drainage of the fill. One 1973 aerial photograph shows standing water (at high tide) in the drainage along the north side of Areas I and G. The open water in this drainage extends nearly to the northeastern corner of Area G.

The off-site area northwest of Area I was filled in the late 1970s. A 1976 aerial photograph shows the intertidal area currently occupied by the boat launch to the north of the site surrounded by a bulkhead or sheetpile wall. A 1977 oblique aerial photograph shows the area enclosed by the wall to be completely filled.

Various photographs from 2005 and 2006 show structural fill being placed along the south side of the 10th Street boat launch property to the northwest of the site, in association with the 12th Street Yacht Basin project.

3.3 PAVING

We evaluated the progression of pavement and building construction at the site by interpreting air photos and where possible confirming with information from site surveys and other engineering drawings. For the purpose of this evaluation, we defined “pavement” as any surface which is low permeability and provides a physical barrier to mixing of materials with underlying soil. Practically, this is limited to either asphalt or Portland cement concrete surfaces. Our understanding of the progression of paving at the site is interpretive, and should not be considered definitive. Our understanding of the progression of paving is shown in Figures 6 and 7. For ease of presentation, we have divided it into four periods, 1947 through 1974, 1974 through 1982, 1982 through 1991, and 1991 through 2005. Figures 6 and 7 also show the year of the aerial photograph in which each building is first evident.

4.0 SUMMARY OF SITE USES AND POTENTIAL RELEASES

4.1 PROPERTY OWNERSHIP

We reviewed property ownership records obtained by Nadler Law Offices, Snohomish County records provided by Pacific Ground Water Group, information from technical reports provided to us, Sanborn maps, and our own research of Snohomish County records and on-line business records. For the purposes of this report, we have noted ownership and occupant information only until 2006, just after redevelopment of the subject site began to take place and buildings and businesses were beginning to be demolished or relocated. Many of the business concerns listed as being present up to the 2006 date currently remain on site.

4.1.1 William Hulbert Mill Co.

William Hulbert Mill Co. purchased the existing shingle and lumber mills on site in 1923. The Limits of the Hulbert Mill Co. holdings are shown in Figure 8. The William Hulbert Mill Co. liquidated and dissolved in 1986, and transferred its assets to the William

Hulbert Mill Company Limited Partnership. In 1990, part of the 30 acre property was transferred to the William G. Hulbert, Jr. and Clare Mumford Hulbert Revocable Living Trust; William Hulbert, III; Tanauan Hulbert Martin and David Francis Hulbert; who all owned the property as Tenants in Common. The Hulbert Mill Company Limited Partnership retained the remaining part of the property. In 1991, the entire 30 acre parcel was sold to the Port of Everett. During the period from 1923 to 1991, the various Hulbert-related ownership interests leased portions of the property to various commercial and industrial tenants.

4.1.2 The Port of Everett

The Port of Everett owned the portion of Area M adjacent to the former Northern Pacific right-of-way and the current Marine View Drive from 11th Street to 13th Street, and a small portion of Area G, since at least 1940. Our research was unable to determine the initial ownership of that property. The limits of the Port of Everett holding are shown in Figure 8.

The Port of Everett has owned the entire subject site since acquisition of the Hulbert property in 1991.

In addition to lease agreements with others on the site, the Port of Everett also had its own activities on the property.

4.2 MAJOR TENANTS

Tenant information was derived from leases and subleases obtained from Snohomish County records, records from the Nadler Law Group offices, technical reports, Polks Directories and Sanborn maps. Figure 8 shows the areas occupied by primary tenants at different times in the history of the site.

4.2.1 Tenants on Hulbert Property

4.2.1.1 Collins Casket Company

Collins Casket Co., originally North Coast Casket, leased a portion of Area M and a small portion of Area G from the Hulbert Mill Company from 1926 to 1991. The Collins Casket Co. lease holding is shown in Figure 8. Collins Casket Company leased its property from Hulbert until the Port purchased the property in 1991, and continued as a casket business owned by Keys International leasing from the Port of Everett until 1996. The company remained in the original building throughout its existence. The operation included a boiler house with related oil house, a “smoke shack” employee area and storage area, and an open-sided storage building.

A concrete warehouse building was built for the casket company operation in 1961 adjacent to the east of the main building. The concrete building was on leased land from the Port of Everett. In the late 1970s the original boiler was replaced by a new boiler and diesel AST located on the east side of the Collins Building, between the Collins Building and Building A (Figure 8). The original boiler house was demolished in about 1984.

Subtenants of Collins Casket Company:

RL Enterprises: 1989-1991. RL Enterprises leased the second and third floors of the Collins building for construction of cabinetry.

Michael's Woodcraft: ca.1990-1991. Michael's Woodcraft leased the second floor of the Collins building for furniture making.

4.2.1.2 Centrecon / Utility Vault (now Oldcastle Precast Company)

Centrecon initially leased property from Hulbert in 1972. The lease area included all of the Hulbert property less the area occupied by the Collins Casket lease, including an extended area westward to the tidelands after the filling of 1973-74. The Centrecon lease holding is shown in Figure 8. The lease holding of Centrecon was reduced to Area G only in 1991, as shown in Figure 8. The Port of Everett assumed the Centrecon lease and its sublease agreements when it purchased the Hulbert property in 1991.

Over the period from 1986 to 1994 Centrecon ownership names changed from Centrecon to Utility Vault Company to Oldcastle Precast Company. Centrecon is the name of reference used in this report through 1988. After 1988, Ameron purchased the assets of Centrecon from Utility Vault as discussed below.

Subtenants of Centrecon / Utility Vault:

Washington Stone Corporation: 1979-1982? On May 1, 1979 Centrecon entered into a ten-year lease with Washington Stone Corporation allowing then to import and process aggregate and similar products in parts of Areas I, J and M. The lease agreement included references to improvements to be made to the site by Centrecon for Washington Stone Corporation. In 1982 the same property was leased to Jenson Reynolds Construction (below). Our review of aerial photography found no evidence that the agreed to improvements were ever constructed or any evidence that the lease area was ever occupied by a business involved with aggregate handling. The area of the lease is shown in Figure 8. A termination of lease document dated December 19, 1989 verifies that the lease had previously been terminated although a specific termination date was not cited.

Jensen Reynolds Construction: 1982-1990. Jensen Reynolds Construction subleased the majority of Areas I and J and a small portion of Area M from Centrecon. Their sublease holding is shown in Figure 8. Jensen Reynolds made pre-fabricated metal waterfront buildings. They constructed three permanent buildings on the property — an open shed/warehouse/fabrication building, an equipment repair shop, and an office. These features are shown in Figure 8. Other improvements included security fencing and a fueling area with three underground storage tanks and fuel dispensers.

Ameron: 1988-2006. In 1988 Ameron bought the assets of Centrecon and subleased Area G and a small portion of Area M from Utility Vault for the purpose of utility pole manufacturing. Ameron subleased from Utility Vault until 2005 when the Port of Everett purchased the lease from Utility Vault. The name Ameron is used in this report to reference activities on Area G after 1988.

4.2.1.3 Commercial Steel Fabricators

Commercial Steel Fabricators leased the western half of Area I from Hulbert in 1991. The Commercial Steel Fabricators lease holding is shown in Figure 8. Commercial Steel Fabricators used the property for the purpose of fabrication and assembly of metal modules, storage and warehousing for shipment. No permanent buildings were constructed. The original lease was for 2 acres with a first right of refusal option for 2 more acres. Whether the option to lease the additional 2 acres was ever exercised is unverified. The lease from Hulbert commenced in January of 1991 and extended through the beginning of March. The Port of Everett assumed the lease after it purchased the property from Hulbert in March of 1991, and the lease continued through the end of 1991.

4.2.2 Tenants on Port of Everett Property Through 2006

The Port of Everett initially owned the narrow section of Area M adjacent to Marine View Drive, and purchased the 30 acre Hulbert property in 1991. The leases of existing Hulbert tenants assumed by the Port in 1991 are shown below with dates of tenancy beginning in 1991. The relationship of owner, tenants and subtenants becomes complicated. In this section all tenants and subtenants of the Port of Everett are simply referred to as “occupants” except as noted. Occupants of Port of Everett-owned portions of the site are described below. Only occupants before 2006 are addressed, we did not investigate leases after 2006. Their locations-of-occupation are shown in Figure 8. For convenience, the buildings and structures on the eastern portion of the site owned by the Port of Everett before 1991 are referred to as the “Northern Building” and the “Other Buildings/Structures” -- “A,” “B” “C”, “D” and “E” as shown in Figure 8. Port of Everett occupants are as follows.

Hulbert Mill Company: 1962-1991. Hulbert Mill Company leased the eastern-most portion of the site owned by the Port of Everett during this period, including the buildings in Area M as shown in Figure 8. Building E was used as the mill office and then later used by Hulbert in the early 1960sfor the log brokering business after the closure of the mill. The remaining buildings (the northern building and buildings “A”, “B” and “C” were leased by Hulbert to various subtenants.

The northern building was built in 1979 by Hulbert and subleased to Centrecon.

Building A was constructed in 1961 by Hulbert and leased to the Collins Casket Company who used it for fabrication of metal caskets and casket interiors. The building was later leased to Nalleys for use in warehousing foods.

Building B was constructed in 1974.

Building C was constructed in 1972 for Hulbert and subleased to Washington Belt as described below.

Collins Casket Company: 1991-1996. Collins Casket Company’s lease with Hulbert Mill Company was assumed by the Port of Everett.

Ameron: 1991-2006. Ameron’s lease of Area G and sublease of the northern portion of Area M, including the Northern Building, were assumed by the Port of Everett in 1991.

Marine Spill Response Company: 1994(?)-2006. MSRC leased portions of Areas J and M, and replaced Jensen Reynolds' warehouse with a new facility to store supplies.

Commercial Steel Fabricators: 1991. Commercial Steel Fabricators' lease and right of first refusal in Area I was assumed from Hulbert by the Port of Everett through 12/31/91.

Veco: 1991. Veco occupied a portion of Jensen Reynolds Construction's former warehouse to store construction and welding supplies and containers.

Snohomish County Public Utility District: 1954-1969. Snohomish County PUD operated an electrical substation in the southeast corner of Area M.

Nalley's: ca. 1990s. Nalley's occupied or partially occupied Southern Building A, using it for warehousing and distribution of food products.

Shaugnessey Company: Shaugnessey Company stored industrial moving equipment and containers on Area I after 1991.

RL Enterprises: 1991-1994. RL Enterprises continued their occupation of portions of the Collins Building through 1994.

Michael's Woodcraft: 1991. Michael's Woodcraft continued their occupation of portions of the Collins Building through 1991.

Tri-Coatings, Inc: 1981-1991. Tri-Coatings occupied a portion of the Northern Building, and provided commercial paints and stripping services. Tri-Coatings expanded into two buildings on adjacent property to the north, and became TC Systems.

Sunset Body Works: 1980-2006. Sunset Body Works occupied a portion of the Northern Building, and provided vehicle auto body repair. Sunset Body Works is now North Central Collision.

Dunlap Wire Rope (aka Dunlap Industrial Hardware): 1980-2006. Dunlap Wire Rope occupies a portion of the Northern Building, and manufactures wire rope, rigging, hydraulic assemblies and other hardware supplies.

Performance Marine: 1981-1985. Performance Marine occupies a portion of the Northern Building, and provides boat repair and service.

BESCO: 1981-1988. BESCO occupied a portion of the Northern Building, and provided wholesale and retail vehicle and machine parts, along with some minor vehicle maintenance.

Churchill Bros. Marine/Churchill Bros. Sail Loft: 1981-2006 Churchill Bros. occupy a portion of the Northern Building, and fabricate boat covers and canvasses.

Sandy's Boat House: 1990-2006. Sandy's Boat House occupied a Southern Building B, and provided boat sales and repair.

Washington Belt and Drive: 1972-2006. Washington Belt and Drive occupies Southern Building C, and provides retail rubber belt sales and services.

Railmakers NW: ca. 1975-87: Railmakers NW occupied a portion of Southern Building B, and fabricated rails for marine vessels.

Sound Propeller: 1972-1976. Sound Propeller occupied a portion of Southern Building B, and provided propeller sales and repair

Prop Shop Propeller Repair: ca. 1982. Prop Shop Propeller Repair occupied a portion of Southern Building B, and provided propeller repair.

Excel Transportation: 1990 at 1200 Marine View Drive. Possibly only an office, but the location and nature of other operations or activities is unknown.

Weathermaster Insulated Glass Manufacturers: 1982-1984 at 1200 Marine View Drive. Possibly only an office, but the location and nature of other operations or activities is unknown.

Hyman-Michael's Scrap Salvage: ca. 1960s. The location and nature of operations is unknown.

Christian Construction: 1968. Barge construction. The precise location and nature of their operations is unknown. They appear to have occupied an area within the northeastern part of the North Marina Peninsula which could have extended onto the western part of Area J.

Tidewater Plywood: 1965 (one year only). Plywood mill, log rafting and storage. Tidewater Plywood most recently occupied the area later occupied by Mid-Mountain Contractors and ABW. The extent of their lease area is unknown but could have extended onto the western part of Area J.

Columbia Hardboard: Prior to 1965. Columbia Hardboard occupied an area within the northeastern part of the North Marina Peninsula, including the former ABW Building southwest of the site. Based on Sanborn maps from 1957 and 1968 buried concrete structures on the western part of Area J may be attributed to Columbia Hardboard.

American Tow Boat: 1961. Log rafting. The precise location and nature of their operations is unknown.

Mid-Mountain Contractors: 1975- 1983. Mid-Mountain leased the northeastern part of the North Marina Peninsula for their operations related to shipping of oil drilling pipe to North Slope Alaska destinations. The western part of Area J was used to store and stage pipe for loading at the 12th Street dock. Mid-Mountain also had an agreement for use of the former ABW building (west of the subject site) for machining and sandblasting of pipe for a 45 day period in 1980. Notation on the rental agreement shows the building was occupied for only 30 days.

4.3 SITE USES THAT COULD RESULT IN RELEASES

Table 1 provides a summary of historic operators on the site and features of concern associated with their operations that might result in environmental contamination concerns. The table is organized by operator, i.e. the entity that was using an area of the site at the time a structure, feature or activity of concern was present. The table provides a brief description of structures or features of concern, separating them based on whether they were identified in reports, lease information, or historical documents observations. Concerns in the "From Reports" column are identified by other consultants as described in the body of reports provided to Pinnacle GeoSciences. Concerns in the "From Leases" column are formally included in the lease and sublease documents which we have obtained. Concerns in the "From Observations" column are ones which we observed on air photos, Sanborn maps, other historical maps, or other documents.

5.0 AREAS OF KNOWN CONTAMINATION

5.1 FENCE BETWEEN AREAS I AND G

The specific item of interest is: "*When the fence separating Areas I and G was constructed.*"

The fence referred to extends from the northern site boundary southward for about 480 feet and then has a short section extending about 25 feet to the east. These measurements are approximate. Aerial photography suggests that the fence is likely a chain-link fence.

The absence and presence of the fence is best documented by aerial photographs as discussed below. However, lease documents also help place a contextual time frame for the construction of the fence. A 1988 Trustee's Deed between Jensen Reynolds and SeaFirst Bank cites improvements on the land including chain-link security fencing. It cites a lease date of March 1, 1982 between Centrecon and Jensen Reynolds Construction and details the improvements made by Jensen Reynolds during the occupancy of the property. The implication is that fence (an improvement by Jenson & Reynolds) that would have been placed at some time after the effective date of their lease which was March 1, 1982.

The northern part of the area occupied by the fence originally appeared to contain surficial fill and/or vegetation that spanned across the future location of the fence. The fence appears to be a chain-link fence which makes its visibility in aerial photographs problematic unless the lighting is ideal and the resolution is sufficient. The most recent aerial photograph in which the fence is clearly not present is dated 2/27/1981. The 6/16/1982 aerial photograph shows Area I as being recently filled and graded, likely in preparation for site use as discussed in Section 3.1.6. Examination of the photography in stereo shows the fence to be present at that date. The northern part of the fence passes through a small wedge of vegetation that spans Areas G and I and that lineation feature through the vegetation could not be readily attributed to any feature other than the fence. The southern-most short section of the fence toward the east is also evident in that photograph as is the continued extension of the fence to the south after the jog to the east.

A 5/22/1983 aerial photograph is inconclusive and could appear to be contradictory regarding the presence of the fence. However, in our opinion it does not lend evidence either way because of the high sun angle (and subsequent lack of shadows) and the poor resolution of that photograph.

Our conclusion is that the fence was constructed no earlier than February 27, 1981 and that it was present on June 16, 1982. Furthermore, lease documents suggest it was constructed sometime after March 1, 1982 by Jensen Reynolds. Figure 9 shows the aerial photography supporting this conclusion.

5.2 FILL IN AREA I AND THE NORTHWEST PART OF AREA G

The specific item of interest is: *"When fill was placed in Area I and the ~~northeast~~ northwest corner of Area G that resulted in the ground surface in these areas increasing to elevations significantly greater than adjacent grades to the east."*

The northeastern part of Area I and the northwestern part of area G (also referred to as Area G-1 have both been areas of episodic fill accumulation. The areas were non-differentiated before the construction of the fence in the early 1980s which is discussed above. After the fence was constructed, filling or stockpiling activities occurred independently on both sides of the fence. In 2006 the fence was removed and excavation activities included the removal of fill or stockpiles from both sides of the fence. The original fill extending above surrounding grade in this area was from the construction of a berm prior to the placement of the dredge spoil fill in 1973.

5.2.1 Aerial Photograph Review

The sequential history of these areas, based upon review of stereo aerial photography, is described below. Figure 10 shows the sequence of filling illustrated on eight aerial photographs in the date range of 1973 to 1999. Aerial photograph dates that are underlined in the table below are shown in Figure 10. We do not have a specific flight date for those aerial photographs identified by year only.

Date	Area I	Area G (and G-1)
1966-70	No fill above grade to the east.	No fill above grade to the east.
6/2/1970	Same as above.	Same as above.
9/13/1973	Area I is bermed and filled with dredge fill.	Berm supporting dredge fill extends onto Area G. Berm height appears consistent with the height indicated on drawing of 8 feet. Area between building a berm is unused.
6/11/1974	Same as above.	Same as above except that area between the building and berm is used for storage. Some vegetation is emerging on the berm.

Date	Area I	Area G (and G-1)
1976	Dredge fill has consolidated and has been graded. The area is being used for log sorting. The southern part of Area I, directly east of the newly constructed barge dock, has been graded smooth and paved. A drainage ditch or trench has been excavated along the north and east side of this graded area and the excavation spoils are piled alongside the trench.	Minor fill in Area G-1, several feet maximum. Possible berm remnant in Area G-1 and small fill piles are evident on top of the former berm. The northern margin of Area G and the bordering property to the north as well as the northern part of the fence between Areas G-1 and I contain dark colored, dense vegetation which is best discerned in oblique photographs.
9/12/1977	Area I is being used for log sorting, no fill. There has possibly been some minor grading of the eastern dredge fill berm to make it a roadway.	Fill in Area G-1 is heavily vegetated and extends eastward along the northern property line of Area G.
1978	Same as above. A small area of white material is visible in the northeast quadrant Area I.	Same as above.
7/19/1979	Significant large log piles. Three areas of white material are visible in the eastern part of Area I. They appear to be in low areas rather than stockpiles.	Minimal fill. Vegetation present that may mask fill

Date	Area I	Area G (and G-1)
<u>4/11/1980</u>	Log piles gone. Small slash and debris piles are present. A pile of steel pipe is present near the northeast corner of Area I. White material noted in the 1979 aerial photograph is now limited to the southeast quadrant of Area I. A pipe or hose is visible running along the ground surface from the west side of the Centrecon pole polishing building westward. The pipe/hose appears to go underneath the berm and then discharges at the west side of the berm into a low area characterized by the white coloration. At the outfall the white material appears to spread into low areas and eventually enter the trench/drainage ditch on the north side of the paved area east of the barge dock. Some grading appears to be occurring, apparently pushing the white material into a stockpile west of the discharge point. The stockpile measures approximately 125 by 50 feet in plan dimension.	Vegetation is still present on the eastern part of Area G-1. Clearing and grading on Area I has encroached into the western part of Area G-1 where vegetation has been removed.
<u>6/16/1982</u>	Area I is cleared and graded flat – no fill piles. The fence is now present separating Areas G and I. There is no longer evidence of the white material. The trench/drainage ditch along the margin of the pavement east of the dock has been filled.	Most of the fill has been removed. Only a few feet of fill extending up to 50 feet from the fence line remain. A settling pond is present – it is oval and approximately 40 by 80 feet. The northern-most 50 feet of Area G has been cleared, graded and paved; no fill is present in this portion of Area G.
<u>6/17/1987</u>	No significant fill on Area I, minimal vegetation is growing next to the fence bordering Area G.	Minimal fill on northwestern Area G. The pond is still present. Much of the area is being used for equipment storage.
7/3/1991	Minimal fill or vegetation accumulation along the northern property line next to fence bordering Area G.	Part of Area G-1 is used for pole storage. The pond is gone. Minimal fill is present. A small pile of additional fill is present at the location of the former pond.

Date	Area I	Area G (and G-1)
8/19/1991	Vegetation increasing along the fence bordering Area G. Small piers are set in a grid pattern over much of Area I – possibly used to hold items being sandblasted. Pier areas have black material around them.	Minimal fill still present. Small pile of additional fill present at fenceline.
8/10/1992	Area I is graded again. The landfarm is present at the northeastern corner of Area I. No fill is present next to the fence adjoining Area G.	Pole storage is gone. The quantity of fill may be less. A vestige of the former pond is evident.
9/9/1993	Area I is used intensely for log storage. Most of the logs are blackened on one end. They could either be treated poles with a creosote butt treatment or salvaged piling with the embedded end stained black by mud and reducing conditions. There are also piles of what appear to be smaller pieces of salvaged wood which suggests the latter (pile salvaging) is the source of the stockpiled timber. Vegetation is increasing along the eastern and northern border. A possible fill pile is present near the northern fence about 40 feet west of the fence bordering Area G.	The southern fence that "defines Area G-1 is now present. It extends about 50-60 feet to the east from the fence separating Areas G and I. The volume of fill present in G-1 has increased significantly. The fill is several feet deep and extends to 50 feet from the fence. The volume of fill is likely in excess of 500 CY. Vegetation is gone from the fill indicating recent accumulation or movement of soil. There is no pole or equipment storage.
1995	Area I is largely unused. Minor accumulation at the northeastern corner that may be equipment or fill surrounded by vegetation.	A significant volume of fill is still present in Area G-1. The area is also used for pole storage again.
9/22/1999	A significant volume of fill has been placed next to the fence separating Areas G and I. The fill piles are 5 or more feet high.	Fill is still present in Area G-1. Some fill has been excavated near the northern end of the fill pile, next to the northern property line.
2000	Significant accumulations of fill are still present on the northeastern corner of Area I. Some vegetation is present on the fill.	Same as above.

Date	Area I	Area G (and G-1)
7/21/2002	Same as above. The fill is covered with vegetation.	More fill has been placed at the northern end of Area G-1. Vegetation is gone from the surface of parts of the fill in Area G-1 suggesting that it has been reworked or partially removed.
2006	Area I is cleared and possible filled again. A pond is present on the south central part of Area I.	All fill has been removed and the area leveled. Some equipment is stored in Area G-1. A small pond borders the fence.

5.2.2 Summary of Filling on Area I

Area I was originally filled in 1973 as part of the 12th Street Channel dredging project. In preparation for the fill placement, a dike was constructed along the west side of Area I and a berm constructed on the north, east and south sides to contain the dredge fill. Figure 15 shows the location of the dike and berm. The portion of the engineering drawing reproduced on Figure 15 also shows that the northeastern corner of Area I served as a borrow source for construction of the northwestern part of the dike. The engineering drawing does not specify the source or character of the fill used to construct the berm on the north, east and south sides of the fill.

It appears to have taken over one year for the fill to settle and consolidate enough for the site to be graded and used. The eastern berm did not settle and remained higher than the surrounding areas to the east and west. By 1976, most of Area I had been graded and was being used for log sorting. By 1982 the area had been graded and a fence erected between Areas I and G as described in Section 5.1 of this report. With the exception of the engineered landfarm observed in the August 10, 1992 photograph (described in Section 5.3) there was no evidence of significant accumulation of fill in the northeastern corner of Area I until after 1995. The 1999 aerial photograph shows a significant accumulation of fill placed on Area I near the fence separating Areas G and I (Area I-1). This fill is still present in 2000, 2002 and 2006. By mid-2006 it has been removed. The 1999 aerial photograph also shows a smaller pile of fill at the northeastern corner of Area I, abutting the northern and eastern fences. The 2004 survey indicates that there was no fill against the fence separating Areas I and G-1 at that time.

5.2.3 Summary of Filling on Area G (G-1)

Area G-1 occupies the northwestern corner of Area G, bordering Area I, and is the location of two extended periods of fill accumulation. Area G-1 was first filled by the construction of the berm to contain the 12th Street Channel dredge material in 1973. Engineering drawings indicate that the berm was about eight feet above the Centrecon yard grade in this area. Sometime between 1974 and 1976 Area I was graded but the remaining berm in Areas I and G-1 area was not removed although it was apparently lowered. The remnant of the dredge berm remained and was probably only several feet high. Aerial photographs from 1976 through 1979 show vegetation emerging on top of the berm remnant. The 1980 aerial photograph shows that the eastern side of the fill retained the vegetation seen in prior years and western side of the fill on Area G-1 was cleared and graded.

A fence was constructed between Areas G-1 and I sometime between March and June of 1982 as described in Section 5.1. After this fence was constructed there was no direct access between Areas G-1 and I and all subsequent fill placement and/or movement activities within Area G-1 would have been by access from the east.

By 1982 most of the fill (the portion of the former berm that was above site grade to the east) had been removed from Area G-1, only 1 to 2 feet of fill remained and it extended from just west of the newly constructed fence to about 50 feet east of the fence, covering about 40 percent of Area G-1 and several feet of the adjoining part of Area I. The northern 50 feet of Area G-1 had been cleared of fill by 1982. A large pond is evident on G-1 in the 1982 photograph. The pond is constructed on top of the fill and is roughly 40 by 80 feet in size. The pond and surrounding fill in Area G-1 is shown in the 1985 survey map discussed in Section 3.1.6. The pond is still present in 1987 and the amount of fill present is about the same. By July, 1991 the pond is gone. A photograph from 1992 suggests that the quantity of fill might be slightly less.

In 1993 the volume of fill present in Area G-1 has increased. The fill is several feet deep and extends up to 50 feet eastward from the fence, covering about 60 percent of Area G-1. The volume of fill likely exceeds 500 cubic yards. This fill remains until sometime after 2002. Several photographs show the fill was moved around at times but the volume remained approximately the same. The fill was removed in early 2006.

5.2.4 Continuous Fill Across Areas I and G

Aerial photography showed that filling spanning the boundary between Areas G and I took place primarily by construction of the berm to contain the 1973 dredge fill. By 1976 we see the fill area being used for log sorting. It is likely that once the dredge fill dewatered and consolidated, the entire area was regraded to create a level surface for the log sorting activities we see in the 1976 aerial photograph. Most of the activity across the boundary between Areas I and G-1 between 1973 and 1982 appears to consist of regrading of the berm material. Minor amounts of dark material apparently originating from the Centrecon sandblasting area are evident crossing the boundary in the 1977 and 1980 aerial photographs, however the visible evidence of this dark fill suggests it extended only slightly onto Area I.

By 1982 the fence had been established between the two areas and after that, cross boundary filling was not feasible.

5.3 LANDFARM ON AREA I

The specific item of interest is: *"When the landfarming area in the northeast corner of Area I was created, when it was decommissioned, and where the treated soil was placed (if discernable from aerial photographs)."*

The landfarm was clearly evident in the aerial photograph dated August 10, 1992. ECI (Earth Consultants, Inc.) sampled the location of the landfarm in September-October 1991 and did not mention or show a landfarm. AGI (Applied GeoTechnology, Inc.) visited the site on 6/30/1992 and observed the landfarm (they had intended to sample the soil in that area and were not aware of the presence of the landfarm). The next aerial photograph available, chronologically, was August 1, 1993 and the landfarm was not present in this photograph. Based on this information, the landfarm was constructed sometime between October 1991 and June 30, 1992 and was removed some time between August 10, 1992 and August 1, 1993.

The only mention of a landfarm in the literature is included in reports by Landau Associates that refer to a landfarm of soils from the removal of three tanks from 1100 – 13th Street in 1991. The Landau Phase I ESA refers to 50 CY (cubic yards) of soil being "placed in a bermed area and aerated". The description goes on to state that the soil was then placed on Port property to the north. The specific location of the soil placement was not noted. This description is included in a letter received by Ecology in August 1991. The Landau Data Gaps Investigation for the subject site corrects the information in the Phase I ESA and states that the tank removal was from Area M, on the north side of 13th Street, not the south side as previously reported.

We considered the likelihood of the landfarm in the 1992 photograph being the landfarm cited by Landau even though the dates differ. The Landau report describing the landfarming activity seems to be clear that the date associated with that landfarm is in the summer of 1991. We have confirmed that the date of the aerial photograph showing the landfarm on Area I is indeed August 10, 1992 which conflicts with the dates reported by Landau. The landfarm in the photograph is approximately 80 by 90 feet. This landfarm is significantly larger than a landfarm needed to treat 50 CY of soil. Fifty CY would be spread to a thickness of two to three inches in a landfarm of this size. Notwithstanding, we reviewed aerial photography for July 2, 1991 and found no evidence of landfarming activities in the general area of the subject site or properties to the south.

The 1993 aerial photograph shows Area I being heavily used for log sorting. There is a possible fill pile located near the northern fence of Area I about 40 to 50 feet from the fence bordering Area G. This pile could be the consolidated landfarm material but we found no information to further support or refute that possibility.

While we can bracket the dates of the presence of the landfarm on Area I we cannot resolve any information about the source, character or final destination of this soil. The anecdotal information about the treatment of soil from a tank removal from Area M reportedly one year earlier could match this feature if the dates reported were incorrect and if additional soil was landfilled as well. Any further conclusions would be speculative given the information we have reviewed.

5.4 CONSTRUCTION DEBRIS AND BURIED STRUCTURES IN AREA J

The specific item of interest is: *"When construction debris was placed as fill in Area J-3 and the source and nature of the buried structures found in western portion of Area J."*

5.4.1 Area J-3 Fill

Area J-3 encompasses the part of the former Hulbert Mill that contained what were likely the most permanent structures associates with the mill operation. Those structures are the boiler house and associated boiler stack, the refuse burner (an 85 foot tall cylindrical iron structure), and the water tower. The 1950 Sanborn map describes these facilities as a "concrete chimney," an "iron refuse burner – 85 feet high" and a "steel water tank on steel trestle – El. 85' – 75,000 gallons." All of these structures would have required substantial foundations which were likely concrete pile caps since all of these structures were constructed over the intertidal area. These three structures were also the last removed after demolition of the mills. The mills were reportedly removed in the early 1960s and the last photograph showing the mill buildings is dated 1961. The 1970 deposition of Mr. William Hulbert, Jr. (father of William G. Hulbert, III) cited the removal of the mill and associated structures as having occurred in 1962. By 1965 all of the mill structures and buildings had been removed except the boiler stack, the refuse burner, and the water tower. By 1967 the refuse burner had been removed and by 1976 the remaining two structures had been removed.

A photograph of the operating mills from the 1930s and subsequent photographs through the 1960s show that debris and granular material was dumped in the area of Area J-3. Based on the proximity, it is possible that bottom ash from the refuse burner was also dumped at this location. The area south of these three structures was gradually filled up until the early 1970s when the large, engineered dredge fill of Area I and parts of Area J was completed.

The extent of structures demolished in 1962 was significant. Historical accounts describe the sawmill fire in 1956 which left it inoperable. Many of the accounts refer to the sawmill "burning down." Aerial photographs show the sawmill structure still present in 1961, five years after the fire. Review of aerial photography shows that the fire actually consumed the lumber storage docks, lumber sheds, one stream dry kiln and two planing mills – all features located north and east of the sawmill.

All mill activities ceased in the early 1960s and all of the mill structures were removed except for the three tall structures. We would expect that a large amount of non-salvageable materials were burned in the refuse burner as the two mills were demolished. This could have included painted wood and possibly treated wood. Residues from these burned materials would accumulate in bottom ash.

Significant changes occurred at the site between two sets of photographs we have of the site - 1956 and 1961. The 1956 photographs show the entire mill in operation and the 1961 shows the area after the mill fire. As discussed in the filling section, it appears that significant filling occurred in this intervening period. A bulkhead is evident surrounding the west and north sides of the burned area in 1961 that was not present in 1953. One test pit on the north side of the property encountered this bulkhead and reported that the lagging was 12"x12" treated wood. The type of treatment was not noted. In our experience, timber and piling of the time period when the wall was constructed were oftentimes untreated cedar, although frequently mistaken as treated. The 1961 photograph show that the piling supporting this bulkhead extend at different lengths above grade. Construction of this bulkhead would have likely generated significant amounts of cutoffs, both from the piling and lagging. These cutoffs could have been burned in the refuse burner as well. If so, the bottom ash from the refuse burner could also contain residues from the wood treatment.

After cessation of all mill activities Hulbert continued to use the intertidal area for storage of log rafts and it appears that some log handling continued. The excavated log pond remained in use and the area immediately to the south and east of it remained near its original intertidal elevation. This is the area to the south of the three structures described above and within Area J. By 1973 this entire area was filled.

The locations of the smokestack, the refuse burner and the water tower structures relative to Area J and J-3 and historical photographs are shown in Figure 11. Since the pile cap foundations for these structures would have been at least ten feet below the filled grade it is unlikely that they were removed. The foundation for the refuse burner would have encroached upon the northwestern corner of area J-3.

The buried “construction debris” which reportedly extends to a significant depth in Area J-3 may also include debris and wastes from past operations. There is no evidence of significant filling in this area after 1976.

5.4.2 Buried Structures in the Western Part of Area J

The Landau Interim Action Report (2009) discusses two buried concrete structures located on or near the western part of Area J. One of these structures which we'll refer to as the "irregular vault", was removed by Kleinfelder in October, 1993. The other structure is portrayed as a "square vault" on Figure 8 of the 2009 Landau report. We understand that both structures were removed from the site. We have identified the origin and actual location of both of these structures. The identification was complicated by errors in the Kleinfelder report that resulted in their reporting of an incorrect location of the irregular vault in their site plan and the same error in subsequent site plans that relied upon the original Kleinfelder plan.

The 1959 Sanborn map identifies a west to east oriented metal overhead conveyor structure which terminates at a square concrete vault at its eastern end. The labeling of the concrete structure is “CONC. PIT” and the pit is partially overlain by a feature that appears to be labeled “SOIL SHED” except that the word “soil” is difficult to read and has been partially inferred. Nearby to the southeast of this structure is an irregular shaped vault, similar to the shape of the vault documented by Kleinfelder. This irregular vault is titled “CONC. PIT” and “LOG DUMP.” The 1967 Sanborn map only shows the irregular vault which is labeled as “CONC.PIT” and “WASTE BURNER DUMP.” Both of these features are faintly visible in photographs dating from 1961 to 1967. They are not visible in the 1955 aerial photograph which shows the 12th Street Pier fill shortly after its initial construction, nor are they visible in the 1974 aerial photograph taken after the second fill of this portion of the 12th Street Pier fill was completed. It is likely that both of these structures were buried by the second fill.

A 1974 engineering drawing shows a square feature at the location of the square foundation structure identified in the Landau figure. That engineering drawing, which was prepared by Reid Middleton Associates for the 12th Street Channel Barge Terminal, identifies this feature, along with other features as "Old concrete foundations to be removed." This drawing places that feature at the same location of the irregular vault shown in the Sanborn map and in the aerial photography. Figure 12 provides an overlay of these locations on the pertinent part of Figure 8 from the Landau 2009 report.

The final confirmation of the mistaken location of the irregular vault by Kleinfelder comes from their own report. Photo Plate 1 in the Kleinfelder report shows several photographs taken during the removal of the vault. One photograph, taken looking to the southeast, shows the MSRC building in the background. Features on the side of the building (a bay door and windows) confirm that the irregular vault was actually located approximately 150 feet north of the location shown in their report.

The actual locations of both of these concrete structures is shown in Figure 12. Both features lie within Area J. The source of the waste materials buried within the irregular vault was not identified but they were likely placed in the vault prior to it being covered over in late 1973 to early 1974. Section 5.7 of this report documents that activities in this part of Area J were largely related to and under the control of business to the west of Area J at that time.

Pertinent portions of the aerial photographs and documents cited in this discussion are shown in Figure 12.

5.5 NORTHERN BOUNDARY OF AREA G

The specific item of interest is: *"Activities or structures along the north boundary of Area G that could have caused the petroleum hydrocarbon and polychlorinated biphenyls (PCB) contamination identified in this area (See 2005 Landau Associates document)."*

5.5.1 Background

The northern boundary of Area G is presently occupied by an underground storm sewer line. In late 2004 a repair was made to a storm drain line and evidence of contamination was noted in excavated soils. The location of this repair is shown in Figure 13. Analytical testing of the soil stockpile from the excavation showed low concentrations of mid-range to heavy-range petroleum hydrocarbons, several PCB aroclors and cPAHs. Furthermore, the soils encountered included concrete fragments and mixed fill suggesting that this area was used for disposal of demolition debris. Follow up testing by Landau Associates shortly after the repair (early 2005) encountered the mixed fill and found the contamination to be localized to the general area of the repair excavation. Samples tested by Landau found evidence of PCBs, PAHs and low concentration petroleum contamination. PCBs and PAHs were found in a soil sample from the initial excavation stockpile. Relatively high concentrations of volatile organic compounds were found in a sample obtained from a depth at or near the top of the storm drain line, close to the repair area. The suite of analyses performed was not consistent from sample to sample so it is difficult to identify patterns between different samples evaluated.

Although the requested scope of this task is to identify possible sources of petroleum hydrocarbons and PCBs in the fill it is important to consider all contaminants detected as indicators of a source area, including contaminants at concentrations well below action levels. Other contaminants observed in the fill stockpile and soil samples collected and analyzed by

Landau include chlorinated solvents (methylene chloride, 1,1,1-trichloroethane and tetrachloroethene) and methyl ethyl ketone (2-butanone). The petroleum distillate volatile organic hydrocarbons in one sample were suggestive of a kerosene or kerosene/gasoline type mix. These solvents and volatile petroleum products are not uncommon to encounter in automotive or truck shop/repair facilities. The PCB aroclors suggest two sources. Aroclors 1254 and 1260 are commonly associated with electrical equipment, specifically transformers. Aroclor 1248 is commonly associated with hydraulic oils. The metals identified are found at many locations across the subject site and as such may not be useful for considering a specific source of the organic chemicals identified in the fill. Based on the chemistry, the likely sources include shop wastes and releases from electrical equipment.

The area of concern lies between the Ameron Building and the northern property line. Figure 13 shows the succession of change in the area of concern between 1967 and 2005. This area was originally tide land and the first construction there was a pile supported dock used for storage. We do not know specifically when this area was initially filled, but by the 1960s the former mill dock structures appeared to be largely underlain by fill, including this area. Until mid-1977, the northern property line along most of Area G is clearly identified by the piling at the edge of the former dock and the much lower grade on the adjacent property to the north. Although the property to the north had been partially filled, a drainage ditch remained along its southern margin – just north of Area G. By mid-1978 the property to the north was filled to approximately the same grade as area G, including this drainage ditch. The storm line, which was likely installed in about 1981-1982, lies several feet south of the northern property line and discharges at the northwestern corner of Area I. The catchment for the portion of the drain line upgradient of the release location encompasses the building east of the Ameron Building and the eastern-most building on the property to the north. The basis for our estimate of the 1981-1982 date range for the installation of the storm sewer system is based on a combination of site development factors evident in aerial photographs including the presence and subsequent removal of substantial fill along the northern margin of Area G and the paving of areas where the storm sewer is now present.

5.5.2 Contaminant Source Scenarios

Four possible scenarios could have led to the presence of soil contamination in the vicinity of the storm line break, these are: 1. Contaminants were already contained within the fill soil surrounding the storm line at the time of placement, 2. The fill soil became contaminated from local releases to the ground surface, 3. Contaminants originated from stormwater leaking from the damaged storm line, and 4. Contaminants migrated to their present location from the property to the north. Each of these scenarios requires a different approach to evaluate. A brief discussion of each scenario is needed to focus on the potential source areas.

Contaminants Contained Within Backfill or Originating from a Surficial Release

The area between the north side of the Ameron Building and the Property line is approximately 80 feet wide. The 30 feet closest to the building is presently paved and the remaining northerly 50 feet has historically been used for storage of fill and equipment storage. As previously mentioned, the original filling of this area appears to have been complete sometime prior to the mid-1960s. Prior to then the area had been a pile supported dock used for the storage of lumber. This area was largely unused until the area was graded for construction of the large manufacturing building in 1972. Through the 1970s and early 1980s the fifty-foot zone next to the property line was at times occupied by piles of fill material. Based on our aerial photograph review it appears that there was no substantial post-sawmill fill placement on the subject area. We observed no evidence that the occupants of the property to the north used the subject property for fill disposition. It is likely that any fill or equipment storage in this area was under the control of the occupants of the manufacturing building. We have not been fully briefed on the historical industrial activities that occurred in and around the manufacturing building but we would expect that the activities could have generated shop wastes and waste hydraulic oil. We would also expect that electrical demand could have necessitated on-site electrical infrastructure. There is other evidence of electrical equipment on the subject property. A small substation occupied the southeastern corner of the entire property (the southeastern corner of Area M) between 1954 and 1969. Aerial photography from 1980 shows pole-mounted transformers on a utility pole at the northeastern corner of Area G. Furthermore, one oblique photograph from 1977 shows a feature that was possibly a small substation and/or electrical switching facility at the northeastern corner of Area M, however, the quality of the photograph prevented confirmation of this observation and there is no other account of such a feature.

Through the sequence of fill and debris accumulation, excavation and placement of the storm drain line, and periodic regrading and reorganization of the area north of the Ameron Building, the conditions observed in the excavation (buried concrete debris and mixed fill), could have accumulated in this area. We cannot, however, rule out the possibility that the debris and mixed fill in this area is comprised of debris from the former sawmill which could have been used as fill behind the bulkhead. Close examination of the debris would likely allow the distinction of the relative age of the concrete material.

Since contaminant sources consistent with the contaminants found in the soils in the northern part of Area G are likely present in Areas G and M, the source of the contaminants in the soil could have been from the subject site.

Contaminants Originating from the Property to the North

The area north of the large manufacturing building was always separate from the adjoining property to the north. It was filled in the 1960s or earlier. This area was subsequently used for the storage of materials and what appear to be soil and/or debris piles. The progression of site development activity suggests that the storm sewer system was installed in 1982. This would have required excavation and filling. The potential for cross-over activities from the property to the north were minimal prior to mid-1977 because of the significant grade difference – the northern property line was characterized by a vertical wall corresponding to the northern edge of the bulkhead structure. The property to the north was finally filled to the approximate grade of the property to the south between mid-1977 and mid-1978. A fence may have been constructed between the two properties as early as 1978 but it is not visible in aerial photographs until the 1990s. Even though the fence may not be visible in earlier photographs, the land use on the two adjoining properties since 1978 is consistent with a fence being present. We observed no evidence of filling activities in this area that may have crossed the property boundary.

After filling in 1978, the land use on the southern margin of the property to the north in the general vicinity of the storm line repair was associated with vehicle parking, boat parking/storage, and container storage. It is possible that drums were stored here but we saw no evidence of drum storage along the fence in the photographs evaluated. Structures on the property to the north are set back approximately 80-100 feet from the property line, consistent with the set back of the manufacturing building from the northern property line. This area was paved as early as 1979. The aerial photographs provide no evidence of specific on-going activities along the property margin that might have resulted in a localized release. However, aerial photograph review is not likely to identify a small release, intentional or unintentional, that might have occurred at the property line.

Contaminants Originating from a Break in the Storm Sewer Line

The portion of the sewer line upgradient to the contaminated area of the northern part of Area G collects storm water from portions of Areas M and G and from the east and west side of the eastern-most building on the property to the north. Figure 14 shows the drainage system configuration in this area.

The area drained on the property to the north is occupied by TC Systems (1032 West Marine Drive). The two eastern-most buildings and likely the third are all occupied by TC Systems. In 2009 Ecology (The Washington State Department of Ecology) fined TC Systems for multiple hazardous waste violations. The fines applied to violations found in 2007 and 2008, most of which were repeat violations found in prior inspections dating back to 1997. Ecology cited spilled compressor oil entering a storm drain, paint solvents set out to evaporate and numerous other housekeeping and procedural issues. Aerial photography from 1995 to 2005 shows that the area between the two eastern-most buildings was heavily used for equipment, materials and possibly waste material storage. This photograph is shown in Figure 14. This photograph coincides with the time frame for the discovery of the contaminated soil in the area of the sewer line break. The full scope of possible contaminants from this facility is unknown but the Ecology documentation identifies possible contaminants consistent with some of those observed in the soil.

As mentioned in the previous section, there are also likely sources for these contaminants on the subject property (Areas G and M) which also drain into the storm drain system. In addition to active business operations areas, the 1995 photograph shown in Figure 14 shows that the northeastern corners of both Areas M and G were used for storage of equipment and waste accumulation (note the blue dumpster).

In October, 1992 ECI sampled and analyzed sediment from the storm sewer outfall at the northwestern corner of Area I. The sample was analyzed for petroleum, selected metals and organochlorine pesticides and PCBs. Petroleum hydrocarbons were present (undifferentiated) and PCBs were not detected although matrix interference resulted in an elevated reporting limit such that the data are of limited use in comparison to Landau's finding at the subject area.

It is possible that the source of some of the organic contaminants observed in the fill soil are from the break in the storm sewer line. This could be further evaluated by additional analysis of residue in the storm drain line and at the outfall. However, it is unlikely that metals contamination noted in the soil is related to the break in the storm sewer line. There is insufficient information to indicate a relationship between the metals contamination and the organic chemical contamination.

5.6 ACTIVITIES CROSSING THE NORTHERN PROPERTY BOUNDARY

The specific item of interest is: *"Whether the operations in Areas G or I extended across the Site boundary to the north at any time during the Site operational history and, vice versa, whether operations to the north extended onto Areas G or I and may have impacted these areas."*

The boundary between Area G and the property to the north has always been a physical barrier preventing physical movement across the property line. Until the property to the north was filled, the northern margin of Area G was the northern edge of a former sawmill dock structure which was ten of more feet higher than the adjoining property. The intertidal zone beneath the dock structure appeared to have filled by the 1960s and a bulkhead replaced the dock structure.

The northern property line between Area G and the property to the north was an incised drainage until the eastern part of the property to the north was filled to its present grade. In 1973 when the large dredge fill was placed, an intertidal drainage channel extended nearly to Marine View Drive.

The boundary between Area I and the property to the north was also partially characterized by the same dock structure. The western-most part, however, was common intertidal land until a major dredge fill placement in 1973. This engineered dredge fill placed in 1973 spanned the subject property, including parts of Areas J, I and G. Figure 15 shows the engineered fill placed in 1973. As as-built drawing by Reid Middleton Associates shows the dike and berm structures that were constructed on Areas J, I and G and extended onto the property to the north, as did the dredge spoil fill. The dike was constructed, at least in-part, from soils excavated from the northeastern corner of Area I and described in the 1973 engineering drawing. Furthermore, log and timber debris from the fill project was stockpiled north of the fill on the property to the north. This is also shown on the engineering drawing.

In 1976 a dike structure was built on the property to the north in preparation for its filling. The eastern-most extension of that dike structure was approximately even with the boundary between areas G and I. This dike structure prevented movement across the property line between Area I and the property to the north.

Once the property to the north was filled, the boundary between Area I and the property to the north was not distinguishable. By 1977 there was evidence of cross-over between the properties as is evidenced by a dirt road. Between 1977 and 1982 when Area I was filled and graded there was opportunity to move across the property line. During this period Area I was used for log storage and there are there are multiple examples of movement across the property line visible in aerial photographs as dirt roads and vehicle tracks. However, use of the property to the north for storage of logs or soil appeared to be minimal and also appeared to just straddle the property line.

With the filling of Area I in 1982 the boundary between Area I and the property to the north was established and no cross-over occurred until 2005 when construction, presumably by the Port of Everett, spanned the two properties.

5.7 ACTIVITIES CROSSING THE SOUTHERN AND SOUTHWESTERN PROPERTY BOUNDARY

The specific item of interest is: *"Whether operations in Areas J, I, or M extended across the Site boundaries to the south or southwest at any time during the Site operational history and, vice versa, whether the operations to the south or southwest of Areas J, I, or M extended across the Site boundaries and impacted these areas."*

In about 1955 a large non-dredge fill was placed that encompassed much of Area J. This fill was incorrectly interpreted to be a sawdust pile in Exhibit A – Figure 7 of the Final Agreed Order. This fill was bounded on the west by a low wall structure, possibly a constructed soil berm. This structure is clearly visible in early aerial photographs of the fill. Another, less obvious berm was constructed near the eastern margin of the fill and a wedge of fill was placed east of this berm, likely intended to merge the new grade into the site grade east of the Collins Building. The newly filled area had its own access road from 13th Street as did the area just west of the wall.

The west wall of this fill formed a natural division of the site which then continued to propagate through future uses of this part of the site. The 1957 and 1968 Sanborn maps describe an eight foot high wire fence at the western margin of this wall (see Figure 12). Land use of the area west of this wall was tied to the activities of businesses west of Area J and west of the Agreed Order site. The area immediately next to the west side of this wall became a parking and equipment laydown area apparently associated with the business activities to the west. The two areas, east and west of the boundary had their own separate access roads from 13th Street. Traffic flow patterns and visual evidence of site access suggests that activities in Area I and the filled part of Area J did not encroach on the part of Area J west of the wall and fence.

When the 12th Street pier received additional fill in late 1973 to early 1974 the newly filled site grade may have then approximated the grade at the top of the wall. Despite this, the division of site use appears to have persisted with the division formed by the fence, vegetation and use of this area for storage. With the completion of site development associated with the construction of the MSRC Building in 1993 a drainage swale was constructed at the alignment of the former berm and fence.

After construction of the 12 Street Barge Wharf in the mid-1970s the road access between the area west of the boundary opened up to allow access to the wharf. To accommodate this, parts of Area J and I were graded and paved. From this date forward, Area I was generally accessible from this route. From 1982 to about 1993 the part of Area J east of the boundary was also accessible by this route but only by passing through Area I. With the construction of the MSRC Building in 1993 Area J became even more limited from Area I.

Business activities on Area I appeared to use the area west of the wall for access purposes starting in about 1982. It appears that this area was used for through truck access but there did not seem to be evidence of industrial activity associated with this site use.

There is no evidence of active industrial features on the western part of Area J, west of the fill constructed in 1955 except for the concrete structures discussed in Section 5.4.2 of this report. This area was used for traffic, parking and equipment storage and laydown which, for the most part, was associated with businesses to the west of the Agreed Order area. The use of the area for equipment storage and laydown could have resulted in localized contaminant release events. The land use in this area, spanning 55 years, is shown in the series of 21 aerial photographs shown in Figure 16.

6.0 THE REFERENCES USED

We relied upon references provided to us by the PLP Consultants, documents provided by The Nadler Group and documents found through our own research and inquiries. The attached list of references differentiates between documents provided to us by the PLP Group and documents we obtained through the Nadler Group and our own research. A considerable number of aerial photographs were provided to us in both paper and digital form. We obtained additional aerial photographs including photographs to create stereo pairs with individual photographs provided to us. Appendix A includes an inventory of aerial photography collected and reviewed for this study. The attached DVD includes digital copies of all aerial photographs including PDFs of stereo pairs arranged for viewing.

7.0 LIMITATIONS

Pinnacle GeoSciences, Inc. prepared this report for use by (the PLP Group). This report may be made available to regulatory agencies and to other parties authorized by (the PLP Group). The report is not intended for use by others and the information contained herein is not applicable to other sites.

Pinnacle GeoSciences has relied upon information provided by others in our description of historical conditions and prior studies. The available data does not provide definitive information with regard to all past uses, operations, incidents or conditions at the site and the vicinity of the site. Our interpretations of site conditions are based solely on review of reports and historical documents. We have not visited the site.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices for environmental services of this type in Washington at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

8.0 CLOSING

Pinnacle GeoSciences appreciates the opportunity to provide environmental consulting services to the PLP Consultants. Please contact us if you have any questions concerning this report.

Sincerely,
Pinnacle GeoSciences, Inc.

State of Washington
Licensed Geologist
Hydrogeologist
219
Stephen C. Perrigo

Stephen C. Perrigo, LHG, LG
Principal

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Note: *Sources* are identified in parenthesis after citations. The document number refers to the document number as it is identified in the project digital file.)

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Aerial Photograph Inventory - North Marina Ameron / Hulbert Site

February 16, 2010

Year	Pair?	File Name (without year prefix)	Image Source	Acquired by:	Photo Date	Oblique?	Color?	Comment
1920c		Everett Waterfront.jpg	www.Historylink.org	PGS-online	estimated	X		
1920s		Collins Casket - Historylink.org	www.Historylink.org	PGS-online	estimated	X		
1925		Mill and Casket Co - Historylink.jpg	www.Historylink.org	PGS-online	1925	X		
1928		1928 - Everett Library Digital Collection.jpg	Everett Library Digital Collection	PGS-online	1928	X		
1928		1928-2 - Everett Library Digital Collection.jpg	Everett Library Digital Collection	PGS-online	1928	X		
1930s		1930s - Sawmill.jpg	"Morrison Photo" in ink	Nadler	estimated	X		date estimated from cars (newest: 1935 Ford)
1947	Pair	D47-294.jpg	AeroMetric	L-H	1947			
1947		Hulbert_aerial_1947.tif	AeroMetric	PGWG-D	1947			Pair with other 1947 pic, this is D47-293
1953		1953 - Sawmill Oblique	unknown	Nadler	1953	X		year noted on back
1953c		1953c - Clark's Aerial		Nadler	estimated	X		Clarks Aerial Broadcasting & Photography
1953		1953-08-18 - Western Ways	Western Ways	Nadler	8/18/1953	X		Western Ways Inc. - stamped on back
1954		1954-10-01 - Western Ways.jpg	Western Ways	Nadler	10/1/1954	X		Western Ways Inc. stamped on back
1955	Pair	D55-9N-34.jpg	AeroMetric	L-H	1955			
		D55-9N-35.jpg						
1955		Hulbert_aerial_1955.tif	AeroMetric	PGWG-D	1955			
1956		EDR Aerial Photo 1956.jpg	EDR	L-EDR	4/9/1956			
1960		1960 - Oblique - Everett Reynolds.jpg	Everett Reynolds	Nadler	early 1960 in pencil	X		Everett Reynolds
1961		8-11-1961-crop2.jpg			8/11/1961			
1965		K-SN-65 15B-32.jpg	WDNR	L-H	7/6/1965			
	Pair	K-SN-65 15B-34.jpg						
		K-SN-B 15B-33.jpg						
1966	Pair	7-29-66_1-5-2-22_north 400dpi.jpg	Unknown	L-D				
		7-29-66_1-5-2-20_south 400dpi.jpg						
1967	Pair	Hulbert_aerial_1967.tif	AeroMetric	PGWG-D	1967			SN-C
		SNC-1967, 6-25	AeroMetric	PGS-AM				
1968		EDR Aerial Photo 1968.jpg	EDR	L-EDR	9/2/1968			
1969		1969-08-02 - Pete Kinch - 422-1-69.jpg	Pete Kinch	Nadler	8/2/1969	X		
1969		1969-08-02 - Pete Kinch - 422-1-70.jpg	Pete Kinch	Nadler	8/2/1969	X		
1969		1969-08-02 - Pete Kinch - 422-2-69.jpg	Pete Kinch	Nadler	8/2/1969	X		annotated with fill location
1970	Pair	NW-69 235 48A-31.jpg	WDNR	L-H	6/2/1970			
		NW-69 235 48A-32.jpg						
1971		EDR Aerial Photo 1971.jpg	EDR	L-EDR	9/18/1971			False Color
1973	Pair	S73027-6-4	Army Corps of Engineers	PGS-AC	9/13/1973			digital enlargement
		S73027-6-5						
1974	Pair	S74047-56-3	Army Corps of Engineers	PGS-AC	6/11/1974			digital enlargement
		S74047-56-4						
1976	Pair	Hulbert_aerial_1976.tif	AeroMetric	PGWG-D	1976			76-4011 SNC 5-26
		SNC-1976, 5-27	AeroMetric	PGS-AM				
1977		1977_SNO0677_105.jpg	Ecology Coastal Atlas	PGWG-D	6/17/1977	X	C	
		1977_SNO0677_120.jpg				X		

Aerial Photograph Inventory - North Marina Ameron / Hulbert Site

February 16, 2010

Year	Pair?	File Name (without year prefix)	Image Source	Acquired by:	Photo Date	Oblique?	Color?	Comment
		~~1977_SNO0677_108.jpg~~				X		does not include site
1977	Pair	S77025-56-4	Army Corps of Engineers	PGS-AC	9/12/1977			digital enlargement
		S77025-56-5						
1978		NW-78 61A-144.jpg	WDNR	L-H	6/2/1978			
	Pair	NW-78 61A-143.jpg						
		NW-78 61A-145.jpg						
1978	Pair	S78044-56-3	Army Corps of Engineers	PGS-AC	7/22/1978			digital enlargement
		S78044-56-4						
1979		Block 32-854.jpg		L-H	6/26/1979			
1979	Pair	S79004-56-3 19 Jul 79.jpg	Army Corps of Engineers	PGS-AC	7/19/1979			digital enlargement
		S79004-56-4 19 Jul 79.jpg						
1980		1980 - Kelly O'Neil.jpg	Kelly O'Neil	Nadler	1980	X		pencil on back: "Photo by Kelly O'Neil 80"
1980		1980-04-11 - Walker-a and -b.jpb	AeroMetric	Nadler	4/11/1980			Two copies - one is cropped
1980	Pair	80-5511(1-3)	AeroMetric	PGS-AM	4/11/1980			digital enlargement
		80-5511(1-4)						
1981		Hulbert_aerial_1981.tif	AeroMetric	PGWG-D	2/27/1981			SS1-81 16B-22
1981		EDR Aerial Photo 1981.jpg	EDR	L-EDR	7/26/1981			False Color
1982		Hulbert_aerial_1982.tif	AeroMetric	PGWG-D	6/16/1982			KS8-42
1982	Pair	KS-1982,8-42	AeroMetric	PGS-AM	6/16/1982			digital enlargement
		KS-1982,8-43						
1983c		1983c - Source Unknown	unknown	Nadler	1983			post-it with "83?" on back
1983		NW C83 11 48-283.jpg	WDNR	L-H	5/22/1983		C	
1983		S83020-56-2	Army Corps of Engineers	PGS-AC	7/17/1983			
1985		8-14-85-crop.tif		L-D	8/14/1985			
1987	Pair	12300 12 NW87 1 48-60.jpg	WDNR	L-H	6/17/1987			
		12300 12 NW87 1 48-61.jpg						
1988		7-20-88-crop1.tif		L-D	7/20/1988			
1989		PS-89 18600 ASL Z6 15 11.jpg	AeroMetric	L-H	9/19/1989		C	Low res of site
1990		EDR Aerial Photo 1990.jpg	EDR	L-EDR	7/10/1990			
1990	Pairs	1990-08-28 - NEIS Mapping - 1-1.jpg	NEIS Mapping Group Inc.	Nadler	8/28/1990			
		1990-08-28 - NEIS Mapping - 1-2.jpg						
		1990-08-28 - NEIS Mapping - 1-3.jpg						
		1990-08-28 - NEIS Mapping - 1-4.jpg						
		1990-08-28 - NEIS Mapping - 2-3.jpg						
		1990-08-28 - NEIS Mapping - 2-4.jpg						
1991		S91003-56-13.jpg	Army Corps of Engineers	L-H	1991		C	
		S91003-56-14.jpg						
	Pair	S91003-56-13.x10.jpg						
		S91003-56-14.x10.jpg						
1991		EDR Aerial Photo 1991.jpg	EDR	L-EDR	2/28/1991			

Aerial Photograph Inventory - North Marina Ameron / Hulbert Site

February 16, 2010

Year	Pair?	File Name (without year prefix)	Image Source	Acquired by:	Photo Date	Oblique?	Color?	Comment
1991		1991-07-02 - Northwest Air Photos.jpg	Northwest Air Photos	Nadler	7/2/1991	X	C	
1991		12400 12 NW91 14 48-110.jpg	WDNR	L-H	7/3/1991			
	Pair	12400' 12 NW91 14 48-111.jpg						
		12400' 12 NW91 14 48-112.jpg						
1992		8-10-92-crop1.tif	Army Corps of Engineers	L-D	8/10/1992			date fits features
1992	Pair	S92006-56-12 10 Aug 92.jpg	Army Corps of Engineers	PGS-AC	8/10/1992			digital enlargement
		S92006-56-13 10 Aug 92.jpg						
1993		1993_SNO0168_mr.jpg	Ecology Coastal Atlas	PGWG-D	1993			Low resolution
		1993_SNO0199_mr.jpg				X	C	Small image
1993		1000 HI-SPEED RAIL 32-348.jpg		L-H	8/1/1993		C	
1993		KIS-93 1''=2000' 17 19.jpg	AeroMetric	L-H	9/9/1993		C	small part of southern part of site.
1993	Pair	KIS-93, 17-17	AeroMetric	PGS-AM	9/9/1993			digital enlargement
		KIS-93, 17-18						
1995		S95006-56-4.jpg	Army Corps of Engineers	L-H	1995		C	
		S95006-56-5.pg.jpg						
	Pair	S95006-56-4.x10.jpg						
		S95006-56-5.x10.jpg						
1999	Pair	S99016-241-74	Army Corps of Engineers	PGS-AC	9/22/1999			digital enlargement
		S99016-241-75						
2000		S00007-241-75.jpg	Army Corps of Engineers	L-H	2000		C	
		S00007-241-76.jpg						
	Pair	S00007-241-75.x10.jpg						
		S00007-241-76.x10.jpg						
2000?		2000_000925_114918_lg.jpg	Ecology Coastal Atlas	PGWG-D	2000	X	C	
		2000_000925_122320_lg.jpg				X		
		2000_000925_122332_lg.jpg				X		
2002	Pair	S02008-241-74	Army Corps of Engineers	PGS-AC	7/21/2002			digital enlargement
		S02008-241-75						
2004		Hulbert_aerial_2004.tif		PGWG-D	6/4/2004		C	SND-04 6-23
2005		11-25-05.JPG		L-D	11/25/2005	X	C	
		11-25-05A.JPG				X	C	
		11-25-05B.JPG				X	C	
2006		EDR Aerial Photo 2006.jpg	EDR	L-EDR			C	
2006		2-7-06.JPG		L-D		X	C	
2006		3-3-06.JPG		L-D	3/3/2006	X	C	
2006		4-29-06.JPG		L-D	4/29/2006	X	C	
2006		2006_060627_03687.jpg	Ecology Coastal Atlas	PGWG-D	6/27/2006	X	C	
2006		9-24-06.JPG		L-D	9/24/2006	X	C	
2006	Pair	12-02-06.JPG		L-D	12/2/2006			
		12-02-06A.JPG						

Aerial Photograph Inventory - North Marina Ameron / Hulbert Site

February 16, 2010

Year	Pair?	File Name (without year prefix)	Image Source	Acquired by:	Photo Date	Oblique?	Color?	Comment

Unusable - either site is not shown or resolution makes it of no value

1971		~~NW-H-71 343-11A-32.jpg~~	WDNR	L-H	7/3/1971			Very high flight - marginal use
2002		~~2002_000925_122326_lg.jpg~~	Ecology Coastal Atlas	PGWG-D	2002	X		
1940s		~~1940s_15-25.jpg~~	Ecology Coastal Atlas	PGWG-D				
1983		~~NW-C83-11-48-281.jpg~~	WDNR	L-H	5/22/1983		C	

Photos within Report Figures

1884		t29nr05e_a.tif		PGWG-D	02/28/1884			1884 Plat Map
		t29nr05e_a_clip.tif		PGWG-D				
1947		1947_aerial.pdf	AeroMetric	PGWG-D	1947			
1955		1955_aerial.pdf	AeroMetric	PGWG-D	1955			
1967		1967_aerial.pdf	AeroMetric	PGWG-D	1967			
1976		1976_aerial.pdf	AeroMetric	PGWG-D	1976			
1981		1981_aerial.pdf	AeroMetric	PGWG-D	1981			
1982		1982_aerial.pdf	AeroMetric	PGWG-D	1982			
		ExhibitA_02_Fig02.tif						
1990		1990_Ortho.jpg		PGWG-D	1990			
2002		2002_Ortho.jpg	?Terraserver	PGWG-D	2002			
		2002_Ortho_zoom.jpg		PGWG-D				
2003		2003_Ortho.jpg	PGE - Snohomish County	PGWG-D	2003			
2004		2004_Aerial.jpg	AeroMetric	PGWG-D	2004			
2006		2006_Ortho.jpg	PGE - No Source Cited	PGWG-D	2006			
2007		2007_ortho.jpg	PGE - No Source Cited	PGWG-D	2007			
		2007_Ortho_zoom.jpg	PGE - No Source Cited	PGWG-D				
		July2008Parcels.jpg						

Key to "Acquired By:

L-H	Hardcopy received from Landau Associates. Scanned at 600 dpi.
L-D	Digital image received from Landau Associates.
L-EDR	Digital image from EDR report provided by Landau, images embedded in a PDF.
PGWG-D	Digital image received from Pacific Grounwater Group (via Landau).
Nadler	Provided by the Nadler Law Group PLLC as digital copies embedded in a PDF
PGS-AC	Army Corps of Engineers digital image purchased by Pinnacle GeoSciences.
PGS-AM	AeroMetric hardcopy purchased by Pinnacle GeoSciences and scanned at 600 dpi, original provided to Landau.
PGS-online	Acquired from on-line sources

Table 1 - Historic Operators and Features of Concern
North Marina Ameron/Hulbert Site
Everett, Washington

						Structure or Feature of Concern		
Operator	**Feature**	**Area**	**Period**	**How Operations Ceased**	**General Activity**	**From Reports** (references cited are listed below)	**From Leases**	**From Observations**
Hulbert Mill		G, M, I, J	1920s through 1962	Terminated operations and demolished above-grade structures.	Saw, shingle and planing mills			Steam turbine generator, blacksmith shop, boiler house, oil house, refuse burner, boiler stack, possible oil/PCB-containing electrical devices associated with electrical power generation and use. (Sanborn maps). Mixed, unusually colored fill and debris around burner and stack (air photos). Potential contaminants from mill fire.
Centrecon/Utility Vault/Oldcastle Precast	Plant Building	G	1972 - Sept. 1988	Purchased by Ameron	Concrete pole production, finishing and storage.	Dust collection system. (7) Drum storage inside and outside building, with drums in poor condition and visible soil staining. Three lined settling ponds. Outside sumps and catch basins. Sand blasting area with sand blasting grit accumulations on west side of building. Compressor room with oil staining on floor, and sump inside building. Unsafely stored flammables inside building. (6)		Settling ponds, sand blasting area with visible blasting sand accumulations on west side of building (air photos). Outside catch basins (engineering drawings). Fill area north of building (air photos).
Ameron			Sept. 1988 - present	Ongoing		Dust collection system. (7) Drum storage inside and outside building, with drums in poor condition and visible soil staining. Three lined settling ponds. Outside sumps and catch basins. Sand blasting area with sand blasting grit accumulations on west side of building. Compressor room with oil staining on floor, and sump inside building. Unsafely stored flammables inside building. (6) 350-gallon hydraulic oil AST. Exact location not identified. (1) Broken storm drain repaired in 2005. Concrete debris, discolored soil, and soil with petroleum odor observed. (5)	Same facilities as Centrecon	Settling ponds, sand blasting area with visible blasting sand accumulations on west side of building (air photos). Outside catch basins (engineering drawings). Fill area north of building (air photos).
Centrecon/Utility Vault/Oldcastle Precast	Lab/Storage Building	G	1986 - Sept. 1988	Purchased by Ameron	Lab, storage	12,000-gallon diesel UST. (7)		
Ameron			Sept. 1988 - present	Ongoing		12,000-gallon diesel UST, removed December 1988. (7)		
Centrecon/Utility Vault/Oldcastle Precast	Pole Polishing Building	G	1979 - Sept. 1988	Purchased by Ameron	Sandblasting, polishing, storage	Unlined holding pond [removed by 1991 (6)], three lined settling ponds. Discharge from lined settling ponds to storm drain system from about 1979 to at least early 1989. (7) Settling ponds were filled at the time that they were taken out of service. Two were filled with soil, one was filled with concrete dust and sand blasting grit. (8) Drum storage inside and outside building. Visible evidence of sand blasting. Air pollution control equipment outside building. (6)		Holding pond [removed by 1989 (air photo)] and settling ponds. Possible discharge of white slurry material to Area I 1978 to 1981 (air photos).
Ameron		G	Sept. 1988 - present	Ongoing		Unlined holding pond, three lined settling ponds. Discharge from lined settling ponds to storm drain system from about 1979 to at least early 1989. (7) Drum storage inside and outside building. Visible evidence of sand blasting. Air pollution control equipment outside building. (6)		Holding pond and settling ponds (air photos).
Centrecon/Utility Vault/Oldcastle Precast	Warehouse and Spray Booth Building	G	1979 - Sept. 1988	Purchased by Ameron	Concrete sealant spraying	Improper flammables storage, application of spray sealant on west side of building, evidence of sand blasting grit. (6)		
Ameron		G	Sept. 1988 - present	Ongoing		Improper flammables storage, application of spray sealant on west side of building, evidence of sand blasting grit. (6)		
Centrecon/Utility Vault/Oldcastle Precast	Laydown Area	J, M	1972 - 1982	Subleased area	Pole storage	No areas of concern documented.		
Collins Casket/Keys International	Main Building	M	1926-1996	Business closed	Casket fabrication	Boiler, and diesel AST with secondary containment. Waste paint containers and soil staining visible in vicinity of "smoke shack." (6)		Collins Casket boilers (2) and AST (Sanborn maps and air photos).
Collins Casket	Warehouse	M	1961 - ?	unknown	Casket warehouse	No references in reports.		Metal fabrication, spray painting (Sanborn maps).
Dunlap Towing		I	1987		Storage	Crane and metal scrap in far northwest corner of Area I, owned by Dunlap Towing and stored with Jensen Reynolds' permission. (9)		Metal scrap (air photos).

Table 1 - Historic Operators and Features of Concern
North Marina Ameron/Hulbert Site
Everett, Washington

						Structure or Feature of Concern		
Operator	**Feature**	**Area**	**Period**	**How Operations Ceased**	**General Activity**	**From Reports (references cited are listed below)**	**From Leases**	**From Observations**
Nalley's		M	? - 2005	unknown	Food warehouse and distribution.	No areas of concern documented.		
Michael's Woodcraft		M	1990-91	unknown	Furniture fabrication	Spray booth, flammable liquids storage room, on second floor of Collins Building. (6)		
Marine Spill Response Co.		J	1994 - 2005		Spill equipment storage	No areas of concern documented.		
RL Enterprises		M	1989-94	unknown	Cabinetry construction	Spray booth on third floor of Collins Building. (6)	Manufacturing and light commercial construction.	
Jensen Reynolds Construction		J, M, I	1982-1990	Foreclosure	Metal building fabrication	Unprotected drum storage in multiple locations, with observed leakage onto pavement and onto bare ground. Spent sand blasting grit deposits on bare ground. Fuel AST inside warehouse, with visible spillage to floor. Visible petroleum spillage to ground surface. Storage of large quantities of scrap metal. Pile of "painted metal chips" in yard, with discolored soil beneath. Deposits of foam pipe insulation in yard. (3) Three fuel USTs (gasoline and diesel fuel, estimated volume two at 2,500 gallons and one at 1,000 gallons) and three dispensers. (reference 6 citing 1987 ECI report) RCRA LQG. (6) Crane and metal scrap in far northwest corner of Area I, owned by Dunlap Towing and stored with Jensen Reynolds' permission. "Large" diesel AST southwest of USTs. (9)	Gasoline and diesel USTs and dispensers.	Metal fabrication, scrap and debris, dismantling of truss bridge and remaining debris, USTs and fueling (air photos).
Commercial Steel Fabricators		I	1991	One year lease only	Metal module fabrication; welding, sandblasting	Drum storage of diesel and gasoline, with soil staining observed; sand blast grit. (6)	Metal fabrication and materials storage.	
Snohomish Co. PUD Substation		M	1954-1969	Removed	Electrical infrastructure	No references in reports.		
Railmakers NW		M	Ca. 1975-87	Relocated	Fabricated rails for marine use			
Sound Propeller		M	1972-76	Relocated	Propeller sales/repair			
Sandy's Boat House		M	1990-present	Ongoing	Boat repair	Minor solvent and waste oil use and storage. (6) Waste oil AST. (1)	Boat sales and service.	
Tri-Coatings		M	1979-91	Relocated to adjacent property north as TC Systems	Commercial paints & stripping	RCRA LQG. Floor sump for stripping coatings, stripping machine, two degreasers, hazardous materials and hazardous waste storage. (6)		
Sunset Body Works		M	1988 - present	Now North Central Collision	Vehicle body repair	RCRA SQG. Paint booths, solvent still, flammables storage areas. (6)		
Port of Everett Maintenance Shop		M	Early 1990s	Facility demolished 2007	Maintenance area	Vehicle maintenance in maintenance shop building. Catch basins inside maintenance shop building possibly plumbed to storm drain system. Unprotected storage of drums and small AST containing petroleum and unknown products, with leakage to ground observed. Sand blasting grit on ground surface. (2) Storm drains inside building may, alternatively, be plumbed to sanitary sewer system. (8)		
Port of Everett Storage		J	1991	Temporary location at Jensen Reynolds building	Warehouse building	Unprotected storage of drums and small tank containing petroleum and unknown products, with leakage to ground observed. Sand blasting grit on ground surface. (2)		
Unknown operator		J, I	Ca 1991		Open yard area	Sludge-like material on ground surface. (2)		
Veco		J	Ca 1991	unknown	Storage of welding, construction supplies and containers	Sumps in building. (reference 6 citing 1987 ECI report) Three fuel USTs (two gasoline and one diesel) and a dispenser island southwest of building, removed in June 1991. Drum storage inside building, and staining around catch basin. (6) Catch basin may be plumbed to sanitary sewer system. (8).		

Table 1 - Historic Operators and Features of Concern
North Marina Ameron/Hulbert Site
Everett, Washington

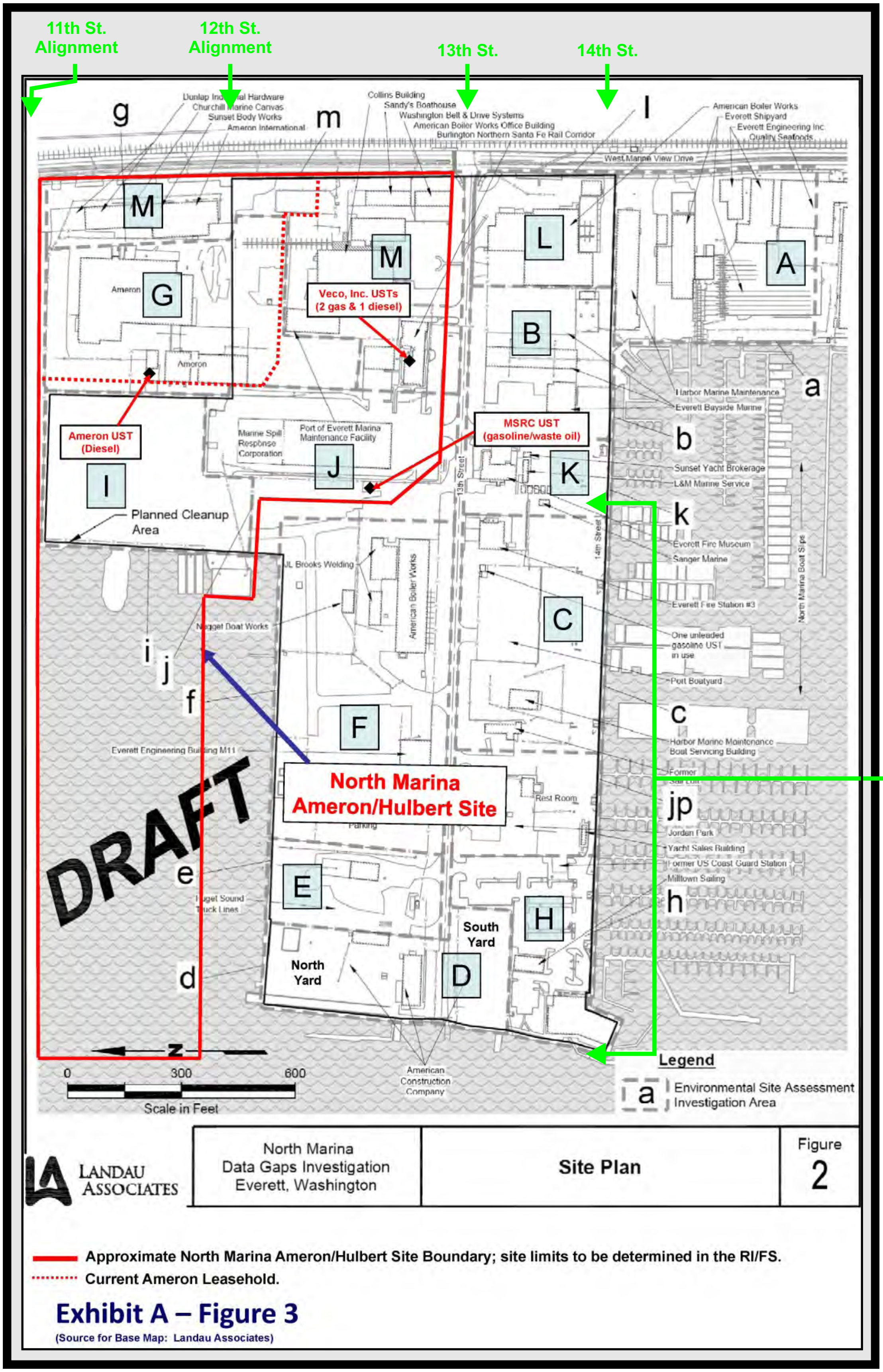
						Structure or Feature of Concern		
Operator	**Feature**	**Area**	**Period**	**How Operations Ceased**	**General Activity**	**From Reports** (references cited are listed below)	**From Leases**	**From Observations**
Mid Mountain Contractors		I , J ?	1974 - 1983		"Unloading, sand blasting, painting, loading" (per lease agreement)		A short-term lease for an off-site building cites "unloading, sandblasting, painting, loading" as allowed activities. No lease information was identified for portion of Mid Mountain lease that overlaps the subject site (Area J).	The portion of Mid Mountain's activities occurring on Area J appears to be limited primarily to pipe storage, with storage of other unidentified materials visible in some air photos. (air photos)
Columbia Hardboard Company/Tidewater Plywood Company	Log Dump/Waste Burner Dump/Conveyor System	J	pre-1957 - post 1965			Abandoned underground concrete structure filled with wood waste, soil, and drums apparently containing oil. (4)		Underground concrete structures shown on Sanborn map and visible in air photos. (Sanborn Maps, air photo)
Unknown operator		I	1991			Unprotected storage of drums containing petroleum and unknown products at fenceline with Ameron. (2)		
Unknown operator	Log storage/sorting	I	1976 - 1978					Unclear from air photos whether stacked timbers are unmilled logs, poles, or piles. Simultaneous storage of log rafts in the adjacent 12th Street Channel is evident throughout this period. (air photo)
Unknown operator	Log storage/sorting	I	1993					Stockpiles of of wood poles or piling with dark colored ends (air photos). The poles/piling are either treated poles or are salvaged piling. In the latter case they could also be treated wood.

Notes:

1. "Structures or Feature of Concern" provides a summary from three sources -- Reports, Leases and Observations. Observations include features visible in aerial photographs and features shown in engineering drawings or Sanborn maps. These comments do not include opinions based on our experience at similar sites or with similar industries.

References cited in this table:

1. Landau Associates. Phase I ESA North Marina Redevelopment Project. Port of Everett, WA for Maritime Trust. November 28, 1001.
2. Hart Crowser. Environmental Engineering Services - Proposed MSRC Facility. For the Port of Everett. November 26, 1991.
3. Earth Consultants, Inc. Supplemental Site Investigation, Jensen Reynolds Property. For the Hulbert Mill Company. December 6, 1988.
4. Kleinfelder. Independent Action Report - Area West of MSRC Warehouse Building. For the Port of Everett. December 7, 1993.
5. Landau Associates. Ameron International Leasehold Environmental Investigation of Oil Affected Area. Memo to the Port of Everett. June 20, 2005.
6. Kleinfelder. Phase I ESA, Phase I Envionmental Audit, Business on 30 acres NW Corner of 13th Street & Marine View Drive. May 29, 1991.
7. PSM International. Report on Investigation conducted at Ameron (Centrecon) Plant in Everett, WA, January 9-13 & February 7-10, 1989. March 1989.
8. Earth Consultants, Inc. Phase II ESA, Hulbert Mill Property. For the Hulbert Mill Company. February 7, 1992.
9. Earth Consultants, Inc. Preliminary Environmental Audit, Jensen Reynolds Property. For the Hulbert Mill Company. July 14, 1987.

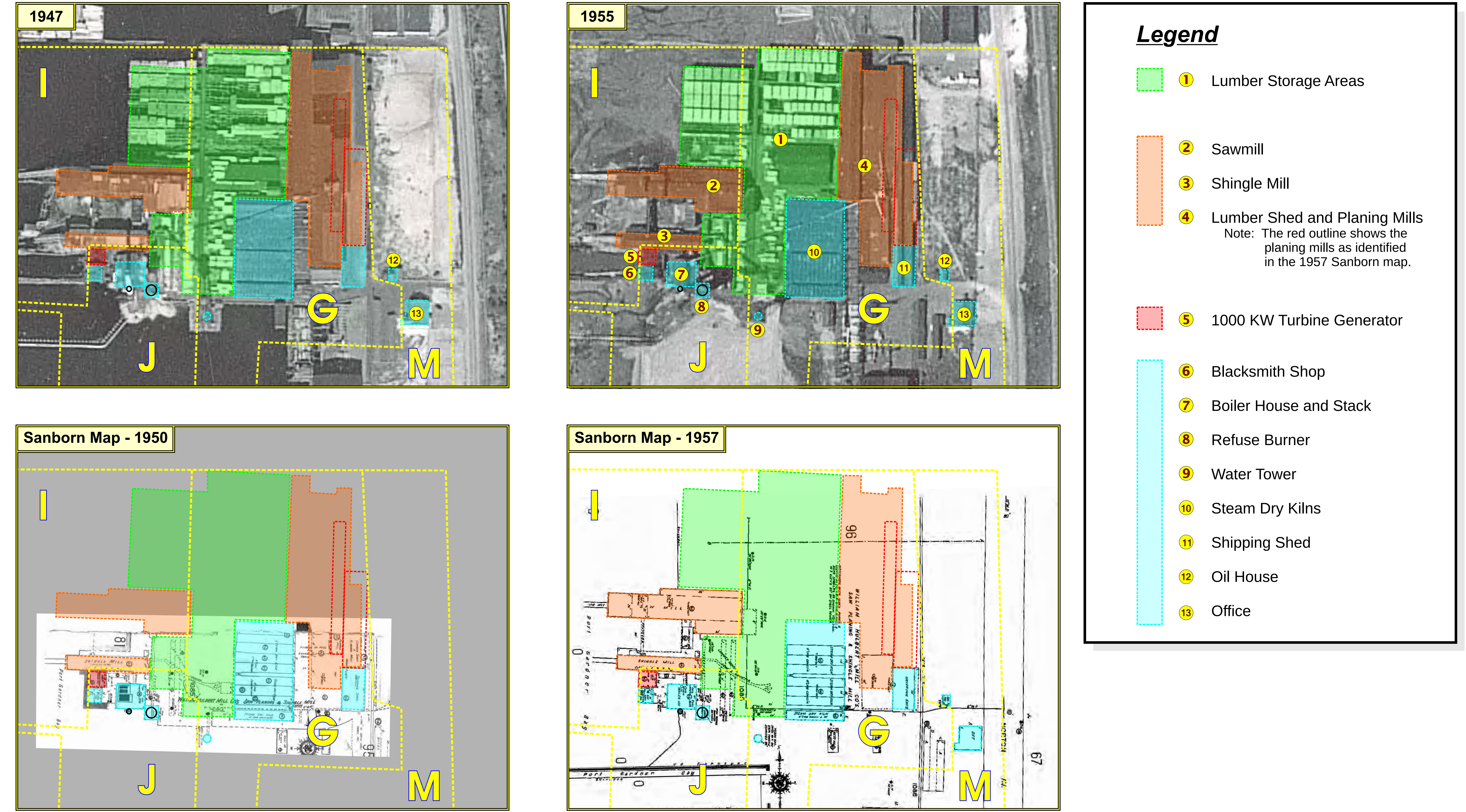


This figure, taken from the Agreed Order, was used as our site definition model describing property boundaries, the limits of the site, and the limits of Areas G, I, J and M. The green annotations are by Pinnacle GeoSciences.

Figure 1

Site Definition
North Marina Ameron/Hulbert Site
Everett, Washington

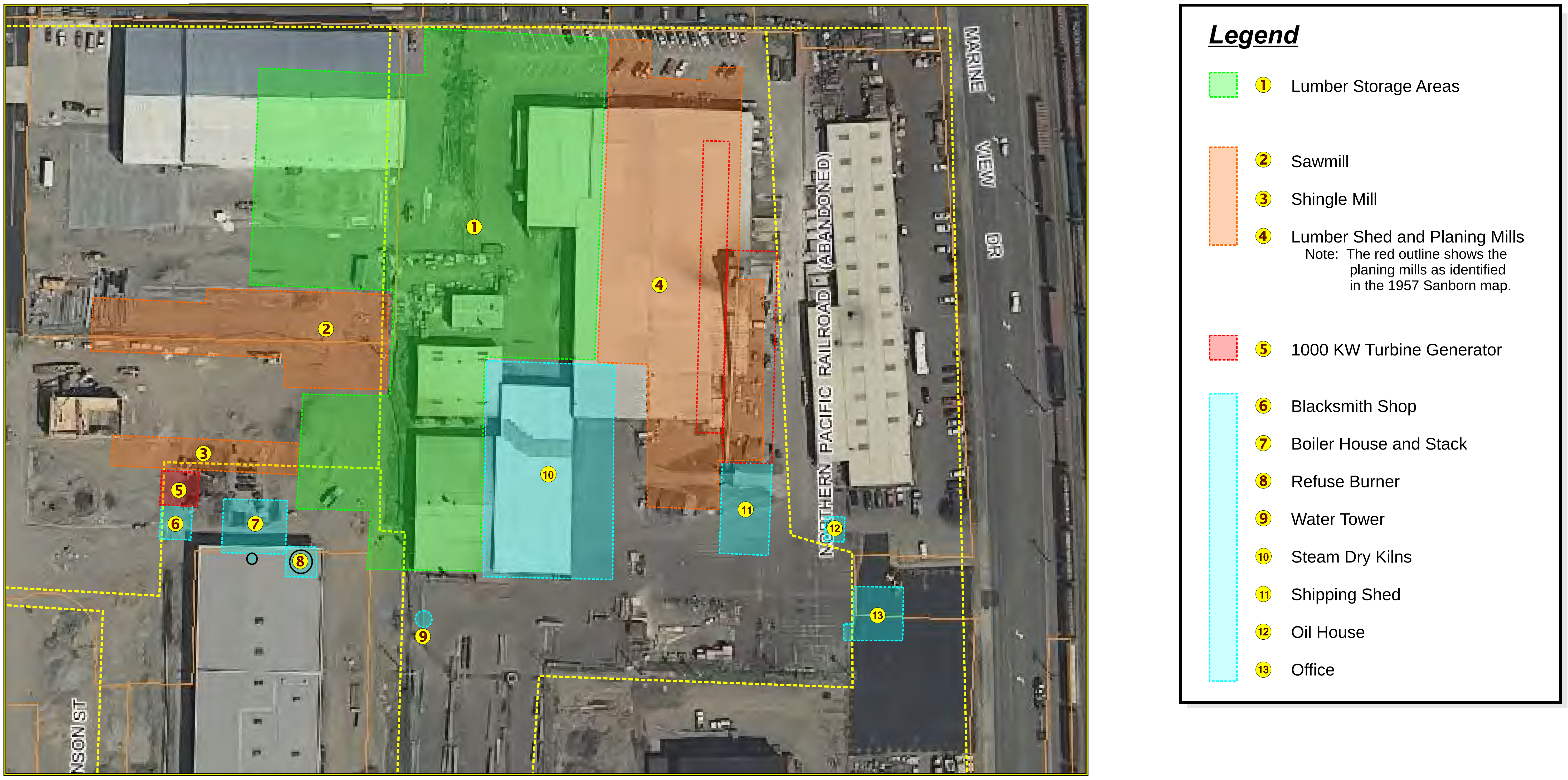
Pinnacle GeoSciences



Approximate Scale: 1-inch = 200 feet
The locations of all features are approximate.

Figure 2
Mill-Related Features
North Marina Ameron/Hulbert Site
Everett, Washington

Pinnacle GeoSciences



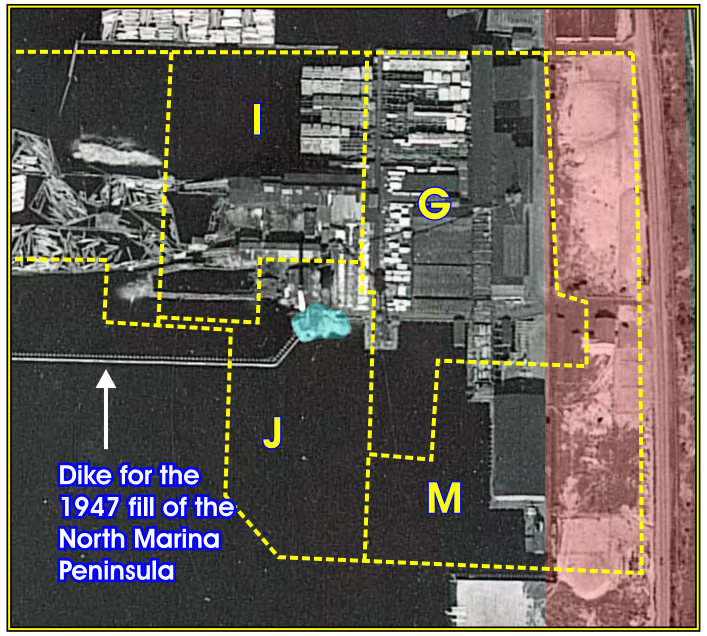
N

0 100 200 feet

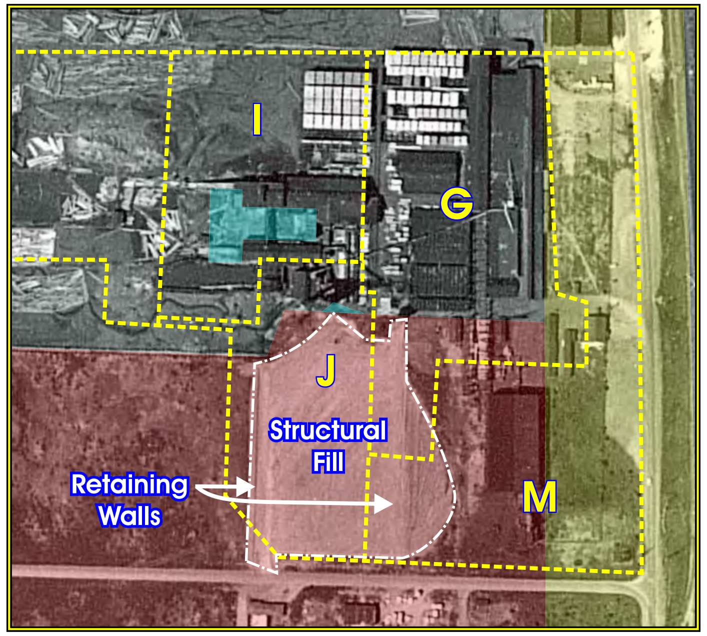
Approximate Scale: 1-inch = 100 feet
The locations of all features are approximate.

Figure 3
Mill-Related Features
2007 Base Photograph
North Marina Ameron/Hulbert Site
Everett, Washington

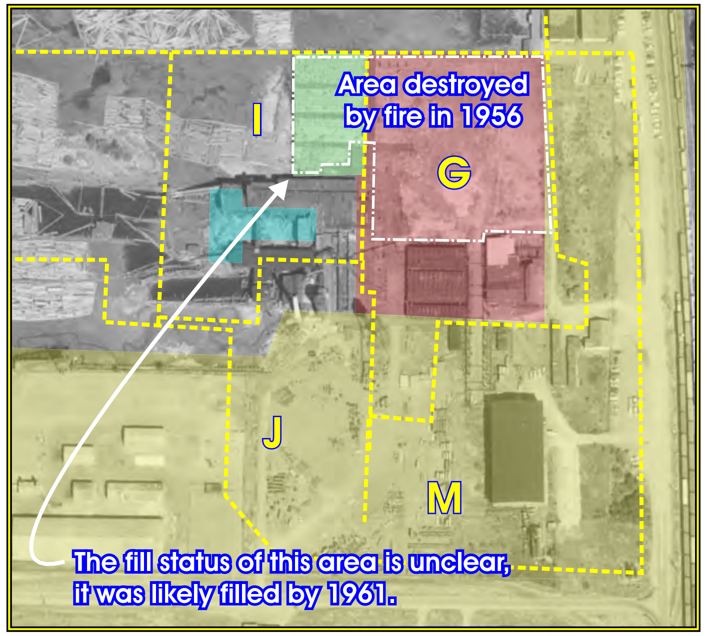
Pinnacle GeoSciences



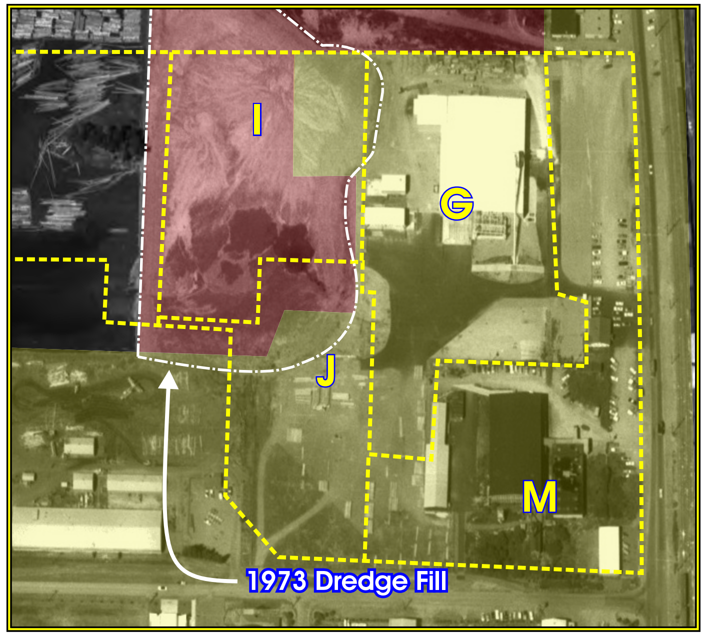
Filling Prior to 1947
Photograph: 1947



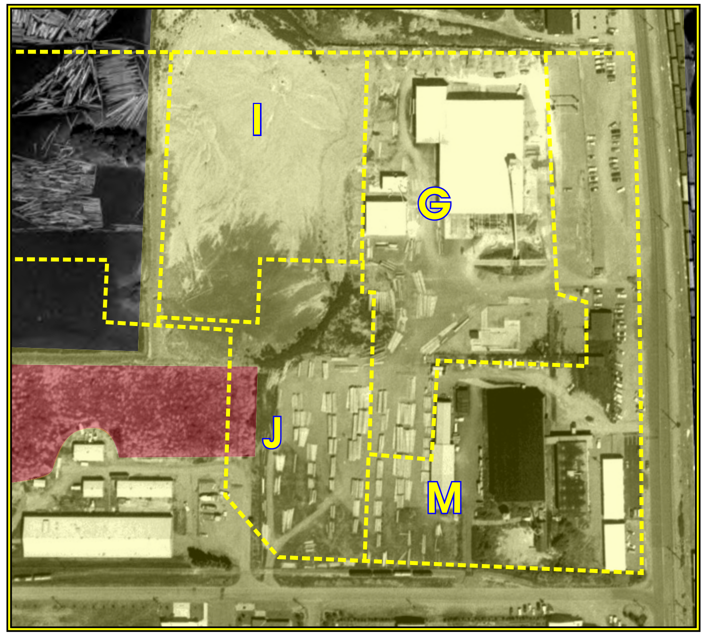
Filling 1947 - 1955
Photograph: 1955



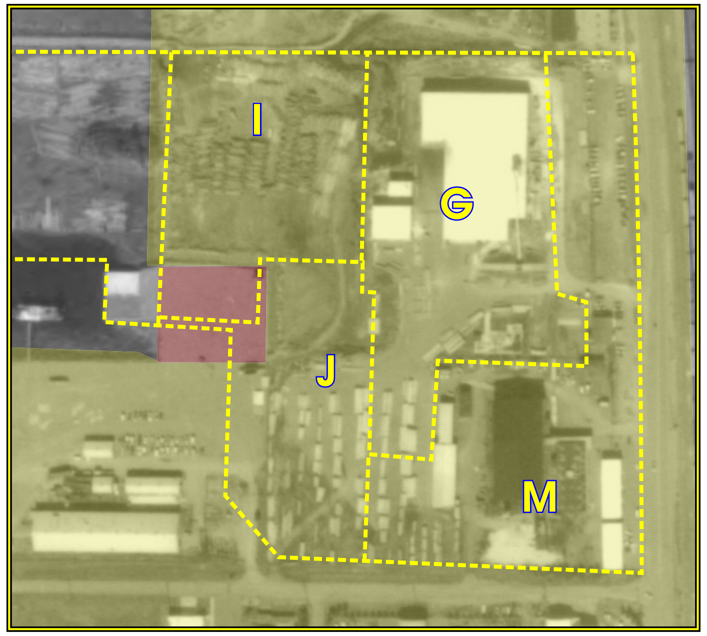
Filling 1955 to 1965
Photograph: 1961



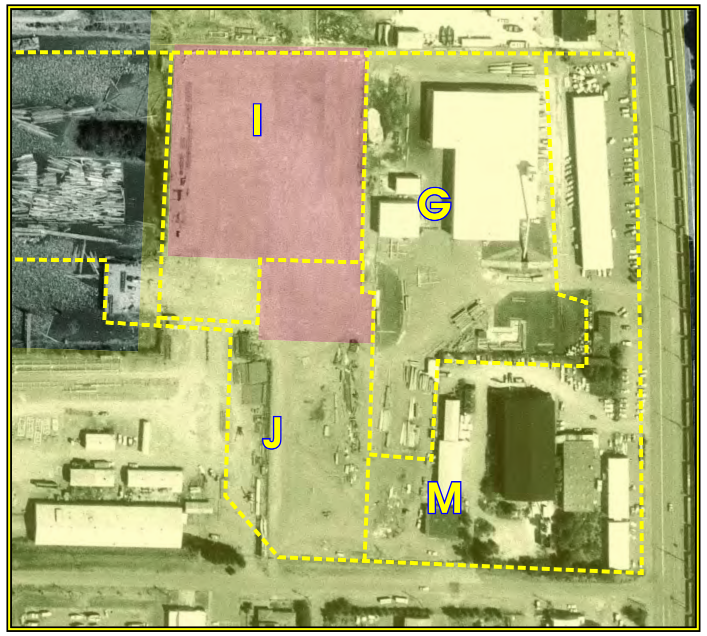
Filling 1973
Photograph: 1973



Filling Late 1973 to Early 1974
Photograph: June, 1974



Filling 1976
Photograph: 1976



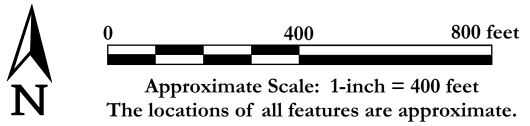
Filling 1982
Photograph: 1982

🟥 Filled during the stated period, to within about five feet of current grade.

🟦 Minimal fill, not approaching current grade.

🟩 Special fill areas (annotated).

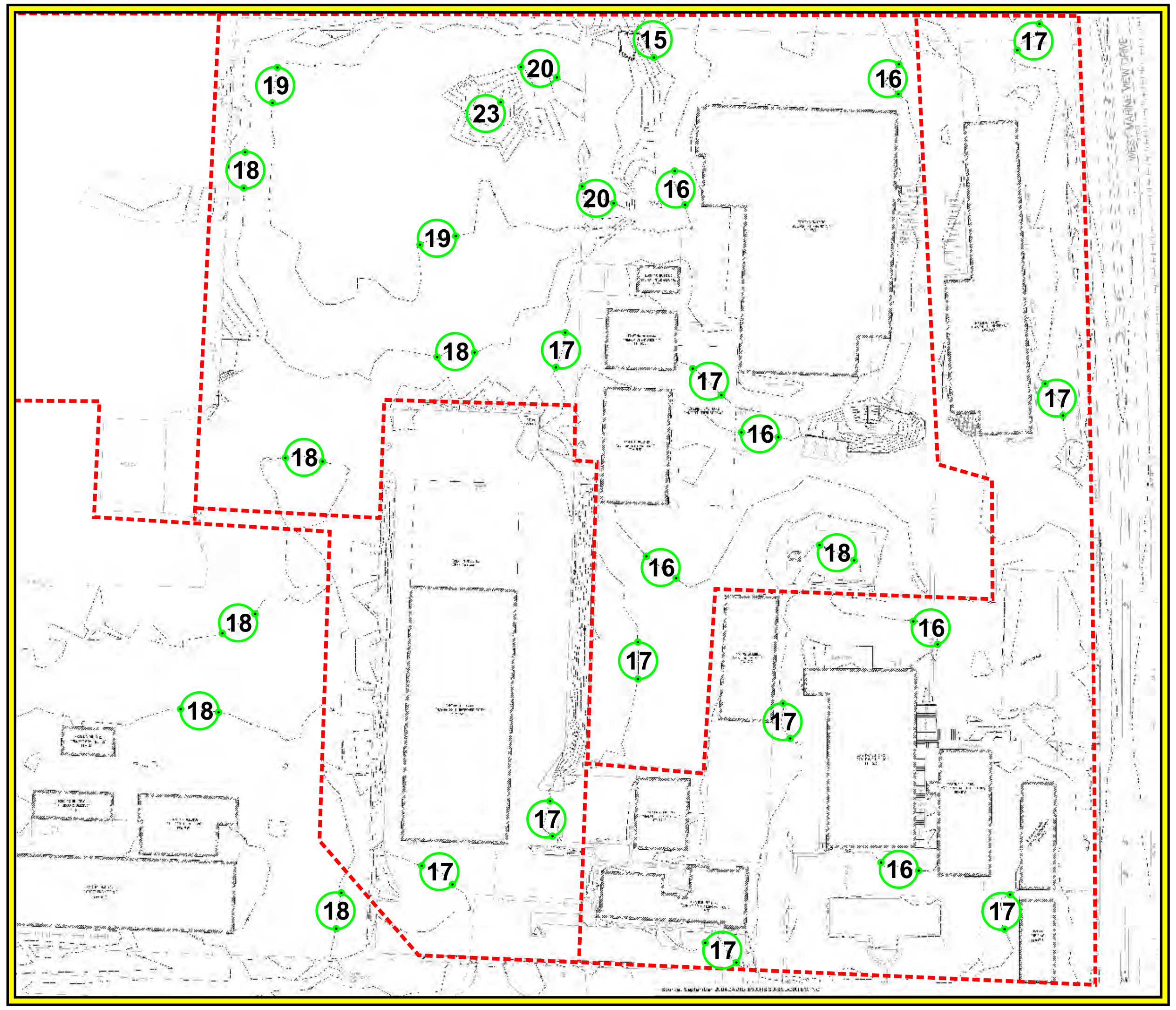
🟨 Filled described in prior periods.



Approximate Scale: 1-inch = 400 feet
The locations of all features are approximate.

Figure 4
Filling History
North Marina Ameron/Hulbert Site
Everett, Washington

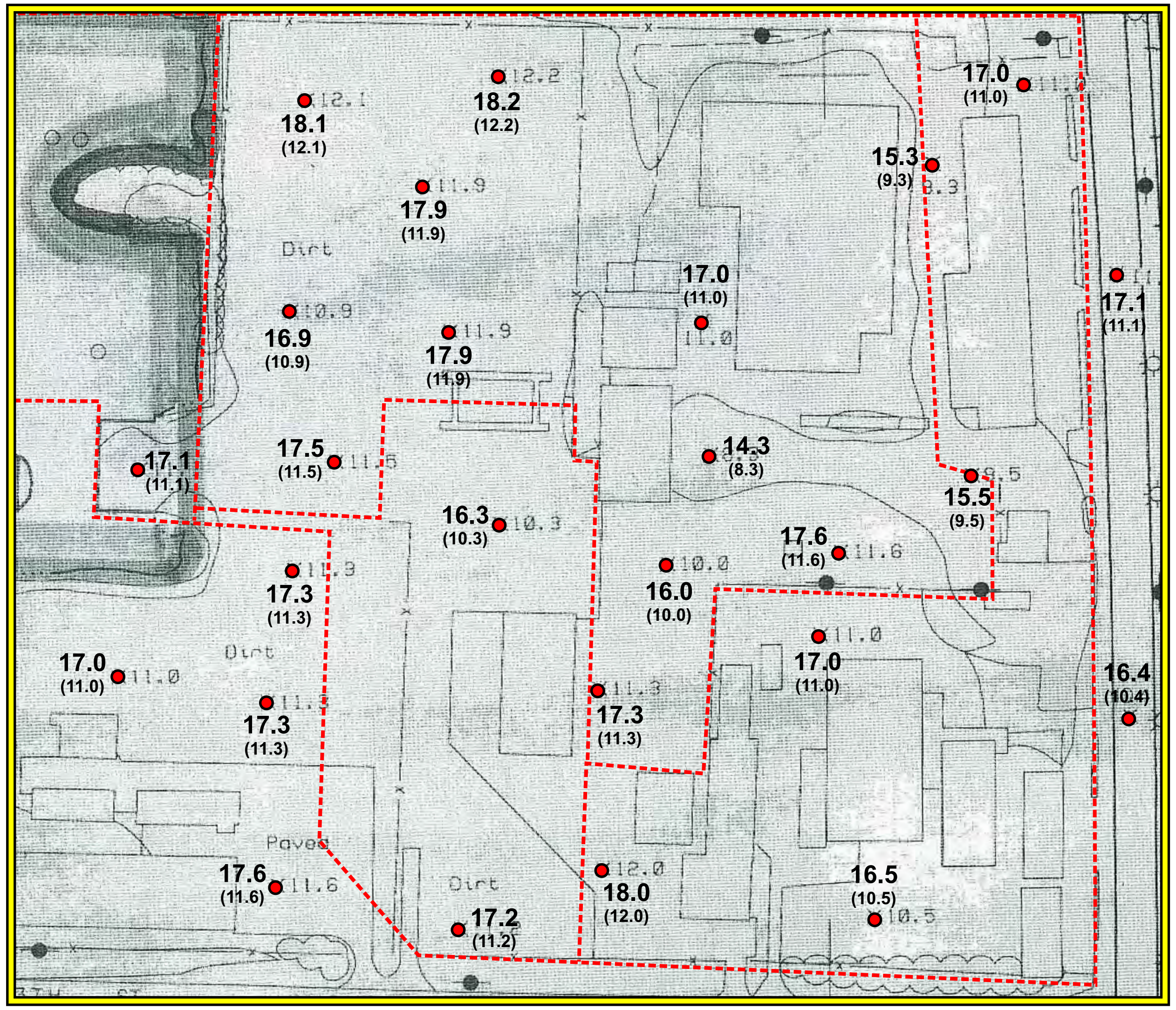
Pinnacle GeoSciences



2004 Elevation Survey Data

Figure C-1, Draft, Ameron/Hulbert Site Interim Action Report, Port of Everett, Washington
Landau Associates, 2009
Based on a map by David Evans & Associates, September, 2004. No datum given.
Original Scale: 1 inch = 60 feet. Reduced to 1 inch = 200 feet.

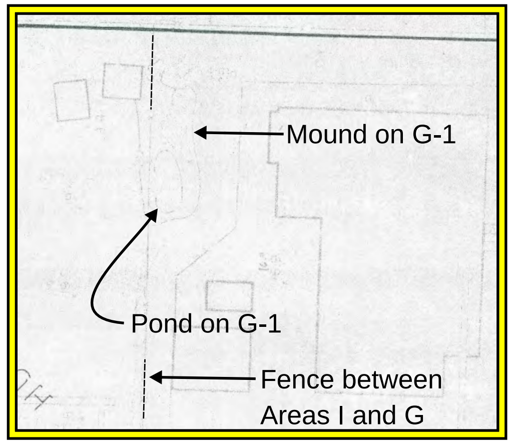
(17) Elevation of underlying black contour line - dots show locations where contour line intercepts the green circle.



1987 (or later)

Aerial Topographic Map of the City of Everett, Section 18, T29M, R5E W.M., Walker and Associates
Undated Drawing, underlying photograph dated 3/2/1987
Scale: 1 inch = 200 feet, Datum: USC&GS, Mean Sea Level, 1929
Required some distortion to match features on 2004 Figure
Spot elevations shown in parenthesis are approximately 6 feet lower than those in 2004 plan

● **17.2** Adjusted elevation (approximate)
(11.2) Mapped elevation



1985 Elevation Survey Data

Sheet 2, Topographic Map for MARDEV PROPERTIES
Reid Middleton & Associates, Inc.
Topographic data from Walker & Associates, 2/3/1985.
Datum: MLLW
Reproduction was very faint and data largely unreadable.
Original Scale: 1 inch = 100 feet. Reduced to 1 inch = 200 feet.

N

0 200 400 feet
Approximate Scale: 1-inch = 200 feet
The locations of all features are approximate.

Figure 5

Site Elevation Data
North Marina Ameron/Hulbert Site
Everett, Washington

Pinnacle GeoSciences

Pavement - through 1974
Photograph: June, 1974

Pavement - through 1982
Photograph: June, 1982

Pavement placed from 1956 to 1961

Pavement added from 1961 to 1974

Pavement present in 1974

Pavement added from 1974 to 1979

Pavement added from 1979 to 1980

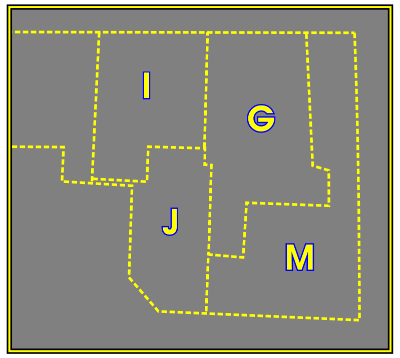
Pavement added from 1980 to 1982

Legend

1982 Location of buildings and the date they first appear in aerial photos.

Shaded areas surrounded by dashed lines show areas of paving within the dates noted below each figure. Refer to notes at right.

Approximate Scale: 1-inch = 200 feet
The locations of all features are approximate.



Yellow dash lines show the approximate locations of areas of the site defined in the Agreed Order.

Notes:

1. All locations shown should be considered approximate. The areas shown have been adapted to the features shown on the underlying aerial photograph. Aerial photographs do not exhibit true scale. Camera angle and parallax induce distortions into the image. The outlined areas should be compared to known site features to accurately place them on the site.

2. The areas shown are based on an interpretation of aerial photography. We have not visited the site. The determination of surface conditions from aerial photography is difficult because the imagery can be affected by lighting conditions, precipitation, and material colors. The areas shown should be considered an interpretation and not a determination of surface conditions. Our interpretations are based on obvious features as well subtle features such as evidence of vegetation or pavement makings. We used multiple aerial photographs to develop our opinions. Some areas may actually be different than interpreted here.

Figure 6

Pavement History 1956 through 1982
North Marina Ameron/Hulbert Site
Everett, Washington

Pinnacle GeoSciences

Pavement - through 1991

Photograph: July, 1991

Pavement present in 1982

Pavement added from 1982 to 1990

Pavement - through 2005

Photograph: July, 2002

Pavement present in 1991

Pavement added from 1991 to 1993

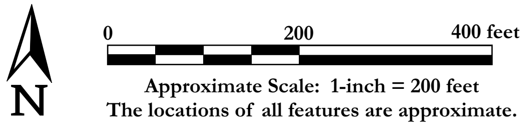
Pavement added from 1993 to 1995

No pavement added between 1995 and 2005

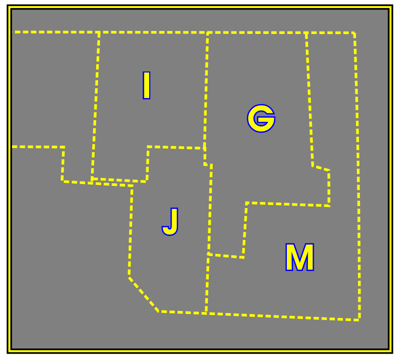
Legend

1982 Location of buildings and the date they first appear in aerial photos.

Shaded areas surrounded by dashed lines show areas of paving within the dates noted below each figure. Refer to notes at right.



Approximate Scale: 1-inch = 200 feet
The locations of all features are approximate.



Yellow dash lines show the approximate locations of areas of the site defined in the Agreed Order.

Notes:

1. All locations shown should be considered approximate. The areas shown have been adapted to the features shown on the underlying aerial photograph. Aerial photographs do not exhibit true scale. Camera angle and parallax induce distortions into the image. The outlined areas should be compared to known site features to accurately place them on the site.

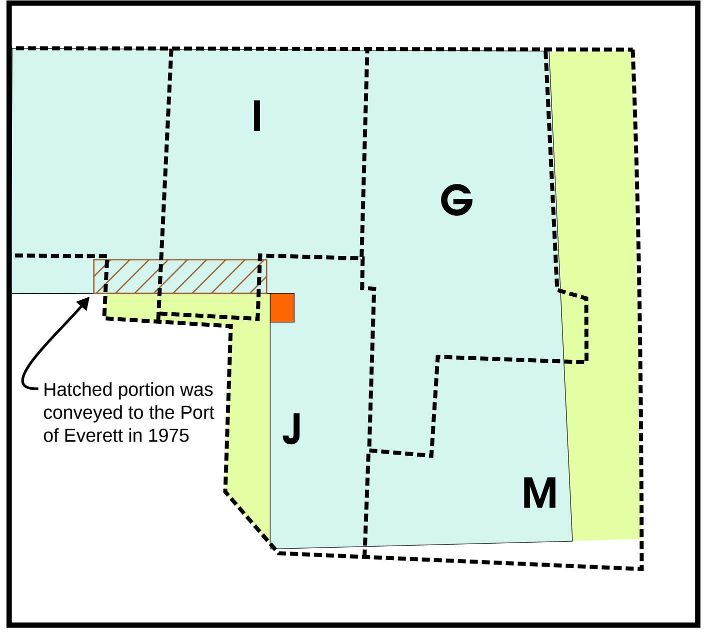
2. The areas shown are based on an interpretation of aerial photography. We have not visited the site. The determination of surface conditions from aerial photography is difficult because the imagery can be affected by lighting conditions, precipitation, and material colors. The areas shown should be considered an interpretation and not a determination of surface conditions. Our interpretations are based on obvious features as well subtle features such as evidence of vegetation or pavement makings. We used multiple aerial photographs to develop our opinions. Some areas may actually be different than interpreted here.

Figure 7

Pavement History 1982 through 2005
North Marina Ameron/Hulbert Site
Everett, Washington

Pinnacle GeoSciences

Ownership



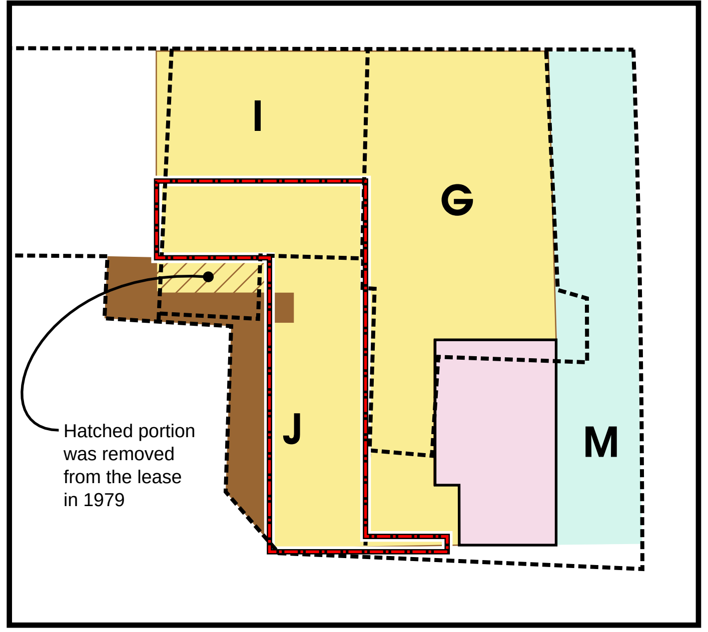
▨ Hulbert - 1923-1991, Hatched portion was conveyed to the Port of Everett in 1975

🟩 Port of Everett, 1940 or earlier to present

🟧 50' x 60' Hulbert 1923-1975. Sold to Port of Everett in 1975

After 1991 the entire area was owned by the Port of Everett.

Non-Owner Occupants: 1926 to 1982



▨ Centrecon / Utility Vault: 1972-1988
Hatched portion removed from lease in 1979

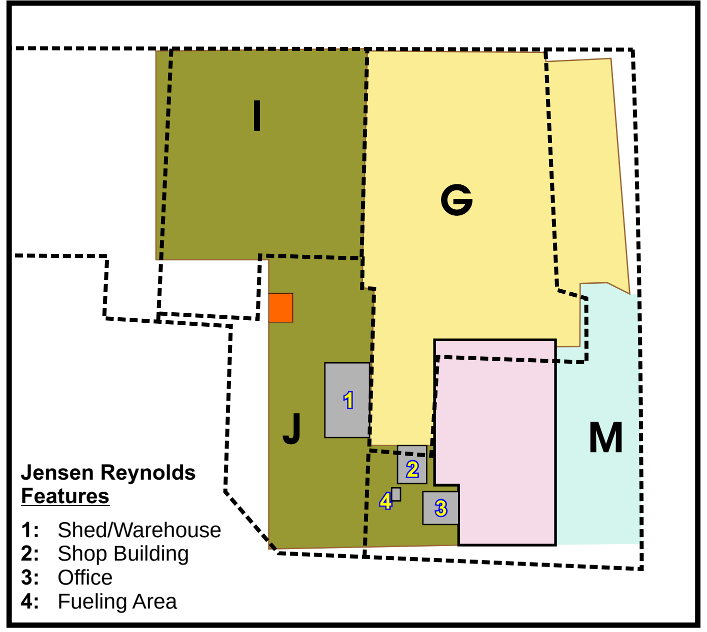
■ North Cascade Casket / Collins Casket: 1926-1996

🟫 Mid-Mountain Contractors 1975 to approx. 1983
Refer to text for prior tenants.

■ Hulbert: 1962 -1991

🟥 Area of Washington Stone 1979 lease.
(no evidence of occupancy)

Non-Owner Occupants: 1982 to 1988



Jensen Reynolds Features
1: Shed/Warehouse
2: Shop Building
3: Office
4: Fueling Area

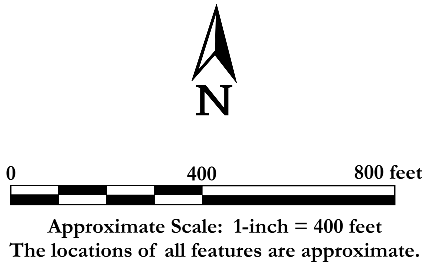
🟨 Centrecon / Utility Vault: 1972-1988

■ Centrecon / Utility Vault: 1972-1988
Sublet to Jensen Reynolds: 1982-1988 (features labeled)

■ North Cascade Casket / Collins Casket: 1926-1996

🟧 50' x 60' leased to Centrecon in 1983 and then sublet to Jensen Reynolds

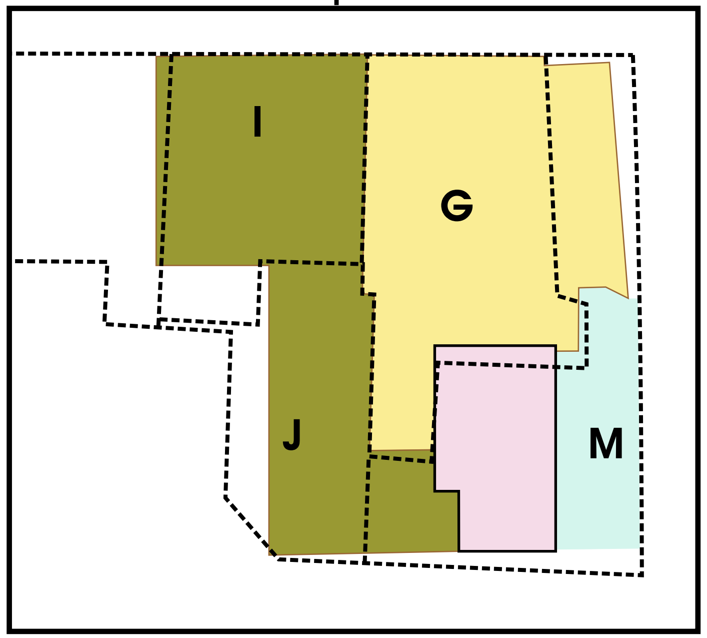
■ Hulbert: 1962 -1991



Approximate Scale: 1-inch = 400 feet
The locations of all features are approximate.

Notes:
1. This figure employs the use of color to convey important information.
2. Boundaries shown are approximate. Refer to the text for further information about boundaries and property lines.

Non-Owner Occupants: 1988 to 1991



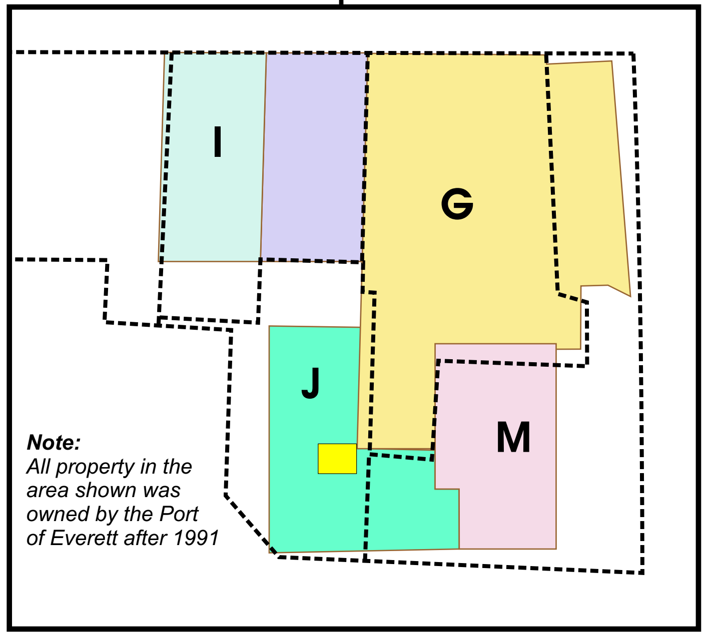
🟨 Ameron: 1988 - present

■ North Cascade Casket / Collins Casket: 1926-1991

■ Jensen Reynolds: 1988-1990 (leased from Hulbert)

■ Hulbert: 1962 -1991

Non-Owner Occupants: 1991 to 2006



Note: All property in the area shown owned by the Port of Everett after 1991

🟨 Ameron: 1988-present

■ North Cascade Casket/Collins Casket: 1928-1996

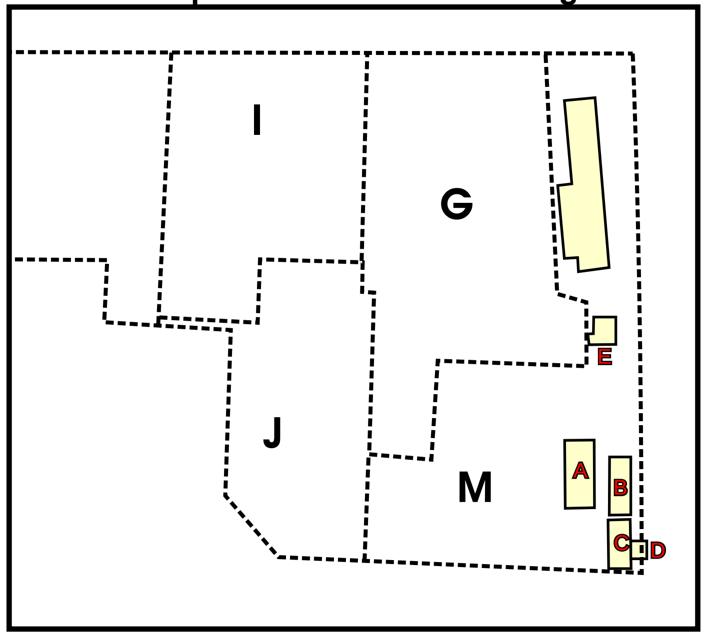
■ Commercial Steel - through 12/31/1991

🟪 Commercial Steel - first right of refusal in 1991 (unknown if executed)

🟩 MSRC: 1993-2005

🟨 Veco (building lease only) 1991

Occupants of Eastern Buildings



See text at right.

Northern Building
Centrecon: 1972 - 1988
Ameron: 1988 to present
Churchill Brothers: 1970s-present
Sunset Auto: 1976 - 2007
Dunlap Wire Rope: 1978 - present
Performance Marine: 1979-1985
Tri-Coatings: 1979 - 1991

Other Buildings/Structures
A: Collins Casket: 1926-1991
Nalleys: 1990s

B: Sandy's Boathouse: 1990 - present
The Propellor Shop: 1982
Sound Propellor: 1972-1976
Railmakers NW: 1975-1989

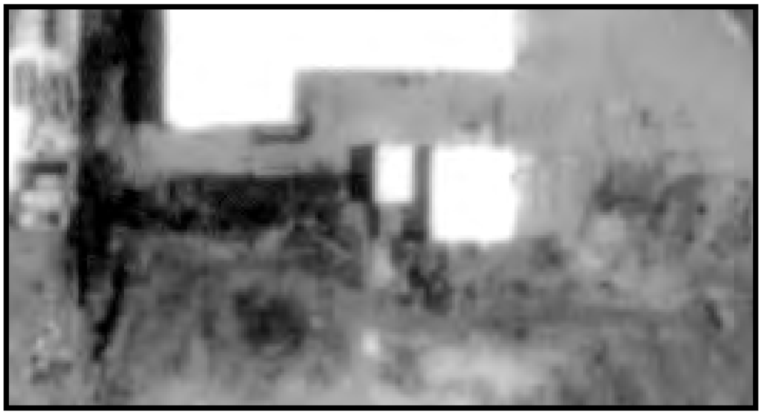
C: Washington Belt: 1972 - present

D: Snohomish PUD: 1954 - 1969

E: Hulbert Office: 1923 - ?

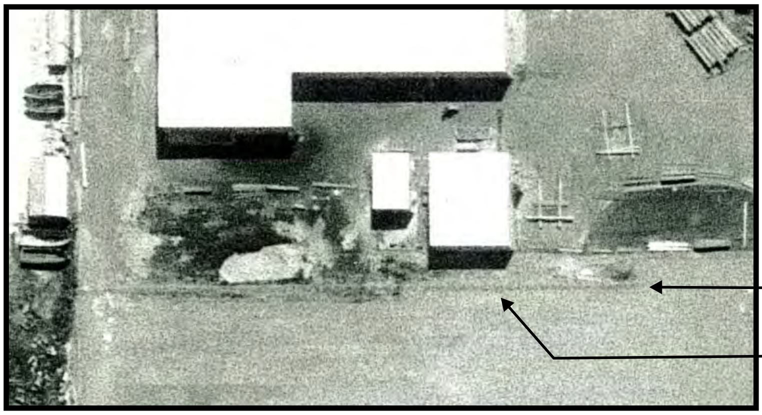
Figure 8
Ownership and Occupants
North Marina Ameron/Hulbert Site
Everett, Washington

Pinnacle GeoSciences



2/27/1981

No fence is evident in this photograph, undisturbed vegetation and fill cross the future alignment of the fence.

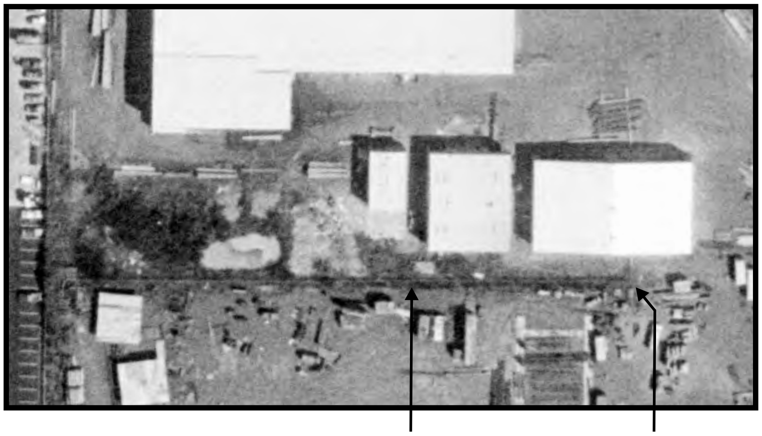


6/16/1982

The fence is clearly evident in this photograph. When viewed in stereo the presence of the fence is more striking.

5/11/1983

There is no clear evidence of the fence in this photograph. This is because of the poor resolution and the high sun angle. As a result this example is inconclusive even though the fence is preset at the time of this photograph.



8/14/1985

The fence is clearly evident in this photograph.

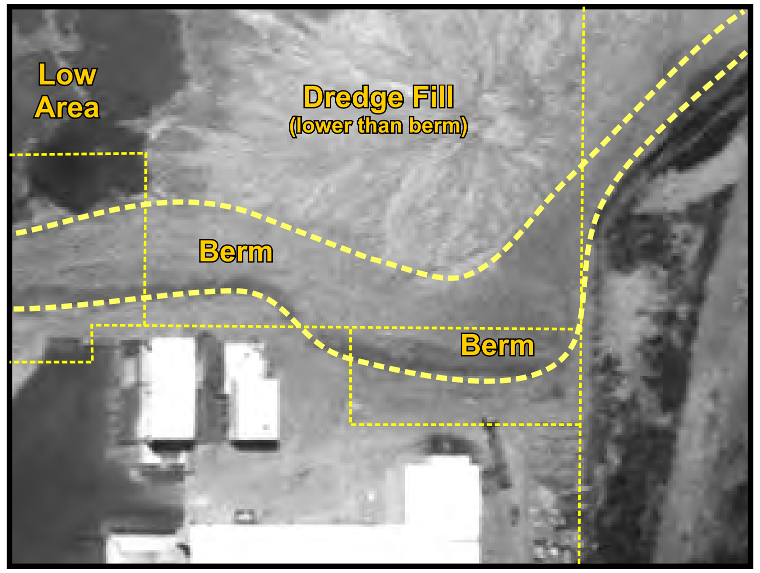
N

No Scale

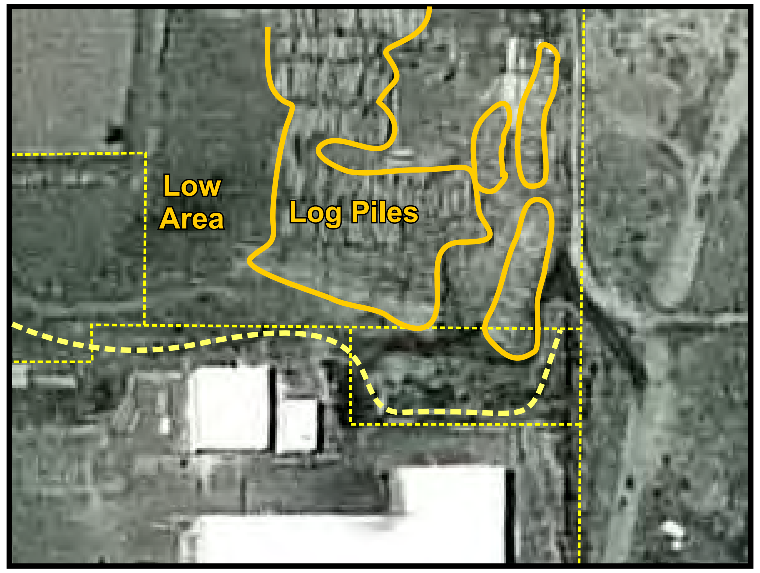
Figure 9

Fence Between Areas G and I
North Marina Ameron/Hulbert Site
Everett, Washington

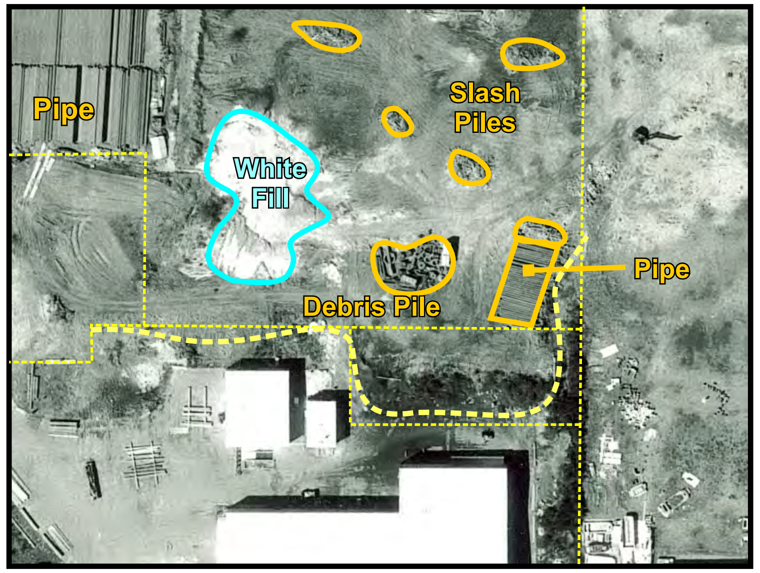
Pinnacle GeoSciences



1973



1976



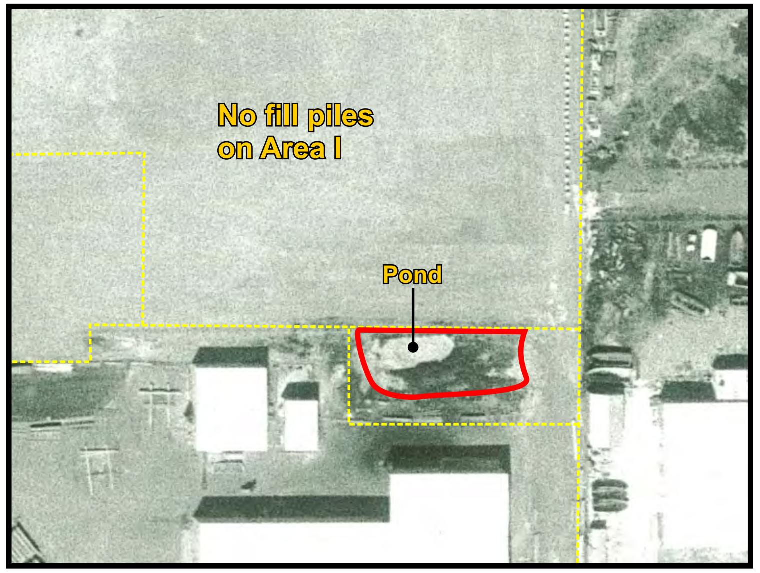
1980

No Scale.
The locations of all features are
approximate and subject to interpretation.

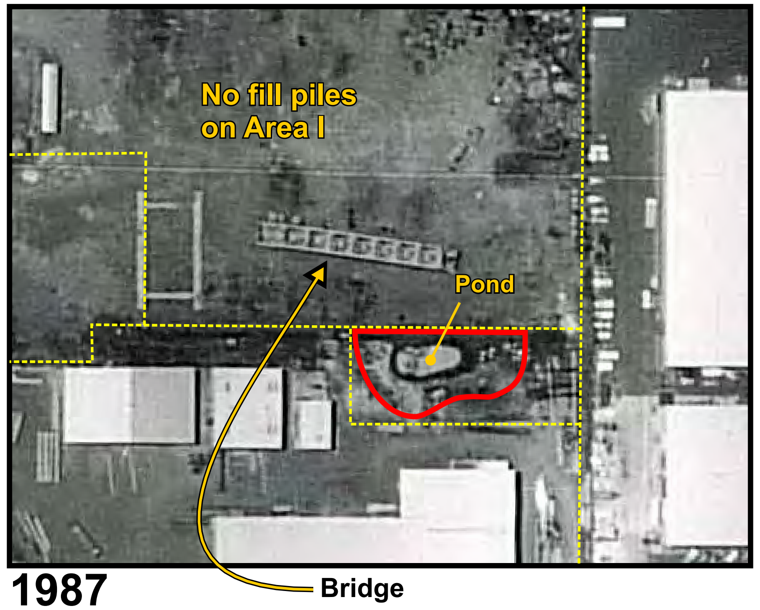
N ➤

Key to Outlines

- ⋯ Margins of dredge fill berm in 1973 and eastern margin of berm remnant thereafter.
- ○ Log / Pipe / Slash / Debris piles.
- ○ Fill piles on Area I on top of dredge fill.
- ○ Approximate extent of fill on G-1 after 1982.



1982



1987

Bridge

This figure illustrates the extent of fill in the northeastern part of Area I and the northwestern part of Area G (G-1). The comments below provide additional information about each aerial photograph:

1973: The berm is on the east side of the dredge fill and is several feet higher than the fill..

1976: The dredge berm in Area G-1 and on I has been flattened and has scattered vegetation.

1980: West half of Area G-1 has been graded and the vegetation removed. Minor fill may be present beneath the poles in Area I.

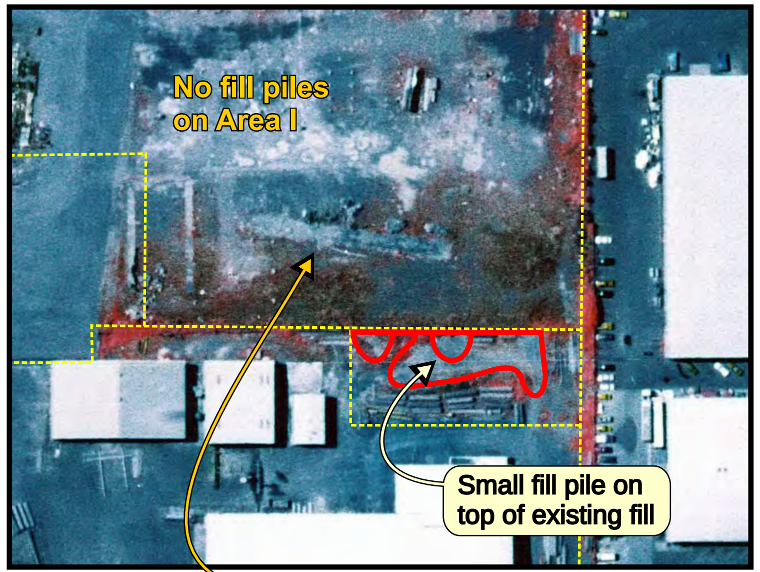
1982: Area I has been graded and 0.5 to 1.0 feet of gravel placed over the entire area. The dredge berm remnant remains in Area G-1 A settling pond is evident in Area G-1. The amount of fill in Area G-1 is reduced.

1987: The settling pond is still present.

1991: Nearly all of the fill in Area G-1 has been removed. The settling pond is no longer present.

1993: A small stockpile is present near the northeastern corner of Area I but it is not against the fence. The amount of fill in G-1 has increased and is clear of vegetation.

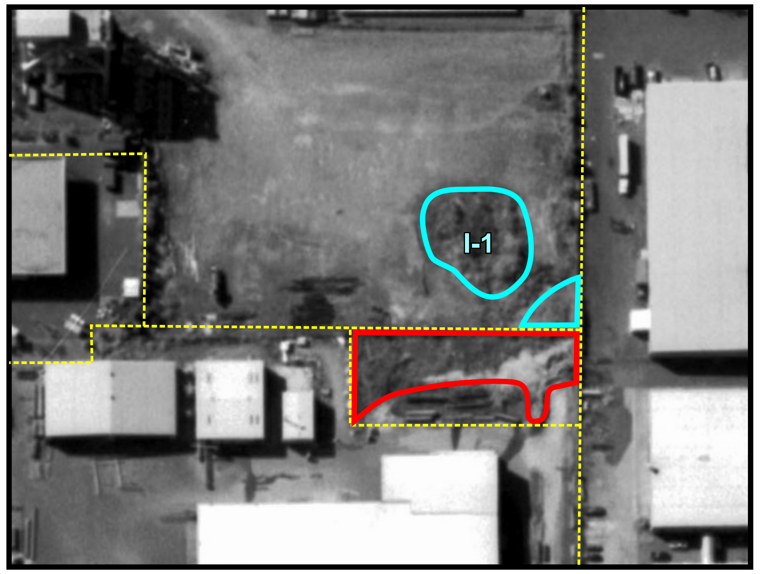
1999: Stockpile I-1 is present on Area I. A stockpile covered with vegetation is present at the northeastern corner of Area I. The fill on Area G-1 has been moved some and vegetation has grown over most of it. This fill remains at the site until 2006.



1991

Residue at former bridge location

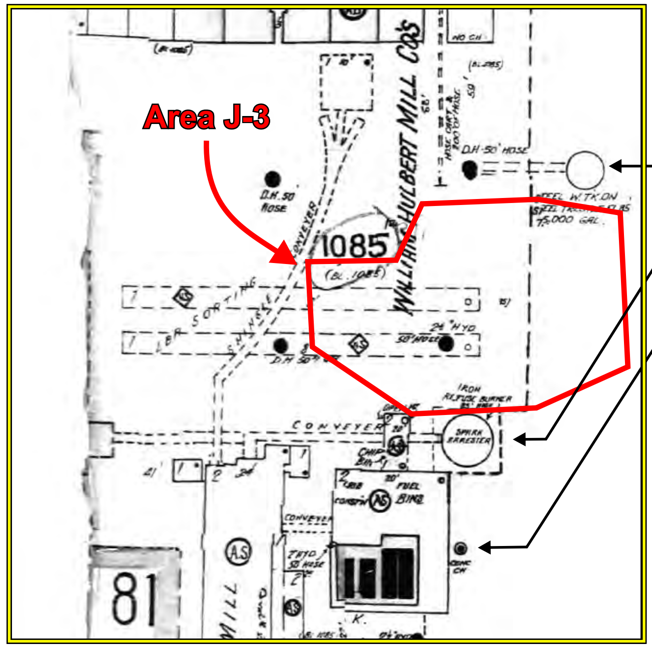
1993



1999

Figure 10
Fill on Areas G and I
North Marina Ameron/Hulbert Site
Everett, Washington

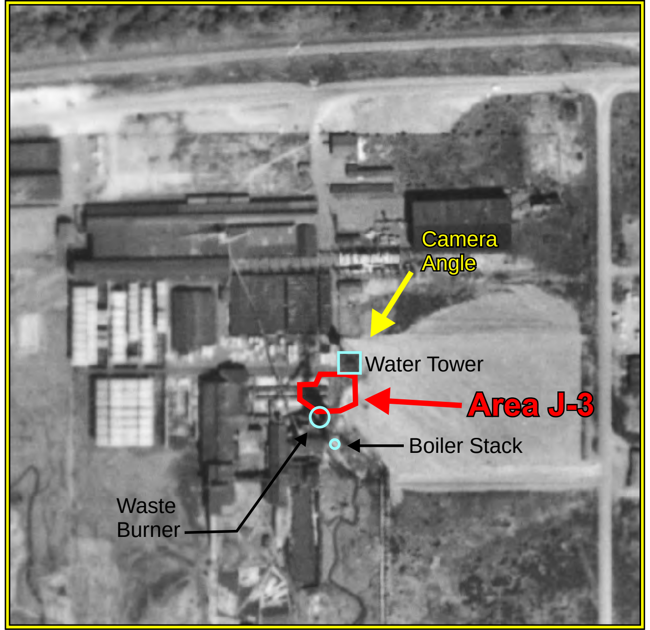
Pinnacle GeoSciences



1950 Sanborn Map

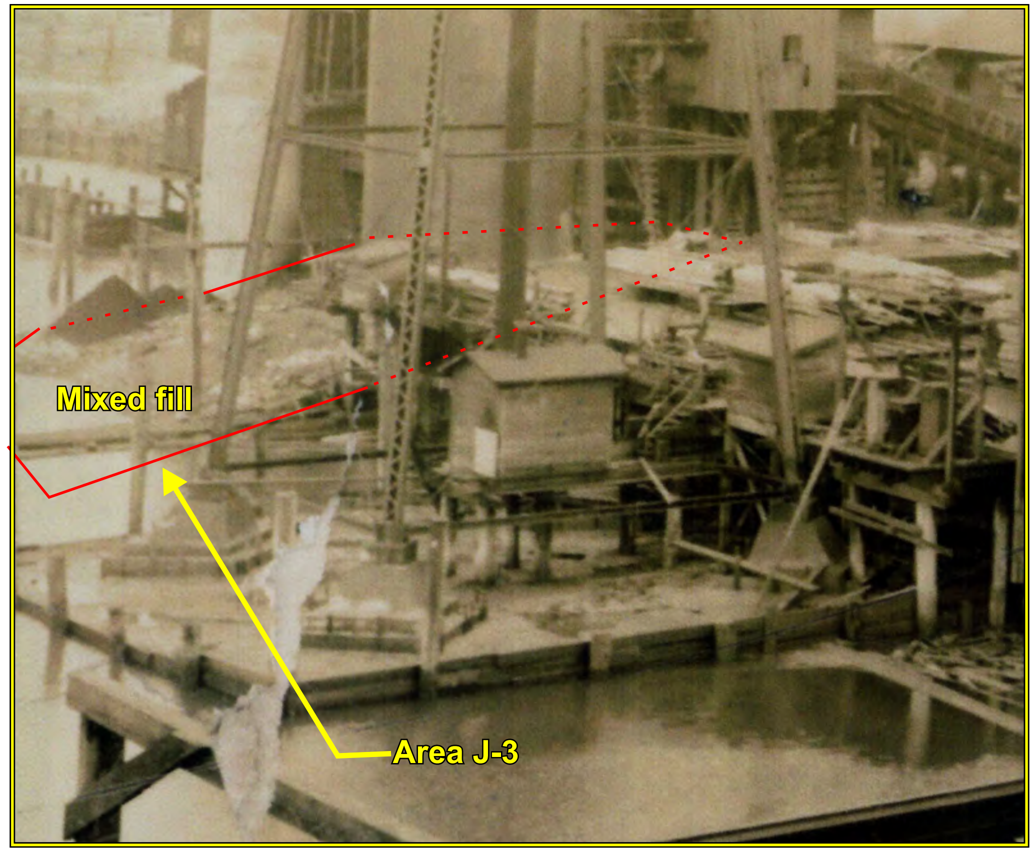
75,000 gallon steel water tank
Iron Refuse Burner, 85 feet high
Concrete Chimney

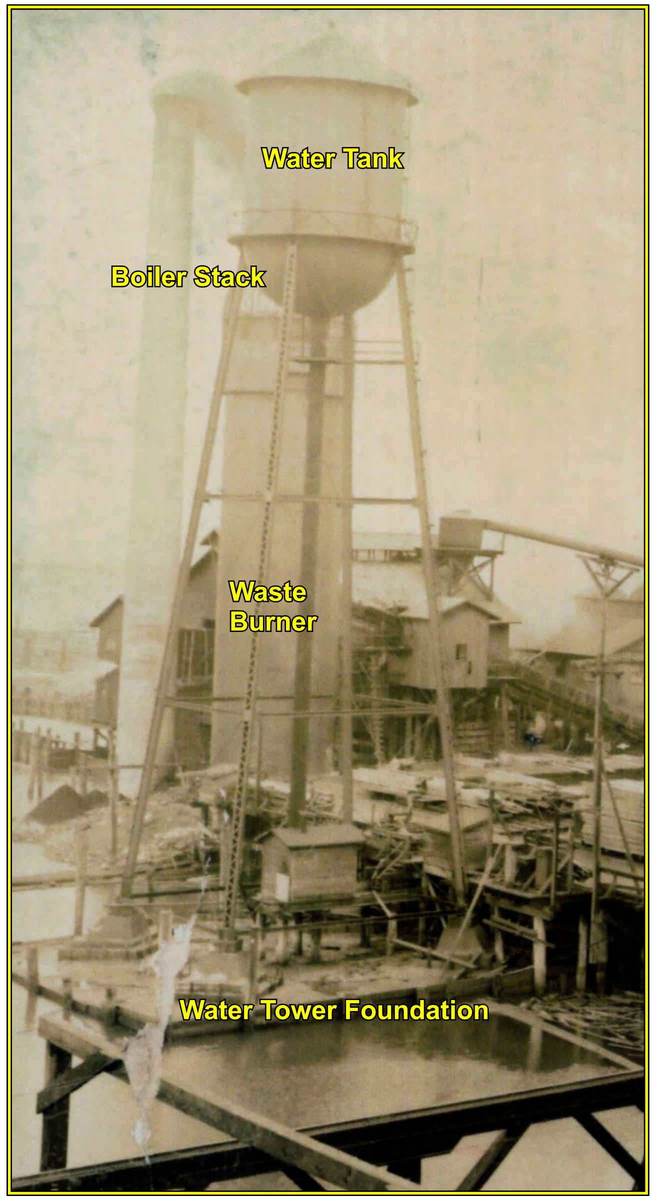
N
No Scale



N
No Scale

1955 with annotations showing orientation of photograph to right

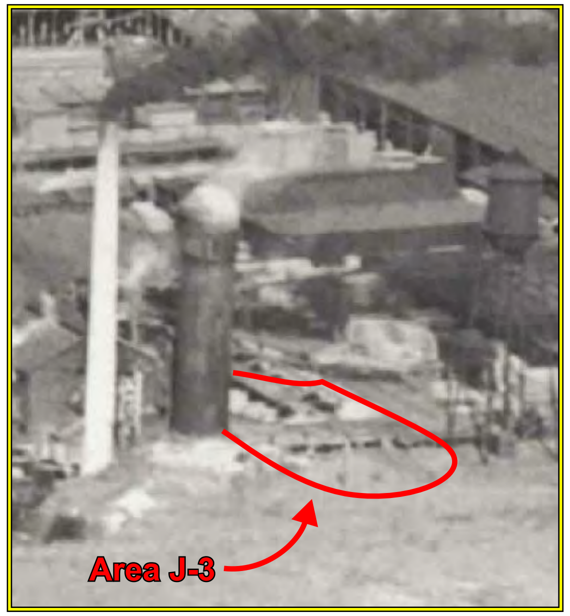




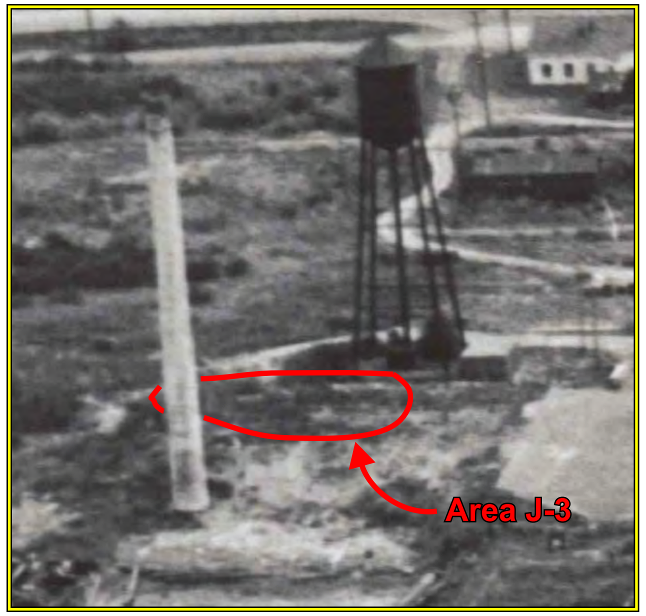
Mid- to Late-1930s

1953

1953



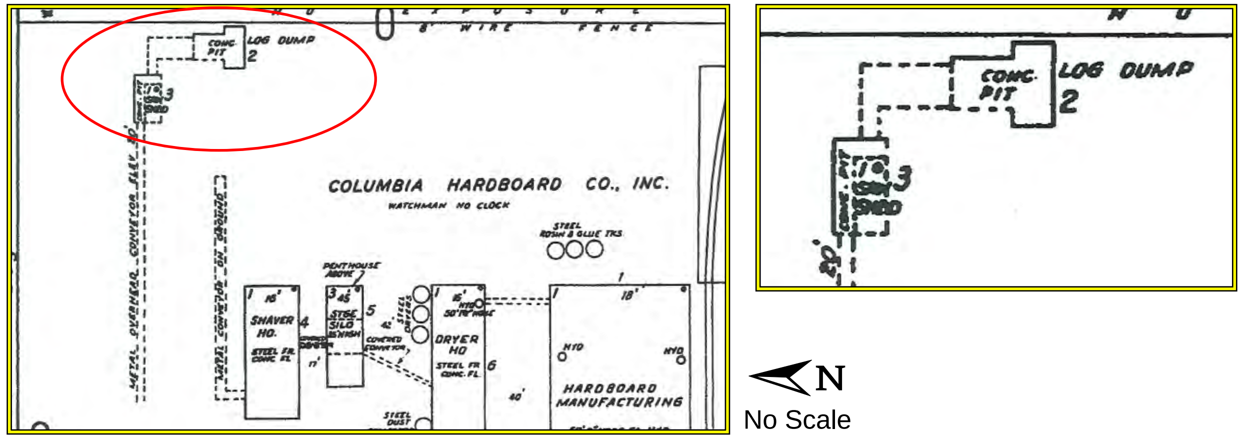
1954



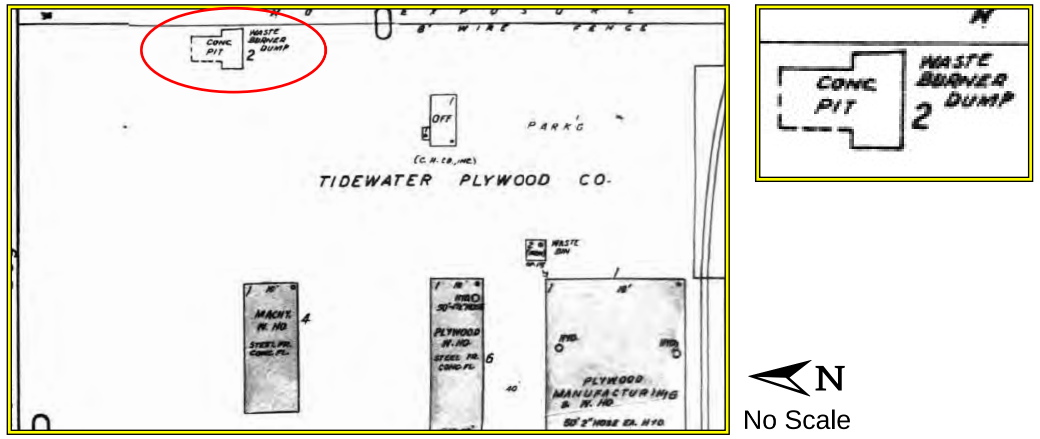
1969

Figure 11
Historic Features in Area J-3
North Marina Ameron/Hulbert Site
Everett, Washington

Pinnacle GeoSciences



Sanborn Map - 1957 (Circled area shown at right)

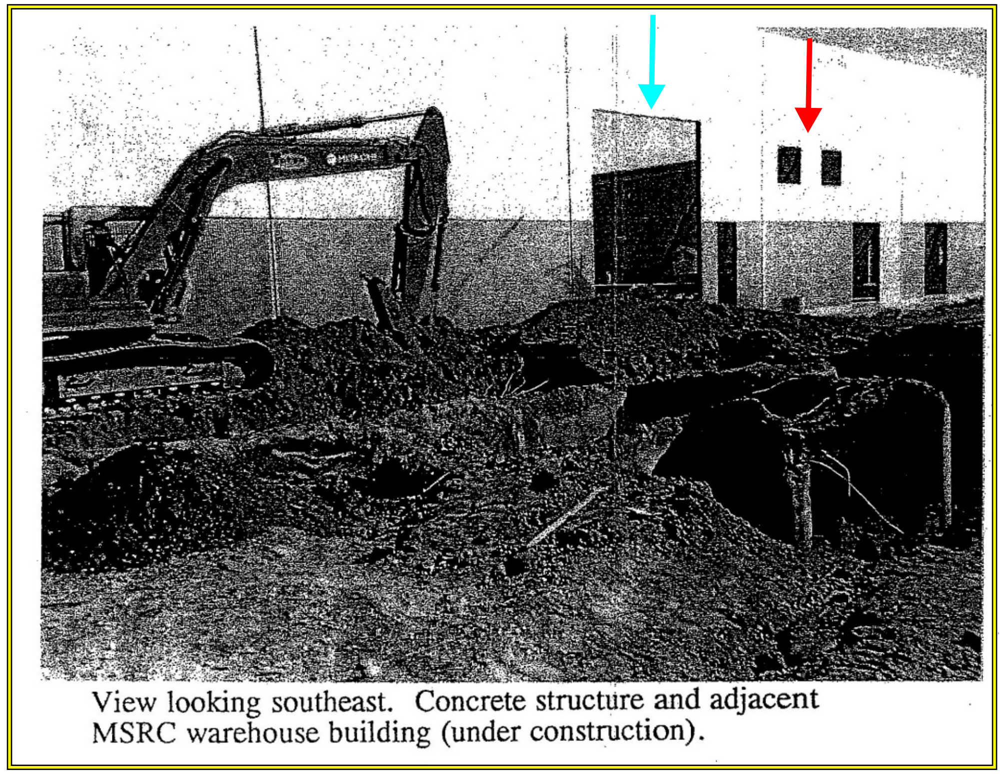


Sanborn Map - 1968 (Circled area shown at right)

1961 Aerial Photo N No Scale

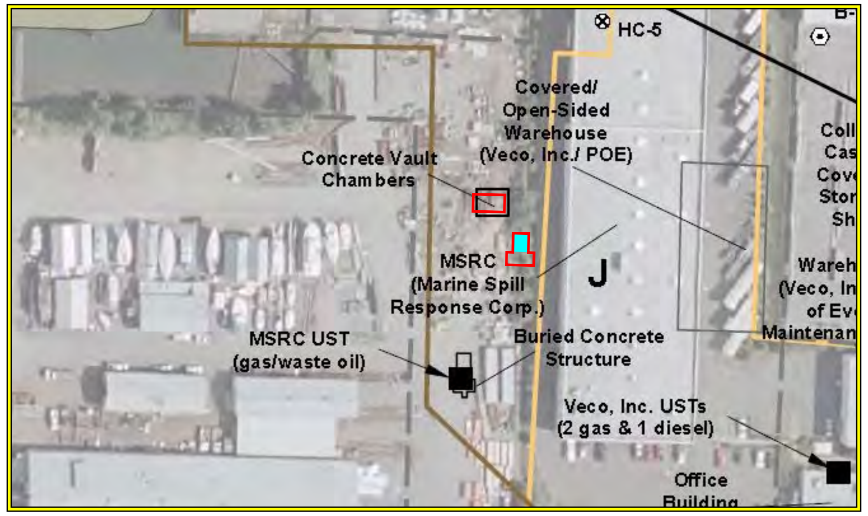
1965 Aerial Photo N No Scale

Recent photograph with features from Kleinfelder photograph identified as well as view angle and the location of the vault that was removed.



View looking southeast. Concrete structure and adjacent MSRC warehouse building (under construction).

Kleinfelder Photograph - door and windows shown in the photograph at top

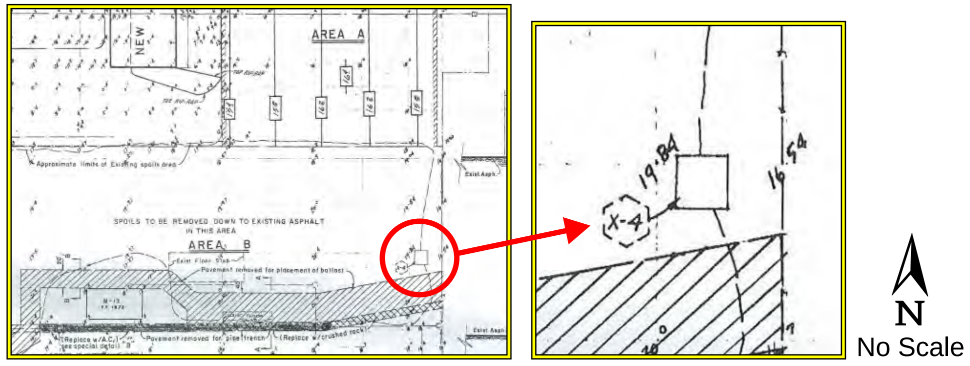


Segment of Figure 3 from Landau Interim Action Report (2009)with the following overlays scaled from common mapped features:

Red: Concrete pit locations as shown in the 1957 Sanborn Map.

Blue: Concrete foundation to be removed (Reid Middleton drawing).

N
No Scale



LEGEND

X-1, X-2, etc. = Old concrete foundations to be removed (Bid Item 2)

= Limits of contract work

Reid Middleton & Associates 1974 engineering drawing

NO.	REVISIONS	DATE	BY
1	AS BUILT DWG.	18 JUNE 75	R.M.

PORT OF EVERETT, WASHINGTON

12th ST. CHANNEL BARGE TERMINAL

SITE PREPARATION

SUB-GRADE PLAN & DETAILS

Reid, Middleton & Associates, Inc.

ENGINEERS • SURVEYORS • PLANNERS

324 MAIN ST., EDMONDS, WASH.

SCALE AS NOTED

DATE 27 Dec. 1974

DESIGN J.H.R.

DRAWN A.R.M.

CHECKED J.H.R

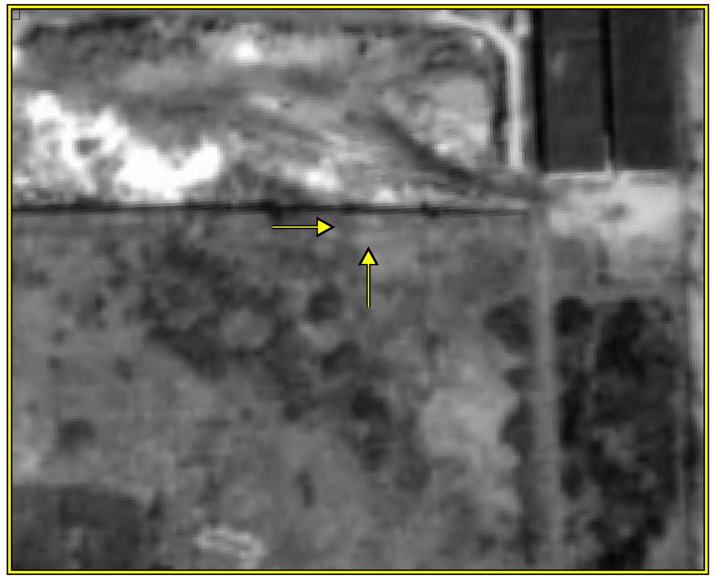
FB 2

JAMES H. REID

Figure 12

Concrete Structures in Area J
North Marina Ameron/Hulbert Site
Everett, Washington

Pinnacle GeoSciences



1967

1973

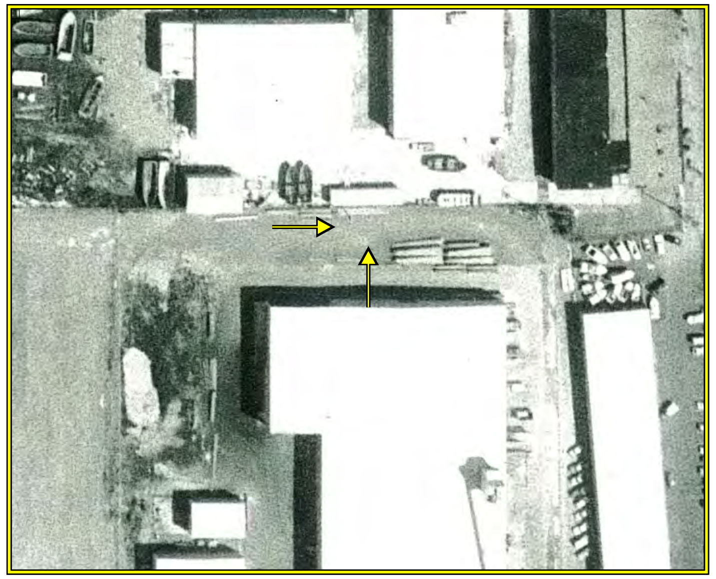
1974

1974 - Enlargement

1976

1977

1980



1982

1995

2005

These aerial photographs shows a series of differing uses of the property north of the current Ameron building where the storm drain break occurred. The first photograph shows the original fill placed at the time the site was occupied by the sawmill. Subsequently the area has been used for storage of fill, laydown of equipment, and as a roadway. The buried storm drain line was installed in about 1982. The approximate location of the repair is identified by the two arrows in each photograph.

N

No scale.
The locations of all features are approximate.

Figure 13

Sewer Line Repair Area on
Northern Area G
North Marina Ameron/Hulbert Site
Everett, Washington

Pinnacle GeoSciences

Left:

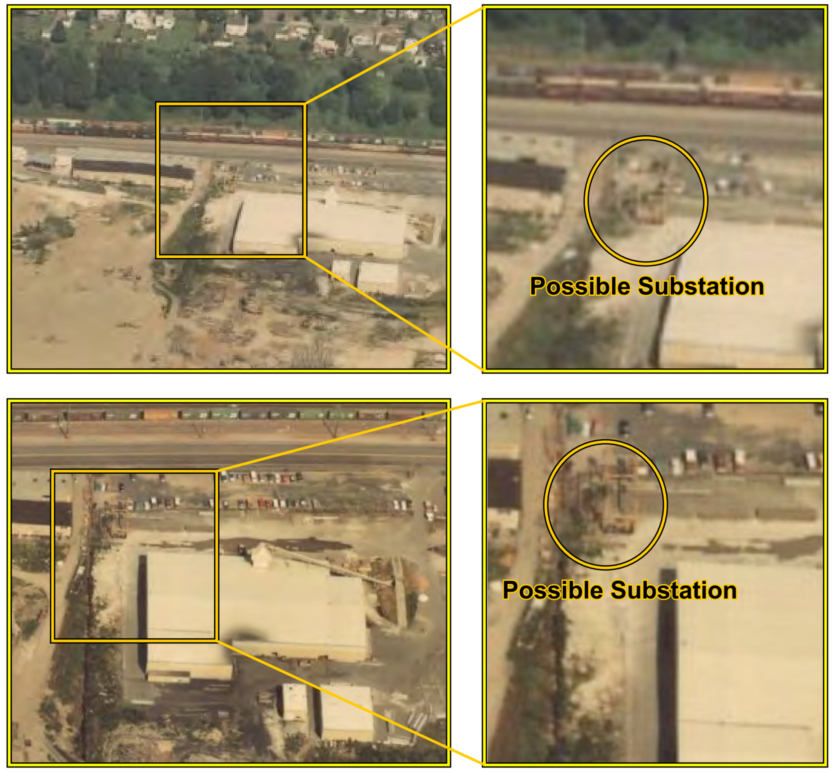
The upper two photographs are oblique photographs taken on November 25, 2005. The general alignment of the storm drain system that discharges past the sewer line break location is shown in yellow on the upper two photographs. The lower photograph is an enlargementfrom the upper photograph of the areas on the subject property and the adjoining property where considerable items are stored on the ground surface.

Below:

This shows part of Figure 3a from Landau's November 28, 2001 Environmental Site Assessment for the North Marina Redevelopment Project. The figure illustrates the storm drain system. The yellow highlighted portion discharges past the sewer line break location.

Right:

The 1977 photographs show a structure that might be an electrical substation-type structure. The photographs are not suitable to clearly identify the item. The 1980 photograph documents the presence of pole mounted transformers at the northeastern corner of the subject property.



1977 (both oblique views)

1980

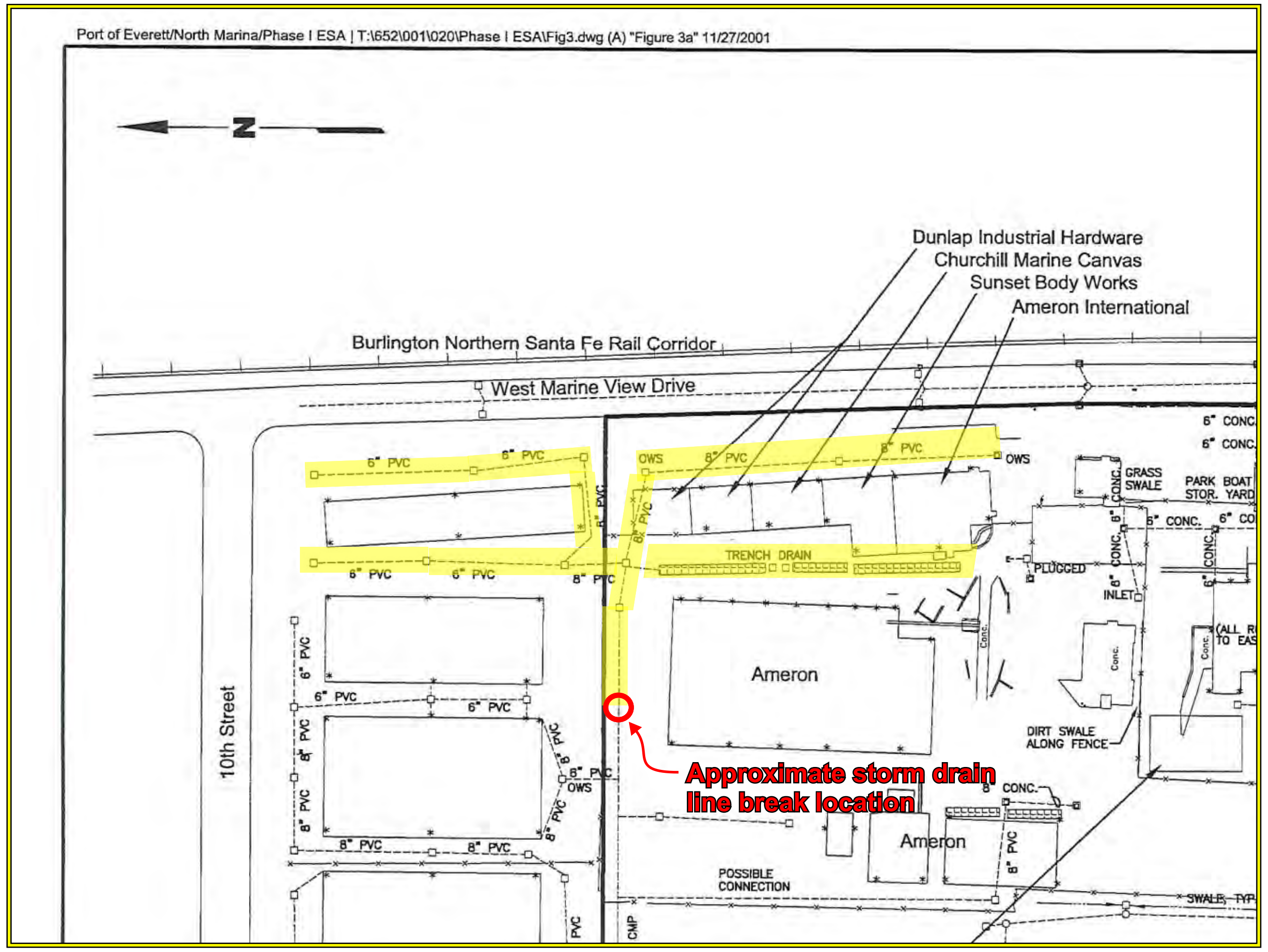
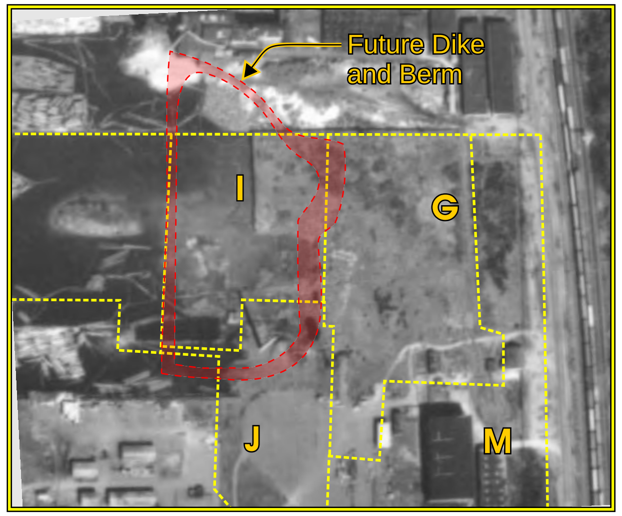


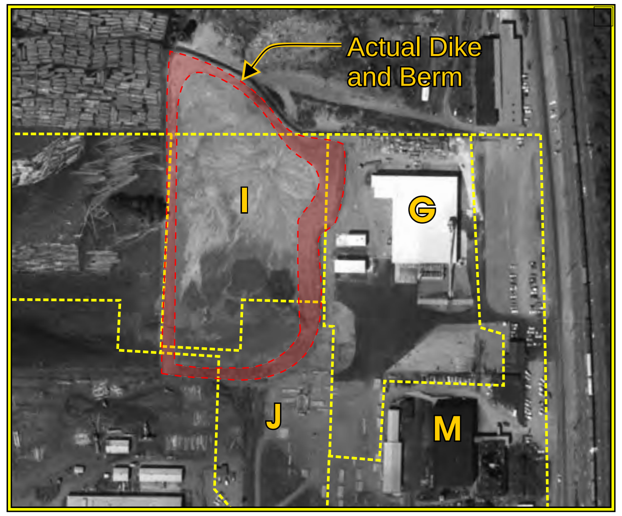
Figure 14
Storm Sewer System on
Northern Area G
North Marina Ameron/Hulbert Site
Everett, Washington

Pinnacle GeoSciences

Large Dredge Disposal Fill - 1973

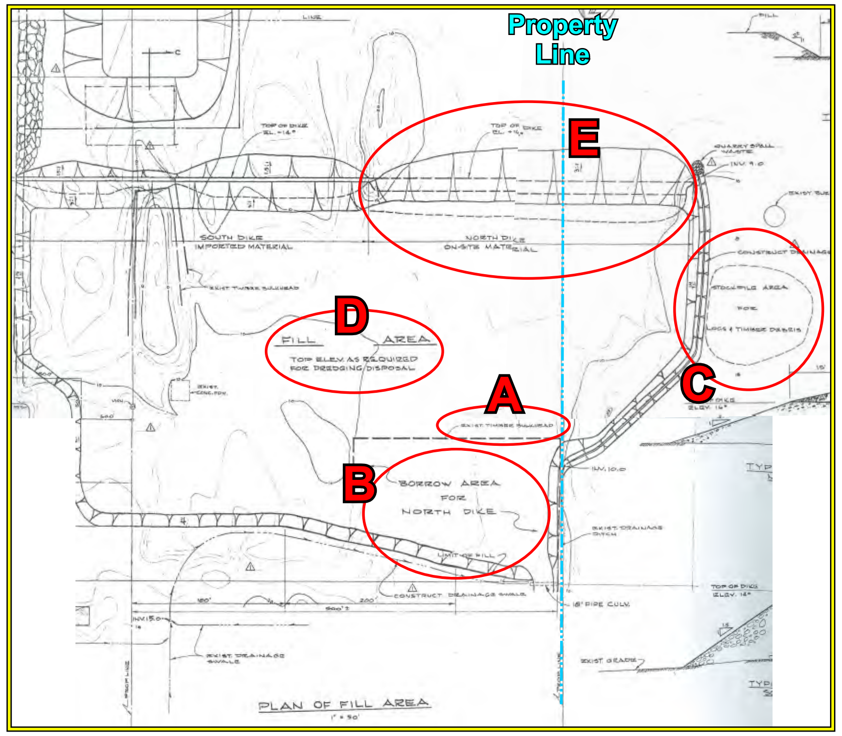


1967



1973, September

1973, September (without overlays)



From Drawing Dated 1/2/1973 and stamped "As-Built"
By Reid Middleton Associates, File 7.76.1-01
Reproduced here at 1 inch = 250 feet

Annotations shown in Red, Above:

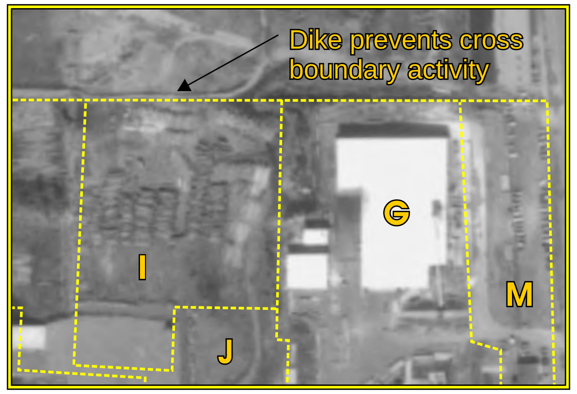
A: Existing timber bulkhead
B: Borrow area for north dike
C: Stockpile area for logs and timber debris
D: Fill area, top elevation as required for dredging disposal
E: Northern Dike

Undated Photo on engineering drawing
circa 1973-1974

Scale for Aerial Photographs

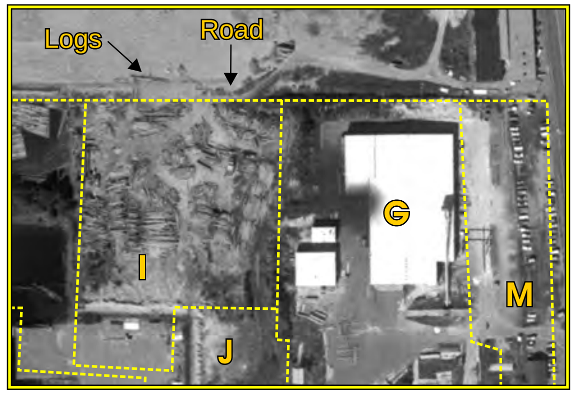
N
0 500 1,000 feet
Approximate Scale: 1-inch = 500 feet
The locations of all features are approximate.

Activity Crossing the North Property Line After Fill Placement

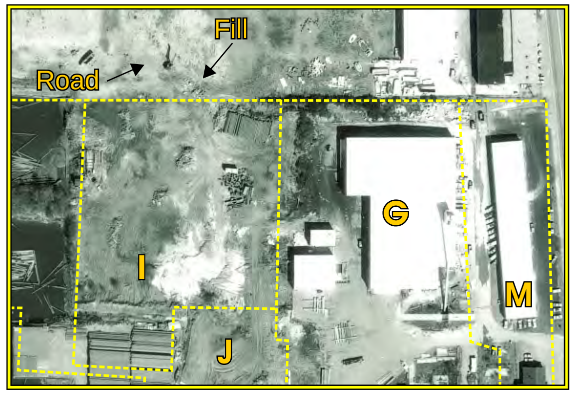


1976

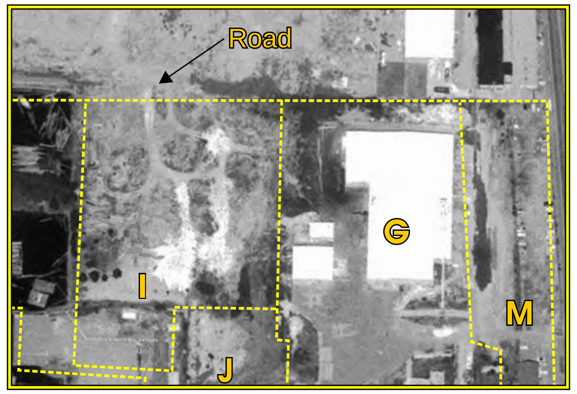
1977- Oblique view - no scale



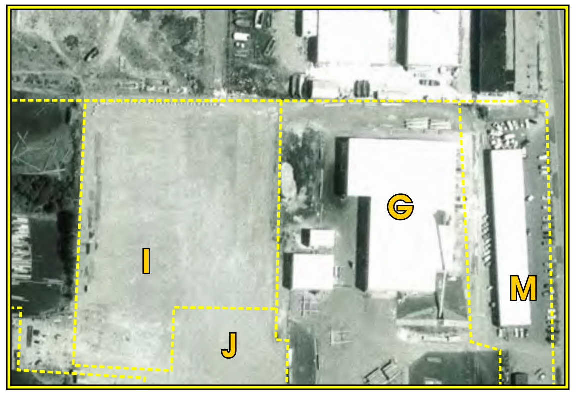
1977



1980



1979



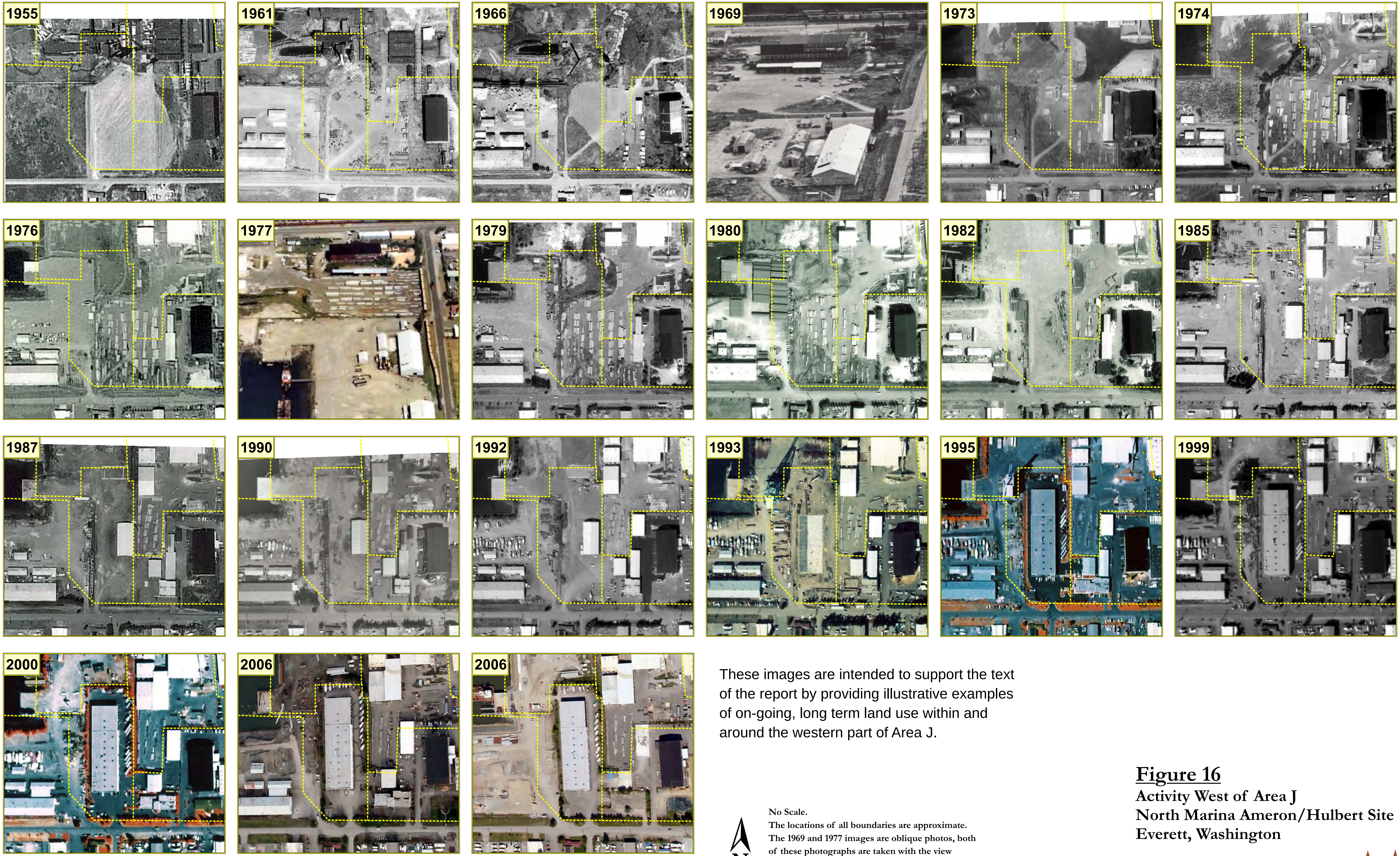
1982 - No cross property line activity

N
0 400 800 feet
Approximate Scale: 1-inch = 400 feet
The locations of all features are approximate.

Figure 15

Cross Property Activity to the North
North Marina Ameron/Hulbert Site
Everett, Washington

Pinnacle GeoSciences



1955 1961 1966 1969 1973 1974
1976 1977 1979 1980 1982 1985
1987 1990 1992 1993 1995 1999
2000 2006 2006

These images are intended to support the text of the report by providing illustrative examples of on-going, long term land use within and around the western part of Area J.

N

No Scale.
The locations of all boundaries are approximate.
The 1969 and 1977 images are oblique photos, both of these photographs are taken with the view toward the east.

Figure 16
Activity West of Area J
North Marina Ameron/Hulbert Site
Everett, Washington

Pinnacle GeoSciences

APPENDIX C

Exploration Logs

Area G

G-FA-1

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
0						GP/SP	Brown, fine to coarse SAND and GRAVEL (dense, moist)(no odor, no sheen)(roadbase)	Groundwater not encountered.
						SP/SM	Brown, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(fill)	
2		b3						
						SM/SC	Brown with black speckles, fine to medium SAND and SILT with clay (dense, moist)(no odor, no sheen)(fill)	
	G-FA-1 2.7-3.7			0				
4								
						SM	Brown, fine to medium SAND with silt (loose, wet)(slight unidentifiable odor, no sheen)(hydraulic fill)	
6		b3						
8								
10		b3						
						WD	- Wood debris (~3" diameter chips)	
12								

Boring Completed 01/20/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation Everett, Washington	Log of Boring G-FA-1	Figure 1-

G-FA-2

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						SW	Brown, fine to coarse SAND with gravel (dense, moist)(no odor, no sheen)(fill)	
						SW	Grey with light green speckles, gravelly, fine to medium SAND with silt (dense, moist)(concrete type odor, no sheen)(fill) Gravel layer without green granules at 1.7'	
2		b3						
	G-FA-2 2.7-3.2			0				
4						SM	Dark grey, fine to medium SAND with silt (loose, wet) (no odor, no sheen) (hydraulic fill)	∇ ATD
6		b3						
8								
10								
12								

Boring Completed 01/20/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

G-FA-3

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0						SP	Brown, fine to medium SAND with gravel (dense, moist)(no odor, no sheen)(roadbase)	
						SM	White, silty, fine to medium SAND with gravel (very dense, damp)(concrete odor, no sheen)(concrete waste materials)(fill)	
2		e3						
4						SP	Grey, fine to medium SAND (loose, wet)(unidentifiable odor, no sheen)(hydraulic fill)	∇ ATD
	G-FA-3 5-5.5			0				
6		e3						
8								
10								
12								

Boring Completed 01/20/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020 4/29/10 N:\PROJECTS\147020 090.GPJ // LANDAU 1 0.GLB // SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation Everett, Washington	Log of Boring G-FA-3	Figure 1-

G-FA-4

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
							Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						SP	Brown, gravelly, fine to medium SAND with crushed concrete (dense, moist)(no odor, no sheen)(roadbase)	
						SP	Brown, fine to mediumd SAND with gravel (medium dense, moist)(no odor, no sheen)(fill)	
						SM	Green, silty, fine SAND with crushed concrete and gravel (dense, moist)(concrete odor, no sheen)(fill)	
2	G-FA-4 2-2.5	e3		74				
						WD	Grey, sandy, WOOD debris with trace gravel (medium dense, moist)(no odor, no sheen)(fill)	
4						SM	Green to white, silty, fine SAND with gravel (dense, moist)(concrete odor, no sheen)(fill)	
6		e3						▽ ATD
8						SP/ SM	Brown, silty, fine SAND with gravel and crushed concrete (medium dense, wet)(no odor, no sheen)(fill)	
10		e3						
12								

Boring Completed 01/20/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

G-FA-5

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Description	Water Level
0						GP	Brown, sandy, GRAVEL with organics (medium dense, moist)(no odor, no sheen)(roadbase)	
						SP	Tan, fine to medium SAND with silt (dense, moist)(no odor, no sheen)(fill)	
2		e3						
						WD	Wood debris	
							Void	
								∇ ATD
4								
6		e3						
						SM	Dark grey, silty, fine SAND (medium dense, wet)(petroleum odor, light sheen)(hydraulic fill)	
8	G-FA-5 8-8.5			0				
10		e3						
12								

Boring Completed 01/20/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020 4/29/10 N:\PROJECTS\147020.090.GPJ // LANDAU 1.0.GLB // SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring G-FA-5

Figure
1-

G-FA-6

Drilling Method: Geoprobe™
Ground Elevation (ft):
Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						GP/SP	Brown, fine to medium SAND and GRAVEL (dense, wet) (no odor, no sheen) (roadbase)	
						SP	Tan, fine to medium SAND with trace concrete residue and trace wood fragments (medium dense, moist) (no odor, no sheen) (fill)	
2		e3						
4								
								▽ ATD
	G-FA-6 5.2-5.5			0		SM	Brown, fine SAND with silt (medium stiff, moist) (light hydrocarbon odor, no sheen) (fill)	
6		e3				SP	Tan, fine to medium SAND with trace concrete residue and trace wood fragments (medium dense, moist) (no odor, no sheen) (fill)	
						SM	Dark grey, fine SAND with silt (medium dense, moist) (petroleum odor, light sheen) (hydraulic fill)	
8								
10		e3						
							Silt content increases to a silty, fine SAND at 11'	
12								

Boring Completed 01/20/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020 4/29/10 N:\PROJECTS\147020 090.GPJ // LANDAU 1.0.GLB // SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation Everett, Washington	Log of Boring G-FA-6	Figure 1-

G-FA-7

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0						GP/SP	Brown, fine to medium SAND and GRAVEL with trace silt (dense, moist)(no odor, no sheen)(roadbase)	
						SP	Light greyish green, medium SAND (loose, damp)(no odor, no sheen)(fill)	
						SM	Tan, fine to medium SAND with silt (medium dense, moist)(no odor, no sheen)(hydraulic fill)	
2		e3						
4								∇ ATD
	G-FA-7 5.0-5.5			0				
6		e3						
8								
10		e3						
						WD	Wood debris	
						SM	Tan, silty, fine SAND (medium dense, wet)(no odor, no sheen)(hydraulic fill)	
						WD	Wood debris	
						SM	Tan, silty, fine SAND (medium dense, wet)(no odor, no sheen)(hydraulic fill)	
12								

Boring Completed 01/20/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020 4/29/10 N:\PROJECTS\147020 090 GPJ // LANDAU 1 0 GLB // SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation Everett, Washington	Log of Boring G-FA-7	Figure 1-

G-FA-8

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0						GP/SP	Brown, fine to medium SAND and CRUSHED GRAVEL (dense, moist)(no odor, no sheen)(roadbase)	
						SM	Tan, fine to medium SAND with concrete residue (medium dense, moist)(no odor, no sheen)(fill)	
2		e3					Becomes tan at 2.1'	
4	G-FA-8 4.0-4.5			0				
								▽ ATD
						SM	Brown, silty, fine SAND with intermixed wood fibers (dense, moist)(no odor, no sheen)(hydraulic fill)	
6		e3						
8								
10		e3						
12								

Boring Completed 01/20/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020 4/29/10 N:\PROJECTS\147020.090.GPJ // LANDAU 1.0.GLB // SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring G-FA-8

Figure
1-

G-1

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level
0						GP	Black, sandy, fine to coarse angular GRAVEL (medium dense, moist) (slight hydrocarbon odor) (gravel roadbase)	
2		f3		0		SP	Tan, fine to coarse SAND with trace gravel (loose, moist) (no odor) (hydraulic fill)	
							-color changes to dark gray	
4								▽ ATD
							- becomes wet at 5 feet	
6		f3		0				
							-3 inch thick woody debris layer	
	NMP2-G-1 -GW @1420							
8								

Boring Completed 12/22/03
Total Depth of Boring = 8.0 ft.

10

12

14

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020.14 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation Everett, Washington	Log of Boring G-1	Figure A-170

G-2

Drilling Method: Geoprobe™

Ground Elevation (ft): No Reference

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE		GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	USCS Symbol		Water Level
0					AC	Asphalt	
					GP	Gray, sandy, fine to coarse angular GRAVEL (medium dense, moist) (slight hydrocarbon odor) (gravel roadbase)	
				0			
2		f3			SP-SM	Green-gray, fine to medium SAND with silt (loose, moist) (no odor) (hydraulic fill)	
4							∇ ATD
6		f3		0			
	NMP2-G-2 -GW @1500				WD	Black woody debris (loose, moist to wet) (no odor)	
8							

Boring Completed 12/22/03
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring G-2

Figure
A-171

G-3

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: GeoprobeTMc Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level
0						AC	Asphalt	
						GP	Brown, sandy, fine to coarse gravel, (medium dense, moist) (gravel roadbase)	
2	NMP2-G-3 -CS 3' @1440	f3		0		SP-SM	Green-gray, fine to medium SAND with silt (loose, moist to wet at 5.75') (no odor) (hydraulic fill)	
4								∇ ATD
6	NMP2-G-3 -CS 6' @1445	f3		0		SP	Dark gray, fine to medium SAND, with shell fragments (moderately loose, wet) (no odor) (hydraulic fill)	
8	NMP2-G-3 -GW @1455							

Boring Completed 02/11/04
Total Depth of Boring = 9.0 ft.

Refusal at 9 feet (rock in cutting shoe)

Depth (ft)
10
12
14

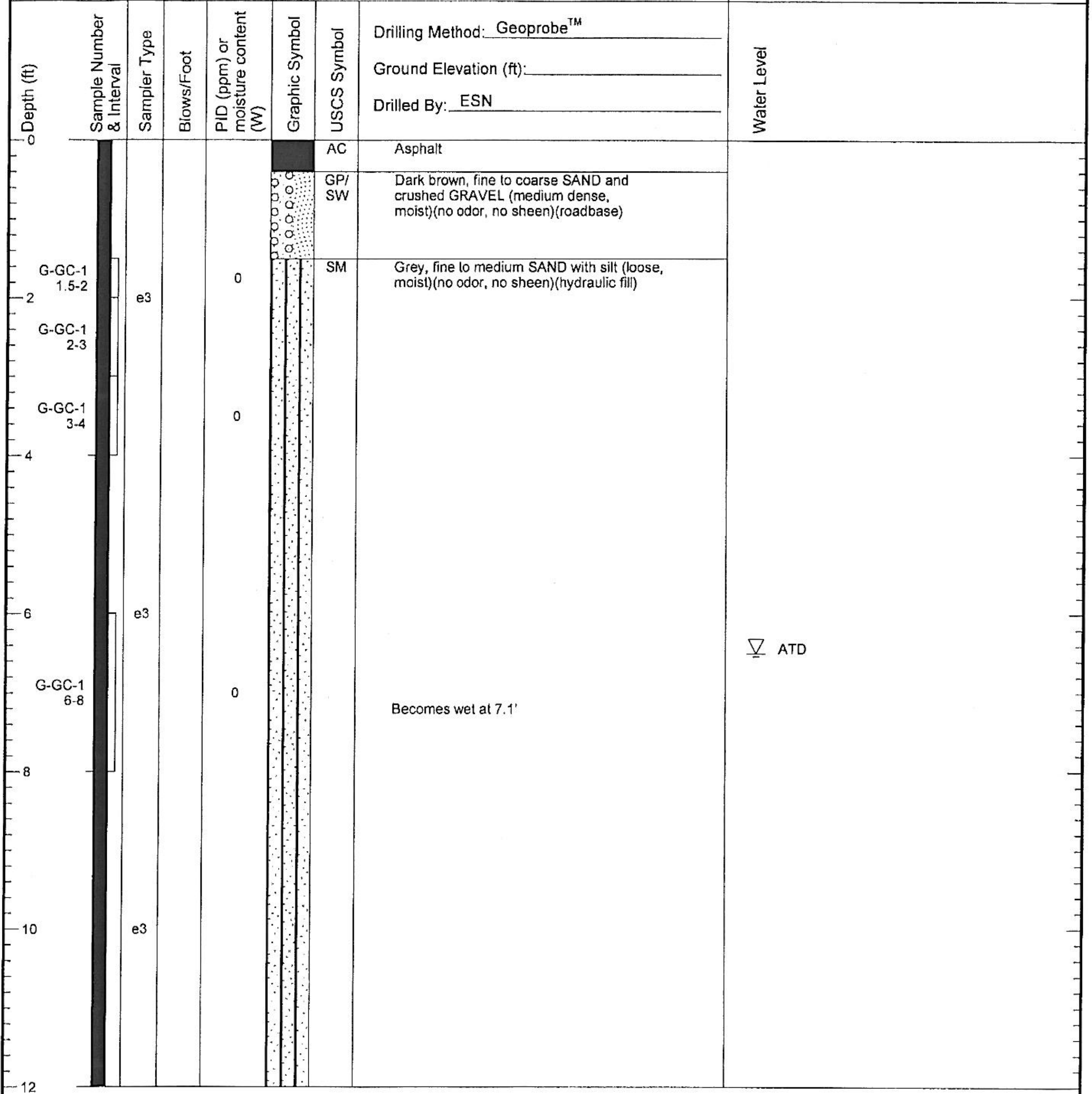
Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation Everett, Washington	Log of Boring G-3	Figure A-172

G-GC-1

Drilling Method: Geoprobe™
Ground Elevation (ft):
Drilled By: ESN



SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						AC	Asphalt	
						GP/SW	Dark brown, fine to coarse SAND and crushed GRAVEL (medium dense, moist)(no odor, no sheen)(roadbase)	
	G-GC-1 1.5-2			0		SM	Grey, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
2		e3						
	G-GC-1 2-3							
	G-GC-1 3-4			0				
4								
6		e3						∇ ATD
	G-GC-1 6-8			0			Becomes wet at 7.1'	
8								
10		e3						
12								

Boring Completed 03/02/05
Total Depth of Boring = 12.0 ft

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring G-GC-1

Figure
A-173

G-GC-2

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: ESN	Water Level
0						AC	Asphalt	
						SW	Brown, fine to course SAND with gravel (dense, moist)(no odor, no sheen)(roadbase)	
	G-GC-2 1.4-1.9			0		SM	Grey, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
2		e3						
	G-GC-2 2.4-3.4							
							Becomes wet at 3.7'	
4								∇ ATD
	G-GC-2 4.4-6.4			0			Becomes dark grey at 5.5' Abundant shell fragments 5.5'-6.0'	
6		e3						
	G-GC-2 6.4-8						Wood debris from 7.3'-7.8'	
8								
10		e3						
12								

Boring Completed 03/02/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation Everett, Washington	Log of Boring G-GC-2	Figure A-174

G-GC-3

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: ESN

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						AC	Asphalt	
						GP/ SW	Brown, fine to coarse SAND and crushed GRAVEL (dense, damp)(no odor, no sheen)(roadbase)	
						SM	Brown, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
	G-GC-3 1.0-1.5			0				
2		e3						
	G-GC-3 2-3							
	G-GC-3 3-4			0				
4								
							Becomes wet at 4.2'	
	G-GC-3 4-6						Becomes grey at 5'	
								∇ ATD
6		e3						
	G-GC-3 6-8						Becomes a silty, fine to medium SAND at 7.1'	
8								
10								
12								

Boring Completed 03/02/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation Everett, Washington	Log of Boring G-GC-3	Figure A-175

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL[1]	TYPICAL DESCRIPTIONS[2][3]
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)	○	GW	Well-graded gravel; gravel/sand mixture(s); little or no fines
			○	GP	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)	▥	GM	Silty gravel; gravel/sand/silt mixture(s)
			▨	GC	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)	⁘	SW	Well-graded sand; gravelly sand; little or no fines
			⁘	SP	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)	▥	SM	Silty sand; sand/silt mixture(s)
			▨	SC	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)		▥	ML	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
			▨	CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
			≋	OL	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)		▥	MH	Inorganic silt; micaceous or diatomaceous fine sand
			▨	CH	Inorganic clay of high plasticity; fat clay
			▨	OH	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL		≋	PT	Peat; humus; swamp soil with high organic content

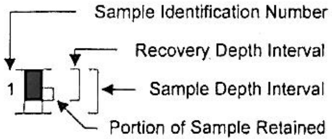
OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT	■	AC or PC	Asphalt concrete pavement or Portland cement pavement
ROCK	▨	RK	Rock (See Rock Classification)
WOOD	≋	WD	Wood, lumber, wood chips
DEBRIS	▨	DB	Construction debris, garbage

Notes:
1. USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
2. Soil descriptions are based on the general approach presented in the *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)* outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the *Standard Test Method for Classification of Soils for Engineering Purposes*, as outlined in ASTM D 2487.
3. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

Primary Constituent:	> 50%	"GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents:	> 30% and ≤ 50%	"very gravelly," "very sandy," "very silty," etc.
	> 15% and ≤ 30%	"gravelly," "sandy," "silty," etc.
Additional Constituents:	> 5% and ≤ 15%	"with gravel," "with sand," "with silt," etc.
	≤ 5%	"trace gravel," "trace sand," "trace silt," etc., or not noted.

Drilling and Sampling Key

SAMPLE NUMBER & INTERVAL



SAMPLER TYPE

Code	Description
a	3.25-inch O.D., 2.42-inch I.D. Split Spoon
b	2.00-inch O.D., 1.50-inch I.D. Split Spoon
c	Shelby Tube
d	Grab Sample
e	Other - See text if applicable
1	300-lb Hammer, 30-inch Drop
2	140-lb Hammer, 30-inch Drop
3	Pushed
4	Other - See text if applicable

Groundwater

▽ ATD Approximate water elevation at time of drilling (ATD) or on date noted. Groundwater levels can fluctuate due to precipitation, seasonal conditions, and other factors.

Field and Lab Test Data

Code	Description
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
GT	Other Geotechnical Testing
CA	Chemical Analysis

6/16/05 \\EDMDATA\GINT\GINT6\PROJECTS\147023.012.GPJ SOIL CLASS SHEET

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Port of Everett
Everett, Washington

Soil Classification System and Key

Figure
1-1

G-FA-1

SAMPLE DATA					SOIL PROFILE		GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft):	
0					GP/ SP	Brown, fine to coarse SAND and GRAVEL (dense, moist)(no odor, no sheen)(roadbase)	Groundwater not encountered.
					SP/ SM	Brown, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(fill)	
2		b3					
					SM/ SC	Brown with black speckles, fine to medium SAND and SILT with clay (dense, moist)(no odor, no sheen)(fill)	
	G-FA-1 2.7-3.7			0			
4							
					SM	Brown, fine to medium SAND with silt (loose, wet)(petroleum / concrete odor, no sheen)(hydraulic fill)	
6		b3					
8							
10		b3					
					WD	- Wood debris (~3" diameter chips)	
12							

Boring Completed 01/20/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

6/16/05 \\EDMDATA\GINT\GINT6\PROJECTS\147023.012.GPJ SOIL BORING LOG

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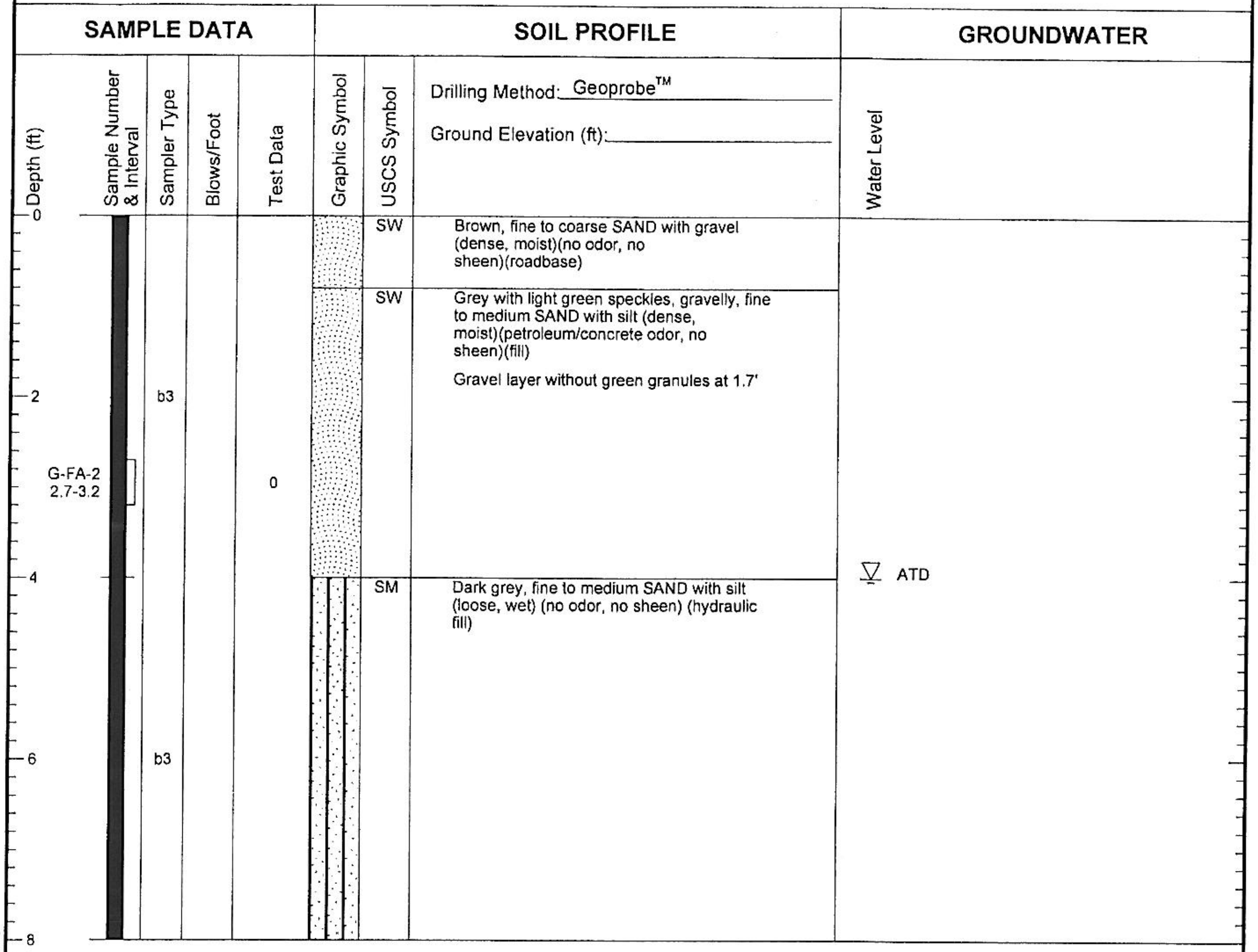
Port of Everett
Everett, Washington

Log of Boring G-FA-1

Figure
1-2

G-FA-2



Drilling Method: Geoprobe™

Ground Elevation (ft):

SW — Brown, fine to coarse SAND with gravel (dense, moist)(no odor, no sheen)(roadbase)

SW — Grey with light green speckles, gravelly, fine to medium SAND with silt (dense, moist)(petroleum/concrete odor, no sheen)(fill)

Gravel layer without green granules at 1.7'

SM — Dark grey, fine to medium SAND with silt (loose, wet) (no odor, no sheen) (hydraulic fill)

∇ ATD

Boring Completed 01/20/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Port of Everett
Everett, Washington

Log of Boring G-FA-2

Figure
1-3

G-FA-3

Drilling Method: Geoprobe™

Ground Elevation (ft):

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol		Water Level
0						SW	Brown, fine to medium SAND with gravel (dense, moist)(no odor, no sheen)(roadbase)	
						SM	White, silty, fine to medium SAND with gravel (very dense, damp)(petroleum/concrete odor, no sheen)(concrete waste materials)(fill)	
2		e3						
4						SP	Grey, fine to medium SAND (loose, wet)(unidentifiable odor, no sheen)(hydraulic fill)	∇ ATD
	G-FA-3 5-5.5			0				
6		e3						
8								
10								
12								

Boring Completed 01/20/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring G-FA-3

Figure
1-4

G-FA-4

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft):	Water Level
0						GP/ SP	Brown, gravelly, fine to medium SAND with crushed concrete (dense, moist)(no odor, no sheen)(roadbase)	
						SW	Brown, fine to mediumd SAND with gravel (medium dense, moist)(no odor, no sheen)(Road Base)	
						SM	Green, silty, fine SAND with crushed concrete and gravel (dense, moist)(petroleum/concrete odor, no sheen)(fill)	
2	G-FA-4 2-2.5	e3		74				
						WD	Grey, sandy, WOOD debris with trace gravel (medium dense, moist)(no odor, no sheen)(fill)	
4						SM	Green to white, silty, fine SAND with gravel (dense, moist)(concrete odor, no sheen)(fill)	
6		e3						▽ ATD
8						SP/ SM	Brown, silty, fine SAND with gravel and crushed concrete (medium dense, wet)(no odor, no sheen)(fill)	
10		e3						
12								

Boring Completed 01/20/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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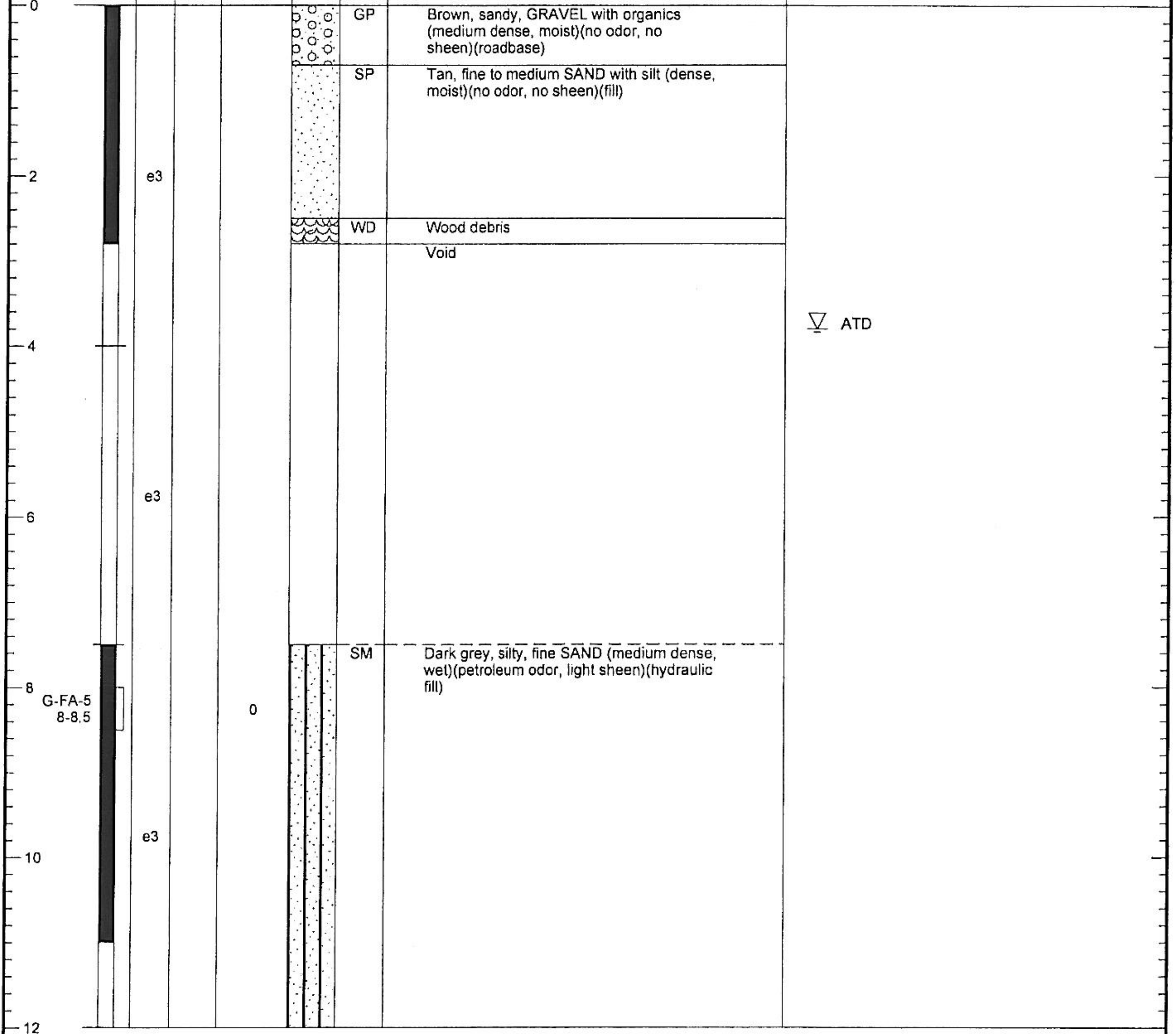
Port of Everett
Everett, Washington

Log of Boring G-FA-4

Figure
1-5

G-FA-5



SAMPLE DATA					SOIL PROFILE		GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Water Level

Drilling Method: Geoprobe™

Ground Elevation (ft):

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	USCS Symbol	Description	Water Level
0					GP	Brown, sandy, GRAVEL with organics (medium dense, moist)(no odor, no sheen)(roadbase)	
					SP	Tan, fine to medium SAND with silt (dense, moist)(no odor, no sheen)(fill)	
2		e3					
					WD	Wood debris	
						Void	
4							∇ ATD
6		e3					
					SM	Dark grey, silty, fine SAND (medium dense, wet)(petroleum odor, light sheen)(hydraulic fill)	
8	G-FA-5 8-8.5			0			
10		e3					
12							

Boring Completed 01/20/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Port of Everett
Everett, Washington

Log of Boring G-FA-5

Figure
1-6

G-FA-6

Drilling Method: Geoprobe™

Ground Elevation (ft): ________

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol		Water Level
0						GP/ SP	Brown, fine to medium SAND and GRAVEL (dense, wet)(no odor, no sheen)(roadbase)	
						SP	Tan, fine to medium SAND with trace concrete residue and trace wood fragments (medium dense, moist)(no odor, no sheen)(fill)	
2		e3						
4								
								ATD
	G-FA-6 5.2-5.5			0		SM	Brown, fine SAND with silt (medium stiff, moist)(light hydrocarbon odor, no sheen)(fill)	
6		e3				SP	Tan, fine to medium SAND with trace concrete residue and trace wood fragments (medium dense, moist)(no odor, no sheen)(fill)	
						SM	Dark grey, fine SAND with silt (medium dense, moist)(petroleum odor, light sheen)(hydraulic fill)	
8								
10		e3						
							Silt content increases to a silty, fine SAND at 11'	
12								

Boring Completed 01/20/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Port of Everett Everett, Washington	Log of Boring G-FA-6	Figure 1-7

G-FA-7

SAMPLE DATA

SOIL PROFILE

Drilling Method: Geoprobe™

Ground Elevation (ft):

GROUNDWATER

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data
2		e3		
5.0-5.5	G-FA-7 5.0-5.5			0
6		e3		
10		e3		

USCS Symbol	Description
GP/SP	Brown, fine to medium SAND and GRAVEL with trace silt (dense, moist)(no odor, no sheen)(roadbase)
SP	Light grey-green, medium SAND (loose, damp)(no odor, no sheen)(fill)
SM	Tan, fine to medium SAND with silt (medium dense, moist)(no odor, no sheen)(hydraulic fill)
WD	Wood debris
SM	Tan, silty, fine SAND (medium dense, wet)(no odor, no sheen)(hydraulic fill)
WD	Wood debris
SM	Tan, silty, fine SAND (medium dense, wet)(no odor, no sheen)(hydraulic fill)

Water Level: ∇ ATD

Boring Completed 01/20/05
Total Depth of Boring = 12.0 ft.

Notes:
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2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

6/16/05 \\EDMDATA\GINT\GINT6\PROJECTS\147023.012.GPJ SOIL BORING LOG

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Port of Everett
Everett, Washington

Log of Boring G-FA-7

Figure
1-8

G-FA-8

Drilling Method: Geoprobe™

Ground Elevation (ft):

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol		Water Level
0						GP/SP	Brown, fine to medium SAND and CRUSHED GRAVEL (dense, moist)(no odor, no sheen)(roadbase)	
						SM	Tan, fine to medium SAND with concrete residue (medium dense, moist)(no odor, no sheen)(fill)	
2		e3					Becomes tan at 2.1'	
4	G-FA-8 4.0-4.5			0				
								∇ ATD
						SM	Brown, silty, fine SAND with intermixed wood fibers (dense, moist)(no odor, no sheen)(hydraulic fill)	
6		e3						
8								
10		e3						
12								

Boring Completed 01/20/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Port of Everett
Everett, Washington

Log of Boring G-FA-8

Figure
1-9

P-10

SAMPLE DATA · SOIL PROFILE · GROUNDWATER

Drilling Method: GeoprobeTM

Ground Elevation (ft): No Reference

Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						AC	Asphalt	
						GP	Brown, sandy, fine to coarse GRAVEL (medium dense, moist) (gravel roadbase)	
2						SP-SM	Green-gray, fine to medium SAND with silt (loose, moist to wet at 5')(no odor) (hydraulic fill)	
	NMP2-PZ-10 -CS-3 @1425	f3		0				
4								▽ ATD
6	NMP2-PZ-10 -CS-6 @1430	f3		12.3				
						SP-SM	Dark-gray to black, fine to medium SAND with silt and 0.5 to 2.5 inch thick layers of wood debris (loose, wet)(no odor) (hydraulic fill) -shell fragments at 7.7 feet	
8								
10								
12								
14								

Boring Completed 02/11/04
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Investigation
Everett, Washington

Log of Boring P-10

Figure
1-10

Area I

I-GC-1

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE		GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	USCS Symbol		Water Level
0	I-GC-1 (0-0.5)				GP/ SW	Brown, fine to medium SAND and crushed GRAVEL (medium dense, dry) (no odor, no sheen) (roadbase)	
					SP	Black, fine to medium SAND (loose, dry) (no odor, no sheen) (fill)	
	I-GC-1 (1-2)			0	SM	Brown, fine to medium SAND with silt (medium dense, moist) (no odor, no sheen) (hydraulic fill)	
2		b3					
	I-GC-1 (2-3)					- Becomes gray at 2.5'	
4							
	I-GC-1 (3-6)			0			
						- Becomes wet at 5.2'	
6		b3					
							∇ ATD
	I-GC-1 (6-9)						
8							
				0			
10		b3				- Wood debris (fibrous) intermittently from 10'-11.5'	
12							

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-1

Figure
1-9

I-GC-10

Drilling Method: Geoprobe™
Ground Elevation (ft): No
Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0	I-GC-10 (0-0.5)			0		GP/ SP	Brown to grayish brown, fine to coarse SAND and GRAVEL (dense, damp) (no odor, no sheen) (roadbase)	
	I-GC-10 (1-2)			0		SM	Dark gray, silty, fine to medium SAND, with coarse sand and trace gravel (medium dense, damp) (no odor, no sheen) (fill)	
2		b3						
	I-GC-10 (2-3)			0				
4						SM	Dark gray, fine to medium SAND, with silt (medium dense, moist) (no odor, no sheen) (fill)	
	I-GC-10 (3-6)							
							- Becomes wet at 6'	
6		b3		0		SP	Dark gray, fine to coarse SAND, with trace silt (loose, wet) (no odor, no sheen) (hydraulic fill)	▽ ATD
	I-GC-10 (6-9)			0		SM	Dark gray, fine to medium SAND, with silt (medium dense, moist) (no odor, no sheen) (fill)	
8								
10		b3						
12								

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
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3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020.140 4/30/10 N:\PROJECTS\147020.090.GPJ // LANDAU 1.0.GLB // SOIL BORING LOG

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Everett, Washington

Log of Boring I-GC-10

Figure
1-10

I-GC-11

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	USCS Symbol	Soil Profile	Water Level
0	I-GC-11 (0-0.5)				SW	Brown, fine to medium SAND, with silt and trace gravel (loose, dry) (no odor, no sheen) (hydraulic fill / fill)	
	I-GC-11 (1-2)			0			
2		b3			SW-SM	Dark gray to gray, fine to medium SAND, with silt (loose, moist) (no odor, no sheen) (hydraulic fill) - Shell fragments from 2.8 to 7.5'	
	I-GC-11 (2-3)						
4							
	I-GC-11 (3-6)			0			
6		b3					
						- Becomes wet at 6.5'	
							∇ ATD
	I-GC-11 (6-9)			0			
8							
10		b3					
12							

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
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2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020.140 4/30/10 N:\PROJECTS\147020.090.GPJ // LANDAU 1.0.GLB // SOIL BORING LOG

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Log of Boring I-GC-11

Figure
1-11

I-GC-12

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Drilled By: Cascade Drilling Inc.	Water Level
0	I-GC-12 (0-0.5)			0		SW	Brown, fine to coarse SAND, with gravel (dense, dry) (no odor, no sheen) (fill / roadbase)	
	I-GC-12 (1-2)			0				
2		b3						
	I-GC-12 (2-3)			0				
						SW-SM	Dark gray, fine to medium SAND, with silt (loose, moist) (no odor, no sheen) (hydraulic fill)	
						SM	Dark gray, silty, fine to medium SAND, with intermittent shell fragments (loose, moist) (no odor, no sheen) (hydraulic fill)	
4								
	I-GC-12 (3-6)							
							- Wood debris from 5 to 7'	
6		b3						
	I-GC-12 (6-9)			0				∇ ATD
8								
10		b3						
							- Becomes wet at 11'	
12								

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020.140 4/30/10 N:\PROJECTS\147020.090.GPJ // LANDAU 1.0.GLB // SOIL BORING LOG

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Everett, Washington

Log of Boring I-GC-12

Figure
1-12

I-GC-13

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Drilled By: Cascade Drilling Inc.	Water Level
0	I-GC-13 (0-0.5)			0		SW	Orangish brown, fine to medium SAND, with trace gravel and coarse sand (medium dense, dry) (no odor, no sheen) (fill / roadbase)	
	I-GC-13 (1-2)			0				
2		b3				ML	Dark gray, SILT, with fine sand (stiff, moist) (no odor, no sheen) (fill)	
	I-GC-13 (2-3)			0				
						SM	Dark gray, silty, fine to medium SAND, with intermittent shell fragments (loose, moist) (no odor, no sheen) (hydraulic fill)	
4								
	I-GC-13 (3-6)							
6		b3					- Becomes wet at 6.2'	
								∇ ATD
	I-GC-13 (6-9)			0				
8								
10		b3						
12								

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring I-GC-13

Figure
1-13

I-GC-14

SAMPLE DATA					SOIL PROFILE		GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Drilled By: Cascade Drilling Inc.	Water Level
0	I-GC-14 (0-0.5)			0	GP/ SP	Brown, fine to coarse SAND and GRAVEL (dense, dry) (no odor, no sheen) (roadbase)	
	I-GC-14 (1-2)			0	SW	Gray, fine to coarse SAND, with gravel (loose, dry) (no odor, no sheen) (fill)	
2		b3					
	I-GC-14 (2-3)			0			
					SM	Dark gray, silty, fine to medium SAND (medium dense, moist) (no odor, no sheen) (hydraulic fill)	
4							
6		b3		0		- Becomes wet at 6.5'	
							∇ ATD
8							
10		b3					
12							

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020.140 4/30/10 N:\PROJECTS\147020.090.GPJ // LANDAU 1.0.GLB // SOIL BORING LOG

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Everett, Washington

Log of Boring I-GC-14

Figure
1-14

I-GC-15

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Hand Implements Ground Elevation (ft): No Drilled By: Landau Associates	
0	I-GC-15 (0-0.5)					SW	Tan, fine to coarse SAND and GRAVEL (medium dense, dry) (no odor, no sheen) (roadbase)	Groundwater not encountered.
						SM	Tan, fine to medium SAND with silt (loose, damp) (no odor, no sheen) (hydraulic fill)	
	I-GC-15 (1-2)			0		SM	Dark brown, fine to medium SAND with silt and wood debris (medium dense, damp) (no odor, no sheen) (fill) -Becomes dark gray below 1.8'	
2	I-GC-15 (2-3)			0				

Boring Completed 08/22/05
Total Depth of Boring = 3.0 ft.

4

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Port of Everett, Data Gaps
Investigation
Everett, Washington

Log of Boring I-GC-15

Figure
1-39

I-GC-16

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Hand Implements Ground Elevation (ft): No Drilled By: Landau Associates	
0	I-GC-16 (0-0.5)					GP/ SP	Light brown, fine to coarse SAND and crushed GRAVEL (medium dense, dry) (slight petroleum hydrocarbon odor, no sheen) (roadbase)	Groundwater not encountered.
	I-GC-16 (1-2)			0		SM/ ML	Tan, silty, fine to medium SAND with shell fragments (loose, damp) (no odor, no sheen) (hydraulic fill)	
2	I-GC-16 (2-3)			0			- Becomes gray at 2'	

Boring Completed 08/22/05
Total Depth of Boring = 3.0 ft.

4

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020.150 4/30/10 N:\PROJECTS\147020.090.GPJ // LANDAU 1.0.GLB // SOIL BORING LOG

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Everett, Washington

Log of Boring I-GC-16

Figure
1-40

I-GC-17

Drilling Method: Hand Implements

Ground Elevation (ft): No

Drilled By: Landau Associates

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0	I-GC-17 (0-0.5)					GP/ SW	Light brown, fine to coarse SAND and GRAVEL (dense, dry) (no odor, no sheen) (roadbase)	Groundwater not encountered.
	I-GC-17 (1-2)			0		SM/ ML	Tan, silty, fine to medium SAND (loose, damp) (no odor, no sheen) (hydraulic fill) - Becomes gray at 1.5'	
2	I-GC-17 (2-3)			0			- Shell fragments in trace amounts at 2.5'	

Boring Completed 08/22/05
Total Depth of Boring = 3.0 ft.

4

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-17

Figure
1-41

I-GC-18

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Hand Implements Ground Elevation (ft): No Drilled By: Landau Associates	
0	I-GC-18 (0-0.5)					GP/ SW	Tan, crushed GRAVEL and fine to medium SAND with coarse sand (dense, dry) (no odor, no sheen) (roadbase)	Groundwater not encountered.
						SM/ ML	Tan, fine to medium SAND with silt (loose, moist/damp) (no odor, no sheen) (hydraulic fill)	
	I-GC-18 (1-2)			0				
2								
	I-GC-18 (2-3)			0				

Boring Completed 08/22/05
Total Depth of Boring = 3.0 ft.

4

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

I-GC-19

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	USCS Symbol	Drilling Method: Hand Implements Ground Elevation (ft): No Drilled By: Landau Associates	
0	I-GC-19 (0-0.5)				GP/ SW	Tan, fine to medium SAND and crushed GRAVEL (dense, damp) (no odor, no sheen) (roadbase)	Groundwater not encountered.
				0		- Wood debris from 1.1'-2.4'	
	I-GC-19 (1-2)				SM	Tan, fine to medium SAND with silt (loose, moist) (no odor, no sheen) (hydraulic fill)	
2	I-GC-19 (2-3)			0	SM/ ML	Dark gray, silty, fine to medium SAND (loose, moist) (no odor, no sheen) (hydraulic fill)	

Boring Completed 08/22/05
Total Depth of Boring = 3.0 ft.

4

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-19

Figure
1-43

I-GC-1a

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0	I-GC-1a (0-0.5)					SM	Brown, silty, fine SAND with abundant wood debris (loose, moist) (no odor, no sheen) (fill)	Groundwater not encountered.
	I-GC-1a (1-2)					SM	Gray, silty, fine to medium SAND with trace shell fragments (loose, moist) (no odor, no sheen) (hydraulic fill)	
2		b3						
	I-GC-1a (2-3)							
	I-GC-1a (3-4)					SP	Dark gray to black, fine to medium SAND with wood debris (black, no odor) and silt and trace brick fragments (loose, moist) (no odor, no sheen) (hydraulic fill)	
4								
6								
8								
10								
12								

Boring Completed 10/18/05
Total Depth of Boring = 4.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-1a

Figure
1-48

I-GC-1b

Drilling Method: Geoprobe™
Ground Elevation (ft):
Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0	I-GC-1b (0-0.5)					GP/ SP	Brown, GRAVEL and fine to coarse SAND (loose, moist) (no odor, no sheen) (roadbase)	Groundwater not encountered.
						SM	Tan, silty, fine to medium SAND (loose, moist) (no odor, no sheen) (hydraulic fill)	
	I-GC-1b (1-2)							
2		b3						
	I-GC-1b (2-3)							
						SM	Dark gray, silty, fine SAND (medium dense, moist) (no odor, no sheen) (hydraulic fill)	
	I-GC-1b (3-4)					SM	Tan, silty, fine to medium SAND (loose, moist) (no odor, no sheen) (hydraulic fill)	
4								
6								
8								
10								
12								

Boring Completed 10/18/05
Total Depth of Boring = 4.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-1b

Figure
1-49

I-GC-1c

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Description	Groundwater
0	I-GC-1c (0-0.5)					GP/SP	Brown, gravel and fine to medium SAND (loose, moist) (no odor, no sheen) (roadbase)	Groundwater not encountered.
						SM	Dark gray to black, fine to medium SAND with silt and trace coarse sand (loose, moist) (no odor, no sheen) (fill)	
	I-GC-1c (1-2)					SM	Tan, silty, fine SAND (loose, moist) (no odor, no sheen) (hydraulic fill)	
2	I-GC-1c (2-3)	b3				SM	Tan, fine to medium SAND with silt (loose, moist) (no odor, no sheen) (hydraulic fill)	
	I-GC-1c (3-4)					SM	Dark gray, silty, fine SAND with trace wood debris (loose to medium dense, moist) (no odor, no sheen) (hydraulic fill)	
4								
6								
8								
10								
12								

Boring Completed 10/18/05
Total Depth of Boring = 4.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-1c

Figure
1-50

I-GC-2

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Drilled By: Cascade Drilling Inc.	Water Level
0	I-GC-2 (0-0.5)					SW	Tan, fine to medium SAND with silt and gravel (loose, dry) (no odor, no sheen) (roadbase/fill)	
	I-GC-2 (1-2)			0		SM	Brown, fine to medium SAND with silt (loose, moist) (no odor, no sheen) (hydraulic fill)	
2		b3						
	I-GC-2 (2-3)					ML	Gray, fine sandy, SILT (stiff, moist) (no odor, no sheen) (hydraulic fill) - Becomes gray at 2.2'	
						SM	Brown, fine to medium SAND with silt (loose, moist) (no odor, no sheen) (hydraulic fill)	
4								
	I-GC-2 (3-6)			0				
							- Becomes wet at 5.2'	
6		b3						
								▽ ATD
	I-GC-2 (6-9)							
8								
				0				
10		b3						
12								

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-2

Figure
1-15

I-GC-20

Drilling Method: Hand Implements

Ground Elevation (ft): No

Drilled By: Landau Associates

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0	I-GC-20 (0-0.5)					GP/ SW	Tan to light gray, fine to medium SAND and crushed GRAVEL (loose, dry) (no odor, no sheen) (roadbase)	Groundwater not encountered.
	I-GC-20 (1-2)			0		SM/ ML	Dark gray with orange mottles, silty, fine SAND (very dense, damp) (no odor, no sheen) (hydraulic fill)	
2	I-GC-20 (2-3)			0		SM	Dark gray, fine to medium SAND with silt (medium dense, damp) (no odor, no sheen) (hydraulic fill)	

Boring Completed 08/22/05
Total Depth of Boring = 3.0 ft.

4

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-20

Figure
1-44

I-GC-21

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Hand Implements Ground Elevation (ft): No Drilled By: Landau Associates	
0	I-GC-21 (0-0.5)					GP/ SW	Light brown, fine to medium SAND and crushed GRAVEL (very dense, dry) (no odor, no sheen) (roadbase)	Groundwater not encountered.
				0				
	I-GC-21 (1-2)							
2								
	I-GC-21 (2-3)			0				

Boring Completed 08/22/05
Total Depth of Boring = 3.0 ft.

4

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

I-GC-22

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Hand Implements Ground Elevation (ft): No Drilled By: Landau Associates	
0	I-GC-22 (0-0.5)					SM/ ML	Gray, silty, fine SAND (very loose, dry) (no odor, no sheen) (hydraulic fill)	Groundwater not encountered.
	I-GC-22 (1-2)			0				
2	I-GC-22 (2-3)			0		SM/ ML	Brown, silty, fine SAND with wood debris (loose, moist) (no odor, no sheen) (hydraulic fill to fill)	

Boring Completed 08/22/05
Total Depth of Boring = 3.0 ft.

4

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-22

Figure
1-46

I-GC-23

Drilling Method: Hand Implements

Ground Elevation (ft): No

Drilled By: Landau Associates

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0	I-GC-23 (0-0.5)					SM/ML	Light gray, silty, fine SAND (very loose, dry) (no odor, no sheen) (hydraulic fill)	Groundwater not encountered.
				0				
	I-GC-23 (1-2)						- Wood debris and roots throughout. Wood debris size up to 2"x4.5"	
2	I-GC-23 (2-3)			0				

Boring Completed 08/22/05
Total Depth of Boring = 3.0 ft.

4

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-23

Figure
1-47

I-GC-24

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0	I-GC-24 (0-0.5)			0		SM	Brown, fine to medium SAND with silt (very loose, moist) (no odor, no sheen) (fill)	Groundwater not encountered.
						ML	Discolored (green, pink, red, orange, gray, white), SILT with clay and trace gravel (stiff, moist) (strong unidentifiable odor, no sheen) (fill)	
2		b3						
	I-GC-24 (1.2-6.0)							
4								
6		b3				SM	Black to dark gray, fine to medium SAND with silt (loose, moist) (no odor, no sheen) (hydraulic fill)	
	I-GC-24 (6.5-7.5)			0				
	I-GC-24 (7.5-8.0)							
8								
10								
12								

Boring Completed 10/18/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-24

Figure
1-51

I-GC-25

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Geoprobe™
Ground Elevation (ft):
Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		GROUNDWATER
0						SM	Tan, silty, fine to medium SAND (loose, dry) (no odor, no sheen) (hydraulic fill)	Groundwater not encountered.
	I-GC-25 (0.5-1.0)			0				
2	I-GC-25 (1.5-2.5)	b3					- Shell fragments from 2-4' - Becomes gray at 2.1'	
	I-GC-25 (2.5-3.5)			0				
4								

Boring Completed 10/18/05
Total Depth of Boring = 4.0 ft.

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Log of Boring I-GC-25

Figure
1-52

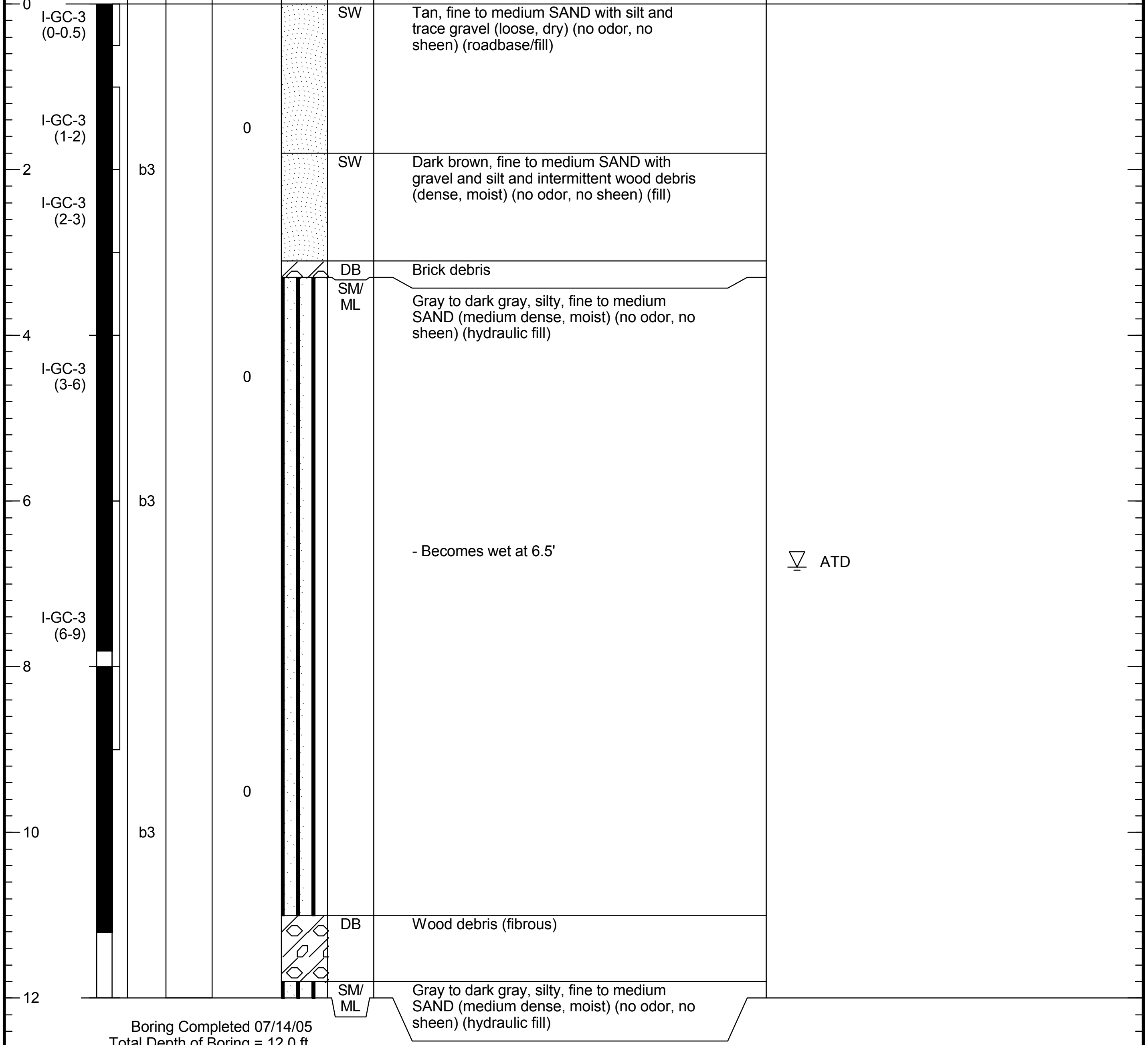
I-GC-3

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Water Level

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.



Sample Number & Interval	Sampler Type	PID (ppm) or moisture content (W)
I-GC-3 (0-0.5)		
I-GC-3 (1-2)		0
	b3	
I-GC-3 (2-3)		
I-GC-3 (3-6)		0
	b3	
I-GC-3 (6-9)		
		0
	b3	

USCS Symbol	Description
SW	Tan, fine to medium SAND with silt and trace gravel (loose, dry) (no odor, no sheen) (roadbase/fill)
SW	Dark brown, fine to medium SAND with gravel and silt and intermittent wood debris (dense, moist) (no odor, no sheen) (fill)
DB	Brick debris
SM/ ML	Gray to dark gray, silty, fine to medium SAND (medium dense, moist) (no odor, no sheen) (hydraulic fill) - Becomes wet at 6.5'
DB	Wood debris (fibrous)
SM/ ML	Gray to dark gray, silty, fine to medium SAND (medium dense, moist) (no odor, no sheen) (hydraulic fill)

∇ ATD

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-3

Figure
1-16

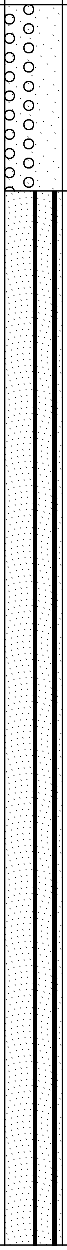
I-GC-4

SAMPLE DATA / SOIL PROFILE / GROUNDWATER

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.



Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	USCS Symbol	Description	Water Level
0	I-GC-4 (0-0.5)				GP/ SP	Brown, fine to coarse SAND and GRAVEL (medium dense, dry) (no odor, no sheen) (roadbase)	
	I-GC-4 (1-2)			0			
2	I-GC-4 (2-3)	b3			SW- SM	Brown, fine to medium SAND, with silt and shell fragments (loose, damp) (no odor, no sheen) (hydraulic fill)	
4	I-GC-4 (3-6)			0		- Becomes gray	
6		b3					
	I-GC-4 (6-9)			0		- Becomes wet at 7.5'	∇ ATD
8							
10		b3					
12							

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-4

Figure 1-17

I-GC-5

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						GP/SW	Brown, fine to coarse SAND and GRAVEL (medium dense, dry) (no odor, no sheen) (roadbase)	
						SM/ML	Discolored (pink, green, orange), fine sandy, SILT, with surrounded gravel (dense, moist) (hydrocarbon odor, no sheen) (fill)	
				0.8				
2		b3						
				1.5		SW	Gray, fine to medium SAND with trace silt (loose, dry) (no odor, no sheen) (hydraulic fill)	
	I-GC-5 (3-3.5)							
						SM/ML	Dark gray, silty, fine to medium SAND (medium dense, moist) (no odor, no sheen) (hydraulic fill)	
4	I-GC-5 (4-5)							
	I-GC-5 (5-6)			0				
6		b3						
								∇ ATD
	I-GC-5 (6-9)							
8								
10		b3						
	I-GC-5 (9-12)			0				
12								

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-5

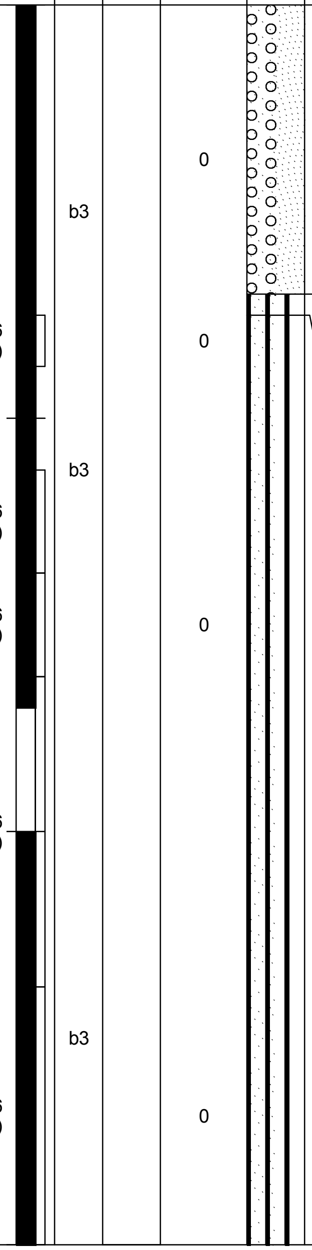
Figure
1-18

I-GC-6

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.



SAMPLE DATA					SOIL PROFILE		GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	USCS Symbol		Water Level
0					GP/SW	Brown, fine to coarse SAND and GRAVEL (dense, moist) (no odor, no sheen) (roadbase)	
				0			
2		b3					
					SM/ML	Discolored (pink, green, orange), fine to medium sandy, SILT (dense, moist) (hydrocarbon odor, no sheen) (fill)	
	I-GC-6 (3.5-4)			0	SM/ML	Dark gray, silty, fine to medium SAND (medium dense, moist) (no odor, no sheen) (hydraulic fill)	
4							
		b3					
	I-GC-6 (4.5-5.5)						
6	I-GC-6 (5.5-6.5)			0		-Becomes wet at 5.8'	∇ ATD
8	I-GC-6 (6.5-9.5)						
10		b3					
	I-GC-6 (9.5-12)			0			
12							

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Investigation
Everett, Washington

Log of Boring I-GC-6

Figure
1-19

I-GC-7

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Geoprobe™
Ground Elevation (ft): No
Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Description	Water Level
0	I-GC-7 (0-0.5)					SW	Brown, fine to coarse SAND, with gravel (medium dense, dry) (no odor, no sheen) (fill / roadbase)	
	I-GC-7 (1-2)			0				
2		b3						
	I-GC-7 (2-3)							
						SW-SM	Gray, fine to medium SAND, with trace silt (loose, moist) (no odor, no sheen) (hydraulic fill)	
						SM	Dark gray, fine to medium SAND, with silt (loose, moist) (no odor, no sheen) (hydraulic fill)	
4								
	I-GC-7 (3-6)			0				
							- Intermittent wood debris from 5 to 8'	
6		b3						
								▽ ATD
	I-GC-7 (6-9)			0				
8								
10		b3					- Becomes wet at 10'	
12								

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-7

Figure
1-20

I-GC-8

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Drilled By: Cascade Drilling Inc.	Water Level
0						SW	Orangish brown, fine to coarse SAND and gravel (medium dense, dry) (no odor, no sheen) (fill / roadbase)	
				0				
2		b3				ML	Discolored (yellow, green, and orange), fine sandy, SILT, with gravel (stiff, moist) (strong petroleum hydrocarbon odor, no sheen) (fill)	
						SM	Dark gray, fine to medium SAND, with silt (loose, moist) (no odor, no sheen) (hydraulic fill)	
	I-GC-8 (3.5-4)			0				
4								
	I-GC-8 (4.5-5.5)							
6	I-GC-8 (5.5-6.5)	b3		0				
							- Becomes wet at 7.0'	∇ ATD
8	I-GC-8 (6.5-9.5)							
10		b3						
	I-GC-8 (9.5-12)			0				
12								

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-8

Figure
1-21

I-GC-9

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						SW	Orangish brown, fine to medium SAND and gravel (medium dense, dry) (no odor, no sheen) (fill / roadbase)	
				0				
2		b3				ML	Dark gray, fine to medium sandy, SILT (stiff, damp) (no odor, no sheen) (fill)	
						ML	Discolored (yellow, green, and orange), fine sandy, SILT, with gravel (stiff, moist) (strong petroleum hydrocarbon odor, no sheen) (fill)	
						SM	Dark gray, fine to medium SAND, with silt (loose, moist) (no odor, no sheen) (hydraulic fill) - Wood debris in trace amounts from 3.0 to 7.5'	
	I-GC-9 (3.5-4)			0				
4								
	I-GC-9 (4.5-5.5)							
6	I-GC-9 (5.5-6.5)	b3		0				
							- Becomes wet at 6.5'	∇ ATD
8	I-GC-9 (6.5-9.5)							
10		b3						
	I-GC-9 (9.5-12)			0				
12								

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring I-GC-9

Figure
1-22

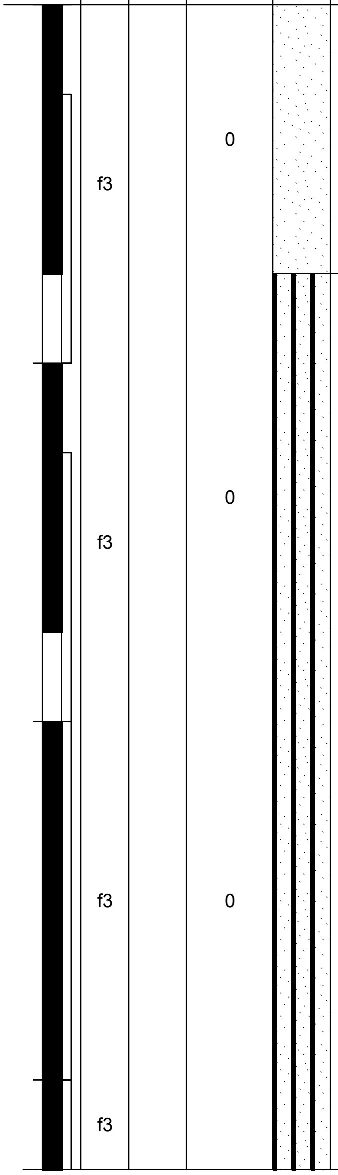
P-11

SAMPLE DATA | SOIL PROFILE | GROUNDWATER

Drilling Method: GeoprobeTM

Ground Elevation (ft): No Reference

Drilled By: Cascade Drilling Inc.



Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						SP	Brown, sandy, fine to coarse GRAVEL (medium dense, moist) (gravel roadbase)	
				0				
2		f3						
						SM	Green-gray, silty, fine to medium SAND; scattered fine wood fragments (loose, slightly moist)(no odor) (hydraulic fill)	
4								
				0				∇ ATD
6		f3					-becomes wet at 6 feet	
8								
10		f3		0				
12								
		f3						
14								

Boring Completed 02/11/04
Total Depth of Boring = 13.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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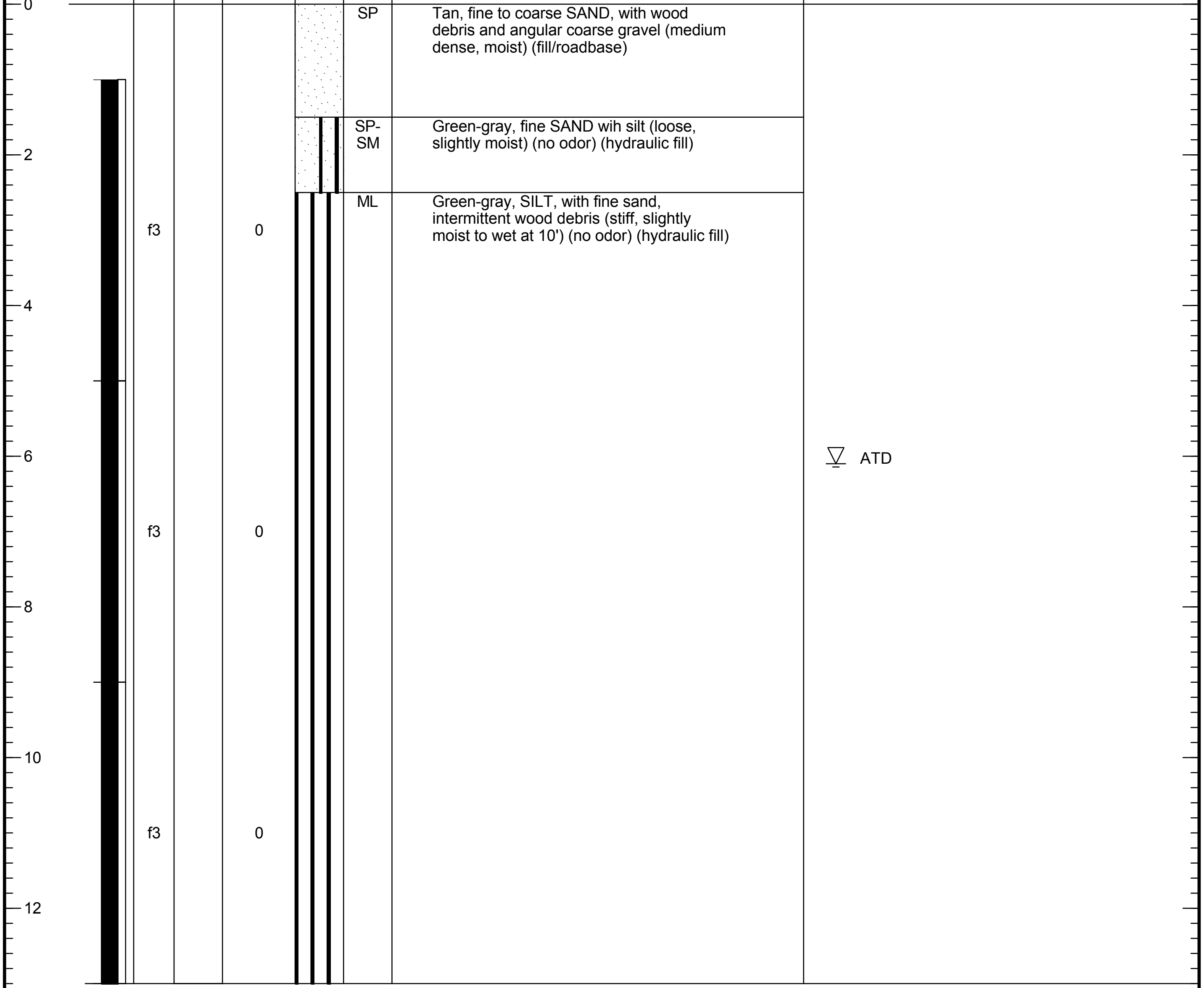
Everett, Washington

Log of Boring P-11

Figure
1-11

P-12

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: GeoprobeTM Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level



Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)
f3		0
f3		0
f3		0

USCS Symbol	Description
SP	Tan, fine to coarse SAND, with wood debris and angular coarse gravel (medium dense, moist) (fill/roadbase)
SP-SM	Green-gray, fine SAND wih silt (loose, slightly moist) (no odor) (hydraulic fill)
ML	Green-gray, SILT, with fine sand, intermittent wood debris (stiff, slightly moist to wet at 10') (no odor) (hydraulic fill)

▽ ATD

Boring Completed 02/11/04
Total Depth of Boring = 13.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring P-12

Figure
1-12

Area J

J-1

SAMPLE DATA					SOIL PROFILE		GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	USCS Symbol	Drilling Method: GeoprobeTM Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level
0					GP	Brown, sandy, fine to coarse GRAVEL (medium dense, moist) (gravel roadbase)	
					WD	Wood debris; wood chips	
2		f3		0	GP	Tan, sandy, fine to coarse GRAVEL (medium dense, moist) (no odor) (gravel roadbase)	
					SP-SM	Green-gray, fine to medium SAND with silt and shell fragments (loose, moist to wet) (no odor)(hydraulic fill)	∇ ATD
4							
6		f3		0	SP-SM	Gray to dark gray, fine to medium SAND with silt (loose, wet) (no odor) (hydraulic fill)	
	NMP2-J-1 -GW @0815						
8							
10							
12							
14							

Boring Completed 02/12/04
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-1

Figure
1-189

J-2

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: GeoprobeTM Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level
0						AC	Asphalt	
						GP	Brown, sandy, fine to coarse GRAVEL (medium dense, moist) (gravel roadbase)	
2		f3		0		SP	Tan, fine to coarse SAND, with shell fragments (loose, moist to wet at 4') (no odor) (hydraulic fill)	
								∇ ATD
4								
6		f3		0				
	NMP2-J-2 -GW @0740					SP- SM	Gray to dark gray, fine to medium SAND with silt (loose, wet) (no odor) (hydraulic fill)	
8								

Boring Completed 02/12/04
Total Depth of Boring = 8.0 ft.

10

12

14

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-2

Figure
1-190

J-FA-1

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
							Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						GP	Brown with dark gray mottles, fine to coarse sandy, CRUSHED GRAVEL (dense, moist)(no odor, no sheen)(road base)	
	J-FA-1 0-2			0				
2		e3				SM	Tan, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
	J-FA-1 2-4							
4								
	J-FA-1 4-5			0				
								∇ ATD
6		e3						
	J-FA-1 5-8							
8								
	J-FA-1 8-10			0				
10		e3					Becomes dark grey at 10' Silt content increases to a silty, fine to medium SAND at 10'	
	J-FA-1 10-12							
	J-FA-1 (GW)							
12								

Boring Completed 01/17/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-FA-1

Figure
1-191

J-FA-2

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Description	Water Level
0						GP/ SP	Dark grey, medium to coarse SAND and CRUSHED GRAVEL (dense, moist)(no odor, no sheen)(roadbase)	
	J-FA-2 0-2			0				
						SM	Grey, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
2		e3						
	J-FA-2 2-4			0				
4								
	J-FA-2 4-5			0				
								∇ ATD
							Becomes wet at 5'	
6		e3						
	J-FA-2 5-8			0				
8								
	J-FA-2 8-10							
10		e3					Shell fragments from 10-12'	
	J-FA-2 10-12							
12								

Boring Completed 01/17/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-FA-2

Figure
1-192

J-GC-1

Drilling Method: Geoprobe™
Ground Elevation (ft):
Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0						AC	Asphalt	
	J-GC-1 0.5-1			0		GP/ SP	Brown, medium to course SAND and CRUSHED GRAVEL (dense, damp)(no odor, no sheen)(roadbase)	Groundwater not encountered.
2	J-GC-1 1.5-2.5	b3				SM	Tan, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
	J-GC-1 2.5-3.5			0				
4								

Boring Completed 01/14/05
Total Depth of Boring = 4.0 ft.

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-GC-1

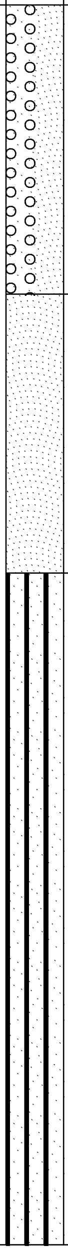
Figure
1-193

J-GC-10

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.



SAMPLE DATA					SOIL PROFILE		GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	USCS Symbol		Water Level
0	J-GC-10 (0-0.5)				GP/ SW	Brown, fine to coarse SAND and GRAVEL (dense, damp/dry) (no odor, no sheen) (roadbase)	
	J-GC-10 (1-2)			0			
2		b3					
	J-GC-10 (2-3)						
					SW	Dark gray, silty, fine SAND (medium dense, moist) (no odor, no sheen) (hydraulic fill)	
4							
	J-GC-10 (3-6)			0			
						- Shell fragments from 5.5'-10.2'	
					SM	Dark gray, fine to coarse SAND with silt (loose, wet) (no odor, no sheen) (hydraulic fill)	
6		b3					
							∇ ATD
	J-GC-10 (6-9)						
8							
				0			
10		b3					
12							

Boring Completed 07/14/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-GC-10

Figure
1-23

J-GC-1b

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0						AC	Asphalt	Groundwater not encountered.
						GP/SW	Brown, fine to medium SAND and GRAVEL (medium dense, moist/damp) (no odor, no sheen) (roadbase)	
	J-GC-1b (0.9-1.4)			0		SW	Tan to light gray, fine SAND with silt and medium to coarse sand (loose, dry) (no odor, no sheen) (hydraulic fill)	
				0				
2	J-GC-1b (1.9-2.9)	b3						
	J-GC-1b (2.9-3.9)						- Becomes light gray at 2.9' - Shell fragments from 3'-4'	
4								
6								
8								
10								
12								

Boring Completed 07/14/05
Total Depth of Boring = 4.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-GC-1b

Figure 1-24

J-GC-1c

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Drilled By: Cascade Drilling Inc.	
0						AC	Asphalt	Groundwater not encountered.
						GP/ SW	Brown, fine to medium SAND and GRAVEL (medium dense, dry/damp) (no odor, no sheen) (roadbase)	
	J-GC-1c (0.7-1.2)			0		SW	Tan to light gray, medium SAND with silt and fine to medium sand (loose, moist) (no odor, no sheen) (hydraulic fill)	
				0				
2	J-GC-1c (1.7-2.7)	b3					- Becomes light gray at 2.4'	
	J-GC-1c (2.7-3.7)							
4								

Boring Completed 07/14/05
Total Depth of Boring = 4.0 ft.

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-GC-1c

Figure
1-25

J-GC-3

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: ESN

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0	J-GC-3 0-0.5			0		SW	Brown, fine to very coarse SAND with gravel (medium dense, moist)(no odor, no sheen)(fill)	
	J-GC-3 1-2							
2		e3						
	J-GC-3 2-3			0		SM	Dark grey, silty, fine SAND (dense, moist)(no odor, no sheen)(hydraulic fill)	
4	J-GC-3 3-5							
						SP	Dark grey, fine to medium SAND with silt (loose to medium dense, moist)(no odor, no sheen)(hydraulic fill)	
6	J-GC-3 5-7	e3						▽ ATD
							- Becomes wet at 6.5'	
	J-GC-3 7-8					WD	Wood debris (~2" diameter chips)	
8								
10								
12								

Boring Completed 03/02/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

J-GC-4

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: ESN

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						AC	Asphalt	
						GP/SP	Brown, fine to medium SAND and GRAVEL (medium dense, moist)(no odor, no sheen)(roadbase)	
	J-GC-4 1.5-2			0		SM	Grey, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
2		e3						
	J-GC-4 2.5-3.5							
4	J-GC-4 3.5-4.5			0				
	J-GC-4 4.5-6.5						- Becomes wet at 5.2'	▽ ATD
6		e3						
	J-GC-4 6.5-8			0			- Shell fragments from 7.1-7.4	
8								

Boring Completed 03/03/05
Total Depth of Boring = 8.0 ft.

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-GC-4

J-GC-4b

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Drilled By: Cascade Drilling Inc.	
0	J-GC-4b (0-0.5)					GP/SW	Brown to very dark brown, fine to coarse SAND and GRAVEL (medium dense, moist) (slight hydrocarbon odor, no sheen) (roadbase)	Groundwater not encountered.
				0		SM	Greenish gray, fine to medium SAND with silt (loose, dry/damp) (no odor, no sheen) (hydraulic fill)	
	J-GC-4b (1-2)			0				
2	J-GC-4b (2-3)	b3						
4								

Boring Completed 07/14/05
Total Depth of Boring = 4.0 ft.

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-GC-4b

Figure
1-26

J-GC-4c

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0	J-GC-4c (0-0.5)					GP/SW	Brown, fine to coarse SAND and GRAVEL (dense, dry/damp) (no odor, no sheen) (roadbase)	Groundwater not encountered.
	J-GC-4c (1-2)			0				
2	J-GC-4c (2-3)	b3						
				0		SW	Gray, fine to medium SAND with silt and trace coarse sand (medium dense, moist) (no odor, no sheen) (hydraulic fill)	
4								

Boring Completed 07/14/05
Total Depth of Boring = 4.0 ft.

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Port of Everett, Data Gaps Investigation Everett, Washington	Log of Boring J-GC-4c	Figure 1-27

J-GC-6

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						AC	Asphalt	
						GP/ SP	Brown, fine to coarse SAND and GRAVEL (medium dense, damp) (no odor, no sheen) (roadbase)	
	J-GC-6 (1.1-1.6)							
				0 0		SW	Brown, fine to coarse SAND, with gravel (medium dense, moist) (no odor, no sheen) (fill)	
2	J-GC-6 (2.1-3.1) J-GC-6 (2.0-2.7)	b3		0		SM	Black, silty, fine SAND, with wood debris (medium dense, moist) (no odor, no sheen) (fill)	
						AC	Yellow, concrete building material	
	J-GC-6 (3.1-4.1)			0		SM	Brown, medium to coarse SAND, with crushed gravel (dense, moist) (no odor, no sheen) (fill)	
4								
	J-GC-6 (4.1-7.1)							
				0		AC	Yellow, concrete building material - Becomes wet at 5.7'	
6		b3						∇ ATD
						GP/ SP	Yellowish gray, fine to coarse SAND and GRAVEL (medium dense, wet) (no odor, no sheen) (fill)	
8	J-GC-6 (7.1-10.1)							
				0				
10		b3						
						AC	Yellow, concrete building material	
						GP/ SP	Yellowish gray, fine to coarse SAND and GRAVEL (medium dense, wet) (no odor, no sheen) (fill)	
12								

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-GC-6

Figure
1-28
(1 of 2)

J-GC-6

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Drilled By: Cascade Drilling Inc.	Water Level
						GP/ SP	Yellowish gray, fine to coarse SAND and GRAVEL (medium dense, wet) (no odor, no sheen) (fill)	
14		b3						
16								
						WD	Black wood debris	
18		b3						
20							No recovery; material was too wet to retain	
22		b3						
24								
26								

Boring Completed 07/15/05
Total Depth of Boring = 24.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Log of Boring J-GC-6

Figure 1-28
(2 of 2)

J-GC-6b

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	SOIL PROFILE	GROUNDWATER
0						AC	Asphalt	Groundwater not encountered.
						GP/SP	Brown, fine to coarse SAND and GRAVEL (medium dense, damp) (no odor, no sheen) (roadbase)	
				0		SW	Gray, fine to coarse SAND, with gravel (medium dense, moist) (no odor, no sheen) (fill)	
2		b3				SM	Black, silty, fine SAND, with wood debris (medium dense, moist) (no odor, no sheen) (fill)	
						SW	Yellow and gray mottles, concrete building material in a coarse SAND matrix (dense, moist) (no odor, no sheen) (fill)	
				0				
4								
6		b3						
8								
10								
12								

Boring Completed 07/15/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Log of Boring J-GC-6b

Figure
1-29

J-GC-6c

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Drilled By: Cascade Drilling Inc.	
0								Groundwater not encountered.
2								
4								
6								
8								
10								
12								

Boring Completed 07/15/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Log of Boring J-GC-6c

Figure
1-30

J-GC-6d

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Description	Groundwater
0						AC	Asphalt	Groundwater not encountered.
						GP/SP	Brown, fine to coarse SAND and GRAVEL (medium dense, damp) (no odor, no sheen) (roadbase)	
						SW	Gray, fine to medium SAND, with silt (loose, moist) (no odor, no sheen) (fill)	
				0				
2		b3						
4								
6		b3						
8								
10								
12								

Boring Completed 07/15/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-GC-6d

Figure 1-31

J-GC-6e

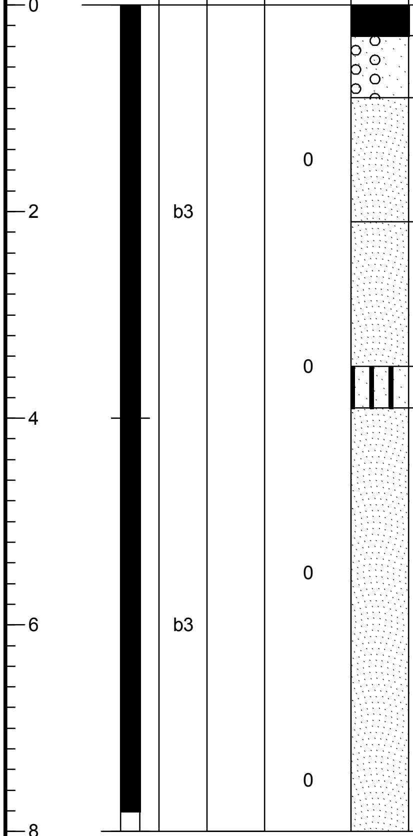
SAMPLE DATA	SOIL PROFILE	GROUNDWATER

Depth (ft) | Sample Number & Interval | Sampler Type | Blows/Foot | PID (ppm) or moisture content (W) | Graphic Symbol | USCS Symbol

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.



USCS Symbol	Description
AC	Asphalt
GP/ SP	Brown, medium to coarse SAND and GRAVEL (medium dense, damp) (no odor, no sheen) (roadbase)
SW	Brownish gray, medium to coarse SAND, with gravel (medium dense, damp) (no odor, no sheen) (fill)
SW	Yellow and gray mottles, concrete building material in a medium to coarse SAND matrix (dense, moist) (no odor, no sheen) (fill)
SM	Black, silty, medium to coarse SAND, with wood debris (loose, moist) (no odor, no sheen) (fill)
SW	Yellow and gray mottles, concrete building material in a medium to coarse SAND matrix (dense, moist) (no odor, no sheen) (fill)

Groundwater not encountered.

Boring Completed 07/15/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Investigation
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Log of Boring J-GC-6e

Figure
1-32

J-GC-7

Drilling Method: Geoprobe™
Ground Elevation (ft): No
Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE		GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	USCS Symbol		Water Level
0					AC	Asphalt	
					GP/ SP	Brown, fine to coarse SAND and GRAVEL (medium dense, damp) (no odor, no sheen) (roadbase)	
	J-GC-7 (0.7-1.2)			0	SW	Brown, fine to coarse SAND, with gravel (medium dense, moist) (no odor, no sheen) (fill)	
				0			
2	J-GC-7 (1.7-2.7)	b3			SM	Tan, fine to medium SAND, with silt (loose, moist) (no odor, no sheen) (hydraulic fill)	
	J-GC-7 (2.7-3.7)						
4							
	J-GC-7 (3.7-6.7)			0			
						- Becomes wet at 5.7'	ATD
6		b3				- Becomes gray at 6.2'	
8	J-GC-7 (6.7-9.7)					- Shell fragments from 8-10'	
10		b3					
					WD	Wood debris from 11.6-11.8'	
12					SM	Gray, fine to medium SAND, with silt (loose, wet) (no odor, no sheen) (hydraulic fill)	

Boring Completed 07/15/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-GC-7

Figure 1-33

J-GC-8

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0						AC	Asphalt	Groundwater not encountered.
				0		GP/ SP	Brown to gray, medium to coarse sandy, crushed Gravel, (medium dense, damp) (no odor, no sheen) (roadbase)	
2	J-GC-8 (2.1-2.6)	b3				SM	Gray to dark gray, silty, fine to medium SAND (medium dense, moist) (no odor, no sheen) (hydraulic fill)	
	J-GC-8 (3.1-4.1)			0				
4	J-GC-8 (4.1-5.1)							
						SM/ ML	Gray, silty, fine SAND, (dense, wet) (no odor, no sheen) (hydraulic fill) - Becomes wet at 6.0'	
6		b3						
	J-GC-8 (5.1-8.1)			0		SM	Gray to dark gray, silty, fine to medium SAND (medium dense, moist) (no odor, no sheen) (hydraulic fill)	
8							- Shell fragments from 8-10'	
10	J-GC-8 (8.1-11.1)	b3						
12								

Boring Completed 07/15/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring J-GC-8

Figure 1-34

J-GC-9

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						AC	Asphalt	
						GP/ SP	Brown to gray, medium to coarse sandy, crushed Gravel, (medium dense, damp) (no odor, no sheen) (roadbase)	
						SM	Gray, medium to coarse sandy, crushed Gravel (medium dense, moist) (no odor, no sheen) (fill)	
2						SM/ ML	Dark gray, fine to coarse SAND, with crushed gravel (dense, wet) (no odor, no sheen) (fill)	
						SM	Gray, fine to medium SAND, with silt (medium dense to loose, moist) (no odor, no sheen) (hydraulic fill)	
4								
6							- Becomes wet at 6.0'	▽ ATD
8							- Shell fragments from 8-10'	
10								
12								

Boring Completed 07/15/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Log of Boring J-GC-9

Area M

M-1

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe^{TM} Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0					■	AC	Asphalt	
	M-1 0.3-0.8			0		SP	Brown, gravelly, medium to coarse SAND (medium dense, moist)(no odor, no sheen)(fill) Gravel decreases at 0.8'	
	M-1 1.3 - 2.3			0		WD	Dark brown, silty, WOOD FILL with sand (dense, moist)(no odor, no sheen)	
2		e3				SP	Tan, fine to medium SAND with silt and shell fragments (medium dense, moist)(no odor, no sheen)(hydraulic fill)	
	M-1 2.3-3.3			0				
4								
								∇ ATD
6		e3						
8								

Boring Completed 01/18/05
Total Depth of Boring = 8.0 ft.

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Log of Boring M-1

Figure
1-214

M-2

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0	M-2 0-0.5			0		AC	Asphalt	
						GP/ SW	Brown, fine to medium SAND and GRAVEL (medium dense, moist)(no odor, no sheen)(roadbase)	ATD
	M-2 1-2			0		SM	Brown to grey, fine to medium SAND with silt and shell fragments (medium dense, moist)(no odor, no sheen)(hydraulic fill)	
2		e3						
	M-2 2-3			0				
4								
6								
8								
10								
12								

Boring Completed 01/18/05
Total Depth of Boring = 4.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

M-2b

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0						AC	Asphalt	Groundwater not encountered.
						GP/ SW	Brown, fine to coarse SAND and GRAVEL (medium dense, damp) (no odor, no sheen) (roadbase)	
	M-2b 1-1.5			0		SW	Brown with grey mottles, fine to medium SAND with subrounded gravel and coarse sand, and trace silt (medium dense, moist) (no odor, no sheen) (hydraulic fill)	
2		e3						
	M-2b 2-3			0		SM	Gray, fine to medium sand, with silt (loose, damp) (no odor, no sheen) (hydraulic fill)	
	M-2b 3-4			0				
4								
6								
8								
10								
12								

Boring Completed 07/15/05
Total Depth of Boring = 4.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring M-2b

Figure
1-36

M-2c

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0						AC	Asphalt	Groundwater not encountered.
						GP/ SW	Brown, fine to coarse SAND and crushed GRAVEL (medium dense, moist) (no odor, no sheen) (roadbase)	
	M-2c 1-1.5			0		SW	Brown with gray mottles, fine to coarse SAND, with gravel and trace silt (medium dense, moist) (no odor, no sheen) (fill)	
2	M-2c 2-3	e3		0		SM	Gray, fine to medium SAND, with silt (loose, moist) (no odor, no sheen) (hydraulic fill)	
	M-2c 3-4			0				
4								

Boring Completed 07/15/05
Total Depth of Boring = 4.0 ft.

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring M-2c

Figure
1-37

M-2d

Drilling Method: Geoprobe™

Ground Elevation (ft): No

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0						AC	Asphalt	Groundwater not encountered.
						GP/ SW	Brown, fine to coarse SAND and crushed GRAVEL (medium dense, moist) (no odor, no sheen) (roadbase)	
	M-2d 0.9-1.4			0		SM	Grey, fine to medium SAND, with silt and shell fragments (medium dense, moist) (no odor, no sheen) (hydraulic fill)	
2	M-2d 1.9-2.9	e3		0				
	M-2d 2.9-3.9			0			- Shell fragements from 2.8 to 3.5'	
4								

Boring Completed 07/15/05
Total Depth of Boring = 4.0 ft.

6

8

10

12

Notes: 1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring M-2d

Figure
1-38

M-3

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0	M-3 0-0.5			0		GP/ SW	Brown, fine to medium sandy, GRAVEL (dense, wet)(no odor, no sheen)(roadbase)	
						SP	Brown, gravelly, SAND with wood fragments (medium dense, moist)(no odor, no sheen)(fill)	
	M-3 1-2			0		SM	Grey, fine to medium SAND with silt (medium dense, moist)(no odor, no sheen)(hydraulic fill)	
2		e3						∇ ATD
	M-3 2-3			0				
4								

Boring Completed 01/18/05
Total Depth of Boring = 4.0 ft.

6

8

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring M-3

Figure
1-216

M-4

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0						AC	Asphalt	
						GP/SW	Brown, fine to coarse SAND with crushed gravel (medium dense, moist)(no odor, no sheen)(roadbase)	
	M-4 0.8-1.3			0		SM	Tan, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
2	M-4 1.8-2.8	e3						
	M-4 2.8-3.8			0				
4								
								∇ ATD
6		e3						
							Shell fragments from 7.2-12'	
8								
10		e3		0				
12								

Boring Completed 01/17/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Log of Boring M-4

Figure
1-217

M-FA-1

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0						AC	Asphalt	
						GP/ SW	Brown to dark grey, fine to coarse SAND and crushed GRAVEL (dense, moist)(no odor, no sheen)(roadbase)	
	M-FA-1 0.2-2					SM	Tan, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
2		e3					Shell fragments from 2.2-3'	
	M-FA-1 3.5-4							▽ ATD
4								
	M-FA-1 4-6							
6		e3						
	M-FA-1 6-8						Shell fragments from 7-12'	
8								
	M-FA-1 8-10							
10		e3						
	M-FA-1 10-12							
12								

Boring Completed 01/17/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Log of Boring M-FA-1

Figure
1-218

M-FA-2

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						AC	Asphalt	
						SP	Brown, medium to coarse SAND with gravel and shell fragments (medium dense, moist)(no odor, no sheen) (fill)	
	M-FA-2 0.5-2						Sand size decreases at 1.3' Gravel absent past 1.3' Becomes grey at 1.3'	
2		b3						
	M-FA-2 3.5-4							
4								▽ ATD
	M-FA-2 4-6							
6		b3				SM	Dark grey, silty, fine to medium SAND with wood and shell fragments (dense, wet)(no odor, no sheen)(hydraulic fill) Becomes loose at 6.5'	
	M-FA-2 6-8							
8								
	M-FA-2 8-10							
10		b3						
	M-FA-2 10-12							
12								

Boring Completed 01/17/05
Total Depth of Boring = 12.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Log of Boring M-FA-2

Figure 1-219

M-GC-1

Drilling Method: Geoprobe™

Ground Elevation (ft): __________

Drilled By: ESN

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						AC	Asphalt	
						GP/ SP	Brown to greyish brown, fine to course SAND and crushed GRAVEL (medium dense, moist)(no odor, no sheen)(roadbase)	
	M-GC-1 1.6-2.1			0		SP	Dark grey to black, fine to medium SAND with gravel and silt (dense, moist)(no odor, no sheen)(fill)	
2		e3						
						SM	Grey, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
	M-GC-1 2.6-3.6							
4	M-GC-1 3.6-4.6			0				
	M-GC-1 4.6-6.6							
6		e3						
							Becomes grey at 6.5'	
							Becomes wet at 6.7'	∇ ATD
	M-GC-1 6.6-8			0				
8								
10		e3						
12								

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 4/29/10 N:\PROJECTS\147020.090.GPJ // LANDAU 1.0.GLB // SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring M-GC-1

Figure 1-220
(1 of 2)

M-GC-1

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: ESN

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
						SM	Grey, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
14		e3						
16								

Boring Completed 03/03/05
Total Depth of Boring = 16.0 ft.

18

20

22

24

26

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

M-GC-2

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: ESN

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		
0						AC	Asphalt	Groundwater not encountered.
						GP/ SW	Dark greenish grey, fine to coarse SAND and GRAVEL (medium dense, moist)(no odor, no sheen)(roadbase)	
	M-GC-2 1.5-2					SM	Grey, fine to medium SAND with silt (medium dense, moist)(no odor, no sheen)(hydraulic fill)	
2		e3						
	M-GC-2 2-3			0				
	M-GC-2 3-4							
4								
	M-GC-2 4-6			0				
6		e3						
	M-GC-2 6-8							
8								

Boring Completed 03/02/05
Total Depth of Boring = 8.0 ft.

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring M-GC-2

Figure
1-221

M-GC-3

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: ESN	Water Level
0						AC	Asphalt	
						GP/ SW	Brown, fine to medium SAND with gravel (medium dense, moist)(no odor, no sheen)(roadbase)	
	M-GC-3 1-1.5			0		SM	Brown, fine to medium SAND with silt (loose, damp)(no odor, no sheen)(hydraulic fill)	
2		e3						
	M-GC-3 2-3							
	M-GC-3 3-4							
4								
	M-GC-3 4-6			0			Becomes wet at 5'	
								∇ ATD
6		e3					Silt content increases to a silty, fine to medium SAND at 6' Wood debris from 6'-8'	
	M-GC-3 6-8							
8								

Boring Completed 03/03/05
Total Depth of Boring = 8.0 ft.

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring M-GC-3

Figure
1-222

M-GC-4

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: ESN

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol		Water Level
0						AC	Asphalt	
						GP/SW	Brown, fine to coarse SAND and GRAVEL (dense, damp)(no odor, no sheen)(roadbase)	
	M-GC-4 1.5-2			0		SM	Brown, fine to medium SAND with silt (loose, damp)(no odor, no sheen)(hydraulic fill)	
2		e3						
	M-GC-4 2.5-3.5							
4	M-GC-4 3.5-4.5			0				
							Becomes grey at 4.3'	
							Becomes wet at 5.1'	
	M-GC-4 4.5-6.5						Wood debris from 5.4' - 5.6'	∇ ATD
6		e3					Shell fragments from 6.0' - 8.0'	
							Wood debris from 6.1' - 6.3'	
	M-GC-4 6.5-8							
8								

Boring Completed 03/02/05
Total Depth of Boring = 8.0 ft.

10

12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation Everett, Washington	Log of Boring M-GC-4	Figure 1-223

M-GC-5

SAMPLE DATA | SOIL PROFILE | GROUNDWATER

Drilling Method: Geoprobe™

Ground Elevation (ft):

Drilled By: ESN

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Description	Water Level
0						SM	Dark brown, fine SAND with silt and grass and grass roots (medium dense, moist)(no odor, no sheen)(topsoil)	
	M-GC-5 1-1.5			0		SW	Tan, fine to coarse SAND with trace silt (loose, moist)(no odor, no sheen)(fill)	
2		e3						
	M-GC-5 2-3							
	M-GC-5 3-4			0		SM	Grey, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
4								
	M-GC-5 4-6			0				
							Becomes wet at 5.6'	∇ ATD
6		e3						
8								
10								
12								

Boring Completed 03/02/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 4/29/10 N:\PROJECTS\147020.090.GPJ // LANDAU 1.0.GLB // SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring M-GC-5

Figure
1-224

Logs by Others

Attachment B

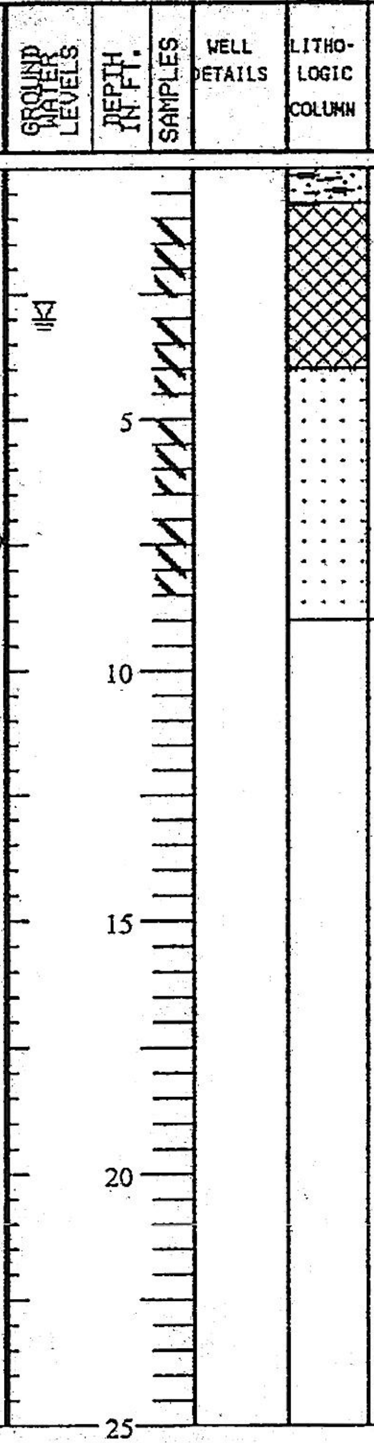
BORING LOGS

LOG OF EXPLORATORY BORING

PROJECT NAME PSM/Centrecon
LOCATION Everett, WA.
DRILLED BY Environmental Drill
DRILL METHOD H.S. Auger
LOGGED BY Lisa Adolfson

BORING NO. EC- 1
PAGE 1 OF 1
REFERENCE ELEV. 16.93'
TOTAL DEPTH 9.00'
DATE COMPLETED 1/11/89

SAMPLE DESIGNATION	SAMPLE INTERVAL	PENETRT. RATE
EC-1-1	1-2.5'	6- 9- 8
EC-1-3	3-4.5'	5- 5- 6
EC-1-5	5-6.5'	50/6
EC-1-7	7.5-9'	14- 6-10



LITHOLOGIC DESCRIPTION

0 - 7 inches: CONCRETE.
7.0 inches - 4.0 feet: SAND; coarse, some silt, grayish brown, moist. Sample contained possible gray staining, no odor. (FILL)

4.0 - 5.0 feet: SAND; fine, some silt, gray, no odor, very moist. (SP) (FILL)
--- @ 5.0 feet: same as above; gray staining, oily sheen on soil, slight gasoline odor.
7.0 - 9.0 feet: same as above; saturated, grading to finer sand, slight sheen on water in sample, no noticable odor. (SP) (FILL)

Bottom of hole at 9.0 feet. Approximately 4.0 feet of water in hole at 11:12 a.m.

REMARKS

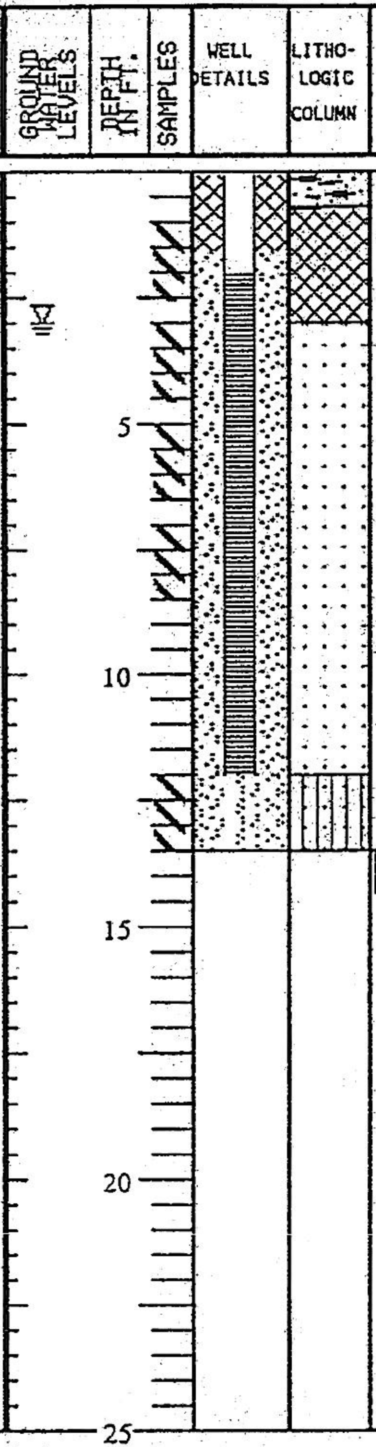
Boring was backfilled with bentonite slurry, covered with concrete.

LOG OF EXPLORATORY BORING

PROJECT NAME PSM/Centrecon
LOCATION Everett, WA.
DRILLED BY Environmental Drill
DRILL METHOD H.S. Auger
LOGGED BY Lisa Adolfson

BORING NO. EC- 2
PAGE 1 OF 1
REFERENCE ELEV. 16.74'
TOTAL DEPTH 13.50'
DATE COMPLETED 1/11/89

SAMPLE DESIGNATION	SAMPLE INTERVAL	PENETRT. RATE
EC-2-1	1-2.5'	6-12-12
EC-2-3	3-4.5'	7- 8- 8
EC-2-5	5-6.5'	6-28-16
EC-2-7	7.5-9'	15-18-50
EC-2-12	12-13.5'	14- 6- 6



LITHOLOGIC DESCRIPTION

0 - 7 inches: CONCRETE.

7 inches - 3.0 feet: SAND; medium to coarse, light brown, moist, no odor. (FILL)

3.0 - 5.0 feet: SAND; fine, some silt, gray, moist, no odor. Cement slab with rounded gravels, trace wood chips. (SP) (FILL)

5.0 - 7.0 feet: same as above: fine sand, cement slab. (SP) (FILL)

7.0 - 9.0 feet: SAND; fine, some silt and coarse sand, saturated, very slight sheen, no odor. (SP) (FILL)

9.0 - 12.0 feet: cuttings, same as above; no sheen noticed, no samples collected due to very difficult drilling. (SP) (FILL)

12.0 - 13.5 feet: SILTY SAND; fine, gray, saturated, shell fragments, wood chips from above, no odor or sheen. (SM)

Bottom of hole at 13.5 feet.

REMARKS

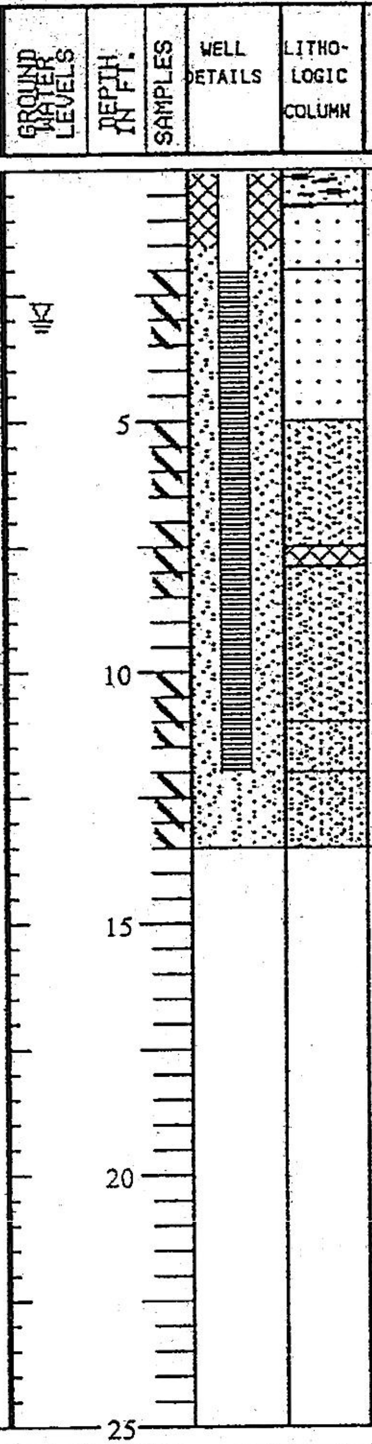
Well Construction Details: Flush mounted lockable casing; 0-2', blank riser pipe; 2-12', schedule 40, 0.010 slot screen. 0-1.5', pellets/powder; 1.5-12', 10-20 Colorado silica sand.

LOG OF EXPLORATORY BORING

PROJECT NAME PSM/Centrecon
LOCATION Everett, WA.
DRILLED BY Environmental Drill
DRILL METHOD H.S. Auger
LOGGED BY Lisa Adolfson

BORING NO. EC- 3
PAGE 1 OF 1
REFERENCE ELEV. 16.59'
TOTAL DEPTH 14.00'
DATE COMPLETED 1/12/89

SAMPLE DESIGN-ATION	SAMPLE INTERVAL	PENETRT. RATE
EC-3-2	2-3.5'	2- 4- 4
EC-3-5	5-6.5'	2- 2- 1
EC-3-7	7.5-9'	1- 2- 3
EC-3-10	10-11.5'	1- 3- 4
EC-3-12	12.5-14'	1- 4- 3



LITHOLOGIC DESCRIPTION

0 - 7 inches: CONCRETE.

7 inches - 2.0 feet: SAND; (SP) (FILL)
2.0 - 5.0 feet: SAND; coarse, grading to fine to medium sand; some silt, gray, moist, no odor or staining, wood pieces. (SW) (FILL)

5.0 - 7.5 feet: SAND; fine, 30% silt, dark gray, saturated, very slight sheen, no odor. (SM) (FILL)

7.5 - 8.0 feet: Wood chip layer, black (organic) to brown mostly decomposed. (FILL)
8.0 - 11.0 feet: SAND; silty fine, light gray micaceous,saturated, no odor or sheen. (SW) (FILL)

11.0 - 12.0 feet: SAND; silty fine, grading to medium sand, gray, abundant clam shells. (SW)
12.0 - 14.0 feet: SAND; silty fine, grading to medium sand, sample driven on log, gray silty sand with clam shells. (SW)

Bottom of hole at 13.5 feet.

REMARKS
Well Construction Details: Flush mounted lockable casing; 0-2', blank riser pipe; 2-12', schedule 40, 0.010 slot screen. 0-1.5', pellets/powder; 1.5-12', 10-20 Colorado silica sand.

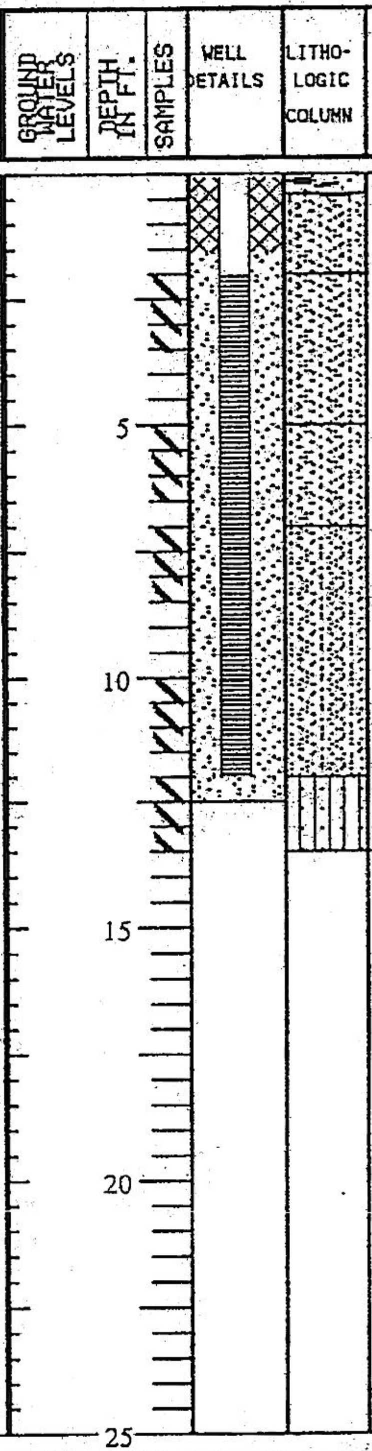
SWEET-EDWARDS/EMCON

LOG OF EXPLORATORY BORING

PROJECT NAME PSM/Centrecon
LOCATION Everett, WA.
DRILLED BY Environmental Drill.
DRILL METHOD
LOGGED BY Lisa Adolfson

BORING NO. EC- 4
PAGE 1 OF 1
REFERENCE ELEV. 16.55'
TOTAL DEPTH 13.50'
DATE COMPLETED 1/12/89

SAMPLE DESIGN-ATION	SAMPLE INTERVAL	PENETRT. RATE
EC-4-2	2.5-4'	2- 2- 2
EC-4-5	5-6.5'	1- 1- 2
EC-4-7	7.5-9'	5- 4- 4
EC-4-10	10-11.5'	2- 2- 1
EC-4-12	12-13.5	3- 1- 2



LITHOLOGIC DESCRIPTION

0 - 4 inches: CONCRETE.

4 inches - 2.0 feet: SAND; silty fine, light gray, moist, no odor or staining. (SP) (POSSIBLE FILL)

2.0 - 5.0 feet: SAND; grading to medium, saturated, no odor or staining, abundant roots. (SP) (POSSIBLE FILL)

5.0 - 7.0 feet: SILTY SAND; fine, light gray, saturated wood layer - peat ? no odor or staining. (SW) (POSSIBLE FILL)

7.0 - 12.0 feet: SILTY SAND; fine, light gray, saturated wood layer - peat ? no odor or staining. (SM-PT)

--- @ 10.0 feet: abundant clam shells

12.0 - 13.5 feet: SILTY SAND; grades to fine, gray, saturated, clam shells, no odor or staining. (SM)

Bottom of hole at 13.5 feet.

REMARKS

Well Construction Details: Flush mounted lockable casing; 0-2',blank riser pipe; 2-12', schedule 40,0.010 slot screen. 0-1.5', pellets/powder; 1.5-12', 10-20 Colorado silica sand.

SWEET-EDWARDS/EMCON

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTION
Coarse Grained Soils More Than 50% Material Larger Than No. 200 Sieve Size	Gravel And Gravelly Soils More Than 50% Coarse Fraction Retained On No. 4 Sieve	Clean Gravels (little or no fines)	░	GW gw	Well-Graded Gravels, Gravel-Sand Mixtures, Little Or No Fines
			░	GP gp	Poorly-Graded Gravels, Gravel-Sand Mixtures, Little Or No Fines
		Gravels With Fines (appreciable amount of fines)	▥	GM gm	Silty Gravels, Gravel-Sand-Silt Mixtures
			▨	GC gc	Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sand And Sandy Soils More Than 50% Coarse Fraction Passing No. 4 Sieve	Clean Sand (little or no fines)	░	SW sw	Well-Graded Sands, Gravelly Sands, Little Or No Fines
			░	SP sp	Poorly-Graded Sands, Gravelly Sands, Little Or No Fines
		Sands With Fines (appreciable amount of fines)	▦	SM sm	Silty Sands, Sand-Silt Mixtures
			▨	SC sc	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils More Than 50% Material Smaller Than No. 200 Sieve Size	Silts And Clays	Liquid Limit Less Than 50	▥	ML ml	Inorganic Silts & Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands; Clayey Silts w/ Slight Plasticity
			▨	CL cl	Inorganic Clays Of Low To Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean
			▥	OL ol	Organic Silts And Organic Silty Clays Of Low Plasticity
	Silts And Clays	Liquid Limit Greater Than 50	▥	MH mh	Inorganic Silts, Micaceous Or Diatomaceous Fine Sand Or Silty Soils
			▨	CH ch	Inorganic Clays Of High Plasticity, Fat Clays.
			▨	OH oh	Organic Clays Of Medium To High Plasticity, Organic Silts
Highly Organic Soils			░	PT pt	Peat, Humus, Swamp Soils With High Organic Contents

Topsoil	░	Humus And Duff Layer
Fill	▩	Highly Variable Constituents

The Discussion In The Text Of This Report Is Necessary For A Proper Understanding Of The Nature Of The Material Presented In The Attached Logs

Notes:

Dual symbols are used to indicate borderline soil classification. Upper case letter symbols designate sample classifications based upon laboratory testing; lower case letter symbols designate classifications not verified by laboratory testing.

I	2" O.D. SPLIT SPOON SAMPLER	C	TORVANE READING, tsf
II	2.4" I.D. RING SAMPLER OR SHELBY TUBE SAMPLER	qu	PENETROMETER READING, tsf
P	SAMPLER PUSHED	W	MOISTURE, percent of dry weight
✳	SAMPLE NOT RECOVERED	pcf	DRY DENSITY, pounds per cubic ft.
∇	WATER LEVEL (DATE)	LL	LIQUID LIMIT, percent
▮	WATER OBSERVATION WELL	PI	PLASTIC INDEX

Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

LEGEND

Proj. No. 5218	Date Oct'91	Plate A1

Environmental Boring Log

Project Name: Hulbert Mill

Sheet 1 of 1

Job No.: 5218

Logged by: TSC

Start Date: 9-27-91

Completion Date: 9-27-91

Boring No: **MW-1**

Drilling Contractor: R & R Drilling

Drilling Method: HSA

Sampling Method: SPT

Ground Surface Elevation:

Hole Completion: ☒ Monitoring Well ☐ Piezometer ☐ Abandoned, sealed with bentonite

Microtip Reading (ppm)	Sample ID	Blow Count	Litho-graphy	Depth in Feet	USCS Symbol	Surface Conditions: Overcast
				1		
				2		
N/A	N/A	3 3 3		3	gm	Brown silty sandy GRAVEL
				4		▽
				5		
				6		
				7		
N/A	N/A	3 3 3		8	sm	Dark gray silty SAND with numerous shell fragments
				9		
				10		
				11		
				12		
				13		Total depth 12.5 feet. Groundwater at approximately 4 feet during drilling.
				14		
				15		
				16		
				17		
				18		
				19		

Notes/Location

Earth Consultants Inc.

Proj. No. 5218 **Date** Oct'91 **Plate** A2

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis and judgment. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use of interpretation by others of information presented on this log.

Monitor Well Completion Form

PROJECT NAME: Hulbert Mill

PROJECT NUMBER: 5218 **PROJECT MANAGER:** PJM

LOGGED BY: TSC **REVIEWED BY:**

WELL I.D.: MW-1 **DATE:** 9-27-91

DRILLING COMPANY: R & R Drilling

METHOD OF DECONTAMINATION PRIOR TO DRILLING: High pressure wash

DEVELOPMENT

METHOD OF DEVELOPMENT: bailer

DEVELOPMENT DATE: 9-30-91

YIELD (GAL) 24 **TIME: FROM** 1200 **TO** 1245

DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT: ☐ CLEAR ☒ SLIGHTLY CLOUDY ☐ MOD. TURBID ☐ VERY MUDDY

ODOR OF WATER: none

WATER DISCHARGED TO: ☐ GROUND SURFACE ☐ TANK TRUCK ☐ SANITARY SEWERS ☐ STORAGE TANK ☒ DRUMS ☐ OTHER

DEPTH TO WATER AT START OF DEVELOPMENT: 4.5 **DEPTH TO WATER AFTER DEVELOPMENT:** 4.6

RECOVERY TIME: not taken

MATERIALS USED

4 SACKS OF #8 Aqua SAND

1 SACKS OF redimix CEMENT

___ SACKS OF GROUT:

___ SACKS OF POWDERED BENTONITE:

___ SACKS OF BENTONITE CHIPS:

___ BUCKETS OF BENTONITE PELLETS:

___ FEET OF ___ INCH BLANK CASING ☐ PVC ☐ ___

10 FEET OF 2 INCH SCREEN .020 INCH SLOT SIZE ☒ SLOTTED PVC ☐ ___

___ FEET OF ___ INCH STEEL CONDUCTOR CASING

___ YARD^3 CEMENT-SAND (REDI-MIX) ORDERED:

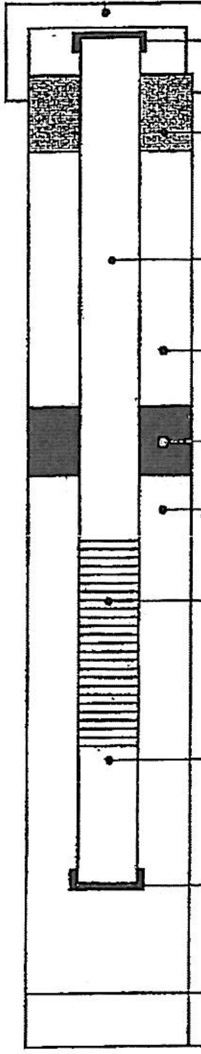
___ YARD^3 CEMENT-SAND (REDI-MIX) USED:

CONCRETE PUMPER USED? ☐ YES ☒ NO

NAME:

☒ TRAFFIC RELATED FLUSH MONUMENT

☐ ABOVE GROUND MONUMENT



CASING ELEVATION ___ FEET ABOVE SEA LEVEL

CEMENT GROUT SURFACE SEAL 0 TO 1 FEET

BLANK CASING .5 TO 2.5 FEET

CASING SEAL SEAL MATERIAL concrete 0 TO 1 FEET

BENTONITE SEAL 1 TO 2 FEET

SAND PACK 2 TO 13 FEET

2 INCH DIAMETER SLOTTED (.020 INCH) SCREEN 2.5 TO 12.5 FEET

BLANK SILT TRAP 12.5 TO 13 FEET

BOTTOM WELL CAP 13 FEET

HOLE CLEANED OUT TO 13 FEET

BOTTOM OF BOREHOLE 13 FEET

NOT TO SCALE

ADDITIONAL INFORMATION

Earth Consultants Inc.

Proj. No. 5218	Drwn. GLS	Date Oct'91	Checked PJM	Date 10-25-91	Plate A3

Environmental Boring Log

Project Name: Hulbert Mill

Sheet 1 of 1

Job No.: 5218

Logged by: TSC

Start Date: 9-27-91

Completion Date: 9-27-91

Boring No: **MW-2**

Drilling Contractor: R & R Drilling

Drilling Method: HSA

Sampling Method: SPT

Ground Surface Elevation:

Hole Completion: ☒ Monitoring Well ☐ Piezometer ☐ Abandoned, sealed with bentonite

Surface Conditions: Overcast

Microtip Reading (ppm)	Sample ID	Blow Count	Litho-graphy	Depth in Feet	USCS Symbol	
				1		
				2		
		7 15		3 ☒	gm	Green gray silty sandy GRAVEL with numerous wood and shell fragments
N/A	N/A	13		☒		
				4		
				5		∇
				6		
				7		
		50/2		8 ☒		no sample recovery
				9		
				10		
				11		
				12		
		3 3		13 ☒	sm	Gray green silty SAND with numerous shell fragments
N/A	N/A	3		☒		
				14		Total depth 14 feet. Groundwater at approximately 5 feet during drilling.
				15		
				16		
				17		
				18		
				19		

Notes/Location

Earth Consultants Inc.

Proj. No. 5218 **Date** Oct'91 **Plate** A4

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis and judgment. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use of interpretation by others of information presented on this log.

Monitor Well Completion Form

PROJECT NAME:	Hulbert Mill		
PROJECT NUMBER:	5218	PROJECT MANAGER:	PJM
LOGGED BY:	TSC	REVIEWED BY:	
WELL I.D.:	MW-2	DATE:	9-27-91
DRILLING COMPANY:	R & R Drilling		
METHOD OF DECONTAMINATION PRIOR TO DRILLING:	High pressure wash		

DEVELOPMENT

METHOD OF DEVELOPMENT:	bailer		
DEVELOPMENT DATE:	9-30-91		
YIELD (GAL)	28	TIME: FROM	1315 TO 1430
DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT:	☐ CLEAR ☐ MOD. TURBID	☐ SLIGHTLY CLOUDY ☒ VERY MUDDY	
ODOR OF WATER:	no odor, slight sheen		
WATER DISCHARGED TO:	☐ GROUND SURFACE ☐ SANITARY SEWERS ☒ DRUMS	☐ TANK TRUCK ☐ STORAGE TANK ☐ OTHER	
DEPTH TO WATER AT START OF DEVELOPMENT:	3.5	DEPTH TO WATER AFTER DEVELOPMENT:	4.5
RECOVERY TIME:	not taken		

MATERIALS USED

4 SACKS OF #8 Aqua SAND

1 SACKS OF Redimix CEMENT

____ SACKS OF GROUT:

____ SACKS OF POWDERED BENTONITE:

____ SACKS OF BENTONITE CHIPS:

____ BUCKETS OF BENTONITE PELLETS:

____ FEET OF ____ INCH BLANK CASING ☐ PVC ☐ ____

10 FEET OF 2 INCH SCREEN .020 INCH SLOT SIZE

☒ SLOTTED PVC ☐ ____

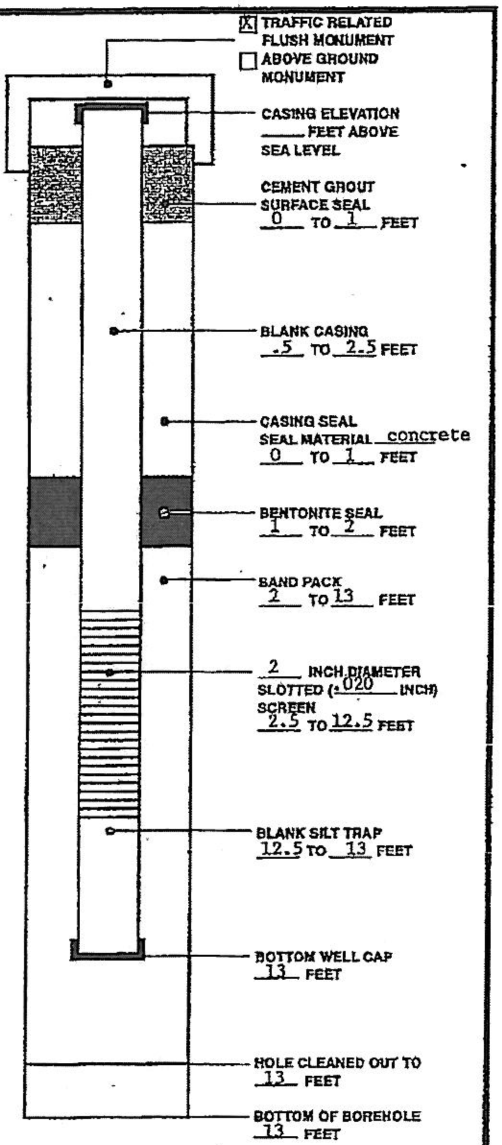
____ FEET OF ____ INCH STEEL CONDUCTOR CASING

____ YARD^3 CEMENT-SAND (REDI-MIX) ORDERED:

____ YARD^3 CEMENT-SAND (REDI-MIX) USED:

CONCRETE PUMPER USED? ☐ YES ☒ NO

NAME:



☒ TRAFFIC RELATED FLUSH MONUMENT

☐ ABOVE GROUND MONUMENT

CASING ELEVATION ____ FEET ABOVE SEA LEVEL

CEMENT GROUT SURFACE SEAL 0 TO 1 FEET

BLANK CASING .5 TO 2.5 FEET

CASING SEAL SEAL MATERIAL concrete 0 TO 1 FEET

BENTONITE SEAL 1 TO 2 FEET

SAND PACK 2 TO 13 FEET

2 INCH DIAMETER SLOTTED (±.020 INCH) SCREEN 2.5 TO 12.5 FEET

BLANK SILT TRAP 12.5 TO 13 FEET

BOTTOM WELL CAP 13 FEET

HOLE CLEANED OUT TO 13 FEET

BOTTOM OF BOREHOLE 13 FEET

NOT TO SCALE

ADDITIONAL INFORMATION

A lot of fines are entering the well. The depth to bottom was 11.5 at the start of development and 9.4 at the end.

Earth Consultants Inc.

Proj. No. 5218	Drwn. GLS	Date Oct'91	Checked PJM	Date 10-25-91	Plate A5

Environmental Boring Log

Project Name: Hulbert Mill

Sheet 1 of 1

Job No.: 5218

Logged by: TSC

Start Date: 9-27-91

Completion Date: 9-27-91

Boring No: **MW-3**

Drilling Contractor: R & R Drilling

Drilling Method: HSA

Sampling Method: SPT

Ground Surface Elevation:

Hole Completion: ☒ Monitoring Well ☐ Piezometer ☐ Abandoned, sealed with bentonite

Microtip Reading (ppm)	Sample ID	Blow Count	Litho-graphy	Depth in Feet	USCS Symbol	Surface Conditions: Overcast
				1		
				2		
		11 12 10		3	gm	Yellow brown silty gravelly SAND
				4		
				5		∇
				6		
				7		
		4 2 3		8	sm	Green gray silty SAND with numerous wood and shell fragments
				9		
				10		
				11		
				12		
		2 3 4		13		
				14		
				15		Total depth 14 feet. Groundwater at approximately 5 feet during drilling.
				16		
				17		
				18		
				19		

Notes/Location

Earth Consultants Inc.

Proj. No. 5218 | Date Oct'91 | Plate A6

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis and judgment. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use of interpretation by others of information presented on this log.

Monitor Well Completion Form

PROJECT NAME:	Hulbert Mill		
PROJECT NUMBER:	5218	**PROJECT MANAGER:**	PJM
LOGGED BY:	TSC	**REVIEWED BY:**	
WELL I.D.:	MW-3	**DATE:**	9-27-91
DRILLING COMPANY:	R & R Drilling		
METHOD OF DECONTAMINATION PRIOR TO DRILLING:	High pressure wash		

DEVELOPMENT

METHOD OF DEVELOPMENT: Bailer

DEVELOPMENT DATE: 9-30-91

YIELD (GAL) 16 **TIME: FROM** 1500 **TO** 1545

DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT: ☐ CLEAR ☐ SLIGHTLY CLOUDY ☒ MOD. TURBID ☐ VERY MUDDY

ODOR OF WATER: None

WATER DISCHARGED TO: ☐ GROUND SURFACE ☐ TANK TRUCK ☐ SANITARY SEWERS ☐ STORAGE TANK ☒ DRUMS ☐ OTHER

DEPTH TO WATER AT START OF DEVELOPMENT: 3.7 **DEPTH TO WATER AFTER DEVELOPMENT:** 3.9

RECOVERY TIME: not taken

MATERIALS USED

4 SACKS OF #8 Aqua SAND

1 SACKS OF Redimix CEMENT

____ SACKS OF GROUT:

____ SACKS OF POWDERED BENTONITE:

____ SACKS OF BENTONITE CHIPS:

____ BUCKETS OF BENTONITE PELLETS:

____ FEET OF ____ INCH BLANK CASING ☐ PVC ☐ ____

10 FEET OF 2 INCH SCREEN .020 INCH SLOT SIZE

☒ SLOTTED PVC ☐ ____

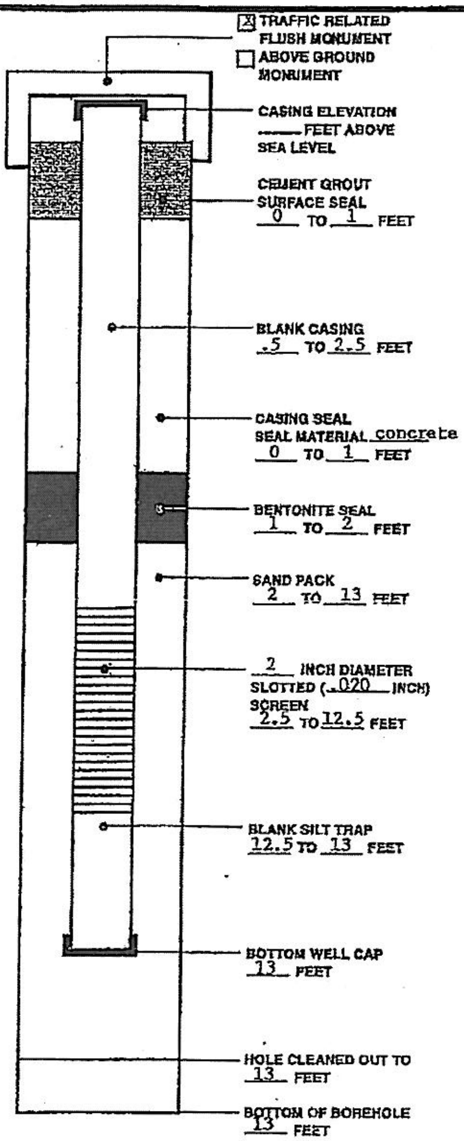
____ FEET OF ____ INCH STEEL CONDUCTOR CASING

____ YARD³ CEMENT-SAND (REDI-MIX) ORDERED:

____ YARD³ CEMENT-SAND (REDI-MIX) USED:

CONCRETE PUMPER USED? ☐ YES ☒ NO

NAME:



☒ TRAFFIC RELATED FLUSH MONUMENT

☐ ABOVE GROUND MONUMENT

CASING ELEVATION ____ FEET ABOVE SEA LEVEL

CEMENT GROUT SURFACE SEAL 0 TO 1 FEET

BLANK CASING .5 TO 2.5 FEET

CASING SEAL SEAL MATERIAL concrete 0 TO 1 FEET

BENTONITE SEAL 1 TO 2 FEET

SAND PACK 2 TO 13 FEET

2 INCH DIAMETER SLOTTED (.020 INCH) SCREEN 2.5 TO 12.5 FEET

BLANK SILT TRAP 12.5 TO 13 FEET

BOTTOM WELL CAP 13 FEET

HOLE CLEANED OUT TO 13 FEET

BOTTOM OF BOREHOLE 13 FEET

NOT TO SCALE

ADDITIONAL INFORMATION

Earth Consultants Inc.

Proj. No. 5218	**Drwn.** GLS	**Date** Oct'91	**Checked** PJM	**Date** 10-25-91	**Plate** A7

TEST PIT NO. Q-1

Logged By PJM

Date 10-7-91

Elev. ______

Depth (ft.)		USCS	Soil Description	W (%)	
0	☒	gm	FILL: Brown GRAVEL		
	▦	sm	Dark gray silty very fine SAND, moist, loose -increasing silt with depth -scattered shell fragments and cobble sized brick fragments -slight hydrocarbon odor near the surface		
5			Test pit terminated at 5 feet below existing grade. No groundwater seepage encountered during excavation.		
10					
15					

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis, and judgement. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use or interpretation by others of information presented on this log.

TEST PIT NO. Q-2

Logged By PJM

Date 10-7-91

Elev. ______

Depth (ft.)		USCS	Soil Description	W (%)	
0	☒	gm	FILL: GRAVEL		
	▦	sm	Brown silty SAND		
	▦	sm	Dark gray silty SAND with scattered wood debris		
5			Test pit terminated at 5 feet below existing grade. No groundwater seepage encountered during excavation.		
10					
15					

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TEST PIT LOGS
HULBERT MILL PROPERTY
EVERETT, WASHINGTON

Proj. No. 5218	**Drwn.** GLS	**Date** Oct'91	**Checked** PJM	**Date** 10-28-91	**Plate** A8

TEST PIT NO. Q-3

Logged By PJM

Date 10-7-91

Elev. ______

Depth (ft)	USCS	Soil Description	W (%)
0	gm	FILL: GRAVEL and assorted wood debris	
	sw	Dark gray SAND with numerous shell fragments and scattered cobbles	
	sm	Dark gray silty SAND with scattered shell fragments	
5		Test pit terminated at 5 feet below existing grade. No groundwater seepage encountered during excavation.	
10			
15			

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis, and judgement. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use or interpretation by others of information presented on this log.

TEST PIT NO. Q-4

Logged By PJM

Date 10-7-91

Elev. ______

Depth (ft)	USCS	Soil Description	W (%)
0	sw	Brown SAND, loose, stratified with zones of shell fragments	
	sm	Dark gray silty SAND, moderately dense with some wood debris	
5		Test pit terminated at 4 feet below existing grade. No groundwater seepage encountered during excavation.	
10			
15			

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Proj. No. 5218	**Drwn.** GLS	**Date** Oct'91	**Checked** PJM	**Date** 10-28-91	**Plate** A9

TEST PIT NO. Q-5

Logged By PJM

Date 10-7-91

Elev. ______

Depth (ft.)	USCS	Soil Description	W (%)	
0	gm	FILL: GRAVEL and SOIL		
		Multicolored (red, green) brick-like fill		
	sw	Dark gray SAND with some silt		
	sm	Dark gray silty SAND		
5		Test pit terminated at 5 feet below existing grade. No groundwater seepage encountered during excavation.		
10				
15				

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis, and judgement. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use or interpretation by others of information presented on this log.

TEST PIT NO. Q-6

Logged By PJM

Date 10-7-91

Elev. ______

Depth (ft.)	USCS	Soil Description	W (%)	
0	gm	FILL: Brown GRAVEL		
	sw	Black medium to coarse SAND		
	sw	Brown SAND		
	sm	Dark gray silty fine SAND with wood fragments		
	sw	Medium to coarse SAND, moist, loose with shell fragments		
5		Test pit terminated at 5 feet below existing grade. No groundwater seepage encountered during excavation.		
10				
15				

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Proj. No. 5218	**Drwn.** GLS	**Date** Oct'91	**Checked** PJM	**Date** 10-28-91	**Plate** A10

sand
grit

TEST PIT NO. Q—7

Logged By PJM

Date 10-7-91

Elev. ______

Depth (ft.)

USCS	Soil Description	W (%)
	FILL: multicolored (red, green) brick-like Fill	
sw	FILL: Black medium to coarse SAND	
sw	Brown SAND, stratified with zones of shell fragments scattered wood debris	
sm	Black silty SAND, moist	

Test pit terminated at 3 feet below existing grade.
No groundwater seepage encountered during excavation.

0
5
10
15

Mult. co

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis, and judgement. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use or interpretation by others of information presented on this log.

TEST PIT NO. Q—8

Logged By PJM

Date 10-7-91

Elev. ______

USCS	Soil Description	W (%)
	FILL: Multicolored (red, green) brick-like Fill	
sw	Gray SAND with shell fragments	
sm	Dark gray silty SAND with scattered shell fragments and wood debris	
sw	Dark gray fine SAND, loose	

Test pit terminated at 3 feet below existing grade.
No groundwater seepage encountered during excavation.

0
5
10
15

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TEST PIT LOGS
HULBERT MILL PROPERTY
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Proj. No. 5218	Drwn. GLS	Date Oct'91	Checked PJM	Date 10-28-91	Plate All

TEST PIT NO. J-1

Logged By TSC

Date 10-7-91

Elev.

Depth (ft)		USCS	Soil Description	W (%)	
0	▩	sm	FILL: Brown silty SAND from surface to concrete sump bottom at 5'	◁	
5			Test pit terminated at 5 feet below existing grade. Groundwater seepage encountered at 3 feet during excavation.		
10					
15					

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis, and judgement. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use or interpretation by others of information presented on this log.

TEST PIT NO. J-2

Logged By TSC

Date 10-7-91

Elev.

Depth (ft)		USCS	Soil Description	W (%)	
0	▩	sm	FILL: Concrete dust and blasting sand, some iron attributed to steel shot mixed in with the blasting sand -becoming wet below 3'		
5			Test pit terminated at 5 feet below existing grade. No groundwater seepage encountered during excavation.		
10					
15					

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Proj. No. 5218	**Drwn.** GLS	**Date** Oct'91	**Checked** PJM	**Date** 10-28-91	**Plate** A12

TEST PIT NO. K-1

Logged By TSC

Date 10-7-91

Elev. ______

Depth (ft.)		USCS	Soil Description	W (%)
0	▨		FILL: Blasting sand	
5	▒	sm	Dark gray silty SAND	
			Test pit terminated at 7 feet below existing grade. No groundwater seepage encountered during excavation.	
10				
15				

blastin sand)

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis, and judgement. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use or interpretation by others of information presented on this log.

TEST PIT NO. TP-1

Logged By TSC

Date 10-7-91

Elev. ______

Depth (ft.)		USCS	Soil Description	W (%)
0	▨	gm	FILL: Brown silty gravelly SAND	
5	▨			
			-6" layer of wood and plant debris	
	▒	sm	Dark gray silty SAND	◁
10			Test pit terminated at 9 feet below existing grade. Groundwater seepage encountered at 9 feet during excavation.	
15				

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Proj. No. 5218	**Drwn.** GLS	**Date** Oct'91	**Checked** PJM	**Date** 10-29-91	**Plate** A13

TEST PIT NO. TP—2

Logged By TSC

Date 10-7-91

Elev. ______

Depth (ft.)	USCS	Soil Description	W (%)	
0		Blasting sand and cement dust		
	sm	FILL: Brown silty SAND		
5	sm	Dark gray silty SAND with scattered shell fragments		
10			◁	

Test pit terminated at 11 feet below existing grade. Groundwater seepage encountered at 11 feet during excavation.

15

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis, and judgement. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use or interpretation by others of information presented on this log.

TEST PIT NO. TP—3

Logged By TSC

Date 10-7-91

Elev. ______

Depth (ft.)	USCS	Soil Description	W (%)	
0	sm	Brown silty SAND		
5	sm	Dark gray silty SAND with scattered shell fragments		
10			◁	

Test pit terminated at 11 feet below existing grade. Groundwater seepage encountered at 11 feet during excavation.

15

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Proj. No. 5218	Drwn. GLS	Date Oct'91	Checked PJM	Date 10-29-91	Plate A14

blas
san

TEST PIT NO. TP—4

Logged By TSC

Date 10-7-91

Elev. ______

Depth (ft.)	USCS	Soil Description	W (%)
0	sm	Brown silty SAND	
	sm	Dark gray silty SAND with scattered shell fragments	
5			
10		Smell of rotten eggs associated with the material from 9.5 feet to 11 feet	◁
		Test pit terminated at 11 feet below existing grade. Groundwater seepage encountered at 11 feet during excavation.	
15			

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis, and judgement. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use or interpretation by others of information presented on this log.

TEST PIT NO. TP—5

Logged By TSC

Date 10-7-91

Elev. ______

Depth (ft.)	USCS	Soil Description	W (%)
0	sm	Brown silty SAND	
	sm	Dark gray silty SAND with scattered fragments	
5			
10			◁
		Test pit terminated at 11 feet below existing grade. Groundwater seepage encountered at 11 feet during excavation.	
15			

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Proj. No. 5218	**Drwn.** GLS	**Date** Oct'91	**Checked** PJM	**Date** 10-29-91	**Plate** A15

TEST PIT NO. TP—6

Logged By TSC

Date 10-7-91

Elev. ______

Depth (ft.)	USCS	Soil Description	W (%)
0	sm	Brown silty SAND wtih extensive plant roots	
5	sm	Brown silty SAND -a wall made of 12" X 12" treated timbers was exposed on the north side of the excavation. The timbers were present to the bottom of the excavation.	
	sm	Dark gray sandy SILT	◁
10 15		Test pit terminated at 8 feet below existing grade. Groundwater seepage encountered at 8 feet during excavation.	

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis, and judgement. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use or interpretation by others of information presented on this log.

TEST PIT NO. TP—7

Logged By TSC

Date 10-7-91

Elev. ______

Depth (ft.)	USCS	Soil Description	W (%)
0		Blasting sand	
	sm	FILL: Brown silty SAND	
5 10	sm	Dark gray silty SAND -scattered shell fragments	◁
15		Test pit terminated at 12 feet below existing grade. Groundwater seepage encountered at 12 feet during excavation.	

5a

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TEST PIT LOGS

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Proj. No. 5218	Drwn. GLS	Date Oct'91	Checked PJM	Date 10-29-91	Plate A16

TEST PIT NO. TP-8

Logged By TSC

Date 10-7-91

Elev. ______

Depth (ft.)	USCS	Soil Description	W (%)
0		Blasting sand	
	sm	Brown silty SAND	
5	sm	Dark gray silty SAND -wood debris	◁
10		Test pit terminated at 7 feet below existing grade. Groundwater seepage encountered at 7 feet during excavation.	
15			

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis, and judgement. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use or interpretation by others of information presented on this log.

5

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Proj. No. 5218	**Drwn.** GLS	**Date** Oct'91	**Checked** PJM	**Date** 10-29-91	**Plate** A17

Key to Exploration Logs

Sample Description

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance.
Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

SAND or GRAVEL Density	Standard Penetration Resistance (N) in Blows/Foot
Very loose	0 – 4
Loose	4 – 10
Medium dense	10 – 30
Dense	30 – 50
Very dense	>50

SILT or CLAY Consistency	Standard Penetration Resistance (N) in Blows/Foot	Approximate Shear Strength in TSF
Very soft	0 – 2	<0.125
Soft	2 – 4	0.125 – 0.25
Medium stiff	4 – 8	0.25 – 0.5
Stiff	8 – 15	0.5 – 1.0
Very stiff	15 – 30	1.0 – 2.0
Hard	>30	>2.0

Moisture

Dry	Little perceptable moisture
Damp	Some perceptable moisture, probably below optimum
Moist	Probably near optimum moisture content
Wet	Much perceptable moisture, probably above optimum

Minor Constituents

	Estimated Percentage
Not identified in description	0 – 5
Slightly (clayey, silty, etc.)	5 – 12
Clayey, silty, sandy, gravelly	12 – 30
Very (clayey, silty, etc.)	30 – 50

Legends

Sampling Test Symbols

BORING SAMPLES

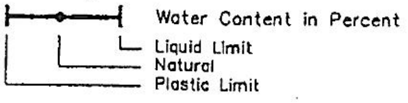
☒	Split Spoon
⧅	Shelby Tube
▥	Cuttings
◫	Core Run
*	No Sample Recovery
P	Tube Pushed, Not Driven

TEST PIT SAMPLES

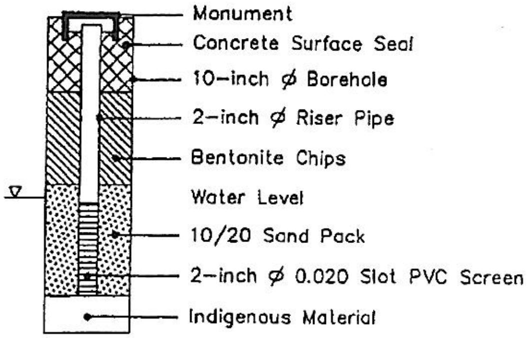
☒	Grab (Jar)
⧄	Bag
⧅	Shelby Tube

Test Symbols

GS	Grain Size Classification
CN	Consolidation
TUU	Triaxial Unconsolidated Undrained
TCU	Triaxial Consolidated Undrained
TCD	Triaxial Consolidated Drained
QU	QU
DS	Direct Shear
K	Permeabilty
PP	Pocket Penetrometer Approximate Compressive Strength in TSF
TV	Torvane Approximate Shear Strength in TSF
CBR	California Bearing Ratio
MD	Moisture Density Relationship
AL	Atterberg Limits

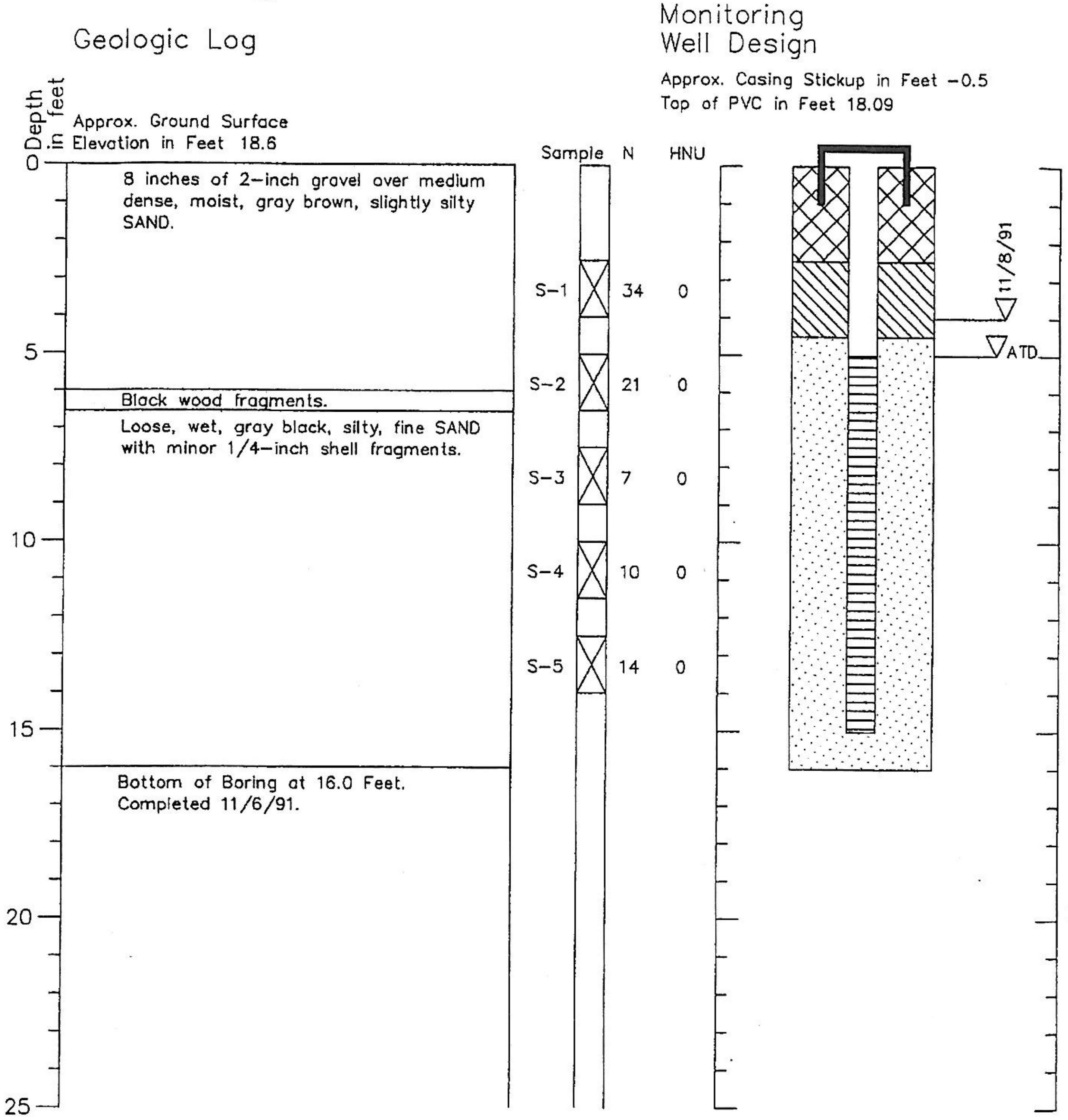


Groundwater Observations



HARTCROWSER
J-3446 11/91
Figure B-1

Boring Log and Construction Data for Monitoring Well HC-MW-1



Approx. Ground Surface Elevation in Feet 18.6

Approx. Casing Stickup in Feet -0.5
Top of PVC in Feet 18.09

8 inches of 2-inch gravel over medium dense, moist, gray brown, slightly silty SAND.

Black wood fragments.

Loose, wet, gray black, silty, fine SAND with minor 1/4-inch shell fragments.

Bottom of Boring at 16.0 Feet. Completed 11/6/91.

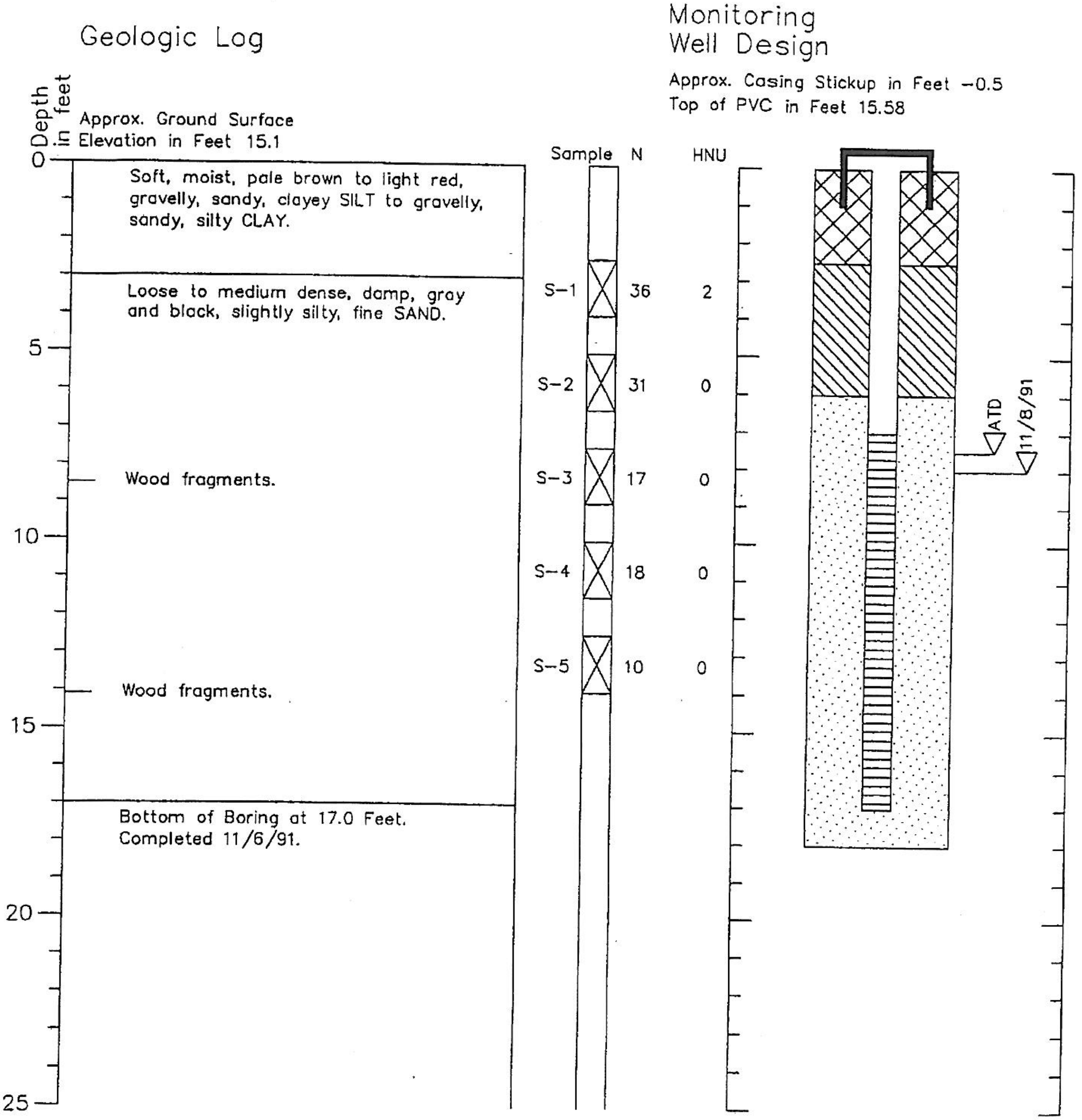
Sample	N	HNU
S-1	34	0
S-2	21	0
S-3	7	0
S-4	10	0
S-5	14	0

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Elevations relative to an assumed datum of 17.9 feet at survey STATION A taken from site survey map.

HARTCROWSER
J-3446 11/91

Figure B-2

Boring Log and Construction Data for Monitoring Well HC-MW-2



Approx. Ground Surface Elevation in Feet 15.1

Approx. Casing Stickup in Feet -0.5
Top of PVC in Feet 15.58

Soft, moist, pale brown to light red, gravelly, sandy, clayey SILT to gravelly, sandy, silty CLAY.

Loose to medium dense, damp, gray and black, slightly silty, fine SAND.

Wood fragments.

Wood fragments.

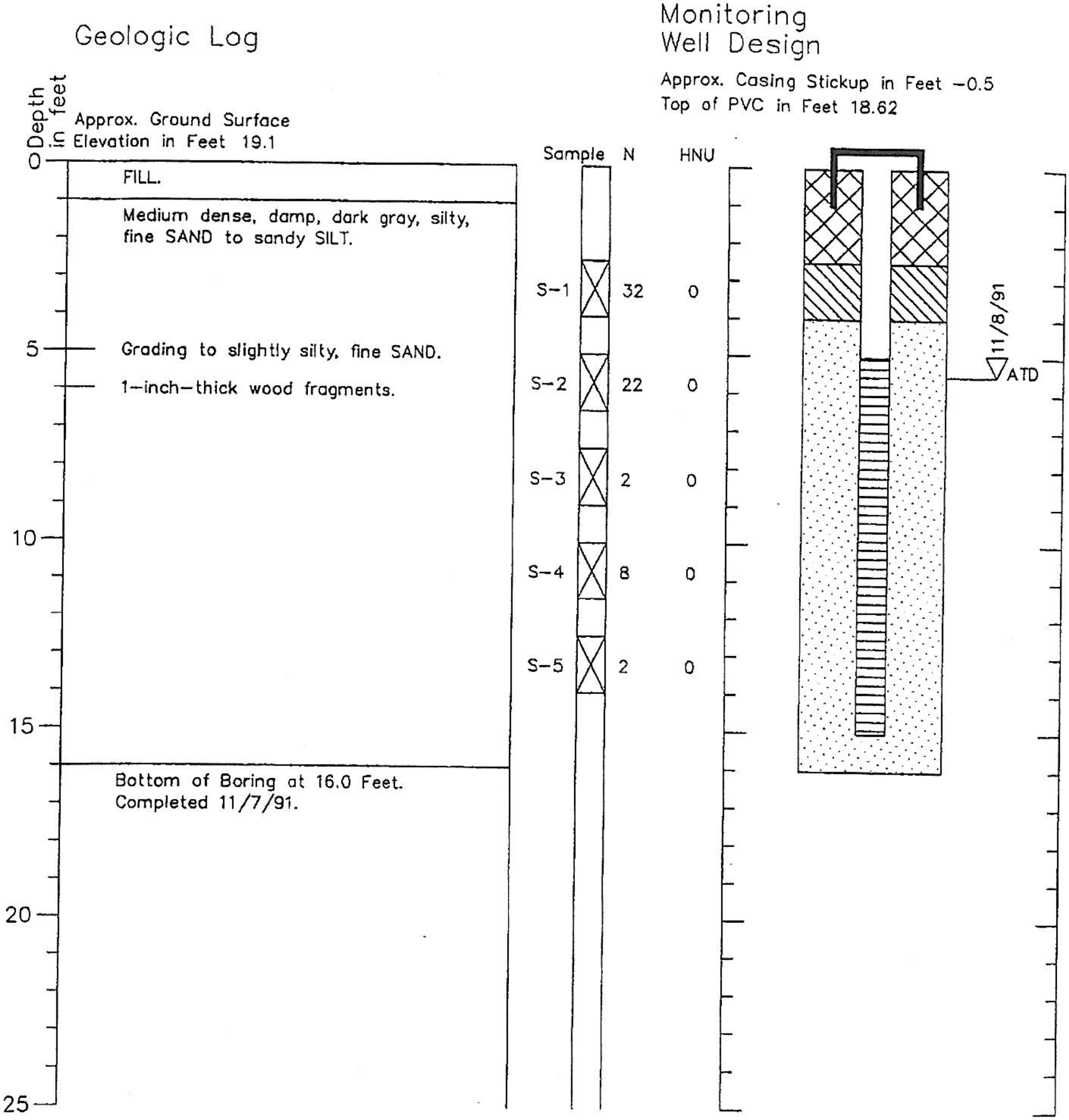
Bottom of Boring at 17.0 Feet. Completed 11/6/91.

Sample	N	HNU
S-1	36	2
S-2	31	0
S-3	17	0
S-4	18	0
S-5	10	0

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Elevations relative to an assumed datum of 17.9 feet at survey STATION A taken from site survey map.

HARTCROWSER
J-3446 11/91
Figure B-3

Boring Log and Construction Data for Monitoring Well HC-MW-3



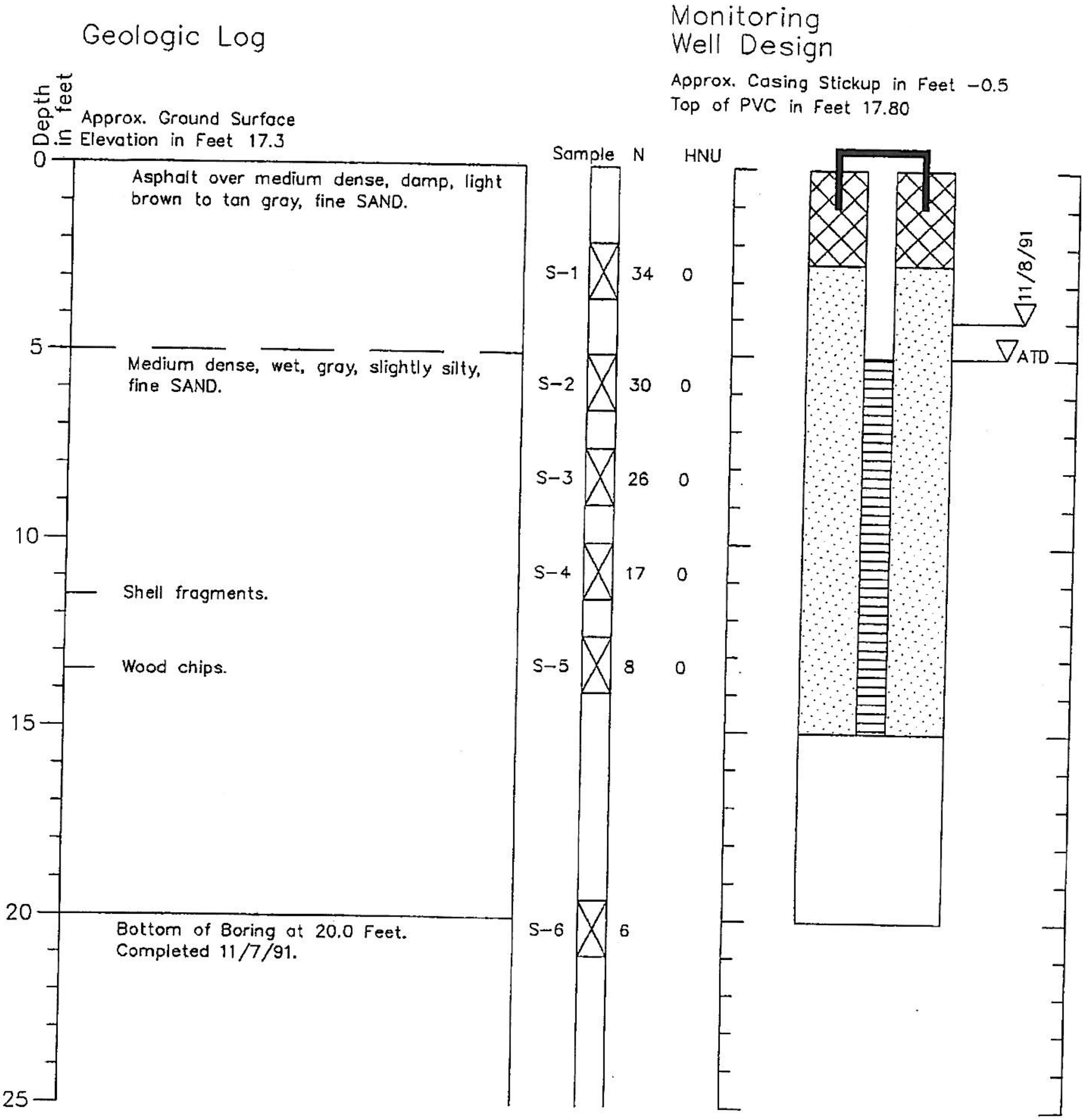
1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Elevations relative to an assumed datum of 17.9 feet at survey STATION A taken from site survey map.

HARTCROWSER

J-3446 11/91

Figure B-4

Boring Log and Construction Data for Monitoring Well HC-MW-4



Geologic Log

Monitoring Well Design

Sample	N	HNU
S-1	34	0
S-2	30	0
S-3	26	0
S-4	17	0
S-5	8	0
S-6	6	

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
4. Elevations relative to an assumed datum of 17.9 feet as survey STATION A taken from site survey map.

HARTCROWSER

J-3446 11/91

Figure B-5

Boring Log HC-5

Soil Descriptions

Ground Surface Elevation in Feet 18

2 inches of crushed gravel over medium dense, damp, brown, gravelly SAND.

— Gray SILT interbeds.

Medium dense, wet, brown, sandy GRAVEL to gravelly SAND.

— Grades loose.

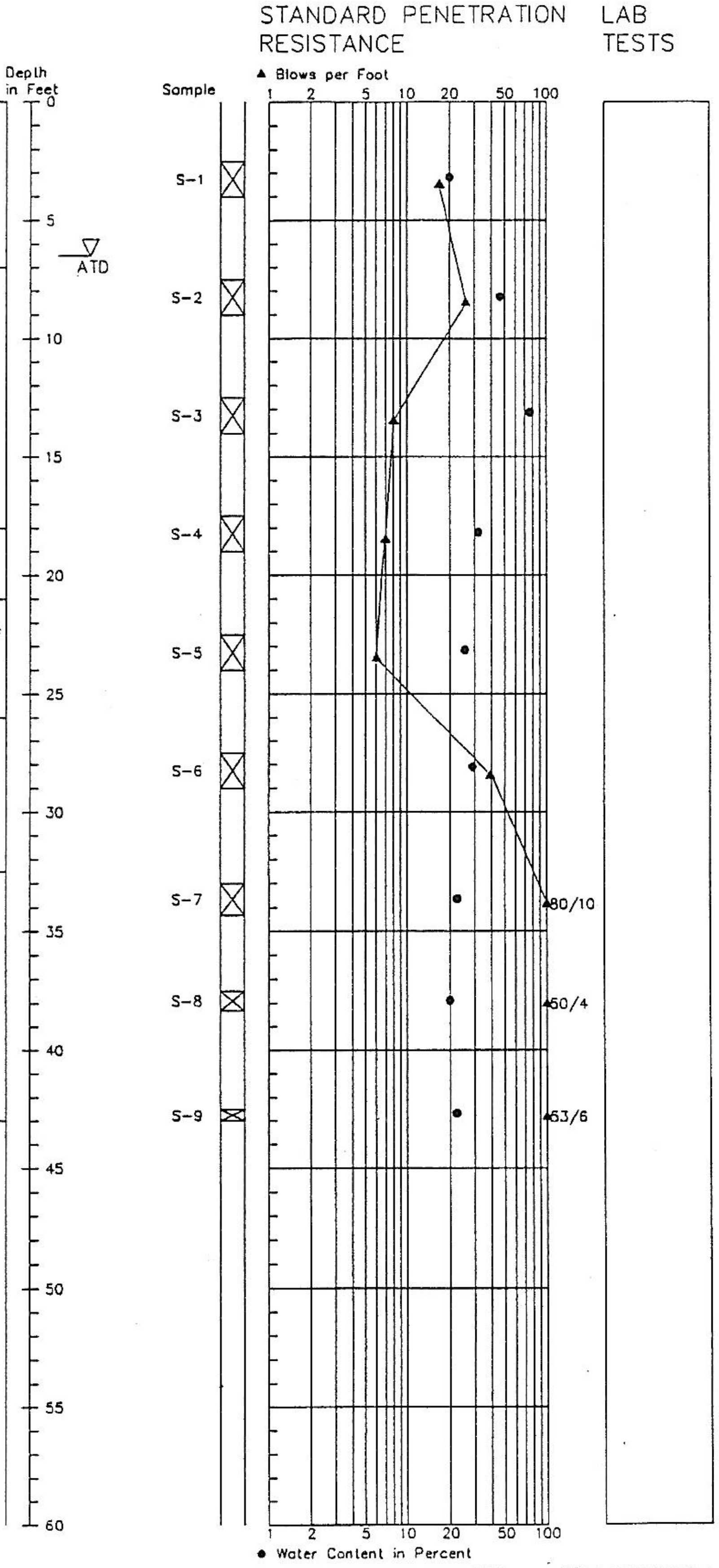
Medium stiff, wet, gray SILT with black organic interbeds.

Medium stiff, moist, gray, slightly, sandy SILT with abundant shell fragments and some wood fragments.

Dense, wet, gray, slightly silty medium SAND.

Very dense, moist, gray, gravelly medium to coarse SAND.

Bottom of Boring at 43.0 Feet.
Completed 10/26/92



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER
J-3446-01 10/92
Figure A-6 1/1

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER B-1 W.O. W-5378
PROJECT NAME William Hulbert Mill Marina

SOIL DESCRIPTION

Ground Surface Elevation Approximately 17 Feet

SOD and TOPSOIL over medium dense, moist, brown SAND with trace silt (Fill)

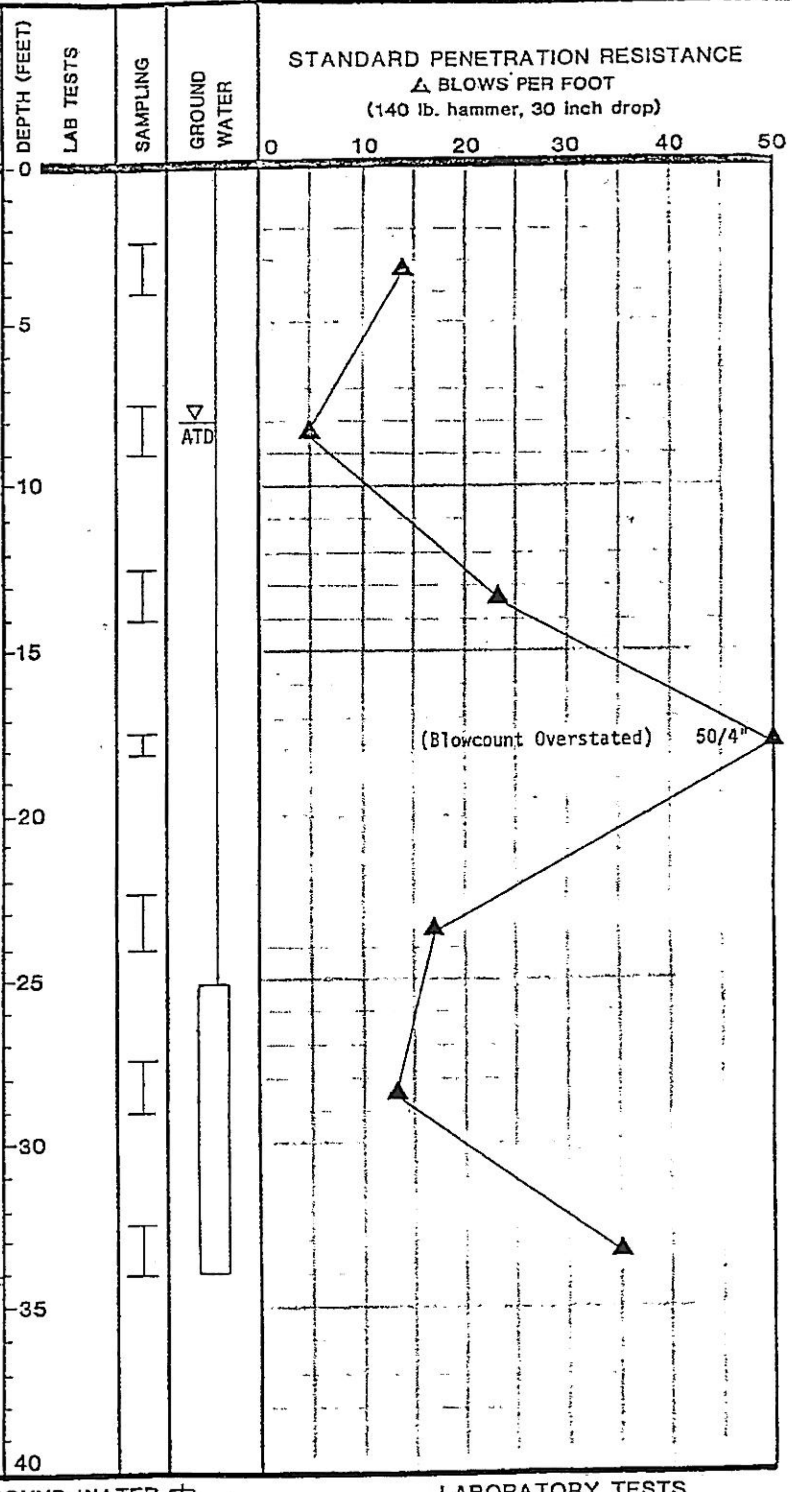
Loose, wet to saturated, gray SAND with some silt and trace gravel (Fill)

Medium dense, saturated, brown-gray, silty, gravelly SAND (Possible Fill)

Very dense, saturated, gray, silty, sandy GRAVEL

Medium dense to dense, wet to saturated, gray, interbedded silty fine SAND to SAND with trace silt; intermixed shell fragments and clay

Boring terminated at 34 feet
9 November 1987



SAMPLING
- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- ☒ 2.5" ID RING SAMPLE
- B BULK SAMPLE
- * SAMPLE NOT RECOVERED

GROUND WATER
- ▨ SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ▽ ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER B-2 W.O. W-5378

PROJECT NAME William Hulbert Mill Marina

SOIL DESCRIPTION

Ground Surface Elevation Approximately 15 Feet

Loose, moist, brown, fine to medium SAND (Fill)

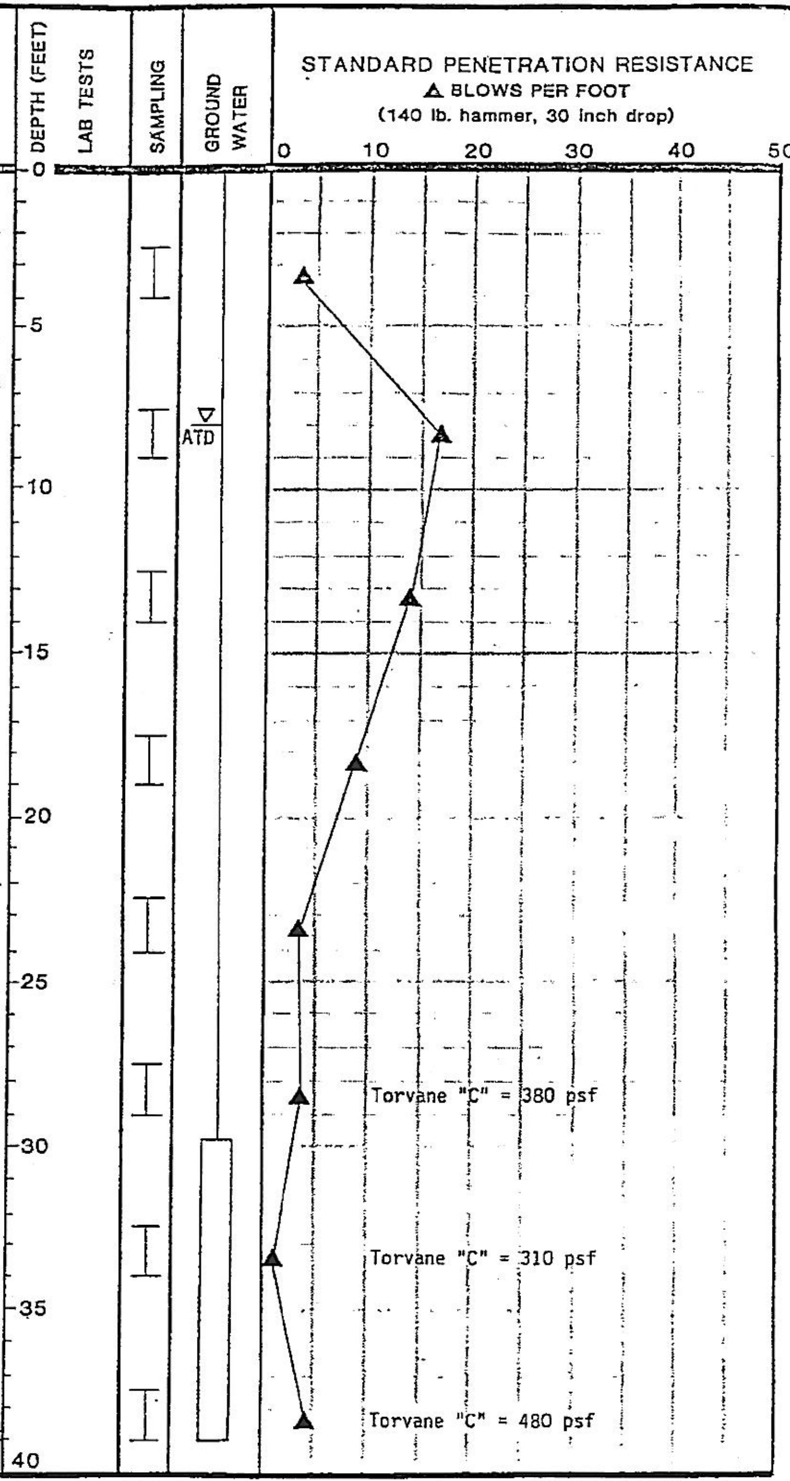
Very Loose, moist, brown-gray, silty SAND interlayered with wood fragments (Fill)

Medium dense, wet to saturated, brown-gray to gray, silty, gravelly SAND with intermixed organics and wood debris (Fill)

Loose, saturated, gray, silty fine SAND with trace organics and shell fragments

Interbedded very loose, saturated, gray, silty fine SAND and very soft to soft, saturated, gray, fine sandy SILT; with trace organics and shell fragments.

Boring terminated at 39 feet 9 November 1987



SAMPLING
- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- ☒ 2.5" ID RING SAMPLE
- B BULK SAMPLE
- * SAMPLE NOT RECOVERED

GROUND WATER
- ▨ SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ▽ ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- PLASTIC LIMIT
- NATURAL WATER CONTENT
- LIQUID LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER B-3 W.O. W-5378

PROJECT NAME William Hulbert Mill Marina

SOIL DESCRIPTION

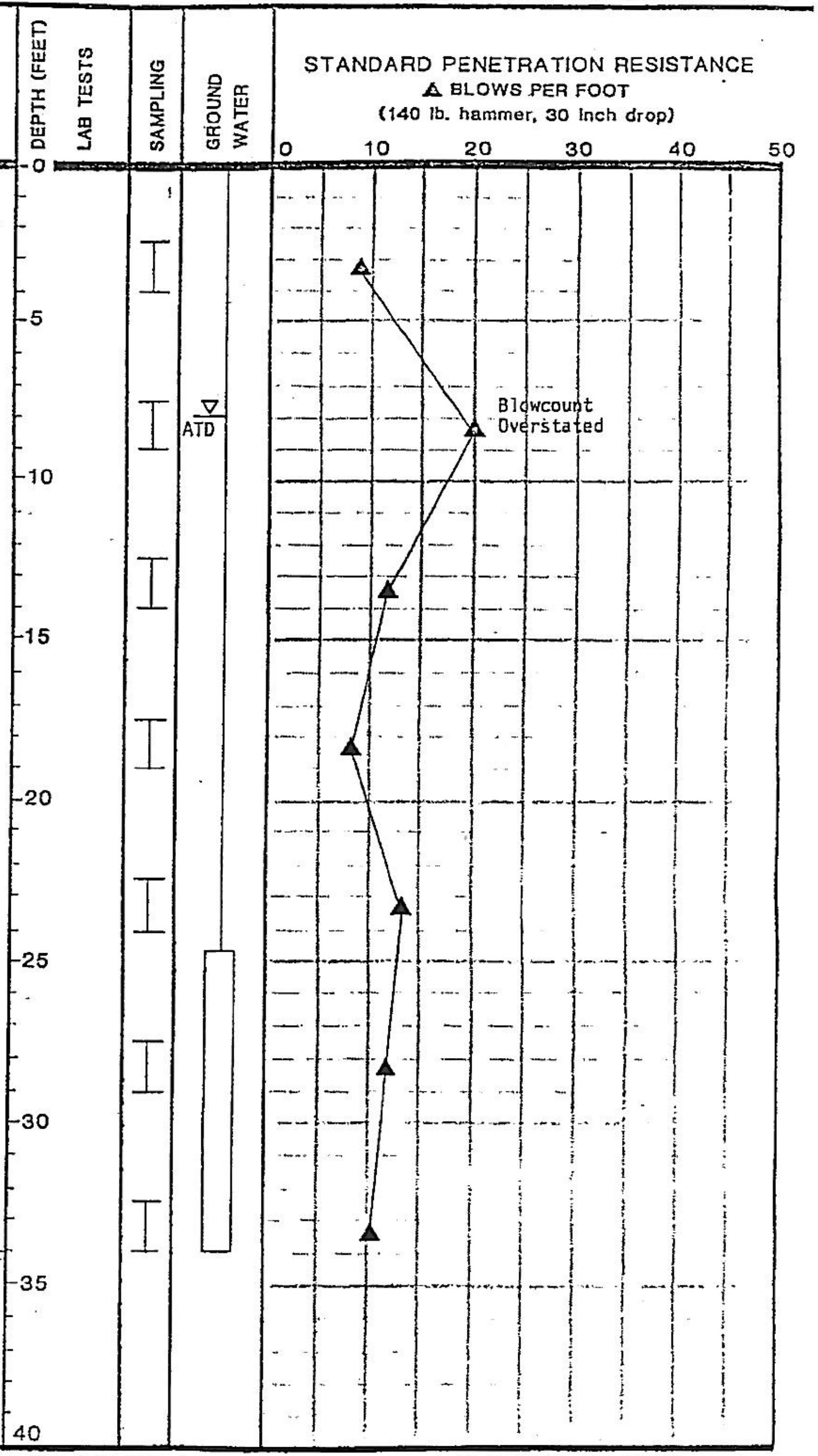
Ground Surface Elevation Approximately 17 Feet

Loose, moist, brown, SAND with some silt (Fill)

Loose to medium dense, moist to saturated, gray to brownish gray, silty fine to medium SAND with some organics; interlayered fine sandy SILT; scattered gravels from 6 to 12 feet (Possible Fill)

Medium dense, saturated, gray, silty fine to medium SAND with some shell fragments; scattered wood debris; interlayered fine sandy SILT

Boring terminated at 34 feet
9 November 1987



SAMPLING
- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- ☒ 2.5" ID RING SAMPLE
- B BULK SAMPLE
- * SAMPLE NOT RECOVERED

GROUND WATER
- ▨ SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- PLASTIC LIMIT — NATURAL WATER CONTENT — LIQUID LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER B-4 W.O. W-5378
PROJECT NAME William Hulbert Mill Marina

SOIL DESCRIPTION

Ground Surface Elevation Approximately 16 Feet

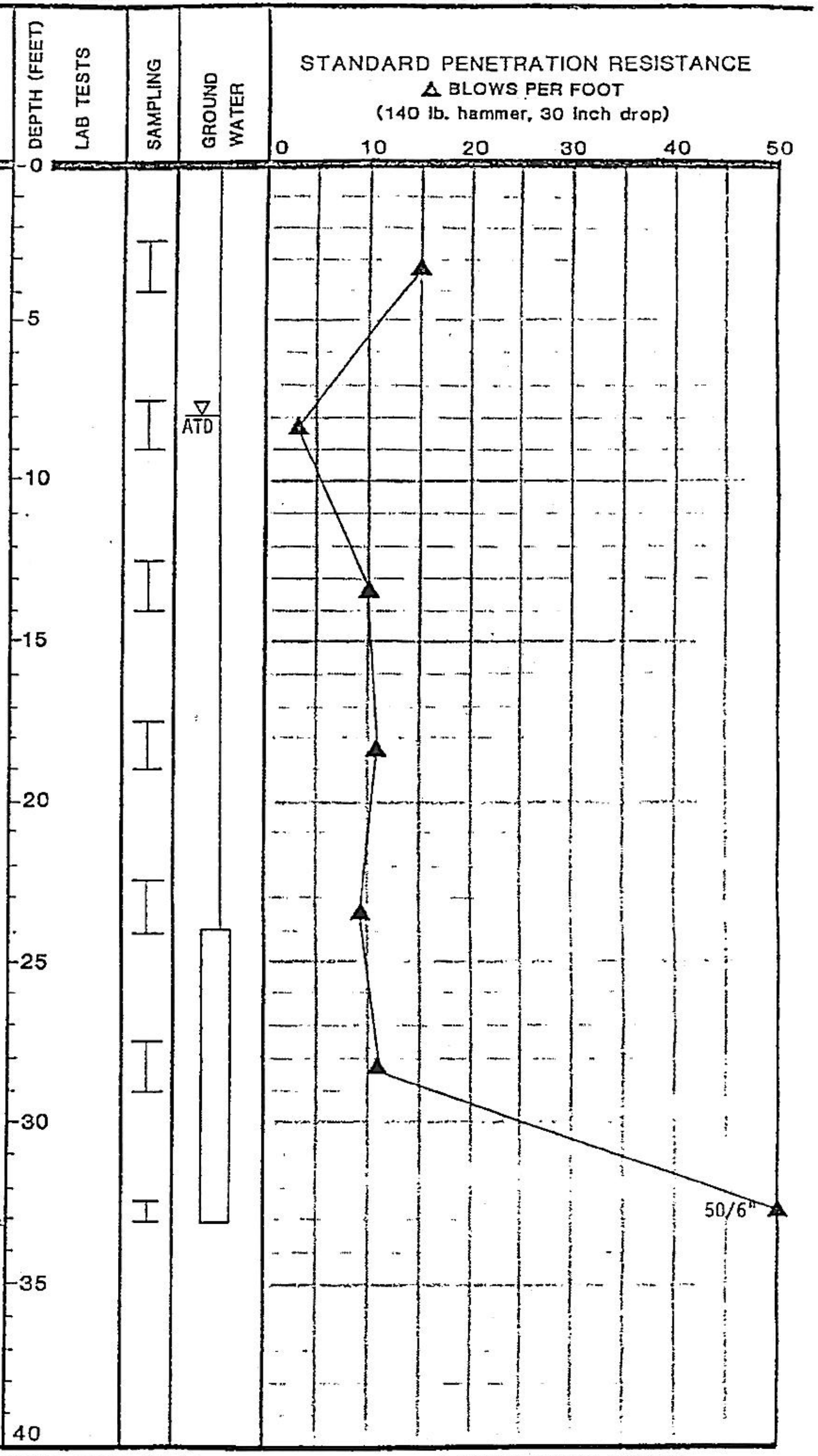
Medium dense, moist, brown-gray, silty SAND with some organics; interlayered fine sandy SILT; scattered gravels (Fill)

Soft, moist to saturated, black-gray, fine sandy SILT with some organics

Loose to medium dense, saturated, black-gray to gray, silty fine to medium SAND with intermixed organics and shell fragments; interbedded with fine sandy SILT

Very dense, saturated, gray, gravelly SAND with trace of silt

Boring terminated at 33 feet
9 November 1987



SAMPLING
- Ɪ 2" OD SPLIT SPOON SAMPLE
- Ⅱ 3" OD SHELBY SAMPLE
- ☒ 2.5" ID RING SAMPLE
- B BULK SAMPLE
- * SAMPLE NOT RECOVERED

GROUND WATER
- ▨ SEAL
- WATER LEVEL AT TIME OF DRILLING ▽ ATD DATE
- ▯ OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER B-5
W.O. W-5378
PROJECT NAME William Hulbert Mill Marina

SOIL DESCRIPTION

Ground Surface Elevation Approximately 18 Feet

Loose, moist, brown/gray, silty fine to medium SAND with some coarse sand, trace gravel (Fill)

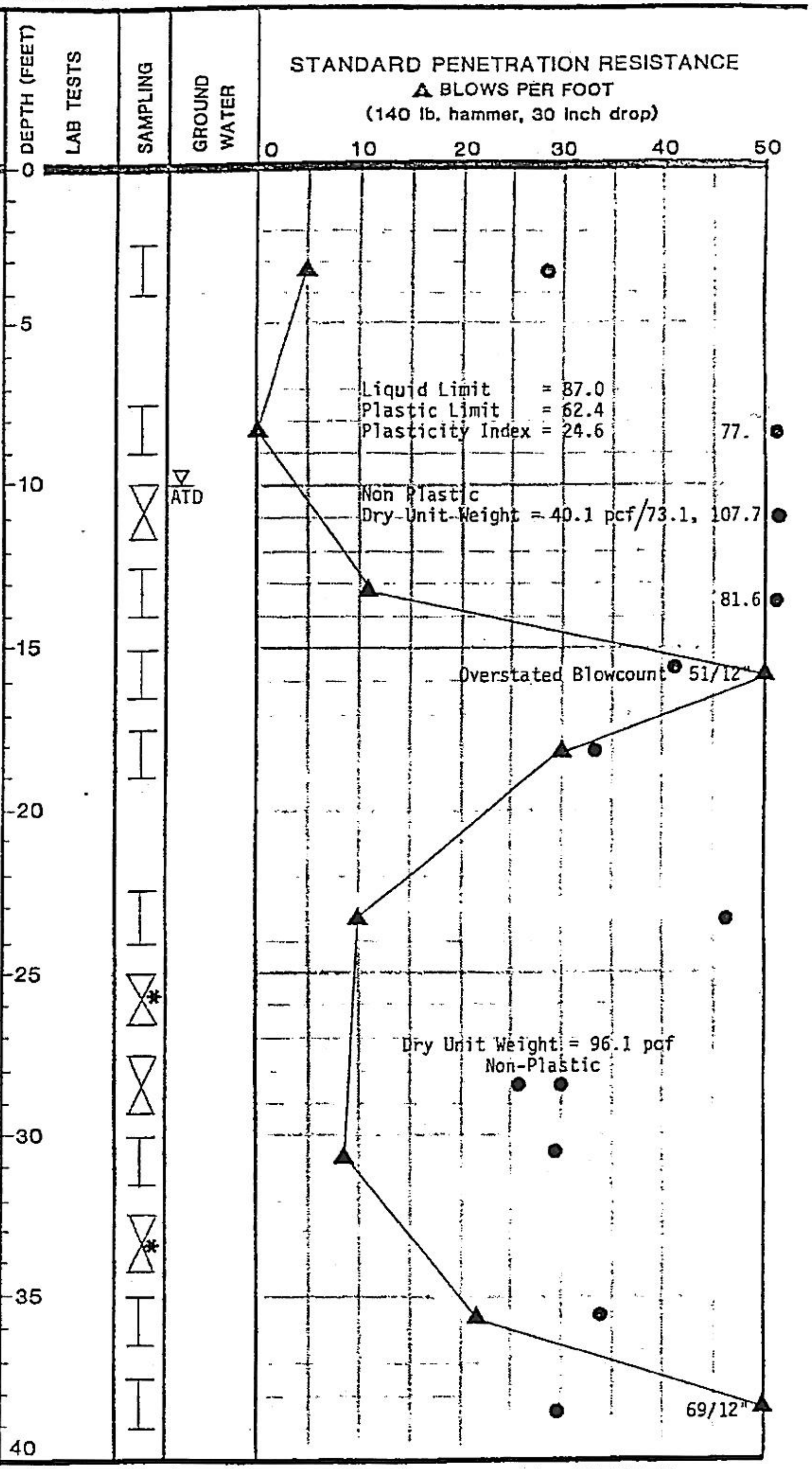
Very soft to stiff, moist to wet, black/gray, fine sandy SILT with trace clay, organics (Fill)

Dense to very dense, wet, gray, silty fine SAND with some medium to coarse sand, gravel, organics

Loose to medium dense, wet, black/gray, silty fine SAND with some medium sand, shell fragments, organics interbedded with fine sandy SILT

Dense to very dense, wet, gray, fine to medium SAND with trace silt, shell fragments

Total depth 39 feet Completed 6 January 1988



SAMPLING
- Ɪ 2" OD SPLIT SPOON SAMPLE
- Ⅱ 3" OD SHELBY SAMPLE
- ☒ 2.5" ID RING SAMPLE
- B BULK SAMPLE
- * SAMPLE NOT RECOVERED

GROUND WATER
- ▨ SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ▽ ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER B-6　W.O. W-5378

PROJECT NAME William Hulbert Hill Marina

SOIL DESCRIPTION

Ground Surface Elevation Approximately 17 Feet

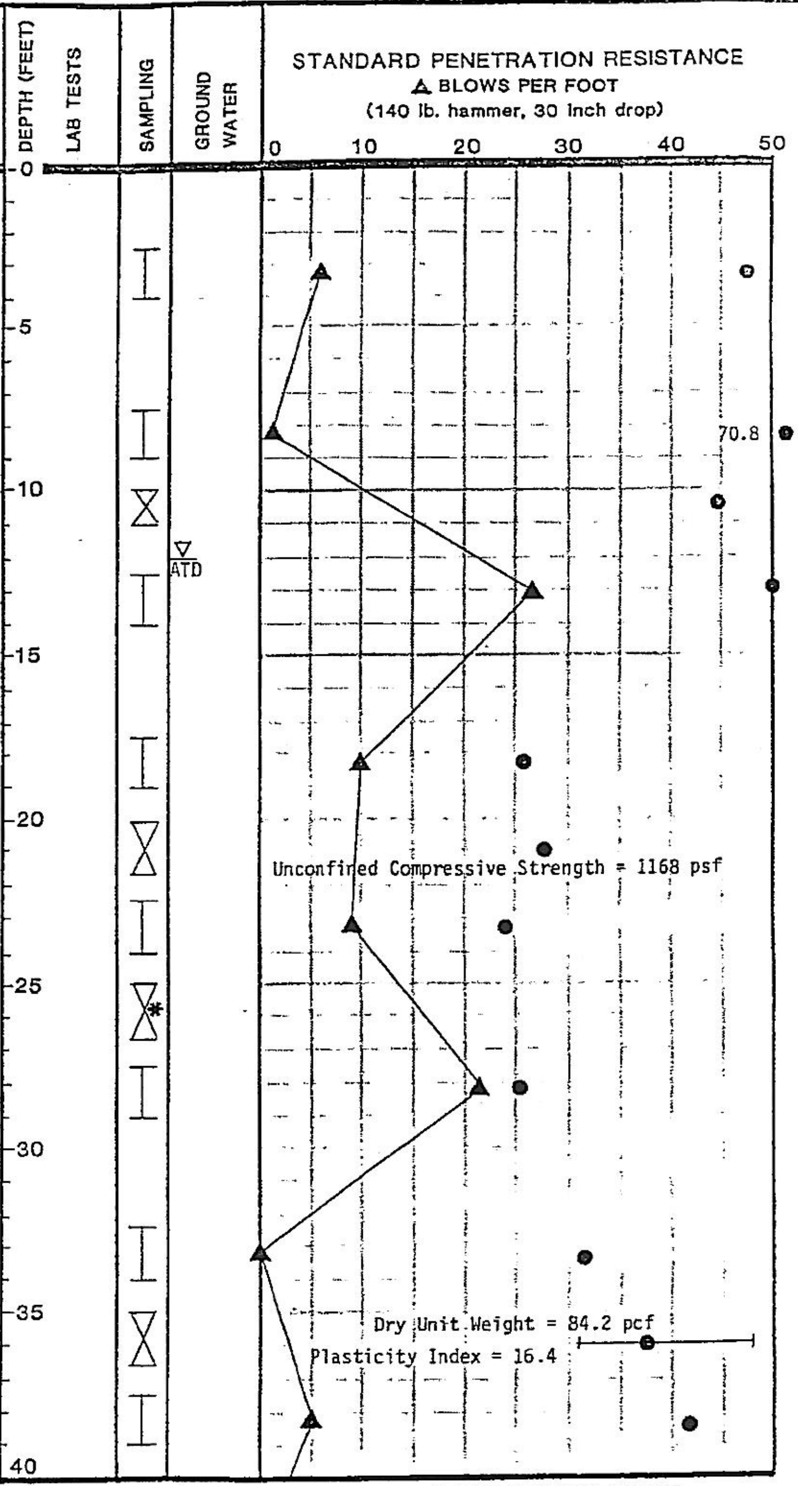
Loose, moist, brown/gray, silty fine to medium SAND with some gravel (Fill)

Loose, moist, black/gray, silty fine SAND interbedded with soft, fine sandy SILT with some organics (Fill)

Medium dense, wet, gray, silty fine SAND with some organics (Possible Fill)

Loose to medium dense, moist to wet, black/gray, silty fine SAND interbedded with fine sandy SILT with some medium sand, shell fragments

Very soft, wet, gray, fine sandy SILT with some silty fine SAND zones, trace organics, clay



Unconfined Compressive Strength = 1168 psf

Dry Unit Weight = 84.2 pcf

Plasticity Index = 16.4

SAMPLING
- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- ☒ 2.5" ID RING SAMPLE
- B BULK SAMPLE
- * SAMPLE NOT RECOVERED

GROUND WATER
- ▨ SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ▽ ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER B-6 (cont.) W.O. W-5378
PROJECT NAME William Hulbert Mill Marina

SOIL DESCRIPTION

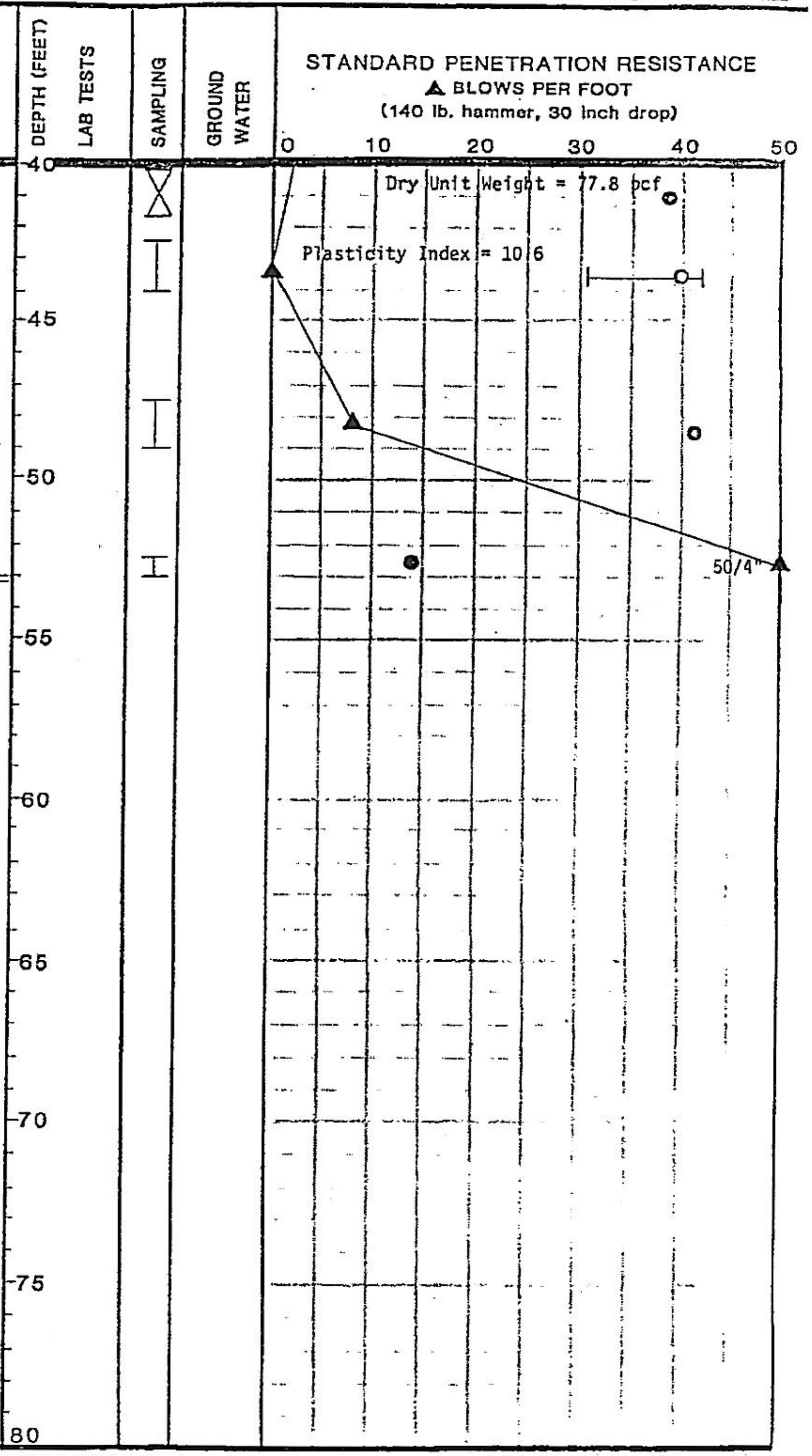
Ground Surface Elevation Approximately 17 Feet

Same as above

— — medium stiff

Dense to very dense, wet, gray, silty fine to medium SAND with trace gravel, shell fragments

Total depth 53 feet
Completed 7 January 1988



SAMPLING
- Ⅰ 2" OD SPLIT SPOON SAMPLE
- Ⅱ 3" OD SHELBY SAMPLE
- ☒ 2.5" ID RING SAMPLE
- B BULK SAMPLE
- * SAMPLE NOT RECOVERED

GROUND WATER
▨ SEAL
DATE
▽ ATD WATER LEVEL AT TIME OF DRILLING
▯ OBSERVATION WELL TIP

LABORATORY TESTS
● % WATER CONTENT
NP NON PLASTIC
LIQUID LIMIT
NATURAL WATER CONTENT
PLASTIC LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER B-7 W.O. W-5378
PROJECT NAME William Hulbert Mill Marina

SOIL DESCRIPTION

Ground Surface Elevation Approximately 16 Feet

Loose to medium dense, moist, brown/gray, silty fine to medium SAND with some gravel, organics (Fill)

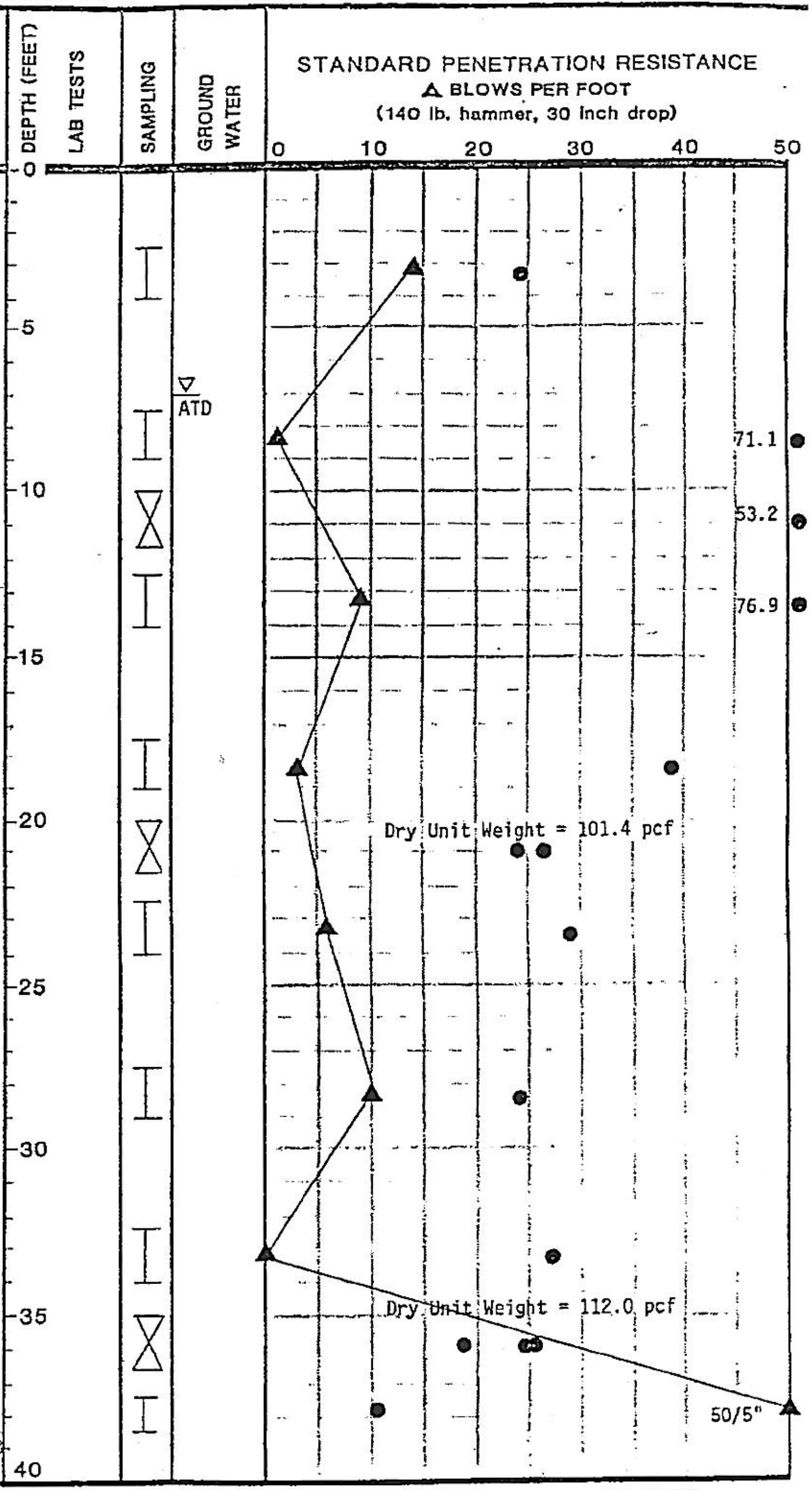
Very soft, wet, gray/black, fine sandy SILT with some organics, interbedded with silty fine SAND (Fill)

— medium stiff

Very loose to loose, moist to wet, gray, silty fine to medium SAND with some organics, shell fragments interbedded with fine sandy SILT

Dense to very dense, wet, gray, fine to medium SAND with some gravel, silt

Total depth 38.5 feet Completed 7 January 1988



SAMPLING
- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- ☒ 2.5" ID RING SAMPLE
- B BULK SAMPLE
- * SAMPLE NOT RECOVERED

GROUND WATER
- ▨ SEAL
- DATE
- ▽ ATD WATER LEVEL AT TIME OF DRILLING
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER B-8
W.O. W-5378
PROJECT NAME William Hulbert Mill Marina

SOIL DESCRIPTION

Ground Surface Elevation Approximately 17 Feet

Loose to medium dense, moist to wet, gray, silty fine to medium SAND with some shell fragments

Very soft to soft, wet, gray, fine sandy SILT with some organics, shell fragments (Fill)

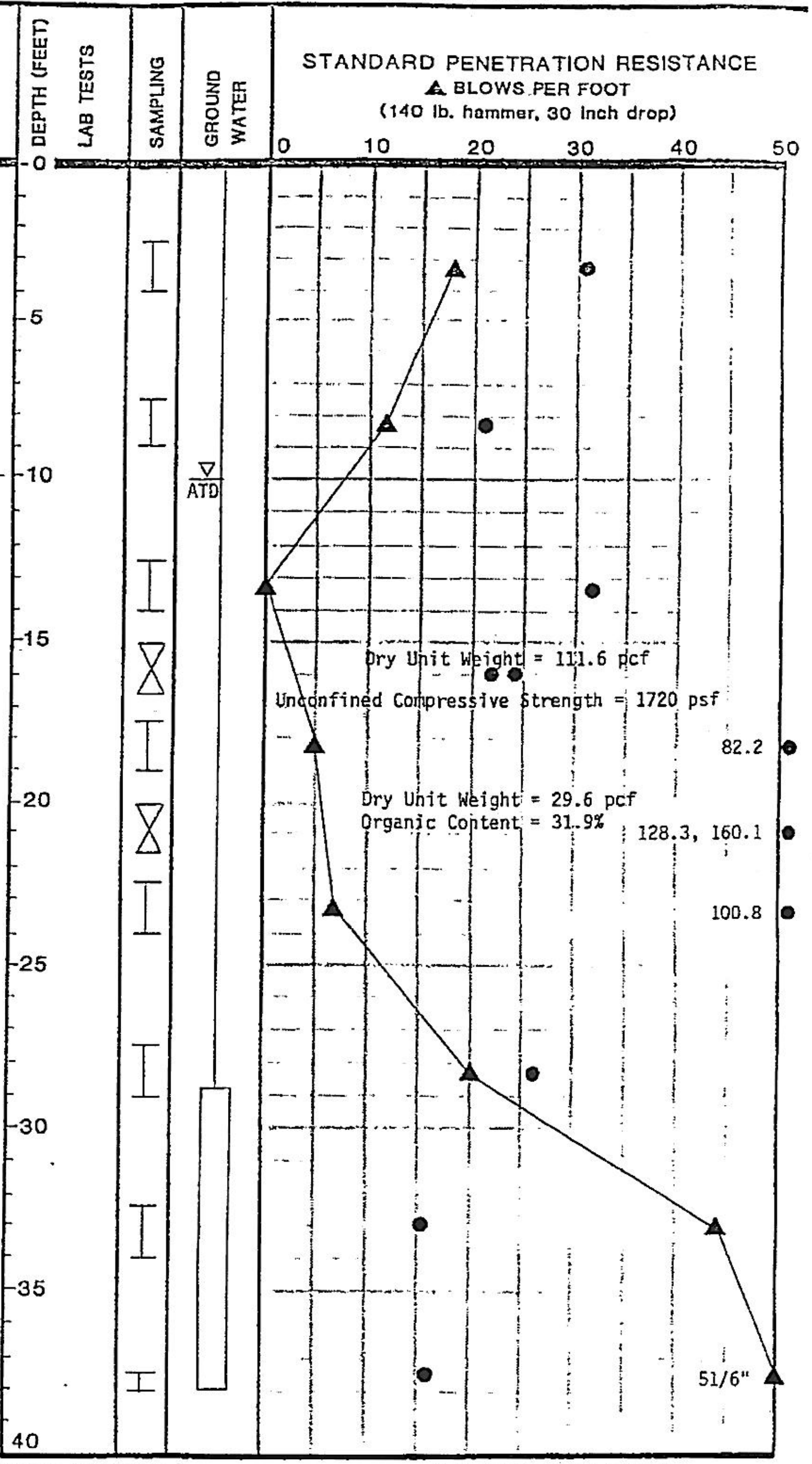
Abundant wood fragments from 17.5 to 26 feet

Medium dense, wet, gray, silty fine to medium SAND with some gravel, shell fragments

dense

very dense

Total depth 38 feet
Completed 7 January 1988



Dry Unit Weight = 111.6 pcf
Unconfined Compressive Strength = 1720 psf

Dry Unit Weight = 29.6 pcf
Organic Content = 31.9%

SAMPLING
- Ⅰ 2" OD SPLIT SPOON SAMPLE
- Ⅱ 3" OD SHELBY SAMPLE
- ☒ 2.5" ID RING SAMPLE
- B BULK SAMPLE
- ★ SAMPLE NOT RECOVERED

GROUND WATER
- ▨ SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ▽ ATD
- ▯ OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- ├─●─┤ PLASTIC LIMIT, NATURAL WATER CONTENT, LIQUID LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER B-9 W.O. W-5378
PROJECT NAME William Hulbert Hill Marina

SOIL DESCRIPTION

Ground Surface Elevation Approximately 17 Feet

Medium dense, moist, gray, silty fine to medium SAND with some organics, shell fragments (Fill)

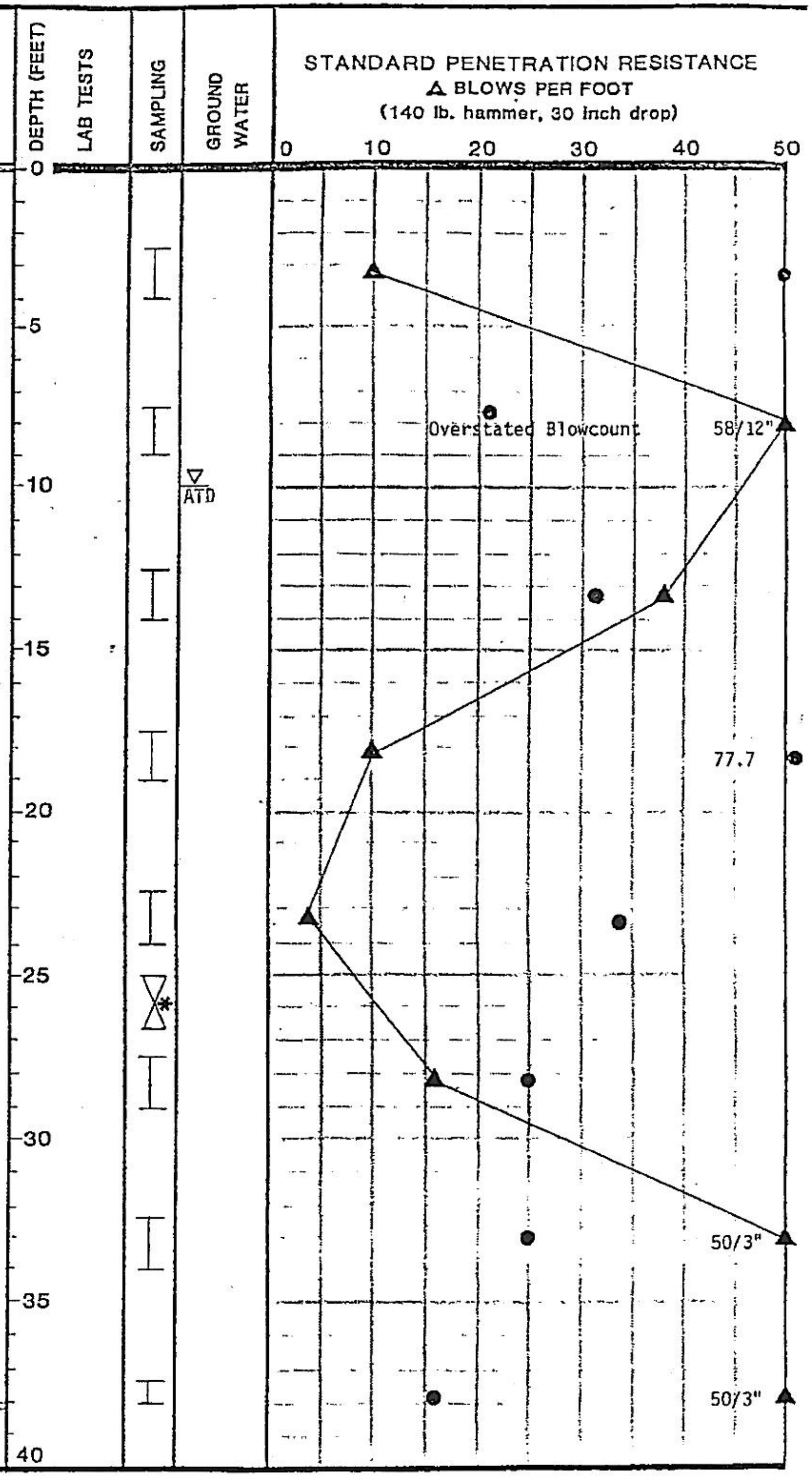
— dense to very dense

Loose, wet, gray/black, silty fine SAND with some medium sand, organics, shell fragments, interbedded with fine sandy SILT

— medium dense

Dense to very dense, wet, gray/black, silty fine to medium SAND with some coarse sand, gravel, shell fragments

Total depth 38 feet
Completed 8 January 1988



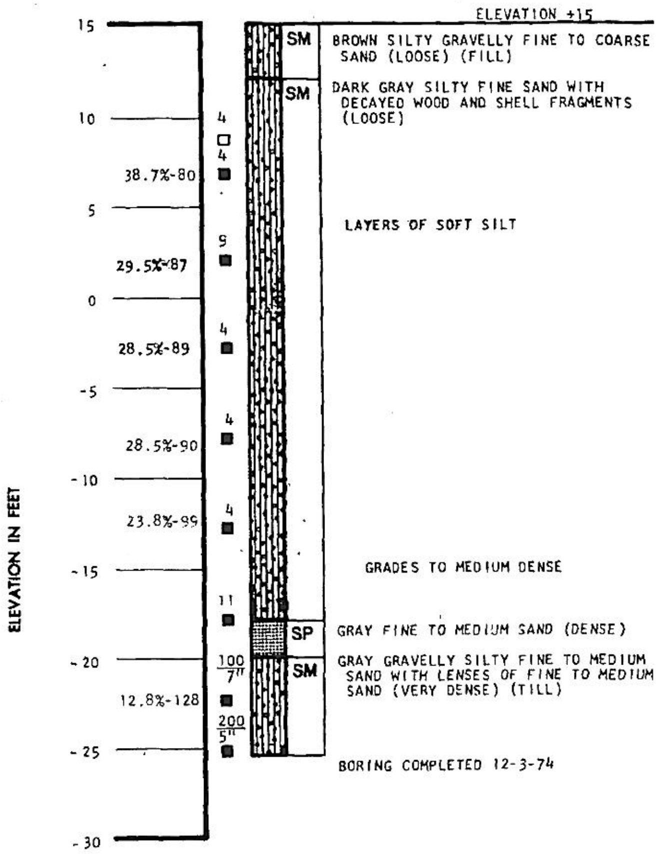
SAMPLING
- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- ☒ 2.5" ID RING SAMPLE
- B BULK SAMPLE
- * SAMPLE NOT RECOVERED

GROUND WATER
▨ SEAL
DATE
WATER LEVEL AT TIME OF DRILLING ▽ ATD
OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

BORING 5

5'



LOG OF BORINGS

DAMES & MOORE

PLATE A-1

FILE 4333-017
BY JAM DATE 12-1-74
CHECKED BY [illegible] DATE

REVISIONS
BY ____ DATE ____
BY ____ DATE ____
PLATE ____ OF ____

APPENDIX D

Terrestrial Ecological Exclusion Form

Washington State Department of Ecology
Toxics Cleanup Program

Terrestrial Ecological Evaluation Process - Primary Exclusions

Documentation Form

Exclusion #	Exclusion Detail	Yes or No?	Are Institutional Controls Required If The Exclusion Applies?
1	Will soil contamination be located at least 6 feet beneath the ground surface and less than 15 feet?	Yes ☐ / No ☐	Yes ☐
	Will soil contamination be located at least 15 feet beneath the ground surface?	Yes ☐ / No ☐	No ☐
	Will soil contamination be located below the conditional point of compliance?	Yes ☐ / No ☐	Yes ☐
2	Will soil contamination be covered by buildings, paved roads, pavement, or other physical barriers that will prevent plants or wildlife from being exposed?	Yes ☐ / No ☐	Yes ☐
3[1]	Is there less than 1.5 acres of contiguous undeveloped land on the site, or within 500 feet of any area of the site affected by hazardous substances **other than** those listed in the table of Hazardous Substances of Concern? And Is there less than 0.25 acres of contiguous undeveloped land on or within 500 feet of any area of the site affected by hazardous substances **listed in** the table of Hazardous Substances of Concern?	**Yes** ☒ / No ☐ **Yes** ☒ / No ☐	Other factors determine
4	Are concentrations of hazardous substances in the soil less than or equal to natural background concentrations of those substances at the point of compliance	Yes ☐ / No ☐	No ☐

---

[1] **A terrestrial ecological evaluation is not required for the Site based on Exclusion Criteria 3.**

APPENDIX E

Health and Safety Plan

Health and Safety Plan
Ameron-Hulbert Site
Everett, Washington

September 14, 2010

Prepared for

Port of Everett, Washington

Landau Associates
130 2nd Avenue South
Edmonds, WA 98020
(425) 778-0907

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TABLE

Table	Title
E-1	Human Health Information for Chemicals of Concern

ATTACHMENTS

Attachment	Title
1	Air Monitoring Strategy
2	Emergency Information and Route to Hospital Map
3	Certification

Site Health and Safety Plan
Summary

Site Name: North Marina Ameron-Hulbert Site

Location: Everett, Washington

Client: Port of Everett

Proposed Dates of Activities: 2010, 2011

Type of Facility: Marinas, boatyards, and commercial and industrial property undergoing redevelopment

Land Use of Area Surrounding Facility: Commercial, industrial, and marine

Site Activities: Drilling soil boreholes using direct-push techniques, well installation, groundwater sampling, and sediment sampling

Potential Site Contaminants: Arsenic, copper, total petroleum hydrocarbons, polycyclic aromatic hydrocarbons, and vinyl chloride

Routes of Entry: Skin contact with soil, groundwater, or sediment; incidental ingestion of soil, water, or sediment; and inhalation of airborne droplets, dusts, or vapors

Protective Measures: Hard hat, safety glasses, gloves, protective clothing, steel-toed boots, personal flotation device if offshore

1.0 INTRODUCTION

This site-specific health and safety plan (HASP) addresses procedures to minimize the risk of chemical exposures, physical accidents to onsite workers, and environmental contamination.

1.1 PURPOSE AND REGULATORY COMPLIANCE

The HASP covers each of the required elements as specified in 29 CFR 1910.120 or equivalent Washington State Department of Labor and Industries regulations. When combined with the Landau Associates Health and Safety Program, this site-specific plan meets all applicable regulatory requirements.

This HASP will be made available to all Landau Associates' personnel and subcontractors involved in field work on this project. For subcontractors, this HASP represents minimum safety procedures. Subcontractors are responsible for their own safety while present on site or conducting work for this project. Subcontractor work may involve safety and health procedures not addressed in the HASP. The HASP was originally prepared by a Certified Industrial Hygienist and has been reviewed by the Landau Associates' Corporate Health and Safety Officer. By signing the documentation form provided with this plan (Attachment 3), project workers also certify their agreement to comply with the plan. Both Landau Associates and its subcontractors are independently responsible for the health and safety of their own employees on the project.

1.2 CHAIN OF COMMAND

The Landau Associates chain of command for health and safety on this project involves the following individuals:

Landau Associates' Task Manager: Kathryn Hartley. The Task Manager, in conjunction with the Project Manager (Larry Beard), has overall responsibility for the successful outcome of the project. The Task Manager, in consultation with the contracted Certified Industrial Hygienist or Corporate Health and Safety (H&S) Manager and the Project Manager, makes final decisions regarding questions concerning the implementation of the site HASP.

Landau Associates' Project H&S Coordinator: To be determined. As the Project H&S Coordinator, this individual is responsible for implementing the HASP in the field. The Project H&S Coordinator informs subcontractors of the minimum requirements of this plan. This person will also assure that proper protective equipment is available and used in the correct manner, decontamination activities are carried out properly, and that employees have knowledge of the local emergency medical system.

Landau Associates' Corporate H&S Manager: Chris Kimmel. The Landau Associates Corporate H&S Manager has overall responsibility for preparation and modification of this HASP. In the event that health and safety issues arise during site operations, the H&S Manager will attempt to resolve them in discussion with the appropriate members of the project team.

Project Team Members: Project team members are responsible for understanding the H&S requirements for this project and implementing these procedures in the field. Team members will receive technical guidance from the Project H&S Coordinator.

1.3 SITE WORK ACTIVITIES

This HASP covers field site activities to be conducted throughout the remedial investigation (RI) at the North Marina Ameron-Hulbert site. The field activities associated with the RI include:

- Drilling shallow boreholes using direct-push technology
- Installation of shallow groundwater wells
- Collection of groundwater samples following installation of the wells
- Water level monitoring at the monitoring wells
- Collection of offshore surface sediment samples
- Collection of sediment from stormwater catch basins.

1.4 SITE DESCRIPTION

The site is used for a variety of commercial, industrial, and marine-related activities. The site is located between 11th and 13th Streets off West Marine View Drive in Everett, Washington. The site is approximately 30 acres (12 acres in-water) and flat.

2.0 HAZARD EVALUATION AND CONTROL MEASURES

2.1 TOXICITY OF CHEMICALS OF CONCERN

Based on previous site information and knowledge of the types of activities conducted at the site, the following chemicals may be present at this site: arsenic (As), copper (Cu), total petroleum hydrocarbons, polycyclic aromatic hydrocarbons, and vinyl chloride.

Human health hazards of these chemicals are summarized in Table E-1. The information provided in this table covers potential toxic effects that might occur if relatively significant acute and/or chronic exposure occurred. However, this information does not indicate that such effects are likely to occur from the planned site activities. The chemicals that may be encountered at this site are not expected to be present at concentrations that could cause significant health hazards from short-term exposures. The types of planned work activities and use of monitoring procedures and protective measures will further limit potential exposures at this site.

Health standards are presented using the following abbreviations:

- PEL – Permissible exposure limit
- TWA – Time-weighted average exposure limit for any 8-hour work shift
- STEL – Short-term exposure limit expressed as a 15-minute time-weighted average and not to be exceeded at any time during a work day.

2.2 POTENTIAL EXPOSURE ROUTES

2.2.1 INHALATION

Inhalation of dusts generated during soil sampling and drilling or sediment sampling could be an issue if the weather is dry, windy, or warm. Exposure via this route could potentially occur if chemicals are present in the soil or sediment and dust particles become airborne during site activities or if volatile organic compounds (VOCs) are liberated when samples are exposed to air or during drilling of soil boreholes.

2.2.2 SKIN CONTACT

Exposure via this route could occur if contaminated soil, groundwater, or sediment contacts the skin or clothing. Protective clothing and decontamination activities specified in this plan will minimize the potential for skin contact with the contaminants.

2.2.3 INGESTION

Exposure via this route could occur if individuals eat, drink, or perform other hand-to-mouth contact in the contaminated (exclusion) zones. Decontamination procedures established in this plan will minimize the inadvertent ingestion of contaminants.

2.3 HEAT STRESS AND HYPOTHERMIA

2.3.1 HEAT STRESS

Use of impermeable clothing reduces the cooling ability of the body due to evaporation reduction. This may lead to heat stress. If such conditions occur during site activities, appropriate work-rest cycles will be utilized and water or electrolyte-rich fluids (Gatorade or equivalent) will be made available to minimize heat stress effects.

Also, when ambient temperatures exceed 70°F, monitoring of employee pulse rates will be conducted. Each employee will check his or her pulse rate at the beginning of each break period. Take the pulse at the wrist for 6 seconds, and multiply by 10. If the pulse rate exceeds 110 beats per minute, then reduce the length of the next work period by one-third.

Example: After a 1-hour work period at 80°F, a worker has a pulse rate of 120 beats per minute. The worker must shorten the next work period by one-third, resulting in a work period of 40 minutes until the next break.

2.3.2 HYPOTHERMIA

Hypothermia can result from abnormal cooling of the core body temperature. It is caused by exposure to a cold environment and wind-chill. Wetness or water immersion can also play a significant role.

Typical warning signs of hypothermia include fatigue, weakness, lack of coordination, apathy, and drowsiness. A confused state is a key symptom of hypothermia. Shivering and pallor are usually absent, and the face may appear puffy and pink. Body temperatures below 90°F require immediate treatment to restore temperature to normal.

Current medical practice recommends slow re-warming as treatment for hypothermia, followed by professional medical care. This can be accomplished by moving the person into a sheltered area and wrapping with blankets in a warm room. In emergency situations, where body temperature falls below 90°F and a heated shelter is not available, use a sleeping bag, blankets, and body heat from another individual to help restore normal body temperature.

2.4 OTHER PHYSICAL HAZARDS

2.4.1 SLIPS/FALLS

As with all field work sites, caution will be exercised to prevent slips on rain-slick surfaces, stepping on sharp objects, etc. Work will not be performed on elevated platforms without fall protection. With offshore work, there is a possibility of falling overboard. When possible, personnel will stand well in from the edges of the deck. Personal flotation devices will be worn at all times when on a vessel. At least one person with current training in first aid and CPR will be on site at all times.

2.4.2 MACHINERY/MOVING PARTS

The drilling equipment or sampling vessel may be equipped with various winches, motors, booms, and other machines. These present a general physical hazard from moving parts. Personnel will stand clear of machinery at all times unless specific instructions are given by the drill rig operator, vessel skipper, or other person in authority. Steel-toed shoes or boots will be worn at all times when on the site or on the vessel. When possible, appropriate guards will be in place during equipment use.

Lifting equipment used to raise and lower sediment sampling equipment may also present a physical hazard. Field personnel should be careful to keep loose clothing, hands, and feet away from winches and capstones. Sampling equipment, especially grab samplers, can present a severe pinch hazard and personnel must make sure they understand how the device works before operating it.

2.4.3 CONFINED SPACES

Confined space entry is not anticipated for this project. Personnel will not enter any confined space without specific approval of the Project Manager, Task Manager, and Corporate H&S Manager.

2.4.4 NOISE

Appropriate hearing protection (ear muffs or ear plugs with a noise reduction rating of at least 20 dBA) will be used if individuals work near high-noise-generating equipment (> 85 dBA). Determination of the need for hearing protection will be made by the Project H&S Coordinator.

2.5 SEDIMENT SAMPLING

All sediment sampling activities conducted from boats will be conducted using basic principles of water safety, including:

- Use Coast Guard-approved life jackets for all offshore activities
- Avoid standing near edge of boat
- Secure workers with lifeline if work must be conducted over edge

- Avoid sampling on stormy days or when seas are high
- Use caution when transferring from land to sea; make sure barges and boats are firmly secured to dock or pier before boarding or disembarking
- Wear hard hats and appropriate personal protective equipment in exclusion areas.

3.0 PROTECTIVE EQUIPMENT AND AIR MONITORING

3.1 PROTECTIVE EQUIPMENT

Work for this project will be conducted in Level D protection. Level C protection is presented as a contingency only and represents a modified protection level, incorporating respiratory protection only where required by site conditions. Situations requiring Levels A or B protection are not anticipated for this project; should they occur, work will stop and the HASP will be amended, as appropriate, prior to resuming work.

Workers performing general site activities where skin contact with highly contaminated materials is unlikely and inhalation risks are not expected will wear coveralls, eye protection, gloves (whenever handling samples), and safety boots. Offshore activities require use of a Coast Guard-approved life jacket. Level D protection will consist of the following:

- Hard hats
- Rain gear or poly-coated Tyvek (wet operations) or uncoated Tyvek (dry operations)
- Safety glasses
- Steel-toed, chemical-resistant boots
- Nitrile, neoprene, or equivalent inner and outer gloves.

Workers performing site activities where heavily contaminated materials are detected will wear chemical-resistant gloves (nitrile, neoprene, or other appropriate outer and inner gloves) and coated Tyvek or other chemical-resistant suits. Workers will use face shields or goggles, as necessary, to avoid splashes.

When performing activities in which inhalation of chemical vapors and dusts is a concern, workers will wear half-mask or full-face air-purifying respirators with combination cartridges. Cartridges should be changed, at a minimum, on a daily basis. They should be changed more frequently if chemical vapors are detected inside the respirator or other symptoms of breakthrough are noted (e.g., irritation, dizziness, breathing difficulty).

3.2 AIR MONITORING

Direct-reading instruments give immediate, real time readings of contaminant levels. Reliable direct-reading instruments, such as the combustible gas indicator, photoionization detector (PID), flame ionization detector, and colorimetric tubes, are available for situations commonly encountered at hazardous and contaminated substance sites. The appropriate type of monitoring equipment depends on the suspected type and concentration of chemical contaminants. The primary limitation of direct-reading instruments is that most do not quantify specific chemical compounds.

Air monitoring for VOCs will be conducted during drilling or other intrusive activities. A PID will be used to monitor for VOCs (Table E-1). The instrument will be calibrated prior to each day's activity according to manufacturer's instructions. Calibration will be recorded in the health and safety logbook or field notes. Readings will be entered into the logbook at a minimum of 30-minute intervals.

Attachment 1 identifies the air monitoring strategy to be used during field investigations.

4.0 SAFETY EQUIPMENT LIST

The following safety equipment must be available on site:

- First aid kit
- Mobile telephone
- Steel-toed safety boots
- Chemical-resistant coveralls and gloves
- Safety glasses
- Hard hat
- Life jackets (during offshore activities only)
- Air monitoring instruments (during onshore activities only)
- Half-face respirator with cartridges.

5.0 EXCLUSION AREAS

If migration of chemicals from the work area is a possibility, or as otherwise required by regulations or client specifications, site control will be maintained by establishing clearly identified work zones. These will include the exclusion zone, contaminant reduction zone, and support zone, as discussed below.

5.1 EXCLUSION ZONE

Exclusion zones will be established around each contaminated substance activity location. Only persons with appropriate training and authorization from the Project H&S Coordinator will enter this perimeter while work is being conducted.

5.2 CONTAMINATION REDUCTION ZONE

A contamination reduction zone will consist of a decontamination station that must be used to exit the exclusion zone. The station will have the brushes and wash fluids necessary to decontaminate personnel and equipment leaving the exclusion zone. Care will be taken to prevent the spread of contamination from this area.

5.3 SUPPORT ZONE

A support zone will be established outside the contamination reduction area to stage clean equipment, don protective clothing, take rest breaks, etc. For sediment sampling conducted from a vessel, this zone will include the cabin of the vessel.

6.0 MINIMIZATION OF CONTAMINATION

To make the work zone procedure function effectively, the amount of equipment and number of personnel allowed in contaminated areas must be minimized. In addition, the amounts of sample collected should not exceed what is needed for laboratory analysis and record samples. Do not kneel on contaminated ground, stir up unnecessary dust, or perform any practice that increases the probability of hand-to-mouth transfer of contaminated materials. Eating, drinking, chewing gum, smoking, or using smokeless tobacco are forbidden in the exclusion zone.

7.0 DECONTAMINATION

Decontamination is necessary to limit the migration of contaminants from the work zone(s) onto the site or from the site into the surrounding environment. Equipment and personnel decontamination are discussed in the following sections, and the following types of equipment will be available to perform these activities:

- Boot and glove wash bucket and rinse bucket
- Scrub brushes – long handled
- Spray rinse applicator
- Plastic garbage bags
- 5-gallon container with soap solution.

Proper decontamination (decon) procedures will be employed to ensure that contaminated materials do not contact individuals and are not spread from the site. These procedures will also ensure that contaminated materials generated during site operations and during decontamination are managed appropriately. All nondisposable equipment will be decontaminated in the contamination reduction zone.

Personnel working in exclusion zones will perform a limited decontamination in the contamination reduction zone prior to changing respirator cartridges (if worn), taking rest breaks, drinking liquids, etc. They will decontaminate fully before eating lunch or leaving the site. The following describes the procedures for decon activities:

1. In the contamination reduction zone, wash and rinse outer gloves and boots in portable buckets.
2. Inspect protective outer suit, if worn, for severe contamination, rips, or tears.
3. If suit is highly contaminated or damaged, full decontamination will be performed.
4. Remove outer gloves. Inspect and discard if ripped or damaged.

8.0 DISPOSAL OF CONTAMINATED MATERIALS

All disposable sampling equipment and personal protective equipment will be rinsed to remove gross contamination and placed inside of a 10 mil polyethylene bag or other appropriate containers. These disposable supplies and containers will be removed from the site by the field personnel and disposed of in a normal refuse container (dumpster) and/or solid waste landfill, unless visibly contaminated with hazardous substances. In such cases, the Project Manager and/or Task Manager will determine the need for special handling and disposal, according to applicable regulations.

9.0 SITE SECURITY AND CONTROL

Site security and control will be the responsibility of the Project H&S Coordinator. The “buddy system” will be used when working in designated hazardous areas. Any security or control problems will be reported to the client or appropriate authorities.

10.0 SPILL CONTAINMENT

Sources of bulk chemicals subject to spillage are not expected to be used in this project. Accordingly, a spill containment plan is not required for this project.

11.0 EMERGENCY RESPONSE PLAN

The Emergency Response Plan outlines the steps necessary for appropriate response to emergency situations. The following paragraphs summarize the key Emergency Response Plan procedures for this project.

11.1 PLAN CONTENT AND REVIEW

The principal hazards addressed by the Emergency Response Plan include the following: fire or explosion, medical emergencies, uncontrolled contaminant release, and situations such as the presence of chemicals above exposure guidelines or inadequate protective equipment for the hazards present. However, in order to help anticipate potential emergency situations, field personnel should always exercise caution and look for signs of potentially hazardous situations, including the following as examples:

- Visible or odorous chemical contaminants
- Drums or other containers
- General physical hazards (e.g., traffic, cranes, moving equipment, ships, sharp or hot surfaces, slippery or uneven surfaces)
- Possible sources of radiation
- Live electrical wires or equipment; underwater pipelines or cables; and poisonous or dangerous animals.

These and other potential problems should be anticipated and steps taken to avert problems before they occur. All personnel will certify (Attachment 3) that they are familiar with the contents of this plan and acknowledge their agreement to comply with the provisions of the plan.

The Emergency Response Plan will be reviewed during the onsite health and safety briefing so that all personnel will know what their duties are should an emergency occur.

11.2 PLAN IMPLEMENTATION

The Project H&S Coordinator will act as the lead individual in the event of an emergency situation and evaluate the situation. This individual will determine the need to implement the emergency procedures, in concert with other resource personnel including client representatives and the Corporate H&S Manager. Other onsite field personnel will assist the H&S Coordinator, as required, during the emergency.

If the Emergency Response Plan is implemented, the Project H&S Coordinator or designees are responsible for alerting all personnel at the affected area by use of a signal device (such as a hand-held air horn), visual, or shouted instructions, as appropriate.

Emergency evacuation routes and safe assembly areas will be identified and discussed in the onsite health and safety briefing, as appropriate. The buddy system will be employed during evacuation to ensure safe escape, and the Project H&S Coordinator will be responsible for roll-call to account for all personnel.

11.3 EMERGENCY RESPONSE CONTACTS

Site personnel must know whom to notify in the event of Emergency Response Plan implementation. The following information will be readily available at the site in a location known to all workers:

- Emergency Telephone Numbers: see list in Attachment 2
- Route to Nearest Hospital: see directions and map in Attachment 2
- Site Descriptions: see the description at the beginning of this plan
- If a significant environmental release of contaminants occurs, the federal, state, and local agencies noted in this plan must be notified within 24 hours. Contact the Project Manager as soon as possible and he/she will be responsible for notifying agencies listed in Attachment 2. If the release to the environment includes navigable waters, also notify the National Response Center.

In the event of an emergency situation requiring implementation of the Emergency Response Plan (e.g., fire or explosion, serious injury, tank leak or other material spill, presence of chemicals above exposure guidelines, inadequate personnel protection equipment for the hazards present), cease all work immediately. Offer whatever assistance is required, but do not enter work areas without proper protective equipment. Workers not needed for immediate assistance will decontaminate per normal procedures (if possible) and leave the work area, pending approval by the Project H&S Coordinator for re-start of work. The following general emergency response safety procedures should be followed.

11.4 FIRES

Landau Associates' personnel will attempt to control only very small fires. If an explosion appears likely, evacuate the area immediately. If a fire occurs that cannot be readily controlled, then immediate intervention by the local fire department or other appropriate agency is imperative. Use these steps:

- If aboard a vessel, abandon the vessel using life rafts or swimming to reach a previously agreed-upon upwind location; exit the water as quickly as possible to minimize the risk of hypothermia
- Contact fire agency identified in the site-specific plan
- Inform Project Manager/Project H&S Coordinator of the situation.

Contact 911 if a medical emergency occurs. If a worker leaves the site to seek medical attention, another worker should accompany the patient. When in doubt about the severity of an accident or exposure, always seek medical attention as a conservative approach. Notify the Project Manager of the outcome of the medical evaluation as soon as possible. For minor cuts and bruises, an onsite first aid kit will be available.

If a worker is seriously injured or becomes ill or unconscious, immediately request assistance from the emergency contact sources noted in the site-specific plan. Do not attempt to assist an unconscious worker in an untested confined space without applying confined space entry procedures or without using proper respiratory protection, such as a self-contained breathing apparatus.

In the event that a seriously injured person is also heavily contaminated, use clean plastic sheeting to prevent contamination of the inside of the emergency vehicle. Less severely injured individuals may also have their protective clothing carefully removed or cut off before transport to the hospital. If it is deemed appropriate to transport the victim to the hospital, follow the route map on Attachment 2.

11.5 PLAN DOCUMENTATIONAND REVIEW

The Project Manager/Project H&S Coordinator will notify the Corporate H&S Manager as soon as possible after an emergency situation has been stabilized. The Project Manager will also notify the appropriate client contacts, and regulatory agencies, if applicable.

The Project Manager and Corporate H&S Manager will critique the emergency response action following the event. The results of the critique will be used to improve future Emergency Response Plans and actions.

12.0 MEDICAL SURVEILLANCE

A medical surveillance program has been instituted for Landau Associates and will also be in effect for Subcontractor employees having exposures to hazardous substances. For Landau Associates, exams are given before employment; annually, thereafter; and upon termination. Content of exams is determined by the Occupational Medicine physician, in compliance with applicable regulations, and is detailed in the Landau Associates' General Health and Safety Program.

Each team member will have undergone a physical examination as noted above in order to verify that he/she is physically able to use protective equipment, work in hot environments, and not be predisposed to occupationally induced disease. Additional exams may be needed to evaluate specific exposures or unexplainable illness.

* * * * * * * * * *

This document has been prepared under the supervision and direction of the following key staff:

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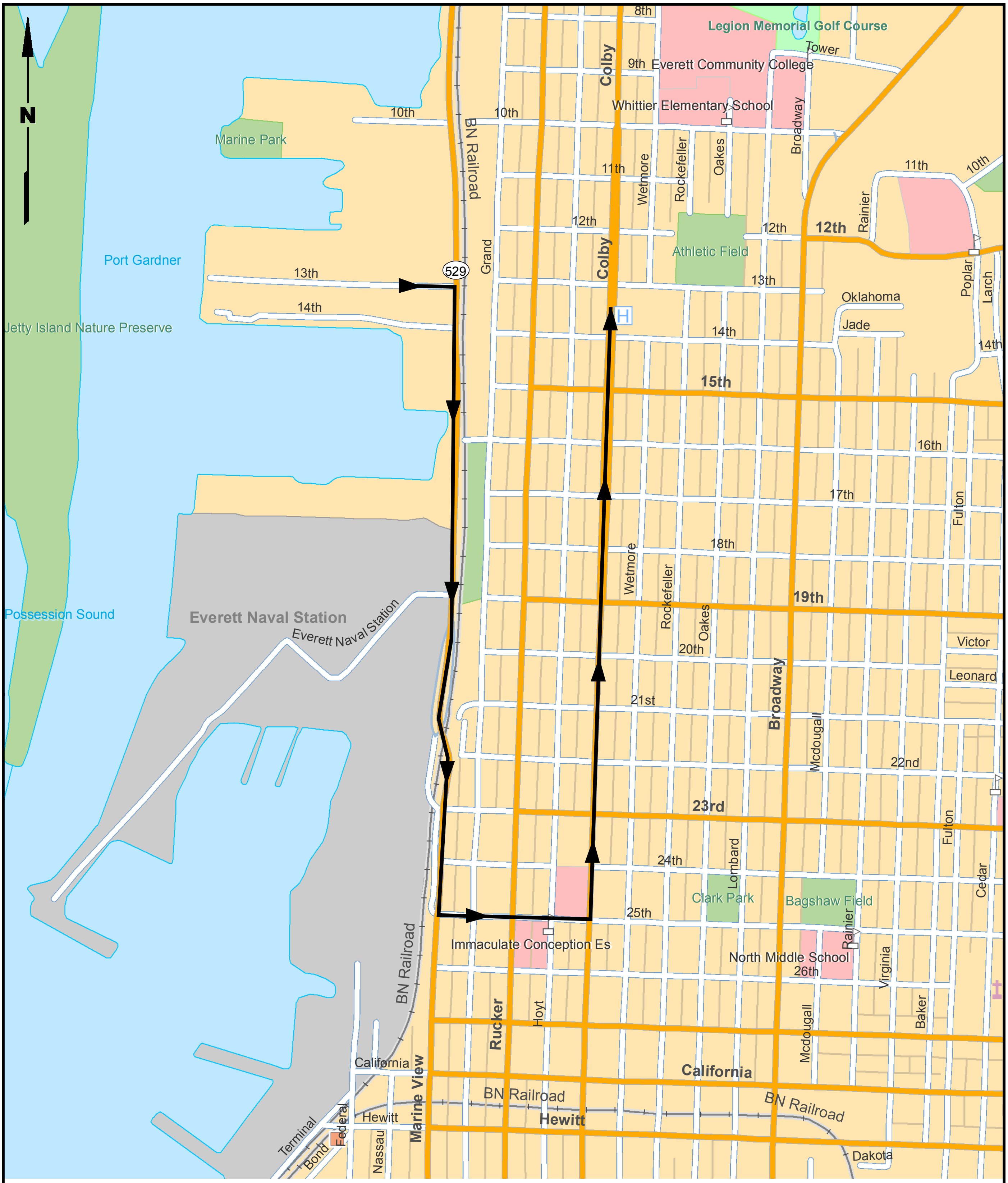

0 1,300 2,600

Scale in Feet

Data Source:ESRI

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LANDAU ASSOCIATES

North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Route to Hospital

Figure
1

TABLE E-1
HUMAN HEALTH INFORMATION FOR CONTAMINANTS OF CONCERN
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Contaminant	PEL (ppm)	IDLH (ppm)	Route of Exposure	Symptoms of Acute Exposure	Instruments Used to Monitor Contaminant
Total Petroleum Hydrocarbons	100	400	Inhalation, ingestion, dermal contact	Skin and mucous membrane irritation; dizziness, nausea	Olfactory, visual, photoionization detector (PID)
Arsenic	0.5 mg/m^3	5.0 mg/m^3	Inhalation, ingestion, dermal contact	Skin and mucous membrane irritation	Visual (dust)
Copper	1.0 mg/m^3	100 mg/m^3	Inhalation, ingestion, dermal or eye contact	Respiratory irritation, vomiting, skin irritation	Visual (dust)
Vinyl Chloride	05 (MRL)	NA	Inhalation, ingestion, absorption, dermal or eye contact	Skin, nose, throat irritation; dizziness, vomiting; carcinogen	PID
Benzo(a)pyrene	0.2 mg/m^3	80 mg/m^3	Inhalation, dermal or eye contact	Respiratory irritation, skin irritation	Olfactory, visual

PEL = Permissible exposure limit.
IDLH = Immediately dangerous to life and health (NIOSH).
N/A = Not applicable.
MRL = Minimal Risk Level.

Notes: OSHA ceiling value not to be exceeded during any part of the working day.
Benzo(a)pyrene is listed as an indicator for polycyclic aromatic hydrocarbons.

ATTACHMENT 1

Air Monitoring Strategy

ATTACHMENT 1
AIR MONITORING STRATEGY
AMERON-HULBERT SITE
EVERETT, WASHINGTON

EXPOSURE	METHOD	MONITORING DESCRIPTION	ACTION LEVEL (a)	ACTION
Total Volatile Organics	Photoionization Detector (PID)	Periodically, or when odors are noted	<25 ppm 25-75 ppm >75 ppm	Level D Protection Level C Protection Shut Down; Contact Corp. Health & Safety Officer; Implement Engineering Controls
Particulate Contaminants	Visual	Handling samples/ Continuously	No Visible Dust Visible Dust	Level D Protection Implement Engineering Controls; Upgrade to Level C in Interim

(a) For ambient air monitoring.

ATTACHMENT 2

Emergency Information and Route to Hospital Map

ATTACHMENT 2

EMERGENCY INFORMATION

HOSPITAL - **Providence Everett Medical Center**
1321 Colby Avenue
Everett, WA 98201
Information: (425) 261-2000

DIRECTIONS -

1. Exit site on 13th Street heading east
2. Turn right on Norton Avenue/West Marine Drive
3. Proceed approximately 1.2 miles
4. Turn left onto Everett Street
5. Turn left on Colby Avenue
6. Proceed to hospital approximately 1 mile north on Colby Avenue

TELEPHONE - Cellular telephones to be carried by each team on/offshore.
EMERGENCY TRANSPORTATION SYSTEMS (Fire, Police, Ambulance) **-911**
EMERGENCY ROUTES - Map (HASP Figure 1)

EMERGENCY CONTACTS -

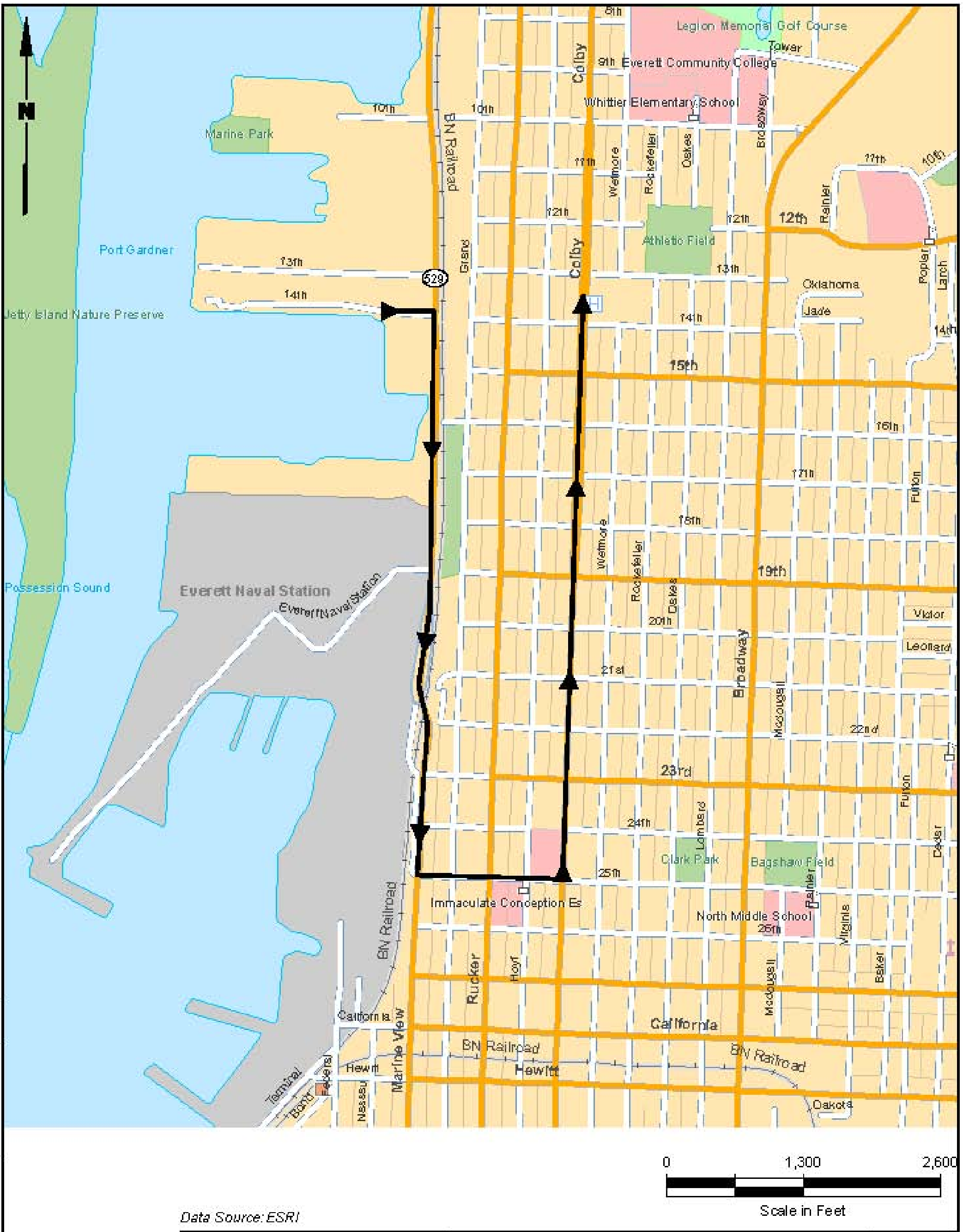
Poison Control Center:	(206) 526-2121
Project Manager – Larry Beard	(425) 778-0907
Corporate H&S Manager – Chris Kimmel	(425) 778-0907
Port of Everett Contact – Greg Dawsey	(425) 388-0624
National Response Center	(800) 424-8802
WA Div. of Emergency Management	(800) 258-5990

In the event of an emergency on land, call for help as soon as possible. Dial 911; give the following information:

- WHERE the emergency is - use cross streets or landmarks
- PHONE NUMBER you are calling from
- WHAT HAPPENED - type of injury
- HOW MANY persons need help
- WHAT is being done for the victim(s)
- YOU HANG UP LAST - let the person you called hang up first.

FIGURE 1

HOSPITAL ROUTE AND MAP



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LANDAU ASSOCIATES

North Marina West End Site
RI/FS Work Plan
Port of Everett, Washington

Route to Hospital

Figure
1

ATTACHMENT 3

Certification

ATTACHMENT 3
CERTIFICATION

All field members are required to read and familiarize themselves with the contents of this Health & Safety Plan and acknowledge their agreement to comply with the provisions of the plan through the entry of a signature and date on the section below.

By my signature, I certify that:

- I have read,
- I understand, and
- I will comply with this site health and safety plan for Port of Everett environmental investigations.

Printed Name	**Signature**	**Date**	**Affiliation**

Personnel health and safety briefing conducted by:

______________________________ ______________________________ ______________________________
Name Signature Date

Plan prepared by/reviewed by:

________________/____________ ________________/____________ ________________/____________
Name Signature Date

APPENDIX F

Upland Investigation Sampling and Analysis Plan

Final
Upland Investigation
Sampling and Analysis Plan
Ameron-Hulbert Site
Everett, Washington

November 15, 2010

Prepared for

Port of Everett, Washington

LANDAU
ASSOCIATES
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F-3 Quantitation Limit Goals for Soil, Groundwater, and Catch Basin Sediment
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1.0 INTRODUCTION

This sampling and analysis plan (SAP) describes the procedures for conducting field activities during the remedial investigation (RI) within the upland portion of the North Marina Ameron-Hulbert Site (Site), between 11th and 13th Streets off West Marine View Drive, Everett, Snohomish County, Washington (Figure F-1). This SAP is an appendix to the North Marina Ameron-Hulbert West End Site RI/Feasibility Study (FS) work plan (work plan), one of the required deliverables under the Agreed Order (No. DE 6677) between the Port of Everett, Ameron International and the Hulberts [the potentially liable parties (PLPs)], and the Washington State Department of Ecology (Ecology). The primary objective of this plan is to provide sampling and analysis procedures and methodologies consistent with accepted procedures such that the data collected will be adequate for use in characterizing upland environmental conditions. The plan was prepared consistent with the requirements of WAC 173-340-820. It provides field, sampling, and analytical procedures to be used during the upland RI.

Investigation of the upland portion of the Site will focus on characterization of soil and groundwater quality. In addition, sediment samples will be collected from selected upland stormwater catch basins. As discussed in Section 7.0 of the work plan, further investigation of Site soil, groundwater, and sediment is needed to evaluate the nature and extent of Site contamination. Results from previous soil investigations and compliance monitoring associated with the interim actions conducted are considered sufficient for characterizing soil quality for much of Area I and Area J. Therefore, RI soil characterization will largely focus on Areas G and M, with limited additional investigation in Areas I and J. Post-interim action groundwater and post-dredging sediment conditions have not been evaluated at the Site. As a result, a Site-wide groundwater evaluation will be conducted and sediment quality will be evaluated throughout the in-water portion of the site during the RI. Marine sediment sampling procedures are presented in the Sediment Sampling and Analysis Plan included as Appendix G to the work plan.

Soil and groundwater investigation locations were selected for two purposes, 1) general characterization, and 2) focused investigation of specific areas of environmental concern. General characterization will be conducted to evaluate whether Site activities have caused releases of hazardous substances to shallow soil or groundwater, to evaluate the quality of fill used to create Site uplands, and to characterize Site geology in areas where specific conditions of environmental concern have not been identified. Focused investigation will be implemented in areas where contamination was encountered during previous investigations, and at locations where current or historic Site features and activities suggest that releases of hazardous substances may have occurred.

2.0 FIELD INVESTIGATION PROCEDURES

This section presents soil sample collection procedures (Section 2.1), monitoring well construction and installation procedures and groundwater sample collection procedures (Section 2.2), and catch basin sediment sample collection procedures (Section 2.3). Equipment decontamination and residual waste management procedures are also presented.

2.1 SOIL SAMPLING

This section describes the activities to be conducted to collect soil samples from direct-push borings and test pits. The RI soil investigation will largely focus on shallow soil, although limited characterization of deeper soil will be conducted in investigation Area J as part of a focus area investigation and in Area G, I, and M as part of general characterization to evaluate the quality of fill placed at the Site during various filling events. As shown on Figure F-2, 46 proposed RI soil boring locations and six test pit locations are distributed throughout the Site. The rationale for the sampling locations is presented in Table F-1.

Soil sample collection methods are presented in Sections 2.1.1 and 2.1.2. General characterization and focus areas will be investigated as described below in Sections 2.1.3 and 2.1.4, respectively. Analytical testing is presented in Section 2.1.5.

2.1.1 SOIL SAMPLE COLLECTION METHODS – DIRECT-PUSH BORINGS

Soil samples will be collected using a truck-mounted Geoprobe® direct-push drilling rig. Soil samples will be obtained from the soil borings using a closed-piston sampling device with a 48-inch long, 1.5-inch inside-diameter (ID) core sampler. The sampler will be advanced to the top of the sample interval with the piston in a locked position. The piston tip will then be loosened and the sampler will be advanced over the desired depth interval, thereby coring the soil inside the sampler's disposable, single-use liner. The sampler will then be withdrawn to retrieve the liner and soil sample. The liner will be cut to remove the soil sample. A new liner will be placed in the core sampler and this process will be repeated until all desired soil samples have been obtained. Between samples, the core sampler, including the piston tip and rods, will be decontaminated, as specified in Section 2.8.

After the liner has been cut, the soil type will be field classified and recorded on the Log of Exploration form in accordance with the Uniform Soil Classification System (ASTM 2009). The soil column retained in the sample liner will be field screened by physical inspection. A visual examination for discoloration of soil, the presence of sheens or non-aqueous phase liquid (NAPL), and precipitates will then be made. The presence of any odor will also be documented.

The core will be divided into the identified sample intervals and the sample intervals will be individually homogenized using decontaminated stainless-steel bowls and spoons. The homogenized sample volumes will then be placed into the appropriate laboratory supplied sample containers. However, volatile organic compound (VOC) soil samples, including samples for hydrocarbon testing, will be collected from the undisturbed soil sample prior to homogenization, as described below.

A photoionization detector (PID) reading will be collected if field observations indicate presence of petroleum hydrocarbons or other VOCs, and will be recorded for each 1-foot (ft) interval. If obvious signs of contamination are observed, a discrete sample will be collected from the area with the greatest level of observed contamination. If the soil consists primarily of course sand or finer grained material, the U.S. Environmental Protection Agency (EPA) method described below will be used. If soil containing significant gravel content is encountered, the EPA method is not effective and the previously accepted method of placing larger sample volume in a larger sample container will be used.

EPA 5035A soil sampling procedures will be used to collect soil samples planned for VOCs or gasoline-range petroleum hydrocarbons (TPH-G) analyses, consistent with recent Ecology guidance. The EPA 5035A soil sampling method is intended to reduce volatilization and biodegradation of samples. The EPA 5035A procedure for soil sample collection is as follows:

- Collect soil "cores" using coring devices (i.e., EnCore® sampler, EasyDraw Syringe®, or a Terra Core™ sampling device). Each "core" will consist of approximately 5 grams of soil. Collect three discrete "cores" from each sampling location. One EasyDraw Syringe® or Terra Core™ device will be used to collect the three discrete "cores"; however, if the EnCore® samplers are used, three sampling devices are required.
- Remove excess soil from coring device. If EasyDraw Syringe® or Terra Core™ sampling device are used for sample collection, place the "cored" soil directly into unpreserved 40 milliliter (ml) vials with a stirbar. If the EnCore® sampler is used, close the sampler for transport to the laboratory.
- Collect one 2-ounce (oz) soil jar of representative soil for moisture content and laboratory screening purposes. Fill the jar to minimize headspace.
- Samples will be placed in shipping cooler at 4°C. Samples will be transported to the laboratory within 24 hours of sample collection, and will be stored at the laboratory at -7°C.

Soil samples will be collected and preserved consistent with the method-specific requirements presented in Table F-2. Analyses will be conducted within the specified holding times, also presented in Table F-2.

2.1.2 SOIL SAMPLE COLLECTION METHODS – TEST PITS

Test pits will be excavated using a backhoe at the locations shown on Figure F-2. At each location, soil will be excavated to visually assess soil conditions continuously to the depth of dredge fill material or to a minimum of 8 ft below ground surface (BGS) where dredge fill is not encountered.

Landau Associates will direct the backhoe operator to collect representative samples of the test pit soils by scraping the bucket along a sidewall of the excavation, or directly by the sampler using hand tools if the test pit is shallower than 4.5 ft.

Soil samples will be screened and logged as described in Section 2.1.1. If obvious signs of contamination are observed, a discrete sample will be collected from the affected zone(s) and a sample will be collected from below the impacted area. Soil samples will be collected and prepared for laboratory analysis as described in Section 2.1.1. If evidence of contamination is not observed in the test pits, soil samples will be collected following the protocol for general characterization soil sampling described in the following section. Test pit excavations will be backfilled as described in Section 2.9.1.

2.1.3 GENERAL CHARACTERIZATION

As shown on Figure F-2, general characterization borings are proposed in areas where previous characterization has not been conducted and specific sources of contamination have not been identified. General characterization samples include GC in the sample identification on the figure. General characterization sampling will also be conducted in areas which were unpaved following the onset of post-saw mill industrial activities at the Site. A 150-ft grid has been added to the figure for reference. It should be noted that the proposed boring locations are approximate and may be adjusted based on observed site conditions, available access, and the location of utilities. At each soil boring location being used for general characterization purposes, except as otherwise noted in Table F-1, the boring will be extended to 12 ft BGS and samples for laboratory analysis will be collected from the ground surface to 4 ft BGS. However, if soil samples are collected in paved areas or in areas where recent surface filling and grading has been conducted, sample collection will begin immediately below the base course layer. The first sample below the base course layer will be identified as the 0 to 1 ft sample.

Unless otherwise indicated in Table F-1, three intervals will be sampled at each boring location: 0 to 1 ft, 1 to 2 ft, and 2 to 3 ft. The top interval (0 to 1 ft) will be immediately analyzed by the laboratory for selected metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, and zinc) and carcinogenic polycyclic aromatic hydrocarbons (cPAHs). Samples from selected areas will also be analyzed for PCBs, SVOCs, and /or diesel-range petroleum hydrocarbons (TPH-D). Gasoline-range petroleum hydrocarbons (TPH-G) and VOCs will also be analyzed if field screening suggests a possible presence. These analyses are defined by sampling location in Table F-1. The two remaining intervals (1 to 2 ft and 2 to 3 ft) will be initially archived at the laboratory pending a review of the results of the top interval. The second interval (1 to 2 ft) will be analyzed for those constituents that are above preliminary screening levels (PSLs) in the top interval. Similarly, the third interval (2 to 3 ft) will be analyzed for constituents that are above PSLs in the second interval. Deeper soil (greater than 3 ft) will be sampled at selected locations as described in Table F-1.

Because several analyses (cPAHs, PCBs, SVOCs, VOCs and TPH) have holding times of 14 days, the analytical laboratory will be required to provide results of the top sample interval with sufficient time to analyze subsequent intervals within holding time. To meet this goal, the laboratory may have to expedite their analysis and reporting. If analysis indicates the presence of constituents other than metals (holding time for metals is 6 months) at concentrations greater than the PSLs in the first sample interval, the second and third interval samples will be extracted to extend the holding times for these intervals

If access limitations are encountered at a proposed sampling location, the sample may be collected from a nearby location. Each general characterization boring will generally be advanced to approximately 12 ft BGS (depending on asphalt/base course thickness), or to the depth indicated in Table F-1. However, if visual evidence of contamination is present at the planned boring depth, the exploration will be extended deeper to adequately delineate the depth of contamination. Borings in some general characterization sample locations will be advanced to the depth of the former tideflat surface to evaluate quality of fill placed during separate filling events, as described in Table F-1, and to delineate Site geologic conditions.

A Site reconnaissance will be conducted prior to intrusive activities to identify obstructions to planned boring locations (i.e., utilities, equipment, materials), and to evaluate the condition of certain features that may affect the approach to or need for investigation at that location (e.g., stormwater sumps). If practical, boring locations will be relocated to accommodate obstructions. However, if locations are obstructed by equipment or materials, and a viable alternative location is not available nearby, the Port will coordinate with applicable tenants to move the obstruction to allow sampling.

2.1.4 FOCUSED AREA CHARACTERIZATION

Conditions will be characterized at identified focus areas of the Site for the following purposes:

- To better delineate contamination identified during previous investigations
- To investigate environmental conditions associated with historical features not sufficiently characterized in previous investigations
- To evaluate and delineate the impact of historical operations not previously characterized.

Focus area sampling locations, the rationale for sampling, the planned sampling intervals, and planned analytical testing are described in Table F-1 and discussed in further detail by area in the work plan. The focus area soil sample locations are shown on Figure F-2. Boring and test pit designations for focused areas contain the letters “FA.”

In general, soil samples will be collected from zones of impacted soil, where present, based on field screening, and from below the impacted zone. If indications of contamination are not identified at a focus area sampling location, sampling protocol for general characterization will be followed, except as described in Table F-1. As indicated in the work plan, additional delineation, consisting of visual observation and possibly analytical testing, may be conducted if significant contamination is observed at proposed investigation locations. For the purposes of this investigation, “significant contamination” is defined as the presence of:

- Free-phase petroleum product material with the presence of sheen, staining, or odor
- Soil or groundwater with visible free product film
- Soils containing waste materials such as blasting sand and concrete-like waste
- Soil with visible staining
- Soil with elevated PID readings of VOCs.

In the event that any of these conditions are encountered during field activities, Landau Associates’ field personnel will contact Landau Associates’ project manager (Larry Beard) for further direction.

2.1.5 SOIL LABORATORY ANALYSIS

Soil samples will be submitted to the laboratory for the analyses described in Table F-1. Analytical testing for general characterization samples will consist of cPAHs using EPA Methods 3545/8270, and metals (antimony, arsenic, copper, cadmium, chromium, lead, mercury, and zinc) using EPA Method 3050A/6010B. In addition to cPAHs and metals, selected samples will be analyzed for PCBs by Method 8082, SVOCs by Method 8270C, VOCs by Method 8260, TPH-Dx by Method NWTPH-Dx, and TPH-Gx by Method NWTPH-Gx (subject to field screening results for VOCs and TPH-Gx), as indicated in Table F-1.

Focus area soil samples will be tested for metals and for additional constituents at some locations, including cPAHs using Method 2545/8270, VOCs by EPA Method 8260, SVOCs by Method 8270C, petroleum hydrocarbon testing using NWTPH-G and/or NWTPH-D analyses based on field screening, PCBs by Method SW8082, and dioxin/furans by Method 1613B, as indicated in Table F-1. Method 8260 Selected Ion Method (SIM) will be used for VOC analysis at locations where vinyl chloride is considered a constituent of concern (COC). Quantitation Limit goals for soil analytical testing are listed in Table F-3.

2.2 GROUNDWATER SAMPLING

This section describes the activities to be conducted to collect groundwater samples from monitoring wells and direct-push borings. The groundwater sampling locations are shown on Figure F-3 and the rationale for the selected locations is summarized in Table F-1.

2.2.1 MONITORING WELLS

This section describes well installation procedures and construction, well development, procedures for collecting groundwater samples from the wells, sampling frequency and duration, and laboratory analysis.

2.2.1.1 Installation and Construction

Monitoring wells will be installed within the shallow aquifer. Monitoring wells will be constructed by a drilling contractor licensed in the state of Washington using the hollow-stem auger drilling method. Prior to initiation of drilling, or any other invasive subsurface activity, the locations of each proposed exploration will be checked in the field to locate aboveground utilities or physical limitations that would prevent drilling at the proposed location. In addition, a public utility locate service will be contacted to locate underground utilities at the perimeter of the Site and a private utility locate service will be contacted to clear explorations for underground utilities. The final location for each borehole will be based on the findings of the field check.

The monitoring wells will be constructed in accordance with Washington State Minimum Standards for Construction and Maintenance of Wells (WAC 173-160; Ecology 2006). Landau Associates field personnel familiar with environmental sampling and construction of resource protection wells will oversee the drilling and well installation activities, and maintain a detailed record of the well construction. The monitoring wells will be drilled using conventional hollow-stem auger techniques with 4.25-inch ID augers. The monitoring wells will be constructed with 2-inch-diameter, flush-threaded, Schedule 40 polyvinyl chloride (PVC) pipe and 10-ft screens with 0.020-inch machine-slotted casing and filter pack material consisting of pre-washed, pre-sized number 10/20 silica sand. The well screens will be placed from 5 to 15 ft BGS to intersect the water table. The filter pack will be placed from the bottom of the well to approximately 1 ft above the top of the screen. Filter pack material will be placed slowly and carefully to avoid bridging of material. A bentonite seal will be placed above the filter pack material to within about 3 ft of ground surface. Grout will be used to backfill the boring to the subgrade for placement of the protective cover.

The well names and the identification numbers assigned by Ecology will be marked on the well identification tags supplied by Ecology and will be attached to each well casing following well installation.

Water levels will be measured at least three times in association with the well installation: during drilling, following the well installation, and following the well development. In addition, water levels will be measured in all site wells within an hour of each other prior to conducting groundwater sampling events. Water levels will be measured at least once in each well as simultaneously as possible during a low, intermediate, and high tide. Water level measurement procedures are discussed further below.

Before and between drilling of each boring and at completion of the project, downhole drilling equipment will be cleaned using a high-pressure hot water or steam washer as described in Section 2.8.

2.2.1.2 Development

The monitoring wells will be developed after construction to remove formation material from the well borehole and the filter pack prior to groundwater level measurement and sampling. Development will be achieved by repeatedly surging the well with a surge block and purging the well until the water runs clear, but no less than five well casing volumes. During development, the purged groundwater will be monitored for the following field parameters:

- pH
- Conductivity
- Temperature
- Turbidity.
- ORP
- DO.

The wells will be developed until the turbidity of the purged groundwater decreases to 5 Nephelometric turbidity units (NTUs), if practicable. If the well dewaters during the initial surging and purging effort, one final well casing volume will be removed after the well has fully recharged, if practicable. Well development activities will be recorded on a Well Development form.

2.2.1.3 Sample Collection

The initial groundwater samples will be collected at least 2 days after well development. Samples will be collected within 1 hour before and 1 hour after a low tide so that samples collected will be of water discharging from the Site that is minimally influenced by marine surface water. For the remedial investigation, one round of groundwater sampling will be conducted during the wet season (November through March) and one round of groundwater sampling will be completed during the dry season (June through October). Collection of groundwater samples will be completed at each monitoring well using the following procedures:

- Immediately following removal of each well monument cover, the well head will be observed for damage, leakage, and staining. Additionally, immediately following removal of the well head cap, any odors will be recorded and the condition of the well opening will be observed. Any damage, leakage, or staining to the well head or well opening will be recorded.
- Prior to sampling, each well will be purged using a pump that is attached to dedicated purge and sample collection tubing (types of pumps used may vary depending on purge volume and depth and include a centrifugal pump, a peristaltic pump, and an electric submersible pump). Purging will begin with a small pumping rate. The rate will be adjusted upward slowly to minimize drawdown (with a target drawdown of less than 0.33 ft) during purging. Purging will continue until at least three casing volumes of water have been removed and specific conductance and temperature have stabilized or until the well goes dry. The purge volume will be calculated based on the following formula:

  1 casing volume (gallons) = $\pi r^2 h$ x 7.48 gal/ft^3

  where: π = 3.14
  r = radius of well casing in ft
  h = height of water column from the bottom of the well, in feet.

- Field parameters, including pH, temperature, conductivity, dissolved oxygen, ORP, and turbidity, will be continuously monitored during purging using a flow cell. Purging of the well will be considered to be complete when all field parameters become stable for three successive readings. The successive readings should be within +/- 0.1 pH units for pH, +/- 3% for conductivity, and +/- 10% for dissolved oxygen and turbidity.
- Purge data will be recorded on a Groundwater Sample Collection form including purge volume; time of commencement and termination of purging; any observations regarding color, turbidity, or other factors that may have been important in evaluation of sample quality; and field measurements of pH, specific conductance, temperature, dissolved oxygen, and turbidity.
- Following the stabilization of field parameters, the flow cell will be disconnected and groundwater samples will be collected. Sample data will be recorded on a Groundwater Sample Collection form, including sample number and time collected; the observed physical characteristics of the sample (e.g., color, turbidity, etc.); and field parameters (pH, specific conductance, temperature, and turbidity).
- Four replicate field measurements of temperature, pH, specific conductance, dissolved oxygen, ORP, and turbidity will be obtained using the following procedures:
  - A 250-mL plastic beaker will be rinsed with deionized water followed by sample water.
  - The electrodes and temperature compensation probe will be rinsed with deionized water followed by sample water.
  - The beaker will be filled with sample water; the probes will be placed in the beaker until the readings are stabilized. Temperature, pH, specific conductance, dissolved oxygen, and turbidity measurements will be recorded on the Groundwater Sample Collection form.
  - The above step will be repeated to collect remaining replicates.

- Any problems or significant observations will be noted in the “comments” section of the Groundwater Sample Collection form.
- Groundwater samples will be collected into the appropriate sample containers using a peristaltic pump. To prevent degassing during sampling for VOCs, a pumping rate will be maintained below about 100 ml/min. The VOC containers will be filled completely so that no headspace remains. Samples will be chilled to 4°C immediately after collecting the sample. Clean gloves will be worn when collecting each sample.
- Groundwater for dissolved metals analyses will be collected last and field filtered through a 0.45 micron, in-line disposable filter. Dissolved metal samples will be preserved, as specified in Table F-2. A note will be made on the sample label, sample collection form, and chain of custody (COC) to indicate the sample has been field filtered and preserved, including the type of preservative used.
- Groundwater samples will be submitted to the laboratory for analysis as described in Section 2.2.4.

2.2.2 DIRECT-PUSH GROUNDWATER SAMPLES

Boreholes advanced for groundwater sampling will be drilled using a truck-mounted Geoprobe® direct-push drilling rig. The direct-push borings will be advanced to a minimum of 4 ft into the water table. Prior to initiation of drilling, or any other invasive subsurface activity, the locations of each proposed exploration will be checked in the field to locate aboveground utilities or physical limitations that would prevent drilling at the proposed location. In addition, a public utility locate service will be contacted to locate underground utilities at the perimeter of the Site and a private utility locate service will be contacted to clear explorations for underground utilities. The final location for each borehole will be based on the findings of the field check.

The sample will be collected using a groundwater sampler consisting of a 4-ft long, wire-wrapped, stainless-steel screen (0.010-inch slot size) with a retractable protective steel sheath. The groundwater sampler will be advanced to the sample depth and the protective sheath will be retracted to expose the stainless-steel screen to the formation. Low-flow purging will be performed for 10 minutes or until purge water is clear using a peristaltic pump. During purging, pH, conductivity, and temperature will be measured using a flow-through cell. Groundwater samples will be collected into the appropriate sample containers using disposable polyethylene tubing and a peristaltic pump. To prevent degassing during sampling for VOCs, a pumping rate will be maintained below about 100 ml/min. The VOC containers will be filled completely so that no headspace remains. Samples will be chilled to 4°C immediately after collecting the sample. Groundwater for dissolved metals analyses will be collected last and field filtered through a 0.45 micron, in-line disposable filter. Dissolved metals samples will be preserved, as specified in Table F-2. A note will be made on the sample label, sample collection form, and COC to indicate the sample has been field filtered and preserved, including the type of preservative used. Groundwater samples will be submitted to the laboratory for analysis as described in Section 2.2.4.

2.2.3 FIELD PARAMETERS

Field parameters, including pH, temperature, conductivity, dissolved oxygen, turbidity, and oxidation reduction potential (Redox) will be measured at each sampling location using a flow-through cell. Ferrous iron will also be measured at each sampling location using a field test kit. Field parameters will be measured during all groundwater monitoring events. All field instruments will be calibrated at the start of each work day. Calibration information will be recorded in the instrument calibration log.

2.2.4 GROUNDWATER LABORATORY ANALYSIS

Groundwater samples will be submitted to the laboratory for various analyses, depending on the previously detected constituents and/or potential COCs based on past practices. Proposed laboratory analyses are described in Table F-1, and include dissolved metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, and zinc) using EPA Methods 3010A/6020 and VOCs using EPA Method 8260. Selected groundwater samples will be screened for TPH using Method NWHCID, with follow-up analysis for gasoline-range TPH using the NWTPH-G method, and/or diesel- and motor oil-range petroleum hydrocarbons using the NWTPH-Dx method (with acid/silica gel cleanup procedures) based on the HCID results. Selected samples will also be analyzed for PCBs using Method 8082, SVOCs using Method 8270, cPAHs using Method 8270SIM, and for hexavalent chromium by Method 3500 if warranted based on field observations. If dioxin is detected in soil at a concentration greater than the natural background level for Washington soil (5.2 ng/kg; Ecology 2010) at sample location J-FA-101, the groundwater sample collected from J-FA-102 will be analyzed for dioxin. In addition to laboratory analysis described above, pH, specific conductance, and temperature turbidity will be measured in the field during sample collection.

All metals samples will be field filtered prior to analysis. Any groundwater samples collected from direct-push borings and submitted for analysis of parameters that tend to partition heavily to soil (i.e., oil-range petroleum hydrocarbons, PCBs, SVOCs, dioxins/furans, and cPAHs) will be centrifuged by the laboratory to settle particulates prior to extraction. Groundwater samples collected from monitoring wells for organic analyses (except VOCs) will be centrifuged if the sample turbidity exceeds 10 NTU (based on average turbidity recorded for four replicates collected prior to sample collection).

Groundwater samples will be collected and preserved consistent with the method-specific requirements presented in Table F-2. Analyses will be conducted within the specified holding times, also presented in Table F-2. All samples will be archived by the laboratory under the COC protocol until Landau Associates directs the laboratory that they may be discarded.

2.3 CATCH BASIN SEDIMENT SAMPLING

This section describes the activities to be conducted to collect sediment samples from catch basins. The stormwater system investigation will be focused on the evaluation of stormwater sediment collected from catch basins in areas of the Site with industrial activities. Based on these criteria, stormwater sediment will be collected from catch basins connected to the stormwater trunk line that discharges to the northeast corner of the in-water area. As shown on Figure F-4 and listed in Table F-4, five catch basins have been identified for sampling.

Catch basin sediment collection methods are presented in Section 2.3.1. Analytical testing is presented in Section 2.3.2.

2.3.1 CATCH BASIN SEDIMENT SAMPLE COLLECTION

Samples from each location will be collected with a telescoping sampling pole with a clean sampling jar attached to the end. Solids will be collected from the bottom of each catch basin and then homogenized using decontaminated stainless-steel bowls and spoons. The homogenized sample volumes will then be placed into the appropriate laboratory supplied sample containers. If there is sufficient solid material in the catch basin, solids will be collected from several areas of the catch basin and placed into the sample container. If there is not a sufficient amount of sediment at the base of the catch basin, samples will be collected from the piping leading into the catch basin. If necessary, water collected with the solid material will be decanted back into the catch basin prior to placing the solid material into the sample container. The sampler will remove material greater than approximately ½-inch diameter prior to placing the solid material in the sample container.

2.3.2 CATCH BASIN SEDIMENT LABORATORY ANALYSIS

Catch basin sediment samples will be analyzed for total metals (including arsenic, cadmium, chromium, copper, lead, mercury, and zinc), SVOCs, TPH-Dx, percent solids, PCBs, and TOC as indicated in Table F-4. In addition, samples collected from catch basins along the northern Site boundary will be analyzed for hexavalent chromium.

2.4 SAMPLE CONTAINERS, PRESERVATION, AND STORAGE

Soil, groundwater, and catch basin sediment samples submitted to the analytical laboratory for analysis will be collected in the appropriate sample container provided by the analytical laboratory. The samples will be preserved by cooling to a temperature of 4°C and as required by the analytical method. Maximum holding and extraction times until analysis is performed will be strictly adhered to by field personnel and the analytical laboratory. Sample containers, preservatives, and holding times for each chemical analysis are presented in Table F-2.

2.5 SAMPLE TRANSPORTATION AND HANDLING

The transportation and handling of soil and groundwater samples will be accomplished in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to release of samples. Samples will be logged on a COC form and will be kept in coolers on ice until delivery to the analytical laboratory. The COC will accompany each shipment of samples to the laboratory.

2.6 SAMPLE CUSTODY

The primary objective of sample custody is to create an accurate, written record that can be used to trace the possession and handling of samples so that their quality and integrity can be maintained from collection until completion of all required analyses. Adequate sample custody will be achieved by means of approved field and analytical documentation. Such documentation includes the COC record that is initially completed by the sampler and is, thereafter, signed by those individuals who accept custody of the sample. A sample is in custody if at least one of the following is true:

- It is in someone’s physical possession.
- It is in someone’s view.
- It is secured in a locked container or otherwise sealed so that tampering will be evident.
- It is kept in a secured area, restricted to authorized personnel only.

Sample control and COC in the field and during transportation to the laboratory will be conducted in general conformance with the procedures described below:

- As few people as possible will handle samples.
- Sample containers will be obtained new or pre-cleaned from the laboratory performing the analyses.
- The sample collector will be personally responsible for the completion of the COC record and the care and custody of samples collected until they are transferred to another person or dispatched properly under COC rules.
- The cooler in which the samples are shipped will be accompanied by the COC record identifying its contents. The original record and laboratory copy will accompany the shipment (sealed inside the shipping container). The other copy will be forwarded to Landau Associates along with sample collection forms.

- Coolers will be sealed with strapping tape and custody seals for shipment to the laboratory. The method of shipment, name of courier, and other pertinent information will be entered in the “remarks” section of the COC record and traffic report.

When samples are transferred, the individuals relinquishing and receiving the samples will sign the COC form and record the date and time of transfer. The sample collector will sign the form in the first signature space. Each person taking custody will observe whether the shipping container is correctly sealed and in the same condition as noted by the previous custodian (if applicable); deviations will be noted on the appropriate section of the COC record.

A designated sample custodian at the laboratory will accept custody of the shipped samples, verify the integrity of the custody seals, and certify that the sample identification numbers match those on the COC record. The custodian will then enter sample identification number data into a bound logbook, which is arranged by a project code and station number. If containers arrive with broken custody seals, the laboratory will note this on the COC record and will immediately notify the sampler and Landau Associates.

2.7 SURVEYING

The location of each monitoring well and direct-push sampling location will be surveyed using differential global positioning system (DGPS) equipment to facilitate accurate placement of these features on project figures and drawings, as well as for submittal to Ecology. Monitoring well reference elevations will be surveyed to the nearest 0.01 ft for use in evaluating groundwater and lithologic unit elevations. Both the top of the monitoring wells casing elevation and ground surface elevation adjacent to the monitoring well will be obtained. This information will be used to develop groundwater elevation contour maps. Vertical Datum (NAVD)88 will be used as the reference elevation datum. Surveying will be accomplished after completion of the well installations.

2.7.1 WATER LEVEL MEASUREMENTS

Water level measurements will be obtained at each monitoring well prior to purging and sample collection. All water levels will be measured using an electronic water level indicator and will be recorded to the nearest 0.01 ft. Measurements will be taken from the top of the well casing.

2.8 EQUIPMENT DECONTAMINATION

The decontamination procedures described below are to be used by field personnel to clean drilling, sampling, and related field equipment. Deviation from these procedures must be documented in field records.

2.8.1 WATER LEVEL INDICATOR

The tape from the water level indicator will be rinsed with drinking water between each well measurement, and washed with alconox soap if petroleum product or sheen is encountered.

2.8.2 SAMPLING EQUIPMENT

All sampling equipment used (e.g., stainless-steel bowls, stainless-steel spoons, hand augers, Geoprobe® core samplers, etc.) will be cleaned using a three-step process, as follows:

1. Scrub surfaces of equipment that would be in contact with the sample with brushes using an Alconox solution
2. Rinse and scrub equipment with clean tap water
3. Rinse equipment a final time with deionized water to remove tap water impurities.

Decontamination of the reusable sampling devices will occur between collection of each sample. Decontamination of sampling equipment that contains a visible sheen will include a hexane rinse (or other appropriate solvent) prior to the tap water rinse. Groundwater sampling equipment in contact with the groundwater is dedicated to a specific sampling location and will not be used at more than one location; therefore, no sampling equipment decontamination is necessary.

2.8.3 HEAVY EQUIPMENT

Heavy equipment (e.g., the drilling rigs and drilling equipment that is used downhole, or that contacts material and equipment going downhole) will be cleansed by a hot water, high pressure wash before each use and at completion of the project. Potable tap water will be used as the cleansing agent.

2.9 RESIDUAL WASTE MANAGEMENT

This section describes the management of the soil cuttings, well development water, purge water, and decontamination water generated during well installation, well development, and groundwater sampling.

2.9.1 SOIL CUTTINGS

Soil cuttings from boreholes will be temporarily stored in 55-gallon drums. Only a small volume of soil cuttings are derived from Geoprobe® borings; soil cuttings from the direct-push investigation are expected to be contained in a several 55-gallon drums. A sufficient supply of drums will be made available by the drilling subcontractor for soil cuttings in case additional storage is needed. Disposal of the soil cuttings will be in accordance with appropriate regulations. A soil composite cutting sample will be collected from the material in the drum. Samples of each drum will be analyzed for parameters required for disposal.

Test pit soil will be put back in the test pit and compacted using the excavator bucket. Visually contaminated soil, if present, will be placed within the observed zone of contamination during backfilling.

2.9.2 DECONTAMINATION WATER, PURGE WATER, AND MONITORING WELL DEVELOPMENT WATER

Decontamination water, purge water, and monitoring well development water generated during soil and groundwater sampling and monitoring well installation will be temporarily stored in 55-gallon drums. Disposal methods will be determined based on the analytical results for the soil and groundwater samples.

3.0 QUALITY ASSURANCE

The overall goal of the project quality assurance (QA) program is to provide a reasonable degree of confidence in project data and results through establishment of a rigorous system of quality and performance checks on data collection, analysis, and reporting activities, as well as to provide for appropriate and timely corrective action to achieve compliance with established performance and quality criteria.

This section presents data quality objectives (DQO) and the quality control (QC) procedures developed to meet these DQOs, sample handling and chain-of-custody procedures, laboratory control samples, performance and system audits, corrective actions, and data validation.

3.1 DATA QUALITY OBJECTIVES

Results from the groundwater quality investigation activities will be used to document and evaluate current groundwater quality conditions in Areas G, I, J, and M and at the point of groundwater discharge to surface water in the in-water portions of the Site. The sample results must be precise, accurate, representative, complete, and comparable to a degree commensurate with this use.

The QA procedures presented are based on DQOs that were developed in accordance with Ecology guidelines (Ecology 2004).

The target control limits (the range within which project data of acceptable quality should fall) for data quality will be laboratory acceptance limits generated according to EPA guidelines (EPA 2005). The target control limits will be used to evaluate data acceptability and are considered to be QC goals for data acceptance.

Completeness of the project will be calculated as the proportion of data generated is validated.

Comparability is an expression of the confidence with which one data set can be compared to another. Data generated will be reported in units consistent with EPA guidelines. Statistical tests used to determine data precision, accuracy, and completeness are presented in the following subsections. Statistical definitions for representativeness and comparability are also provided in the following subsections.

3.1.1 PRECISION

Precision is a measure of mutual agreement among individual measurements of the same property under prescribed conditions. Precision is best expressed in terms of the standard deviation or relative percent difference (RPD). QA/QC sample types that test precision include field and laboratory duplicates and matrix or blank spike duplicates. The estimate of precision of duplicate measurements will be expressed as RPD, which is calculated:

$$RPD = \left| \frac{D_1 - D_2}{(D_1 + D_2)/2} \right| x\,100$$

where: D_1 = first sample value

D_2 = second sample value (duplicate).

The RPDs will be routinely calculated and compared with DQO control limits. RPD control limits for field duplicate samples will be 50 percent.

3.1.2 ACCURACY

Accuracy is the degree of agreement of a measurement (or an average of measurements of the same property) X, with an accepted reference or true value T, usually expressed as the difference between the two values (X-T), the difference as a percentage of the reference or true value (100 (X-T)/T), or as a ratio (X/T). Accuracy is a measure of the bias in a system and is expressed as the percent recovery of spiked (matrix or surrogate spike) samples:

$$Percent\ Recovery = \frac{(Spiked\ Sample\ Result - Unspiked\ Sample\ Result)}{Amount\ of\ Spike\ Added}\ x\,100$$

The percent recovery will be routinely calculated and checked against DQO control limits.

3.1.3 REPRESENTATIVENESS

Representativeness expresses the degree to which data accurately and precisely represent an actual condition or characteristic of a population. Representativeness can be evaluated using replicate samples, additional sampling locations, and blanks.

3.1.4 COMPLETENESS

Completeness is a measure of the proportion of data obtained from a task sampling plan that is determined to be valid. It is calculated as the number of valid data points divided by the total number of data points requested. The QA objective for completeness during this project will be 95 percent. Completeness will be routinely determined and compared to the DQO acceptable percentage.

3.1.5 COMPARABILITY

Comparability is an expression of the confidence with which one data set can be compared to another. QA procedures in this document will provide for measurements that are consistent and representative of the media and conditions measured. All sampling procedures and analytical methods used for the sediment investigation sampling activities will be consistent to provide comparability of results for samples and split samples. Data collected under this plan also will be calculated, qualified, and reported in units consistent with EPA guidelines.

3.2 FIELD AND LABORATORY QUALITY CONTROL SAMPLES

Field and laboratory control samples will used to evaluate data precision, accuracy, representativeness, completeness, and comparability of the analytical results for the verification sampling. A summary of the QC samples is presented in the following subsections.

3.2.1 BLIND FIELD DUPLICATE

Blind field duplicate samples will be used to evaluate data precision. Groundwater blind field duplicates will consist of split samples collected at a single sample location. Co-located blind field duplicates of soil and catch basin sediment will be collected from side by side locations. Blind field duplicates of water will be collected by alternately filling sample containers for both the original and the corresponding duplicate sample at the same location to decrease variability between the duplicates. Duplicates for all media will be submitted "blind" to the laboratory as discrete samples (i.e., given unique sample identifiers to keep the duplicate identity unknown to the laboratory), but will be clearly identified in the field log. Blind field duplicates will be collected at a frequency of one per 20 samples, not including QC samples, but not less than one duplicate per sampling event per matrix and will be analyzed for a suite of analyses equal to the union of all analyses requested during that sampling event, for that matrix. If the volume of soil or catch basin sediment at a given location is not sufficient to complete a duplicate sample set, blind field duplicates for separate analyses may be collected as splits from different field samples. For example, a split sample may be taken from one location and submitted as the blind field duplicate for metals and PCBs, while the blind field duplicate samples for TPH-D, SVOCs, and TOC may be collected as a split of a different sample.

3.2.2 FIELD TRIP BLANKS

Field trip blanks will consist of deionized water sealed in a sample container by the analytical laboratory. The trip blank will accompany VOC and TPH-G groundwater sample containers during transportation to and from the field, and then will be returned to the laboratory with each shipment of VOC and TPH-G samples. The trip blank will remain unopened until submitted to the laboratory for analysis of VOCs and TPH-G (if required) to determine possible sample contamination during transport.

3.2.3 FIELD RINSATE BLANKS

Field rinsate blanks will consist of deionized water passed over decontaminated sampling equipment and transferred to sample containers for analysis at the laboratory. Field rinsate blanks are used to identify potential cross contamination between the sampling equipment and the sample. Currently, groundwater sample collection will be conducted using disposable and/or dedicated equipment, thereby eliminating potential cross contamination between samples via sampling equipment. As a result, collection of rinsate blanks is not currently planned. If non-dedicated equipment is used during groundwater sample collection, at least one field equipment blank will be collected for laboratory analysis.

3.2.4 LABORATORY METHOD BLANKS

One laboratory method blank will be analyzed for all parameters (except total solids) to assess possible laboratory contamination. Dilution water will be used whenever possible. Method blanks will contain all reagents used for analysis. The generation and analysis of additional method, reagent, and glassware blanks may be necessary to verify that laboratory procedures do not contaminate samples.

3.2.5 LABORATORY CONTROL SAMPLE

One laboratory control sample will be analyzed for all parameters except total solids.

3.2.6 SURROGATE SPIKES

Samples analyzed for organic constituents will be spiked with appropriate surrogate compounds as defined by the analytical methods.

3.2.7 LABORATORY MATRIX SPIKE

A minimum of 1 laboratory matrix spike per 20 samples, not including QC samples, or 1 matrix spike sample per batch of samples if fewer than 20 samples are obtained, will be analyzed for inorganic analysis for each matrix sampled. The matrix spikes will be performed using a project sample. These analyses will be performed to provide information on accuracy and to verify that extraction and concentration levels are acceptable. The laboratory spikes will follow EPA guidelines for matrix and blank spikes. Note that a matrix spike duplicate (MSD) will not be collected because the current federal guidance for Quality Assurance Project Plans (QAPP) developed by EPA, the Department of Defense (DoD), and the Department of Energy (DOE) indicates that the MSD is not an effective measurement of precision in environmental media and is not a useful data quality indicator (EPA 2005).

3.2.8 LABORATORY DUPLICATE

A minimum of 1 laboratory duplicate per 20 samples, not including QC samples, or 1 laboratory duplicate sample per batch of samples if fewer than 20 samples are obtained, will be analyzed for arsenic and copper. These analyses will be performed to provide information on the precision of the chemical analyses. The laboratory duplicate will follow EPA guidance in the method.

3.3 CORRECTIVE ACTIONS

Corrective actions will be needed for two categories of nonconformance:

- Deviations from the methods or QA requirements established in this plan
- Equipment or analytical malfunctions.

Corrective action procedures to be implemented based on detection of unacceptable data are developed on a case-by-case basis. Such actions may include one or more of the following:

- Altering procedures in the field
- Using a different batch of sample containers
- Performing an audit of field or laboratory procedures
- Reanalyzing samples (if holding times allow)
- Resampling and analyzing
- Evaluating sampling and analytical procedures to determine possible causes of the discrepancies
- Accepting the data without action, acknowledging the level of uncertainty
- Rejecting the data as unusable.

During field operations and sampling procedures, the field personnel will be responsible for conducting and reporting required corrective actions. A description of any action taken will be entered in the daily field notebook. The project manager will be consulted immediately if field conditions are such that conformance with this plan is not possible. The field coordinator will consult with the Landau Associates' project manager, who may authorize changes or exceptions to the QA/QC portion of the plan, as necessary and appropriate.

During laboratory analysis, the laboratory QA officer will be responsible for taking required corrective actions in response to equipment malfunctions. If an analysis does not meet DQOs outlined in this plan, corrective action will follow the guidelines in the noted EPA analytical methods and the EPA guidelines for data validation for organics and inorganics analyses (EPA 1999, 2004). At a minimum, the laboratory will be responsible for monitoring the following:

- Calibration check compounds must be within performance criteria specified in the EPA method or corrective action must be taken prior to initiation of sample analysis. No analyses may be performed until these criteria are met.

- Before processing any samples, the analyst should demonstrate (through analysis of a reagent blank) that interferences from the analytical system, glassware, and reagents are within acceptable limits. Each time a set of samples is extracted or there is a change in reagents, a reagent blank should be processed as a safeguard against chronic laboratory contamination. The blank samples should be carried through all stages of the sample preparation and measurement steps.
- Method blanks should, in general, be below instrument detection limits. If contaminants are present, then the source of contamination must be investigated, corrective action taken and documented, and all samples associated with a contaminated blank reanalyzed. If upon reanalysis, blanks do not meet these requirements, Landau Associates will be notified immediately to discuss whether analyses may proceed.
- Surrogate spike analysis must be within the specified range for recovery limits for each analytical method utilized or corrective action must be taken and documented. Corrective action includes: 1) reviewing calculations, 2) checking surrogate solutions, 3) checking internal standards, and 4) checking instrument performance. Subsequent action could include recalculating the data and/or reanalyzing the sample if any of the above checks reveal a problem. If the problem is determined to be caused by matrix interference, reanalysis may be waived if so directed following consultation with Landau Associates. If the problem cannot be corrected through reanalysis, the laboratory will notify Landau Associates prior to data submittal so that additional corrective action can be taken, if appropriate.
- If the recovery of a surrogate compound in the method blank is outside the recovery limits, the blank will be reanalyzed along with all samples associated with that blank. If the surrogate recovery is still outside the limits, Landau Associates will be notified immediately to discuss whether analyses may proceed.
- If quantitation limits or matrix spike control limits cannot be met for a sample, Landau Associates will be notified immediately to discuss corrective action required.
- If holding times are exceeded, all positive and undetected results may need to be qualified as estimated concentrations. If holding times are grossly exceeded, Landau Associates may determine the data to be unusable.

If analytical conditions are such that nonconformance with this plan is indicated, Landau Associates will be notified as soon as possible so that any additional corrective actions can be taken. The laboratory project manager will then document the corrective action by a memorandum submitted to Landau Associates. A narrative describing the anomaly, the steps taken to identify and correct the anomaly, and any recalculation, reanalysis, or re-extractions will be submitted with the data package in the form of a cover letter.

3.4 DATA VERIFICATION AND VALIDATION

All RI data will be verified and validated to determine the results are acceptable and meet the quality objectives described in Section 3.1. Prior to submitting a laboratory report, the laboratory will verify that all the data are consistent, correct, and complete, with no errors or omissions.

Validation of the data will be performed by Landau Associates following the guidelines in the appropriate sections of the EPA Contract Laboratory Program *National Functional Guidelines for Organic and Inorganic Data Review* (EPA 1999, 2004) and will include evaluations of the following:

- Chain-of-custody records
- Holding times
- Laboratory method blanks
- Surrogate recoveries
- Laboratory matrix spikes and matrix spike duplicates
- Blank spikes/laboratory control samples
- Laboratory duplicates
- Corrective action records
- Completeness
- Overall assessment of data quality.

In the event that a portion of the data is outside the DQO limits or the EPA guidance (EPA 1999, 2004), or sample collection and/or documentation practices are deficient, corrective action(s) will be initiated. Corrective action, as described in Section 3.3, will be determined by the field coordinator and Landau Associates' QA officer in consultation with the Landau Associates' project/task manager and may include any of the following:

- Rejection of the data and resampling
- Qualification of the data
- Modified field and/or laboratory procedures.

Data qualification arising from data validation activities will be described in the data validation report, rather than in individual corrective action reports.

4.0 DATA MANAGEMENT PROCEDURES

All laboratory analytical results, including QC data, will be submitted in hard copy and electronically to Landau Associates. Electronic format will include comma separated value (CSV) files that will be downloaded directly to an Excel spreadsheet. Following validation of the data, any qualifiers will be added to the Excel spreadsheets. All survey data will be provided electronically in a format that can be downloaded into an Excel spreadsheet. All field data (groundwater field parameter data and water levels measurements) will be entered into an Excel spreadsheet and verified to determine all entered data is correct and without omissions and errors. Following receipt of all RI data all survey data, water level measurements, field parameters, and analytical results will be formatted electronically and downloaded to Ecology's Environmental Information Management (EIM) system.

* * * * * * * * * *

This document has been prepared under the supervision and direction of the following key staff:

LANDAU ASSOCIATES, INC.

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5.0 REFERENCES

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Data Source: ESRI 2008

Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\Appendix F\FigF-1_Vicinity Map.mxd 4/26/2010

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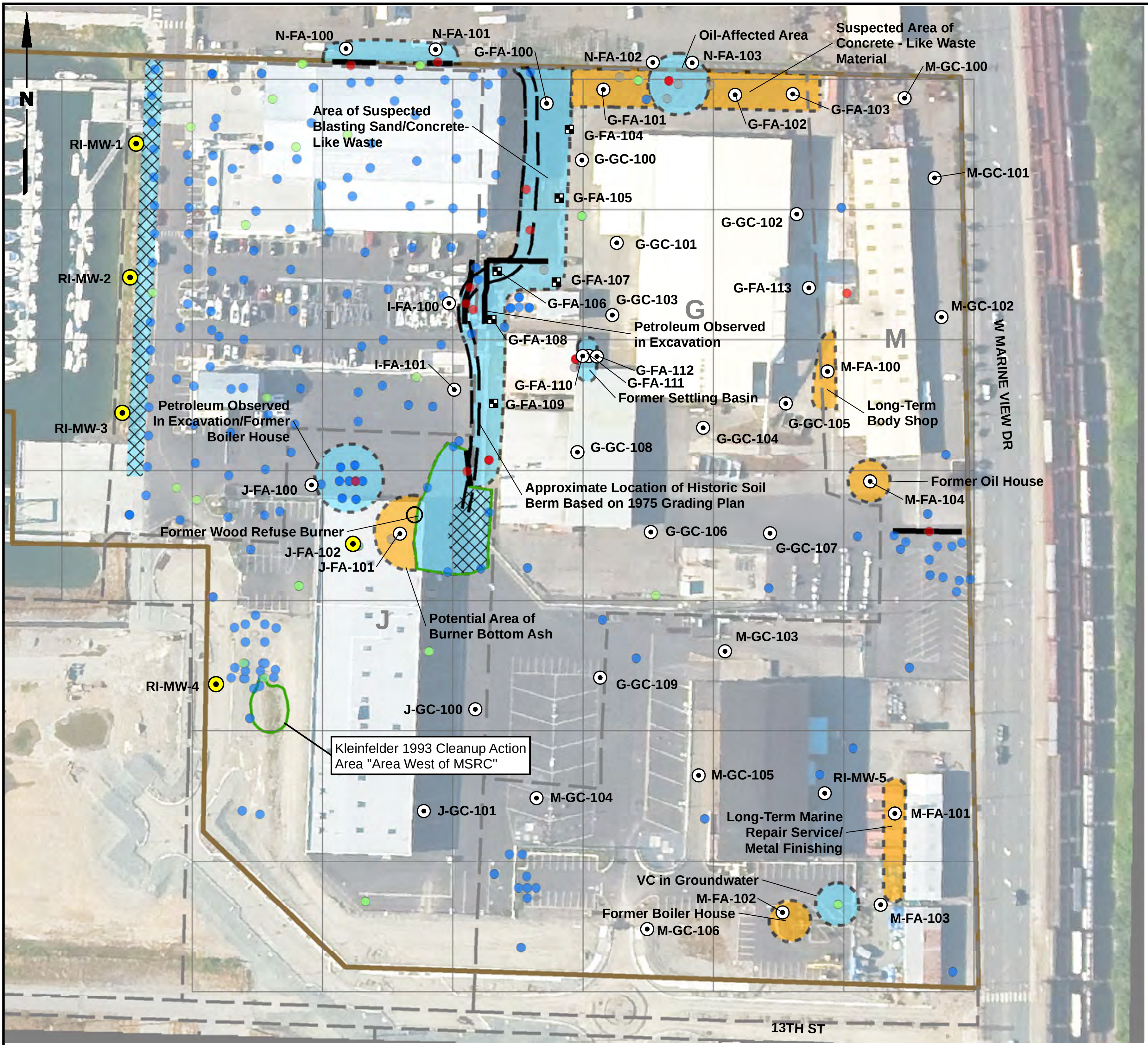
North Marina Ameron/Hulbert Site
RI/FS Work Plan
Everett, Washington

Vicinity Map

Figure
F-1

Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\Appendix F\FigF-2_Proposed Sampling Locations.mxd 9/15/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet



Legend

⊙	Proposed Soil Boring Locations
⊙	Chemical analysis for soil is not planned at the indicated location. Chemical analysis for soil may be added based on field screening results.
◘	Proposed Test Pit Locations
🔴	Soil Sample Exceeded Cleanup Screening Level - Represents soil remaining
🔵	Soil Sample Below Cleanup Screening Levels Represents Soil Remaining
🟢	Soil Samples Exceeds Copper Cleanup Screening Level - Represents Soil Remaining
●	Soil Sample Locations with No Analytical Data
▬	Residual Contamination Present at Excavation Sidewall
▨	Arsenic - affected crushed rock containment Area
🟦	Characterization in Areas of Known Contamination
🟧	Characterization in Areas of Potential Contamination
☐	150' Sample Grid
☐	Approximate Ameron/Hulbert Site Boundary
⌐	G - Area Designation

0 150 300

Scale in Feet

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Groundwater exceedances for metals are not shown.
3. VC = Vinyl Chloride

Data Source: Port of Everett (2009 Image)

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North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Proposed Soil Boring Locations

Figure
F-2

Legend

◐ Proposed Monitoring Well

● Proposed Soil Boring Location; I-FA-101

☒ AGI & Earth Consultants, Inc. Concrete Settling Basin Sump Sample Location (1992)

◐ Earth Consultants, Inc. Monitoring Well (1992)

▲ LAI Excavation Grab Sample (2007)

⊙ LAI Soil Boring Location (2004-2006)

◐ LAI Monitoring Well (2004)

⊕ Sweet Edwards/Emcon Monitoring Well (1989)

♦ Sweet Edwards/Emcon Pond Sample (1989)

○ Hart Crowser Monitoring Well (1991-1992)

● Groundwater Sample Exceeds Cleanup Screening Level - Constituent that exceeds is noted below sample name (for metals analyses, only exceedances in dissolved concentrations are shown).

▨ Arsenic - Affected Crushed Rock Containment Area Along Shoreline and in J-3

🟦 Characterization in Areas of Known Contamination

🟧 Characterization in Areas of Potential Contamination

🟨 Excavation Extents

🟫 Approximate North Marina Ameron/Hulbert Site Boundary

G - Area Designation

0 150 300

Scale in Feet

Note
1. **Blue** text indicates well or boring groundwater sampling locations
Gray text indicates former well or groundwater sampling locations.
2. * Indicates sample is being collected from an existing monitoring well.
3. As = Arsenic, Cu = Copper, VC= Vinyl Chloride, BEHP = Bis(2-ethylhexyl) phthalate, TPH = Total Petroleum Hydrocarbons
4. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Source: 6/19/2002 Google Earth Image

Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\Appendix F\FigF-3_Proposed GW Sample Locations.mxd 9/15/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet

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North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Proposed Groundwater Sampling Locations

Figure
F-3

Legend

◎ Proposed Sediment Sampling Locations

◎ Samples to be Archived for Potential Laboratory Analysis

● Proposed Catch Basin Sediment Sampling Location

⊙ Landau Associates Sediment Sampling Locations (2009)

◉ SAIC Sediment Sample Location (2009)

○— Catch Basin and Piping

▭ Approximate Ameron/Hulbert Site Boundary

⌐¬ G - Area Designation

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Source: Port of Everett (2009 Image)

0 150 300
Scale in Feet

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North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Proposed Sediment and Stormwater System Sampling Locations

Figure
F-4

Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\Appendix F\FigF-4_Proposed Sediment and Stormwater Locations.mxd 8/25/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet

TABLE F-1
PROPOSED INVESTIGATION LOCATIONS SUMMARY
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Location ID	Location	Rationale for Sample Collection	Surface Conditions	Soil Sampling Protocol for Focus Areas	Soil Sampling Protocol for General Characterization	Groundwater Analyses (a)
INVESTIGATION AREA G						
G-FA-100	North end of Interim Action Area G-1	Evaluate shallow soil quality in area where soil confirmation samples were not collected following interim action excavation. Gravel was placed in this area following interim action excavation; therefore, sampling will begin below the gravel surface material.	Gravel	Advance boring to 4 ft. Collect sample from surface soil below recently placed gravel and analyze for metals.	--	--
G-FA-101 through G-FA-103	North of manufacturing building	Delineation of concrete-like waste material.	Paved	Advance borings to 12 ft. Visual screening to delineate vertical extent of concrete-like waste material, if present. Collect sample of waste material, if present, and from below bottom depth of waste material and analyze for metals and cPAHs. If waste material is not encountered, follow protocol for general characterization sampling.	0 to 1 ft: metals, cPAHs, (analyze for VOCs and/or TPH based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	--
G-FA-104 through G-FA-109	West of manufacturing building and support structures	Test pits to delineate sandblast grit and concrete-like waste material observed during previous investigations and interim actions. Delineation of petroleum hydrocarbons observed at the southeastern corner of Interim Action Area G-1a (G-FA-108). Soil borings will be conducted if proposed sample location is in a paved area.	Gravel	Advance test pits to hydraulic fill, or to at least 8 ft if hydraulic fill not encountered. Visual screening to delineate vertical extent of concrete-like waste material, sandblast grit, and petroleum hydrocarbons. Collect samples from visually affected area, if present, and from below affected area and analyze for metals. Analyze samples with evidence of petroleum, if present, for TPH-Dx and/or TPH-G based on field screening. If waste materials are not encountered, follow protocol for general characterization sampling.	0 to 1 ft: metals (analyze for VOCs and/or TPH based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	--
G-FA-110 through G-FA-112	Former settling basins east of pole polishing building	Additional characterization of three former settling basins based on results from previous investigation.	Paved	Collect samples from former settling basins (estimate depth is 5 ft BGS) and analyze for metals. Confirm bottom depth of basins. Collect samples from zones of visually affected material, if present, otherwise analyze composite sample of material below pavement section.	--	--
G-FA-113	Downgradient of former area of petroleum-impacted soil west of the sublease building	Evaluate potential impacts from petroleum-impacted soil previously identified and reportedly removed.	Paved	Advance boring to 12 ft. Screen soil for visual or olfactory evidence of petroleum. Sample from affected area, if present, and from below affected area and test for metals, cPAHs, and TPH-Dx. Analyze for TPH-G based on field screening. If no evidence of contamination, follow general characterization sampling protocol.	0 to 1 ft: cPAHs, metals, TPH-D (TPH-G and/or VOCs based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	Collect sample and test for TPH- HCID, dissolved metals, and VOCs (follow-up TPH analysis based on HCID results)
G-GC-100 and G-GC-104	Around manufacturing building	Delineate extent of concrete and sandblasting waste west of manufacturing building, general characterization of soil conditions around manufacturing plant in areas that were unpaved after manufacturing operations began, and quality of fill placed between 1955 and 1961.	Paved	Advance boring to 12 ft. Screen soil for visual or olfactory evidence of petroleum. Sample from affected area, if present, and from below affected area and test for metals, cPAHs, and TPH-Dx. Analyze for TPH-G based on field screening. If no evidence of contamination, follow general characterization sampling protocol.	0 to 1 ft: cPAHs, metals, TPH-D (TPH-G and/or VOCs based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	Collect sample from G-GC-100 and test for dissolved metals, VOCs, and TPH-HCID (follow-up TPH analysis based on HCID results)

TABLE F-1
PROPOSED INVESTIGATION LOCATIONS SUMMARY
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Location ID	Location	Rationale for Sample Collection	Surface Conditions	Soil Sampling Protocol for Focus Areas	Soil Sampling Protocol for General Characterization	Groundwater Analyses (a)
G-GC-105 and G-GC-109	Around manufacturing building, and to the south	General characterization of soil conditions around manufacturing plant in areas that were unpaved after manufacturing operations began, and quality of fill placed between 1947 and 1961.	Paved	Advance boring to 12 ft. Screen soil for visual or olfactory evidence of petroleum. Sample from affected area, if present, and from below affected area and test for metals, and SVOCs, and PCBs (PCBs at G-GC-105 only). If no evidence of contamination, follow general characterization sampling protocol.	0 to 1 ft: SVOCs and metals, TPH and/or VOCs based on field screening, (add PCBs at G-GC-105) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	--
G-GC-101 through G-GC-103, G-GC-106 through G-GC-108	Around manufacturing building	Delineate extent of concrete and sandblasting waste west of manufacturing building, general characterization of soil conditions around manufacturing plant in areas that were unpaved after manufacturing operations began, and quality of fill placed between 1955 and 1961.	Paved	Advance borings to 12 ft. Extend G-GC-106 to native tideflat surface. Visual screening to delineate vertical extent of concrete and sandblast waste, if present. Collect samples from visually affected area and from below affected area, if present, and analyze for cPAHs and metals. In addition, analyze samples for TPH-Dx and/or TPH-G based on field screening results. If evidence of contamination or waste material is not encountered, follow general characterization sampling protocol.	0 to 1 ft: cPAHs, metals, TPH and/or VOCs (based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	--
P10 (G-2)	South of pole finishing building	General groundwater characterization.	Paved	--	--	Collect sample from existing monitoring well and test for dissolved metals and VOCs
SEE-EC-3	West of lab/storage building	General groundwater characterization.	Concrete	--	--	Collect sample from existing monitoring well and test for dissolved metals and VOCs
Sump	Beneath manufacturing building	General groundwater characterization	--	--	--	Collect sample from sump discharge and analyze for VOCs, SVOCs, cPAHs, dissolved metals, and TPH-HCID(follow-up TPH analysis based on HCID results).
INVESTIGATION AREA I						
RI-MW-1, RW-MW-2 and RI-MW-3	Esplanade	Characterization of groundwater at point of discharge to surface water, downgradient of arsenic-affected crushed rock. Evaluate quality of fill placed in 1976.	Planting strip	Extend borings to 15 ft. Field screening for evidence of impact. Collect samples from affected areas and from below affected areas, if present, and analyze for metals and cPAHs. If no evidence of contamination, no soil samples will be collected from these locations.	--	Install monitoring wells at RI-MW-1, RI-MW-2, and RI-MW-3. Analyze samples for dissolved metals, SVOCs, cPAHs, and VOCs.

TABLE F-1
PROPOSED INVESTIGATION LOCATIONS SUMMARY
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Location ID	Location	Rationale for Sample Collection	Surface Conditions	Soil Sampling Protocol for Focus Areas	Soil Sampling Protocol for General Characterization	Groundwater Analyses (a)
I-FA-100 and I-FA-101	East of historical soil berm	Assist delineation of concrete-like waste material and sandblast grit observed during excavation in interim action Area G-1a. Evaluate quality of fill placed in 1982. Evaluate groundwater quality near downgradient edge of previously observed concrete-like waste material and sandblast grit.	Paved	Extend boring I-FA-100 to native tideflat surface and boring I-FA-101 to 12 ft. Visual screening to delineate vertical extent of concrete-like waste material and sandblast grit, if present. Collect sample from affected area and from below affected area, if present, and analyze for metals. If no visual evidence of contamination, no soil samples will be collected from I-FA-100 and one soil sample will be collected from I-FA-101 to confirm field observations.		Collect samples from I-FA-100 and I-FA-101and test samples for dissolved metals and VOCs
INVESTIGATION AREA J						
J-FA-100	northwest of former MSRC building	Evaluate groundwater conditions in area where petroleum hydrocarbons were observed during previous construction project and former location of boiler associated with mill.	Paved	Advance boring to 12 ft. Screen soil for visual or olfactory evidence of petroleum. If evidence of petroleum is observed, test sample in affected area and below affected area for SVOCs, PCBs, and TPH-Dx (TPH-G based on field screening results), and metals. If no evidence of petroleum, collect one soil sample from capillary fringe.	--	Collect sample and test for dissolved metals, VOCs, SVOCs, cPAHs, PCBs, and TPH-HCID (follow-up TPH analysis based on HCID results)
J-FA-101 and J-FA-102	Historical mill features (wood waste burner and potential associated fill) / interim action area J-3	Investigate potential presence of bottom ash at native tideflat surface / evaluate groundwater quality downgradient of Area J-3 and former burner area.	Paved	Extend borings to native tideflat surface. Screen soil for visual evidence of bottom ash or other affected material. Collect sample from affected soil and from below affected soil, if present, for metals dioxins/furans, cPAHs, and TPH-Dx (TPH-G and/or VOCs based on field screening results). If no evidence of contamination is observed at J-FA-102, no soil samples will be collected from this location. Soil samples from J-FA-102, if collected, will be analyzed for dioxins/furans only if ash is observed at this location. If no evidence of contamination is observed at J-FA-101, collect sample from below fill for the previously specified analyte groups..	--	Sample J-FA-102 and test for dissolved metals, VOCs, and TPH-HCID (follow-up TPH analysis based on HCID results) Sample J-FA-102 and test for dioxins/furans if the soil samples from J-FA-101 and/or J-FA-102 (if collected and analyzed for dioxins/furans) have dioxin/furan concentrations in excess of 5.2 ng/kg. If ash is observed at J-FA-102, collect the groundwater sample from a supplemental boring approximately 50 ft west of J-FA-102 instead of from the J-FA-102 boring. .
RI-MW-4	1993 MSRC Interim Action Area	Evaluate groundwater conditions downgradient of 1993 MSRC Interim Action and quality of fill placed between 1973 and 1974.	Paved	Advance boring to native tideflat surface. Screen soil for visual or olfactory evidence of petroleum or other contamination. If evidence of petroleum is observed, test sample in affected area and from below affected area for NWTPH-Dx and/or NWTPH-G (based on field screening results), metals, and cPAHs. If no evidence of contamination is observed, no soil samples will be collected at this location.	--	Install monitoring well RI-MW-4 and test sample for TPH-HCID, metals, VOCs, SVOCs, and cPAHs (follow-up analysis for TPH based on HCID results);
J-GC-100 and J-GC 101	East of former MSRC building	General characterization of soil conditions in area of former warehouse / evaluate condition of fill.	Paved	Advance borings to 12 ft. Screen soil for evidence of contamination. Collect sample from affected area and below affected area, if present, and analyze samples for metals and cPAHs. If no evidence of contamination, follow general characterization sampling protocol.	0 to 1 ft: metals, cPAHs, TPH and/or VOCs (based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	Collect sample from J-GC-100 and test for dissolved metals and VOCs

TABLE F-1
PROPOSED INVESTIGATION LOCATIONS SUMMARY
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Location ID	Location	Rationale for Sample Collection	Surface Conditions	Soil Sampling Protocol for Focus Areas	Soil Sampling Protocol for General Characterization	Groundwater Analyses (a)
INVESTIGATION AREA M						
M-FA-100	West of Ameron sublease building	Evaluate potential impact from long-term operations of body shop.	Paved	Advance boring to 12 ft. Screen soil for visual or olfactory evidence of contamination and for VOCs using a PID. Collect sample from affected area and below affected area, if present, and analyze for metals and cPAHs. Analyze samples for VOCs and/or TPH based on field screening. If no evidence of contamination, follow general characterization sampling protocol.	0 to 1 ft: Metals, cPAHs (analyze for VOCs and/or TPH based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	Collect sample and test for dissolved metals, VOCs, TPH-HCID (follow-up with additional TPH analysis based on HCID results)
RI-MW-5 and M-FA-101	West of former Sandy's Boathouse and in former area of metal finishing	Evaluate potential impact from long-term operations of engine repair facility and metal casket finishing.	Paved / Gravel	Advance borings to 12 ft. Screen soil for visual or olfactory evidence of contamination and for VOCs using a PID. Collect sample from affected area and below affected area, if present, and analyze for metals. Analyze samples for VOCs, cPAHs, and/or TPH based on field screening. If no evidence of contamination, follow general characterization sampling protocol.	0 to 1 ft: metals; (analyze for VOCs, cPAHs, and/or TPH based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	Install RI-MW-5 and test for dissolved metals, VOCs, SVOCs, cPAHs, and TPH-HCID (follow-up TPH analysis based on HCID results)
M-FA-102	South of Collins Building	Evaluate conditions downgradient of former boiler house, delineate and evaluate potential source of vinyl chloride contamination in area of sample M-3.	Paved	Advance boring to 12 ft. Screen soil for visual or olfactory evidence of contamination and for VOCs using a PID. Collect sample from affected area and below affected area, if present, and analyze for metals, SVOCs, and PCBs. Analyze samples for VOCs and TPH based on field screening. If no evidence of contamination, follow general characterization sampling protocol.	0 to 1 ft: metals, SVOCs, PCBs (analyze for VOCs and/or TPH based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	Collect sample and test for dissolved metals, VOCs, PCBs, SVOCs, cPAHs, and TPH-HCID (follow-up with additional TPH analysis based on HCID results)
M-FA-103	Southeast of Collins Building	Evaluate potential source of vinyl chloride contamination in area of sample M-3.	Paved	Advance boring to 12 ft. Screen soil for visual or olfactory evidence of contamination and for VOCs using a PID. Collect sample from affected area and below affected area, if present, and analyze for metals. Analyze samples for VOCs, cPAHs, and TPH based on field screening. If no evidence of contamination, follow general characterization sampling protocol.	0 to 1 ft: metals (analyze for VOCs, cPAHs, and/or TPH based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	Collect sample and test for dissolved metals, VOCs, TPH-HCID (follow-up with additional TPH analysis based on HCID results)
M-FA-104	South of Ameron sublease building; area of former oil house	Evaluate potential impacts from petroleum storage associated with former mill.	Paved	Advance boring to 12 ft. Screen soil for visual or olfactory evidence of petroleum. Sample from affected area, if present, and from below affected area and test for metals, cPAHs, and TPH-Dx. Analyze for TPH-G based on field screening. If no evidence of contamination, follow general characterization sampling protocol.	0 to 1 ft: cPAHs, metals, TPH-D (TPH-G and/or VOCs based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	Collect sample and test for TPH- HCID, dissolved metals, and VOCs (follow-up TPH analysis based on HCID results)
M-GC-100	North of Ameron sublease building	General characterization in areas with no previous sampling and evaluate fill quality in area of pre-1940 fill.	Paved	Extend boring to 12 ft BGS. Screen soil for visual or olfactory evidence of contamination. Collect sample from affected area and below affected area, if present, and analyze for metals, SVOCs, and PCBs. If no evidence of contamination, follow general characterization sampling protocol.	0 to 1 ft: metals, SVOCs, PCBs (analyze for VOCs and/or TPH based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	Collect sample and test for TPH- HCID, dissolved metals, VOCs, SVOCs, and cPAHs (follow-up TPH analysis based on HCID results)
M-GC-101 and M-GC 102	East of Ameron sublease building	General characterization in areas with no previous sampling and evaluate fill quality in area of pre-1940 fill.	Paved	Extend boring M-GC-102 to former tideflat surface and other borings to 12 ft BGS. Screen soil for visual or olfactory evidence of contamination. Collect sample from affected area and below affected area, if present, and analyze for metals and cPAHs. If no evidence of contamination, follow general characterization sampling protocol.	0 to 1 ft: metals, cPAHs (analyze for VOCs and/or TPH based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	--
M-GC-103 through M-GC-106	South end of Area M	General characterization in areas with no previous sampling and in areas that were unpaved after manufacturing operations began. Evaluate conditions in the Port's waste accumulation area (M-GC-103), and in the area of a former warehouse (M-GC-104). Evaluate quality of fill placed between 1947 and 1955.	Paved	Advance borings to 12 ft and extend boring M-GC-106 to the native tideflat surface. Screen soil for visual or olfactory evidence of contamination. Collect sample from affected area and below affected area, if present, and analyze for metals and cPAHs. If no evidence of contamination, follow general characterization sampling protocol.	0 to 1 ft: metals, cPAHs (analyze for VOCs and/or TPH based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	Collect samples from M-GC-103 and M-GC-105 and test for metals and VOCs

TABLE F-1
PROPOSED INVESTIGATION LOCATIONS SUMMARY
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Location ID	Location	Rationale for Sample Collection	Surface Conditions	Soil Sampling Protocol for Focus Areas	Soil Sampling Protocol for General Characterization	Groundwater Analyses (a)
ECI-MW-3	West of Ameron sublease building	General groundwater characterization.	Paved	--	--	Collect sample from existing monitoring well and test for dissolved metals, SVOCs, cPAHs, and VOCs (analyze for hexavalent chromium based on field observations)
OFF-PROPERTY						
N-FA-100 and N-FA-101	Norton Industries property, north of interim action area I-5	Delineate extent of arsenic impact north of northern boundary of interim action area I-5.	Paved	Advance boring to hydraulic fill. Visual screening to delineate extent of concrete-like waste material and sandblast grit. Collect samples from visually affected area and from below affected area, if present, and analyze for metals. If waste materials are not encountered, follow protocol for general characterization sampling.	0 to 1 ft: metals (analyze for VOCs and/or TPH based on field screening) 1 to 2 ft: archive 2 to 3 ft: archive analyze archived samples based on results from 0 to 1 ft interval	Collect sample from N-FA-100 and test for dissolved metals and VOCs
N-FA-102 and N-FA-103	Norton Industries property, north of Ameron oil-affected area	Delineate extent and evaluate source of petroleum hydrocarbons in the oil-affected area north of the manufacturing building.	Paved	Screen soil for visual or olfactory evidence of contamination. Collect sample from affected area and below affected area, if present, and analyze for metals, SVOCs, VOCs, PCBs, and TPH. If no evidence of contamination, follow general characterization sampling protocol and begin sampling at 1 to 2 ft based on previous investigation results.	0 to 1 ft: archive 1 to 2 ft: Metals, SVOCs, VOCs, PCBs, TPH 2 to 3 ft: archive analyze archived samples based on results from 1 to 2 ft interval	Collect sample from N-FA-102 and test for dissolved metals, SVOCs, cPAHs, PCBs, TPH-HCID, and VOCs (follow-up with additional TPH analysis based on HCID results)

TABLE F-2
SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIMES
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Matrix / Analysis	Analytical Method	Container	Preservation	Maximum Holding Time (Days)
Soil:				
NWTPH-HCID	NWTPH-HCID	8-oz. jar - glass (b)	Store cool at 4°C	14
NWTPH-Dx	NWTPH-Dx (a)	8-oz. jar - glass (b)	Store cool at 4°C	14
NWTPH-G / BTEX / VOCs	NWTPH-Gx / 8021 / 8260	3 x 40-ml vial - glass 1 2-oz jar - glass	Store at -7°C	14
Metals (including mercury)	EPA 6010B (7471B for mercury)	8-oz. jar - glass (b)	Store cool at 4°C	180 (mercury 28 days)
SVOCs / cPAHs	EPA 8270/3545	8-oz. jar - glass (b)	Store cool at 4°C	14
PCBs	EPA 8082	8-oz. jar - glass (b)	Store cool at 4°C	14
Water:				
NWTPH-HCID	NWTPH-HCID	2 x 500-mL amber glass	Store cool at 4°C	7
NWTPH-Gx	NWTPH-Gx	2 x 40-ml vials - glass	Add HCl to pH<2; Store cool at 4°C	14
NWTPH-Dx	NWTPH-Dx (a)	2 x 500-mL amber glass	Store cool at 4°C	7
VOCs	EPA 8260B	2 x 40-ml vials - glass	Add HCl to pH<2; Store cool at 4°C	14
SVOCs / cPAHs	EPA 8270/3545 (SIM for cPAHs only)	2 x 500-mL amber glass	Store cool at 4°C	7
PCBs	EPA 8082	2 x 500-mL amber glass	Store cool at 4°C	7
Dissolved Metals (including mercury)	EPA 3010A / 6020 (7470 for mercury)	1-L polyethylene	Add $HN0_3$; Store cool at 4°C	180 (mercury 28 days)
Catch Basin Sediment:				
Hexavalent Chromium	EPA 3500	2 x 8-oz. jar - glass	Store cool at 4°C	28
Metals	EPA 6010B (7471B for mercury)		Store cool at 4°C	180 (mercury 28 days)
PCBs	EPA 8082		Store cool at 4°C	14
SVOCs	EPA 8270		Store cool at 4°C	14
TPH-Dx	NWTPH-Dx (a)		Store cool at 4°C	14
TOC	PSEP (c)	2-oz. jar - glass	Store cool at 4°C	14

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
SVOCs = Semivolatile Organic Compounds
VOCs = Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls
HCID = Hydrocarbon Identification
TPH = Total Petroleum Hydrocarbons
SIM = Selected ion monitoring
cPAHs = Carcinogenic Polycyclic Aromatic Hydrocarbons

(a) Laboratory sample preparation / Cleanup method: Acid / Silica gel cleanup.
(b) One 8-oz glass jar metals and SVOC/cPAH analyses. If additional analyses are planned at location, collect two 8-oz glass jars.
(c) Puget Sound Estuary Protocol

TABLE F-3
QUANTITATION LIMIT GOALS FOR SOIL, GROUNDWATER, AND CATCH BASIN SEDIMENT
AMERON-HULBERT SITE
EVERETT, WASHINGTON

		SOIL / CATCH BASIN SEDIMENT		WATER	
Analyte	**Analytical Method (a)**	**Reporting Limits (b)**	**Units**	**Reporting Limits (b)**	**Units**
CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS (cPAHS)					
Benzo(a)anthracene	EPA-8270 (SIM for water)	ND(<0.067)	mg/Kg	ND(<0.1)	µg/L
Chrysene	EPA-8270 (SIM for water)	ND(<0.067)	mg/Kg	ND(<0.1)	µg/L
Benzo(b)fluoranthene	EPA-8270 (SIM for water)	ND(<0.067)	mg/Kg	ND(<0.1)	µg/L
Benzo(k)fluoranthene	EPA-8270 (SIM for water)	ND(<0.067)	mg/Kg	ND(<0.1)	µg/L
Benzo(a)pyrene	EPA-8270 (SIM for water)	ND(<0.067)	mg/Kg	ND(<0.1)	µg/L
Indeno(1,2,3-cd)pyrene	EPA-8270 (SIM for water)	ND(<0.067)	mg/Kg	ND(<0.1)	µg/L
Dibenz(a,h)anthracene	EPA-8270 (SIM for water)	ND(<0.067)	mg/Kg	ND(<0.1)	µg/L
METALS					
Arsenic	EPA-7060	ND(<0.1)	mg/Kg	ND(<1.0)	µg/L
Cadmium	EPA-6010	ND(<0.2)	mg/Kg	ND(<2.0)	µg/L
Chromium	EPA-6010	ND(<0.5)	mg/Kg	ND(<5.0)	µg/L
Copper	EPA-6010	ND(<0.2)	mg/Kg	ND(<2.0)	µg/L
Lead	EPA-6020	ND(<2.0)	mg/Kg	ND(<1.0)	µg/L
Mercury	EPA-7471	ND(<.05)	mg/Kg	ND(<.05)	µg/L
Zinc	EPA-6010	ND(<0.6)	mg/Kg	ND(<10)	µg/L
PCBs					
Aroclor 1016	EPA-8082 MOD	ND(<0.033)	mg/Kg	ND(<0.01)	µg/L
Aroclor 1221	EPA-8082 MOD	ND(<0.066)	mg/Kg	ND(<0.01)	µg/L
Aroclor 1232	EPA-8082 MOD	ND(<0.033)	mg/Kg	ND(<0.01)	µg/L
Aroclor 1242	EPA-8082 MOD	ND(<0.033)	mg/Kg	ND(<0.01)	µg/L
Aroclor 1248	EPA-8082 MOD	ND(<0.033)	mg/Kg	ND(<0.01)	µg/L
Aroclor 1254	EPA-8082 MOD	ND(<0.033)	mg/Kg	ND(<0.01)	µg/L
Aroclor 1260	EPA-8082 MOD	ND(<0.033)	mg/Kg	ND(<0.01)	µg/L
TOTAL PETROLEUM HYDROCARBONS (TPH)					
Hydrocarbon Identification	NWTPH-HCID (c)	ND (<50,<20,<100) (e)	mg/Kg	ND(<0.25, <0.63, <0.63) (e)	µg/L
Gasoline Range	NWTPH-Gx (c)	ND(<5)	mg/Kg	ND(<250)	µg/L
Diesel Range	NWTPH-Dx (c,d)	ND(<5)	mg/Kg	ND(<250)	µg/L
Motor Oil Range	NWTPH-Dx (c,d)	ND(<10)	mg/Kg	ND(<500)	µg/L
VOLATILE ORGANICS COMPOUNDS (VOCs)					
Chloromethane	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Bromomethane	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Vinyl Chloride	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.1)	µg/L
Chloroethane	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Methylene Chloride	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.3)	µg/L
Acetone	EPA-8260 (f)	ND(<0.01)	mg/Kg	ND(<0.1)	µg/L
Carbon Disulfide	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
1,1-Dichloroethene	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
1,1-Dichloroethane	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
trans-1,2-Dichloroethene	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
cis-1,2-Dichloroethene	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Chloroform	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
1,2-Dichloroethane	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
2-Butanone	EPA-8260 (f)	ND(<0.01)	mg/Kg	ND(<0.1)	µg/L
1,1,1-Trichloroethane	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Carbon Tetrachloride	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Vinyl Acetate	EPA-8260 (f)	ND(<0.01)	mg/Kg	ND(<0.2)	µg/L
Bromodichloromethane	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
1,2-Dichloropropane	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L

TABLE F-3
QUANTITATION LIMIT GOALS FOR SOIL, GROUNDWATER, AND CATCH BASIN SEDIMENT
AMERON-HULBERT SITE
EVERETT, WASHINGTON

		SOIL / CATCH BASIN SEDIMENT		WATER	
Analyte	**Analytical Method (a)**	**Reporting Limits (b)**	**Units**	**Reporting Limits (b)**	**Units**
VOLATILE ORGANICS COMPOUNDS (VOCs) Continued					
cis-1,3-Dichloropropene	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Trichloroethene	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Dibromochloromethane	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
1,1,2-Trichloroethane	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Benzene	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
trans-1,3-Dichloropropene	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Bromoform	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.5)	µg/L
4-Methyl-2-Pentanone	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.1)	µg/L
2-Hexanone	EPA-8260 (f)	ND(<0.01)	mg/Kg	ND(<0.1)	µg/L
Tetrachloroethene	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
1,1,2,2-Tetrachloroethane	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Toluene	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Chlorobenzene	EPA-8260 (f)	ND(<0.003)	mg/Kg	ND(<0.2)	µg/L
Ethyl Benzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
Styrene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
Trichlorofluoromethane	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
1,1,2-Trichlorotrifluoroethane	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
m,p-Xylene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.4)	µg/L
o-Xylene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
1,2-Dichlorobenzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
1,3-Dichlorobenzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
1,4-Dichlorobenzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
Acrolein	EPA-8260 (f)	ND(<0.01)	mg/kg	ND(<5)	µg/L
Methyl Iodide	EPA-8260 (f)	ND(<0.01)	mg/kg	ND(<0.2)	µg/L
Bromoethane	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
Acrylonitrile	EPA-8260 (f)	ND(<0.01)	mg/kg	ND(<0.1)	µg/L
1,1-Dichloropropene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
Dibromomethane	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
1,1,1,2-Tetrachloroethane	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
1,2-Dibromo-3-Chloropropane	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.1)	µg/L
1,2,3-Trichloropropane	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.5)	µg/L
trans-1,4-Dichloro-2-Butene	EPA-8260 (f)	ND(<0.01)	mg/kg	ND(<0.1)	µg/L
1,3,5-Trimethylbenzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
1,2,4-Trimethylbenzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
Hexachlorobutadiene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.5)	µg/L
Ethylene Dibromide	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
Bromochloromethane	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
2,2-Dichloropropane	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
1,3-Dichloropropane	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
Isopropyl Benzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
n-Propyl Benzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
Bromobenzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
2-Chlorotoluene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
4-Chlorotoluene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
tert-Butylbenzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
sec-Butylbenzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
4-Isopropyl Toluene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
n-Butylbenzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.2)	µg/L
1,2,4-Trichlorobenzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.5)	µg/L
Naphthalene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.5)	µg/L
1,2,3-Trichlorobenzene	EPA-8260 (f)	ND(<0.003)	mg/kg	ND(<0.5)	µg/L
SVOCs					
1,2,4-Trichlorobenzene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
1,2-Dichlorobenzene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
1,3-Dichlorobenzene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
1,4-Dichlorobenzene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
2,2'-Oxybis(1-Chloropropane)	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
2,4,5-Trichlorophenol	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L

TABLE F-3
QUANTITATION LIMIT GOALS FOR SOIL, GROUNDWATER, AND CATCH BASIN SEDIMENT
AMERON-HULBERT SITE
EVERETT, WASHINGTON

		SOIL / CATCH BASIN SEDIMENT		WATER	
Analyte	Analytical Method (a)	Reporting Limits (b)	Units	Reporting Limits (b)	Units
2,4,6-Trichlorophenol	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
2,4-Dichlorophenol	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
2,4-Dimethylphenol	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
2,4-Dinitrophenol	EPA-8270	ND(<670)	µg/Kg	ND(<10)	µg/L
2,4-Dinitrotoluene	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
2,6-Dinitrotoluene	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
2-Chloronaphthalene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
2-Chlorophenol	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
2-Methylnaphthalene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
2-Methylphenol	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
2-Nitroaniline	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
2-Nitrophenol	EPA-8270	ND(<67)	µg/Kg	ND(<5)	µg/L
3,3'-Dichlorobenzidine	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
3-Nitroaniline	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
4,6-Dinitro-2-Methylphenol	EPA-8270	ND(<670)	µg/Kg	ND(<10)	µg/L
4-Bromophenyl-phenylether	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
4-Chloro-3-methylphenol	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
4-Chloroaniline	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
4-Chlorophenyl-phenylether	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
4-Methylphenol	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
4-Nitroaniline	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
4-Nitrophenol	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
Acenaphthene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Acenaphthylene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Anthracene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Benzo(a)anthracene	EPA-8270	ND(<67)	µg/Kg	ND(<0.1)	µg/L
Benzo(a)pyrene	EPA-8270	ND(<67)	µg/Kg	ND(<0.1)	µg/L
Benzo(b)fluoranthene	EPA-8270	ND(<67)	µg/Kg	ND(<0.1)	µg/L
Benzo(g,h,i)perylene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Benzo(k)fluoranthene	EPA-8270	ND(<67)	µg/Kg	ND(<0.1)	µg/L
Benzoic Acid	EPA-8270	ND(<670)	µg/Kg	ND(<10)	µg/L
Benzyl Alcohol	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
Benzyl butyl phthalate	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
bis(2-Chloroethoxy) Methane	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Bis-(2-Chloroethyl) Ether	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
bis(2-Ethylhexyl)phthalate	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Carbazole	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Chrysene	EPA-8270	ND(<67)	µg/Kg	ND(<0.1)	µg/L
Dibenz(a,h)anthracene	EPA-8270	ND(<67)	µg/Kg	ND(<0.1)	µg/L
Dibenzofuran	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Diethylphthalate	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Dimethylphthalate	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Di-n-Butylphthalate	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Di-n-Octyl phthalate	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Fluoranthene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Fluorene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Hexachlorobenzene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Hexachlorobutadiene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Hexachlorocyclopentadiene	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
Hexachloroethane	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Indeno(1,2,3-cd)pyrene	EPA-8270	ND(<67)	µg/Kg	ND(<0.1)	µg/L
Isophorone	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Naphthalene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Nitrobenzene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
N-Nitroso-Di-N-Propylamine	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
N-Nitrosodiphenylamine	EPA-8270	ND(<333)	µg/Kg	ND(<5)	µg/L
Pentachlorophenol	EPA-8270	ND(<330)	µg/Kg	ND(<5)	µg/L
Phenanthrene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Phenol	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
Pyrene	EPA-8270	ND(<67)	µg/Kg	ND(<1)	µg/L
CONVENTIONALS					

TABLE F-3
QUANTITATION LIMIT GOALS FOR SOIL, GROUNDWATER, AND CATCH BASIN SEDIMENT
AMERON-HULBERT SITE
EVERETT, WASHINGTON

		SOIL / CATCH BASIN SEDIMENT		WATER	
Analyte	Analytical Method (a)	Reporting Limits (b)	Units	Reporting Limits (b)	Units
Total Dissolved Solids	2540 C-97	--	--	5	mg/L
Total Organic Carbon	PSEP (g)	0.02%	--	--	--
Hexavalent Chromium	EPA 3500	0.10%	mg/kg	--	--

ND = Not Detected.

(a) Analytical methods are from SW-846 (EPA 1986) and updates, unless otherwise noted.

(b) Reporting limit goals are based on current laboratory data and may be modified during the investigation process as methodology is refined. Laboratory reporting will be based on the lowest standard on the calibration curve. Instances may arise where high sample concentrations, nonhomogeneity of samples, or matrix interferences preclude achieving the desired reporting limits.

(c) Methods as described in Analytical Methods for Petroleum Hydrocarbons, Washington State Department of Ecology, Publication ECY97-602, June 1997 (Ecology 1997).

(d) Acid/silica gel cleanup procedures will be applied to soil and water samples analyzed for NWTPH-Dx.

(e) The three reporting limits are for diesel-range organics, gasoline-range organics, and oil-range organics, respectively.

(f) Method 8260 will be performed using a 20-mL purge to obtain lower reporting limits.

(g) Puget Sound Estuary Protocol

TABLE F-4
CATCH BASIN SEDIMENT SAMPLING LOCATIONS
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Catch Basin ID	Location	Analyses
SD-3	north end of Area M	metals (a), SVOCs, PCBs, TOC, percent solids, TPH-D, hexavalent chromium
SD-4	north end of Area M	metals (a), SVOCs, PCBs, TOC, percent solids, TPH-D, hexavalent chromium
SD-7	north end of Area G	metals (a), SVOCs, PCBs, TOC, percent solids, TPH-D, hexavalent chromium
CB111	northwest corner of Area I	metals (a), SVOCs, PCBs, TOC, percent solids, TPH-D, hexavalent chromium
CB101	northwest corner of Area I	metals (a), SVOCs, PCBs, TOC

SVOCs = semivolatile organic compounds
PCBs = polychlorinated biphenyls
TOC = total organic carbon
TPH-D = diesel range petroleum hydrocarbons
(a) metals analysis for arsenic, cadmium, chromium, copper, lead, mercury, and zinc

APPENDIX G

Sediment Investigation
Sampling and Analysis Plan

Final
Sediment Investigation
Sampling and Analysis Plan
Ameron-Hulbert Site
Everett, Washington

November 17, 2010

Prepared for

Port of Everett, Washington

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1.0 INTRODUCTION AND BACKGROUND INFORMATION

This sampling and analysis plan (SAP) describes the sample collection, handling, and laboratory analysis procedures for the remedial investigation (RI) sediment characterization within the in-water portion of the North Marina Ameron-Hulbert Site (Site), located between 11th and 13th Streets off West Marine View Drive, Everett, Snohomish County, Washington (Figure G-1). This SAP is an appendix to the Site RI/Feasibility Study (FS) work plan (Work Plan), one of the required deliverables under the Agreed Order (No. DE 6677) between the Port of Everett (Port), Ameron International and the Hulberts (the PLPs), and the Washington State Department of Ecology (Ecology). The primary objective of this SAP is to provide sampling, sample handling, and analytical testing methodologies consistent with accepted procedures such that the data collected will be adequate for use in characterizing Site sediment conditions. This SAP was prepared consistent with the requirements of Washington Administrative Code (WAC) 173-340-820, the Sediment Management Standards (SMS; WAC 173-204; Ecology 1995), and the Sediment Sampling and Analysis Plan Appendix (SAPA; Ecology 2008). This SAP provides field, sampling, and analytical procedures to be used during the RI.

1.1 SITE DESCRIPTION

The Site is located in Everett, WA, between 11th and 13th Streets off West Marine View Drive, in the northeastern portion of the North Marina Area, and includes a large part of the 12th Street Yacht Basin to the west. The Site is owned by the Port and includes approximately 30 acres of uplands and adjacent in-water property. The uplands portion of the Site consists of buildings and paved areas, some of which are currently under construction. Stormwater runoff at the Site is collected in catch basins and discharged to marine surface water via stormwater outfalls. Approximate locations of the outfalls are shown on Figure G-2.

The in-water portion of the Site consists of the majority of the 12th Street Yacht Basin as shown on Figure G-2. Portions of the northern and eastern in-water areas contain riprap along the shoreline. The riprap functions to prevent erosion and create slope stability. A riparian area and intertidal "eco bench" was created along the north shoreline of the Yacht Basin as compensation for the marina development-related impacts, as shown on Figure G-2. The mitigation area consists of about a 12-ft wide (plan view) strip of uplands and intertidal habitat located between the pedestrian esplanade and the subtidal zone that was planted with native vegetation and is being monitored and maintained by the Port along the entire north shore of the 12th Street Yacht Basin. Subtidal sediment [below an elevation of -4 ft mean lower low water (MLLW)] is a mixture of silt and sand [Pentec Environmental (Pentec) 2004].

A biological evaluation (BE) conducted by Pentec (2004) describes the habitat, biota, and vegetation within the 12th Street Waterway and North Marina. According to the Pentec BE, the lower Snohomish River basin, including the North Marina waterways, are habitat for juvenile salmonid rearing and migration, saltwater-freshwater transition, and possibly adult migration. Salmonid species believed to be present in the Site vicinity include Chinook salmon and bull trout, which are listed as threatened species under the federal Endangered Species Act. Coho salmon are also believed to be present in the Site vicinity, and are a candidate species that may be listed in the future.

Scattered rockweed has been observed on riprap and pilings in the 12th Street Waterway. Little algae and no marsh plants are found on the floats or along the shorelines within the North Marina, except for plantings associated with the eco bench. Eelgrass is not present in the waterway. Forage fish documented in the Port Gardner area include Pacific herring, Pacific sand lance, and surf smelt and may be present in either waterway.

1.2 SITE HISTORY

The North Marina Area has been used for a variety of commercial, industrial, and marine-related activities since the late 1800s. From about 1890 until about 1950, timber-product operations dominated waterfront industrial activities. Over that period, the shoreline of Port Gardner Bay was near the current location of West Marine View Drive, with shingle and lumber mills either along the shoreline or located on wharfs to the west of the shoreline. The North Marina Area was filled to its current configuration between about 1947 and 1955, using predominantly dredge fill from the Snohomish River to create the Site uplands from the tidelands to the west of the original shoreline.

After the additional uplands were created, businesses transitioned from primarily the wood products industry to a broader range of industries and commercial enterprises, predominantly related to marine repair; concrete products manufacturing; and other marine, commercial, and light industrial activities. Although tenants have changed over time, the type of operations conducted at the Site did not change substantially under Port ownership until the Port initiated plans for redevelopment of the North Marina Area.

Prior to development of the 12th Street Yacht Basin, the 12th Street Waterway was formerly used as a log rafting area for the Hulbert Mill, which was located at the head of the waterway until it was destroyed by fire in the 1950s. The 12th Street Waterway has been altered by dredging and filling over several decades to convert portions of the shoreline to industrial and commercial uses and to provide navigation. The Port redeveloped the waterway into a 150-slip marina designed to accommodate large pleasure boats in 2007. The renovation required dredging and removal of overwater structures and pilings. The approximate limits for a portion of the dredging that occurred within the 12th Street Waterway as part of the recent redevelopment are shown on Figure G-2.

1.3 PREVIOUS SEDIMENT INVESTIGATIONS

Three sediment quality investigations were conducted in the 12th Street Waterway, in advance of it being redeveloped into the 12th Street Yacht Basin, to evaluate the sediment quality for open water disposal under the Puget Sound Dredge Disposal Analysis (PSDDA) program. These investigations were:

- *Subsurface Exploration and Engineering Report, William Hulbert Marina Site. Everett, Washington.* Rittenhouse-Zeman & Associates (RZA) for William Hulbert (February 1988)
- *Sampling and Analysis Report for Characterization, Proposed 12th Street Marina, Everett, Washington*. Prepared by RZA for the Hulbert Mill Company (March 1991)
- *Puget Sound Dredged Disposal Analysis, Full Characterization for the 12th Street Marina.* Prepared by Pentec Environmental for the Port of Everett (February 1, 2001).

The sediment quality investigations consisted of laboratory analysis of 18 composite samples collected from 39 sediment cores and one surface sediment sample. The sample locations are shown on Figure G-3. Laboratory analysis for sediment samples included volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) including carcinogenic polycyclic aromatic hydrocarbons (cPAHs), metals, petroleum hydrocarbons, pesticides, polychlorinated biphenyls (PCBs), organotins, conventional paramaters, and grain size. Selected samples were also submitted for bioassay analysis. . Carbon normalized and dry weight analytical results are presented in Tables G-1 and G-2, respectively, in conjunction with the SMS sediment quality standards (SQS) and cleanup screening levels (CSL), and the Apparent Effects Threshold (AET) values for comparison to dry weight sediment data.

A comparison of the analytical results for the sediment samples to the SQS and CSL (see Section 5.3 of this Work Plan) indicates that surface sediment at the one sampling location (RZA-C-2; 0.92 mg/kg) and subsurface sediment at one location (RZA-C-6; 90 mg/kg) in the 12th Street Yacht Basin exceeded the SQS (0.41 mg/kg) and CSL (0.59 mg/kg) for mercury. Surface sample ECI-Area-R (526 mg/kg) exceeded the SQS for zinc (410 mg/kg). The SQS for benzyl butyl phthalate (4.9 mg/kg) was exceeded at RZA-C-2 (31.5 mg/kg). Sediment at one subsurface location (RZA-C-7; 337 mg/kg) exceeded the sediment the SQS for di-n-butyl phthalate 220 mg./kg).

The in-water portion of the Site has been dredged; the approximate limits for a portion of the dredging that occurred within the 12th Street Waterway in 2005 are shown on Figure G-2). Much of the sediment characterization has been associated with disposal/relocations requirements of the dredged sediment. A post-dredge sediment quality sample was collected in the 12th Street Yacht Basin to evaluate sediment quality as part of the evaluation of Port Gardner Bay under the Puget Sound Initiative (PSI; SAIC 2009). Sediment samples were also collected by Landau Associates in the southern portion of the 12th Street Yacht Basin in 2009 as part of the remedial investigation for the adjacent North Marina West End Site (Landau Associates 2009). Surface sediment at the location of the SAIC and Landau Associates 2009 samples meets the SMS cleanup standards.

2.0 OBJECTIVES AND DESIGN OF SEDIMENT INVESTIGATION

This section describes the objectives of the sediment investigation and the sampling approach for achieving the objectives.

2.1 OBJECTIVES

The objectives of the sediment investigation are to determine if previous Site activities have impacted sediment quality to an extent that may pose a threat to human health or adversely affect biological resources and, if necessary, determine the lateral and vertical extent of the contamination.

2.2 OVERALL SAMPLING DESIGN

The sediment investigation will be conducted in a phased approach. The first phase of the investigation is designed to determine if impacts to sediment by Site activities have occurred. Therefore, the focus of the initial phase will be in areas most likely to be impacted by Site activities. The primary pathways for contaminants to potentially migrate from the uplands portion of the Site to sediment are via surface water runoff and groundwater discharge. Surface water from the Site is discharged to the in-water portions of the Site via stormwater outfalls. Because the north and south sides of the in-water portions of the Site are relatively protected, any sediment transported via surface water runoff likely settles near the outfall. Also, much of the aquatic area that lies within the preliminary Site boundary has been dredged within the last 2 to 7 years for maintenance and redevelopment purposes, so any affected sediment is anticipated to be limited to areas in close proximity to the shoreline. Based on these considerations, the sediment investigation has been designed to focus primarily on aquatic areas in the vicinity of Site stormwater outfalls near the shoreline, with limited additional characterization of Site sediment in areas located at distance from the outfall. The known outfall locations are shown on Figure G-2.

During the initial investigation, sediment samples will be collected from the upper 10 centimeters (cm) of sediment, which, in accordance with the sediment management standards (SMS), is considered the predominantly biologically active zone for the Puget Sound. Each surface sediment sample will undergo analysis for SMS chemicals and porewater organotins.

A second phase of sediment quality monitoring will be implemented if the results of this initial investigation determine the quality of surface sediment poses a threat to human health and the environment (i.e., concentrations are detected in the initial surface sediment samples that exceed the SMS). This phase will focus on determining the lateral and vertical extent of the contamination. During this phase, surface sediment samples will be collected to delineate lateral extent and sediment core samples will be collected to determine the vertical extent. It is anticipated that it would only be necessary to extend the cores to 4 ft below ground surface (BGS) due to the extensive dredging that has previously occurred at the Site.

Currently, biological testing is not planned for sediment quality characterization. However, this may be further evaluated, depending on the results from the initial two phases of the investigation (if applicable). If required, a supplemental sediment SAP to address biological testing will be submitted to Ecology for review and approval.

2.3 PROPOSED SAMPLING LOCATIONS

As previously mentioned in Section 2.2, sediment characterization will primarily focus on aquatic areas near the shoreline and, more specifically, near the stormwater outfalls. Riprap is located along much of the Site shoreline and, although the proposed sediment sampling stations are located in areas anticipated to be beyond the limits of the shoreline riprap, sample locations will be modified in the field if riprap is encountered. The proposed sediment sampling locations are shown on Figure G-4.

Six sampling stations are planned for the in-water portion of the Site within the 12th Street Yacht Basin:

- Three stations (A/H-SED-1 through A/H-SED-3) are directly offshore from the stormwater outfall located in the northeastern corner of the 12th Street Yacht Basin.
- Three stations (A/H-SED-4, A/H-SED-5 and A/H-SED-7) are located offshore from outfalls located along the eastern and northern boundaries of the 12th Street Yacht Basin.
- Two stations (A/H-SED-6 and A/H-SED-8) are located in the west central and central portion of the 12th Street Yacht Basin for general characterization.

The main stormwater trunkline for the uplands portion of the Site and businesses to the north discharges at the outfall in the northeast corner of the 12th Street Yacht Basin, so the highest potential for impact to Site sediment is at or near this outfall. Surface sediment from station A/H-SED-1 will be analyzed and samples collected from stations A/H-SED-2 and A/H-SED-3 will initially be archived at the laboratory. Samples A/H-SED-2 and A/H-SED-3 will be analyzed if the analytical results for A/H-SED-1 exceeds the SMS for one or more constituents of concern (COCs). The analyses for these samples will be limited to the constituent group(s) that exhibit one or more SMS exceedances (e.g., SVOCs).

3.0 FIELD INVESTIGATION PROCEDURES

This section presents station positioning methods, sample collection procedures, and equipment decontamination procedures.

3.1 STATION POSITIONING METHODS

Proposed sediment station coordinates are presented in Table G-3. The objective of the station positioning is to accurately [±3 meters (m)] establish and record the positions of all sampling locations. Station locations will be surveyed using a Trimble NT300D differential global positioning system (DGPS) or equivalent DGPS with the use of a known survey control point. All station coordinates will be reported in Washington State Plane South Zone coordinate system [North America Datum (NAD) 83].

Vertical position control will be evaluated by using the depth sounder on the sampling vessel. A lead line (or weighted tape) will be periodically used to measure from the water surface to the mudline as a check and to provide a correction factor (if necessary) for readings from the vessel's depth sounder. In-field adjustments to depth readings due to tidal stages will be made using tidal prediction software loaded on the ship's navigational system. Actual mudline elevations (in MLLW) will be adjusted after field activities are completed relative to tidal elevation observations made by National Ocean Services.

3.1.1 SURFACE SEDIMENT SAMPLE ACQUISITION

This section describes the procedures for collecting surface sediment samples. Surface sediment sampling will follow Puget Sound Estuary Program (PSEP) protocols. Samples will be collected from an appropriate sampling vessel with a mechanical grab sampler (i.e., hydraulically powered van Veen grab). If a location cannot be accessed by vessel, samples will be collected by hand using a small grab sampler. Also, if a grab sample cannot be collected at a planned location due to obstructions, impenetrable material, or unsuitable bottom slope conditions, an alternative location in the vicinity of the planned location will be sampled. The general procedure for collecting surface sediment samples is as follows:

1. Make logbook entries, as necessary, throughout the sampling process for thorough recordkeeping.
2. Maneuver the sampling vessel to the proposed sampling location.
3. Prepare the sampler for deployment.
4. Guide the sampler into the water keeping it clear of the sampling vessel.
5. Lower the sampler through the water column to the bottom at approximately 0.3 [meters per second (m/sec)].
6. Upon firm contact with the bottom, record the location with the DGPS.
7. Retrieve the sampler and raise it to the surface at approximately 0.3 m/sec.

8. Guide the sampler onto the deck of the sampling vessel; use care to avoid unnecessary jostling that might disturb the integrity of the sample.
9. Examine the sample relative to the following sediment acceptance criteria:
   - The sampler is not overfilled with sediment so that the sediment surface presses against the top of the sampler.
   - No leakage has occurred, as indicated by overlying water on the sediment surface.
   - No winnowing has occurred, as indicated by a relatively flat, undisturbed surface.
   - The penetration depth is adequate.
   - The grab sampler is properly closed.
10. Siphon off any standing water from the surface of the sediment using a hose primed with Site water. Be careful during siphoning not to disturb the integrity of the sediment surface.
11. Document sample observations.
12. Collect the upper 10 cm of material from the sampler using a stainless-steel scoop or spoon. Take care not to include any material that has been in contact with any interior sampler surface.
13. Thoroughly rinse the interior of the sampler until all loose sediment has been washed off.
14. Repeat the sampling process until sufficient sediment volume is obtained to satisfy the volume requirements for the laboratory analysis. Collect successive grab samples, if necessary, within a radius of 3 m of the targeted station coordinates.
15. Homogenize the bulk sediment with a stainless-steel spoon or heavy-duty, variable-speed drill with stainless-steel stirring paddle until the sediment appears uniform in color and texture.
16. Distribute homogenized sediment to appropriate laboratory-supplied sample containers and make certain that sample labels are completely filled out and affixed to the containers.
17. Clean the exterior of all sample containers and store them in an ice chest at approximately 4°Centrigrade (C), away from the immediate work area.
18. Thoroughly decontaminate the sampler by following the procedures in Section 3.5
19. Make sure that all logbook entries are complete.
20. Proceed to the next sampling location.

There may be conditions encountered during field activities that require modification of the general procedures outlined above. Any such procedural modifications will be carefully documented.

3.2 SEDIMENT CORE SAMPLE ACQUISITION

This section describes the procedures for collecting core sediment samples, should collection of core samples be necessary based on the results of the surface sediment sample analyses. Core samples are collected by inserting a cylindrical tube into the sediment, closing the top of the tube, and withdrawing a sediment core. At most locations, the core samples will be collected from an appropriate sampling vessel with a mechanical core sampler (e.g., a vibracore). If a location cannot be accessed by vessel, samples will be collected by hand using a push-core sampler. Also, if a core sample cannot be collected at a planned location due to obstructions, impenetrable material, or unsuitable bottom slope conditions, an alternative location in the vicinity of the planned location will be sampled. The general procedures for collecting core sediment samples are as follows:

1. The sampling vessel will be maneuvered to the target station coordinates (Table G-3).
2. The vibracore and a decontaminated core tube with core catcher in place will be deployed.
3. Continuous core samples will be collected until the planned penetration depth is reached or until refusal is met. If refusal is met prior to reaching a depth of at least 75 percent of the target penetration, the vessel will be repositioned and another attempt will be made. If unsuccessful on the second try, the project manager will be contacted to determine whether additional attempts to obtain a sample will be made.
4. The location and depth of penetration will be measured and recorded.
5. The sample core tube will be extracted, and the vibracore assembly will be retrieved aboard the vessel.
6. The core sample will be evaluated at the visible ends of the core tube to verify adequate retention of sediment in the core tube. If sample retention is adequate, the core tube will be capped, labeled, and prepared for transport to the processing facility.
7. Core tubes will be capped with aluminum foil or pre-cleaned expansion plugs to prevent contamination or loss of sample.
8. The core tube will be marked with the Station ID, collection time, retention amount, penetration depth and recovery, and clear indication of which end is “up” (sediment surface at top).
9. Core tubes will be kept cool (on ice) during storage and transit to the processing facility.

If conditions are encountered that require the collection of sediment core samples, it is anticipated that it will only be necessary to extend the cores to 4 ft BGS due to the extensive dredging that has occurred at the Site in the past. Based on a planned coring depth of 4 ft BGS, three subsamples would be collected from each core. The depth intervals of the subsamples would be approximately 1.0 to 2.0 ft BGS, 2.0 to 3.0 ft BGS, and 3.0 to 4.0 ft BGS. It is assumed that the surface sediment sample is representative of the 0 to 1.0 ft interval.

All interval measurements will be adjusted according to the percent retention (length of sediment sample retrieved/penetration depth of core tube) of the sediment collected within each individual core tube. For example, if 3 ft of sediment was retrieved from a core with a penetration depth of 4 ft, the retention ratio would be 0.75 or 75 percent. The resulting intervals to be sampled would then be adjusted for 75 percent sediment retention.

Initially, the 1.0 to 2.0 ft depth interval would be submitted for chemical analysis. The samples collected from the deeper depth intervals would be frozen and archived at the laboratory pending the results for the uppermost subsurface sample, with the exception of mercury. If mercury is a planned analytical parameter based on surface sediment results (see Section 4.0), then mercury would be tested for in each sample to meet holding time requirements. Sediment samples would be tested sequentially downward until concentrations for all constituents are below the SMS.

3.3 SAMPLE DOCUMENTATION AND HANDLING

This section describes the sampling documentation and handling procedures to be used during the surface sediment quality investigation. The procedures and quality control (QC) criteria will be used to verify that sample integrity is maintained from the time of sample collection to the time of analysis in the laboratory.

3.3.1 SAMPLE DOCUMENTATION

A complete record of field activities will be maintained. Documentation necessary to meet quality assurance (QA) objectives for this project include: field notes and sampling forms, sample container labels, and sample chain-of-custody forms. All original documentation will be kept in the Landau Associates project files. The documentation and other project records will be safeguarded to prevent loss, damage, or alteration.

If an error is made on a document, corrections will be made by drawing a single line through the error and entering the correct information. The erroneous information will not be obliterated. Corrections will be initialed and dated, and, if necessary, a footnote explaining the correction will be added. Errors will be corrected by the person who made the entry, whenever possible. Documentation will include:

- Record-keeping by field personnel of primary field activities
- Record-keeping of all samples collected for analysis
- Use of sample labels and chain-of-custody tracking forms for all samples collected for analysis.

Field logbooks will provide descriptions of all sampling activities, conferences associated with field sampling activities, sampling personnel, weather conditions, and a record of all modifications to the procedures and plans identified in this Work Plan. The field logbooks are intended to provide sufficient data and observations to enable participants to reconstruct events that occurred during the sampling period.

Information to be collected for surface sediment samples includes bottom depth, sampler penetration depth, and information on sediment characteristics (e.g., sediment type, color, odor, and the presence of any debris). After sample collection, the following information will be recorded on the field log sheet:

- Sample Identification
- Date, time, and name of person logging sample
- Sampling location coordinates
- Depth of water at the location
- Sampler penetration depth
- Physical observations including, e.g., presence of debris, color, presence of sheen, apparent grain size, and odor; the presence of wood debris will be described on a qualitative basis using the following descriptors:
  - None (No observable wood waste)
  - Trace (less than about 5 percent wood waste)
  - Some (between about 5 and 15 percent wood waste)
  - Significant (between about 15 and 30 percent wood waste)
  - Very significant (between about 30 percent and 50 percent)
  - Primarily (greater that 50 percent wood waste).

3.3.2 SAMPLE IDENTIFICATION

Each sediment sample will be assigned an individual sample identification. The samples will be identified in a manner that identifies that the sample was collected as part of the RI; identifies the sample type (i.e., sediment); identifies the location of the sample (i.e., station number); and identifies the sample depth interval. For example, the sample collected at station 1 will be identified as A/H-SED-1 (0 to 10 cm).

3.3.3 SAMPLE CONTAINER LABELS

Sample labels will be made of waterproof material and be self-adhering. An indelible pen will be used to fill out each label. Each sample label will contain the project number, sample identification, preservation technique (if applicable), analyses, date and time of collection, and initial of the person(s) preparing the sample. Clear packaging tape will be affixed over the label and wrapped completely around the sample container to prevent label damage or loss during transport and storage.

3.3.4 SAMPLE CONTAINERS, PRESERVATION, AND STORAGE

Samples submitted to the analytical laboratory for sediment analysis will be placed in the appropriate sample container provided by the analytical laboratory (Table G-4). The samples will be preserved by cooling to a temperature of 4°C and as required by the analytical method. Maximum holding and extraction times until analysis will be strictly adhered to by field personnel and the analytical laboratory. Sample containers, preservatives, and holding times for each chemical analysis to be performed during the surface sediment quality investigation are presented in Table G-4.

3.3.5 SAMPLE PACKING AND SHIPPING

The transportation and handling of samples will be accomplished in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to the possible hazardous nature of samples. Regulations for packing, marking, labeling, and shipping of hazardous materials are promulgated by the U.S. Department of Transportation in the Code of Federal Regulations (CFR), 49 CFR 173.6 and 173.24.

Prior to shipping, samples will be placed on sealed, reusable ice packs, or double-bagged ice in coolers following collection. At the end of the day, samples sent to the analytical laboratory will be inventoried. A plastic cooler will be used as a shipping container, with the drain plug taped shut. When appropriate, approximately 1 inch of packing material will be placed in the bottom of the liner.

The sample bottles will be placed in the cooler containing ice or frozen reusable ice packs. Sample containers will be individually wrapped with plastic bubble-wrap and packaged carefully with sufficient packing material to avoid breakage or cross-contamination, and will be shipped to the offsite analytical laboratory at proper temperature (approximately 4°C). The chain-of-custody accompanying the samples to the laboratory will be placed inside a separate plastic bag and taped inside the cooler lid.

The cooler will be secured with signed custody seals and taped shut with strapping tape. Samples will be transported to the laboratory at the end of the sampling activities. The cooler will be transported to the laboratory by the laboratory's courier.

3.3.6 SAMPLE CUSTODY

The primary objective of sample custody is to create an accurate, written record that can be used to trace the possession and handling of samples so that their quality and integrity can be maintained from collection until completion of all required analyses. Adequate sample custody will be achieved by means of approved field and analytical documentation. Such documentation includes the chain-of-custody record, which is initially completed by the sampler and is, thereafter, signed by those individuals who accept custody of the sample.

3.4 EQUIPMENT DECONTAMINATION

The decontamination procedures described below are to be used by field personnel to clean sampling and related field equipment. Deviation from these procedures must be documented in field records.

All sampling equipment used (e.g., stainless-steel bowls, stainless-steel spoons, etc.) will be cleaned using a three-step process as follows:

1. Scrub surfaces of equipment that would be in contact with the sample with brushes using an Alconox solution
2. Rinse and scrub equipment with clean tap water
3. Rinse equipment a final time with deionized water to remove tap water impurities.

Decontamination of the reusable sampling devices must occur between each sample. Excess sediment sample material and rinsate water will be returned to the original sampling location.

3.5 MANAGEMENT OF RESIDUAL WASTES

Excess sediment generated during sediment sampling will be returned to the water at the station where it was collected. Decontamination water will be drummed for offsite disposal.

4.0 LABORATORY ANALYSIS

The laboratory analyses for this investigation will be consistent with the PSEP guidelines (PSEP 1997a,b,c) and protocols required by SMS (Ecology 1995) and described in SAPA (Ecology 2008). All surface sediment samples will undergo analysis for SMS chemicals including metals (arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc). SVOCs identified on the SMS list of chemical parameters; and conventional parameters [grain size, total organic carbon (TOC), total volatile solids, total solids, ammonia, and total sulfides]. As requested by Ecology, two surface sediment samples (A/H-SED-1 and A/H-SED-4) will also be analyzed for dioxins and furans. Samples collected from the remaining stations will be archived and potentially analyzed for dioxins and furans based on the analytical results for A/H-SED-1 and A/H-SED-4.

Analysis of core samples, if collected, will be determined after consultation with Ecology.

Sample preparation, cleanup, and analytical methods will be in accordance with U.S. Environmental Protection Agency (EPA 1986, 1994a,b) and PSEP protocols (PSEP 1997a,b,c) for the SVOCs, metals, and TOC analyses. Sample preparation methods, cleanup methods, and analytical methods are summarized in Table G-5. All analytical testing and reporting will be conducted in accordance with SAPA guidelines (Ecology 2008), the specified method, and the QA/QC requirements described in this work plan.

Reasonable adjustments to sample volume used for analysis will be made to account for total solids content and TOC in an effort to achieve the SQS criteria. However, low TOC levels (0.1 percent to 0.3 percent) have been observed in Puget Sound sediments such that an increase in sample volume used for analysis may not achieve the criteria due to other factors such as matrix interferences. The TOC-normalized laboratory reporting limits for several compounds may exceed SQS criteria if TOC content in sediments is very low (0.1 percent to 0.3 percent). The results will also be reported on a dry weight basis, and compared to the dry weight analogs of the SMS criteria.

Analyses will target Practical Quantitation Limits (PQLs) in Table G-5. In the event that the laboratory PQLs exceed SQS criteria, every effort will be made by the laboratory to resolve the cause of the exceedance and achieve the requested criteria. The laboratory Contract Administrator and QA person will also immediately contact Landau Associates RI Task Manager regarding the circumstances and options to resolve the detection limits. These efforts may include extracting additional sample volume and performing additional cleanup procedures.

Once a sample aliquot has been removed from the sample container for analysis, any remaining sample will be preserved by freezing, as appropriate, to extend the sample holding time should reanalysis of the sample be required.

5.0 QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

This section describes both field and laboratory QA/QC procedures and provides a description of the data quality review that will be performed on the analytical results. Implementation of these procedures, in conjunction with the sample collection and handling procedures described in Section 3.0, should provide a reasonable degree of confidence in the project data.

5.1 LABORATORY QA/QC FOR CHEMICAL ANALYSES

QA/QC for chemical testing of sediment samples includes laboratory instrument QA/QC and analytical method QA/QC. Instrument QA/QC monitors the performance of the instrument and method QA/QC monitors the performance of sample preparation procedures. The analytical laboratory will be responsible for instrument and method QA/QC. QA/QC procedures to be performed by the laboratory are summarized in Table G-6 for analyses of organic compounds, Table G-7 for analyses of metals, and Table G-8 for analyses of conventional parameters. The frequency that each procedure should be implemented and the control limits for the procedures are also summarized in Tables G-6, G-7, and G-8. When an instrument or method control limit is exceeded, the laboratory will contact Landau Associates' QC Officer immediately. The laboratory will be responsible for correcting the problem and will reanalyze the samples within the sample hold time if sample reanalysis is appropriate.

5.2 FIELD AND LABORATORY QUALITY CONTROL SAMPLES

Field and laboratory control samples that will be used for quality control purposes during the sediment investigation are described in the following subsections.

5.2.1 BLIND FIELD DUPLICATE

One blind field duplicate will be collected during each phase of the sediment investigation. The blind field duplicate will consist of a split sample collected at a single sample location. The sample will be homogenized, split into duplicate sample containers, and submitted blind to the laboratory as a discrete sample. The blind field duplicate samples will be used to evaluate data precision. The blind field duplicates will be analyzed for the same SMS constituents as the sediment samples.

5.2.2 LABORATORY MATRIX SPIKE

A minimum of one laboratory matrix spike will be included with each analysis. These analyses will be performed to provide information on accuracy and to verify that extraction and concentration levels are acceptable. The laboratory spikes will follow EPA guidance for matrix and blank spikes.

5.2.3 LABORATORY MATRIX SPIKE DUPLICATE

A minimum of one laboratory matrix spike duplicate will be included with each organic analysis. These analyses will be performed to provide information on the precision of chemical analyses. The laboratory spikes will follow EPA guidance for matrix and blank spike duplicates.

5.2.4 LABORATORY DUPLICATES

A minimum of one laboratory duplicate per 20 samples, not including laboratory QC samples, or one laboratory duplicate sample per batch of samples if fewer than 20 samples are obtained, will be included with each analysis. Laboratory triplicates will be analyzed for TOC and total solids. These analyses will be performed to provide information on the precision of chemical analyses. The laboratory duplicate will follow EPA guidance in the method.

5.2.5 LABORATORY METHOD BLANKS

One laboratory method blank will be analyzed for all parameters (except total solids) to assess possible laboratory contamination. Dilution water will be used whenever possible. Method blanks will contain all reagents used for analysis. The generation and analysis of additional method, reagent, and glassware blanks may be necessary to verify that laboratory procedures do not contaminate samples.

5.2.6 LABORATORY CONTROL SAMPLE

One laboratory control sample will be analyzed for all parameters except total solids.

5.2.7 SURROGATE SPIKES

Samples analyzed for organic constituents will be spiked with appropriate surrogate compounds as defined by the analytical methods.

5.3 DATA QUALITY EVALUATION

An internal data quality evaluation will be performed on all sample data collected as part of surface sediment quality investigation to determine acceptability of data results. Data quality evaluation will be performed in accordance with the appropriate sections of the EPA Contract Laboratory Program *National Functional Guidelines for Organic and Inorganic Data Review* (EPA 1994a,b) and the *Data Validation Guidance Manual for Selected Sediment Variables* (PTI 1989) and will include evaluation of the following:

- Chain-of-custody records
- Holding times
- Laboratory method blanks
- Surrogate recoveries
- Laboratory matrix spikes and matrix spike duplicates
- Blank spikes/laboratory control samples
- Laboratory duplicates
- Corrective action records
- Completeness
- Overall assessment of data quality.

A Stage IV data validation, as defined in EPA's *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009), may be performed on dioxin and furan data based on detected concentrations. If completed, the Stage IV validation will be performed in accordance with the guidance document and EPA's *National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review* (EPA 2005). The Stage IV data validation will include evaluation of the items listed above as well as the following:

- Recalculation of instrument and sample results
- Evaluation of the instrument outputs for confirmation of correct identification and quantitation of analytes
- Confirmation of non-detected analytes.

Data qualification arising from data validation activities will be described in the data validation report, rather than in individual corrective action reports.

Care will be taken by the lab to not use method detection limits and to use PQLs in accordance with the SAPA.

6.0 DATA ANALYSIS, RECORD KEEPING, AND REPORTING REQUIREMENTS

The approach for analysis of the sediment sample analytical data, recordkeeping, and reporting are described in this section.

6.1 DATA ANALYSIS

Carbon normalized and dry weight analytical results for the sediment investigation will be compared to the SMS (i.e., SQS and CSL criteria as described in Section 5.3 of this work plan) and the AET values (for dry weight sediment data). The comparison of the analytical data to the SMS for each phase of the investigation will be used to determine the need for additional sediment sampling and/or the need for a sediment cleanup action.

6.2 RECORDKEEPING

All reports, work plans, and field logs associated with the sediment investigation will be maintained in a file for a period of at least 10 years from the date of the Agreed Order No. DE 6677. These records will be furnished upon request or made available for inspection by any authorized representative of Ecology.

6.3 REPORTING

This section describes requirements for laboratory reports. The Agreed Order establishes reporting requirements for the RI/FS.

6.3.1 LABORATORY ANALYTICAL REPORTS

Analytical reports from the laboratory for this project will be accompanied by sufficient backup data and QC results to enable reviewers to evaluate the quality of the data. The analytical laboratory deliverables will include the following:

- Case narrative, including adherence to prescribed protocols, nonconformity events, corrective measures, and/or data deficiencies
- Sample analytical results
- Surrogate recoveries
- Matrix spike/matrix spike duplicate results
- Blank spike/blank spike duplicate results
- Laboratory duplicates

- Blank results
- Sample custody (including signed, original chain-of-custody records)
- Analytical responsibility
- Initial and continuing calibration data
- Quantitation reports.

6.3.2 RI/FS REPORT

Following receipt of analytical data for each phase of the sediment investigation, a summary of the data and the scope, schedule, and submittal requirements for the next phase (if determined necessary) will be developed by the Port and submitted to Ecology for review and concurrence.

Following completion of all uplands and sediment RI activities, the results of the investigation will be reported as part of the written RI/FS report and will include a description of the field activities and observations, laboratory analytical results, QA/QC, and data validation results. In addition to the written report, the sediment data will be submitted and entered electronically into Ecology's environmental information managing system (EIM) templates within 45 days of data validation.

7.0 HEALTH AND SAFETY PLAN

A site-specific health and safety plan (HASP) was prepared to minimize the risk of chemical exposures, physical accidents to onsite workers, and environmental contamination. The HASP is provided in Appendix E of this RI/FS work plan.

8.0 SCHEDULE

The Agreed Order establishes the RI/FS schedule and reporting requirements. In accordance with the Agreed Order, RI field activities will begin within 30 days of submittal of the final work plan to Ecology. The specific schedule for the sediment portion of the RI has not been determined, but will be commenced in a timely manner following initiation of RI field activities. If additional sediment investigation field activities are needed to adequately delineate the extent and magnitude of contamination at the Site, the scope, schedule, and submittal requirements for these additional characterization activities will be developed by the Port and submitted to Ecology for review and concurrence.

9.0 PROJECT PERSONNEL AND RESPONSIBILITIES

The Site project team is shown in the organization chart on Figure G-5. An analytical laboratory and vessel operator will also be part of the project team, although the firms that will be used in this capacity have not been selected yet. The responsibilities of the individuals of the project team are described below:

- Erik Gerking, with the Port of Everett, is responsible for establishing the objectives for the project, coordinating with regulatory agencies, and acquiring permits. He has the authority to modify the delivery order to address changing project requirements or unforeseen circumstances, if such modifications are deemed necessary to achieve the project objectives.
- Larry Beard is Landau Associates' project manager and has the overall responsibility for project activities and progress. He is responsible for planning, scheduling, cost control, and completion of project tasks. He also has overall responsibility for overseeing the development and implementation of all parts of the SAP, monitoring the quality of the technical and managerial aspects of the project, interfacing with the Port of Everett, and providing appropriate timeliness of all project deliverables.
- Kathryn Hartley is Landau Associates' RI task manager. She is responsible for the overall performance of the field operations, including adherence to the SAP and HASP, scheduling, and sample logging and custody. She will also be the Site Safety Officer and QA/QC Officer for this project. She will advise the Landau Associates project manager regarding health and safety issues. Kathryn Hartley will be responsible for preparation of the RI.
- Piper Roelen is Landau Associates' FS task manager. He is responsible for the overall preparation of the FS.
- The marine sampling services subcontractor is responsible for providing equipment and personnel appropriately trained and skilled to perform the sediment sampling activities according to the SAP. The marine sampling subcontractor will operate under the immediate direction of the Landau Associates' RI Task Manager.
- The analytical laboratory is responsible for performing all chemical analyses for the project according to the specifications established in the SAP. The laboratory will coordinate closely with the Landau Associates' RI Task Manager. The analytical laboratory will be subcontracted by and under the direction of Landau Associates and will hold a Washington State Accreditation as required under the SAPA.

* * * * * * * * * *

This document has been prepared under the supervision and direction of the following key staff:

LANDAU ASSOCIATES, INC.

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Principal

Kathryn F. Hartley
Project Scientist

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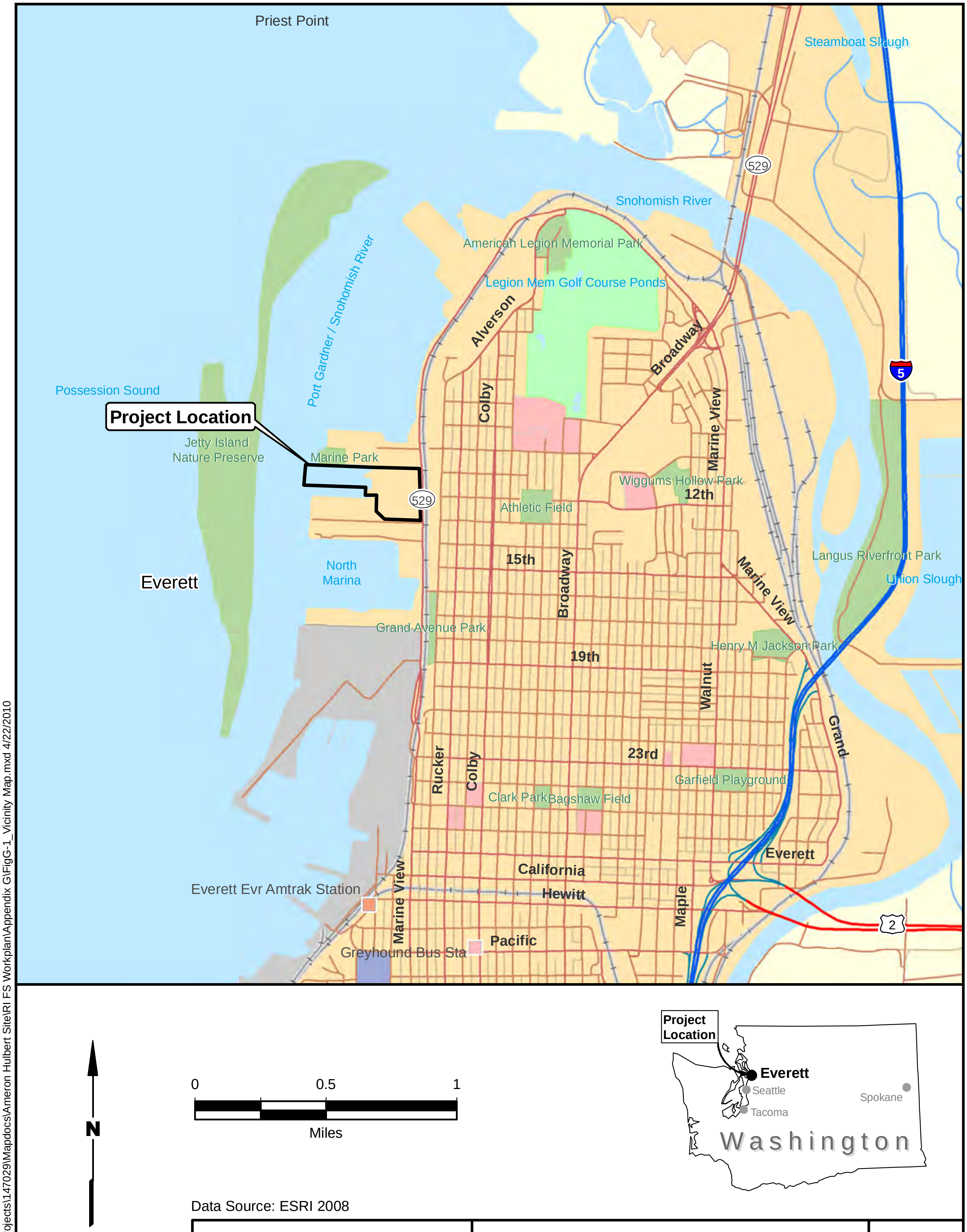

Data Source: ESRI 2008

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LANDAU ASSOCIATES

North Marina Ameron/Hulbert Site
RI/FS Work Plan
Everett, Washington

Vicinity Map

Figure
G-1

Legend

J ▬ Investigation Area Designation and Boundary

— Storm Drain System Outfall

🟨 Riparian and Intertidal Habitat Bench

☐ Approximate Dredging Area of 12th Street Yacht Basin

☐ Approximate North Marina Ameron/Hulbert Site Boundary

0 160 320
Scale in Feet

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Source: Port of Everett (2009 Image)

Landau Associates

North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Current Site Features

Figure
G-2

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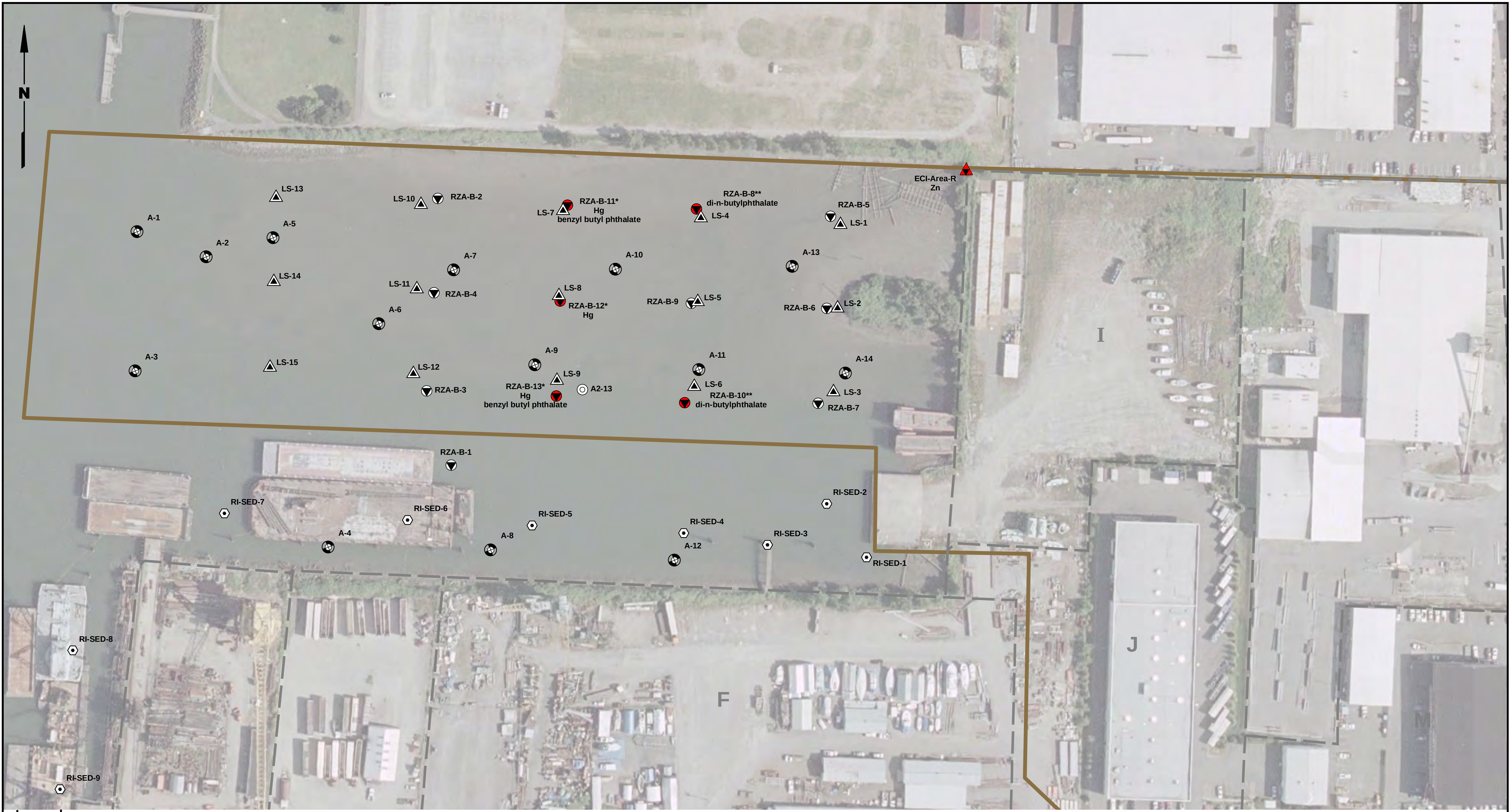
Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\Appendix G\FigG-3_SedimentCharacterization.mxd 5/18/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet



Legend

⊗	Pentec Sediment Sample Locations (2001)
▼	Rittenhouse-Zeman Assoc. Sediment Coring Locations (1991)
△	Earth Consultants, Inc. Sediment Sample Location (1992)
▲	Layton and Sell, Inc. Sediment Sample Location (1988; RZA 1989 App. B)
◎	SAIC Sediment Sample Location (2009)
●	Sample Exceeds SMS Criteria - Constituent that exceeds is noted below sample name.
⊙	Landau Associates Sediment Sampling Locations (2009)
⌐ ¬	G - Area Designation
▭	Approximate North Marina Ameron/Hulbert Site Boundary

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Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Site aquatic lands were dredged as part of the 12th St. Yacht Basin development subsequent to data collection.
3. Hg = Mercury; Zn = zinc.
4. * Sample exceeds SMS criteria for Hg and benzyl butyl phthalate in shallow (C-2; 0-4ft) and Hg in deep (C-6; >4ft) composite samples.
5. ** Sample exceeds SMS criteria for di-n-butylphthalate in deep (C7; >4ft) composite sample.

0 140 280

Scale in Feet

Data Source: 6/19/2002 Google Earth Image

North Marina Ameron/Hulbert Site RI/FS Work Plan Port of Everett, Washington	**Sediment Characterization Sample Locations and Analytical Results**	Figure G-3

Y:\Projects\147029\Mapdocs\Ameron Hulbert Site\RI FS Workplan\Appendix G\FigG-4_Proposed Sediment and Stormwater Locations.mxd 8/25/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet

Legend

◎ Proposed Sediment Sampling Locations

◎ Samples to be Archived for Potential Laboratory Analysis

● Proposed Catch Basin Sediment Sampling Location

⬡ Landau Associates Sediment Sampling Locations (2009)

◉ SAIC Sediment Sample Location (2009)

○— Catch Basin and Piping

▭ Approximate Ameron/Hulbert Site Boundary

⌐¬ G - Area Designation

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

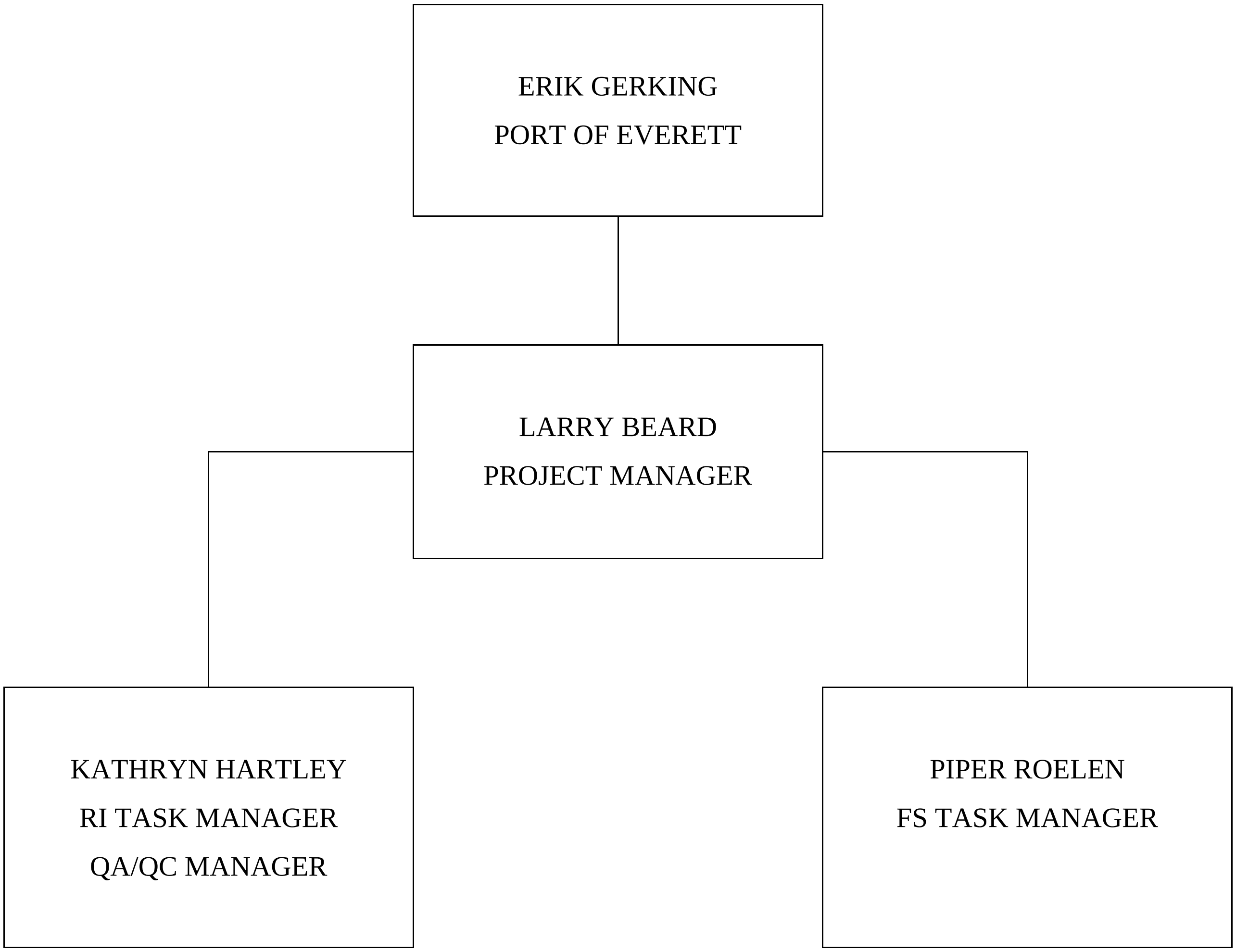
Data Source: Port of Everett (2009 Image)

LANDAU ASSOCIATES

North Marina Ameron/Hulbert Site
RI/FS Work Plan
Port of Everett, Washington

Proposed Sediment and Stormwater System Sampling Locations

Figure
G-4



LANDAU ASSOCIATES

North Marina Ameron/Hulbert Site
RI-FS Work Plan
Port of Everett, Washington

Organizational Chart – Project Team

Figure
G-5

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Cleanup Screening Levels SQS (b)	Cleanup Screening Levels CSL (c)																
Sample Name:			RI-SED-1	RI-SED-2	RI-SED-3	RI-SED-4	RI-SED-5	RI-SED-6	RI-SED-7	A2-13 (a)	CM-1	CM-2	CM-3	CM-S4	CM-S5	CM-S6	CM-S7	CM-S8
Depth Range:																		
Date Collected:			5/12/2009	5/12/2009	5/12/2009	5/11/2009	5/11/2009	5/11/2009	5/11/2009	8/4/2008	11/10/2000	11/8/2000	11/7/2000	11/9/2000	11/9/2000	11/8/2000	11/7/2000	11/7/2000
Sample Type:			Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
Petroleum Hydrocarbons (mg/kg)																		
NWPTH-D/EPA413.1																		
Diesel Range Organics																		
Total Oil & Grease																		
Metals (mg/kg)																		
EPA 6000/7000/200.8																		
Antimony											7 U	6 U	7 U	6 U	6 U	7 U	6 U	6 U
Arsenic	57	93	20	20	20	30	26	30	30	20	10	10	10	11	8	12	7	7
Beryllium																		
Cadmium	5.1	6.7	0.4	0.4	0.5	0.4 U	0.4 U	0.4 U	0.4 U	0.4	0.3 U	0.3	0.3 U	0.3	0.3 U	0.3 U	0.2 U	0.3 U
Chromium	260	270	61	56	63	69	70.1	66	64	59	41.9	41.1	53.4	41.2	40.8	43.1	44.4	44
Copper	390	390	68.7	62.2	70.4	68.6	68.1	65.5	63.2	60.0	39	31	47	34	30	31	33	30
Lead	450	530	12	11	12	12	12	12	12	11	12	8	10	10	8	7	5	5
Mercury	0.41	0.59	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.06	0.07	0.09	0.05	0.06 U	0.07 U	0.05	0.06 U
Nickel											39	37	48	39	39	41	43	44
Selenium																		
Silver	6.1	6.1	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.7 U	0.6 U	0.4 U	0.4 U	0.6	0.4 U	0.4 U	0.4 U	0.4	0.4 U
Thallium																		
Zinc	410	960	109	101	111	109	112	102	100	90	62	58	76	56	51	55	56	56
Pesticides (mg/kg)																		
EPA 8080																		
4,4'-DDD											0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U
4,4'-DDE											0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U
4,4'-DDT											0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U
Aldrin											0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Alpha-BHC																		
Beta-BHC																		
Chlordane											0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Delta-BHC																		
Dieldrin											0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
EndoSulfan I																		
Endosulfan Sulfate																		
Endrin																		
Endrin Aldehyde																		
Gamma-BHC																		
Heptachlor											0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Heptachlor Epoxide																		
Lindane											0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methoxychlor																		
Total DDT											0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U
Toxaphene																		

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			RI-SED-1	RI-SED-2	RI-SED-3	RI-SED-4	RI-SED-5	RI-SED-6	RI-SED-7	A2-13 (a)	CM-1	CM-2	CM-3	CM-S4	CM-S5	CM-S6	CM-S7	CM-S8
Depth Range:																		
Date Collected:			5/12/2009	5/12/2009	5/12/2009	5/11/2009	5/11/2009	5/11/2009	5/11/2009	8/4/2008	11/10/2000	11/8/2000	11/7/2000	11/9/2000	11/9/2000	11/8/2000	11/7/2000	11/7/2000
Sample Type:			Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels																	
	SQS (b)	CSL (c)																
PCBs (mg/kg OC)																		
EPA 8080																		
Aroclor 1016			1.0 U	1.4 U	0.9 U	1.0 U	0.9 U	0.9 U	0.9 U	1.124 U	1.214 U	1.176 U	1.118 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Aroclor 1221			1.0 U	1.4 U	0.9 U	1.0 U	0.9 U	0.9 U	0.9 U	1.124 U	2.500 U	2.294 U	2.176 U	4.239 U	4.512 U	4.588 U	4.086 U	4.588 U
Aroclor 1232			1.2 U	1.1 U	0.6 U	1.1 U	0.5 U	1.4 U	0.5 U	1.124 U	1.214 U	1.176 U	1.118 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Aroclor 1242			1.0 U	1.4 U	0.9 U	1.0 U	0.9 U	0.9 U	0.9 U	1.124 U	1.214 U	1.176 U	1.118 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Aroclor 1248			1.0 U	1.4 U	0.9 U	1.0 U	0.9 U	0.9 U	0.9 U	1.124 U	1.214 U	1.176 U	1.118 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Aroclor 1254			1.0 U	1.4 U	0.9 U	1.0 U	0.9 U	0.9 U	0.9 U	1.124 U	1.214 U	1.176 U	1.118 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Aroclor 1260			1.0 U	1.4 U	0.9 U	1.0 U	0.9 U	0.9 U	0.9 U	1.124 U	1.214 U	1.176 U	1.118 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Aroclor 1262			1.0 U	1.4 U	0.9 U	1.0 U	0.9 U	0.9 U	0.9 U	1.124 U								
Aroclor 1268			0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U								
Total PCBs	130		0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	2.500 U	2.294 U	2.176 U	4.239 U	4.512 U	4.588 U	4.086 U	4.588 U
Organotin (mg/L)																		
Porewater																		
Butyl Tin Ion			0.000011	0.000017	0.000026	0.000014	0.000008	0.000008 U	0.00001									
Dibutyl Tin Ion			0.000012 U	0.000012 U	0.000013	0.000012 U	0.000012 U	0.000012 U	0.000012 U									
Tributyltin	0.05	0.15	0.000008 U	0.000008 U	0.000008 U	0.000008 U	0.000008 U	0.000008 U	0.000008 U		0.00002 U	0.00007 U	0.00002 U					
Tributyl Tins (mg/kg)																		
Krone 1988 SIM GC/MS																		
Tributyl Tin Ion										0.0038 U								
Dibutyl Tin Ion										0.0056 U								
Butyl Tin Ion										0.0040 U								
Bioassay																		
Biochemical Oxygen Demand (mg/Kg)																		
Chemical Oxygen Demand (mg/Kg)																		
Microtox Test (% Light Change)																		
Amphipod Mortality (%)										10								
Echinoderm Mortality (%)																		
Neanthes Mortality (%)										4								
Conventionals																		
Ammonia (mg/Kg)																		
Sulfide (mg/kg)			251 J1	276 J1	385 J1	306 J1	219 J1	268 J1	156 J1	137	71	19	16	5.6 U	12	6	3.6 U	640
Total Kjeldahl Nitrogen (mg/Kg)																		
Total Sulfides (mg/Kg)																		
Total Volatile Solids (mg/Kg)																		
N Ammonia (mg N/kg)			50.0 J1	13.9 J1	20.4 J1	16.0 J1	18.4 J1	17.2 J1	18.7 J1	8.79	45	25	20	150	34	56	36	47
Total Organic Carbon (%)			1.97	1.48	2.17	2.05	2.35	2.14	2.25	1.78	1.4	1.7	1.7	0.92	0.82	0.85	0.93	0.85
Total Solids (%)			47.40	48.60	48.90	47.70 J1	50.80 J1	48.50 J1	46.90 J1	53.80	71.9	72.6	67.6	73.9	76.6	73.2	73.2	73.1
Total Volatile Solids (%)			6.75 J1	7.14 J1	7.31 J1	7.41 J1	7.10 J1	7.57 J1	7.50 J1	6.82	4.6	4.6	6.3	2.8	2.7	2.8	3.1	2.8
Preserved Total Solids (%)										54.80	69	69.8	58	77.6	67.2	74.7	66.7	55.6

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

		Sample Name:	RI-SED-1	RI-SED-2	RI-SED-3	RI-SED-4	RI-SED-5	RI-SED-6	RI-SED-7	A2-13 (a)	CM-1	CM-2	CM-3	CM-S4	CM-S5	CM-S6	CM-S7	CM-S8
		Depth Range:																
		Date Collected:	5/12/2009	5/12/2009	5/12/2009	5/11/2009	5/11/2009	5/11/2009	5/11/2009	8/4/2008	11/10/2000	11/8/2000	11/7/2000	11/9/2000	11/9/2000	11/8/2000	11/7/2000	11/7/2000
		Sample Type:	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels																	
	SQS (b)	CSL (c)																
SVOCs (mg/kg OC) **EPA SW8270/8120**																		
LPAHs																		
Acenaphthene	16	57	0.1 U	0.1 U	0.1 U	0.2 U	0.2 U	0.4 U	1.0 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Acenaphthylene	66	66	0.7 U	0.9 U	0.7 U	0.9 U	0.6 U	0.6 U	0.8 U	1.124 U	1.357 U	1.176 U	1.235	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Anthracene	220	1200	1.3 U	1.4 U	0.9 U	0.9 U	0.8 U	1.0 U	0.7 U	1.067 J	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Fluorene	23	79	1.1 U	1.5 U	1.1 U	0.9 U	0.9 U	0.8 U	0.5 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Naphthalene	99	170	0.6 U	0.9 U	0.6 U	0.6 U	0.5 U	0.4 U	0.3 U	1.124 U	3.786	2.882	4.176	3.370	3.659	4.353	2.581	2.118 J
Phenanthrene	100	480	0.4 J	0.6 U	0.3 J	0.4 U	0.3 U	0.3 U	0.2 J	1.292	3.143	1.882	3.176	2.174	3.049	2.588	2.366	2.235 U
2-Methylnaphthalene	38	64	0.3 U	0.5 U	0.3 U	0.3 U	0.2 U	0.2 U	0.2 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Total LPAH	370	780	0.5	0.9 U	0.6 J	0.6 U	0.5 U	0.5 U	0.3 J	2.360 J	6.929	4.765	8.588	5.543	6.707	6.941	4.946	2.118 J
HPAHs																		
Benzo(a)anthracene	110	270	0.0 J	0.0 U	0.0 J	0.0 U	0.0 U	0.0 U	0.0 U	0.787 J	1.714	1.118 J	1.353	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Benzo(a)pyrene	99	210	0.0 J	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.674 J	1.429	1.176 U	1.412	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Benzo(b)fluoranthene	--	--	0.0 J	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.629								
Benzo(k)fluoranthene	--	--	0.0 J	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.843 J								
Total Benzofluoranthenes	230	450	0.0 J	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	3.258 J	2.643 J	1.176 U	2.588	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Benzo(g,h,i)perylene	31	78	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Chrysene	110	460	0.0	0.0	0.0 J	0.0 U	0.0 U	0.0 U	0.0 U	1.461	2.071	1.471	2.235	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Dibenz(a,h)anthracene			0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U								
Fluoranthene	160	1200	0.0	0.0 J	0.0	0.0 U	0.0 J	0.0 U	0.0 J	3.652	4.714	2.765	5.176	2.065 U	2.561	4.118	2.366	2.235 U
Indeno(1,2,3-cd)pyrene	34	88	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Pyrene	1000	1400	0.0	0.0 J	0.0	0.0 U	0.0 J	0.0 U	0.0 J	2.360	4.286	2.412	4.118	2.065 U	3.293	3.765	2.688	2.353
Total HPAH	960	5300	0.0 J	0.0 J	0.0 J	0.0 U	0.0 J	0.0 U	0.0 J	8.933	16.857 J	7.765 J	16.882	2.065 U	5.854	7.882	5.054	2.353
OTHER SVOCs																		
1,2,4-Trichlorobenzene	0.81	1.8	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	0.493 U	0.412 U	0.459 U	0.641 U	0.768 U	0.741 U	0.753 U	0.741 U
1,2-Dichlorobenzene	2.3	2.3	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	0.100 U	0.082 U	0.094 U	0.130 U	0.159 U	0.153 U	0.151 U	0.153 U
1,3-Dichlorobenzene			0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	0.100 U	0.082 U	0.094 U	0.130 U	0.159 U	0.153 U	0.151 U	0.153 U
1,4-Dichlorobenzene	3.1	9	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	0.100 U	0.082 U	0.094 U	0.130 U	0.159 U	0.153 U	0.151 U	0.153 U
Bis(2-ethylhexyl)phthalate	47	78	0.0	0.0	0.0 J	0.0 J	0.0	0.0 J	0.0	4.157	1.571	2.000	2.000	3.696	2.317	2.353	2.043 U	3.294
Benzyl butyl phthalate	4.9	64	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Dibenzofuran	15	58	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Diethylphthalate	61	110	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Dimethylphthalate	53	53	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Di-n-Butylphthalate	220	1700	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	1.714 UJ	2.000 UJ	1.588 UJ	4.022 UJ	4.634 UJ	3.647 UJ	10.753 UJ	3.294 UJ
Di-n-octyl phthalate	58	4500	0.0 U	0.0 U	33.8 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Hexachlorobenzene	0.38	2.3	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Hexachlorobutadiene	3.9	6.2	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
Hexachloroethane			0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U
N-Nitrosodiphenylamine	11	11	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	0.0 U	1.124 U	1.357 U	1.176 U	1.176 U	2.065 U	2.317 U	2.235 U	2.043 U	2.235 U

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			RI-SED-1	RI-SED-2	RI-SED-3	RI-SED-4	RI-SED-5	RI-SED-6	RI-SED-7	A2-13 (a)	CM-1	CM-2	CM-3	CM-S4	CM-S5	CM-S6	CM-S7	CM-S8
Depth Range:																		
Date Collected:			5/12/2009	5/12/2009	5/12/2009	5/11/2009	5/11/2009	5/11/2009	5/11/2009	8/4/2008	11/10/2000	11/8/2000	11/7/2000	11/9/2000	11/9/2000	11/8/2000	11/7/2000	11/7/2000
Sample Type:			Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels																	
	SQS (b)	CSL (c)																
SVOCs (mg/kg)																		
EPA SW8270/8120																		
1-Methylnaphthalene			0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U								
2,4-Dimethylphenol	0.029	0.029	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
2-Methylphenol	0.063	0.063	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
4-Methylphenol	0.67	0.67	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.490	0.041	0.031	0.039	0.021	0.019 U	0.021	0.019 U	0.019 U
Benzoic Acid	0.65	0.65	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.200 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Benzyl Alcohol	0.057	0.073	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
Pentachlorophenol	0.36	0.69	0.1 U	0.099 U	0.098 U	0.1 U	0.098 U	0.1 U	0.098 U	0.098 U	0.093 U	0.098 U	0.099 U	0.096 U	0.093 U	0.096 U	0.096 U	0.096 U
Phenol	0.42	1.2	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.017 J	0.02 U	0.140	0.054	0.024	0.036	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
2,2'-Oxybis(1-Chloropropane)																		
2,4,5-Trichlorophenol																		
2,4,6-Trichlorophenol																		
2,4-Dichlorophenol																		
2,4-Dinitrophenol																		
2,4-Dinitrotoluene																		
2,6-Dinitrotoluene																		
2-Chloronaphthalene																		
2-Chlorophenol																		
2-Nitroaniline																		
2-Nitrophenol																		
3- and 4-Methylphenol																		
3,3'-Dichlorobenzidine																		
3-Nitroaniline																		
4,6-Dinitro-2-Methylphenol																		
4-Bromophenyl-phenylether																		
4-Chloro-3-methylphenol																		
4-Chloroaniline																		
4-Chlorophenyl-phenylether																		
4-Nitroaniline																		
4-Nitrophenol																		
Aniline																		
Benzofluoranthenes	230	450									0.037 J	0.02 U	0.044	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
Carbazole																		
Dibenzo(a,h)anthracene	12	33									0.019 U	0.02 U	0.02 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
Hexachlorocyclopentadiene																		
Isophorone																		
Nitrobenzene																		
N-nitrosodimethylamine																		
N-Nitroso-di-n-propylamine																		

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			RI-SED-1	RI-SED-2	RI-SED-3	RI-SED-4	RI-SED-5	RI-SED-6	RI-SED-7	A2-13 (a)	CM-1	CM-2	CM-3	CM-S4	CM-S5	CM-S6	CM-S7	CM-S8
Depth Range:																		
Date Collected:			5/12/2009	5/12/2009	5/12/2009	5/11/2009	5/11/2009	5/11/2009	5/11/2009	8/4/2008	11/10/2000	11/8/2000	11/7/2000	11/9/2000	11/9/2000	11/8/2000	11/7/2000	11/7/2000
Sample Type:			Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels																	
	SQS (b)	CSL (c)																
VOCs (mg/kg)																		
EPA 8260/824																		
1,1,1-Trichloroethane																		
1,1,2,2-Tetrachloroethane																		
1,1,2-Trichloroethane																		
1,1-Dichloroethane																		
1,1-Dichloroethene																		
1,2,3-Trichlorobenzene																		
1,2-Dichlorobenzene																		
1,2-Dichloroethane																		
1,2-Dichloropropane																		
1,3-Dichlorobenzene																		
1,4-Dichlorobenzene																		
2-Butanone																		
2-Chloroethylvinylether																		
2-Hexanone																		
4-Methyl-2-Pentanone (MIBK)																		
Acetone																		
Benzene																		
bis(2-Chloroethoxy) Methane																		
Bis-(2-Chloroethyl) Ether																		
Bromodichloromethane																		
Bromoform																		
Bromomethane																		
Carbon Disulfide																		
Carbon Tetrachloride																		
Chlorobenzene																		
Chloroethane																		
Chloroform																		
Chloromethane																		
cis-1,2-Dichloroethene																		
cis-1,3-Dichloropropene																		
Dibromochloromethane																		
Ethylbenzene											0.0014 U	0.0014 U	0.0016 U	0.0012 U	0.0013 U	0.0013 U	0.0014 U	0.0013 U
Methylene Chloride																		
Styrene																		
Tetrachloroethene											0.0014 U	0.0014 U	0.0016 U	0.0012 U	0.0013 U	0.0013 U	0.0014 U	0.0013 U
Toluene																		
trans-1,2-Dichloroethene																		
trans-1,3-Dichloropropene																		
Trichloroethene											0.0014 U	0.0014 U	0.0016 U	0.0012 U	0.0013 U	0.0013 U	0.0014 U	0.0013 U
Trichlorofluoromethane																		
Trichlorotrifluoroethane																		
Vinyl Acetate																		
Vinyl Chloride																		
Xylenes, Total											0.0014 U	0.0014 U	0.0016 U	0.0012 U	0.0013 U	0.0013 U	0.0014 U	0.0013 U

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			RI-SED-1	RI-SED-2	RI-SED-3	RI-SED-4	RI-SED-5	RI-SED-6	RI-SED-7	A2-13 (a)	CM-1	CM-2	CM-3	CM-S4	CM-S5	CM-S6	CM-S7	CM-S8
Depth Range:																		
Date Collected:			5/12/2009	5/12/2009	5/12/2009	5/11/2009	5/11/2009	5/11/2009	5/11/2009	8/4/2008	11/10/2000	11/8/2000	11/7/2000	11/9/2000	11/9/2000	11/8/2000	11/7/2000	11/7/2000
Sample Type:			Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels																	
	SQS (b)	CSL (c)																
GRAIN SIZE																		
Clay (phi <10) (%)			10.5	10.8	12.8	12.0	11.9	11.3	10.1	8.7	4.9	5.5	7.5	4.3	4.2	5.5	5.3	5
Clay (phi 8 to 9) (%)			7.4	7.4	8.2	7.3	7.8	7.0	5.8	4.5	2.1	2.1	3	1.7	1.8	2.2	2.1	1.9
Clay (phi 9 to 10) (%)			4.9	6.0	7.0	5.8	5.9	5.7	4.9	5.5	1.8	1.8	2.6	1.6	1.2	1.7	1.7	1.8
Fines (%)			93.9	97.0	97.7	97.6	94.9	92.6	81.0	83.2	44.8	46.7	67.9	45.8	46	49.3	50	40.3
Gravel (>phi -1) (%)			0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.2	2.6	2.2	2.2	0.2	0.5	0.4	1.6	1.9
Sand (phi 0 to 1) (%)			0.3	0.2	0.2	0.2	0.5	0.6	1.9	0.7	3.8	3.3	1.3	4.4	3.5	2.5	1.6	2.2
Sand (phi -1 to 0) (%)			0.2	0.1	0.2	0.1	0.6	0.9	2.1	0.8	1.3	1.5	1.6	0.9	0.7	0.7	0.7	1.3
Sand (phi 1 to 2) (%)			0.5	0.2	0.1	0.1	0.2	0.4	2.0	1.8	9.4	5.9	1.8	10.7	10.4	7.3	5.7	13.6
Sand (phi 2 to 3) (%)			1.0	0.3	0.1	0.1	0.4	0.6	3.2	3.8	12.9	15.1	5.5	18.8	14.2	15.3	15.4	19.7
Sand (phi 3 to 4) (%)			4.1	2.2	1.7	1.8	3.4	4.9	8.9	9.6	25.2	25.5	19.7	19.3	24.7	24.6	25	21
Silt (phi 4 to 5) (%)			17.2	14.3	13.8	15.8	19.0	14.7	13.7	14.4	18.3	17.3	22.5	21.2	23.4	20.3	22.7	14.4
Silt (phi 5 to 6) (%)			20.2	24.7	21.0	20.5	18.5	19.0	20.8	23.3	8.8	10.2	16.4	9	8.2	10.4	9	8.3
Silt (phi 6 to 7) (%)			21.7	21.0	22.2	23.1	19.3	22.2	16.2	16.6	5.7	6.4	10.7	5.2	4.7	6.1	6.6	5.7
Silt (phi 7 to 8) (%)			12.0	12.8	12.7	13.1	12.4	12.6	9.5	10.2	3.2	3.4	5.2	2.9	2.5	3.1	2.6	3.2

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			ECI-Area-R	RZA-B-2	RZA-B-4	RZA-B-5	RZA-B-7	RZA-B-9	RZA-B-10	RZA-B-11	RZA-B-13	RZA-C-1	RZA-C-2	RZA-C-3	RZA-C-4	RZA-C-5	RZA-C-6	RZA-C-7
Depth Range:				(13-14.5)	(0-1.5)	(10.5-11.5)	(0-1.5)	(2-3)	(4-6)	(6-7)	(3-4)							
Date Collected:			10/9/1991	########	########	10/22/1990	10/23/1990	10/24/1990	10/24/1990	10/29/1990	10/30/1990	10/21/1990	10/30/1990	10/24/1990	10/23/1990	10/21/1990	10/30/1990	10/25/1990
Sample Type:			Marine Sediment/ Storm Water Outfall	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels																	
	SQS (b)	CSL (c)																
Petroleum Hydrocarbons (mg/kg)																		
NWPTH-D/EPA413.1																		
Diesel Range Organics			2100															
Total Oil & Grease												140	240	170	250	30 U	96	81
Metals (mg/kg)																		
EPA 6000/7000/200.8																		
Antimony			11									0.64	1.3	0.89	1.1	0.56	0.87	0.17
Arsenic	57	93	57									6.7	6.5	2.5	11	3.6	3.4	3.3
Beryllium			1 U															
Cadmium	5.1	6.7	3									2.6	4.2	3.7	3.8	2.8	3.5	3.4
Chromium	260	270	118									48	72	42	70	41	55	39
Copper	390	390	167									18	25	15	40	4.4	14	9.6
Lead	450	530	113									24	26	17	27	11	15	14
Mercury	0.41	0.59	0.2 U									0.14	0.92	0.11	0.17	0.1	0.90	0.071
Nickel			38									30	68	49	73	29	58	53
Selenium			1 U															
Silver	6.1	6.1	2									1.3	1.1	0.35	0.58	0.41	0.28	0.45
Thallium			1 U															
Zinc	410	960	526									64	74	62	87	55	59	53
Pesticides (mg/kg)																		
EPA 8080																		
4,4'-DDD			0.1 U															
4,4'-DDE			0.1 U															
4,4'-DDT																		
Aldrin			0.1 U									0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Alpha-BHC			0.1 U															
Beta-BHC			0.3 U															
Chlordane			1 U									0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Delta-BHC			0.1 U															
Dieldrin			0.1 U									0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
EndoSulfan I			0.1 U															
Endosulfan Sulfate			0.1 U															
Endrin			0.1 U															
Endrin Aldehyde			0.1 U															
Gamma-BHC			0.1 U															
Heptachlor			0.1 U									0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Heptachlor Epoxide			0.1 U															
Lindane												0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methoxychlor			0.2 U															
Total DDT												0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U
Toxaphene			3 U															

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			ECI-Area-R	RZA-B-2	RZA-B-4	RZA-B-5	RZA-B-7	RZA-B-9	RZA-B-10	RZA-B-11	RZA-B-13	RZA-C-1	RZA-C-2	RZA-C-3	RZA-C-4	RZA-C-5	RZA-C-6	RZA-C-7
Depth Range:				(13-14.5)	(0-1.5)	(10.5-11.5)	(0-1.5)	(2-3)	(4-6)	(6-7)	(3-4)							
Date Collected:			10/9/1991	########	########	10/22/1990	10/23/1990	10/24/1990	10/24/1990	10/29/1990	10/30/1990	10/21/1990	10/30/1990	10/24/1990	10/23/1990	10/21/1990	10/30/1990	10/25/1990
Sample Type:			Marine Sediment/ Storm Water Outfall	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
Cleanup Screening Levels	SQS (b)	CSL (c)																
PCBs (mg/kg OC)																		
EPA 8080																		
Aroclor 1016			59 U															
Aroclor 1221			59 U															
Aroclor 1232			59 U															
Aroclor 1242			59 U															
Aroclor 1248			59 U															
Aroclor 1254			59 U															
Aroclor 1260			59 U															
Aroclor 1262																		
Aroclor 1268																		
Total PCBs	130		59 U									6.468 U	4.305 U	4.333 U	3.812 U	13.402 U	10.156 U	12.500 U
Organotin (mg/L)																		
Porewater																		
Butyl Tin Ion																		
Dibutyl Tin Ion																		
Tributyltin	0.05	0.15																
Tributyl Tins (mg/kg)																		
Krone 1988 SIM GC/MS																		
Tributyl Tin Ion																		
Dibutyl Tin Ion																		
Butyl Tin Ion																		
Bioassay																		
Biochemical Oxygen Demand (mg/Kg)												425.4	419.4	521.3	667.5	375	354.2	458.9
Chemical Oxygen Demand (mg/Kg)												49743.6	98716	100061.5	112715.2	22727.3	48451.1	16408.9
Microtox Test (% Light Change)												-24	-24	-23.3	-16.4	-27	-4.4	3.5
Amphipod Mortality (%)												40	50	56	50	9	34	31
Echinoderm Mortality (%)												11.1	6.7	9.8	24.6	7	2.7	8.4
Neanthes Mortality (%)												4	4	8	10	2	6	6
Conventionals																		
Ammonia (mg/Kg)				16.1	25	12.5	19.1	13.8	12.5	12.9	14.5							
Sulfide (mg/kg)																		
Total Kjeldahl Nitrogen (mg/Kg)												470	1800	770	500	250	600	560
Total Sulfides (mg/Kg)				2.8	10.1	5 U	5 U	12.6	12.2	5.6	10.6							
Total Volatile Solids (mg/Kg)												5.2	7.4	7.6	6.8	3.3	3.3	1.7
N Ammonia (mg N/kg)																		
Total Organic Carbon (%)			1.7 (d)	1.7 (d)	1.7 (d)	1.7 (d)	1.7 (d)	1.7 (d)	1.7 (d)	1.7 (d)	1.7 (d)	2.01	3.02	3	3.41	0.97	1.28	1.04
Total Solids (%)				74.5	72	80.1	73.4	65.2	63.9	76	70.3	66.3	66.2	65	60.4	74.8	66.5	76.3
Total Volatile Solids (%)																		
Preserved Total Solids (%)																		

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			ECI-Area-R	RZA-B-2	RZA-B-4	RZA-B-5	RZA-B-7	RZA-B-9	RZA-B-10	RZA-B-11	RZA-B-13	RZA-C-1	RZA-C-2	RZA-C-3	RZA-C-4	RZA-C-5	RZA-C-6	RZA-C-7
Depth Range:				(13-14.5)	(0-1.5)	(10.5-11.5)	(0-1.5)	(2-3)	(4-6)	(6-7)	(3-4)							
Date Collected:			10/9/1991	########	########	10/22/1990	10/23/1990	10/24/1990	10/24/1990	10/29/1990	10/30/1990	10/21/1990	10/30/1990	10/24/1990	10/23/1990	10/21/1990	10/30/1990	10/25/1990
Sample Type:			Marine Sediment/ Storm Water Outfall	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels																	
	SQS (b)	CSL (c)																
SVOCs (mg/kg OC)																		
EPA SW8270/8120																		
LPAHs																		
Acenaphthene	16	57	588 U									9.950 U	6.623 U	6.667 U	5.865 U	20.619 U	15.625 U	19.231 U
Acenaphthylene	66	66	588 U									9.950 U	6.623 U	6.667 U	5.865 U	20.619 U	15.625 U	19.231 U
Anthracene	220	1200	588 U									6.468 U	4.305 U	4.333 U	3.812 U	13.402 U	10.156 U	12.500 U
Fluorene	23	79	588 U									9.950 U	6.623 U	6.667 U	5.865 U	20.619 U	15.625 U	19.231 U
Naphthalene	99	170	588 U									10.448 U	6.954 U	7.000 U	6.158 U	21.649 U	16.406 U	20.192 U
Phenanthrene	100	480	588 U									15.920 U	10.596 U	10.667 U	9.384 U	32.990 U	25.000 U	30.769 U
2-Methylnaphthalene	38	64	588 U									9.950 U	6.623 U	6.667 U	5.865 U	20.619 U	15.625 U	19.231 U
Total LPAH	370	780	588 U									30.348 U	20.199 U	20.333 U	17.889 U	62.887 U	47.656 U	58.654 U
HPAHs																		
Benzo(a)anthracene	110	270	588 U									22.388 U	14.901 U	15.000 U	13.196 U	46.392 U	35.156 U	43.269 U
Benzo(a)pyrene	99	210	588 U									33.831 U	22.517 U	22.667 U	19.941 U	70.103 U	53.125 U	65.385 U
Benzo(b)fluoranthene	--	--	588 U									39.801 U	26.490 U	26.667 U	23.460 U	82.474 U	62.500 U	76.923 U
Benzo(k)fluoranthene	--	--	588 U									39.801 U	26.490 U	26.667 U	23.460 U	82.474 U	62.500 U	76.923 U
Total Benzofluoranthenes	230	450	588 U									39.801 U	26.490 U	26.667 U	23.460 U	82.474 U	62.500 U	76.923 U
Benzo(g,h,i)perylene	31	78	588 U									26.866 U	17.881 U	18.000 U	15.836 U	55.670 U	42.188 U	51.923 U
Chrysene	110	460	588 U									33.333 U	22.185 U	22.333 U	19.648 U	69.072 U	52.344 U	64.423 U
Dibenz(a,h)anthracene			588 U									6.468 U	4.305 U	4.333 U	3.812 U	13.402 U	10.156 U	12.500 U
Fluoranthene	160	1200	588 U									31.343 U	20.861 U	21.000 U	18.475 U	64.948 U	49.219 U	60.577 U
Indeno(1,2,3-cd)pyrene	34	88	588 U									9.950 U	6.623 U	6.667 U	5.865 U	20.619 U	15.625 U	19.231 U
Pyrene	1000	1400	588 U									21.393 U	14.238 U	14.333 U	12.610 U	44.330 U	33.594 U	41.346 U
Total HPAH	960	5300	588 U									89.552 U	59.603 U	60.000 U	52.786 U	185.567 U	140.625 U	173.077 U
OTHER SVOCs																		
1,2,4-Trichlorobenzene	0.81	1.8		0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	3.184 U	2.119 U	2.133 U	1.877 U	6.598 U	5.000 U	6.154 U
1,2-Dichlorobenzene	2.3	2.3	588 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.841 U	1.225 U	1.233 U	1.085 U	3.814 U	2.891 U	3.558 U
1,3-Dichlorobenzene			588 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	8.458 U	5.629 U	5.667 U	4.985 U	17.526 U	13.281 U	16.346 U
1,4-Dichlorobenzene	3.1	9	588 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	9.453 U	6.291 U	6.333 U	5.572 U	19.588 U	14.844 U	18.269 U
Bis(2-ethylhexyl)phthalate	47	78	588 U									154.229 U	102.649 U	103.333 U	90.909 U	319.588 U	242.188 U	298.077 U
Benzyl butyl phthalate	4.9	64	588 U									23.383 U	31.457	15.667 U	13.783 U	48.454 U	36.719 U	45.192 U
Dibenzofuran	15	58	588 U									9.950 U	6.623 U	6.667 U	5.865 U	20.619 U	15.625 U	19.231 U
Diethylphthalate	61	110	588 U									4.826 U	3.212 U	3.233 U	2.845 U	10.000 U	7.578 U	9.327 U
Dimethylphthalate	53	53	588 U									7.960 U	5.298 U	5.333 U	4.692 U	16.495 U	12.500 U	15.385 U
Di-n-Butylphthalate	220	1700	588 U									69.652 U	46.358 U	46.667 U	55.718	144.330 U	109.375 U	336.538
Di-n-octyl phthalate	58	4500	588 U									308.458 U	205.298 U	206.667 U	181.818 U	639.175 U	484.375 U	596.154 U
Hexachlorobenzene	0.38	2.3	588 U	1.35 U	1.35 U	1.35 U	1.35 U					8.358 U	5.563 U	5.600 U	4.927 U	17.320 U	13.125 U	16.154 U
Hexachlorobutadiene	3.9	6.2	588 U									10.547 U	7.020 U	7.067 U	6.217 U	21.856 U	16.563 U	20.385 U
Hexachloroethane			588 U									69.652 U	46.358 U	46.667 U	41.056 U	144.330 U	109.375 U	134.615 U
N-Nitrosodiphenylamine	11	11	588 U									8.010 U	5.331 U	5.367 U	4.721 U	16.598 U	12.578 U	15.481 U

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			ECI-Area-R	RZA-B-2	RZA-B-4	RZA-B-5	RZA-B-7	RZA-B-9	RZA-B-10	RZA-B-11	RZA-B-13	RZA-C-1	RZA-C-2	RZA-C-3	RZA-C-4	RZA-C-5	RZA-C-6	RZA-C-7
Depth Range:				(13-14.5)	(0-1.5)	(10.5-11.5)	(0-1.5)	(2-3)	(4-6)	(6-7)	(3-4)							
Date Collected:			10/9/1991	########	########	10/22/1990	10/23/1990	10/24/1990	10/24/1990	10/29/1990	10/30/1990	10/21/1990	10/30/1990	10/24/1990	10/23/1990	10/21/1990	10/30/1990	10/25/1990
Sample Type:			Marine Sediment/ Storm Water Outfall	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels																	
	SQS (b)	CSL (c)																
SVOCs (mg/kg)																		
EPA SW8270/8120																		
1-Methylnaphthalene																		
2,4-Dimethylphenol	0.029	0.029	10 U									0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
2-Methylphenol	0.063	0.063	10 U									0.072 U	0.072 U	0.072 U	0.072 U	0.072 U	0.072 U	0.072 U
4-Methylphenol	0.67	0.67										0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Benzoic Acid	0.65	0.65	60 U									0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U
Benzyl Alcohol	0.057	0.073	10 U									0.073 U	0.073 U	0.073 U	0.073 U	0.073 U	0.073 U	0.073 U
Pentachlorophenol	0.36	0.69	60 U									0.504 U	0.504 U	0.504 U	0.504 U	0.504 U	0.504 U	0.504 U
Phenol	0.42	1.2	10 U									0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
2,2'-Oxybis(1-Chloropropane)			10 U															
2,4,5-Trichlorophenol			10 U															
2,4,6-Trichlorophenol			10 U															
2,4-Dichlorophenol			10 U															
2,4-Dinitrophenol			60 U															
2,4-Dinitrotoluene			10 U															
2,6-Dinitrotoluene			10 U															
2-Chloronaphthalene			10 U															
2-Chlorophenol			10 U															
2-Nitroaniline			60 U															
2-Nitrophenol			10 U															
3- and 4-Methylphenol			10 U															
3,3'-Dichlorobenzidine			10 U															
3-Nitroaniline			60 U															
4,6-Dinitro-2-Methylphenol			60 U															
4-Bromophenyl-phenylether			10 U															
4-Chloro-3-methylphenol			10 U															
4-Chloroaniline			10 U															
4-Chlorophenyl-phenylether			10 U															
4-Nitroaniline			60 U															
4-Nitrophenol			60 U															
Aniline			10 U															
Benzofluoranthenes	230	450																
Carbazole																		
Dibenzo(a,h)anthracene	12	33																
Hexachlorocyclopentadiene			10 U															
Isophorone			10 U															
Nitrobenzene			10 U															
N-nitrosodimethylamine			10 U															
N-Nitroso-di-n-propylamine			10 U															

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

		Sample Name:	ECI-Area-R	RZA-B-2	RZA-B-4	RZA-B-5	RZA-B-7	RZA-B-9	RZA-B-10	RZA-B-11	RZA-B-13	RZA-C-1	RZA-C-2	RZA-C-3	RZA-C-4	RZA-C-5	RZA-C-6	RZA-C-7
		Depth Range:		(13-14.5)	(0-1.5)	(10.5-11.5)	(0-1.5)	(2-3)	(4-6)	(6-7)	(3-4)							
		Date Collected:	10/9/1991	########	########	10/22/1990	10/23/1990	10/24/1990	10/24/1990	10/29/1990	10/30/1990	10/21/1990	10/30/1990	10/24/1990	10/23/1990	10/21/1990	10/30/1990	10/25/1990
		Sample Type:	Marine Sediment/ Storm Water Outfall	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels																	
	SQS (b)	CSL (c)																
VOCs (mg/kg)																		
EPA 8260/824																		
1,1,1-Trichloroethane			0.005 U															
1,1,2,2-Tetrachloroethane			0.005 U															
1,1,2-Trichloroethane			0.005 U															
1,1-Dichloroethane			0.005 U															
1,1-Dichloroethene			0.005 U															
1,2,3-Trichlorobenzene			10 U															
1,2-Dichlorobenzene			0.005 U															
1,2-Dichloroethane			0.005 U															
1,2-Dichloropropane			0.005 U															
1,3-Dichlorobenzene			0.005 U															
1,4-Dichlorobenzene			0.005 U															
2-Butanone			0.01 U															
2-Chloroethylvinylether			0.01 U															
2-Hexanone			0.01 U															
4-Methyl-2-Pentanone (MIBK)			0.01 U															
Acetone			0.05 U															
Benzene			0.005 U															
bis(2-Chloroethoxy) Methane			10 U															
Bis-(2-Chloroethyl) Ether			10 U															
Bromodichloromethane			0.005 U															
Bromoform			0.005 U															
Bromomethane			0.005 U															
Carbon Disulfide			0.005 U															
Carbon Tetrachloride			0.005 U															
Chlorobenzene			0.005 U															
Chloroethane			0.005 U															
Chloroform			0.005 U															
Chloromethane			0.005 U															
cis-1,2-Dichloroethene			0.005 U															
cis-1,3-Dichloropropene			0.005 U															
Dibromochloromethane			0.005 U															
Ethylbenzene			0.005 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U							
Methylene Chloride			0.017															
Styrene			0.005 U															
Tetrachloroethene			0.005 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U							
Toluene			0.005 U															
trans-1,2-Dichloroethene			0.005 U															
trans-1,3-Dichloropropene			0.005 U															
Trichloroethene			0.005 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U							
Trichlorofluoromethane			0.005 U															
Trichlorotrifluoroethane			0.01 U															
Vinyl Acetate			0.01 U															
Vinyl Chloride			0.005 U															
Xylenes, Total			0.005 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U							

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			ECI-Area-R	RZA-B-2	RZA-B-4	RZA-B-5	RZA-B-7	RZA-B-9	RZA-B-10	RZA-B-11	RZA-B-13	RZA-C-1	RZA-C-2	RZA-C-3	RZA-C-4	RZA-C-5	RZA-C-6	RZA-C-7
Depth Range:				(13-14.5)	(0-1.5)	(10.5-11.5)	(0-1.5)	(2-3)	(4-6)	(6-7)	(3-4)							
Date Collected:			10/9/1991	########	########	10/22/1990	10/23/1990	10/24/1990	10/24/1990	10/29/1990	10/30/1990	10/21/1990	10/30/1990	10/24/1990	10/23/1990	10/21/1990	10/30/1990	10/25/1990
Sample Type:			Marine Sediment/ Storm Water Outfall	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels																	
	SQS (b)	CSL (c)																
GRAIN SIZE																		
Clay (phi <10) (%)																		
Clay (phi 8 to 9) (%)																		
Clay (phi 9 to 10) (%)																		
Fines (%)																		
Gravel (>phi -1) (%)																		
Sand (phi 0 to 1) (%)																		
Sand (phi -1 to 0) (%)																		
Sand (phi 1 to 2) (%)																		
Sand (phi 2 to 3) (%)																		
Sand (phi 3 to 4) (%)																		
Silt (phi 4 to 5) (%)																		
Silt (phi 5 to 6) (%)																		
Silt (phi 6 to 7) (%)																		
Silt (phi 7 to 8) (%)																		

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Cleanup Screening Levels				
	SQS (b)	CSL (c)			
Sample Name:			RZA-C-8	LS-COMP-A	LS-COMP-B
Depth Range:					
Date Collected:			10/23/1990	10/8/1987	10/8/1987
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
Petroleum Hydrocarbons (mg/kg)					
NWPTH-D/EPA413.1					
Diesel Range Organics					
Total Oil & Grease			100		
Metals (mg/kg)					
EPA 6000/7000/200.8					
Antimony			1	0.7	0.6
Arsenic	57	93	10	0.8	0.8
Beryllium					
Cadmium	5.1	6.7	3.6	0.4	0.6
Chromium	260	270	51		
Copper	390	390	17	60	75
Lead	450	530	16	15	87
Mercury	0.41	0.59	0.14	0.1	0.1
Nickel			41	58	65
Selenium					
Silver	6.1	6.1	0.29	0.5	0.5
Thallium					
Zinc	410	960	54	142	123
Pesticides (mg/kg)					
EPA 8080					
4,4'-DDD					
4,4'-DDE					
4,4'-DDT					
Aldrin			0.01 U	0.0008 U	0.0008 U
Alpha-BHC					
Beta-BHC					
Chlordane			0.01 U	0.034 U	0.032 U
Delta-BHC					
Dieldrin			0.01 U	0.0017 U	0.0016 U
EndoSulfan I					
Endosulfan Sulfate					
Endrin					
Endrin Aldehyde					
Gamma-BHC					
Heptachlor			0.01 U	0.0008 U	0.0008 U
Heptachlor Epoxide					
Lindane			0.01 U	0.0008 U	0.0008 U
Methoxychlor					
Total DDT			0.69 U	0.0017 U	0.0016 U
Toxaphene					

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

		Sample Name:	RZA-C-8	LS-COMP-A	LS-COMP-B
		Depth Range:			
		Date Collected:	10/23/1990	10/8/1987	10/8/1987
		Sample Type:	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels				
	SQS (b)	CSL (c)			
PCBs (mg/kg OC)					
EPA 8080					
Aroclor 1016					
Aroclor 1221					
Aroclor 1232					
Aroclor 1242					
Aroclor 1248					
Aroclor 1254					
Aroclor 1260					
Aroclor 1262					
Aroclor 1268					
Total PCBs	130		9.091 U	1.349 U	1.208 U
Organotin (mg/L)					
Porewater					
Butyl Tin Ion					
Dibutyl Tin Ion					
Tributyltin	0.05	0.15			
Tributyl Tins (mg/kg)					
Krone 1988 SIM GC/MS					
Tributyl Tin Ion					
Dibutyl Tin Ion					
Butyl Tin Ion					
Bioassay					
Biochemical Oxygen Demand (mg/Kg)			563.5		
Chemical Oxygen Demand (mg/Kg)			22881.6		
Microtox Test (% Light Change)			-1.7		
Amphipod Mortality (%)			61		
Echinoderm Mortality (%)			8.6		
Neanthes Mortality (%)			4		
Conventionals					
Ammonia (mg/Kg)					
Sulfide (mg/kg)					
Total Kjeldahl Nitrogen (mg/Kg)			640		
Total Sulfides (mg/Kg)				3.2	2.4
Total Volatile Solids (mg/Kg)			2.6		
N Ammonia (mg N/kg)					
Total Organic Carbon (%)			1.43	2.52	2.65
Total Solids (%)			70.1	71.6	69.8
Total Volatile Solids (%)				6.61	6.60
Preserved Total Solids (%)					

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

		Sample Name:	RZA-C-8	LS-COMP-A	LS-COMP-B
		Depth Range:			
		Date Collected:	10/23/1990	10/8/1987	10/8/1987
		Sample Type:	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels				
	SQS (b)	CSL (c)			
SVOCs (mg/kg OC)					
EPA SW8270/8120					
LPAHs					
Acenaphthene	16	57	13.986 U	0.198 J	0.170 U
Acenaphthylene	66	66	13.986 U	0.516 J	0.030 U
Anthracene	220	1200	9.091 U	0.476 J	0.340 J
Fluorene	23	79	13.986 U	0.516	0.174 U
Naphthalene	99	170	14.685 U	0.516 J	0.415 J
Phenanthrene	100	480	22.378 U	1.190	0.830
2-Methylnaphthalene	38	64	13.986 U	0.159 J	0.260 U
Total LPAH	370	780	42.657 U	3.413 J	1.585 J
HPAHs					
Benzo(a)anthracene	110	270	31.469 U	2.183	1.358
Benzo(a)pyrene	99	210	47.552 U	1.349	1.057
Benzo(b)fluoranthene	--	--	55.944 U		
Benzo(k)fluoranthene	--	--	55.944 U		
Total Benzofluoranthenes	230	450	55.944 U	3.294	1.849 J
Benzo(g,h,i)perylene	31	78	37.762 U	1.190	0.679
Chrysene	110	460	46.853 U	1.548	1.208
Dibenz(a,h)anthracene			9.091 U		
Fluoranthene	160	1200	44.056 U	2.937	1.509
Indeno(1,2,3-cd)pyrene	34	88	13.986 U	0.992	0.642 J
Pyrene	1000	1400	30.070 U	3.016	2.038
Total HPAH	960	5300	125.874 U	16.508	10.340 J
OTHER SVOCs					
1,2,4-Trichlorobenzene	0.81	1.8	4.476 U	0.306 U	0.275 U
1,2-Dichlorobenzene	2.3	2.3	2.587 U	0.040 U	0.034 U
1,3-Dichlorobenzene			11.888 U	0.060 U	0.053 U
1,4-Dichlorobenzene	3.1	9	13.287 U	0.151 U	0.136
Bis(2-ethylhexyl)phthalate	47	78	216.783 U	1.944 B	1.057 B
Benzyl butyl phthalate	4.9	64	32.867 U	1.468 J	1.057
Dibenzofuran	15	58	13.986 U	0.278 U	0.249 U
Diethylphthalate	61	110	6.783 U	0.131 U	0.117 U
Dimethylphthalate	53	53	11.189 U	0.476 J	0.143 U
Di-n-Butylphthalate	220	1700	97.902 U	0.254 U	0.230 U
Di-n-octyl phthalate	58	4500	433.566 U	0.397 J	0.491 U
Hexachlorobenzene	0.38	2.3	11.748 U	0.290 U	0.260 U
Hexachlorobutadiene	3.9	6.2	14.825 U	0.302 U	0.272 U
Hexachloroethane			97.902 U	0.262 U	0.234 U
N-Nitrosodiphenylamine	11	11	11.259 U	0.516 U	0.491 U

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Cleanup Screening Levels				
		Sample Name:	RZA-C-8	LS-COMP-A	LS-COMP-B
		Depth Range:			
		Date Collected:	10/23/1990	10/8/1987	10/8/1987
		Sample Type:	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	SQS (b)	CSL (c)			
SVOCs (mg/kg)					
EPA SW8270/8120					
1-Methylnaphthalene					
2,4-Dimethylphenol	0.029	0.029	0.05 U	0.012 U	0.011 U
2-Methylphenol	0.063	0.063	0.072 U	0.0050 U	0.0047 U
4-Methylphenol	0.67	0.67	0.12 U	0.0025 U	0.0024 U
Benzoic Acid	0.65	0.65	0.69 U	0.058 J	0.012 U
Benzyl Alcohol	0.057	0.073	0.073 U	0.0044 U	0.0042 U
Pentachlorophenol	0.36	0.69	0.504 U	0.0053 U	0.0051 U
Phenol	0.42	1.2	0.12 U	0.0033 U	0.0032 U
2,2'-Oxybis(1-Chloropropane)					
2,4,5-Trichlorophenol					
2,4,6-Trichlorophenol					
2,4-Dichlorophenol					
2,4-Dinitrophenol					
2,4-Dinitrotoluene					
2,6-Dinitrotoluene					
2-Chloronaphthalene					
2-Chlorophenol					
2-Nitroaniline					
2-Nitrophenol					
3- and 4-Methylphenol					
3,3'-Dichlorobenzidine					
3-Nitroaniline					
4,6-Dinitro-2-Methylphenol					
4-Bromophenyl-phenylether					
4-Chloro-3-methylphenol					
4-Chloroaniline					
4-Chlorophenyl-phenylether					
4-Nitroaniline					
4-Nitrophenol					
Aniline					
Benzofluoranthenes	230	450		0.083	0.049 J
Carbazole					
Dibenzo(a,h)anthracene	12	33		0.0085 U	0.0081 U
Hexachlorocyclopentadiene					
Isophorone					
Nitrobenzene					
N-nitrosodimethylamine					
N-Nitroso-di-n-propylamine					

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Cleanup Screening Levels				
	SQS (b)	CSL (c)			
Sample Name:			RZA-C-8	LS-COMP-A	LS-COMP-B
Depth Range:					
Date Collected:			10/23/1990	10/8/1987	10/8/1987
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
VOCs (mg/kg)					
EPA 8260/824					
1,1,1-Trichloroethane					
1,1,2,2-Tetrachloroethane					
1,1,2-Trichloroethane					
1,1-Dichloroethane					
1,1-Dichloroethene					
1,2,3-Trichlorobenzene					
1,2-Dichlorobenzene					
1,2-Dichloroethane					
1,2-Dichloropropane					
1,3-Dichlorobenzene					
1,4-Dichlorobenzene					
2-Butanone					
2-Chloroethylvinylether					
2-Hexanone					
4-Methyl-2-Pentanone (MIBK)					
Acetone					
Benzene					
bis(2-Chloroethoxy) Methane					
Bis-(2-Chloroethyl) Ether					
Bromodichloromethane					
Bromoform					
Bromomethane					
Carbon Disulfide					
Carbon Tetrachloride					
Chlorobenzene					
Chloroethane					
Chloroform					
Chloromethane					
cis-1,2-Dichloroethene					
cis-1,3-Dichloropropene					
Dibromochloromethane					
Ethylbenzene				0.0026 U	0.0025 U
Methylene Chloride					
Styrene					
Tetrachloroethene				0.0015 U	0.0014 U
Toluene					
trans-1,2-Dichloroethene					
trans-1,3-Dichloropropene					
Trichloroethene				0.0017 U	0.0017 U
Trichlorofluoromethane					
Trichlorotrifluoroethane					
Vinyl Acetate					
Vinyl Chloride					
Xylenes, Total				0.0029 U	0.0028 U

TABLE G-1
MARINE SEDIMENT SAMPLE RESULTS
RI/FS WORK PLAN - AMERON HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Cleanup Screening Levels				
Sample Name:			RZA-C-8	LS-COMP-A	LS-COMP-B
Depth Range:					
Date Collected:			10/23/1990	10/8/1987	10/8/1987
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	SQS (b)	CSL (c)			
GRAIN SIZE					
Clay (phi <10) (%)					
Clay (phi 8 to 9) (%)					
Clay (phi 9 to 10) (%)					
Fines (%)					
Gravel (>phi -1) (%)					
Sand (phi 0 to 1) (%)					
Sand (phi -1 to 0) (%)					
Sand (phi 1 to 2) (%)					
Sand (phi 2 to 3) (%)					
Sand (phi 3 to 4) (%)					
Silt (phi 4 to 5) (%)					
Silt (phi 5 to 6) (%)					
Silt (phi 6 to 7) (%)					
Silt (phi 7 to 8) (%)					

U = the analyte was not detected in the sample at the given reporting limit.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J1 = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
Shaded value indicates exceedance of SQS
Boxed value indicates exceedance of CSL

(a) See SAIC 2009, Appendix F for full bioassay analysis of A2-13
(b) SMS Sediment Quality Standard (Chapter 173-204 WAC).
(c) CSL Cleanup Screening Level (Chapter 173-204 WAC).
(d) No TOC data is available. Recorded value is the average of the TOC data presented on this table.

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			RI-SED-1	RI-SED-2	RI-SED-3	RI-SED-4	RI-SED-5	RI-SED-6	RI-SED-7	A2-13	CM-1	CM-2	CM-3	CM-S4	CM-S5
Depth Range:															
Date Collected:			5/12/2009	5/12/2009	5/12/2009	5/11/2009	5/11/2009	5/11/2009	5/11/2009	8/4/2008	11/10/2000	11/8/2000	11/7/2000	11/9/2000	11/9/2000
Sample Type:			Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels (a)														
	SQS (b)	CSL (c)													
Petroleum Hydrocarbons (mg/kg)															
NWPTH-D/EPA413.1															
Diesel Range Organics															
Total Oil & Grease															
Metals (mg/kg)															
EPA 6000/7000/200.8															
Antimony											7 U	6 U	7 U	6 U	6 U
Arsenic	57	93	20	20	20	30	26	30	30	20	10	10	10	11	8
Beryllium															
Cadmium	5.1	6.7	0.4	0.4	0.5	0.4 U	0.4 U	0.4 U	0.4 U	0.4	0.3 U	0.3	0.3 U	0.3	0.3 U
Chromium	260	270	61	56	63	69	70.1	66	64	59	41.9	41.1	53.4	41.2	40.8
Copper	390	390	68.7	62.2	70.4	68.6	68.1	65.5	63.2	60.0	39	31	47	34	30
Lead	450	530	12	11	12	12	12	12	12	11	12	8	10	10	8
Mercury	0.41	0.59	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.06	0.07	0.09	0.05	0.06 U
Nickel											39	37	48	39	39
Selenium															
Silver	6.1	6.1	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.7 U	0.6 U	0.4 U	0.4 U	0.6	0.4 U	0.4 U
Thallium															
Zinc	410	960	109	101	111	109	112	102	100	90	62	58	76	56	51
Pesticides and PCBs (mg/kg)															
EPA 8080															
4,4'-DDD											0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0019 U
4,4'-DDE											0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0019 U
4,4'-DDT											0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0019 U
Aldrin											0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Alpha-BHC															
Aroclor 1016			0.004 U	0.0039 U	0.004 U	0.0039 U	0.004 U	0.004 U	0.0039 U	0.020 U	0.017 U	0.02 U	0.019 U	0.019 U	0.019 U
Aroclor 1221			0.004 U	0.0039 U	0.004 U	0.0039 U	0.004 U	0.004 U	0.0039 U	0.020 U	0.035 U	0.039 U	0.037 U	0.039 U	0.037 U
Aroclor 1232			0.004 U	0.0043 U	0.004 U	0.0039 U	0.004 U	0.004 U	0.0039 U	0.020 U	0.017 U	0.02 U	0.019 U	0.019 U	0.019 U
Aroclor 1242			0.004 U	0.0039 U	0.004 U	0.0039 U	0.004 U	0.004 U	0.0039 U	0.020 U	0.017 U	0.02 U	0.019 U	0.019 U	0.019 U
Aroclor 1248			0.004 U	0.0039 U	0.004 U	0.0039 U	0.004 U	0.004 U	0.0039 U	0.020 U	0.017 U	0.02 U	0.019 U	0.019 U	0.019 U
Aroclor 1254			0.004 U	0.0039 U	0.004 U	0.0039 U	0.004 U	0.004 U	0.0039 U	0.020 U	0.017 U	0.02 U	0.019 U	0.019 U	0.019 U
Aroclor 1260			0.004 U	0.0039 U	0.004 U	0.0039 U	0.004 U	0.004 U	0.0039 U	0.020 U	0.017 U	0.02 U	0.019 U	0.019 U	0.019 U
Aroclor 1262			0.004 U	0.0039 U	0.004 U	0.0039 U	0.004 U	0.004 U	0.0039 U	0.020 U					
Aroclor 1268			0.004 U	0.0039 U	0.004 U	0.0039 U	0.004 U	0.004 U	0.0039 U	0.020 U					
Beta-BHC															
Chlordane											0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Delta-BHC															
Dieldrin											0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
EndoSulfan I															
Endosulfan Sulfate															
Endrin															
Endrin Aldehyde															
Gamma-BHC															
Heptachlor											0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Heptachlor Epoxide															
Lindane											0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methoxychlor															
Total DDT											0.0017 U	0.002 U	0.0019 U	0.0019 U	0.0019 U
Total PCBs	0.13	1	0.004 U	0.0039 U	0.004 U	0.0039 U	0.004 U	0.004 U	0.0039 U		0.035 U	0.039 U	0.037 U	0.039 U	0.037 U
Toxaphene															
Organotin (mg/L)															
Porewater															
Butyl Tin Ion			0.000011	0.000017	0.000026	0.000014	0.000008	0.000008 U	0.00001						

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			RI-SED-1	RI-SED-2	RI-SED-3	RI-SED-4	RI-SED-5	RI-SED-6	RI-SED-7	A2-13	CM-1	CM-2	CM-3	CM-S4	CM-S5
Depth Range:															
Date Collected:			5/12/2009	5/12/2009	5/12/2009	5/11/2009	5/11/2009	5/11/2009	5/11/2009	8/4/2008	11/10/2000	11/8/2000	11/7/2000	11/9/2000	11/9/2000
Sample Type:			Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels (a)														
	SQS (b)	CSL (c)													
Dibutyl Tin Ion			0.000012 U	0.000012 U	0.000013	0.000012 U	0.000012 U	0.000012 U	0.000012 U						
Tributyltin	0.05 (d)	0.15 (d)	0.000008 U	0.000008 U	0.000008 U	0.000008 U	0.000008 U	0.000008 U	0.000008 U		0.00002 U	0.00007 U	0.00002 U		
Tributyl Tins (mg/kg)															
Krone 1988 SIM GC/MS															
Tributyl Tin Ion										0.0038 U					
Dibutyl Tin Ion										0.0056 U					
Butyl Tin Ion										0.0040 U					
Bioassay															
Biochemical Oxygen Demand (mg/Kg)															
Chemical Oxygen Demand (mg/Kg)															
Microtox Test (% Light Change)															
Amphipod Mortality (%)															
Echinoderm Mortality (%)															
Neanthes Mortality (%)															

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			RI-SED-1	RI-SED-2	RI-SED-3	RI-SED-4	RI-SED-5	RI-SED-6	RI-SED-7	A2-13	CM-1	CM-2	CM-3	CM-S4	CM-S5
Depth Range:															
Date Collected:			5/12/2009	5/12/2009	5/12/2009	5/11/2009	5/11/2009	5/11/2009	5/11/2009	8/4/2008	11/10/2000	11/8/2000	11/7/2000	11/9/2000	11/9/2000
Sample Type:			Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels (a)														
	SQS (b)	CSL (c)													
Conventionals															
Ammonia (mg/Kg)															
Sulfide (mg/kg)			**276** J1	**385** J1	**306** J1	**219** J1	**268** J1	**156** J1	**68.0** J1	137	71	19	16	5.6 U	12
Total Kjeldahl Nitrogen (mg/Kg)															
Total Sulfides (mg/Kg)															
Total Volatile Solids (mg/Kg)															
N Ammonia (mg N/kg)			**13.9** J1	**20.4** J1	**16.0** J1	**18.4** J1	**17.2** J1	**18.7** J1	**14.7** J1	8.79	45	25	20	150	34
Total Organic Carbon (%)	10 (e)	10 (e)	1.48	2.17	2.05	2.35	2.14	2.25	1.65	1.78	1.4	1.7	1.7	0.92	0.82
Total Solids (%)			48.60	48.90	47.70 J1	50.80 J1	48.50 J1	46.90 J1	55.50	53.80	71.9	72.6	67.6	73.9	76.6
Total Volatile Solids (%)	25 (e)	25 (e)	7.14 J1	7.31 J1	7.41 J1	7.10 J1	7.57 J1	7.50 J1	5.86 J1	6.82	4.6	4.6	6.3	2.8	2.7
Preserved Total Solids (%)										54.80	69	69.8	58	77.6	67.2
SVOCs (mg/kg)															
EPA SW8270/8120															
1,2,4-Trichlorobenzene	0.031	0.051	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.0069 U	0.007 U	0.0078 U	0.0059 U	0.0063 U
1,2-Dichlorobenzene	0.035	0.05	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.0014 U	0.0014 U	0.0016 U	0.0012 U	0.0013 U
1,3-Dichlorobenzene			0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.0014 U	0.0014 U	0.0016 U	0.0012 U	0.0013 U
1,4-Dichlorobenzene	0.11	0.11	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.0014 U	0.0014 U	0.0016 U	0.0012 U	0.0013 U
1-Methylnaphthalene			0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U					
2,2'-Oxybis(1-Chloropropane)															
2,4,5-Trichlorophenol															
2,4,6-Trichlorophenol															
2,4-Dichlorophenol															
2,4-Dimethylphenol	0.029	0.029	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
2,4-Dinitrophenol															
2,4-Dinitrotoluene															
2,6-Dinitrotoluene															
2-Chloronaphthalene															
2-Chlorophenol															
2-Methylnaphthalene	38	64	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
2-Methylphenol	0.063	0.063	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
2-Nitroaniline															
2-Nitrophenol															
3- and 4-Methylphenol															
3,3'-Dichlorobenzidine															
3-Nitroaniline															
4,6-Dinitro-2-Methylphenol															
4-Bromophenyl-phenylether															
4-Chloro-3-methylphenol															
4-Chloroaniline															
4-Chlorophenyl-phenylether															
4-Methylphenol	0.67	0.67	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.490	0.041	0.031	0.039	0.021	0.019 U
4-Nitroaniline															
4-Nitrophenol															
Acenaphthene	0.5	0.5	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Acenaphthylene	1.3	1.3	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.021	0.019 U	0.019 U
Aniline															
Anthracene	0.96	0.96	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.019 J	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Benzo(a)anthracene	1.3	1.6	**0.015** J	0.02 U	**0.01** J	0.02 U	0.02 U	0.02 U	0.02 U	0.014 J	0.024	0.019 J	0.023	0.019 U	0.019 U
Benzo(a)pyrene	1.6	1.6	**0.01** J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.012 J	0.02	0.02 U	0.024	0.019 U	0.019 U
Benzo(b)fluoranthene			**0.011** J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.029					
Benzo(g,h,i)perylene	0.67	0.72	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Benzo(k)fluoranthene			**0.011** J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.015 J					
Benzofluoranthenes	3.2	3.6	**0.022** J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.037 J	0.02 U	0.044	0.019 U	0.019 U
Benzoic Acid	0.65	0.65								0.200 U	0.19 U	0.2 U	0.2 U	0.19 U	0.19 U
Benzyl Alcohol	0.057	0.073	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Benzyl butyl phthalate	0.063	0.9								0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			RI-SED-1	RI-SED-2	RI-SED-3	RI-SED-4	RI-SED-5	RI-SED-6	RI-SED-7	A2-13	CM-1	CM-2	CM-3	CM-S4	CM-S5
Depth Range:															
Date Collected:			5/12/2009	5/12/2009	5/12/2009	5/11/2009	5/11/2009	5/11/2009	5/11/2009	8/4/2008	11/10/2000	11/8/2000	11/7/2000	11/9/2000	11/9/2000
Sample Type:			Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
Cleanup Screening Levels (a)	SQS (b)	CSL (c)													
Bis(2-ethylhexyl)phthalate	1.3	3.1	**0.036**	**0.023**	**0.017** J	**0.014** J	**0.022**	**0.012** J	**0.029**	0.074	0.022	0.034	0.034	0.034	0.019
Carbazole															
Chrysene	1.4	2.8	**0.024**	**0.022**	**0.017** J	0.02 U	0.02 U	0.02 U	0.02 U	0.026	0.029	0.025	0.038	0.019 U	0.019 U
cPAH TEQ															
Dibenz(a,h)anthracene										0.020 U					
Dibenzo(a,h)anthracene	0.23	0.23	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Dibenzofuran	0.54	0.54	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Diethylphthalate	0.2	1.2	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Dimethylphthalate	0.071	0.16	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Di-n-Butylphthalate	1.4	5.1	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.024 UJ	0.034 UJ	0.027 UJ	0.037 UJ	0.038 UJ
Di-n-octyl phthalate	6.2	6.2	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Fluoranthene	1.7	2.5	**0.028**	**0.017** J	**0.024**	0.02 U	**0.01** J	0.02 U	**0.015** J	0.065	0.066	0.047	0.088	0.019 U	0.021
Fluorene	0.54	0.54	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Hexachlorobenzene	0.022	0.07	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Hexachlorobutadiene	0.011	0.12	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Hexachlorocyclopentadiene															
Hexachloroethane			0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Indeno(1,2,3-cd)pyrene	0.6	0.69	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Isophorone															
Naphthalene	2.1	2.1	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.053	0.049	0.071	0.031	0.03
Nitrobenzene															
N-nitrosodimethylamine															
N-Nitroso-di-n-propylamine															
N-Nitrosodiphenylamine	0.028	0.04	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.019 U	0.02 U	0.02 U	0.019 U	0.019 U
Pentachlorophenol	0.36	0.69	0.1 U	0.099 U	0.098 U	0.1 U	0.098 U	0.1 U	0.098 U	0.097 U	0.093 U	0.098 U	0.099 U	0.096 U	0.093 U
Phenanthrene	1.5	1.5	**0.015** J	0.02 U	**0.014** J	0.02 U	0.02 U	0.02 U	**0.012** J	0.023	0.044	0.032	0.054	0.02	0.025
Phenol	0.42	1.2	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	**0.017** J	0.02 U	**0.019**	0.054	0.024	0.036	0.019 U	0.019 U
Pyrene	2.6	3.3	**0.025**	**0.018** J	**0.021**	0.02 U	**0.01** J	0.02 U	**0.014** J	0.042	0.06	0.041	0.07	0.019 U	0.027
Total HPAH	12	17	**0.124** J	**0.057** J	**0.072** J	0.02 U	**0.02** J	0.02 U	**0.029** J	0.159	0.236 J	0.132 J	0.287	0.019 U	0.048
Total LPAH	5.2	5.2	**0.015** J	0.02 U	**0.014** J	0.02 U	0.02 U	0.02 U	**0.012** J	0.042 J	0.097	0.081	0.146	0.051	0.055
VOCs (mg/kg)															
EPA 8260/824															
1,1,1-Trichloroethane															
1,1,2,2-Tetrachloroethane															
1,1,2-Trichloroethane															
1,1-Dichloroethane															
1,1-Dichloroethene															
1,2,3-Trichlorobenzene															
1,2-Dichlorobenzene	0.035	0.05													
1,2-Dichloroethane															
1,2-Dichloropropane															
1,3-Dichlorobenzene															
1,4-Dichlorobenzene	0.11	0.11													
2-Butanone															
2-Chloroethylvinylether															
2-Hexanone															
4-Methyl-2-Pentanone (MIBK)															
Acetone															
Benzene															
bis(2-Chloroethoxy) Methane															
Bis-(2-Chloroethyl) Ether															
Bromodichloromethane															
Bromoform															
Bromomethane															
Carbon Disulfide															
Carbon Tetrachloride															

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

		Sample Name:	RI-SED-1	RI-SED-2	RI-SED-3	RI-SED-4	RI-SED-5	RI-SED-6	RI-SED-7	A2-13	CM-1	CM-2	CM-3	CM-S4	CM-S5
		Depth Range:													
		Date Collected:	5/12/2009	5/12/2009	5/12/2009	5/11/2009	5/11/2009	5/11/2009	5/11/2009	8/4/2008	11/10/2000	11/8/2000	11/7/2000	11/9/2000	11/9/2000
		Sample Type:	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels (a)														
	SQS (b)	CSL (c)													
Chlorobenzene															
Chloroethane															
Chloroform															
Chloromethane															
cis-1,2-Dichloroethene															
cis-1,3-Dichloropropene															
Dibromochloromethane															
Ethylbenzene											0.0014 U	0.0014 U	0.0016 U	0.0012 U	0.0013 U
Methylene Chloride															
Styrene															
Tetrachloroethene											0.0014 U	0.0014 U	0.0016 U	0.0012 U	0.0013 U
Toluene															
trans-1,2-Dichloroethene															
trans-1,3-Dichloropropene															
Trichloroethene											0.0014 U	0.0014 U	0.0016 U	0.0012 U	0.0013 U
Trichlorofluoromethane															
Trichlorotrifluoroethane															
Vinyl Acetate															
Vinyl Chloride															
Xylenes, Total											0.0014 U	0.0014 U	0.0016 U	0.0012 U	0.0013 U

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Cleanup Screening Levels (a)													
Sample Name:			RI-SED-1	RI-SED-2	RI-SED-3	RI-SED-4	RI-SED-5	RI-SED-6	RI-SED-7	A2-13	CM-1	CM-2	CM-3	CM-S4	CM-S5
Depth Range:															
Date Collected:			5/12/2009	5/12/2009	5/12/2009	5/11/2009	5/11/2009	5/11/2009	5/11/2009	8/4/2008	11/10/2000	11/8/2000	11/7/2000	11/9/2000	11/9/2000
Sample Type:			Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Surface Sediment	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	SQS (b)	CSL (c)													
GRAIN SIZE															
Clay (phi <10) (%)			10.5	10.8	12.8	12.0	11.9	11.3	10.1	8.7	4.9	5.5	7.5	4.3	4.2
Clay (phi 8 to 9) (%)			7.4	7.4	8.2	7.3	7.8	7.0	5.8	4.5	2.1	2.1	3	1.7	1.8
Clay (phi 9 to 10) (%)			4.9	6.0	7.0	5.8	5.9	5.7	4.9	5.5	1.8	1.8	2.6	1.6	1.2
Fines (%)			93.9	97.0	97.7	97.6	94.9	92.6	81.0	83.2	44.8	46.7	67.9	45.8	46
Gravel (>phi -1) (%)			0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.2	2.6	2.2	2.2	0.2	0.5
Sand (phi 0 to 1) (%)			0.3	0.2	0.2	0.2	0.5	0.6	1.9	0.7	3.8	3.3	1.3	4.4	3.5
Sand (phi -1 to 0) (%)			0.2	0.1	0.2	0.1	0.6	0.9	2.1	0.8	1.3	1.5	1.6	0.9	0.7
Sand (phi 1 to 2) (%)			0.5	0.2	0.1	0.1	0.2	0.4	2.0	1.8	9.4	5.9	1.8	10.7	10.4
Sand (phi 2 to 3) (%)			1.0	0.3	0.1	0.1	0.4	0.6	3.2	3.8	12.9	15.1	5.5	18.8	14.2
Sand (phi 3 to 4) (%)			4.1	2.2	1.7	1.8	3.4	4.9	8.9	9.6	25.2	25.5	19.7	19.3	24.7
Silt (phi 4 to 5) (%)			17.2	14.3	13.8	15.8	19.0	14.7	13.7	14.4	18.3	17.3	22.5	21.2	23.4
Silt (phi 5 to 6) (%)			20.2	24.7	21.0	20.5	18.5	19.0	20.8	23.3	8.8	10.2	16.4	9	8.2
Silt (phi 6 to 7) (%)			21.7	21.0	22.2	23.1	19.3	22.2	16.2	16.6	5.7	6.4	10.7	5.2	4.7
Silt (phi 7 to 8) (%)			12.0	12.8	12.7	13.1	12.4	12.6	9.5	10.2	3.2	3.4	5.2	2.9	2.5

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			CM-S6	CM-S7	CM-S8	ECI-Area-R	RZA-B-2	RZA-B-4	RZA-B-5	RZA-B-7	G RZA-B-9	RZA-B-10	RZA-B-11	RZA-B-13
Depth Range:							(13-14.5)	(0-1.5)	(10.5-11.5)	(0-1.5)	(2-3)	(4-6)	(6-7)	(3-4)
Date Collected:			11/8/2000	11/7/2000	11/7/2000	10/9/1991	10/19/1990	10/19/1990	10/22/1990	10/23/1990	10/24/1990	10/24/1990	10/29/1990	10/30/1990
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment/ Storm Water Outfall	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels (a)													
	SQS (b)	CSL (c)												
Petroleum Hydrocarbons (mg/kg)														
NWPTH-D/EPA413.1														
Diesel Range Organics						2100								
Total Oil & Grease														
Metals (mg/kg)														
EPA 6000/7000/200.8														
Antimony			7 U	6 U	6 U	11								
Arsenic	57	93	12	7	7	57								
Beryllium						1 U								
Cadmium	5.1	6.7	0.3 U	0.2 U	0.3 U	3								
Chromium	260	270	43.1	44.4	44	118								
Copper	390	390	31	33	30	167								
Lead	450	530	7	5	5	113								
Mercury	0.41	0.59	0.07 U	0.05	0.06 U	0.2 U								
Nickel			41	43	44	38								
Selenium						1 U								
Silver	6.1	6.1	0.4 U	0.4	0.4 U	2								
Thallium						1 U								
Zinc	410	960	55	56	56	526								
Pesticides and PCBs (mg/kg)														
EPA 8080														
4,4'-DDD			0.0019 U	0.0019 U	0.0019 U	0.1 U								
4,4'-DDE			0.0019 U	0.0019 U	0.0019 U	0.1 U								
4,4'-DDT			0.0019 U	0.0019 U	0.0019 U									
Aldrin			0.001 U	0.001 U	0.001 U	0.1 U								
Alpha-BHC						0.1 U								
Aroclor 1016			0.019 U	0.019 U	0.019 U	1 U								
Aroclor 1221			0.039 U	0.038 U	0.039 U	1 U								
Aroclor 1232			0.019 U	0.019 U	0.019 U	1 U								
Aroclor 1242			0.019 U	0.019 U	0.019 U	1 U								
Aroclor 1248			0.019 U	0.019 U	0.019 U	1 U								
Aroclor 1254			0.019 U	0.019 U	0.019 U	1 U								
Aroclor 1260			0.019 U	0.019 U	0.019 U	1 U								
Aroclor 1262														
Aroclor 1268														
Beta-BHC						0.3 U								
Chlordane			0.001 U	0.001 U	0.001 U	1 U								
Delta-BHC						0.1 U								
Dieldrin			0.002 U	0.002 U	0.002 U	0.1 U								
EndoSulfan I						0.1 U								
Endosulfan Sulfate						0.1 U								
Endrin						0.1 U								
Endrin Aldehyde						0.1 U								
Gamma-BHC						0.1 U								
Heptachlor			0.001 U	0.001 U	0.001 U	0.1 U								
Heptachlor Epoxide						0.1 U								
Lindane			0.001 U	0.001 U	0.001 U									
Methoxychlor						0.2 U								
Total DDT			0.0019 U	0.0019 U	0.0019 U									
Total PCBs	0.13	1	0.039 U	0.038 U	0.039 U									
Toxaphene						3 U								
Organotin (mg/L)														
Porewater														
Butyl Tin Ion														

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			CM-S6	CM-S7	CM-S8	ECI-Area-R	RZA-B-2	RZA-B-4	RZA-B-5	RZA-B-7	G RZA-B-9	RZA-B-10	RZA-B-11	RZA-B-13
Depth Range:							(13-14.5)	(0-1.5)	(10.5-11.5)	(0-1.5)	(2-3)	(4-6)	(6-7)	(3-4)
Date Collected:			11/8/2000	11/7/2000	11/7/2000	10/9/1991	10/19/1990	10/19/1990	10/22/1990	10/23/1990	10/24/1990	10/24/1990	10/29/1990	10/30/1990
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment/ Storm Water Outfall	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels (a)													
	SQS (b)	CSL (c)												
Dibutyl Tin Ion														
Tributyltin	0.05 (d)	0.15 (d)												
Tributyl Tins (mg/kg)														
Krone 1988 SIM GC/MS														
Tributyl Tin Ion														
Dibutyl Tin Ion														
Butyl Tin Ion														
Bioassay														
Biochemical Oxygen Demand (mg/Kg)														
Chemical Oxygen Demand (mg/Kg)														
Microtox Test (% Light Change)														
Amphipod Mortality (%)														
Echinoderm Mortality (%)														
Neanthes Mortality (%)														

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			CM-S6	CM-S7	CM-S8	ECI-Area-R	RZA-B-2	RZA-B-4	RZA-B-5	RZA-B-7	G RZA-B-9	RZA-B-10	RZA-B-11	RZA-B-13
Depth Range:							(13-14.5)	(0-1.5)	(10.5-11.5)	(0-1.5)	(2-3)	(4-6)	(6-7)	(3-4)
Date Collected:			11/8/2000	11/7/2000	11/7/2000	10/9/1991	10/19/1990	10/19/1990	10/22/1990	10/23/1990	10/24/1990	10/24/1990	10/29/1990	10/30/1990
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment/ Storm Water Outfall	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels (a)													
	SQS (b)	CSL (c)												
Conventionals														
Ammonia (mg/Kg)							16.1	25	12.5	19.1	13.8	12.5	12.9	14.5
Sulfide (mg/kg)			6	3.6 U	640									
Total Kjeldahl Nitrogen (mg/Kg)														
Total Sulfides (mg/Kg)							2.8	10.1	5 U	5 U	12.6	12.2	5.6	10.6
Total Volatile Solids (mg/Kg)														
N Ammonia (mg N/kg)			56	36	47									
Total Organic Carbon (%)	10 (e)	10 (e)	0.85	0.93	0.85									
Total Solids (%)			73.2	73.2	73.1		74.5	72	80.1	73.4	65.2	63.9	76	70.3
Total Volatile Solids (%)	25 (e)	25 (e)	2.8	3.1	2.8									
Preserved Total Solids (%)			74.7	66.7	55.6									
SVOCs (mg/kg)														
EPA SW8270/8120														
1,2,4-Trichlorobenzene	0.031	0.051	0.0063 U	0.007 U	0.0063 U		0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U
1,2-Dichlorobenzene	0.035	0.05	0.0013 U	0.0014 U	0.0013 U	10 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
1,3-Dichlorobenzene			0.0013 U	0.0014 U	0.0013 U	10 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
1,4-Dichlorobenzene	0.11	0.11	0.0013 U	0.0014 U	0.0013 U	10 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														
2,2'-Oxybis(1-Chloropropane)						10 U								
2,4,5-Trichlorophenol						10 U								
2,4,6-Trichlorophenol						10 U								
2,4-Dichlorophenol						10 U								
2,4-Dimethylphenol	0.029	0.029	0.019 U	0.019 U	0.019 U	10 U								
2,4-Dinitrophenol						60 U								
2,4-Dinitrotoluene						10 U								
2,6-Dinitrotoluene						10 U								
2-Chloronaphthalene						10 U								
2-Chlorophenol						10 U								
2-Methylnaphthalene	38	64	0.019 U	0.019 U	0.019 U	10 U								
2-Methylphenol	0.063	0.063	0.019 U	0.019 U	0.019 U	10 U								
2-Nitroaniline						60 U								
2-Nitrophenol						10 U								
3- and 4-Methylphenol						10 U								
3,3'-Dichlorobenzidine						10 U								
3-Nitroaniline						60 U								
4,6-Dinitro-2-Methylphenol						60 U								
4-Bromophenyl-phenylether						10 U								
4-Chloro-3-methylphenol						10 U								
4-Chloroaniline						10 U								
4-Chlorophenyl-phenylether						10 U								
4-Methylphenol	0.67	0.67	0.021	0.019 U	0.019 U									
4-Nitroaniline						60 U								
4-Nitrophenol						60 U								
Acenaphthene	0.5	0.5	0.019 U	0.019 U	0.019 U	10 U								
Acenaphthylene	1.3	1.3	0.019 U	0.019 U	0.019 U	10 U								
Aniline						10 U								
Anthracene	0.96	0.96	0.019 U	0.019 U	0.019 U	10 U								
Benzo(a)anthracene	1.3	1.6	0.019 U	0.019 U	0.019 U	10 U								
Benzo(a)pyrene	1.6	1.6	0.019 U	0.019 U	0.019 U	10 U								
Benzo(b)fluoranthene						10 U								
Benzo(g,h,i)perylene	0.67	0.72	0.019 U	0.019 U	0.019 U	10 U								
Benzo(k)fluoranthene						10 U								
Benzofluoranthenes	3.2	3.6	0.019 U	0.019 U	0.019 U									
Benzoic Acid	0.65	0.65	0.19 U	0.19 U	0.19 U	60 U								
Benzyl Alcohol	0.057	0.073	0.019 U	0.019 U	0.019 U	10 U								
Benzyl butyl phthalate	0.063	0.9	0.019 U	0.019 U	0.019 U	10 U								

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Cleanup Screening Levels (a)													
Sample Name:			CM-S6	CM-S7	CM-S8	ECI-Area-R	RZA-B-2	RZA-B-4	RZA-B-5	RZA-B-7	G RZA-B-9	RZA-B-10	RZA-B-11	RZA-B-13
Depth Range:							(13-14.5)	(0-1.5)	(10.5-11.5)	(0-1.5)	(2-3)	(4-6)	(6-7)	(3-4)
Date Collected:			11/8/2000	11/7/2000	11/7/2000	10/9/1991	10/19/1990	10/19/1990	10/22/1990	10/23/1990	10/24/1990	10/24/1990	10/29/1990	10/30/1990
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment/ Storm Water Outfall	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	SQS (b)	CSL (c)												
Bis(2-ethylhexyl)phthalate	1.3	3.1	0.02	0.019 U	0.028	10 U								
Carbazole														
Chrysene	1.4	2.8	0.019 U	0.019 U	0.019 U	10 U								
cPAH TEQ														
Dibenz(a,h)anthracene						10 U								
Dibenzo(a,h)anthracene	0.23	0.23	0.019 U	0.019 U	0.019 U									
Dibenzofuran	0.54	0.54	0.019 U	0.019 U	0.019 U	10 U								
Diethylphthalate	0.2	1.2	0.019 U	0.019 U	0.019 U	10 U								
Dimethylphthalate	0.071	0.16	0.019 U	0.019 U	0.019 U	10 U								
Di-n-Butylphthalate	1.4	5.1	0.031 UJ	0.1 UJ	0.028 UJ	10 U								
Di-n-octyl phthalate	6.2	6.2	0.019 U	0.019 U	0.019 U	10 U								
Fluoranthene	1.7	2.5	0.035	0.022	0.019 U	10 U								
Fluorene	0.54	0.54	0.019 U	0.019 U	0.019 U	10 U								
Hexachlorobenzene	0.022	0.07	0.019 U	0.019 U	0.019 U	10 U	0.023 U	0.023 U	0.023 U	0.023 U				
Hexachlorobutadiene	0.011	0.12	0.019 U	0.019 U	0.019 U	10 U								
Hexachlorocyclopentadiene						10 U								
Hexachloroethane			0.019 U	0.019 U	0.019 U	10 U								
Indeno(1,2,3-cd)pyrene	0.6	0.69	0.019 U	0.019 U	0.019 U	10 U								
Isophorone						10 U								
Naphthalene	2.1	2.1	0.037	0.024	0.018 J	10 U								
Nitrobenzene						10 U								
N-nitrosodimethylamine						10 U								
N-Nitroso-di-n-propylamine						10 U								
N-Nitrosodiphenylamine	0.028	0.04	0.019 U	0.019 U	0.019 U	10 U								
Pentachlorophenol	0.36	0.69	0.096 U	0.096 U	0.096 U	60 U								
Phenanthrene	1.5	1.5	0.022	0.022	0.019 U	10 U								
Phenol	0.42	1.2	0.019 U	0.019 U	0.019 U	10 U								
Pyrene	2.6	3.3	0.032	0.025	0.02	10 U								
Total HPAH	12	17	0.067	0.047	0.02									
Total LPAH	5.2	5.2	0.059	0.046	0.018 J									
VOCs (mg/kg)														
EPA 8260/824														
1,1,1-Trichloroethane						0.005 U								
1,1,2,2-Tetrachloroethane						0.005 U								
1,1,2-Trichloroethane						0.005 U								
1,1-Dichloroethane						0.005 U								
1,1-Dichloroethene						0.005 U								
1,2,3-Trichlorobenzene						10 U								
1,2-Dichlorobenzene	0.035	0.05				0.005 U								
1,2-Dichloroethane						0.005 U								
1,2-Dichloropropane						0.005 U								
1,3-Dichlorobenzene						0.005 U								
1,4-Dichlorobenzene	0.11	0.11				0.005 U								
2-Butanone						0.01 U								
2-Chloroethylvinylether						0.01 U								
2-Hexanone						0.01 U								
4-Methyl-2-Pentanone (MIBK)						0.01 U								
Acetone						0.05 U								
Benzene						0.005 U								
bis(2-Chloroethoxy) Methane						10 U								
Bis-(2-Chloroethyl) Ether						10 U								
Bromodichloromethane						0.005 U								
Bromoform						0.005 U								
Bromomethane						0.005 U								
Carbon Disulfide						0.005 U								
Carbon Tetrachloride						0.005 U								

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

											G			
Sample Name:			CM-S6	CM-S7	CM-S8	ECI-Area-R	RZA-B-2	RZA-B-4	RZA-B-5	RZA-B-7	RZA-B-9	RZA-B-10	RZA-B-11	RZA-B-13
Depth Range:							(13-14.5)	(0-1.5)	(10.5-11.5)	(0-1.5)	(2-3)	(4-6)	(6-7)	(3-4)
Date Collected:			11/8/2000	11/7/2000	11/7/2000	10/9/1991	10/19/1990	10/19/1990	10/22/1990	10/23/1990	10/24/1990	10/24/1990	10/29/1990	10/30/1990
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment/ Storm Water Outfall	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
Cleanup Screening Levels (a)	SQS (b)	CSL (c)												
Chlorobenzene						0.005 U								
Chloroethane						0.005 U								
Chloroform						0.005 U								
Chloromethane						0.005 U								
cis-1,2-Dichloroethene						0.005 U								
cis-1,3-Dichloropropene						0.005 U								
Dibromochloromethane						0.005 U								
Ethylbenzene			0.0013 U	0.0014 U	0.0013 U	0.005 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methylene Chloride						0.017								
Styrene						0.005 U								
Tetrachloroethene			0.0013 U	0.0014 U	0.0013 U	0.005 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Toluene						0.005 U								
trans-1,2-Dichloroethene						0.005 U								
trans-1,3-Dichloropropene						0.005 U								
Trichloroethene			0.0013 U	0.0014 U	0.0013 U	0.005 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Trichlorofluoromethane						0.005 U								
Trichlorotrifluoroethane						0.01 U								
Vinyl Acetate						0.01 U								
Vinyl Chloride						0.005 U								
Xylenes, Total			0.0013 U	0.0014 U	0.0013 U	0.005 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

		Sample Name:	CM-S6	CM-S7	CM-S8	ECI-Area-R	RZA-B-2	RZA-B-4	RZA-B-5	RZA-B-7	G RZA-B-9	RZA-B-10	RZA-B-11	RZA-B-13
		Depth Range:					(13-14.5)	(0-1.5)	(10.5-11.5)	(0-1.5)	(2-3)	(4-6)	(6-7)	(3-4)
		Date Collected:	11/8/2000	11/7/2000	11/7/2000	10/9/1991	10/19/1990	10/19/1990	10/22/1990	10/23/1990	10/24/1990	10/24/1990	10/29/1990	10/30/1990
		Sample Type:	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment/ Storm Water Outfall	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels (a)													
	SQS (b)	CSL (c)												
GRAIN SIZE														
Clay (phi <10) (%)			5.5	5.3	5									
Clay (phi 8 to 9) (%)			2.2	2.1	1.9									
Clay (phi 9 to 10) (%)			1.7	1.7	1.8									
Fines (%)			49.3	50	40.3									
Gravel (>phi -1) (%)			0.4	1.6	1.9									
Sand (phi 0 to 1) (%)			2.5	1.6	2.2									
Sand (phi -1 to 0) (%)			0.7	0.7	1.3									
Sand (phi 1 to 2) (%)			7.3	5.7	13.6									
Sand (phi 2 to 3) (%)			15.3	15.4	19.7									
Sand (phi 3 to 4) (%)			24.6	25	21									
Silt (phi 4 to 5) (%)			20.3	22.7	14.4									
Silt (phi 5 to 6) (%)			10.4	9	8.3									
Silt (phi 6 to 7) (%)			6.1	6.6	5.7									
Silt (phi 7 to 8) (%)			3.1	2.6	3.2									

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Cleanup Screening Levels (a)		Sample Name: RZA-C-1	RZA-C-2	RZA-C-3	RZA-C-4	RZA-C-5	RZA-C-6	RZA-C-7	RZA-C-8	LS-COMP-A	LS-COMP-B
	SQS (b)	CSL (c)										
Depth Range:												
Date Collected:			10/21/1990	10/30/1990	10/24/1990	10/23/1990	10/21/1990	10/30/1990	10/25/1990	10/23/1990	10/8/1987	10/8/1987
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
Petroleum Hydrocarbons (mg/kg)												
NWPTH-D/EPA413.1												
Diesel Range Organics												
Total Oil & Grease			140	240	170	250	30 U	96	81	100		
Metals (mg/kg)												
EPA 6000/7000/200.8												
Antimony			0.64	1.3	0.89	1.1	0.56	0.87	0.17	1	0.7	0.6
Arsenic	57	93	6.7	6.5	2.5	11	3.6	3.4	3.3	10	0.8	0.8
Beryllium												
Cadmium	5.1	6.7	2.6	4.2	3.7	3.8	2.8	3.5	3.4	3.6	0.4	0.6
Chromium	260	270	48	72	42	70	41	55	39	51		
Copper	390	390	18	25	15	40	4.4	14	9.6	17	60	75
Lead	450	530	24	26	17	27	11	15	14	16	15	87
Mercury	0.41	0.59	0.14	0.92	0.11	0.17	0.1	0.9	0.071	0.14	0.1	0.1
Nickel			30	68	49	73	29	58	53	41	58	65
Selenium												
Silver	6.1	6.1	1.3	1.1	0.35	0.58	0.41	0.28	0.45	0.29	0.5	0.5
Thallium												
Zinc	410	960	64	74	62	87	55	59	53	54	142	123
Pesticides and PCBs (mg/kg)												
EPA 8080												
4,4'-DDD												
4,4'-DDE												
4,4'-DDT												
Aldrin			0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0008 U	0.0008 U
Alpha-BHC												
Aroclor 1016												
Aroclor 1221												
Aroclor 1232												
Aroclor 1242												
Aroclor 1248												
Aroclor 1254												
Aroclor 1260												
Aroclor 1262												
Aroclor 1268												
Beta-BHC												
Chlordane			0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.034 U	0.032 U
Delta-BHC												
Dieldrin			0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0017 U	0.0016 U
EndoSulfan I												
Endosulfan Sulfate												
Endrin												
Endrin Aldehyde												
Gamma-BHC												
Heptachlor			0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0008 U	0.0008 U
Heptachlor Epoxide												
Lindane			0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0008 U	0.0008 U
Methoxychlor												
Total DDT			0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.0017 U	0.0016 U
Total PCBs	0.13	1	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.034 U	0.032 U
Toxaphene												
Organotin (mg/L)												
Porewater												
Butyl Tin Ion												

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			RZA-C-1	RZA-C-2	RZA-C-3	RZA-C-4	RZA-C-5	RZA-C-6	RZA-C-7	RZA-C-8	LS-COMP-A	LS-COMP-B
Depth Range:												
Date Collected:			10/21/1990	10/30/1990	10/24/1990	10/23/1990	10/21/1990	10/30/1990	10/25/1990	10/23/1990	10/8/1987	10/8/1987
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels (a)											
	SQS (b)	CSL (c)										
Dibutyl Tin Ion												
Tributyltin	0.05 (d)	0.15 (d)										
Tributyl Tins (mg/kg)												
Krone 1988 SIM GC/MS												
Tributyl Tin Ion												
Dibutyl Tin Ion												
Butyl Tin Ion												
Bioassay												
Biochemical Oxygen Demand (mg/Kg)			425.4	419.4	521.3	667.5	375	354.2	458.9	563.5		
Chemical Oxygen Demand (mg/Kg)			49743.6	98716	100061.5	112715.2	22727.3	48451.1	16408.9	22881.6		
Microtox Test (% Light Change)			-24	-24	-23.3	-16.4	-27	-4.4	3.5	-1.7		
Amphipod Mortality (%)			40	50	56	50	9	34	31	61		
Echinoderm Mortality (%)			11.1	6.7	9.8	24.6	7	2.7	8.4	8.6		
Neanthes Mortality (%)			4	4	8	10	2	6	6	4		

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Cleanup Screening Levels (a)											
Sample Name:			RZA-C-1	RZA-C-2	RZA-C-3	RZA-C-4	RZA-C-5	RZA-C-6	RZA-C-7	RZA-C-8	LS-COMP-A	LS-COMP-B
Depth Range:												
Date Collected:			10/21/1990	10/30/1990	10/24/1990	10/23/1990	10/21/1990	10/30/1990	10/25/1990	10/23/1990	10/8/1987	10/8/1987
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	SQS (b)	CSL (c)										
Conventionals												
Ammonia (mg/Kg)												
Sulfide (mg/kg)												
Total Kjeldahl Nitrogen (mg/Kg)			470	1800	770	500	250	600	560	640		
Total Sulfides (mg/Kg)											3.2	2.4
Total Volatile Solids (mg/Kg)			5.2	7.4	7.6	6.8	3.3	3.3	1.7	2.6		
N Ammonia (mg N/kg)												
Total Organic Carbon (%)	10 (e)	10 (e)	2.01	3.02	3	3.41	0.97	1.28	1.04	1.43	2.52	2.65
Total Solids (%)			66.3	66.2	65	60.4	74.8	66.5	76.3	70.1	71.6	69.8
Total Volatile Solids (%)	25 (e)	25 (e)									6.61	6.60
Preserved Total Solids (%)												
SVOCs (mg/kg)												
EPA SW8270/8120												
1,2,4-Trichlorobenzene	0.031	0.051	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.0077 U	0.0073 U
1,2-Dichlorobenzene	0.035	0.05	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.0010 U	0.0009 U
1,3-Dichlorobenzene			0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.0015 U	0.0014 U
1,4-Dichlorobenzene	0.11	0.11	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.0038 U	0.00360
1-Methylnaphthalene												
2,2'-Oxybis(1-Chloropropane)												
2,4,5-Trichlorophenol												
2,4,6-Trichlorophenol												
2,4-Dichlorophenol												
2,4-Dimethylphenol	0.029	0.029	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.012 U	0.011 U
2,4-Dinitrophenol												
2,4-Dinitrotoluene												
2,6-Dinitrotoluene												
2-Chloronaphthalene												
2-Chlorophenol												
2-Methylnaphthalene	38	64	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.004 J	0.0069 U
2-Methylphenol	0.063	0.063	0.072 U	0.072 U	0.072 U	0.072 U	0.072 U	0.072 U	0.072 U	0.072 U	0.0050 U	0.0047 U
2-Nitroaniline												
2-Nitrophenol												
3- and 4-Methylphenol												
3,3'-Dichlorobenzidine												
3-Nitroaniline												
4,6-Dinitro-2-Methylphenol												
4-Bromophenyl-phenylether												
4-Chloro-3-methylphenol												
4-Chloroaniline												
4-Chlorophenyl-phenylether												
4-Methylphenol	0.67	0.67	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.0025 U	0.0024 U
4-Nitroaniline												
4-Nitrophenol												
Acenaphthene	0.5	0.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.005 J	0.0045 U
Acenaphthylene	1.3	1.3	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.013 J	0.0008 U
Aniline												
Anthracene	0.96	0.96	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.012 J	0.009 J
Benzo(a)anthracene	1.3	1.6	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.055	0.036
Benzo(a)pyrene	1.6	1.6	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.034	0.028
Benzo(b)fluoranthene			0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U		
Benzo(g,h,i)perylene	0.67	0.72	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.030	0.018
Benzo(k)fluoranthene			0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U		
Benzofluoranthenes	3.2	3.6									0.083	0.049 J
Benzoic Acid	0.65	0.65	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.058 J	0.012 U
Benzyl Alcohol	0.057	0.073	0.073 U	0.073 U	0.073 U	0.073 U	0.073 U	0.073 U	0.073 U	0.073 U	0.0044 U	0.0042 U
Benzyl butyl phthalate	0.063	0.9	0.47 U	0.95	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.037 J	0.028

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

	Cleanup Screening Levels (a)											
Sample Name:			RZA-C-1	RZA-C-2	RZA-C-3	RZA-C-4	RZA-C-5	RZA-C-6	RZA-C-7	RZA-C-8	LS-COMP-A	LS-COMP-B
Depth Range:												
Date Collected:			10/21/1990	10/30/1990	10/24/1990	10/23/1990	10/21/1990	10/30/1990	10/25/1990	10/23/1990	10/8/1987	10/8/1987
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	SQS (b)	CSL (c)										
Bis(2-ethylhexyl)phthalate	1.3	3.1	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	0.049 B	0.028 B
Carbazole												
Chrysene	1.4	2.8	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.039	0.032
cPAH TEQ												
Dibenz(a,h)anthracene			0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U		
Dibenzo(a,h)anthracene	0.23	0.23									0.0085 U	0.0081 U
Dibenzofuran	0.54	0.54	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.0070 U	0.0066 U
Diethylphthalate	0.2	1.2	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.097 U	0.0033 U	0.0031 U
Dimethylphthalate	0.071	0.16	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.012 J	0.0038 U
Di-n-Butylphthalate	1.4	5.1	1.4 U	1.4 U	1.4 U	1.9	1.4 U	1.4 U	3.5	1.4 U	0.0064 U	0.0061 U
Di-n-octyl phthalate	6.2	6.2	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	0.010 J	0.013 U
Fluoranthene	1.7	2.5	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.074	0.040
Fluorene	0.54	0.54	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.013	0.0046 U
Hexachlorobenzene	0.022	0.07	0.168 U	0.168 U	0.168 U	0.168 U	0.168 U	0.168 U	0.168 U	0.168 U	0.0073 U	0.0069 U
Hexachlorobutadiene	0.011	0.12	0.212 U	0.212 U	0.212 U	0.212 U	0.212 U	0.212 U	0.212 U	0.212 U	0.0076 U	0.0072 U
Hexachlorocyclopentadiene												
Hexachloroethane			1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.0066 U	0.0062 U
Indeno(1,2,3-cd)pyrene	0.6	0.69	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.025	0.017 J
Isophorone												
Naphthalene	2.1	2.1	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.013 J	0.011 J
Nitrobenzene												
N-nitrosodimethylamine												
N-Nitroso-di-n-propylamine												
N-Nitrosodiphenylamine	0.028	0.04	0.161 U	0.161 U	0.161 U	0.161 U	0.161 U	0.161 U	0.161 U	0.161 U	0.013 U	0.013 U
Pentachlorophenol	0.36	0.69	0.504 U	0.504 U	0.504 U	0.504 U	0.504 U	0.504 U	0.504 U	0.504 U	0.0053 U	0.0051 U
Phenanthrene	1.5	1.5	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.030	0.022
Phenol	0.42	1.2	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.0033 U	0.0032 U
Pyrene	2.6	3.3	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.076	0.054
Total HPAH	12	17	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	0.416	0.274 J
Total LPAH	5.2	5.2	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.086 J	0.042 J
VOCs (mg/kg)												
EPA 8260/824												
1,1,1-Trichloroethane												
1,1,2,2-Tetrachloroethane												
1,1,2-Trichloroethane												
1,1-Dichloroethane												
1,1-Dichloroethene												
1,2,3-Trichlorobenzene												
1,2-Dichlorobenzene	0.035	0.05										
1,2-Dichloroethane												
1,2-Dichloropropane												
1,3-Dichlorobenzene												
1,4-Dichlorobenzene	0.11	0.11										
2-Butanone												
2-Chloroethylvinylether												
2-Hexanone												
4-Methyl-2-Pentanone (MIBK)												
Acetone												
Benzene												
bis(2-Chloroethoxy) Methane												
Bis-(2-Chloroethyl) Ether												
Bromodichloromethane												
Bromoform												
Bromomethane												
Carbon Disulfide												
Carbon Tetrachloride												

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			RZA-C-1	RZA-C-2	RZA-C-3	RZA-C-4	RZA-C-5	RZA-C-6	RZA-C-7	RZA-C-8	LS-COMP-A	LS-COMP-B
Depth Range:												
Date Collected:			10/21/1990	10/30/1990	10/24/1990	10/23/1990	10/21/1990	10/30/1990	10/25/1990	10/23/1990	10/8/1987	10/8/1987
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels (a)											
	SQS (b)	CSL (c)										
Chlorobenzene												
Chloroethane												
Chloroform												
Chloromethane												
cis-1,2-Dichloroethene												
cis-1,3-Dichloropropene												
Dibromochloromethane												
Ethylbenzene											0.0026 U	0.0025 U
Methylene Chloride												
Styrene												
Tetrachloroethene											0.0015 U	0.0014 U
Toluene												
trans-1,2-Dichloroethene												
trans-1,3-Dichloropropene												
Trichloroethene											0.0017 U	0.0017 U
Trichlorofluoromethane												
Trichlorotrifluoroethane												
Vinyl Acetate												
Vinyl Chloride												
Xylenes, Total											0.0029 U	0.0028 U

TABLE G-2
MARINE SEDIMENT SAMPLE RESULTS - DRY WEIGHT
AMERON/HULBERT SITE
PORT OF EVERETT, WASHINGTON

Sample Name:			RZA-C-1	RZA-C-2	RZA-C-3	RZA-C-4	RZA-C-5	RZA-C-6	RZA-C-7	RZA-C-8	LS-COMP-A	LS-COMP-B
Depth Range:												
Date Collected:			10/21/1990	10/30/1990	10/24/1990	10/23/1990	10/21/1990	10/30/1990	10/25/1990	10/23/1990	10/8/1987	10/8/1987
Sample Type:			Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core	Marine Sediment Core
	Cleanup Screening Levels (a)											
	SQS (b)	CSL (c)										
GRAIN SIZE												
Clay (phi <10) (%)												
Clay (phi 8 to 9) (%)												
Clay (phi 9 to 10) (%)												
Fines (%)												
Gravel (>phi -1) (%)												
Sand (phi 0 to 1) (%)												
Sand (phi -1 to 0) (%)												
Sand (phi 1 to 2) (%)												
Sand (phi 2 to 3) (%)												
Sand (phi 3 to 4) (%)												
Silt (phi 4 to 5) (%)												
Silt (phi 5 to 6) (%)												
Silt (phi 6 to 7) (%)												
Silt (phi 7 to 8) (%)												

U = the analyte was not detected in the sample at the given reporting limit.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
Shaded value indicates exceedance of SQS
Boxed value indicates exceedance of CSL

(a) Dry weight equivalent criteria are based on the Puget Sound Apparent Effect Threshold Values (Barrick et al. 1988)
(b) SMS Sediment Quality Standard (Chapter 173-204 WAC).
(c) CSL Cleanup Screening Level (Chapter 173-204 WAC).
(d) Ecology, 1996, SMS technical memorandum: testing, reporting and evaluation of tribuyltin data in PSDAA and SMA programs
(e) DMMP clarification paper and SMS technical information memorandum: Management of Wood Waste Under Dredged Material Management Program and the SMS Cleanup Program.

TABLE G-3
PROPOSED SEDIMENT STATION COORDINATES
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Sample Identification	Northing (a)	Easting (a)
RI-SED-1	368951.1304	1301361.2048
RI-SED-2	368928.8869	1301347.3313
RI-SED-3	368899.4470	1301290.4142
RI-SED-4	368697.8075	1301357.8367
RI-SED-5	368974.0281	1300946.9489
RI-SED-6	368827.2598	1300485.6589

(a) Washington State Plane North Zone coordinate system [North America Datum (NAD) 83]

TABLE G-4
SAMPLE SIZE, CONTAINERS, AND HANDLING METHODS
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Sample Type	Container	Preservation	Maximum Holding Time (a)
Metals	8 oz - WMG with teflon-lined lid	Cool, 4° C	6 months, 28 days for mercury
Volatiles	2 oz - WMG with teflon-lined lid	Cool, 4° C	14 days, 6 months (b)
Semivolatiles	8 oz - WMG with teflon-lined lid	Cool, 4° C	14 days (a), 1 year (b)
PCBs	8 oz - WMG with teflon-lined lid	Cool, 4° C	14 days (a), 1 year (b)
Pesticides	8 oz - WMG with teflon-lined lid	Cool, 4° C	14 days (a), 1 year (b)
TOC	4 oz - WMG with teflon-lined lid	Cool, 4° C	28 days, 6 months (b)
Total Solids	4 oz - WMG with septa lid	Cool, 4° C	14 days, 6 months (b)

PCBs = Polychlorinated Biphenyls
TOC= Total Organic Carbon
WMG = Wide Mouth Glass

(a) Holding time shown is from sample collection to extraction; holding time from extraction to analysis is 40 days.
(b) Holding time shown is from sample collection to extraction if sample is frozen.

TABLE G-5
RECOMMENDED SAMPLE PREPARATION METHODS, CLEANUP METHODS, ANALYTICAL METHODS, AND PRACTICAL QUANTITATION LIMITS FOR SEDIMENTS
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Chemical	Recommended Sample Preparation Methods (a)	Recommended Sample Cleanup Methods (b)	Recommended Analytical Methods (c)	Recommended PQLs (d,e)
Metals				**(mg/kg dry weight)**
Antimony	PSEP/3050B	--	6010B/6020/B7041	50
Arsenic	PSEP/3050B	--	6010B/6020/7061A	19
Cadmium	PSEP/3050B	--	6010B/6020/7131A	1.7
Chromium	PSEP/3050B	--	6010B/6020/7191	87
Copper	PSEP/3050B	--	6010B/6020	130
Lead	PSEP/3050B	--	6010B/6020	150
Mercury	-- (f)	--	7471A/245.5	0.14
Nickel	PSEP/3050B		6010B/6020	47
Silver	PSEP/3050B	--	6010B/6020	2
Zinc	PSEP/3050B	--	6010B/6020	137
Nonionizable Organic Compounds				**(µg/kg dry weight or as listed)**
LPAH Compounds				
Naphthalene	3540C/3550B/3545	3640A/3660B	8270C/1625C	700
Acenaphthylene	3540C/3550B/3545	3640A/3660B	8270C/1625C	433
Acenaphthene	3540C/3550B/3545	3640A/3660B	8270C/1625C	167
Fluorene	3540C/3550B/3545	3640A/3660B	8270C/1625C	180
Phenanthrene	3540C/3550B/3545	3640A/3660B	8270/1625C	500
Anthracene	3540C/3550B/3545	3640A/3660B	8270C/1625C	320
2-Methylnaphthalene	3540C/3550B/3545	3640A/3660B	8270C/1625C	223
HPAH Compounds				
Fluoranthene	3540C/3550B/3545	3640A/3660B	8270C/1625C	567
Pyrene	3540C/3550B/3545	3640A/3660B	8270C/1625C	867
Benz[a]anthracene	3540C/3550B/3545	3640A/3660B	8270C (h) / 1625C	433
Chrysene	3540C/3550B/3545	3640A/3660B	8270C (h) / 1625C	467
Total benzofluoranthenes (g)	3540C/3550B/3545	3640A/3660B	8270C (h) / 1625C	1067
Benzo[a]pyrene	3540C/3550B/3545	3640A/3660B	8270C (h) / 1625C	533
Indeno[1,2,3-cd]pyrene	3540C/3550B/3545	3640A/3660B	8270C (h) / 1625C	200
Dibenz[a,h]anthracene	3540C/3550B/3545	3640A/3660B	8270C (h) / 1625C	77
Benzo[ghi]perylene	3540C/3550B/3545	3640A/3660B	8270C/1625C	223
Chlorinated Benzenes				
1,2-Dichlorobenzene	3540C/3550B/3545	3640A/3660B	8270C (h) / 1625C	35
1,3-Dichlorobenzene	3540C/3550B/3545	3640A/3660B	8270C (h) / 1625C	57
1,4-Dichlorobenzene	3540C/3550B/3545	3640A/3660B	8270C (h) / 1625C	37
1,2,4-Trichlorobenzene	3540C/3550B/3545	3640A/3660B	8270C (h) / 1625C	31
Hexachlorobenzene	3540C/3550B/3545	3640A/3660B	8270C (h) / 1625C	22
Phthalate Esters				
Dimethyl phthalate	3540C/3550B/3545	3640A/3660B	8270C/1625C	24
Diethyl phthalate	3540C/3550B/3545	3640/A3660B	8270C/1625C	67
Di-n-butyl phthalate	3540C/3550B/3545	3640A/3660B	8270C/1625C	467
Butyl benzyl phthalate	3540C/3550B/3545	3640A/3660B	8270C/1625C	21
Bis[2-ethylhexyl]phthalate	3540C/3550B/3545	3640A/3660B	8270C/1625C	433
Di-n-octyl phthalate	3540C/3550B/3545	3640A/3660B	8270C/1625C	2067
Miscellaneous Extractable Compounds				**(µg/kg dry weight or as listed)**
Dibenzofuran	3540C/3550B/3545	3640A/3660B	8270C/1625C	180
Hexachlorobutadiene	3540C/3550B/3545	3640A/3660B	8270C/1625C	11
Hexachloroethane	3540C/3550B/3545	3640A/3660B	8270C/1625C	47
N-nitrosodiphenylamine	3540C/3550B/3545	3640A/3660B	8270C/1625C	28
PCBs				
PCB Aroclors®	3540/3550	3620B/3640A/3660B	8082	6
Chlorinated Pesticides				
DDD	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	3.3
DDE	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	2.3
Total DDT	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	6.7
Aldrin	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	1.7
Chlordane	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	1.7
Dieldrin	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	2.3
Heptachlor	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	1.7
Lindane	3540C/3550B/3545	3620B/3640A/3660B	8081A/8085	1.7

TABLE G-5
RECOMMENDED SAMPLE PREPARATION METHODS, CLEANUP METHODS, ANALYTICAL METHODS, AND PRACTICAL QUANTITATION LIMITS FOR SEDIMENTS
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Chemical	Recommended Sample Preparation Methods (a)	Recommended Sample Cleanup Methods (b)	Recommended Analytical Methods (c)	Recommended PQLs (d,e)
Volatile Organic Compounds				
Ethylbenzene	-- (i)	--	8260B/1624C	3.2
Tetrachloroethene	-- (i)	--	8260B/1624C	3.2
Total xylene	-- (i)	--	8260B/1624C	3.2
Trichloroethene	-- (i)	--	8260B/1624C	3.2
Ionizable Organic Compounds				
Phenol	3540C/3550B/3545	3640A/3660B	8270C/1625C	140
2-Methylphenol	3540C/3550B/3545	3640A/3660B	8270C/1625C	63
4-Methylphenol	3540C/3550B/3545	3640A/3660B	8270C/1625C	223
2,4-Dimethylphenol	3540C/3550B/3545	3640A/3660B	8270C/1625C	29
Pentachlorophenol	3540C/3550B/3545	3640A/3660B	8270C/1625C	120
Benzyl alcohol	3540C/3550B/3545	3640A/3660B	8270C/1625C	57
Benzoic acid	3540C/3550B/3545	3640A/3660B	8270C/1625C	217
Conventional Sediment Variables				
Ammonia	-- (j)	--	Plumb (1981)	100 mg/L
Grain size	-- (j)	--	Plumb (1981)	1%
Total solids	-- (j)	--	PSEP (1997a)	0.1% (wetwt)
TOC	-- (j)	--	9060	0.10%
Total sulfides	-- (j)	--	Plumb (1981)/ 9030B	10 (mg/kg)
Total Volatile Solids	-- (j)	--	160.3	0.01%
Site Specific Compounds				**(µg/kg dry weight or as listed)**
Ammonia	-- (j)	--	See above	100
Other potentially toxic metals (e.g., antimony, beryllium, nickel)	PSEP	--	See above	Sb 50, Ni 47
Pesticides, herbicides	3540C/3550B	3620B/3640A/3660B	8081A/8085/8151A	1.7-6.7
Petroleum compounds (e.g. benzene, toluene, ethylbenzene, xylene)	--	--	8021B/8260B/1624C	50
Total petroleum hydrocarbons	--	--	8440 Ecology method - pub. 97-602 (1997)	20 mg/kg (gasoline), 50 mg/kg (#2 diesel), 100 mg/kg (motor oil) based on 100% solids
Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDDs/PCDFs)	--	--	1613	1 - 10 ng/kg
Guaiacols	3540C	--	NCASI Method CP – 86.02 Chlorinated Phenols	50-100
Resin acids	3540C (using acetone)	--	NCASI Method RA/FA 85.02	50-100
Radioactive substances, Explosive compounds	8330	--	8095/8330	250-2200 (method 8330)

Protocol, Appendix A (PSWQA, 1996) Krone 1998

73 ug TBT/Kg Bulk
.05 ug TBT/L pour water
EPA - U.S. Environmental Protection Agency
GPC - gel permeation chromatography
HPAH - high molecular weight polycyclic aromatic hydrocarbon
LAET = Lowest Apparent Effects Threshold
LPAH - low molecular weight polycyclic aromatic hydrocarbon
NCASI = National Council for Air and Stream Improvement, Inc.
Ni = Nickel

PCB - polychlorinated biphenyl
PCDD = polychlorinated dibenzo-p-dioxins
PCDF = polychlorinated dibenzofurans
PQL = Practical Quantitation Limits
PSEP - Puget Sound Estuary Program
RA/FA =
Sb = Antimony
TOC - total organic carbon
VOC = Volatile Organic Compounds

mg/L = milligrams per liter
mL = milliliter
ng/kg = nanograms per kilogram
µg/kg - micrograms per kilogram

TABLE G-5
RECOMMENDED SAMPLE PREPARATION METHODS, CLEANUP METHODS, ANALYTICAL METHODS, AND PRACTICAL QUANTITATION LIMITS FOR SEDIMENTS
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Chemical	Recommended Sample Preparation Methods (a)	Recommended Sample Cleanup Methods (b)	Recommended Analytical Methods (c)	Recommended PQLs (d,e)

(a) Recommended sample preparation methods are:
- PSEP (1997a)
- Method 3050B and 3500 series - sample preparation methods from SW-846 (EPA 1996) and subjected to changes by EPA updates.

(b) Recommended sample cleanup methods are:
- Sample extracts subjected to GPC cleanup follow the procedures specified by EPA SW-846 Method 3640A. Special care should be used during GPC to minimize loss of analytes.
- If sulfur is present in the samples (as is common in most marine sediments), cleanup procedures specified by EPA SW-846 Method 3660B should be used.
- All PCB extracts should be subjected to sulfuric acid/permanganate cleanup as specified by EPA SW-846 Method 3665A.
- Additional cleanup procedures may be necessary on a sample-by-sample basis. Alternative cleanup procedures are described in PSEP (1997b) and EPA (1986).

(c) Recommended analytical methods are:
- Method 6000, 7000, 8000, and 9000 series - analytical methods from SW-846 (EPA 1986) and updates.
- The SW-846 and updates are available from the web site at: http://www.epa.gov/epaoswer/hazwaste/test/sw846.htm.
- Method 1613 - analytical method from EPA-821/B-94-005 (EPA 1994c).
- Method 1624C/1625C - isotope dilution method.
- NCASI analytical methods.
- Plumb (1981) - EPA/U.S. Army Corps of Engineers Technical Report EPA/CE-81-1
- PSEP (1986).
- Acid volatile sulfide method for sediment (EPA 1991).

(d) To achieve the recommended PQLs for organic compounds, it may be necessary to use a larger sample size (approximately 100 g), a smaller final extract volume for gas chromatography/mass spectrometry analyses (0.5 mL), and one of the recommended sample cleanup methods, as necessary, to reduce interference, using different analytical methods with better sensitivity. Detection limits are on a dry-weight basis unless otherwise indicated. For sediment samples with low TOC, it may be necessary to achieve even lower detection limits for certain analytes in order to compare the TOC-normalized concentrations with applicable numerical criteria.

(e) The recommended PQLs are based on a value equal to one third of the 1988 dry weight LAET value (Barrick et al 1988) except for the following chemicals: 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, hexachlorobenzene, hexachlorobutadiene, n-nitrosodiphenylamine, 2-methylphenol, 2,4-dimethylphenol, and benzyl alcohol, for which the recommended maximum detection limit is equal to the full value of the 1988 dry weight LAET.

(f) The sample digestion method for mercury is described in the analytical method (Method 7471A, September 1994).

(g) Total benzofluoranthenes represent the sum of the b, j, and k isomers.

(h) Selected ion monitoring may improve the sensitivity of method 8270C and is recommended in cases when detection limits must be lowered to human health criteria levels or when TOC levels elevate detection limits above ecological criteria levels. See PSEP organics chapter, appendix B–Guidance for Selected Ion Monitoring (PSEP 1997b).

(i) Sample preparation methods for VOCs analyses are described in the analytical methods.

(j) Sample preparation methods for sediment conventional analyses are described in the analytical methods.

TABLE G-6
QUALITY CONTROL PROCEDURES FOR ORGANIC ANLAYSES
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Quality Control Procedure	Frequency	Control Limit	Corrective Action
Instrument Quality Assurance/Quality Control			
Initial Calibration	See reference method(s) in Table G-3	See reference method(s) in Table G-3	Laboratory to recalibrate and reanalyze affected samples
Continuing Calibration	See reference method(s) in Table G-3	See reference method(s) in Table G-3	Laboratory to recalibrate if correlation coefficient or response factor does not meet method requirements
Method Quality Assurance/Quality Control			
Holding Times	Not applicable	See TableG-2	Qualify data or collect fresh samples in cases of extreme holding time or temperature exceedance
Detection Limits	Annually	See Table G-3	Laboratory must initiate corrective actions (which may include additional cleanup steps as well as other measures) and contact the QA/QC coordinator and/or project manager immediately.
Method Blanks	One per sample batch or every 20 samples, whichever is more frequent, or when there is a change in reagents	Analyte concentration < PQL	Laboratory to eliminate or greatly reduce laboratory contamination due to glassware or reagents or analytical system; reanalyze affected samples
Analytical (Laboratory) Replicates and Matrix Spike Duplicates	1 duplicate analysis with every sample batch or every 20 samples, whichever is more frequent; Use analytical replicates when samples are expected to contain target analytes. Use matrix spike duplicates when samples are not expected to contain target analytes	Compound and matrix-specific RPD. 35 percent applied when the analyte concentration is > PQL	Laboratory to redigest and reanalyze samples if analytical problems suspected, or to qualify the data if sample homogeneity problems are suspected and the project manager consulted
Matrix Spikes	One per sample batch or every 20 samples, whichever is more frequent; spiked with the same analytes at the same concentration as the LCS	Compound and matrix specific	Matrix interferences should be assessed and explained in case narrative accompanying the data package.

TABLE G-6
QUALITY CONTROL PROCEDURES FOR ORGANIC ANLAYSES
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Quality Control Procedure	Frequency	Control Limit	Corrective Action
Surrogate Spikes	Added to every organics sample as specified in analytical protocol	Compound specific	Follow corrective actions specified in SW-846.
LCS, Certified or Standard Reference Material	One per analytical batch or every 20 samples, whichever is more frequent	Compound specific, recovery, and relative standard deviation for repeated analyses should not exceed the control limits specified in the method or performance based intralaboratory control limits, whichever is lower	Laboratory to correct problem to verify the analysis can be performed in a clean matrix with acceptable precision and recovery; then reanalyze affected samples
Field Quality Assurance/Quality Control			
Field Replicates	At project manager's discretion	Not applicable	Not applicable
Field Blanks	At project manager's discretion	Analyte concentration. PQL	Compare to method blank results to rule out laboratory contamination; modify sample collection and equipment decontamination procedures

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LCS - laboratory control sample
PQL - practical quantitation limit
QA/QC - Quality Assurance/Quality Control.
RPD - relative percent difference

TABLE G-7
QUALITY CONTROL PROCEDURES FOR METALS ANALYSES
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Quality Control Procedure	Frequency	Control Limit	Corrective Action
Instrument Quality Assurance/Quality Control			
Initial Calibration	Daily	Correlation coefficient $\geq$ 0.995	Laboratory to optimize and recalibrate the instrument and reanalyze any affected samples
Initial Calibration Verification	Immediately after initial calibration	90 to 110 percent recovery for ICP-AES, ICP-MS and GFAA (80 to 120 percent for mercury), or performance-based intralaboratory control limits, whichever is lower	Laboratory to resolve discrepancy prior to sample analysis
Continuing Calibration Verification	After every 10 samples or every 2 hours, whichever is more frequent, and after the last sample	90 to 110 percent recovery for ICP-AES and GFAA, 85 to 115 percent for ICP-MS (80 to 120 percent for mercury)	Laboratory to recalibrate and reanalyze affected samples
Initial and Continuing Calibration Blanks	Immediately after initial calibration, then 10 percent of samples or every 2 hours, whichever is more frequent, and after the last sample	Analyte concentration < PQL	Laboratory to recalibrate and reanalyze affected samples
ICP Interelement Interference Check Samples	At the beginning and end of each analytical sequence or twice per 8-hour shift, whichever is more frequent	80 - 120 percent of the true value	Laboratory to correct problem, recalibrate, and reanalyze affected samples
Method Quality Assurance/Quality Control			
Holding Times	Not applicable	See Table G-2	Qualify data or collect fresh samples
Detection Limits	Not applicable	See Table G-3	Laboratory must initiate corrective actions and contact the QA/QC coordinator and/or the project manager immediately
Method Blanks	With every sample batch or every 20 samples, whichever is more frequent		Laboratory to redigest and reanalyze samples with analyte concentrations < 10 times the highest method blank
Analytical (Laboratory) Replicates and Matrix Spike Duplicates	1 duplicate analysis with every sample batch or every 20 samples, whichever is more frequent; Use analytical replicates when samples are expected to contain target analytes. Use matrix spike replicates when samples are not expected to contain target analytes	RPD $\leq$ 20 percent applied when the analyte concentration is > PQL	Laboratory to redigest and reanalyze samples if analytical problems suspected, or to qualify the data if sample homogeneity problems are suspected and the project manager consulted
Matrix Spikes	With every sample batch or every 20 samples, whichever is more frequent	75 to 125 percent recovery applied when the sample concentration is < 4 times the spiked concentration for a particular analyte	Laboratory may be able to correct or minimize problem; or qualify and accept data

TABLE G-7
QUALITY CONTROL PROCEDURES FOR METALS ANALYSES
AMERON-HULBERT SITE
EVERETT, WASHINGTON

Quality Control Procedure	Frequency	Control Limit	Corrective Action
Laboratory Control Samples, Certified or Standard Reference Material	Overall frequency of 5 percent of field samples	80 to 20 percent recovery, or performance based intralaboratory control limits, whichever is lower	Laboratory to correct problem to verify the analysis can be performed in a clean matrix with acceptable precision and recovery; then reanalyze affected samples
Field Quality Assurance/Quality Control			
Field Replicates	At project manager's discretion	Not applicable	Not applicable
Field Blanks	At project manager's discretion	Analyte concentration ≤ PQL	Compare to method blank results to rule out laboratory contamination; modify sample collection and equipment decontamination procedures

CLP - Contract Laboratory Program (EPA)
EPA - U.S. Environmental Protection Agency
GFAA - graphite furnace atomic absorption
ICP-MS - inductively coupled plasma/mass spectrometry
ICP-AES - inductively coupled plasma/atomic emission spectrometry
PQL - practical quantitation limit
QA/QC = Quality Assurance/Quality Control
RPD - relative percent difference

TABLE G-8
QUALITY CONTROL PROCEDURES FOR CONVENTIONAL ANALYSES
AMERON-HULBERT SITE
EVERETT, WASHINGTON

	Suggested Control Limit						
Analyte	**Initial Calibration**	**Continuing Calibration**	**Calibration Blanks**	**Laboratory Control Samples**	**Matrix Spikes**	**Laboratory Triplicates**	**Method Blank**
Ammonia	Correlation coefficient ≥0.995	90 to 110 percent recovery	Analyte concentration ≤ PQL	8 to 120 percent recovery	75 to 125 percent recovery	20 percent RSD	Analyte concentration ≤ PQL
Grain size	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	20 percent RSD	Not applicable
Total organic carbon	Correlation coefficient ≥0.995	90 to 110 percent recovery	Analyte concentration ≤ PQL	80 to 120 percent recovery	75 to 125 percent recovery	20 percent RSD	Analyte concentration ≤ PQL
Total sulfides	Correlation coefficient ≥0.990	85 to 115 percent recovery	Not applicable	65 to 135 percent recovery	65 to 135 percent recovery	20 percent RSD	Analyte concentration ≤ PQL
Total solids	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	20 percent RSD	Analyte concentration ≤ PQL

EPA = U.S. Environmental Protection Agency
PSEP = Puget Sound Estuary Program
PQL = practical quantitation limit
QA/QC = quality assurance and quality control
RSD = relative standard deviation

Notes:

EPA and PSEP control limits are not available for conventional analytes. The control limits provided above are suggested limits only. They are based on EPA control limits for metals analyses (see Table G-5), and an attempt has been made to take into consideration the expected analytical accuracy using PSEP methodology. Corrective action to be taken when control limits are exceeded is left to the Project Manager's discretion. The corrective action indicated for metals in Table G-5 may be applied to conventional analytes.

When applicable, the QA/QC procedures indicated in this table should be completed at the same frequency as for metals analyses (see Table G-5).