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PHASE 2 ENVIRONMENTAL SITE ASSESSMENT AND CLEANUP REPORT

Riverside Woodyard

Prepared for: Kimberly-Clark Worldwide Inc.

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Aspect Consulting, LLC

State of Washington
Hydrogeologist
2412
Licensed Geologist
Dana L. Cannon
12/11/06

State of Washington
Hydrogeologist
272
Licensed Geologist
Steve J. Germiat
12/11/06

Dana Cannon, LHG
Project Hydrogeologist
dcannon@aspectconsulting.com

Steve Germiat, LHG
Associate Hydrogeologist
sgermiat@aspectconsulting.com

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Executive Summary

This Phase 2 environmental site assessment (ESA) and cleanup report provides the results of a Phase 2 environmental site assessment and independent cleanup action at Kimberly-Clark Worldwide Inc.'s approximately 26-acre Riverside Woodyard property (Subject Property) located at 3700 Railway Avenue in Everett, Washington. This combined release and cleanup report is being submitted to the Washington State Department of Ecology (Ecology) in accordance with WAC 173-340-300.

The site investigation focuses on the recognized environmental conditions (RECs) identified for the Subject Property in the Phase 1 ESA completed in December 2005 under the new ASTM standard. Phase 2 sampling and analysis was conducted to determine whether constituents of potential environmental concern associated with identified RECs are present in the Subject Property's soil and/or groundwater at concentrations above applicable screening levels consistent with the state Model Toxics Control Act (MTCA).

The Subject Property has been used historically for storage of untreated logs and, since the mid-1990s, wood chips and large woody material (hog fuel) used as fuel for boilers at Kimberly-Clark's (K-C) pulp and paper mill.

The Phase 2 sampling results confirmed a limited release of hydraulic oil associated with the hydraulic truck tipper at the Subject Property. The petroleum-contaminated surface soil has been cleaned up by excavation and transport to an off-site facility for thermal treatment and disposal. Confirmation soil sampling in the excavation confirms residual oil-range petroleum concentrations below the MTCA Method A industrial soil screening level.

Oil-range petroleum hydrocarbons are present in soils within an active stormwater management swale next to the access road on the western edge of part of the Subject Property; water in the swale is pumped directly to the City of Everett's wastewater treatment facility. The swale soils, which sampling results demonstrate have not adversely impacted groundwater quality, are being managed as part of stormwater management best management practices.

Concentrations of total carcinogenic polycyclic aromatic hydrocarbons (cPAHs) in surface soils along an existing railroad spur, and a small drainage swale north of the spur, exceed the 2 mg/kg MTCA Method A soil screening level for industrial land use which is based on groundwater protection. The cPAHs along the active rail spur are likely associated with ongoing active rail operations and creosote-treated railroad ties, a condition common throughout the state. The cPAHs in the nearby swale soils may be the result of runoff-derived sediment from the spur, with the swale providing the intended treatment of the runoff. Surrounding soil samples indicate that cPAH concentrations above the 2 mg/kg soil screening level are not pervasive in the area. Groundwater quality data collected from the adjacent Former Riverside Sawmill Site indicate that comparable concentrations of cPAHs in saturated soils at the water table have not adversely impacted groundwater quality; this is consistent with cPAHs' low solubility and dissolved phase mobility in the environment. The detected concentrations in the two soil samples are also well below the 18 mg/kg MTCA Method C industrial soil screening level based on direct contact. Therefore, we conclude that the detected cPAH concentrations pose no unacceptable risk to human health or the environment under an industrial land use.

The results of well-distributed sampling locations in this area of the Subject Property and the adjacent area where creosote wood materials such as ties were chipped for permitted incineration in the K-C Everett Mill on the west side of Everett did not exceed MTCA Method A soil cleanup levels for industrial use.

The Subject Property meets the definition of an industrial property under MTCA. The property is zoned and designated industrial under a comprehensive plan and development regulations by the City of Everett, a jurisdiction planning under the Growth Management Act. The Property owner, Kimberly-Clark Worldwide Inc., intends to maintain industrial use of the Subject Property. The cleanup of petroleum-contaminated soils at the truck tipper achieved MTCA soil screening levels acceptable for unrestricted use including industrial. However, concentrations of cPAHs remain in soils on the Subject Property at concentrations above MTCA Method A soil cleanup levels for unrestricted use and below MTCA Method A soil cleanup levels for industrial use. The owner will record a restrictive covenant for industrial use of the Subject Property as provided by MTCA.

There are no constituents of concern other than cPAHs on the Subject Property. Based on the site investigation, if the cPAHs are remediated in the future to meet applicable cleanup standards, the deed restriction may be terminated.

1 Introduction

The Riverside Woodyard (Subject Property) encompasses two parcels owned by Kimberly-Clark Worldwide Inc. (K-C), totaling approximately 26 acres, and located at 3700 Railway Avenue in Everett, Washington (Figure 1).

In December 2005, a Phase 1 Environmental Site Assessment (ESA) was conducted for the Subject Property and adjacent properties (Delta Environmental Consultants 2005). The Phase 1 ESA was completed in accordance with the current ASTM Standard E 1527-05. The Phase 1 ESA included a reconnaissance of the properties, review of readily available records, search of pertinent environmental databases, evaluation of historical aerial photographs and maps, discussion with site workers regarding current and past practices, and interviews with regulatory agency personnel regarding the Subject Property and neighboring properties. The December 2005 Phase 1 ESA incorporates information from three previous ESAs and, as such, provides the most comprehensive review of history and environmental conditions based on all available information. The outcome of the Phase 1 ESA was identification of recognized environmental conditions (RECs).

The Phase 1 ESA notes that many of the RECs identified in earlier site studies no longer exist because the Subject Property was restored and debris removed as K-C and its predecessors ended various operations.. These observations were confirmed by site reconnaissance in connection with the development of the sampling plan for the Phase 2 ESA. Former RECs are shown in light gray on the figures in this report.

In addition to the Phase 1 ESA review, the Riverside Woodyard and adjacent Former Riverside Chip Mill/Storage Areas and Former Riverside Sawmill properties have undergone site investigations, including environmental sampling and analysis as part of a cooperative effort by the City and K-C to perform site characterization on these properties. Information regarding these adjacent properties is discussed in Section 4.8 and is included for reference in Appendix D to this report. The Appendix D information includes:

- An aerial photograph in 1982, identifying the distinct main historical use areas and current lot boundaries;
- A figure from the Phase 1 ESA showing the historical buildings and facilities, none of which were on the Subject Property, but were mainly the former Chip Mill on Lot 2 and the former Sawmill on Lot 4, which were separate operations built decades apart from each other; and
- A figure showing recent sampling locations in the area.

This Phase 2 ESA report presents environmental characterization results associated with the Subject Property. Figure 1 illustrates the location of the Subject Property. This Phase 2 ESA report has been prepared for use by K-C, the City, and the Washington State Department of Ecology (Ecology).

This report includes the following sections:

- Description of the Subject Property;
- Overview of Phase 2 Sampling and Analysis;
- Sampling Results;
- Description of Soil Cleanup Action; and
- Conclusion.

Appendix A presents the Phase 2 ESA field sampling procedures and exploration logs for the Subject Property. Appendix B presents the Quality Assurance Project Plan for the Phase 2 ESA sampling and analysis program. Appendix C provides Aspect Consulting's independent analytical data quality assurance review and a CD containing electronic copies (.pdf format) of the analytical laboratory's reports for the Phase 2 ESA data. Appendix D contains figures that show historical use and recent sampling of the Subject Property and adjacent properties.

2 Description of Subject Property

2.1 Location and Land Use

The Subject Property encompasses approximately 26 acres and is bordered on the west by Burlington Northern Santa Fe Railroad (BNSF) tracks and to the south by Canyon Lumber Company (Figure 1). The City's Former Chip Mill/Storage Areas and Former Riverside Sawmill properties are located to the north, east, and southeast. The Subject Property is currently zoned for heavy manufacturing industrial use (City of Everett land use zone M-2).

The Subject Property remained vegetated and undeveloped until the late 1960s when a Chip Mill facility was constructed on the adjacent property immediately north. From the late-1960s through early-1990s, the Subject Property was used primarily for storage of untreated logs. Figure D-1 in Appendix D is a 1982 aerial photograph showing the historical extent of log storage on the Subject Property. Since the mid-1990s, the primary use of the Subject Property has been for storage of wood chips and hog fuel used as fuel for boilers at K-C's pulp and paper mill on the west side of Everett. The scale house, used to weigh trucks transporting wood chips and hog fuel to the property, also occurs in the southwestern corner of the Subject Property (Figure 1).

Specific historical uses on the Subject Property that were identified as RECs in the Phase 1 ESA are described in more detail with the sampling results in Section 4.

2.2 Physical Setting

Topography across the Subject Property is generally flat. A stormwater drainage swale conveyance, referred to as the western swale, runs along the western side of the access road next to the Subject Property and the Former Riverside Chip Mill/Storage Areas and is part of the City's combined sewer system. A pump station at the north of the western swale pumps water in the swale directly to the City's publicly owned treatment works (POTW), located east of the Snohomish River across from the Subject Property. Paved and gravel roads and parking areas are present throughout the Subject Property.

2.2.1 Hydrogeology and Groundwater Flow Directions

Subsurface soils consist of fill material underlain by river alluvium. The fill material consists of sand and gravel including dredged sediments from the adjacent Snohomish River, and woody debris. The underlying native alluvium is variable and consists of sand, silt, and gravel with an organic silt layer encountered between 10 and 15 feet below ground surface. Depth to groundwater is typically 6 to 9 feet below ground surface.

One monitoring well (MW-1) was installed on the Subject Property as part of the site investigation. Four monitoring wells installed at the Former Riverside Chip Mill/Storage Areas (MW-2 through MW-5), six monitoring wells (MW-6 through MW-11) and one piezometer (B-15) installed at the Former Riverside Sawmill, and a previously installed well, W-4, were used for determining the local groundwater flow conditions (Figure 2). Two of these monitoring wells (MW-1 and W-4) are located on the Subject Property. Water level data from these collective wells located on and in the vicinity of the Subject Property provide the best representation of the local groundwater flow conditions.

The adjacent Snohomish River is tidally influenced, and the groundwater levels in these monitoring wells show varying degree of tidal response. Table 1 presents the water level data collected in wells at high tide and low tide, in July and September 2006. Because all of the monitoring wells were installed by September 2006, the discussion below relies on the September 2006 water level data. Figure 2 presents the high and low tide groundwater elevation measurements collected in September 2006.

Of the 13 measuring points, shoreline wells MW-3 and MW-5 showed the greatest water level change between the high tide and low tide measurements. Conversely, shoreline wells MW-2 and MW-6 showed negligible change in response to tides. Differences in tidal response between the shoreline wells is attributable to differences in permeability of subsurface aquifer materials near the wells as well as the presence and character of bulkhead-type structures along the river shoreline. Further inland on the Subject Property, water levels in wells MW-1 and W-4 had water level differences less than 0.1 foot, with slightly higher groundwater elevations during the low tide measurement round (Figure 2; Table 1).

Based on materials encountered during drilling and the measured groundwater elevations, we believe that groundwater in MW-6, outside of the Subject Property, represents a thin zone of perched water in a sandy fill layer on top of silt fill. The perched water is not the same water-bearing unit as the water table aquifer observed elsewhere on the properties. The MW-6 water level data are therefore not considered in determination of groundwater flow directions.

Figure 2 shows interpreted groundwater elevation contours for the high tide measurements. The water level data indicate a semi-radial groundwater flow system, with groundwater flowing generally northeast and southeast from the central area of the properties. Based on the water level data, the general shape of the groundwater elevation contours and inferred flow direction would be similar for low tide, but the gradient (water table slope) would steepen considerably near MW-3 and MW-5. Groundwater in the water table aquifer ultimately discharges to the Snohomish River.

3 Overview of Phase 2 Sampling and Analysis

3.1 Rationale for Sampling

The sampling plan was based on the historical information in the Phase 1 ESA, the Phase 1 ESA records review and site reconnaissance, additional interviews with personnel from K-C and the City, additional site reconnaissance in May and June 2006, and informal consultation with Toxics Cleanup Program staff from Ecology.

The Phase 2 ESA specifically addresses the RECs identified in the Phase 1 ESA (Delta Environmental Consultants 2005). The Phase 1 ESA provides the most comprehensive review of historical information and identification of RECs based on all available information and was the basis for the Phase 2 sampling and analysis for the Phase 2 ESA. The Phase 2 ESA sampling and analysis was conducted to determine whether constituents of potential environmental concern associated with identified RECs are present in the Subject Property's soil and/or groundwater at concentrations above applicable MTCA screening levels. In addition, samples were taken in areas where no RECs were identified but were needed to provide geographical distribution for the site investigation.

The Phase 1 ESA identified 14 RECs on the Subject Property, many of which may no longer exist or likely pose limited concern with respect to protection of human health and the environment. For example, 11 of the 14 RECs were surficial petroleum stains or sheens. Five of these RECs were identified in earlier Phase 1 ESAs, but were not observed during the December 2005 Phase 1 ESA. The fact that many of the stains/sheens were not observed in December 2005 suggests that they were not extensive when observed in the earlier ESAs.

Table 2 describes the RECs identified for the Subject Property; those identified in earlier Phase 1 ESAs but not observed in the December 2005 Phase 1 are displayed in light gray. The REC locations are shown on Figure 3.

3.2 Phased Sampling Approach

The field sampling strategy for the Phase 2 ESA included two phases of field sampling. The first phase (Phase A) involved two main elements:

- Installation of six monitoring wells to provide general information on groundwater flow direction in the vicinity. This information helped guide locations of the subsequent sampling explorations; and

- Extensive soil sampling to evaluate the presence of contaminants potentially present in soils associated with identified RECs. To address uncertainty in the precise locations of specific RECs presented in the Phase 1 ESA, the field sampling strategy included multiple explorations to provide coverage in these locations. Where potential for impact to groundwater is of concern based on the Phase 1 ESA findings, saturated soil at and below the water table was sampled. In addition to providing data to evaluate risk from human direct contact with the soil, the soil quality data were used to determine the need for, and guide location of, monitoring wells to be installed and sampled during the second phase of field sampling.

The second phase of field sampling (Phase B) involved additional soil sampling and groundwater sampling to address data gaps. Using the soil quality data to help guide the groundwater sampling program provides greater confidence that potential contaminant source areas (RECs), and resulting potential groundwater impacts, have been located in the field and characterized.

Confirmation soil samples were also collected in the excavation as part of the soil cleanup described below.

3.3 Screening Levels

To determine if release reporting, additional investigation, or other remedial actions are warranted, the Phase 2 ESA sampling results are compared to applicable MTCA screening levels. The current use of the Subject Property is industrial and K-C's future use will be industrial for the foreseeable future. For the purposes of this Phase 2 ESA, the soil sample results are compared against MTCA soil screening levels for industrial land use.

The applicable soil screening levels are listed in Table 3 and include:

- MTCA soil cleanup levels for industrial land use (the more stringent of Method A industrial soil cleanup levels and standard Method C direct contact soil cleanup levels); and
- MTCA ecological indicator soil concentrations for protection of wildlife.

The soil screening levels are listed in Table 3, and soil sample results above the screening levels are highlighted in that table.

Groundwater quality data are compared against MTCA groundwater screening levels and, because shallow groundwater discharges to Snohomish River surface water, surface water screening levels. The groundwater and surface water screening levels include:

- MTCA groundwater screening levels based on drinking water use: the more stringent of Method A groundwater cleanup levels and standard Method B groundwater cleanup levels); and
- MTCA surface water screening levels based on human and ecological receptors: the more stringent of Method B surface water cleanup levels based on human consumption of fish and state surface water quality standards for protection of aquatic organisms (freshwater chronic standards in WAC 173-201A-240).

The groundwater screening levels are listed in Table 4, and groundwater sample results above the screening levels are highlighted in that table.

These screening levels are typically employed for screening level analysis and are evaluated as a whole and in the context of past, current, and future site uses. A sample result that is higher than these levels does not necessarily trigger cleanup or establish the appropriate cleanup standard.

MTCA Method A soil screening levels are "intended to provide conservative levels," typically employed for voluntary cleanups without active government oversight and routine cleanup actions. MTCA Method C soil screening levels are risk-based levels based on worker direct contact exposure in an industrial land use (WAC 173 340-700 and -900). Explanatory notes for the analytical data tables in this report (see Tables 3 and 4) contain an explicit cautionary note on misusing the tables. The cautionary note explains that the screening levels used in this ESA should not automatically be used to define cleanup levels that must be met for financial, real estate, insurance coverage or placement, or similar transactions or purposes. Exceedances of the screening levels used in this assessment do not necessarily mean the soil must be restored to these levels (WAC 173-340-900).

The following section details the sampling and analysis results for the Subject Property, relative to these screening levels.

4 Sampling Results

Soil quality results for the Subject Property are summarized below, organized by REC. Soil sampling locations are shown on Figure 3, and analytical results for the samples, relative to screening levels, are provided in Table 3. Groundwater analytical results, relative to screening levels, are provided in Table 4.

4.1 Diesel Release near AST/Fuel Pump (RECs S-30, S-53)

In the late 1980s, an estimated 100 to 200 gallons of diesel fuel were released to the ground as a result of vehicle overfilling near the 10,000-gallon diesel above-ground storage tank (AST). During the December 2005 Phase 1 ESA, limited areas of petroleum staining were also observed adjacent to the diesel fuel pump next to the AST.

The ESA does not specify the precise location of the 1980s diesel release, so three explorations were advanced along the downgradient (east) edge of the AST to provide coverage. First, boring MW-1 (completed as a monitoring well) was advanced immediately east of the AST. Two direct push soil borings (B-5 and B-6) were also advanced immediately northeast and southeast of the AST. Three soil samples were collected from each boring at depths of 0 to 1 foot, 2 to 3 feet, and a depth interval at and below the water table (sample depths ranging from 7 to 10 feet). No evidence of petroleum was observed in the soils from the three borings. The nine soil samples were submitted for laboratory analysis of diesel- and oil-range petroleum hydrocarbons (NWTPH-Dx), the aromatic volatile organic compounds (VOCs) benzene, toluene, ethylbenzene, and xylenes (BTEX; EPA Method 8260), and polycyclic aromatic hydrocarbons (PAHs; EPA Method 8270SIM).

Soil results from eight of nine samples from the Diesel AST area are below MTCA screening levels. The concentration of oil-range petroleum hydrocarbons in the 2- to 3-foot soil sample from MW-1 was 4,900 mg/kg, exceeding the 2,000 mg/kg MTCA Method A screening level. Notably, petroleum was not detected in any of the saturated soil samples collected at the water table from the three borings, indicating no petroleum impact in groundwater.

A groundwater sample was collected from monitoring well MW-1, providing empirical data to evaluate whether petroleum concentrations in soil above the water table at MW-1 have adversely impacted groundwater quality. The MW-1 groundwater sample was analyzed for diesel- and oil-range petroleum hydrocarbons (NWTPH-Dx) and total suspended solids (TSS; Standard Method SM 2540D).

No diesel- or oil-range petroleum hydrocarbons were detected in the MW-1 groundwater sample. The data demonstrate that the elevated oil-range hydrocarbon concentration detected in soil above the water table in the MW-1 boring has not adversely impacted groundwater quality.

The data indicate negligible adverse environmental impact associated with this REC.

4.2 Central Storage Area

One surface soil sample SS-9 was collected in the northeastern portion of the Subject Property, an area where storage of logs has historically occurred. The sample provides general soil quality data for this area, although the Phase 1 ESA identifies no RECs for the area. The soil sample was submitted for laboratory analysis of diesel- and oil-range petroleum hydrocarbons and SVOCs.

The soil results do not exceed MTCA screening levels. The data indicate no adverse environmental impact in this area.

4.3 Truck Tipper (S-2/S-55)

Sample SS-11 was collected from soils at the truck tipper, where soil staining was observed in the Phase 1 ESA (REC S-2/S-55). Soils stained from a release of hydraulic oil from the tipper's hydraulic rams remained at the time of sampling. The surface soil sample was submitted for laboratory analysis of diesel- and oil-range petroleum hydrocarbons, semivolatile organic compounds (SVOCs; EPA Method 8270C), and RCRA eight metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver; EPA Methods 200.8 and 1631).

The oil-range petroleum concentration in sample SS-11 was 28,000 mg/kg, which substantially exceeds the MTCA Method A soil screening level. Concentrations of eight metals and SVOCs including PAHs in sample SS-11 were below MTCA soil screening levels.

The visual observations and analytical data confirm a release of hydraulic oil to surface soils immediately adjacent to the truck tipper.

Section 5 describes the completed soil cleanup action performed at the truck tipper to address the release.

4.4 Sump at Scale House (REC WW-4)

Drainage from the truck scale is conveyed to a concrete sump just west of it. If the water level in the sump rises high enough, a sump pump pumps the water to the ground immediately south of the sump.

One hand-augered boring (HA-1) was advanced to a depth of 3 feet in the drainage area immediately south of the sump. Soil samples were collected at depths of 0 to 1 and 2 to 3 feet. The two soil samples were submitted for laboratory analysis of diesel- and oil-range petroleum hydrocarbons.

No diesel- or oil-range hydrocarbons were detected in the soil samples. The data indicate no adverse environmental impact associated with this REC.

4.5 Creosote Wood Chipping Area (REC OSD-19)

K-C and their lessee, United Wood Products, chipped creosote-treated wood for permitted use as hog fuel at the K-C Everett mill on the west side of Everett (REC OSD-19). United Wood Products operated at the property in 2003 and 2004 and left a long pile of wood waste that remains immediately south of the rail spur (approximate outline shown on Figure 3). The creosote-treated wood was delivered via rail using the east-west-trending railroad spur that approximately bisects the Subject Property.

The wood pile has been part of ongoing operations at the K-C Riverside Woodyard and is in the process of being removed as a result of termination of the tenant United Wood Products' operations.

Soil sampling was conducted to evaluate the presence of cPAHs in surface soils beneath and around the pile of creosote-treated wood waste. The wood waste in the pile was also sampled to determine if the pile could be a source, should any exceedances of MTCA screening levels be discovered in releases onto the Subject Property.

Test pits TP-12 and TP-13 were advanced through the wood waste pile to penetrate the soils beneath it; the wood waste is approximately 9 to 10 feet thick at these locations. One sample of the underlying soil was collected from the upper 1 or 1.5 feet below soil grade in each test pit (samples TP-12-S-1 and TP-12-S-1). Test pit TP-14 was advanced near the southeast corner of the large wood waste pile, in the area where K-C did the majority of their chipping of creosote-treated wood. Approximately 4 feet of chipped wood waste overlies soil at this location, and soil sample TP-14-S-1 was collected from a depth of 0.5 to 1.5 feet below soil grade. In addition, surface soil samples SS-33 and SS-34 were collected east and west of the large wood waste pile, adjacent to other piles of wood waste. The five soil samples were analyzed for PAHs (EPA Method 8270SIM).

None of the five surface soil samples contains total cPAH concentrations above the 2 mg/kg MTCA Method A industrial soil screening level. The only cPAH detected in the soil samples from TP-12, TP-13, and TP-14, collected beneath creosote-containing wood waste, was chrysene (0.051 mg/kg in TP-14-S-1). Non-carcinogenic PAHs were detected in the three soil samples but at concentrations below MTCA industrial soil screening levels. Samples SS-33 and SS-34 contained total cPAH concentrations of 1.4 and 1.2 mg/kg, respectively. Note that total cPAH concentrations reported throughout this report are calculated using toxicity equivalency factors (TEFs) in accordance with MTCA (WAC 173-340-708[8]).

The data indicate that, during the creosote-wood chipping and the past few years that the wood waste pile has been there, cPAHs have not been released to soil at concentrations above the MTCA Method A industrial soil screening level.

4.6 Railroad Spur

During Phase A soil sampling, two surface soil samples were collected in the area around the east-west-trending existing railroad spur that was used to deliver the creosote-treated wood to the Subject Property. Sample SS-13 was located between the railroad track and a retaining wall for the large pile of creosote-treated wood waste south of it. Sample SS-8 was on the northern edge of a shallow stormwater swale north of the spur. Samples SS-8 and SS-13 were submitted for laboratory analysis of diesel- and oil-range petroleum hydrocarbons and SVOCs.

The detected total cPAH concentrations were above the 2 mg/kg MTCA Method A industrial soil screening level in samples SS-8 (3.9 mg/kg) and SS-13 (2.7 mg/kg).

Phase B surface soil samples RL-SS-1, RL-SS-2, and RL-SS-3 were then collected at locations generally west, north, and east, respectively of the SS-8/SS-13 sample pair, to better define the lateral extent of cPAHs in soil. The three soil samples contained total cPAH concentrations ranging from 0.14 to 0.67 mg/kg – below the Method A industrial soil screening level.

The data suggest that the cPAH concentration at SS-13 is attributable to ongoing active rail operations and creosote-treated railroad ties beneath the railroad tracks, a condition common throughout the state. Review of aerial photos indicates that the tracks have been in place since before 1947 (first available aerial photo). The elevated cPAH concentration at SS-8 could be attributable to long-term accumulation of soil runoff from the railroad spur into the adjacent stormwater swale. The purpose of a drainage swale is to capture and attenuate contaminants in runoff, and the data indicate that the swale is providing the intended treatment of runoff. The data from RL-SS-1, located on the south edge of the drainage swale, indicate the higher cPAH concentrations are not pervasive at the swale.

The 2 mg/kg Method A industrial soil screening level for total cPAHs is based on protection of groundwater as a drinking water source. There is abundant information in the literature documenting the low solubility and dissolved phase mobility of cPAHs. For example, based on information in MTCA Table 747-1, cPAHs have on the order of 6,000 to 30,000 times greater affinity to sorb to organic matter in soil than a mobile organic like benzene; the alluvial soils at the Subject Property are relatively high in organic matter. The lack of cPAH mobility in water is demonstrated empirically on the neighboring Former Riverside Sawmill Site, which has the same basic hydrogeologic conditions as those on the Subject Property. On that site, groundwater from monitoring well MW-7 showed no detectable dissolved-phase PAHs (all less than 0.2 ug/L) yet was screened at the water table adjacent to a test pit (TP-9) where 2.5 mg/kg total cPAHs (above the Method A screening level) was detected in a sample of soil collected at the water table (Former Riverside Sawmill Remedial Investigation; Aspect Consulting 2006b).

In addition, the detected total cPAH concentrations in surface soil samples SS-8 and SS-13 are well below the 18 mg/kg MTCA Method C industrial soil screening level based on worker direct contact.

In our opinion, the collective information indicates that the detected cPAH concentrations near the rail spur do not pose an unacceptable risk to human health or the environment under an industrial land use.

4.7 Western Swale

The active drainage swale conveyance described in Section 2.2 is located along the western boundary of Subject Property. Water in the swale is pumped directly to the City of Everett's wastewater treatment plant east of the river. Debris and evidence of petroleum have been observed in the swale in the past Phase 1 ESAs (REC WW-1).

Four surface soil samples (0- to 1-foot depth) were collected in the portion of the swale within the Subject Property. Sample SS-36 is located approximately 30 feet south of the northern property boundary. Sample SS-37 is located in the swale adjacent to REC OSD-15 (debris in the swale; Table 2). Sample SS-38 is located generally west of the rail spur. Sample SS-39 is located near the southern end of the swale. The four soil samples were analyzed for diesel- and oil-range petroleum hydrocarbons.

The soil sampled was soft, organic-rich soil that is presumably beneath water during the wet season; the soil was saturated a few inches below grade. No visual or olfactory indications of petroleum were observed during sampling at the four locations. The samples were submitted for laboratory analysis of diesel- and oil-range petroleum hydrocarbons.

Detected concentrations of oil-range petroleum hydrocarbons in these samples, from north to south (SS-36 through SS-39), were 4,000, 800, 3,400, and 1,400 mg/kg, respectively. Samples SS-36 and SS-38 exceed the 2,000 mg/kg MTCA soil screening level, which is based on protection of groundwater for drinking water use and, more specifically, to prevent accumulation of free-phase petroleum on the water table. No free-phase petroleum product or sheen was observed while sampling these soils. No other analyte concentrations exceed MTCA screening levels.

Additional surface soil samples (SS-1, SS-2, SS-35) were collected in the swale north of the Subject Property (refer to Figure D-3 in Appendix D). Oil-range petroleum hydrocarbons detected in the three samples ranged from 4,400 to 6,900 mg/kg, respectively. No free-phase petroleum product or sheen was observed while sampling these soils.

In addition to observations of the swale soil, observations and data from borings advanced downgradient (east) of the swale further indicate that free product is not accumulating at the water table beneath the swale. Seven borings were advanced didn't test PAHs

downgradient of the swale, three of which are located on the Subject Property (B-5, B-6, MW-1) and four on the Former Riverside Chip Mill/Storage Areas property to the north (B-1 through B-4; Figure D-3). Petroleum was not observed during drilling these seven borings, nor was it detected in any of the samples of saturated soil collected at the water table from the borings.

Most importantly, petroleum was not detected in the groundwater sample collected from monitoring well MW-1 (<50 ug/L diesel-range and <250 ug/L oil-range), located on the Subject Property downgradient of swale soil samples SS-35 and SS-36. The groundwater quality data indicate that oil-range hydrocarbons in swale soils upgradient of MW-1 have not adversely impacted groundwater quality.

If free product was present on the water table in the area of the swale, we expect that petroleum hydrocarbons would be detectable in nearby downgradient water table soil samples and groundwater samples.

Review of historical aerial photographs indicates that the western swale was constructed in the early 1970s, so the soft muddy soil present in the swale has presumably accumulated from suspended sediment in runoff over a period of 30 years or so. Consequently, a sufficient length of time has elapsed for free product and/or dissolved-phase petroleum hydrocarbons to migrate from swale soils to the water table (depth of 6 to 8 feet) if such migration were going to occur. Furthermore, if the measured petroleum concentrations in the swale soil were approaching residual saturation – the concentration above which petroleum becomes a mobile free phase – we expect that disturbance of the soils during sampling would have generated a petroleum sheen. Sheen was not observed when collecting any of the seven samples of soil in the swale.

In our opinion, the collective weight of evidence empirically demonstrates that measured petroleum concentrations in swale soils have not adversely impacted groundwater quality, in accordance with MTCA (WAC 173-340-747[3][f] and [10][c]). We base this conclusion on the facts that (1) dissolved-phase petroleum is not detectable in the groundwater sample from MW-1 (located downgradient of SS-35 with the highest detected oil concentration [6,900 mg/kg] in soil) or any of the seven water table soil samples collected downgradient of the swale; and (2) the absence of free product (including sheen) in any of 14 soil explorations within or downgradient of the swale. This conclusion is consistent with the fact that oil-range (high molecular weight) petroleum hydrocarbons have low solubility and are not readily mobile in the environment (Total Petroleum Hydrocarbon Working Group 1999).

In our opinion, the swale soils pose no risk to human health or the environment, and no remedial action for these soils is necessary under MTCA.

It should also be noted that the City and K-C plan to perform maintenance on the drainage swale in 2007 as part of drainage system maintenance under stormwater best management practices (BMPs). The maintenance will include addressing accumulations and vegetation in the swale for its continued stormwater conveyance function for the Subject Property and adjacent properties.

4.8 Adjacent Properties

This section addresses the potential effect of adjacent properties on the Subject Property and the Subject Property on adjacent properties. This section provides additional information relating to adjacent properties for use with the City's VCP application to Ecology.

The Subject Property is situated in a developed area comprised of mixed uses. Immediately adjacent properties are the Former Riverside Chip Mill/Storage Areas property to the north and south, the Canyon Lumber property to the south, and the Former Riverside Sawmill property to the east; these properties are zoned and used as industrial properties. A residential development occurs up the hillside to the west separated from the Subject Property by the Burlington Northern Santa Fe (BNSF) rail line.

The 2005 Phase 1 ESA performed a record review per ASTM standard and did not identify any off-site sources known to be of present concern to affect the Subject Property. The 12 previously identified adjacent property RECs are no longer considered RECs with respect to the Site because the Phase 1 ESA indicates those RECs have been cleaned up or demonstrated to be downgradient or cross-gradient of the Site.

As noted in Section 1 of this report, each of the Former Riverside Chip Mill/Storage Areas, Former Riverside Sawmill, and Riverside Woodyard properties have undergone environmental review and characterization through environmental sampling and analysis as part of a cooperative effort by the City and K-C to perform site characterization on all of these properties. The sampling grid showing the soil and groundwater sampling on the various properties is shown on Figure D-3 of Appendix D.

Sampling results from the Former Riverside Chip Mill/Storage Areas indicate no adverse environmental impact on that property, consistent with the property's limited industrial activity (Aspect Consulting 2006a). Therefore, there is negligible potential for cross-contamination of the Subject Property from that property

Sampling results from the Former Riverside Sawmill also demonstrate the absence of potential for cross-contamination from the former sawmill facility, as documented in the Former Riverside Sawmill Remedial Investigation (Aspect Consulting 2006b). Somewhat elevated pentachlorophenol (PCP), tetrachlorophenol (TCP), and Stoddard-range petroleum hydrocarbons (6.6 ug/L PCP, 3.7 ug/L TCP, and 2,700 ug/L Stoddard-range petroleum hydrocarbons) were detected in groundwater at the Former Sawmill site, and occurred only toward the center of that site as a result of wood treating activities that took place there. The extent of these constituents of concern was bounded successfully by sampling results from on-site monitoring wells and soil borings, and there is evidence that these constituents are attenuating naturally in the aquifer. This localized area of impact is hydraulically cross-gradient of the Subject Property and does not pose a threat of migration to the Subject Property. The sampling results collectively demonstrate these constituents on the Former Sawmill Site will not adversely impact the Subject Property.

Based on the sampling results from the Subject Property documented in this report, we conclude that the Subject Property is not a source property affecting adjacent properties. Based on the direction of groundwater flow (Figure 2), the limited nature of RECs on adjoining properties due to limited manufacturing facilities and industrial operations (Figures D-1 and D-2 in Appendix D), and an extensive grid of recent sampling results demonstrating that any ongoing RECs consist of isolated contamination (Figure D-3 in Appendix D), we conclude that the Riverside Woodyard property is not subject to contamination from adjacent properties.

5 Truck Tipper Cleanup Action

Soils impacted by release of hydraulic oil at the truck tipper were cleaned up to achieve residual concentrations of oil-range petroleum in soil below the 2,000 mg/kg Method A soil cleanup level (which is identical for unrestricted and industrial land use). Approximately 55 tons of impacted soil were initially excavated and transported to Rinker Materials of Everett, Washington, for thermal desorption treatment and disposal at their permitted landfill. The approximate area of the truck tipper soil excavation is depicted on Figure 4. The excavation extended laterally beyond the observed extent of oil-stained soils. A portion of the excavation area was underlain by pavement which had been deflected downward on the western edge and was covered by a thin layer of soil and wood chips. Soils were excavated on top of and around the edge of the pavement.

Within the excavation area, a thin layer of oil-soaked wood chips overlaid crushed rock (quarry spalls) with sand and compacted silt. Soils were excavated to a depth approximately 1 foot below the observed depth of oil staining. Based on visual observation, the depth of soil staining was limited to the upper few inches so soils were excavated to a depth of about 15 to 18 inches below original grade.

At this depth of excavation, soils in the excavation bottom were field screened for presence of petroleum using visual and odor indications, and using a "sheen test" in which a small amount of soil was put in a glass of clean water and shaken to see if a petroleum sheen was generated. Because no indication of petroleum was observed in the residual soils by any of the field screening methods, two discrete confirmation soil samples (TT-SS-1 and TT-SS-2) were collected from the excavation bottom (Figure 4). Oil-range petroleum concentrations detected in the two samples were 5,800 mg/kg and 1,400 mg/kg, respectively.

Because the sampling results at TT-SS-1 exceeded the MTCA Method A cleanup level, soils were excavated an additional 2 to 3.5 feet deeper below the south half of the excavation from where TT-SS-1 was collected. The approximately 28 additional tons of soil were transported to Rinker Materials for treatment and disposal. The same field screening procedures were used to observe for presence of petroleum in the new excavation subgrade soils, and no evidence of petroleum was observed. The confirmation soil sample TT-SS-3 collected at the bottom of the deeper excavation contained no detectable oil-range petroleum hydrocarbons.

The truck tipper soil cleanup successfully removed the thin veneer of wood chips and soil containing hydraulic oil at saturation concentrations (28,000 mg/kg in sample SS-11), and achieved residual oil-range petroleum concentrations in soil below the 2,000 mg/kg

Method A soil cleanup level. The excavation was backfilled with crushed rock, compacted, to generally match the existing surface soils removed.

Following completion of the cleanup action, soils at the truck tipper meet MTCA soil cleanup standards and no longer represent a risk to human health or the environment. In addition, K-C is implementing spill containment measures to limit the chance for future releases of truck tipper hydraulic oil to surrounding soils.

6 Conclusions

The release of hydraulic oil in soil at the truck tipper has been cleaned up to achieve MTCA Method A soil cleanup standards.

cPAH concentrations in surface soils near the railroad spur do not pose a risk to industrial workers through direct contact with the soil. Two samples of the soil contain total cPAH concentrations above the Method A industrial soil screening based on protecting groundwater as a drinking water source; however, the available information indicates that the relatively low concentrations (up to 3.9 mg/kg total cPAHs) pose negligible risk of leaching to impact groundwater quality.

Oil-range petroleum hydrocarbon concentrations detected in soil samples from the western swale soil exceed the MTCA Method A soil screening level, which is based on groundwater protection. However, the collective soil and groundwater data demonstrate empirically, in accordance with MTCA, that petroleum concentrations in swale soils have not adversely impacted groundwater quality despite having had sufficient time to do so. Furthermore, water in the swale is pumped directly to a secondary wastewater treatment plant, and the City and K-C plan to perform maintenance of the swale in 2007 as part of the active stormwater management system under applicable BMPs.

Based on the sampling data and information on the Subject Property and adjacent properties in the Phase 1 and Phase 2 ESA reports, there is little potential for the Subject Property to be a source property affecting other properties or, conversely, that other adjacent properties have affected the Subject Property.

The Subject Property meets the definition of an industrial property under MTCA. The property is zoned and designated industrial under a comprehensive plan and development regulations by the City of Everett, a jurisdiction planning under the Growth Management Act (GMA). The Property owner, Kimberly-Clark Worldwide Inc., intends to maintain industrial use of the Subject Property. The cleanup of petroleum-contaminated soils at the truck tipper achieved MTCA soil screening levels acceptable for unrestricted use, including industrial. However, concentrations of cPAHs remain in soils on the Subject Property at concentrations above MTCA Method A soil cleanup levels for unrestricted use. The owner will record a restrictive covenant for the Subject Property as provided by MTCA

There are no constituents of concern other than cPAHs on the Subject Property. Based on the site investigation, if the cPAHs are remediated in the future to meet applicable cleanup standards, the deed restriction may be terminated.

7 Limitations

Work for this project was performed and this report prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of Kimberly-Clark Worldwide Inc. for specific application to the referenced property. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

8 References

Aspect Consulting 2006a. Phase 2 Environmental Site Assessment and Cleanup Report, Former Riverside Chip Mill/Storage Areas. December 2006.

Aspect Consulting 2006b. Remedial Investigation, Former Riverside Sawmill. December 2006.

Delta Environmental Consultants, 2005. Phase 1 Environmental Site Assessment, Kimberly-Clark Worldwide, Inc., Riverside Woodyard, Everett, Washington. December 28, 2005.

Total Petroleum Hydrocarbon Working Group, 1999. Volume 5. Human Health Risk-Based Evaluation of Petroleum Release Sites: Implementing the Working Group Approach. Prepared by D.J. Voorhees, W.H. Weisman, and J.B. Gustofson. American Scientific Publishers, Amherst, Massachusetts. June 1999.

Table 1 - Groundwater Elevation Data
060050

Well No.	Top of Casing Elevation in Feet	Ground Surface Elevation in Feet	Top of Screen Depth in Feet	Top of Screen Elevation in Feet	Bottom of Screen Depth in Feet	Bottom of Screen Elevation in Feet	7/6/2006 - High Tide		7/12/2006 - Low Tide		9/8/2006 - Low Tide		9/11/2006 - High Tide	
							Depth to Water in Feet	Groundwater Elevation in Feet	Depth to Water in Feet	Groundwater Elevation in Feet	Depth to Water in Feet	Groundwater Elevation in Feet	Depth to Water in Feet	Groundwater Elevation in Feet
MW-1	14.80	15.3	6.0	9.3	16.0	-0.8	6.44	8.36	6.43	8.37	7.06	7.74	7.08	7.72
MW-2	17.37	14.7	4.0	10.7	14.0	0.7	8.89	8.48	8.91	8.46	9.46	7.91	9.49	7.88
MW-3	14.15	14.5	5.0	9.5	15.0	-0.6	7.91	6.24	dry	< -0.5	Dry	< -0.5	7.29	6.86
MW-4	15.22	15.6	4.5	11.1	14.5	1.1	7.90	7.32	7.68	7.54	8.38	6.84	8.44	6.78
MW-5	16.51	14.1	5.0	9.1	15.0	-0.9	9.85	6.66	11.72	4.79	13.43	3.08	10.42	6.09
MW-6	20.43	17.9	4.0	13.9	14.0	3.9	6.75	13.68	6.80	13.63	7.54	12.89	7.57	12.86
MW-7	12.00	na	4.0	7.6	14.0	-2.4	nm	nm	nm	nm	4.47	7.53	4.51	7.49
MW-8	14.53	14.9	4.0	10.9	14.0	0.9	nm	nm	nm	nm	11.43	3.10	7.96	6.57
MW-9	16.98	14.7	4.0	10.7	14.0	0.7	nm	nm	nm	nm	8.91	8.07	8.87	8.11
MW-10	16.47	14.0	4.0	10.0	14.0	0.0	nm	nm	nm	nm	8.38	8.09	8.29	8.18
MW-11	19.54	17.2	4.0	13.2	14.0	3.2	nm	nm	nm	nm	nm	nm	11.19	8.35
B-15	16.20	14.2	4.0	10.2	14.0	0.2	6.69	9.51	6.72	9.48	7.46	8.74	7.50	8.70
W-4	18.90	15.8	15.0	0.8	20.0	-4.3	10.81	8.09	10.76	8.14	11.32	7.58	11.40	7.50

na: Not reported by surveyor.
nm: No measurement (well not installed).

Table 2 - Description of Recognized Environmental Conditions

060050 - Everett, Washington

Previous Findings with December 2005 Phase I ESA Observations in Parenthesis	
REC ID	**Description**
OSD-15	SCRAP WOOD, METAL, AND TIRES IN DRAINAGE SWALE (OBSERVED DURING DECEMBER 2005 PHASE I ESA)
OSD-19	RAILROAD TIE GRINDING AREA (STILL PRESENT BUT GRINDING OPERATION NO LONGER PERFORMED)
S-1	3,000 SQ. FT. SHEEN, HOG FUEL PILE (STAINING NOT OBSERVED DURING DECEMBER 2005 PHASE I ESA)
S-2	2,000 SQ. FT. SHEEN, TRUCK DUMPER (OBSERVED DURING DECEMBER 2005 PHASE I ESA-SEE FINDING S-55)
S-3	S-3 1,500 SQ. FT. SHEEN, N OF RR SPUR (STAINING NOT OBSERVED DURING DECEMBER 2005 PHASE I ESA)
S-11	TWO 5 SQ. FT. STAINS, 10,000-GALLON DIESEL TANK (MINOR STAINING ON CONCRETE OBSERVED DURING DECEMBER 2005 PHASE I ESA)
S-30	SPILL, 10,000-GALLON DIESEL AST (NO NEW INFORMATION AVAILABLE)
S-43	1000 TO 1500 SQ. FT. STAINING ON EAST SIDE OF HOG PILE (STAINING NOT OBSERVED DURING DECEMBER 2005 PHASE I ESA)
S-49	MINOR (DE MINIMUS) PETROLEUM STAINING FROM HEAVY EQUIPMENT (STAINING NOT OBSERVED DURING DECEMBER 2005 PHASE I ESA)
S-50	STAINING AND STRESSED VEGETATION NEAR CULVERT (STAINING NOT OBSERVED DURING DECEMBER 2005 PHASE I ESA)
WW-4	SUMP, SCALEHOUSE AREA (STILL PRESENT)

New Findings - December 2005 Phase I ESA	
REC ID	**Description**
S-53	5-10 SQ. FT. PETROLEUM STAINING, ADJACENT TO DIESEL FUEL PUMP
S-54	10-20 SQ. FT. STAINED AREA UNDER HEAVY EQUIPMENT
S-55	200-400 SQ. FT. STAINED AREA UNDER AND AROUND TRUCK LIFT (FORMER LOCATION OF S-2 IDENTIFIED IN 1998 REPORT BUT NOT OBSERVED IN 2000 UPDATE REPORT)

Note:
Descriptions are verbatim from Phase 1 ESA (Delta Environmental Consultants 2005). REC not observed in December 2005 Phase I ESA are displayed by light gray text.

Table 3 - Soil Quality Data for Riverside Woodyard

60050

						Diesel Release near AST/Fuel Pump									Central Storage Area	Truck Tipper				Sump at Scale House	
Chemical Name	Method A Soil (Unrestricted)	Method B Soil (Unrestricted)[1]	Method A Soil (Industrial)	Method C Soil (Industrial)[2]	173-340-7493 Eco Indicator Wildlife	B-5-1-2 06/29/06 (1-2 ft.)	B-5-2-3 06/29/06 (2-3 ft.)	B-5-7-8 06/29/06 (7-8 ft.)	B-6-0-1 06/29/06 (0-1 ft.)	B-6-2-3 06/29/06 (2-3 ft.)	B-6-7-8 06/29/06 (7-8 ft.)	MW-1-0-1 06/27/06 (0-1 ft.)	MW-1-2-3 06/27/06 (2-3 ft.)	MW-1-9-10 06/27/06 (9-10 ft.)	SS-09 06/28/06 (0-1 ft.)	[4]SS-11 06/28/06 (0-1 ft.)	[4]TT-SS-1 10/30/06 (0-1 ft.)	TT-SS-2 10/30/06 (0-1 ft.)	TT-SS-3 12/06/06 (0-1 ft.)	HA-1-0-1 07/06/06 (0-1 ft.)	HA-1-2-3 07/06/06 (2-3 ft.)
Total Petroleum Hydrocarbons																					
Diesel (C10-C25) in mg/kg	2,000		2,000		6,000	89	50 U	50 U	210	50 U	50 U	230	1,500	50 U	83	**5,500**			50 U	50 U	50 U
Oil (C25-C36) in mg/kg	2,000		2,000			250 U	250 U	250 U	1,100	56	250 U	1,200	**4,900**	250 U	830	**28,000**	**5,800**	1,400	250 U	250 U	250 U
Metals																					
Arsenic in mg/kg	20	20	20	87.5	132											4.53					
Barium in mg/kg		16,000		700,000	102											20					
Cadmium in mg/kg	2	80		3,500	14											1 U					
Chromium in mg/kg	2,000	120,000	2,000	5,300,000	67											6.85					
Lead in mg/kg	250		1,000		118											3.97					
Mercury in mg/kg	2	24	2	1,100	5.5											0.2 UJ					
Selenium in mg/kg		400		18,000	0.3											1 U					
Silver in mg/kg		400		18,000												1 U					
BTEX																					
Benzene in mg/kg	0.03	18	0.03	2,400		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U							
Ethylbenzene in mg/kg	6	8,000	6	350,000		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U							
Toluene in mg/kg	7	6,400	7	280,000		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U							
Total Xylenes in mg/kg		16,000		700,000		0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U							
Other Semivolatiles																					
1,2,4-Trichlorobenzene in mg/kg		800		35,000											1.5 U	0.3 U					
1,2-Dichlorobenzene in mg/kg		7,200		320,000											1.5 U	0.3 U					
1,3-Dichlorobenzene in mg/kg															1.5 U	0.3 U					
1,4-Dichlorobenzene in mg/kg		42		5,500											1.5 U	0.3 U					
2,4,5-Trichlorophenol in mg/kg		8,000		350,000											15 U	3 U					
2,4,6-Trichlorophenol in mg/kg		91		12,000											15 U	3 U					
2,4-Dichlorophenol in mg/kg		240		11,000											15 U	3 U					
2,4-Dimethylphenol in mg/kg		1,600		70,000											15 U	3 U					
2,4-Dinitrophenol in mg/kg		160		7,000											45 U	9.0 U					
2,4-Dinitrotoluene in mg/kg		160		7,000											1.5 U	0.3 U					
2,6-Dinitrotoluene in mg/kg		80		3,500											1.5 U	0.3 U					
Total DNTs in mg/kg		1.47													ND	ND					
2-Chloronaphthalene in mg/kg		6,400		280,000											1.5 U	0.3 U					
2-Chlorophenol in mg/kg		400		18,000											15 U	3 U					
2-Methylphenol in mg/kg		4,000		180,000											15 U	3 U					
2-Nitroaniline in mg/kg															1.5 U	0.3 U					
2-Nitrophenol in mg/kg															15 U	3 U					
3-Nitroaniline in mg/kg															45 U	9.0 U					
4,6-Dinitro-2-methylphenol in mg/kg															45 U	9.0 U					
4-Bromophenyl phenyl ether in mg/kg															1.5 U	0.3 U					
4-Chloro-3-methylphenol in mg/kg															15 U	3 U					
4-Chloroaniline in mg/kg		320		14,000											150 U	30 U					
4-Chlorophenyl phenyl ether in mg/kg															1.5 U	0.3 U					
4-Methylphenol in mg/kg		400		18,000											15 U	3 U					
4-Nitroaniline in mg/kg															45 U	9.0 U					
4-Nitrophenol in mg/kg															15 U	3 U					
Acenaphthene in mg/kg		4,800		210,000											1.5 U	0.3 U					
Acenaphthylene in mg/kg															1.5 U	0.3 U					
Anthracene in mg/kg		24,000		1,100,000											1.5 U	0.3 U					
Benzo(g,h,i)perylene in mg/kg															1.5 U	0.3 U					
Benzoic acid in mg/kg		320,000		14,000,000											150 U	30 U					
Benzyl alcohol in mg/kg		24,000		1,050,000											1.5 U	0.3 U					
Bis(2-chloroethoxy)methane in mg/kg															1.5 U	0.3 U					
Bis(2-chloroethyl) ether in mg/kg		0.91		120											1.5 U	0.3 U					

Aspect Consulting
December 2006
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Table 3 - Soil Quality Data for Riverside Woodyard

60050

						Diesel Release near AST/Fuel Pump									Central Storage Area	Truck Tipper				Sump at Scale House	
Chemical Name	Method A Soil (Unrestricted)	Method B Soil (Unrestricted)[1]	Method A Soil (Industrial)	Method C Soil (Industrial)[2]	173-340-7493 Eco Indicator Wildlife	B-5-1-2 06/29/06 (1-2 ft.)	B-5-2-3 06/29/06 (2-3 ft.)	B-5-7-8 06/29/06 (7-8 ft.)	B-6-0-1 06/29/06 (0-1 ft.)	B-6-2-3 06/29/06 (2-3 ft.)	B-6-7-8 06/29/06 (7-8 ft.)	MW-1-0-1 06/27/06 (0-1 ft.)	MW-1-2-3 06/27/06 (2-3 ft.)	MW-1-9-10 06/27/06 (9-10 ft.)	SS-09 06/28/06 (0-1 ft.)	[4]SS-11 06/28/06 (0-1 ft.)	[4]TT-SS-1 10/30/06 (0-1 ft.)	TT-SS-2 10/30/06 (0-1 ft.)	TT-SS-3 12/06/06 (0-1 ft.)	HA-1-0-1 07/06/06 (0-1 ft.)	HA-1-2-3 07/06/06 (2-3 ft.)
Bis(2-chloroisopropyl) ether in mg/kg															1.5 U	0.3 U					
Bis(2-ethylhexyl) phthalate in mg/kg		71		9,375											15 U	3 U					
Benzyl butyl phthalate in mg/kg		16,000		700,000											1.5 U	0.3 U					
Carbazole in mg/kg		50		6,600											3 U	0.6 U					
Dibenzofuran in mg/kg		160		7,000											1.5 U	0.3 U					
Diethyl phthalate in mg/kg		64,000		2,800,000											1.5 U	0.3 U					
Dimethyl phthalate in mg/kg		80,000		3,500,000											1.5 U	0.3 U					
Di-n-butyl phthalate in mg/kg		8,000		350,000											1.5 U	0.3 U					
Di-n-octyl phthalate in mg/kg		1,600		70,000											1.5 U	0.3 U					
Fluoranthene in mg/kg		3,200		140,000											1.5 U	0.3 U					
Fluorene in mg/kg		3,200		140,000											1.5 U	0.3 U					
Hexachlorobenzene in mg/kg		0.63		82											1.5 U	0.3 U					
Hexachlorobutadiene in mg/kg		13		700											1.5 U	0.3 U					
Hexachlorocyclopentadiene in mg/kg		480		21,000											4.5 U	0.9 U					
Hexachloroethane in mg/kg		71		3,500											1.5 U	0.3 U					
Isophorone in mg/kg		1,100		140,000											1.5 U	0.3 U					
2-Methylnaphthalene in mg/kg		320		14,000											1.5 U	0.3 U					
Naphthalene in mg/kg	5	1,600	5	70,000											1.5 U	0.3 U					
Total Naphthalenes in mg/kg	5	1,600	5	70,000											ND	ND					
Nitrobenzene in mg/kg		40		1,800											1.5 U	0.3 U					
N-Nitroso-di-n-propylamine in mg/kg		0.14		19											1.5 U	0.3 U					
N-Nitrosodiphenylamine in mg/kg		200		27,000											3 U	0.6 U					
Pentachlorophenol in mg/kg		8.3		1,100											15 U	3 U					
Phenanthrene in mg/kg															1.5 U	0.3 U					
Phenol in mg/kg		48,000		2,100,000											15 U	3 U					
Pyrene in mg/kg		2,400		110,000											1.5 U	0.3 U					
Benz(a)anthracene in mg/kg		0.14		18											1.5 U	0.3 U					
Benzo(a)pyrene in mg/kg	0.1	0.14	2	18	12										1.5 U	0.3 U					
Benzo(b)fluoranthene in mg/kg		0.14		18											1.5 U	0.3 U					
Benzo(k)fluoranthene in mg/kg		0.14		18											1.5 U	0.3 U					
Chrysene in mg/kg		0.14		18											1.5 U	0.3 U					
Dibenzo(a,h)anthracene in mg/kg		0.14		18											1.5 U	0.3 U					
Indeno(1,2,3-cd)pyrene in mg/kg		0.14		18											1.5 U	0.3 U					
[3]Total cPAHs TEF in mg/kg	0.1	0.14	2	18											ND	ND					
Polycyclic Aromatic Hydrocarbons (PAHs)																					
Acenaphthene in mg/kg		4,800		210,000		0.005 U	0.005 U	0.005 U	0.05 U	0.005 U	0.005 U	0.05 U	0.05 U	0.005 U							
Acenaphthylene in mg/kg						0.005 U	0.005 U	0.005 U	0.05 U	0.005 U	0.0059	0.05 U	0.05 U	0.005 U							
Anthracene in mg/kg		24,000		1,100,000		0.005 U	0.005 U	0.005 U	0.05 U	0.005 U	0.0072	0.05 U	0.05 U	0.005 U							
Benzo(g,h,i)perylene in mg/kg						0.005 U	0.005 U	0.005 U	0.05 U	0.005 U	0.0087	0.05 U	0.05 U	0.005 U							
Fluoranthene in mg/kg		3,200		140,000		0.005 U	0.005 U	0.013	0.27	0.005 U	0.026	0.05 U	0.056	0.005 U							
Fluorene in mg/kg		3,200		140,000		0.005 U	0.005 U	0.005 U	0.05 U	0.005 U	0.005 U	0.05 U	0.093	0.005 U							
Naphthalene in mg/kg	5	1,600	5	70,000		0.005 U	0.005 U	0.005 U	0.05 U	0.005 U	0.009	0.05 U	0.05 U	0.005 U							
Phenanthrene in mg/kg						0.005 U	0.005 U	0.005 U	0.081	0.005 U	0.0099	0.05 U	0.25	0.005 U							
Pyrene in mg/kg		2,400		110,000		0.005 U	0.005 U	0.013	0.22	0.005 U	0.035	0.05 U	0.092	0.005 U							
Benz(a)anthracene in mg/kg		0.14		18		0.005 U	0.005 U	0.0057	0.069	0.005 U	0.033	0.05 U	0.05 U	0.005 U							
Benzo(a)pyrene in mg/kg	0.1	0.14	2	18	12	0.005 U	0.005 U	0.0069	0.05 U	0.005 U	0.032	0.058	0.05 U	0.005 U							
Benzo(b)fluoranthene in mg/kg		0.14		18		0.005 U	0.005 U	0.0079	0.069	0.005 U	0.031	0.087	0.05 U	0.005 U							
Benzo(k)fluoranthene in mg/kg		0.14		18		0.005 U	0.005 U	0.005 U	0.05 U	0.005 U	0.011	0.084	0.05 U	0.005 U							
Chrysene in mg/kg		0.14		18		0.005 U	0.005 U	0.0052	0.084	0.005 U	0.034	0.05 U	0.05 U	0.005 U							
Dibenzo(a,h)anthracene in mg/kg		0.14		18		0.005 U	0.005 U	0.005 U	0.05 U	0.005 U	0.005 U	0.05 U	0.05 U	0.005 U							
Indeno(1,2,3-cd)pyrene in mg/kg		0.14		18		0.005 U	0.005 U	0.005 U	0.05 U	0.005 U	0.0085	0.05 U	0.05 U	0.005 U							
[3]Total cPAHs TEF in mg/kg	0.1	0.14	2	18		ND	ND	0.01	0.05	ND	0.04	0.09	ND	ND							

Table 3 - Soil Quality Data for Riverside Woodyard

60050

						Creosote Wood Chipping Area					Railroad Spur					Western Swale			
Chemical Name	Method A Soil (Unrestricted)	Method B Soil (Unrestricted)^1	Method A Soil (Industrial)	Method C Soil (Industrial)^2	173-340-7493 Eco Indicator Wildlife	SS-33 09/06/06 (0-1 ft.)	SS-34 09/06/06 (0-1 ft.)	TP-12-S-1 11/14/06 (0.3-1.5 ft.)	TP-13-S-1 11/14/06 (0.4-1.4 ft.)	TP-14-S-1 11/14/06 (0-1.2 ft.)	RL-SS-1 11/07/06 (0-1 ft.)	RL-SS-2 11/07/06 (0-1 ft.)	RL-SS-3 11/07/06 (0-1 ft.)	SS-08 06/28/06 (0-1 ft.)	SS-13 06/28/06 (0-1 ft.)	SS-36 09/06/06 (0-1 ft.)	SS-37 10/04/06 (0-1 ft.)	SS-38 10/04/06 (0-1 ft.)	SS-39 10/04/06 (0-1 ft.)
Total Petroleum Hydrocarbons																			
Diesel (C10-C25) in mg/kg	2,000		2,000		6,000									370	240				
Oil (C25-C36) in mg/kg	2,000		2,000											1,100	1,400	**4,000**	800	**3,400**	1,400
Metals																			
Arsenic in mg/kg	20	20	20	87.5	132									7.23	11.1				
Barium in mg/kg		16,000		700,000	102									47	41.5				
Cadmium in mg/kg	2	80		3,500	14									1 U	1 U				
Chromium in mg/kg	2,000	120,000	2,000	5,300,000	67									15.4	11				
Lead in mg/kg	250		1,000		118									10.8	10.4				
Mercury in mg/kg	2	24	2	1,100	5.5									0.2 U	0.2 U				
Selenium in mg/kg		400		18,000	0.3									1 U	1 U				
Silver in mg/kg		400		18,000										1 U	1 U				
BTEX																			
Benzene in mg/kg	0.03	18	0.03	2,400															
Ethylbenzene in mg/kg	6	8,000	6	350,000															
Toluene in mg/kg	7	6,400	7	280,000															
Total Xylenes in mg/kg		16,000		700,000															
Other Semivolatiles																			
1,2,4-Trichlorobenzene in mg/kg		800		35,000										0.3 U	0.3 U				
1,2-Dichlorobenzene in mg/kg		7,200		320,000										0.3 U	0.3 U				
1,3-Dichlorobenzene in mg/kg														0.3 U	0.3 U				
1,4-Dichlorobenzene in mg/kg		42		5,500										0.3 U	0.3 U				
2,4,5-Trichlorophenol in mg/kg		8,000		350,000										3 U	3 U				
2,4,6-Trichlorophenol in mg/kg		91		12,000										3 U	3 U				
2,4-Dichlorophenol in mg/kg		240		11,000										3 U	3 U				
2,4-Dimethylphenol in mg/kg		1,600		70,000										3 U	3 U				
2,4-Dinitrophenol in mg/kg		160		7,000										9.0 U	9.0 U				
2,4-Dinitrotoluene in mg/kg		160		7,000										0.3 U	0.3 U				
2,6-Dinitrotoluene in mg/kg		80		3,500										0.3 U	0.3 U				
Total DNTs in mg/kg		1.47												ND	ND				
2-Chloronaphthalene in mg/kg		6,400		280,000										0.3 U	0.3 U				
2-Chlorophenol in mg/kg		400		18,000										3 U	3 U				
2-Methylphenol in mg/kg		4,000		180,000										3 U	3 U				
2-Nitroaniline in mg/kg														0.3 U	0.3 U				
2-Nitrophenol in mg/kg														3 U	3 U				
3-Nitroaniline in mg/kg														9.0 U	9.0 U				
4,6-Dinitro-2-methylphenol in mg/kg														9.0 U	9.0 U				
4-Bromophenyl phenyl ether in mg/kg														0.3 U	0.3 U				
4-Chloro-3-methylphenol in mg/kg														3 U	3 U				
4-Chloroaniline in mg/kg		320		14,000										30 U	30 U				
4-Chlorophenyl phenyl ether in mg/kg														0.3 U	0.3 U				
4-Methylphenol in mg/kg		400		18,000										3 U	3 U				
4-Nitroaniline in mg/kg														9.0 U	9.0 U				
4-Nitrophenol in mg/kg														3 U	3 U				
Acenaphthene in mg/kg		4,800		210,000										2.1	0.3 U				
Acenaphthylene in mg/kg														0.5	0.33				
Anthracene in mg/kg		24,000		1,100,000										3.7	0.37				
Benzo(g,h,i)perylene in mg/kg														0.75	1				
Benzoic acid in mg/kg		320,000		14,000,000										30 U	30 U				
Benzyl alcohol in mg/kg		24,000		1,050,000										0.3 U	0.3 U				
Bis(2-chloroethoxy)methane in mg/kg														0.3 U	0.3 U				
Bis(2-chloroethyl) ether in mg/kg		0.91		120										0.3 U	0.3 U				

Table 3 - Soil Quality Data for Riverside Woodyard
60050

						Creosote Wood Chipping Area					Railroad Spur					Western Swale			
Chemical Name	Method A Soil (Unrestricted)	Method B Soil (Unrestricted)^1	Method A Soil (Industrial)	Method C Soil (Industrial)^2	173-340-7493 Eco Indicator Wildlife	SS-33 09/06/06 (0-1 ft.)	SS-34 09/06/06 (0-1 ft.)	TP-12-S-1 11/14/06 (0.3-1.5 ft.)	TP-13-S-1 11/14/06 (0.4-1.4 ft.)	TP-14-S-1 11/14/06 (0-1.2 ft.)	RL-SS-1 11/07/06 (0-1 ft.)	RL-SS-2 11/07/06 (0-1 ft.)	RL-SS-3 11/07/06 (0-1 ft.)	SS-08 06/28/06 (0-1 ft.)	SS-13 06/28/06 (0-1 ft.)	SS-36 09/06/06 (0-1 ft.)	SS-37 10/04/06 (0-1 ft.)	SS-38 10/04/06 (0-1 ft.)	SS-39 10/04/06 (0-1 ft.)
Bis(2-chloroisopropyl) ether in mg/kg														0.3 U	0.3 U				
Bis(2-ethylhexyl) phthalate in mg/kg		71		9,375										3 U	3 U				
Benzyl butyl phthalate in mg/kg		16,000		700,000										0.3 U	0.3 U				
Carbazole in mg/kg		50		6,600										1.1	0.6 U				
Dibenzofuran in mg/kg		160		7,000										1.8	0.3 U				
Diethyl phthalate in mg/kg		64,000		2,800,000										0.3 U	0.3 U				
Dimethyl phthalate in mg/kg		80,000		3,500,000										0.3 U	0.3 U				
Di-n-butyl phthalate in mg/kg		8,000		350,000										0.3 U	0.3 U				
Di-n-octyl phthalate in mg/kg		1,600		70,000										0.3 U	0.3 U				
Fluoranthene in mg/kg		3,200		140,000										13	1.4				
Fluorene in mg/kg		3,200		140,000										3.2	0.3 U				
Hexachlorobenzene in mg/kg		0.63		82										0.3 U	0.3 U				
Hexachlorobutadiene in mg/kg		13		700										0.3 U	0.3 U				
Hexachlorocyclopentadiene in mg/kg		480		21,000										0.90 U	0.9 U				
Hexachloroethane in mg/kg		71		3,500										0.3 U	0.3 U				
Isophorone in mg/kg		1,100		140,000										0.3 U	0.3 U				
2-Methylnaphthalene in mg/kg		320		14,000										1.4	0.3 U				
Naphthalene in mg/kg	5	1,600	5	70,000										1.2	0.3 U				
Total Naphthalenes in mg/kg	5	1,600	5	70,000										2.6	ND				
Nitrobenzene in mg/kg		40		1,800										0.3 U	0.3 U				
N-Nitroso-di-n-propylamine in mg/kg		0.14		19										0.3 U	0.3 U				
N-Nitrosodiphenylamine in mg/kg		200		27,000										0.6 U	0.6 U				
Pentachlorophenol in mg/kg		8.3		1,100										3 U	3 U				
Phenanthrene in mg/kg														13	0.31				
Phenol in mg/kg		48,000		2,100,000										3 U	3 U				
Pyrene in mg/kg		2,400		110,000										8.9	1.5				
Benz(a)anthracene in mg/kg		0.14		18										4.1	1				
Benzo(a)pyrene in mg/kg	0.1	0.14	2	18	12									2.6	1.9				
Benzo(b)fluoranthene in mg/kg		0.14		18										4.6	2.9				
Benzo(k)fluoranthene in mg/kg		0.14		18										1.4	0.79				
Chrysene in mg/kg		0.14		18										4.8	1.9				
Dibenzo(a,h)anthracene in mg/kg		0.14		18										0.41	0.37				
Indeno(1,2,3-cd)pyrene in mg/kg		0.14		18										0.86	1.1				
^{3}Total cPAHs TEF in mg/kg	0.1	0.14	2	18										3.91	2.65				
Polycyclic Aromatic Hydrocarbons (PAHs)																			
Acenaphthene in mg/kg		4,800		210,000		0.05 U	0.05 U	0.082	0.005 U	0.05 U	0.05 U	0.05 U	0.25 U						
Acenaphthylene in mg/kg						0.086	0.053	0.05 U	0.005 U	0.05 U	0.05 U	0.05 U	0.25 U						
Anthracene in mg/kg		24,000		1,100,000		0.27	0.082	0.054	0.005 U	0.05 U	0.05 U	0.05 U	0.25 U						
Benzo(g,h,i)perylene in mg/kg						0.84	0.66	0.05 U	0.005 U	0.05 U	0.064	0.11	0.31						
Fluoranthene in mg/kg		3,200		140,000		1	1.5	0.15	0.005 U	0.095	0.11	0.087	0.45						
Fluorene in mg/kg		3,200		140,000		0.069	0.05 U	0.073	0.005 U	0.05 U	0.05 U	0.05 U	0.25 U						
Naphthalene in mg/kg	5	1,600	5	70,000		0.075	0.05 U	0.14	0.005 U	0.052	0.05 U	0.05 U	0.25 U						
Phenanthrene in mg/kg						0.25	0.81	0.21	0.005 U	0.088	0.05 U	0.05 U	0.25 U						
Pyrene in mg/kg		2,400		110,000		0.85	1.2	0.12	0.005 U	0.11	0.084	0.093	0.46						
Benz(a)anthracene in mg/kg		0.14		18		0.72	0.72	0.05 U	0.005 U	0.05 U	0.079	0.09	0.33						
Benzo(a)pyrene in mg/kg	0.1	0.14	2	18	12	1	0.83	0.05 U	0.005 U	0.05 U	0.095	0.13	0.47						
Benzo(b)fluoranthene in mg/kg		0.14		18		1.3	1.3	0.05 U	0.005 U	0.05 U	0.17	0.2	0.72						
Benzo(k)fluoranthene in mg/kg		0.14		18		0.34	0.41	0.05 U	0.005 U	0.05 U	0.065	0.058	0.25 U						
Chrysene in mg/kg		0.14		18		0.98	1	0.05 U	0.005 U	0.051	0.12	0.18	0.49						
Dibenzo(a,h)anthracene in mg/kg		0.14		18		0.25	0.23	0.05 U	0.005 U	0.05 U	0.05 U	0.05 U	0.25 U						
Indeno(1,2,3-cd)pyrene in mg/kg		0.14		18		0.76	0.61	0.05 U	0.005 U	0.05 U	0.06	0.093	0.28						
^{3}Total cPAHs TEF in mg/kg	0.1	0.14	2	18		1.42	1.24	ND	ND	0.05	0.14	0.19	0.67						

Table 4 - Groundwater Quality Data for Riverside Woodyard

060050

Chemical Name	Method A Groundwater	Method B Groundwater[1]	Method B Surface Water[2]	173-201A WAC Surface Water Fresh	MW-01 09/11/06
Total Petroleum Hydrocarbons					
Diesel (C10-C25) in ug/L	500				50 U
Oil (C25-C36) in ug/L	500				250 U
Conventionals					
Total Suspended Solids in mg/L					140
Field Parameters					
Temperature in deg c					17.2
Specific Conductance in umhos/cm					1,212
Dissolved Oxygen in mg/L					1.4
pH in pH Units					6.7
Eh (ORP) in Hz					-203

Notes

Concentrations in bold and shaded exceed MTCA Method A or MTCA Method B groundwater screening levels.

Concentrations located within thick box borders exceed MTCA Method B or WAC 201A surface water screening levels.

U - Not detected at indicated detection limit

J - Estimated value

ND - Calculated non-detect value

Blank Cell - Not Analyzed

[1] MTCA standard Method B formula values for potable water (Equations 720-1 and 720-2 in WAC 173-340-720(4)(b))

[2] MTCA standard Method B formula values for human consumption of fish (Equations 730-1 and 730-2 in WAC 173-340-730(3)(b))

Aspectconsulting
IN-DEPTH PERSPECTIVE

179 Madrone Lane North
Bainbridge Island, WA 98110
(206) 780 9370

811 First Avenue #480
Seattle, WA 98104
(206) 328 7443

Riverside Woodyard
Everett, Washington

DATE: Nov 2006	PROJECT NO. 060050
DESIGNED BY: SGJ	
DRAWN BY: ACM	FIGURE NO. 1
REVISED BY: ACM	

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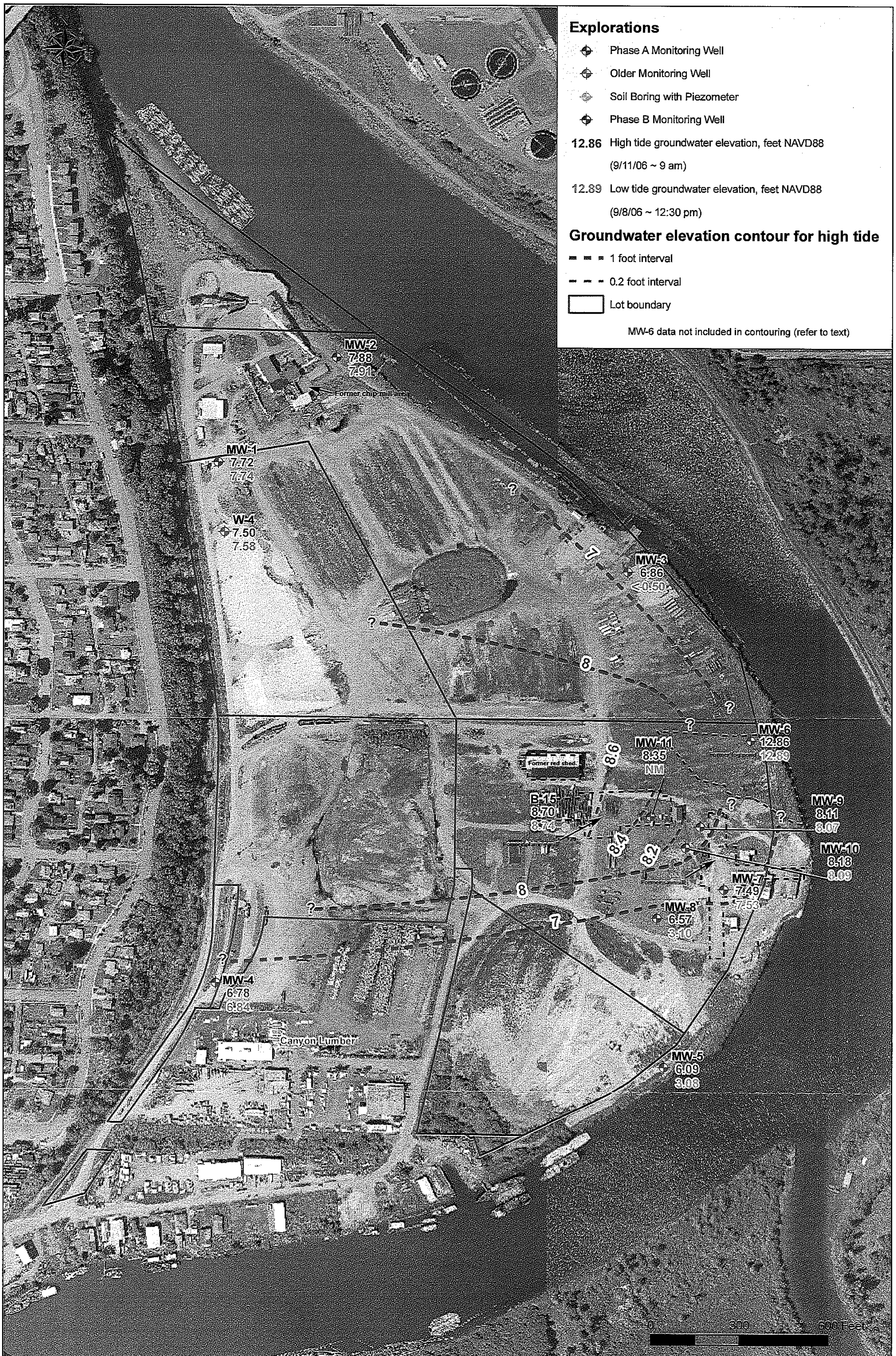

Aspect consulting
IN-DEPTH PERSPECTIVE

179 Madrone Lane North
Bainbridge Island, WA 98110
(206) 780-9370

811 First Avenue #480
Seattle, WA 98104
(206) 328-7443

Groundwater Elevation Data

Subject Property and Adjacent Properties
Everett, Washington

DATE: June 2006	PROJECT NO. 060050
DESIGNED BY: ACM	
DRAWN BY: ACM	FIGURE NO. 2
REVIEWED BY: ACM	

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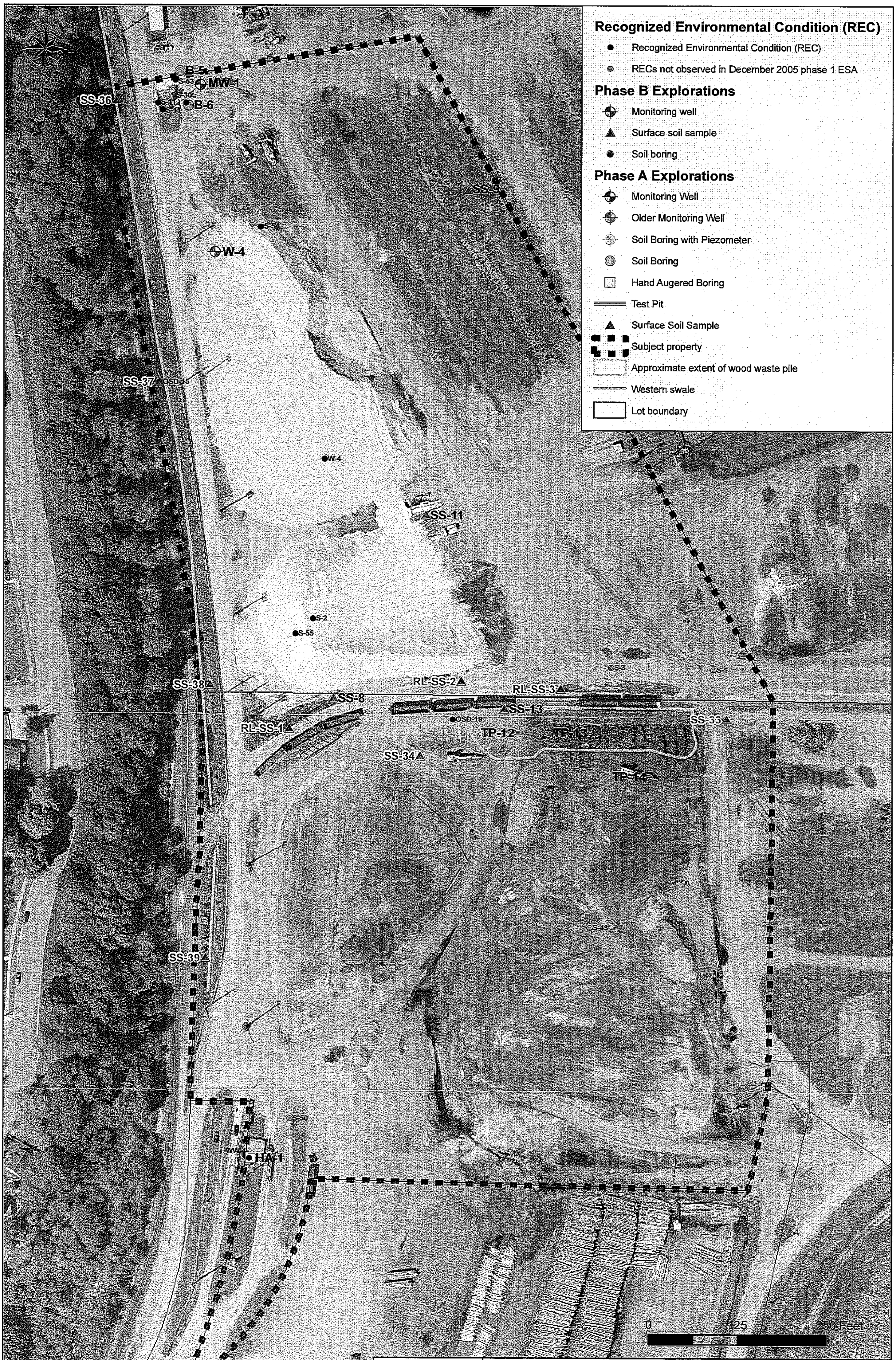

Aspect consulting
IN-DEPTH PERSPECTIVE

179 Madrone Lane North
Bainbridge Island, WA 98110
(206) 780-9370

811 First Avenue #480
Seattle, WA 98104
(206) 328-7443

Phase 2 ESA Explorations
Riverside Woodyard
Everett, Washington

DATE: Nov 2006	PROJECT NO. 060050
DESIGNED BY: SJG	
DRAWN BY: ACM	FIGURE NO. 3
REVISED BY: ACM	

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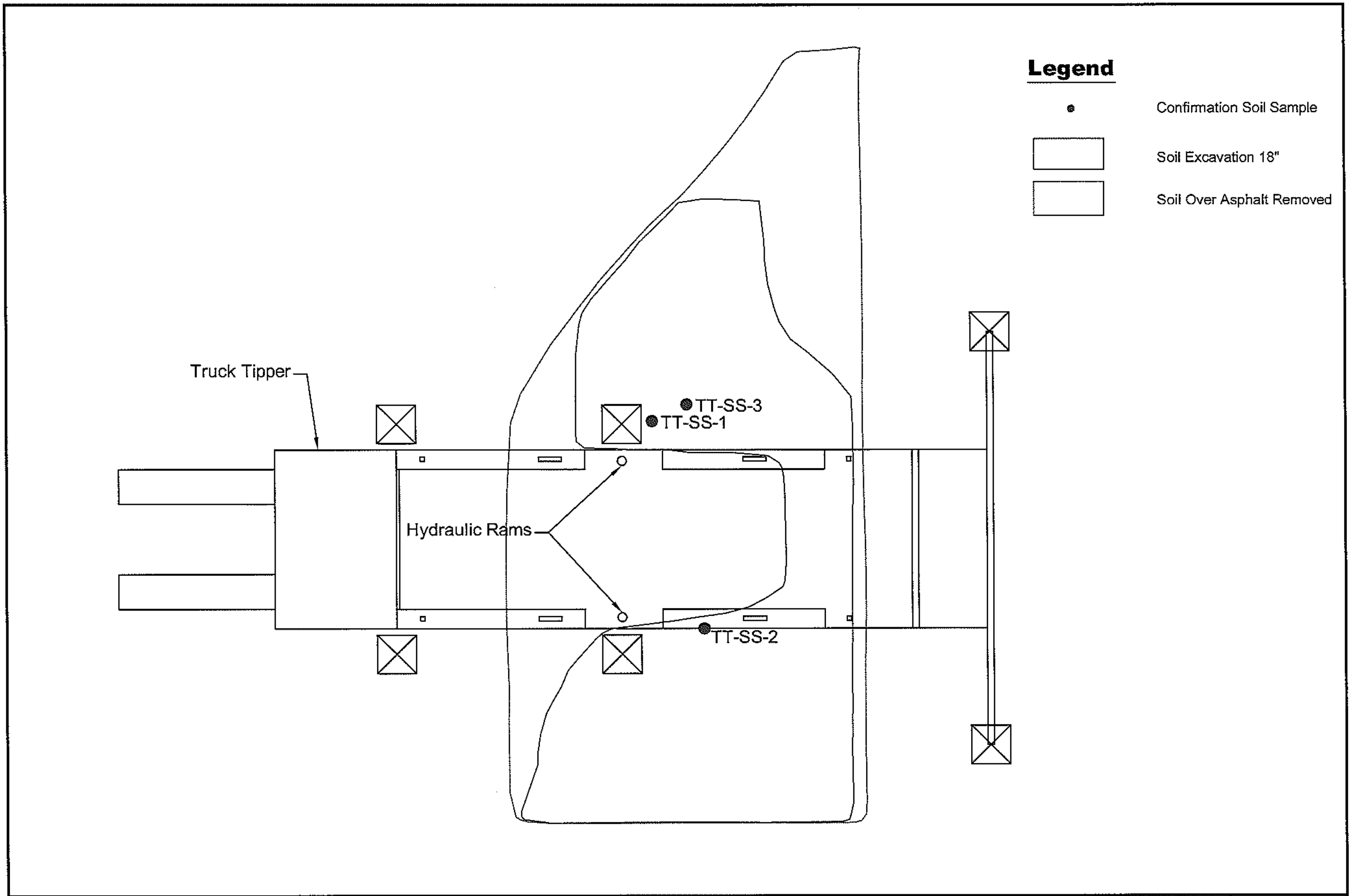
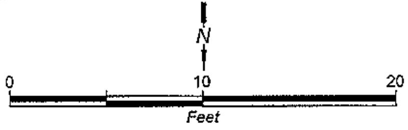




Aspect consulting
IN-DEPTH PERSPECTIVE

179 Madrone Lane North
Bainbridge Island, WA 98110
(206) 780-9370

811 First Avenue #480
Seattle, WA 98104
(206) 328-7443

Truck Tipper
Soil Cleanup Excavation

K-C Riverside Woodyard
Everett, Washington

DATE: December 2006	PROJECT NO. 060050
DESIGNED BY: JWC	
DRAWN BY: LAL	FIGURE NO. 4
REVISED BY: -	

Q:\Riverside Property\060050 Riverside Property\2006-11 Truck Tipper\truck tipper.dwg

APPENDIX A

Field Sampling Procedures and Exploration Logs

Field Sampling Procedures

This section describes field sampling procedures followed during the Phase 2 ESA. Sampling locations for the project were located in the field with hand-held GPS, using Washington state plane coordinates. Decontamination and management of investigation-derived waste is described at the end of this section.

Subsurface Soil Sampling

Subsurface soil quality samples were collected from direct push boring, test pit, and hand auger explorations, as described below. A licensed geologist from Aspect Consulting was present throughout completion of the soil borings, test pits, and hand-augered borings, and prepared a geologic log for each of the explorations completed.

Each soil sample was screened using a photoionization detector (PID) to monitor for the presence of volatile organic compounds (VOCs). The field representative also visually classified the soils in accordance with ASTM Method D 2488 and recorded soil descriptions, field screening results, and other relevant details (e.g., staining, debris, odors, etc.) on the boring log.

All soil samples submitted for VOC analyses were collected in accordance with EPA Method 5035A as required by Ecology. The soil aliquot for VOC analysis was collected from the soil sample using a laboratory-supplied modified disposable plastic syringe as required by the 5035A method, and placed in pre-weighed laboratory supplied vials.

For all other analyses, the soil samples were removed from the sampler using a stainless steel spoon and placed in a stainless steel bowl for homogenization with the stainless steel spoon. Gravel-sized material greater than approximately 0.5 inch was removed from the sample during mixing. A representative aliquot of the homogenized soil was placed into certified-clean jars supplied by the analytical laboratory.

Details on each soil exploration method are given below.

Direct Push Soil Borings

Aspect Consulting subcontracted with Northwest Probe of Milton, Washington, to complete direct push soil borings. Direct push soil borings were advanced using a direct push (Geoprobe) rig and were sampled on a continuous basis. Each boring was advanced to collect samples at pre-determined depth intervals or as determined by field screening. Samples were collected in disposable 1.5-inch diameter plastic liners. The liners were opened by a stainless steel blade to access the sample.

Soil samples targeted for VOC analyses were collected in accordance with EPA Method 5035A prior to homogenization for the other analyses. Each soil boring was decommissioned with hydrated granular bentonite, and the location recorded using GPS.

Test Pits

Aspect Consulting subcontracted with Clearcreek Contractors of Everett, Washington, to excavate test pits using a track-mounted excavator.

For test pits advanced to depths of 3 feet or less, which are deemed safe for worker entry, the Aspect field representative collected samples directly from the excavation sidewalls or bottom. For test pits advanced to depths greater than 3 feet, soil samples were collected directly from the excavator bucket. In this case, caution was taken to sample soils from the middle of the bucket rather than the soils in contact with the sides of the bucket. Care was also taken to document from which depth interval soil in the bucket was from.

Each test pit location was staked and labeled, and the location recorded using GPS.

Hand-Augered Soil Borings

Shallow soil borings were hand-augered to a depth of three feet using a decontaminated 3-inch diameter stainless steel hand auger. Soil samples were collected by emptying the auger into the stainless steel bowl. In locations where soils were too dense for penetration by the hand auger (quarry spalls), the exploration was advanced using the excavator or the probe drill rig; in these cases soil samples were collected using the methods described above for those exploration types.

Soil samples targeted for VOC analyses were collected in accordance with EPA Method 5035A prior to homogenization for the other samples. Each boring location was staked and labeled, and the location recorded using GPS.

Surface Soil Sampling

We collected surface soil samples using a decontaminated shovel where possible. Following removal of surface duff and vegetation, if present, discrete samples were collected from the upper 12 inches of soil and placed in a stainless steel bowl. In locations where soils were too dense for penetration by hand using a shovel (quarry spalls), the samples were collected using the excavator or the probe drill rig; in these cases soil samples were collected using the methods described above for those exploration types. Soil samples targeted for VOC analyses were collected in accordance with EPA Method 5035A prior to homogenization for the other analyses. Each surface soil sampling location were staked and labeled, and the location recorded using GPS.

Monitoring Well Installation and Development

Aspect Consulting subcontracted with Northwest Probe of Milton, Washington to install monitoring wells using hollow-stem auger methods. Northwest Probe's AMS PowerProbe 9630 drill rig is capable of drilling by both hollow-stem auger and direct push (Geoprobe) methods. A licensed geologist from Aspect Consulting was present throughout drilling and well installation and prepared a geologic and well construction log for each of the monitoring well borings drilled.

We initially drilled and sampled a soil boring using the rig's direct push capability. The geologic log was prepared using the continuous soil core information. Any soil sampling for chemical analysis during drilling of the monitoring well borings was done using the same methods as for direct push borings, described above.

We then overdrilled the boring location using a 4-inch inside diameter hollow stem auger to allow well construction. The monitoring wells were constructed in accordance with Chapter 173-160 WAC. The wells were constructed with 2-inch-diameter, threaded Schedule 40 PVC slotted screen and blank casing. Well screens were 0.020-inch slot (20-slot) and 10 feet in length. Well screen depths were determined based on the field conditions and the primary constituents of potential concern (COPC) for a specific REC. For example, in areas with petroleum hydrocarbons as the primary COPC, the associated monitoring wells were screened across the water table to detect evidence of free-phase petroleum if present. Screens were filter-packed with 10/20 silica sand, and an annular seal consisting of bentonite chips were placed above the filter pack. If drilling conditions prevent installation of a 2-inch-diameter filter-packed well, 1-inch-diameter pre-packed wells may be installed; this was done for installation of piezometer B-15.

A concrete surface seal was set at grade. The finished monitoring wells were protected with above-grade ("stick up") locking steel monuments, except in traffic areas where a steel flush-mount monument was used.

Following installation, each monitoring well was developed to remove fine-grained material from inside the well casing and filter pack, and to improve hydraulic communication between the well screen and the surrounding water-bearing formation. Well development was performed using a submersible electric pump gently surged across the entire length of the well screen. Each well was developed until visual turbidity was reduced to minimal levels, or until 10 casing volumes of water plus a volume equal to any water added during drilling was removed.

Groundwater Level Monitoring

After completion, the top-of-casing elevations for the new monitoring wells were surveyed to an accuracy of 0.01 foot by a licensed surveyor (Perteet Inc.) under contract to City of Everett. Depth-to-groundwater measurements were conducted in the wells using an electric well sounder, graduated to 0.01 foot.

Groundwater Sampling

Groundwater samples were collected with a peristaltic pump and dedicated downhole polyethylene tubing, following low-flow sampling techniques to minimize suspended solids in the samples. Prior to sample collection, the depth to water in the well was measured. The well was then purged at flow rates less than 0.5 liter per minute, and the field parameters temperature, pH, electrical conductance, dissolved oxygen, and oxidation-reduction potential (Eh) were monitored using a YSI meter and flow-through cell. These field parameters were recorded at 2 to 4 minute intervals throughout well purging until they stabilized. Stabilization is defined as three successive readings where the parameter values vary by less than 10% (or 0.5 mg/L dissolved oxygen if the readings are below 1 mg/L). However, no more than three well casing volumes were purged prior to groundwater sample collection. Once purging was complete, the groundwater samples were collected using the same low flow rate.

Sample Documentation and Handling Procedures

Field Documentation

While conducting field work, the field representative documented pertinent observations and events on field forms specific to each activity (e.g., boring log form, groundwater sampling form etc.) and/or in a field notebook, and, when warranted, photographed specific sampling locations. Field notes included a description of each field activity, sample descriptions, and associated details such as the date, time, and field conditions.

Sample Labeling and Nomenclature

Sample labels were filled out using indelible ink to indicate the sample number, date, preservative added, if any, and any pertinent comments.

Sample Handling

Upon collection, samples were placed upright in a cooler. Some samples were stored temporarily in a freezer on site. Blue ice was placed in each cooler going to the lab to meet sample preservation requirements. Samples were delivered to the analytical laboratory within 24 hours from sample collection to meet preservation requirements of EPA Method 5035A for soil VOC analysis.

Upon sample receipt, the laboratory documented sample delivery conditions. A designated sample custodian accepted custody of the shipped samples and verified that the chain of custody form matches the samples received. The laboratory notified as soon as possible the Aspect Consulting project manager of any issues noted with the sample shipment or custody.

Sample Custody

After collection, samples were maintained in Aspect Consulting's custody until formally transferred to a transport courier or the analytical laboratory. For purposes of this work, custody of the samples was defined as follows.

- In plain view of the field representatives;
- Inside a cooler that is in plain view of the field representative; or
- Inside any locked space such as a cooler, locker, car, or truck to which the field representative has the only immediately available key(s).

A chain of custody record provided by the laboratory was initiated at the time of sampling for all samples collected. The record was signed by the field representative and others who subsequently took custody of the sample. Couriers or other professional shipping representatives are not required to sign the chain of custody form if it is within a secured cooler. A copy of the chain of custody form with appropriate signatures was kept by Aspect Consulting's project manager, and a copy is provided with the laboratory's data report.

Decontamination and Investigative-Derived Waste

All non-disposable sampling equipment (stainless steel spoons, bowls, Geoprobe split barrel samplers, hand auger, and shovel) was decontaminated before collection of each sample. The decontamination sequence consisted of a scrub with a detergent (Alconox) solution, followed by tap water (potable) rinse, and finished with thorough spraying with deionized or distilled water. Decontamination water was discharged to the ground, because the sampling equipment was not observed to be grossly contaminated (e.g., no free-phase petroleum).

The hollow-stem auger sections and excavator bucket were decontaminated between each monitoring well boring or test pit location using a steam cleaner. Rinseate water generated from decontamination was discharged to the ground near the associated monitoring well or test pit because the equipment was not observed to be grossly contaminated (e.g., no free-phase petroleum).

Soil cuttings from hollow-stem auger (well) borings were placed on plastic sheeting and covered with plastic next to the exploration. The small volume of soil cuttings from the direct push borings were accumulated and placed in plastic garbage bags awaiting analytical data. Soil cuttings from borings with uncontaminated soil based on lab data were subsequently spread near the respective borings locations.

Excavated soils from each test pit were temporarily placed on the ground next to it during observation of subsurface conditions and presence of gross contamination. Because gross contamination of the cuttings was not observed in any test pit, the excavated soils were used to backfill the same test pit.

The development water and purge water from the Phase A monitoring wells was field screened for signs of contamination (odor, sheen, etc). Development and purge water showing no evidence of contamination was discharged to the ground near each well. Development and purge water from all monitoring wells on the Subject Property showed no evidence of contamination and was thus discharged to the ground near each well.

Table A-1 - Test Pit Descriptions

060050 - Everett, Washington

Location	Depth Intervals	Soil Description	Sample Depth Interval in Feet
TP-12	0 to 9.2	(Loose), moist, dark brown wood waste. Little to no creosote odor.	wood: 0 to 9.2
	9.2 to 10.8	(Dense), moist to wet, brown and gray, silghtly silty, sandy GRAVEL (crushed rock) with wood waste fragments in upper soil.	soil: 9.5 to 10.8
TP-13	0 to 10.5	(Loose), moist, dark brown wood waste including large timbers in upper 1.5 feet. Creosote staining and odor. Water seepage entering pit.	wood: 0 to 10.5
	10.5 to 10.9	(Dense), moist, gray, silghtly silty, sandy GRAVEL (crushed rock).	
	10.9 to 11.8	(Dense), moist to wet, gray, SAND with trace grvel.	soil: 10.9 to 11.8
TP-14	0 to 4.2	(Loose), moist, dark brown wood waste, decreasing size with depth. No creosote odor.	
	4.2 to 5.4	(Med dense), moist, gray, slightly silty, sandy GRAVEL with trace wood waste and crushed rock	soil: 4.2 to 5.4

Major Divisions		Fines	Symbol	Description
Coarse-Grained Soils - More than 50 %(1) Retained on No. 200 Sieve	Gravels - More than 50 %(1) of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines(5)	**GW**	Well-graded gravel and gravel with sand, little to no fines
			GP	Poorly-graded gravel and gravel with sand, little to no fines
		≥15% Fines(5)	**GM**	Silty gravel and silty gravel with sand
			GC	Clayey gravel and clayey gravel with sand
	Sands - 50 %(1) or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines(5)	**SW**	Well-graded sand and sand with gravel, little to no fines
			SP	Poorly-graded sand and sand with gravel, little to no fines
		≥15% Fines(5)	**SM**	Silty sand and silty sand with gravel
			SC	Clayey sand and clayey sand with gravel
Fine-Grained Soils - 50 %(1) or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50		**ML**	Silt, sandy silt, gravelly silt, silt with sand or gravel
			CL	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay
			OL	Organic clay or silt of low plasticity
	Silts and Clays Liquid Limit 50 or More		**MH**	Elastic silt, clayey silt, silt with micaceous or diatomaceous fine sand or silt
			CH	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel
			OH	Organic clay or silt of medium to high plasticity
Highly Organic Soils			**PT**	Peat, muck and other highly organic soils

Terms Describing Relative Density and Consistency

	Density	SPT(2) blows/foot
Coarse-Grained Soils	Very Loose	0 to 4
	Loose	4 to 10
	Medium Dense	10 to 30
	Dense	30 to 50
	Very Dense	>50
	Consistency	**SPT(2) blows/foot**
Fine-Grained Soils	Very Soft	0 to 2
	Soft	2 to 4
	Medium Stiff	4 to 8
	Stiff	8 to 15
	Very Stiff	15 to 30
	Hard	>30

Test Symbols

G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Chemical
DD = Dry Density
K = Permeability

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

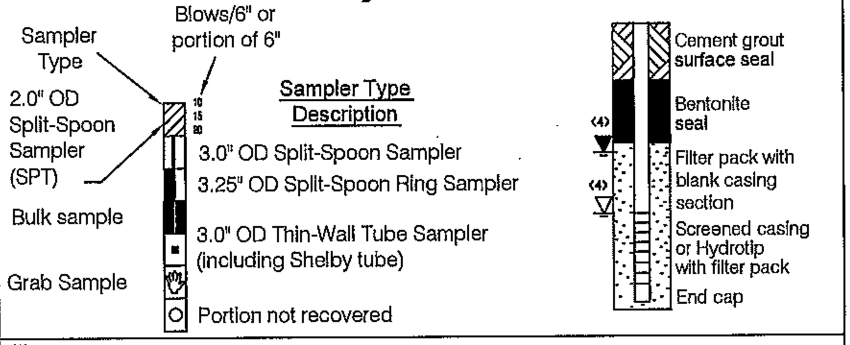
(3) Estimated Percentage

Percentage by Weight	Modifier
<5	Trace
5 to 15	Slightly (sandy, silty, clayey, gravelly)
15 to 30	Sandy, silty, clayey, gravelly)
34 to 49	Very (sandy, silty, clayey, gravelly)

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols



(1) Percentage by dry weight
(2) (SPT) Standard Penetration Test (ASTM D-1586)
(3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)
(4) Depth of groundwater ▼ ATD = At time of drilling
▽ Static water level (date)
(5) Combined USCS symbols used for fines between 5% and 15% as estimated in General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

J:_ACAD Standards\Drawings\Exploration Log Key.dwg

Aspect consulting
IN-DEPTH PERSPECTIVE

179 Madrone Lane North
Bainbridge Island, WA 98110
(206) 780-9370

811 First Avenue #480
Seattle, WA 98104
(206)-328-7443

Exploration Log Key

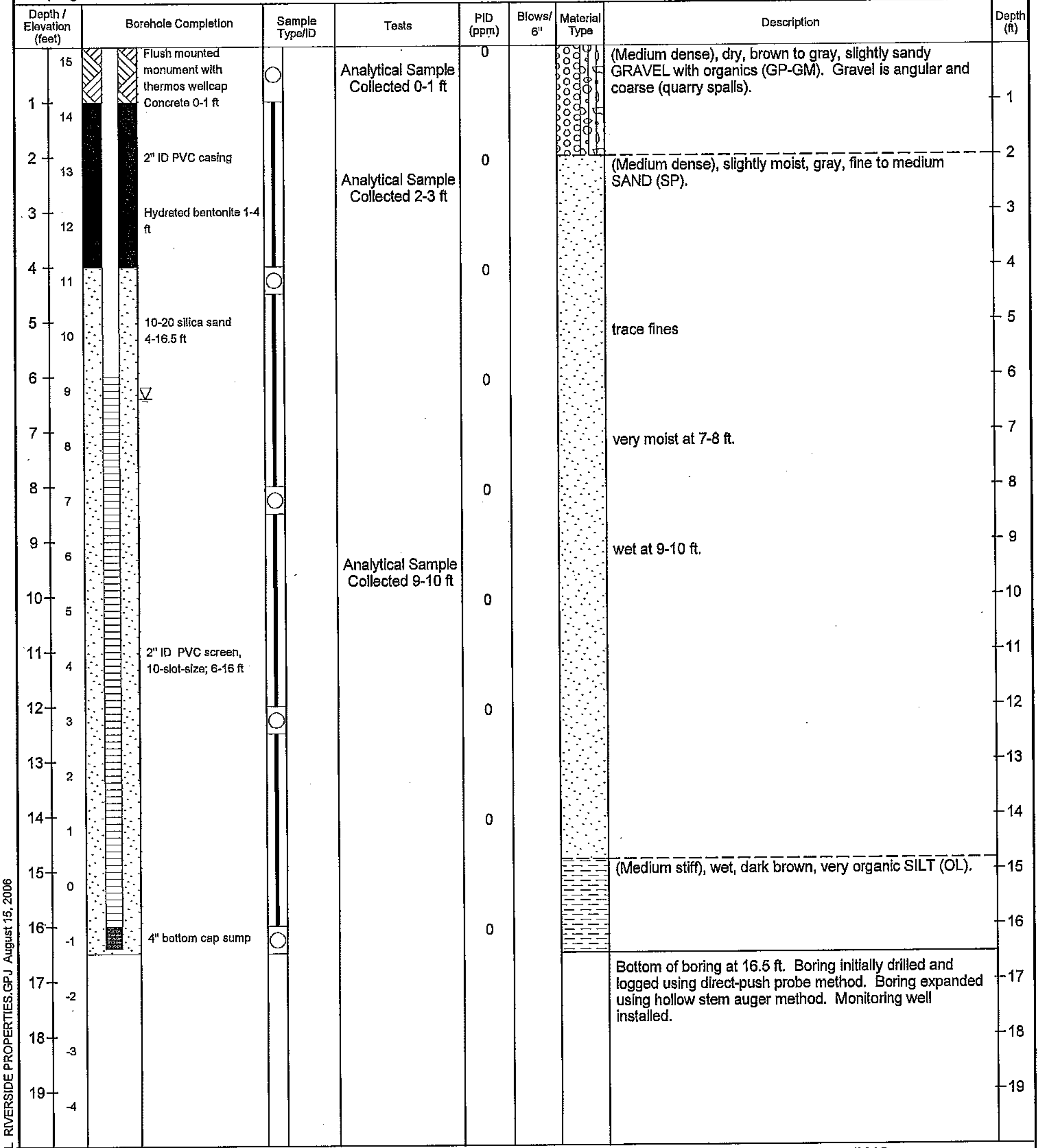
DATE:
DESIGNED BY:
DRAWN BY:
REVISED BY:
PROJECT NO.
FIGURE NO.
A-1

Aspectconsulting
IN-DEPTH PERSPECTIVE

Monitoring Well Construction Log

Project Number	Well Number	Sheet
060050	MW-1	1 of 1

Project Name: Riverside Properties
Location:
Driller/Method: Northwest Probe / Direct-Push Probe & Hollow Stem Auger
Sampling Method: Continuous Core
Ground Surface Elev (NAVD 88): 15.25
Top of Casing Elev. (NAVD 88): 14.80
Depth to Water (ft BGS):
Start/Finish Date: 6/27/2006



Depth / Elevation (feet)		Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
	15	Flush mounted monument with thermos wellcap Concrete 0-1 ft	○	Analytical Sample Collected 0-1 ft	0			(Medium dense), dry, brown to gray, slightly sandy GRAVEL with organics (GP-GM). Gravel is angular and coarse (quarry spalls).	
1	14								1
2	13	2" ID PVC casing		Analytical Sample Collected 2-3 ft	0			(Medium dense), slightly moist, gray, fine to medium SAND (SP).	2
3	12	Hydrated bentonite 1-4 ft							3
4	11		○		0				4
5	10	10-20 silica sand 4-16.5 ft						trace fines	5
6	9	⊽			0				6
7	8							very moist at 7-8 ft.	7
8	7		○		0				8
9	6			Analytical Sample Collected 9-10 ft				wet at 9-10 ft.	9
10	5				0				10
11	4	2" ID PVC screen, 10-slot-size; 6-16 ft							11
12	3		○		0				12
13	2								13
14	1				0				14
15	0							(Medium stiff), wet, dark brown, very organic SILT (OL).	15
16	-1	4" bottom cap sump	○		0				16
17	-2							Bottom of boring at 16.5 ft. Boring initially drilled and logged using direct-push probe method. Boring expanded using hollow stem auger method. Monitoring well installed.	17
18	-3								18
19	-4								19

Sampler Type:
○ No Recovery
▯ Continuous Core

PID - Photoionization Detector (Headspace Measurement)
▼ Static Water Level
⊽ Water Level (ATD)

Logged by: JWC
Approved by: SJG
Figure No. A - 2

MONITORING WELL RIVERSIDE PROPERTIES.GPJ August 15, 2006

Aspect consulting
IN-DEPTH PERSPECTIVE

Boring Log

Project Number	Boring Number	Sheet
060050	B-5	1 of 1

Project Name: Riverside Properties
Ground Surface Elev:
Location:
Driller/Method: Northwest Probe / Direct-Push Probe
Depth to Water (ft BGS):
Sampling Method: Continuous Core
Start/Finish Date: 6/29/2006

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Description	Depth (ft)
0		○		0		Asphalt	
1			Analytical Sample Collected 1-2 ft			Concrete (Medium dense), slightly moist, slightly silty, very sandy fine to coarse GRAVEL (GP-GM). Sand is fine-coarse.	1
2			Analytical Sample Collected 2-3 ft	0		(Medium dense), slightly moist, gray, fine to medium SAND (SP).	2
4	Backfilled with hydrated bentonite 0-12 ft	○		0			4
6	▽			0			6
7			Analytical Sample Collected 7-8 ft			(Medium stiff), wet, gray, very sandy SILT with organics (OL/SM).	7
8				0		(Medium dense), wet, gray, fine to coarse SAND with trace silt and gravel (SP/SW).	8
10				0			10
11						(Medium stiff), gray to brown, organic SILT with wood (OL/PT).	11
12				0		Bottom of boring at 12 ft. Backfilled with hydrated bentonite chips.	12
13							13
14							14
15							15
16							16
17							17
18							18
19							19

Sampler Type:
○ No Recovery
‖ Continuous Core

PID - Photoionization Detector (Headspace Measurement)
▼ Static Water Level
▽ Water Level (ATD)

Logged by: JWC
Approved by: SJG
Figure No. A - 3

Aspect consulting
IN-DEPTH PERSPECTIVE

Boring Log

Project Number	Boring Number	Sheet
060050	B-6	1 of 1

Project Name: Riverside Properties
Location:
Driller/Method: Northwest Probe / Direct-Push Probe
Sampling Method: Continuous Core
Ground Surface Elev:
Depth to Water (ft BGS):
Start/Finish Date: 6/29/2006

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
				0				
1			Analytical Sample Collected 0-1 ft				(Medium dense), dry, brown to gray, sandy GRAVEL with trace silt (GW). Gravel is angular and coarse (quarry spalls).	1
2				0			(Medium stiff), dry to slightly moist, slightly sandy SILT with organics (OL).	2
3			Analytical Sample Collected 2-3 ft				(Medium dense), slightly moist, gray, fine to medium SAND (SP).	3
4				0				4
5								5
6	Backfilled with hydrated bentonite 0-11 ft			0			wet at 6-7.5 ft.	6
7	∇							7
8			Analytical Sample Collected 7-8 ft	0			(Medium stiff) wet, gray and brown layererd organic SILT (OL) and PEAT (PT).	8
9							(Medium dense), wet, gray medium SAND (SP).	9
10				0				10
11				0			Bottom of boring at 11 ft. Backfilled with hydrated bentonite chips.	11
12								12
13								13
14								14
15								15
16								16
17								17
18								18
19								19

Sampler Type:
○ No Recovery
▯ Continuous Core

PID - Photoionization Detector (Headspace Measurement)
▼ Static Water Level
∇ Water Level (ATD)

Logged by: JWC
Approved by: SJG
Figure No. A - 4

APPENDIX B

Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN

This Quality Assurance Project Plan (QAPP) defines, in specific terms, the quality assurance (QA) and quality control (QC) objectives and functional activities associated with the analysis of soil and groundwater samples collected during this environmental characterization.

Analytical Laboratory

Friedman and Bruya Inc. (FBI) of Seattle, Washington, analyzed the samples collected during this characterization program. The contact information for the laboratory is:

Friedman and Bruya Inc.
3012 16th Avenue West
Seattle, Washington 98119-2029
(206) 285-8282
Fax: (206) 283-5044

Michael Erdahl was FBI's project manager for this project.

Analytical Methods and Reporting Limits

Laboratory analytical methods for soil and groundwater analyses performed during this environmental characterization were as follow:

Chemical Group	Analytical Method
Gasoline-range petroleum hydrocarbons	NWTPH-Gx
Diesel- and Oil-range petroleum hydrocarbons	NWTPH-Dx
Benzene, toluene, ethylbenzene, xylenes (BTEX)	EPA Method 5035A/EPA Method 8021
Volatile organic compounds (VOCs)	EPA Method 5035A/EPA Method 8260B
Semivolatile organic compounds (SVOCs)	EPA Method 8270C
Pentachlorophenol/Tetrachlorophenol	Canadian Pulp Method (water only)
Polycyclic aromatic hydrocarbons (PAHs, low-level)	EPA Method 8270SIM
Polychlorinated biphenyls (PCBs)	EPA Method 8082
Metals other than mercury	EPA Method 220.8 (ICP-MS)
Mercury	EPA Method 1631
Total dissolved solids (TDS)	Standard Method SM2540C
Total suspended solids (TSS)	Standard Method SM2540D

The laboratory typically achieved the reporting limits (RLs) and method detection limits (MDLs) presented in tables at the end of this appendix for the methods defined. The RL is defined as the lowest concentration at which a chemical can be accurately and reproducibly quantified, within specified limits of precision and accuracy, for a given environmental sample. The RL can vary from sample to sample depending on sample size, sample dilution, matrix interferences, moisture content, and other sample-specific conditions. The RLs usually correspond to the lowest calibration standard. The MDL is the minimum concentration of a compound that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero; MDLs are established by the laboratory using prepared samples, not samples of environmental media.

In general, the RLs for this project were below applicable MTCA screening criteria. For some VOC and SVOC parameters, it is not technically feasible to achieve RLs below screening levels. This was particularly true for cPAHs in samples where oil-range petroleum and/or biogenic organic matter (e.g., wood waste) was present.

Data Quality Indicators

Data quality indicators (DQIs), including precision, accuracy, representativeness, comparability, and completeness (PARCC parameters), and data RLs are dictated by the data quality objectives, project requirements, and intended uses of the data. For this project, the analytical data must be of sufficient technical quality to determine whether contaminants are present and, if present, whether their concentrations are above or below conservative MTCA screening criteria based on protection of human health and the environment.

An assessment of data quality is based upon quantitative (precision, accuracy, and completeness) and qualitative (representativeness and comparability) indicators. Definitions of these parameters and the applicable QC procedures are presented below.

Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared with their average values. Analytical precision is measured through matrix spike/matrix spike duplicate (MS/MSD) samples and laboratory control samples/laboratory control sample duplicate (LCS/LCSD) for organic analysis and through laboratory duplicate samples for inorganic analyses. Analytical precision is quantitatively expressed as the relative percent difference (RPD) between the LCS/LCSD, MS/MSD, or lab duplicate pairs. Analytical precision measurements were carried out at a minimum frequency of 1 per 20 samples or one per laboratory analysis group. Laboratory precision was evaluated against laboratory quantitative RPD performance criteria provided with the lab's analytical data report; a listing of the lab's current criteria is presented in the tables at the end of this appendix.

Accuracy

Accuracy measures the closeness of the measured value to the true value. The accuracy of chemical test results is assessed by "spiking" samples with known standards (surrogates, blank spikes, or matrix spikes) and establishing the average recovery. Accuracy measurements on MS samples were carried out at a minimum frequency of one in twenty samples per matrix analyzed. Blank spikes were analyzed at a minimum frequency of one in twenty samples per matrix analyzed. Surrogate recoveries were determined for each sample analyzed for organics. Laboratory accuracy were evaluated against the lab's quantitative matrix spike and surrogate spike recovery performance criteria as provided with the lab's analytical data report; a listing of the lab's current criteria is presented in tables at the end of this appendix.

Representativeness

Representativeness measures how closely the measured results reflect the actual concentration or distribution of the chemical compounds in the matrix sampled. The sampling plan design, sampling techniques, and sample handling protocols (e.g., homogenizing, storage, and preservation) have been developed to ensure representative samples.

For example, all soil and water samples to be analyzed for diesel-/oil-range petroleum hydrocarbons (NWTPH-Dx analysis) underwent silica gel cleanup as part of this analysis to reduce the chance for false positives due to analytical interference from natural, wood-related organic compounds (resulting from historical use).

Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. The use of standard techniques for both sample collection and laboratory analysis should make data collected comparable to internal data generated for this project as well as pre-existing analytical data that may exist.

Completeness

Completeness is defined as the percentage of measurements made that are judged to be valid measurements. Results were considered valid if all the precision, accuracy, and representativeness objectives are met and if RLs are sufficient for the intended uses of the data. The target completeness goal for this project is 95 percent.

Laboratory internal QC checks, preventive maintenance, and corrective action, as described in other sections of this document, were implemented to help meet the QA objectives established for these analyses.

Quality Control Procedures

Field and laboratory QC procedures are outlined below.

Field Quality Control

Beyond use of standard sampling protocols described in Appendix A, field QC procedures for this project consisted of the regular maintenance and calibration of field instrumentation (e.g., PID for evaluating presence of VOCs in soil samples, and the YSI meter for measuring field parameters during groundwater sampling) in accordance with manufacturer recommendations prior to use

Laboratory Quality Control

The laboratory's QA officers are responsible for ensuring that the laboratory implements all routine internal QC and QA procedures.

The laboratory QC procedures used for this project consisted of the following at a minimum:

- Instrument calibration and standards as defined in the laboratory standard operating procedures (SOPs);
- Laboratory blank measurements at a minimum frequency of 5 percent or one per twenty samples; and
- Accuracy and precision measurements as defined above, at a minimum frequency of 5 percent or one per twenty samples per matrix.

Corrective Actions

If routine QC audits by the laboratory result in detection of unacceptable conditions or data, actions specified in the laboratory SOPs were taken. Specific corrective actions are outlined in each SOP used and can include the following:

- Identifying the source of the violation;
- Reanalyzing samples if holding time criteria permit;
- Resampling and analyzing;
- Evaluating and amending sampling and analytical procedures; and/or
- Accepting but qualifying data to indicate the level of uncertainty.

If unacceptable conditions occur, the laboratory contacted Aspect Consulting's project manager to discuss the issues and determine the appropriate corrective action. The primary corrective action taken was multiple reanalyses in an attempt to get the analysis QC parameters within control limits for low-level PAHs in matrices containing oil and/or wood-related natural organic matter. The outcome was that acceptable QC could be achieved only with sample dilution, with corresponding elevated PAH reporting limits, in several soil samples.

Data Reduction, Quality Review, and Reporting

All data will undergo two levels of QA/QC evaluation: one at the laboratory and one by a validator independent of the laboratory. Initial data reduction, evaluation, and reporting at the laboratory were carried out as described in the appropriate analytical protocols. Quality control data resulting from methods and procedures described in this document will also be reported.

Minimum Data Reporting Requirements

The following sections describe the minimum data reporting requirements necessary to allow proper QA/QC reporting.

Sample Receipt. Cooler receipt forms were filled out for all sample shipments to document problems in sample packaging, chain of custody, and sample preservation.

Reporting. For each analytical method run, analytes for each sample were reported as a detected concentration or as less than the specific reporting limit (RL). Solid data were reported on a dry weight basis except that from gas chromatograph-mass spectrometry (GC-MS) methods (EPA Method 8260 and EPA Method 8270). The laboratory reported dilution factors for each sample as well as date of extraction (if applicable), date of analysis, extraction method, any cleanup methods performed, and confirmation results where required.

Internal Quality Control Reporting. Internal quality control samples were analyzed at the rates specified in the applicable analytical method.

- **Laboratory Method Blanks.** Analytes were reported for each laboratory blank. Non-blank sample results were designated as corresponding to a particular laboratory blank in terms of analytical batch processing.
- **Surrogate Spike Samples.** Surrogate spike recoveries were reported with organic reports where appropriate. The report also specified the control limits for surrogate spike results as well as the spiking concentration. Spike recoveries outside of specified control limits (as defined in the laboratory SOP) resulted in the sample being rerun.
- **Matrix Spike Samples.** Matrix spike recoveries were reported for organic and inorganic analyses. General sample results were designated as corresponding to a particular matrix spike sample. The report indicated which sample was spiked and the spike concentration. The report also specified the control limits for matrix spike results for each method and matrix. Spike recoveries outside of specified control limits (as defined in the laboratory SOP) resulted in the sample being rerun.
- **Laboratory Duplicate and/or Matrix Spike Duplicate Pairs.** Relative percent differences were reported for duplicate pairs relative to analyte/matrix-specific control limits defined in the laboratory SOP.
- **Laboratory Control Samples (LCS).** LCS recoveries were reported for organic analyses. LCS results and control limits were reported with the corresponding sample data.

Data Quality Review

Reported analytical results were qualified by the laboratory to identify QC concerns in accordance with the specifications of the analytical methods. In some cases, additional laboratory data qualifiers were reported by the laboratory to more completely explain QC concerns regarding a particular sample result (e.g., X flag for petroleum results not indicative of a specific product, yet quantitating in that carbon range). All additional data qualifiers were defined in the laboratory's narrative reports associated with each case.

Aspect Consulting prepared an independent data quality review for all analytical data generated for this project. The data quality review was performed in generally accordance with EPA National Functional Guidelines for organics and inorganic analyses and laboratory-defined QC limits, with regard to the following, as appropriate to the particular analysis:

- Sample documentation/custody;

- Holding times;
- Method and trip blanks (representativeness);
- Reporting limits;
- Blank spike, matrix spike, and surrogate percent recoveries (accuracy);
- Laboratory duplicate pair RPDs (precision);
- Comparability; and
- Completeness.

Preventative Maintenance Procedures and Schedules

Preventative maintenance in the laboratory is the responsibility of the laboratory personnel and analysts. This maintenance includes routine care and cleaning of instruments, and inspection and monitoring of carrier gases, solvents, and glassware used in analyses. Details of the maintenance procedures are addressed in the respective laboratory SOPs.

Precision and accuracy data are examined for trends and excursions beyond control limits to determine evidence of instrument malfunction. Maintenance were performed when an instrument begins to change as indicated by the degradation of peak resolution, shift in calibration curves, decrease in sensitivity, or failure to meet one or another of the method-specific QC criteria.

Performance and System Audits

The Aspect Consulting project manager has responsibility for performance of the laboratory QA program. This was achieved through regular contact with the analytical laboratory's project manager. To ensure comparable data, all samples of a given matrix to be analyzed by each specified analytical method were processed consistently by the same analytical laboratory.

Gasoline Range Organics (Purgable TPH) Analysis

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 8015M / NWTPH-Gx								
NA	TPH as Gasoline	Soil	ug/g	2	0.469	20	57-136	50-143
460-00-4	4-Bromofluorobenzene	Soil	%	s	NA	NA	58-139	58-139
Method 8015M / NWTPH-Gx								
NA	TPH as Gasoline	Water	ug/L	100	12.5	20	62-128	53-117
460-00-4	4-Bromofluorobenzene	Water	%	s	NA	NA	51-134	51-134
Method AK101								
NA	GRO	Soil	ug/g	2	0.469	20	60-120 m	60-140 m
460-00-4	4-Bromofluorobenzene	Soil	%	s	NA	NA	50-150 m	50-150 m
Method AK101								
NA	GRO	Water	ug/L	100	12.5	20	60-120 m	75-125 m
460-00-4	4-Bromofluorobenzene	Water	%	s	NA	NA	50-150 m	50-150 m

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.
s - Surrogate compound
m - Method specified value

Diesel Range Organics (Extractable TPH) Analysis
GC4

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 8015M / NWTPH-Dx								
NA	TPH as Diesel (low)	Soil	ug/g	10	1.62	20	69-142	82-133
NA	TPH as Diesel (high)	Soil	ug/g	50	4.7	20	69-142	82-133
84-15-1	o-Terphenyl	Soil	%	s	NA	NA	67-127	67-127
Method 8015M / NWTPH-Dx								
NA	TPH as Diesel	Water	ug/L	50	13.6	20	74-139	50-150
84-15-1	o-Terphenyl	Water	%	s	NA	NA	51-132	51-132
Method AK102								
NA	DRO	Soil	ug/g	10	1.62	20	75-125 m	60-140 m
84-15-1	o-Terphenyl	Soil	%	s	NA	NA	60-120 m	60-120 m
Method AK102								
NA	DRO	Water	ug/L	50	13.6	20	75-125 m	75-125 m
84-15-1	o-Terphenyl	Water	%	s	NA	NA	60-120 m	60-120 m
Method AK103								
NA	RRO	Soil	ug/g	50	4.22	20	60-120 m	60-140 m
84-15-1	Triacontane	Soil	%	s	NA	NA	60-120 m	60-120 m

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.
s - Surrogate compound
m - Method specified value

Diesel Range Organics (Extractable TPH) Analysis
GC6

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 8015M / NWTPH-Dx								
NA	TPH as Diesel (low)	Soil	ug/g	10	1.62	20	71-130	71-137
NA	TPH as Diesel (high)	Soil	ug/g	50	4.7	20	71-130	71-137
84-15-1	o-Terphenyl	Soil	%	s	NA	NA	53-144	53-144
Method 8015M / NWTPH-Dx								
NA	TPH as Diesel	Water	ug/L	50	13.6	20	74-143	50-150
84-15-1	o-Terphenyl	Water	%	s	NA	NA	52-134	52-134
Method AK102								
NA	DRO	Soil	ug/g	10	1.62	20	75-125 m	60-140 m
84-15-1	o-Terphenyl	Soil	%	s	NA	NA	60-120 m	60-120 m
Method AK102								
NA	DRO	Water	ug/L	50	13.6	20	75-125 m	75-125 m
84-15-1	o-Terphenyl	Water	%	s	NA	NA	60-120 m	60-120 m
Method AK103								
NA	RRO	Soil	ug/g	50	4.22	20	60-120 m	60-140 m
84-15-1	Triacontane	Soil	%	s	NA	NA	60-120 m	60-120 m

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.
s - Surrogate compound
m - Method specified value

Purgable Aromatic Hydrocarbons Analysis

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 8021 (BTEX MTBE)								
71-43-2	Benzene	Soil	ug/g	0.02	0.00508	20	52-123	50-150
108-88-3	Toluene	Soil	ug/g	0.02	0.00971	20	61-123	50-150
100-41-4	Ethylbenzene	Soil	ug/g	0.02	0.00573	20	58-123	50-150
95-47-6 10	Total Xylenes	Soil	ug/g	0.06	0.0186	20	57-122	50-150
1634-04-4	Methyl t-butyl ether (MT	Soil	ug/g	0.02	0.00808	20	70-130	50-150
460-00-4	4-Bromofluorobenzene	Soil	%	s	NA	NA	50-132	50-132
Method 8021 (BTEX MTBE)								
71-43-2	Benzene	Water	ug/L	1	0.313	20	69-119	50-150
108-88-3	Toluene	Water	ug/L	1	0.232	20	70-122	50-150
100-41-4	Ethylbenzene	Water	ug/L	1	0.716	20	78-112	50-150
95-47-6 10	Total Xylenes	Water	ug/L	3	1.24	20	74-112	50-150
1634-04-4	Methyl t-butyl ether (MT	Water	ug/L	5	0.447	20	70-130	50-150
460-00-4	4-Bromofluorobenzene	Water	%	s	NA	NA	52-124	52-124
Method AK 101 (BTEX)								
71-43-2	Benzene	Soil	ug/g	0.02	0.00508	20	60-120 m	60-140 m
108-88-3	Toluene	Soil	ug/g	0.02	0.00971	20	60-120 m	60-140 m
100-41-4	Ethylbenzene	Soil	ug/g	0.02	0.00573	20	60-120 m	60-140 m
95-47-6 10	Total Xylenes	Soil	ug/g	0.06	0.0186	20	60-120 m	60-140 m
460-00-4	4-Bromofluorobenzene	Soil	%	s	NA	NA	50-150 m	50-150 m
Method AK 101 (BTEX)								
71-43-2	Benzene	Water	ug/L	1	0.313	20	60-120 m	75-125 m
108-88-3	Toluene	Water	ug/L	1	0.232	20	60-120 m	75-125 m
100-41-4	Ethylbenzene	Water	ug/L	1	0.716	20	60-120 m	75-125 m
95-47-6 10	Total Xylenes	Water	ug/L	3	1.24	20	60-120 m	75-125 m
460-00-4	4-Bromofluorobenzene	Water	%	s	NA	NA	50-150 m	50-150 m

Notes:

RL – Method Reporting Limit

MDL – Method Detection Limit

RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.

s - Surrogate compound

m - Method specified value

Volatile Organic Compounds (VOC's) Analysis

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 8260B Methanol Extraction (Volatile Organics)								
630-20-6	1,1,1,2-Tetrachloroethane	Soil	ug/g	0.05	0.0126	20	78-127	66-128
71-55-6	1,1,1-Trichloroethane	Soil	ug/g	0.05	0.00254	20	69-128	57-132
79-34-5	1,1,2,2-Tetrachloroethane	Soil	ug/g	0.05	0.00287	20	67-138	60-143
79-00-5	1,1,2-Trichloroethane	Soil	ug/g	0.05	0.0047	20	75-127	63-135
75-34-3	1,1-Dichloroethane	Soil	ug/g	0.05	0.0027	20	72-121	62-127
75-35-4	1,1-Dichloroethene	Soil	ug/g	0.05	0.00941	20	64-132	41-128
563-58-6	1,1-Dichloropropene	Soil	ug/g	0.05	0.00508	20	71-122	63-126
87-61-6	1,2,3-Trichlorobenzene	Soil	ug/g	0.05	0.00337	20	70-130	50-150
96-18-4	1,2,3-Trichloropropane	Soil	ug/g	0.05	0.00283	20	68-126	62-132
120-82-1	1,2,4-Trichlorobenzene	Soil	ug/g	0.05	0.00571	20	70-130	50-150
95-63-6	1,2,4-Trimethylbenzene	Soil	ug/g	0.05	0.00219	20	70-130	50-150
96-12-8	1,2-Dibromo-3-chloropropane	Soil	ug/g	0.05	0.0184	20	52-144	40-154
106-93-4	1,2-Dibromoethane (EDB)	Soil	ug/g	0.05	0.00168	20	73-131	66-134
95-50-1	1,2-Dichlorobenzene	Soil	ug/g	0.05	0.00293	20	70-130	50-150
107-06-2	1,2-Dichloroethane (EDC)	Soil	ug/g	0.05	0.00211	20	67-137	62-127
78-87-5	1,2-Dichloropropane	Soil	ug/g	0.05	0.00363	20	73-126	64-128
108-67-8	1,3,5-Trimethylbenzene	Soil	ug/g	0.05	0.00181	20	70-130	50-150
541-73-1	1,3-Dichlorobenzene	Soil	ug/g	0.05	0.00392	20	70-130	50-150
142-28-9	1,3-Dichloropropane	Soil	ug/g	0.05	0.00203	20	75-127	66-130
106-46-7	1,4-Dichlorobenzene	Soil	ug/g	0.05	0.00283	20	70-130	50-150
594-20-7	2,2-Dichloropropane	Soil	ug/g	0.05	0.0079	20	49-146	25-147
78-93-3	2-Butanone (MEK)	Soil	ug/g	0.5	0.0136	20	70-130	50-150
95-49-8	2-Chlorotoluene	Soil	ug/g	0.05	0.00149	20	70-130	50-150
591-78-6	2-Hexanone	Soil	ug/g	0.5	0.00433	20	70-130	50-150
106-43-4	4-Chlorotoluene	Soil	ug/g	0.05	0.00247	20	70-130	50-150
108-10-1	4-Methyl-2-pentanone	Soil	ug/g	0.5	0.0181	20	70-130	50-150
67-64-1	Acetone	Soil	ug/g	0.5	0.0462	20	70-130	50-150
71-43-2	Benzene	Soil	ug/g	0.03	0.00175	20	71-119	60-124
108-86-1	Bromobenzene	Soil	ug/g	0.05	0.00256	20	70-130	50-150
75-27-4	Bromodichloromethane	Soil	ug/g	0.05	0.00336	20	72-113	41-131
75-25-2	Bromoform	Soil	ug/g	0.05	0.00422	20	70-130	47-146
74-83-9	Bromomethane	Soil	ug/g	0.05	0.00818	20	70-130	50-150
56-23-5	Carbon Tetrachloride	Soil	ug/g	0.05	0.00448	20	62-131	51-133
108-90-7	Chlorobenzene	Soil	ug/g	0.05	0.00268	20	77-122	68-123
75-00-3	Chloroethane	Soil	ug/g	0.05	0.0134	20	70-130	50-150
67-66-3	Chloroform	Soil	ug/g	0.05	0.00511	20	73-124	64-128
74-87-3	Chloromethane	Soil	ug/g	0.05	0.00444	20	70-130	50-150
540-59-0	cis-1,2-Dichloroethene	Soil	ug/g	0.05	0.00585	20	73-131	43-148
10061-01-	cis-1,3-Dichloropropene	Soil	ug/g	0.05	0.00297	20	72-135	56-138
124-48-1	Dibromochloromethane	Soil	ug/g	0.05	0.0048	20	72-132	42-142
74-95-3	Dibromomethane	Soil	ug/g	0.05	0.00637	20	79-124	62-136
75-45-6	Dichlorodifluoromethane	Soil	ug/g	0.05	0.00859	20	70-130	50-150
100-41-4	Ethylbenzene	Soil	ug/g	0.05	0.00254	20	70-130	50-150

87-68-3	Hexachlorobutadiene	Soil	ug/g	0.05	0.0151	20	69-130	59-137
98-82-8	Isopropylbenzene	Soil	ug/g	0.05	0.00247	20	70-130	50-150
108-38-3 1	m,p-Xylene	Soil	ug/g	0.1	0.00526	20	70-130	50-150
75-09-2	Methylene chloride	Soil	ug/g	0.5	0.0431	20	64-121	36-128
91-20-3	Naphthalene	Soil	ug/g	0.05	0.00217	20	70-130	50-150
103-65-1	n-Propylbenzene	Soil	ug/g	0.05	0.00383	20	70-130	50-150
95-47-6	o-Xylene	Soil	ug/g	0.05	0.00323	20	70-130	50-150
99-87-6	p-Isopropyltoluene	Soil	ug/g	0.05	0.00404	20	70-130	50-150
135-98-8	sec-Butylbenzene	Soil	ug/g	0.05	0.00453	20	70-130	50-150
100-42-5	Styrene	Soil	ug/g	0.05	0.00252	20	70-130	50-150
98-06-6	tert-Butylbenzene	Soil	ug/g	0.05	0.0032	20	70-130	50-150
127-18-4	Tetrachloroethene	Soil	ug/g	0.05	0.00299	20	70-130	62-132
108-88-3	Toluene	Soil	ug/g	0.05	0.00237	20	73-130	60-129
540-59-0	trans-1,2-Dichloroethene	Soil	ug/g	0.05	0.00222	20	67-115	40-134
10061-02-	trans-1,3-Dichloropropene	Soil	ug/g	0.05	0.00424	20	75-136	58-138
79-01-6	Trichloroethene	Soil	ug/g	0.03	0.0085	20	70-122	63-123
75-69-4	Trichlorofluoromethane	Soil	ug/g	0.05	0.00999	20	70-130	50-150
75-01-4	Vinyl chloride	Soil	ug/g	0.05	0.00621	20	70-130	50-150
1868-53-7	Dibromofluoromethane	Soil	%	s	NA	NA	51-134	51-134
17060-07-	1,2-Dichloroethane-d4	Soil	%	s	NA	NA	51-137	51-137
2037-26-5	Toluene-d8	Soil	%	s	NA	NA	54-139	54-139
460-00-4	4-Bromofluorobenzene	Soil	%	s	NA	NA	42-164	42-164

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.
s - Surrogate compound

Volatile Organic Compounds (VOC's) Analysis

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 8260B (Volatile Organics)								
630-20-6	1,1,1,2-Tetrachloroethane	Water	ug/L	1	0.062	20	81-126	78-123
71-55-6	1,1,1-Trichloroethane	Water	ug/L	1	0.0735	20	78-127	63-134
79-34-5	1,1,2,2-Tetrachloroethane	Water	ug/L	1	0.062	20	80-134	56-151
79-00-5	1,1,2-Trichloroethane	Water	ug/L	1	0.0867	20	77-125	62-137
75-34-3	1,1-Dichloroethane	Water	ug/L	1	0.0654	20	81-117	67-126
75-35-4	1,1-Dichloroethene	Water	ug/L	1	0.18	20	53-135	49-130
563-58-6	1,1-Dichloropropene	Water	ug/L	1	0.0967	20	66-121	76-122
87-61-6	1,2,3-Trichlorobenzene	Water	ug/L	1	0.297	20	70-130	50-150
96-18-4	1,2,3-Trichloropropane	Water	ug/L	1	0.0702	20	77-122	51-144
120-82-1	1,2,4-Trichlorobenzene	Water	ug/L	1	0.107	20	70-130	50-150
95-63-6	1,2,4-Trimethylbenzene	Water	ug/L	1	0.1228	20	70-130	50-150
96-12-8	1,2-Dibromo-3-chloropropane	Water	ug/L	1	0.134	20	85-130	33-150
106-93-4	1,2-Dibromoethane (EDB)	Water	ug/L	1	0.0883	20	77-131	61-139
95-50-1	1,2-Dichlorobenzene	Water	ug/L	1	0.0508	20	70-130	50-150
107-06-2	1,2-Dichloroethane (EDC)	Water	ug/L	1	0.0526	20	67-137	56-137
78-87-5	1,2-Dichloropropane	Water	ug/L	1	0.0778	20	79-122	75-121
108-67-8	1,3,5-Trimethylbenzene	Water	ug/L	1	0.065	20	70-130	50-150
541-73-1	1,3-Dichlorobenzene	Water	ug/L	1	0.0722	20	70-130	50-150
142-28-9	1,3-Dichloropropane	Water	ug/L	1	0.0885	20	80-124	63-134
106-46-7	1,4-Dichlorobenzene	Water	ug/L	1	0.0639	20	70-130	50-150
594-20-7	2,2-Dichloropropane	Water	ug/L	1	0.126	20	62-140	17-159
78-93-3	2-Butanone (MEK)	Water	ug/L	10	0.234	20	70-130	50-150
95-49-8	2-Chlorotoluene	Water	ug/L	1	0.12	20	70-130	50-150
591-78-6	2-Hexanone	Water	ug/L	10	0.0864	20	70-130	50-150
106-43-4	4-Chlorotoluene	Water	ug/L	1	0.0766	20	70-130	50-150
108-10-1	4-Methyl-2-pentanone	Water	ug/L	10	0.0597	20	70-130	50-150
67-64-1	Acetone	Water	ug/L	10	0.556	20	70-130	50-150
71-43-2	Benzene	Water	ug/L	1	0.0787	20	74-123	76-112
108-86-1	Bromobenzene	Water	ug/L	1	0.0757	20	70-130	50-150
75-27-4	Bromodichloromethane	Water	ug/L	1	0.0573	20	74-111	70-114
75-25-2	Bromoform	Water	ug/L	1	0.0433	20	65-138	52-140
74-83-9	Bromomethane	Water	ug/L	1	0.539	20	70-130	50-150
56-23-5	Carbon Tetrachloride	Water	ug/L	1	0.0508	20	71-132	55-138
108-90-7	Chlorobenzene	Water	ug/L	1	0.0695	20	82-118	85-112
75-00-3	Chloroethane	Water	ug/L	1	0.231	20	70-130	50-150
67-66-3	Chloroform	Water	ug/L	1	0.0664	20	81-119	75-124
74-87-3	Chloromethane	Water	ug/L	1	0.107	20	70-130	50-150
540-59-0	cis-1,2-Dichloroethene	Water	ug/L	1	0.094	20	77-124	83-112
10061-01-	cis-1,3-Dichloropropene	Water	ug/L	1	0.046	20	79-134	67-125
124-48-1	Dibromochloromethane	Water	ug/L	1	0.065	20	71-132	78-114
74-95-3	Dibromomethane	Water	ug/L	1	0.11	20	82-123	56-141
75-45-6	Dichlorodifluoromethane	Water	ug/L	1	0.0949	20	70-130	50-150
100-41-4	Ethylbenzene	Water	ug/L	1	0.405	20	70-130	50-150

87-68-3	Hexachlorobutadiene	Water	ug/L	1	0.175	20	65-135	51-141
98-82-8	Isopropylbenzene	Water	ug/L	1	0.0671	20	70-130	50-150
108-38-3 1	m,p-Xylene	Water	ug/L	2	0.184	20	70-130	50-150
75-09-2	Methylene chloride	Water	ug/L	12	5.56	20	60-123	66-126
103-65-1	Naphthalene	Water	ug/L	1	0.104	20	70-130	50-150
91-20-3	n-Propylbenzene	Water	ug/L	1	0.0877	20	70-130	50-150
95-47-6	o-Xylene	Water	ug/L	1	0.0557	20	70-130	50-150
99-87-6	p-Isopropyltoluene	Water	ug/L	1	0.0877	20	70-130	50-150
135-98-8	sec-Butylbenzene	Water	ug/L	1	0.102	20	70-130	50-150
100-42-5	Styrene	Water	ug/L	1	0.0601	20	70-130	50-150
98-06-6	tert-Butylbenzene	Water	ug/L	1	0.0741	20	70-130	50-150
127-18-4	Tetrachloroethene	Water	ug/L	1	0.157	20	75-120	71-128
108-88-3	Toluene	Water	ug/L	1	0.106	20	72-128	69-129
540-59-0	trans-1,2-Dichloroethene	Water	ug/L	1	0.169	20	66-115	67-104
10061-02-6	trans-1,3-Dichloropropene	Water	ug/L	1	0.04	20	80-134	63-136
79-01-6	Trichloroethene	Water	ug/L	1	0.171	20	75-121	75-117
75-69-4	Trichlorofluoromethane	Water	ug/L	1	0.159	20	70-130	50-150
75-01-4	Vinyl chloride	Water	ug/L	1	0.163	20	70-130	50-150
1868-53-7	Dibromofluoromethane	Water	%	s	NA	NA	75-125	75-125
17060-07-0	1,2-Dichloroethane-d4	Water	%	s	NA	NA	67-133	67-133
2037-26-5	Toluene-d8	Water	%	s	NA	NA	79-129	79-129
460-00-4	4-Bromofluorobenzene	Water	%	s	NA	NA	76-145	76-145

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.
s - Surrogate compound

Semivolatile Organic Compounds (SVOC's) Analysis

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 8270C (Semivolatile Organics)								
120-82-1	1,2,4-Trichlorobenzene	Soil	ug/g	0.03	0.0139	20	50-106	50-150
95-50-1	1,2-Dichlorobenzene	Soil	ug/g	0.03	0.0145	20	49-113	50-150
541-73-1	1,3-Dichlorobenzene	Soil	ug/g	0.03	0.013	20	46-111	50-150
106-46-7	1,4-Dichlorobenzene	Soil	ug/g	0.03	0.0138	20	47-112	18-122
95-95-4	2,4,5-Trichlorophenol	Soil	ug/g	0.3	0.111	20	71-111	50-150
88-06-2	2,4,6-Trichlorophenol	Soil	ug/g	0.3	0.13	20	44-119	50-150
120-83-2	2,4-Dichlorophenol	Soil	ug/g	0.3	0.116	20	72-98	50-150
105-67-9	2,4-Dimethylphenol	Soil	ug/g	0.3	0.0867	20	40-95	50-150
51-28-5	2,4-Dinitrophenol	Soil	ug/g	0.45	0.221	20	63-137	50-150
121-14-2	2,4-Dinitrotoluene	Soil	ug/g	0.03	0.0101	20	53-125	50-150
606-20-2	2,6-Dinitrotoluene	Soil	ug/g	0.03	0.0119	20	47-121	50-150
91-58-7	2-Chloronaphthalene	Soil	ug/g	0.03	0.0136	20	50-109	50-150
95-57-8	2-Chlorophenol	Soil	ug/g	0.3	0.124	20	47-107	33-115
91-57-6	2-Methylnaphthalene	Soil	ug/g	0.03	0.0132	20	50-109	50-150
95-48-7	2-Methylphenol	Soil	ug/g	0.3	0.104	20	55-100	50-150
88-74-4	2-Nitroaniline	Soil	ug/g	0.03	0.0106	20	80-111	50-150
88-75-5	2-Nitrophenol	Soil	ug/g	0.3	0.0769	20	58-103	50-150
99-09-2	3-Nitroaniline	Soil	ug/g	0.03	0.00628	20	27-136	50-150
534-52-1	4,6-Dinitro-2-methylphenol	Soil	ug/g	0.3	0.104	20	76-112	50-150
101-55-3	4-Bromophenyl phenyl ether	Soil	ug/g	0.03	0.014	20	50-118	50-150
59-50-7	4-Chloro-3-methylphenol	Soil	ug/g	0.3	0.112	20	46-123	29-115
106-47-8	4-Chloroaniline	Soil	ug/g	0.3	0.0829	20	10-90	50-150
7005-72-3	4-Chlorophenyl phenyl ether	Soil	ug/g	0.03	0.0147	20	52-119	50-150
106-44-5	4-Methylphenol	Soil	ug/g	0.3	0.0971	20	43-104	50-150
100-01-6	4-Nitroaniline	Soil	ug/g	0.03	0.0112	20	71-148	50-150
100-02-7	4-Nitrophenol	Soil	ug/g	0.3	0.107	20	27-136	10-123
83-32-9	Acenaphthene	Soil	ug/g	0.03	0.0149	20	49-110	54-110
208-96-8	Acenaphthylene	Soil	ug/g	0.03	0.0137	20	51-113	50-150
120-12-7	Anthracene	Soil	ug/g	0.03	0.0112	20	51-105	50-150
56-55-3	Benz(a)anthracene	Soil	ug/g	0.03	0.0133	20	47-113	50-150
50-32-8	Benzo(a)pyrene	Soil	ug/g	0.03	0.00566	20	48-113	50-150
205-99-2	Benzo(b)fluoranthene	Soil	ug/g	0.06	0.0157	20	44-116	50-150
191-24-2	Benzo(g,h,i)perylene	Soil	ug/g	0.03	0.00585	20	51-135	50-150
207-08-9	Benzo(k)fluoranthene	Soil	ug/g	0.06	0.0183	20	54-130	50-150
65-85-0	Benzoic acid	Soil	ug/g	3	0.315	20	64-134	50-150
100-51-6	Benzyl alcohol	Soil	ug/g	0.03	0.0107	20	73-108	50-150
111-44-4	Bis(2-chloroethoxy)methane	Soil	ug/g	0.03	0.0124	20	62-99	50-150
54460-96-7	Bis(2-chloroethyl) ether	Soil	ug/g	0.03	0.0129	20	28-166	50-150
117-81-7	Bis(2-chloroisopropyl) ether	Soil	ug/g	0.03	0.0146	20	48-107	50-150
85-68-7	Bis(2-ethylhexyl) phthalate	Soil	ug/g	0.06	0.0237	20	58-119	50-150
86-74-8	Carbazole	Soil	ug/g	0.06	0.0158	20	47-155	50-150
218-01-9	Chrysene	Soil	ug/g	0.03	0.0135	20	45-108	50-150
84-74-2	Dibenz(a,h)anthracene	Soil	ug/g	0.06	0.0202	20	71-126	50-150

117-84-0	Dibenzofuran	Soil	ug/g	0.06	0.0182	20	76-97	50-150
53-70-3	Diethyl phthalate	Soil	ug/g	0.03	0.0057	20	51-117	50-150
132-64-9	Dimethyl phthalate	Soil	ug/g	0.03	0.0152	20	49-117	50-150
84-66-2	Di-n-butyl phthalate	Soil	ug/g	0.03	0.0134	20	54-111	50-150
131-11-3	Di-n-octyl phthalate	Soil	ug/g	0.03	0.0137	20	41-144	50-150
206-44-0	Fluoranthene	Soil	ug/g	0.03	0.0125	20	50-108	50-150
86-73-7	Fluorene	Soil	ug/g	0.03	0.0143	20	53-113	50-150
118-74-1	Hexachlorobenzene	Soil	ug/g	0.03	0.0133	20	51-110	50-150
87-68-3	Hexachlorobutadiene	Soil	ug/g	0.03	0.0141	20	50-108	50-150
77-47-4	Hexachlorocyclopentadiene	Soil	ug/g	0.03	0.0057	20	37-113	50-150
67-72-1	Hexachloroethane	Soil	ug/g	0.03	0.0143	20	48-110	50-150
193-39-5	Indeno(1,2,3-cd)pyrene	Soil	ug/g	0.03	0.0058	20	37-143	50-150
78-59-1	Isophorone	Soil	ug/g	0.03	0.0127	20	49-120	50-150
91-20-3	Naphthalene	Soil	ug/g	0.03	0.0128	20	52-104	50-150
98-95-3	Nitrobenzene	Soil	ug/g	0.03	0.0122	20	48-107	50-150
621-64-7	N-Nitroso-di-n-propylamine	Soil	ug/g	0.03	0.0108	20	50-122	18-134
86-30-6	N-Nitrosodiphenylamine	Soil	ug/g	0.03	0.011	20	35-131	50-150
87-86-5	Pentachlorophenol	Soil	ug/g	0.3	0.0839	20	34-120	28-120
85-01-8	Phenanthrene	Soil	ug/g	0.03	0.0133	20	50-110	50-150
108-95-2	Phenol	Soil	ug/g	0.3	0.1047	20	42-100	10-119
129-00-0	Pyrene	Soil	ug/g	0.06	0.0166	20	45-113	61-101
367-12-4	2-Fluorophenol	Soil	%	s	NA	NA	26-125	26-125
13127-88-	Phenol-d6	Soil	%	s	NA	NA	35-110	35-110
4165-60-0	Nitrobenzene-d5	Soil	%	s	NA	NA	45-119	45-119
321-60-8	2-Fluorobiphenyl	Soil	%	s	NA	NA	50-118	50-118
118-79-6	2,4,6-Tribromophenol	Soil	%	s	NA	NA	39-106	39-106
1718-51-0	Terphenyl-d14	Soil	%	s	NA	NA	45-126	45-126

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.
s - Surrogate compound

Semivolatile Organic Compounds (SVOC's) Analysis

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 8270C (Semivolatile Organics)								
120-82-1	1,2,4-Trichlorobenzene	Water	ug/L	1	0.322	20	53-111	67-115
95-50-1	1,2-Dichlorobenzene	Water	ug/L	1	0.217	20	58-109	50-150
541-73-1	1,3-Dichlorobenzene	Water	ug/L	1	0.214	20	55-107	50-150
106-46-7	1,4-Dichlorobenzene	Water	ug/L	1	0.24	20	48-117	50-150
95-95-4	2,4,5-Trichlorophenol	Water	ug/L	10	2.49	20	70-112	50-150
88-06-2	2,4,6-Trichlorophenol	Water	ug/L	10	2.92	20	55-117	50-150
120-83-2	2,4-Dichlorophenol	Water	ug/L	10	2.18	20	72-102	50-150
105-67-9	2,4-Dimethylphenol	Water	ug/L	10	3.55	20	36-101	50-150
51-28-5	2,4-Dinitrophenol	Water	ug/L	10	2.35	20	54-135	50-150
121-14-2	2,4-Dinitrotoluene	Water	ug/L	1	0.287	20	68-118	45-137
606-20-2	2,6-Dinitrotoluene	Water	ug/L	1	0.3	20	63-116	50-150
91-58-7	2-Chloronaphthalene	Water	ug/L	1	0.358	20	61-107	50-150
95-57-8	2-Chlorophenol	Water	ug/L	10	2.06	20	58-104	49-99
91-57-6	2-Methylnaphthalene	Water	ug/L	1	0.314	20	62-105	50-150
95-48-7	2-Methylphenol	Water	ug/L	10	2.02	20	45-94	50-150
88-74-4	2-Nitroaniline	Water	ug/L	1	0.267	20	68-124	50-150
88-75-5	2-Nitrophenol	Water	ug/L	10	2.77	20	70-95	50-150
99-09-2	3-Nitroaniline	Water	ug/L	1	0.234	20	33-157	50-150
534-52-1	4,6-Dinitro-2-methylphenol	Water	ug/L	10	2.51	20	75-113	50-150
101-55-3	4-Bromophenyl phenyl ether	Water	ug/L	1	0.279	20	66-109	50-150
59-50-7	4-Chloro-3-methylphenol	Water	ug/L	10	1.83	20	54-117	9-119
106-47-8	4-Chloroaniline	Water	ug/L	1	0.188	20	24-132	50-150
7005-72-3	4-Chlorophenyl phenyl ether	Water	ug/L	1	0.371	20	62-116	50-150
106-44-5	4-Methylphenol	Water	ug/L	10	1.66	20	42-83	50-150
100-01-6	4-Nitroaniline	Water	ug/L	1	0.441	20	65-158	50-150
100-02-7	4-Nitrophenol	Water	ug/L	10	1.25	20	10-74	18-53
83-32-9	Acenaphthene	Water	ug/L	1	0.359	20	64-108	53-111
208-96-8	Acenaphthylene	Water	ug/L	1	0.354	20	66-107	50-150
120-12-7	Anthracene	Water	ug/L	1	0.353	20	67-105	50-150
56-55-3	Benz(a)anthracene	Water	ug/L	1	0.214	20	67-104	50-150
50-32-8	Benzo(a)pyrene	Water	ug/L	1	0.227	20	65-105	50-150
205-99-2	Benzo(b)fluoranthene	Water	ug/L	1	0.227	20	61-104	50-150
191-24-2	Benzo(g,h,i)perylene	Water	ug/L	1	0.236	20	67-127	50-150
207-08-9	Benzo(k)fluoranthene	Water	ug/L	1	0.196	20	73-120	50-150
65-85-0	Benzoic acid	Water	ug/L	100	23	20	70-130	50-150
100-51-6	Benzyl alcohol	Water	ug/L	1	0.125	20	42-107	50-150
111-91-1	Bis(2-chloroethoxy)methane	Water	ug/L	1	0.278	20	70-98	50-150
111-44-4	Bis(2-chloroethyl) ether	Water	ug/L	2	0.6	20	32-110	50-150
54460-96-7	Bis(2-chloroisopropyl) ether	Water	ug/L	1	0.296	20	59-97	50-150
117-81-7	Bis(2-ethylhexyl) phthalate	Water	ug/L	1	0.464	20	40-141	50-150
86-74-8	Carbazole	Water	ug/L	1	0.294	20	63-157	50-150
218-01-9	Chrysene	Water	ug/L	1	0.22	20	43-117	50-150
53-70-3	Dibenz(a,h)anthracene	Water	ug/L	1	0.374	20	72-130	50-150

132-64-9	Dibenzofuran	Water	ug/L	1	0.352	20	66-108	50-150
84-66-2	Diethyl phthalate	Water	ug/L	1	0.185	20	58-116	50-150
131-11-3	Dimethyl phthalate	Water	ug/L	1	0.153	20	55-117	50-150
84-74-2	Di-n-butyl phthalate	Water	ug/L	1	0.336	20	50-118	50-150
117-84-0	Di-n-octyl phthalate	Water	ug/L	1	0.353	20	54-129	50-150
206-44-0	Fluoranthene	Water	ug/L	1	0.287	20	67-105	50-150
86-73-7	Fluorene	Water	ug/L	1	0.366	20	69-109	50-150
118-74-1	Hexachlorobenzene	Water	ug/L	1	0.362	20	52-116	50-150
87-68-3	Hexachlorobutadiene	Water	ug/L	1	0.338	20	38-120	50-150
77-47-4	Hexachlorocyclopentadiene	Water	ug/L	1	0.283	20	25-113	50-150
67-72-1	Hexachloroethane	Water	ug/L	1	0.206	20	55-108	50-150
193-39-5	Indeno(1,2,3-cd)pyrene	Water	ug/L	1	0.224	20	51-128	50-150
78-59-1	Isophorone	Water	ug/L	1	0.213	20	62-114	50-150
91-20-3	Naphthalene	Water	ug/L	1	0.286	20	65-101	50-150
98-95-3	Nitrobenzene	Water	ug/L	1	0.32	20	63-105	50-150
621-64-7	N-Nitroso-di-n-propylamine	Water	ug/L	1	0.271	20	62-118	22-137
86-30-6	N-Nitrosodiphenylamine	Water	ug/L	1	0.409	20	47-143	50-150
87-86-5	Pentachlorophenol	Water	ug/L	10	2.47	20	30-123	51-103
85-01-8	Phenanthrene	Water	ug/L	1	0.489	20	69-102	50-150
108-95-2	Phenol	Water	ug/L	10	0.786	20	18-50	12-44
129-00-0	Pyrene	Water	ug/L	1	0.272	20	58-108	58-95
367-12-4	2-Fluorophenol	Water	%	s	NA	NA	23-77	23-77
13127-88-3	Phenol-d6	Water	%	s	NA	NA	`10-63	`10-63
4165-60-0	Nitrobenzene-d5	Water	%	s	NA	NA	58-113	58-113
321-60-8	2-Fluorobiphenyl	Water	%	s	NA	NA	57-111	57-111
118-79-6	2,4,6-Tribromophenol	Water	%	s	NA	NA	40-105	40-105
1718-51-0	Terphenyl-d14	Water	%	s	NA	NA	34-129	34-129

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.
s - Surrogate compound

Polynuclear Aromatic Hydrocarbon (PAH or PNA) Analysis

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 8270C SIM (PAHs)								
83-32-9	Acenaphthene	Soil	ug/kg	5	0.432	20	60-109	52-110
208-96-8	Acenaphthylene	Soil	ug/kg	5	0.398	20	61-108	47-115
120-12-7	Anthracene	Soil	ug/kg	5	0.405	20	56-100	43-102
56-55-3	Benz(a)anthracene	Soil	ug/kg	5	0.467	20	57-106	50-110
50-32-8	Benzo(a)pyrene	Soil	ug/kg	5	1.47	20	51-108	52-107
205-99-2	Benzo(b)fluoranthene	Soil	ug/kg	5	0.556	20	55-131	57-119
191-24-2	Benzo(g,h,i)perylene	Soil	ug/kg	5	0.214	20	48-129	15-130
207-08-9	Benzo(k)fluoranthene	Soil	ug/kg	5	0.43	20	54-124	57-116
218-01-9	Chrysene	Soil	ug/kg	5	0.425	20	58-110	48-114
53-70-3	Dibenzo(a,h)anthracene	Soil	ug/kg	5	0.39	20	50-134	26-134
206-44-0	Fluoranthene	Soil	ug/kg	5	0.81	20	56-102	43-118
86-73-7	Fluorene	Soil	ug/kg	5	0.577	20	60-109	47-114
193-39-5	Indeno(1,2,3-cd)pyrene	Soil	ug/kg	5	0.422	20	47-128	23-128
91-20-3	Naphthalene	Soil	ug/kg	5	0.441	20	57-111	52-109
85-01-8	Phenanthrene	Soil	ug/kg	5	0.47	20	57-106	41-114
129-00-0	Pyrene	Soil	ug/kg	5	0.668	20	56-115	64-105
1719-06-8	Anthracene-d10	Soil	%	s	NA	NA	18-150	18-150
1718-53-2	Benzo(a)anthracene-d12	Soil	%	s	NA	NA	40-143	40-143

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.
s - Surrogate compound

Polynuclear Aromatic Hydrocarbon (PAH or PNA) Analysis

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 8270C SIM (PAHs)								
83-32-9	Acenaphthene	Water	ug/L	0.1	0.00968	20	50-127	54-131
208-96-8	Acenaphthylene	Water	ug/L	0.1	0.00833	20	54-126	29-148
120-12-7	Anthracene	Water	ug/L	0.1	0.0163	20	48-128	32-132
56-55-3	Benz(a)anthracene	Water	ug/L	0.1	0.0179	20	53-121	53-86
50-32-8	Benzo(a)pyrene	Water	ug/L	0.1	0.0111	20	52-127	55-88
205-99-2	Benzo(b)fluoranthene	Water	ug/L	0.1	0.0153	20	54-130	44-100
191-24-2	Benzo(g,h,i)perylene	Water	ug/L	0.1	0.0228	20	53-123	44-82
207-08-9	Benzo(k)fluoranthene	Water	ug/L	0.1	0.0303	20	55-126	63-80
218-01-9	Chrysene	Water	ug/L	0.1	0.0124	20	55-119	54-87
53-70-3	Dibenzo(a,h)anthracene	Water	ug/L	0.1	0.0337	20	58-125	52-90
206-44-0	Fluoranthene	Water	ug/L	0.1	0.0166	20	51-132	42-131
86-73-7	Fluorene	Water	ug/L	0.1	0.0109	20	50-129	40-134
193-39-5	Indeno(1,2,3-cd)pyrene	Water	ug/L	0.1	0.0216	20	54-125	46-84
91-20-3	Naphthalene	Water	ug/L	0.1	0.0105	20	50-120	57-114
85-01-8	Phenanthrene	Water	ug/L	0.1	0.00952	20	48-125	31-146
129-00-0	Pyrene	Water	ug/L	0.1	0.0162	20	54-128	50-83
1719-06-8	Anthracene-d10	Water	%	s	NA	NA	36-135	36-135
1718-53-2	Benzo(a)anthracene-d12	Water	%	s	NA	NA	36-136	36-136

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.
s - Surrogate compound

Polychlorinated Biphenyls (PCBs) Analysis

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 8082 (PCBs as Arochlors)								
11104-28-2	Aroclor 1221	Soil	ug/g	0.1				
11141-16-5	Aroclor 1232	Soil	ug/g	0.1				
1274-11-2	Aroclor 1016	Soil	ug/g	0.1	0.0274	20	70-130	50-150
53469-21-9	Aroclor 1242	Soil	ug/g	0.1				
12672-29-6	Aroclor 1248	Soil	ug/g	0.1				
11097-69-1	Aroclor 1254	Soil	ug/g	0.1				
11096-82-5	Aroclor 1260	Soil	ug/g	0.1	0.0257	20	70-130	50-150
37324-23-5	Aroclor 1262	Soil	ug/g	0.1				
877-09-8	Tetrachlorometaxylene	Soil	%	s	NA	NA	50-150	50-150

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 8082 (PCBs as Arochlors)								
11104-28-2	Aroclor 1221	Water	ug/L	0.1				
11141-16-5	Aroclor 1232	Water	ug/L	0.1				
1274-11-2	Aroclor 1016	Water	ug/L	0.1	0.0436	20	70-130	50-150
53469-21-9	Aroclor 1242	Water	ug/L	0.1				
12672-29-6	Aroclor 1248	Water	ug/L	0.1				
11097-69-1	Aroclor 1254	Water	ug/L	0.1				
11096-82-5	Aroclor 1260	Water	ug/L	0.1	0.0297	20	70-130	50-150
37324-23-5	Aroclor 1262	Water	ug/L	0.1				
877-09-8	Tetrachlorometaxylene	Water	%	s	NA	NA	50-150	50-150

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.
s - Surrogate compound

Metals Analysis

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 200.8 (Total Metals)								
7440-36-0	Antimony	Soil	ug/g	1	0.00271	20	70-130	50-150
7440-38-2	Arsenic	Soil	ug/g	1	0.00528	20	70-130	50-150
7440-39-3	Barium	Soil	ug/g	1	0.00402	20	70-130	50-150
7440-41-7	Beryllium	Soil	ug/g	1	0.00676	20	70-130	50-150
7440-43-9	Cadmium	Soil	ug/g	1	0.00165	20	70-130	50-150
7440-47-3	Chromium	Soil	ug/g	1	0.0131	20	70-130	50-150
7440-48-4	Cobalt	Soil	ug/g	1	0.00138	20	70-130	50-150
7440-50-8	Copper	Soil	ug/g	1	0.0215	20	70-130	50-150
7439-92-1	Lead	Soil	ug/g	1	0.00497	20	70-130	50-150
7439-96-5	Manganese	Soil	ug/g	1	0.0142	20	70-130	50-150
7439-98-7	Molybdenum	Soil	ug/g	1	0.00445	20	70-130	50-150
7440-02-0	Nickel	Soil	ug/g	1	0.00947	20	70-130	50-150
7782-49-2	Selenium	Soil	ug/g	1	0.00972	20	70-130	50-150
7440-22-4	Silver	Soil	ug/g	1	0.00644	20	70-130	50-150
7440-28-0	Thallium	Soil	ug/g	1	0.00338	20	70-130	50-150
7440-62-2	Vanadium	Soil	ug/g	1	0.00345	20	70-130	50-150
7440-66-6	Zinc	Soil	ug/g	1	0.0635	20	70-130	50-150

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.
s - Surrogate compound

Metals Analysis

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 2008 (Total Metals)								
7440-36-0	Antimony	Water	ug/L	1	0.0348	20	70-130	50-150
7440-38-2	Arsenic	Water	ug/L	1	0.0467	20	70-130	50-150
7440-39-3	Barium	Water	ug/L	1	0.0327	20	70-130	50-150
7440-41-7	Beryllium	Water	ug/L	1	0.0609	20	70-130	50-150
7440-43-9	Cadmium	Water	ug/L	1	0.0201	20	70-130	50-150
7440-47-3	Chromium	Water	ug/L	1	0.0188	20	70-130	50-150
7440-48-4	Cobalt	Water	ug/L	1	0.0326	20	70-130	50-150
7440-50-8	Copper	Water	ug/L	1	0.0142	20	70-130	50-150
7439-92-1	Lead	Water	ug/L	1	0.0288	20	70-130	50-150
7439-96-5	Manganese	Water	ug/L	1	0.0164	20	70-130	50-150
7439-98-7	Molybdenum	Water	ug/L	1	0.018	20	70-130	50-150
7440-02-0	Nickel	Water	ug/L	1	0.0274	20	70-130	50-150
7782-49-2	Selenium	Water	ug/L	1	0.0977	20	70-130	50-150
7440-22-4	Silver	Water	ug/L	1	0.0625	20	70-130	50-150
7440-28-0	Thallium	Water	ug/L	1	0.0138	20	70-130	50-150
7440-62-2	Vanadium	Water	ug/L	1	0.0335	20	70-130	50-150
7440-66-6	Zinc	Water	ug/L	1	0.0407	20	70-130	50-150

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.
s - Surrogate compound

Total Mercury

CAS #	Analyte	Matrix	Units	RL	MDL	Precision (RPD)	Accuracy (%Rec) (LCS)	Accuracy (%Rec) (MS)
Method 1631 (Total Mercury)								
7439-97-	Mercury	Soil	ug/g	0.2	0.00010	20	70-130	50-150
Method 1631 (Total Mercury)								
7439-97-	Mercury	Water	ug/L	0.2	0.000148	20	70-130	50-150

Notes:
RL – Method Reporting Limit
MDL – Method Detection Limit
RL, MDL and Accuracy values are laboratory generated (unless footnoted) and are subject to change.

APPENDIX C

Analytical Data Quality Assurance Review and Laboratory Reports (Electronic Format)

Laboratory analysis of soil samples collected for the Phase 2 environmental site assessment of the Subject Property was performed by Friedman and Bruya Inc. of Seattle, Washington. Analytical methods used were as specified in the Quality Assurance Project Plan (QAPP) included as Appendix B to this report. A CD containing electronic copies of Friedman and Bruya's laboratory data reports is included at the end of this attachment.

In accordance with the QAPP, Aspect Consulting independently reviewed the laboratory summary data package to assess the quality and reliability of the reported analytical data and identify any limitations that could affect the use of the data. The data quality assurance review was performed in general accordance with EPA National Functional Guidelines (EPA 1999, 2001, 2004) with regard to the following, as appropriate to the particular analysis:

- Sample documentation/custody;
- Holding times;
- Reporting limits;
- Laboratory duplicates RPDs (precision);
- Blank spike, matrix spike, and surrogate percent recoveries (accuracy);
- Completeness; and
- Data report formats.

Data were evaluated relative to quality control limits (e.g., spike recoveries) specified by the laboratory in their standard operating procedure for each analysis. The following sections describe the results of the quality assurance review by sample batch and analytical method (chemical group). In the review of each data requirement below, a checked box (☑) indicates that the data quality objective was met and an empty box (☐) indicates that a discussion of the data requirement follows.

Laboratory Batch 606276

Twenty-five soil samples were collected on June 28, 2006. The samples were submitted to Friedman & Bruya, Inc. for the following chemical analyses:

- Diesel, Motor Oil (NWTPH-Dx with silica gel cleanup);
- BTEX (EPA 5035A/8021B);
- Volatile Organic Compounds (EPA 8260B);
- Semivolatile Organic Compounds (EPA 8270C);
- Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM);
- Polychlorinated Biphenyls (EPA 8082); and
- Total Metals (EPA 200.8 and 1631).

Soil data for the laboratory batch are 100 percent complete and generally acceptable for the purposes of the Phase 2 ESA, as described below.

Sample Handling and Documentation

The soil samples were hand delivered to the lab on June 29, 2006. No chain-of-custody or labeling anomalies were identified by the laboratory.

Volatile Organics (EPA Method 8260B)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ Surrogate recoveries
- ☑ LCS recoveries
- ☑ MS recoveries
- ☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

Semivolatile Organics (EPA Method 8270C)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ Surrogate recoveries
- ☑ LCS recoveries
- ☑ LCSD relative percent differences
- ☑ MS recoveries
- ☑ MS/MSD relative percent differences
- ☑ Duplicate relative percent differences

Some samples were diluted due to matrix interferences. Reporting limits were raised accordingly. The lab noted that surrogate recoveries for diluted samples may not be meaningful and no data were qualified due to poor surrogate recoveries.

Sample SS-27: One internal standard associated with seven of the SVOCs[1] was below control limits due to matrix interferences. Five of these SVOCs were detected at low concentrations (0.02 to 0.21 milligrams/kilograms [mg/kg]) and reported by the lab as estimates (J). Re-analysis produced the same result (low recovery). The sample was then re-analyzed at a 50-fold dilution to overcome matrix interferences and these 7 analytes

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[1] di-n-octyl phthalate, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, benzo(g,h,i)perylene

were reported from this dilution as non-detected at a 50-fold increase in reporting limit (1.5 mg/kg) but with no qualification (recovery within control limits). We rejected the undiluted, estimated results because recovery of the internal standard was unacceptably low (22%). The diluted results, with acceptable QC, for the seven compounds are acceptable for use with the understanding that the elevated reporting limits exceed the most stringent screening levels for the cPAHs. All other data are acceptable for use.

Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ Surrogate recoveries
- ☑ LCS recoveries
- ☑ LCSD relative percent differences
- ☑ MS recoveries
- ☑ MS/MSD relative percent differences

Some samples were diluted due to matrix interferences. Reporting limits were raised accordingly. The lab noted that surrogate recoveries for diluted samples may not be meaningful and no data were qualified due to poor surrogate recoveries.

The data are acceptable for use with the understanding that the elevated reporting limits exceed most stringent screening levels for the cPAHs.

BTEX (EPA 5035A/8021B)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ LCS recoveries

No data quality issues were identified and the data are acceptable for use.

Diesel and Motor Oil-Range Hydrocarbons (NWTPH-Dx with silica gel cleanup)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ LCS recoveries
- ☑ MS recoveries

☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

Polychlorinated Biphenyls (EPA 8082)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

Total Metals (EPA Methods 200.8 and 1631)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences
☑ Duplicate relative percent differences

No data quality issues were identified and the data are acceptable for use

Laboratory Batch 606293

Fifty-four soil samples were collected on June 29 and 30, 2006. The samples were submitted to Friedman & Bruya, Inc. for the following chemical analyses:

- Diesel, Motor Oil (NWTPH-Dx with silica gel cleanup);
- Gasoline (NWTPH-G);
- BTEX (EPA 5035A/8021B);
- Volatile Organic Compounds (EPA 8260B);
- Semivolatile Organic Compounds (EPA 8270C);
- Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM);
- Polychlorinated Biphenyls (EPA 8082); and

- Total Metals (EPA 200.8 and 1631).

Soil data for the laboratory batch are 100 percent complete and generally acceptable for the purposes of the Phase 2 ESA, as described below.

Sample Handling and Documentation

The soil samples were hand delivered to the lab on June 30, 2006. No chain-of-custody or labeling anomalies were identified by the laboratory.

Volatile Organics (EPA Method 8260B)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ Surrogate recoveries
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences

Appropriate dilutions were performed for sample B-18-6-8 to obtain trimethylbenzene results within the calibration range. The trimethylbenzene results from the original analysis are replaced with the results from the diluted analysis. No data quality issues were identified and the data are acceptable for use.

Semivolatile Organics (EPA Method 8270C)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ Surrogate recoveries
☑ LCS recoveries
☑ LCSD relative percent differences
☑ MS recoveries
☑ MS/MSD relative percent differences
☑ Duplicate relative percent differences

Appropriate dilutions were performed for several samples (B-18-6-8, B-18-8-10, and B-19-6-18) to obtain pentachlorophenol results within the calibration range. The pentachlorophenol results from the original analysis are replaced with the results from the diluted analysis. No data quality issues were identified and the data are acceptable for use.

Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ Surrogate recoveries
- ☑ LCS recoveries
- ☑ LCSD relative percent differences
- ☑ MS recoveries
- ☑ MS/MSD relative percent differences

Some samples were diluted due to matrix interferences. Reporting limits were raised accordingly. The lab noted that surrogate recoveries for diluted samples may not be meaningful and no data were qualified due to poor surrogate recoveries.

The lab qualified the PAH reporting limits associated with "out of control" internal standards as estimated "J" values. These samples had been diluted due to matrix interferences. No additional data qualifiers were assigned and the data, as qualified, are acceptable for use.

Gasoline-Range Hydrocarbons (NWTPH-G)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ LCS recoveries
- ☑ MS recoveries
- ☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

BTEX (EPA 5035A/8021B)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ LCS recoveries

No data quality issues were identified and the data are acceptable for use.

Diesel and Motor Oil-Range Hydrocarbons (NWTPH-Dx with silica gel cleanup)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies.
☑ Analysis holding times
☑ Laboratory blank contamination
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences

Three samples (B-18-6-8, B-18-8-10, and B-19-6-8) had diesel-range (C10 to C25) hydrocarbons reported but the lab noted that the chromatographic pattern did not match diesel; rather it was likely overlap from the stoddard solvent range. These results were qualified accordingly in the database, although it is not a data quality issue. No data quality issues were identified and the data are acceptable for use.

Polychlorinated Biphenyls (EPA 8082)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

Total Metals (EPA Methods 200.8 and 1631)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences
☑ Duplicate relative percent differences

No data quality issues were identified and the data are acceptable for use.

Laboratory Batch 607032

Thirty-one soil samples were collected on July 6, 2006. The samples were submitted to Friedman & Bruya, Inc. the following chemical analyses:

- Diesel, Motor Oil (NWTPH-Dx with gilica gel cleanup);
- BTEX (EPA 5035A/8021B);
- Volatile Organic Compounds (EPA 8260B);
- Semivolatile Organic Compounds (EPA 8270C);
- Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM);
- Polychlorinated Biphenyls (EPA 8082); and
- Total Metals (EPA 200.8 and 1631).

Soil data for the laboratory batch are 100 percent complete and generally acceptable for the purposes of the Phase 2 ESA, as described below.

Sample Handling and Documentation

The soil samples were hand delivered to the lab on July 7, 2006. No chain-of-custody or labeling anomalies were identified by the laboratory.

Volatile Organics (EPA Method 8260B)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ Surrogate recoveries
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

Semivolatile Organics (EPA Method 8270C)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ Surrogate recoveries
☑ LCS recoveries
☑ LCSD relative percent differences

- ☑ MS recoveries
- ☑ MS/MSD relative percent differences
- ☑ Duplicate relative percent differences

Some samples were diluted due to matrix interferences. Reporting limits were raised accordingly. The lab noted that surrogate recoveries for diluted samples may not be meaningful and no data were qualified due to poor surrogate recoveries.

The data are acceptable for use with the understanding that the elevated reporting limits exceed most stringent screening levels for the cPAHs.

Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ Surrogate recoveries
- ☑ LCS recoveries
- ☑ LCSD relative percent differences
- ☑ MS recoveries
- ☑ MS/MSD relative percent differences

Some samples were diluted due to matrix interferences. Reporting limits were raised accordingly. The lab noted that surrogate recoveries for diluted samples may not be meaningful and no data were qualified due to poor surrogate recoveries.

The data are acceptable for use with the understanding that the elevated reporting limits exceed most stringent screening levels for the cPAHs.

BTEX (EPA 5035A/8021B)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ LCS recoveries

No data quality issues were identified and the data are acceptable for use.

Diesel and Motor Oil-Range Hydrocarbons (NWTPH-Dx with silica gel cleanup)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times

☑ Laboratory blank contamination
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

Polychlorinated Biphenyls (EPA 8082)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

Total Metals (EPA Methods 200.8 and 1631)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences
☑ Duplicate relative percent differences

No data quality issues were identified and the data are acceptable for use.

Laboratory Batch 609048

Three soil samples were collected on September 6, 2006. The samples were submitted to Friedman & Bruya, Inc. for one or more of the following chemical analyses:

- Diesel, Motor Oil (NWTPH-Dx with silica gel cleanup); and
- Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM).

Data for the laboratory batch are 100 percent complete and acceptable for the purposes of the Phase 2 ESA, as described below.

Sample Handling and Documentation

The soil samples were hand delivered to the lab on September 7, 2006. No chain-of-custody or labeling anomalies were identified by the laboratory.

Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ Surrogate recoveries
☑ Lab control sample (LCS) recoveries
☑ Lab control sample duplicate (LCSD) relative percent differences
☑ Matrix spike (MS) recoveries
☑ Matrix spike/matrix spike duplicate (MS/MSD) relative percent differences

Some samples were diluted due to matrix interferences. Reporting limits were raised accordingly. The lab noted that surrogate recoveries for diluted samples may not be meaningful and no data were qualified due to poor surrogate recoveries. No data quality issues were identified and the data are acceptable for use.

Diesel and Motor Oil-Range Hydrocarbons (NWTPH-Dx with silica gel cleanup)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ Surrogate recoveries
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

Laboratory Batch 609090

This laboratory batch included one soil sample collected on September 7, 2006, and six groundwater samples collected on September 11, 2006. The samples were submitted to Friedman & Bruya, Inc. for one or more of the following chemical analyses:

- Diesel, Motor Oil (NWTPH-Dx with silica gel cleanup);
- Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM);
- Pentachlorophenol (PCP) and Tetrachlorophenol (TCP) (Canadian Pulp Method); and
- Total Suspended Solids (SM 2540D).

The data for the laboratory batch are 100 percent complete and acceptable for the purposes of the RI, as described below.

Sample Handling and Documentation

The samples were hand delivered to the lab on September 12, 2006. No chain-of-custody or labeling anomalies were identified by the laboratory.

Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ Surrogate recoveries
☑ LCS recoveries
☑ LCSD relative percent differences
☑ MS recoveries
☑ MS/MSD relative percent differences

Some samples were diluted due to matrix interferences. Reporting limits were raised accordingly. The lab noted that surrogate recoveries for diluted samples may not be meaningful and no data were qualified due to poor surrogate recoveries. No data quality issues were identified and the data are acceptable for use.

Diesel and Motor Oil-Range Hydrocarbons (NWTPH-Dx with silica gel cleanup)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination

- ☑ Surrogate recoveries
- ☑ LCS recoveries
- ☑ MS recoveries
- ☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

PCP and TCP (Canadian Pulp Method)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ Surrogate recoveries
- ☑ LCS recoveries
- ☑ LCS/LCSD relative percent differences
- ☑ MS recoveries
- ☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

Total Suspended Solids (SM 2540D)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ LCS recoveries
- ☑ MS recoveries
- ☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

Laboratory Batch 610068

Five soil samples were collected on October 4, 2006. The samples were submitted to Friedman & Bruya, Inc. for one or more of the following chemical analyses:

- Diesel, Motor Oil (NWTPH-Dx with silica gel cleanup); and
- Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM).

Data for the laboratory batch are 100 percent complete and acceptable for the purposes of the RI, as described below.

Sample Handling and Documentation

The soil samples were hand delivered to the lab on October 5, 2006. No chain-of-custody or labeling anomalies were identified by the laboratory.

Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ Surrogate recoveries
- ☑ Lab control sample (LCS) recoveries
- ☑ Lab control sample duplicate (LCSD) relative percent differences
- ☑ Matrix spike (MS) recoveries
- ☑ Matrix spike/matrix spike duplicate (MS/MSD) relative percent differences

Some samples were diluted due to matrix interferences. Reporting limits were raised accordingly. Recovery for the surrogate anthracene-d10 was above lab control limits for sample SS-40; the recovery of surrogate benzo(a)anthracene-d12 was within control limits. Surrogate recoveries for sample SS-41 were within control limits. The lab noted that surrogate recoveries for diluted samples may not be meaningful and no data were qualified due to poor surrogate recoveries; the high recovery would indicate high bias, if any, to SS-40 results. No data were qualified and the data are acceptable for use.

Diesel and Motor Oil-Range Hydrocarbons (NWTPH-Dx with silica gel cleanup)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ Surrogate recoveries
- ☑ LCS recoveries
- ☑ MS recoveries
- ☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

Laboratory Batch 610434

Two soil samples were collected on October 30, 2006. The samples were submitted to Friedman & Bruya, Inc. for the following chemical analysis:

- Diesel, Motor Oil (NWTPH-Dx with silica gel cleanup).

Data for the laboratory batch are 100 percent complete and acceptable for the purposes of the Phase 2 ESA, as described below.

Sample Handling and Documentation

The soil samples were hand delivered to the lab on October 31, 2006. No chain-of-custody or labeling anomalies were identified by the laboratory.

Diesel and Motor Oil-Range Hydrocarbons (NWTPH-Dx with silica gel cleanup)

The following data requirements were evaluated:

☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ Surrogate recoveries
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

Laboratory Batch 611100

Three soil samples were collected on November 7, 2006. The samples were submitted to Friedman & Bruya, Inc. for the following chemical analysis:

- Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM).

Data for the laboratory batch are 100 percent complete and acceptable for the purposes of the Phase 2 ESA, as described below.

Sample Handling and Documentation

The soil samples were hand delivered to the lab on November 8, 2006. No chain-of-custody or labeling anomalies were identified by the laboratory.

Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination
- ☑ Surrogate recoveries
- ☑ Lab control sample (LCS) recoveries
- ☑ Lab control sample duplicate (LCSD) relative percent differences
- ☑ Matrix spike (MS) recoveries
- ☑ Matrix spike/matrix spike duplicate (MS/MSD) relative percent differences

Some samples were diluted due to matrix interferences. Reporting limits were raised accordingly. Recovery for the surrogate anthracene-d10 was above lab control limits for sample RL-SS-3; the recovery of surrogate benzo(a)anthracene-d12 was within control limits. Surrogate recoveries for samples RL-SS-1 and RL-SS-2 were within control limits. The lab noted that surrogate recoveries for diluted samples may not be meaningful and no data were qualified due to poor surrogate recoveries; the high recovery would indicate high bias, if any, to the two sets of PAH results. No data were qualified and the data are acceptable for use.

Laboratory Batch 611180

Three samples of soil and two samples of wood waste were collected on November 14, 2006. The samples were submitted to Friedman & Bruya, Inc. for the following chemical analysis:

- Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM).

Data for the laboratory batch are 100 percent complete and acceptable for the purposes of the Phase 2 ESA, as described below.

Sample Handling and Documentation

The soil samples were hand delivered to the lab on November 8, 2006. No chain-of-custody or labeling anomalies were identified by the laboratory.

Polynuclear Aromatic Hydrocarbons (EPA 8270-SIM)

The following data requirements were evaluated:

- ☑ Sample and quality control analysis frequencies
- ☑ Analysis holding times
- ☑ Laboratory blank contamination

☑ Surrogate recoveries
☑ Lab control sample (LCS) recoveries
☑ Lab control sample duplicate (LCSD) relative percent differences
☑ Matrix spike (MS) recoveries
☑ Matrix spike/matrix spike duplicate (MS/MSD) relative percent differences

Some samples were diluted due to matrix interferences. Reporting limits were raised accordingly. No data were qualified and the data are acceptable for use.

Laboratory Batch 612049

One soil sample was collected on December 6, 2006. The sample was submitted to Friedman & Bruya, Inc. for the following chemical analysis:

- Diesel, Motor Oil (NWTPH-Dx with silica gel cleanup).

Data for the laboratory batch are 100 percent complete and acceptable for the purposes of the Phase 2 ESA and Cleanup Report, as described below.

Sample Handling and Documentation

The soil sample was hand delivered to the lab on December 6, 2006. No chain-of-custody or labeling anomalies were identified by the laboratory.

Diesel and Motor Oil-Range Hydrocarbons (NWTPH-Dx with silica gel cleanup)

The following data requirements were evaluated:

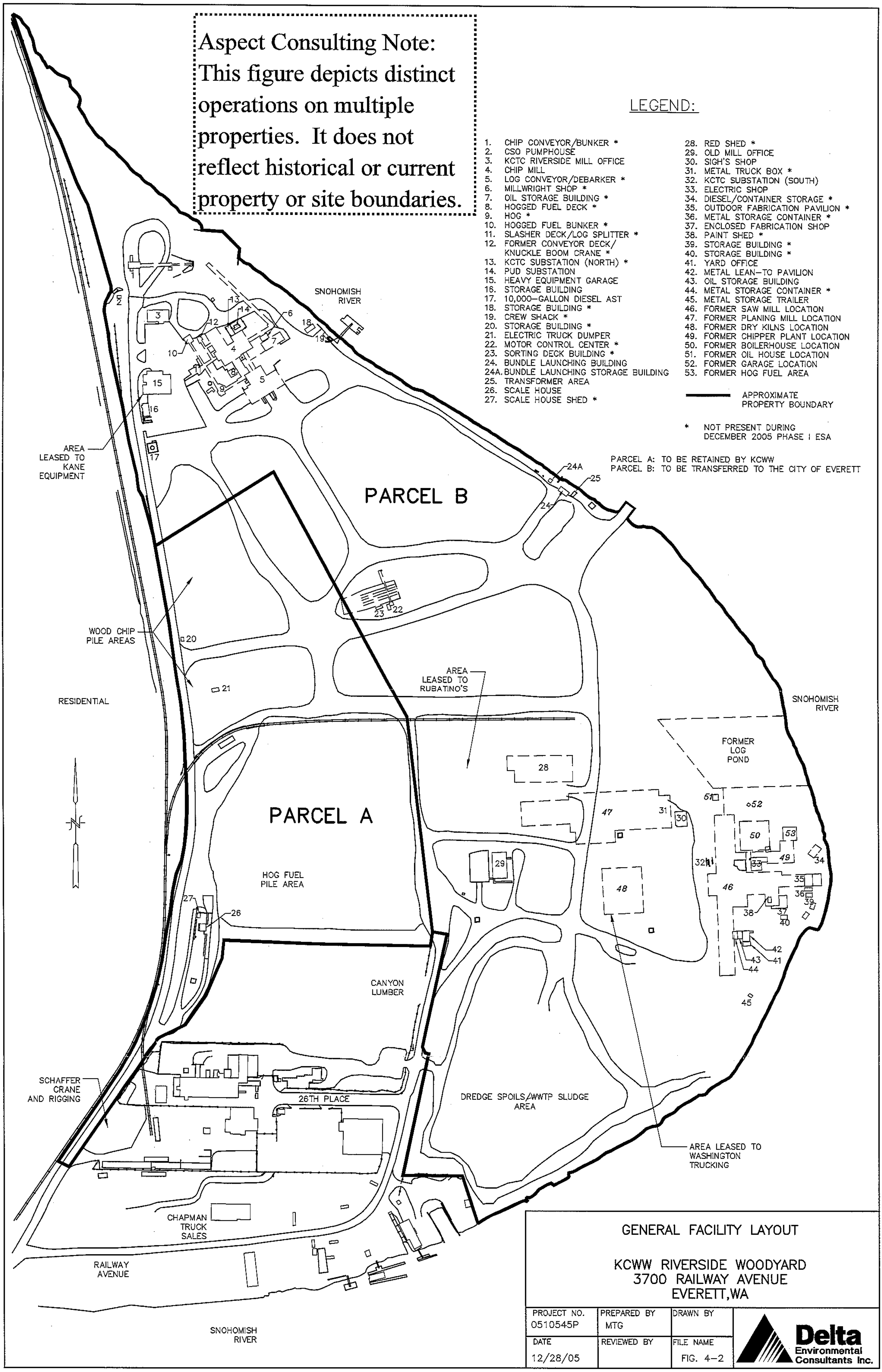
☑ Sample and quality control analysis frequencies
☑ Analysis holding times
☑ Laboratory blank contamination
☑ Surrogate recoveries
☑ LCS recoveries
☑ MS recoveries
☑ MS/MSD relative percent differences

No data quality issues were identified and the data are acceptable for use.

APPENDIX D

Figures of Historical Uses and Recent Sampling of Subject Property and Adjacent Properties

Aspect Consulting Note:
This figure depicts distinct operations on multiple properties. It does not reflect historical or current property or site boundaries.



LEGEND:

1. CHIP CONVEYOR/BUNKER *
2. CSO PUMPHOUSE
3. KCTC RIVERSIDE MILL OFFICE
4. CHIP MILL
5. LOG CONVEYOR/DEBARKER *
6. MILLWRIGHT SHOP *
7. OIL STORAGE BUILDING *
8. HOGGED FUEL DECK *
9. HOG *
10. HOGGED FUEL BUNKER *
11. SLASHER DECK/LOG SPLITTER *
12. FORMER CONVEYOR DECK/ KNUCKLE BOOM CRANE *
13. KCTC SUBSTATION (NORTH) *
14. PUD SUBSTATION
15. HEAVY EQUIPMENT GARAGE
16. STORAGE BUILDING
17. 10,000-GALLON DIESEL AST
18. STORAGE BUILDING *
19. CREW SHACK *
20. STORAGE BUILDING *
21. ELECTRIC TRUCK DUMPER
22. MOTOR CONTROL CENTER *
23. SORTING DECK BUILDING *
24. BUNDLE LAUNCHING BUILDING

24A. BUNDLE LAUNCHING STORAGE BUILDING

25. TRANSFORMER AREA
26. SCALE HOUSE
27. SCALE HOUSE SHED *
28. RED SHED *
29. OLD MILL OFFICE
30. SIGH'S SHOP
31. METAL TRUCK BOX *
32. KCTC SUBSTATION (SOUTH)
33. ELECTRIC SHOP
34. DIESEL/CONTAINER STORAGE *
35. OUTDOOR FABRICATION PAVILION *
36. METAL STORAGE CONTAINER *
37. ENCLOSED FABRICATION SHOP
38. PAINT SHED *
39. STORAGE BUILDING *
40. STORAGE BUILDING *
41. YARD OFFICE
42. METAL LEAN-TO PAVILION
43. OIL STORAGE BUILDING
44. METAL STORAGE CONTAINER *
45. METAL STORAGE TRAILER
46. FORMER SAW MILL LOCATION
47. FORMER PLANING MILL LOCATION
48. FORMER DRY KILNS LOCATION
49. FORMER CHIPPER PLANT LOCATION
50. FORMER BOILERHOUSE LOCATION
51. FORMER OIL HOUSE LOCATION
52. FORMER GARAGE LOCATION
53. FORMER HOG FUEL AREA

━━ APPROXIMATE PROPERTY BOUNDARY

* NOT PRESENT DURING DECEMBER 2005 PHASE I ESA

PARCEL A: TO BE RETAINED BY KCWW
PARCEL B: TO BE TRANSFERRED TO THE CITY OF EVERETT

GENERAL FACILITY LAYOUT

KCWW RIVERSIDE WOODYARD
3700 RAILWAY AVENUE
EVERETT,WA

PROJECT NO. 0510545P	PREPARED BY MTG	DRAWN BY
DATE 12/28/05	REVIEWED BY	FILE NAME FIG. 4-2

Delta Environmental Consultants Inc.

Figure D-2

Note: This figure shows distinct operations on multiple properties. It does not reflect historical or current property or site boundaries.

General use areas

▭ Lot boundary

"Lot" and 'Parcel" are synonymous

Aerial photo - 1982

Aspectconsulting
IN-DEPTH PERSPECTIVE

179 Madrone Lane North
Bainbridge Island, WA 98110
(206) 780-9370

811 First Avenue #480
Seattle, WA 98104
(206)-328-7443

Lot Boundaries and Historical Use Areas
Subject Property and Adjacent Properties
Everett, Washington

DATE Nov 2006	PROJECT NO. 060050
DESIGNED BY ACM	
DRAWN BY ACM	FIGURE NO. D-1
REVIEWED BY ACM	

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Note: This figure shows distinct operations on multiple properties It does not reflect historical or current property or site boundaries.

Aspect consulting
IN-DEPTH PERSPECTIVE
179 Madrone Lane North
Bainbridge Island, WA 98110
(206) 780-9370
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Recent Sampling Locations
Subject Property and Adjacent Properties
Everett, Washington

DATE Nov 2006	PROJECT NO. 060050
DESIGNED BY ACM	
DRAWN BY ACM	FIGURE NO. D-3
REVIEWED BY ACM	

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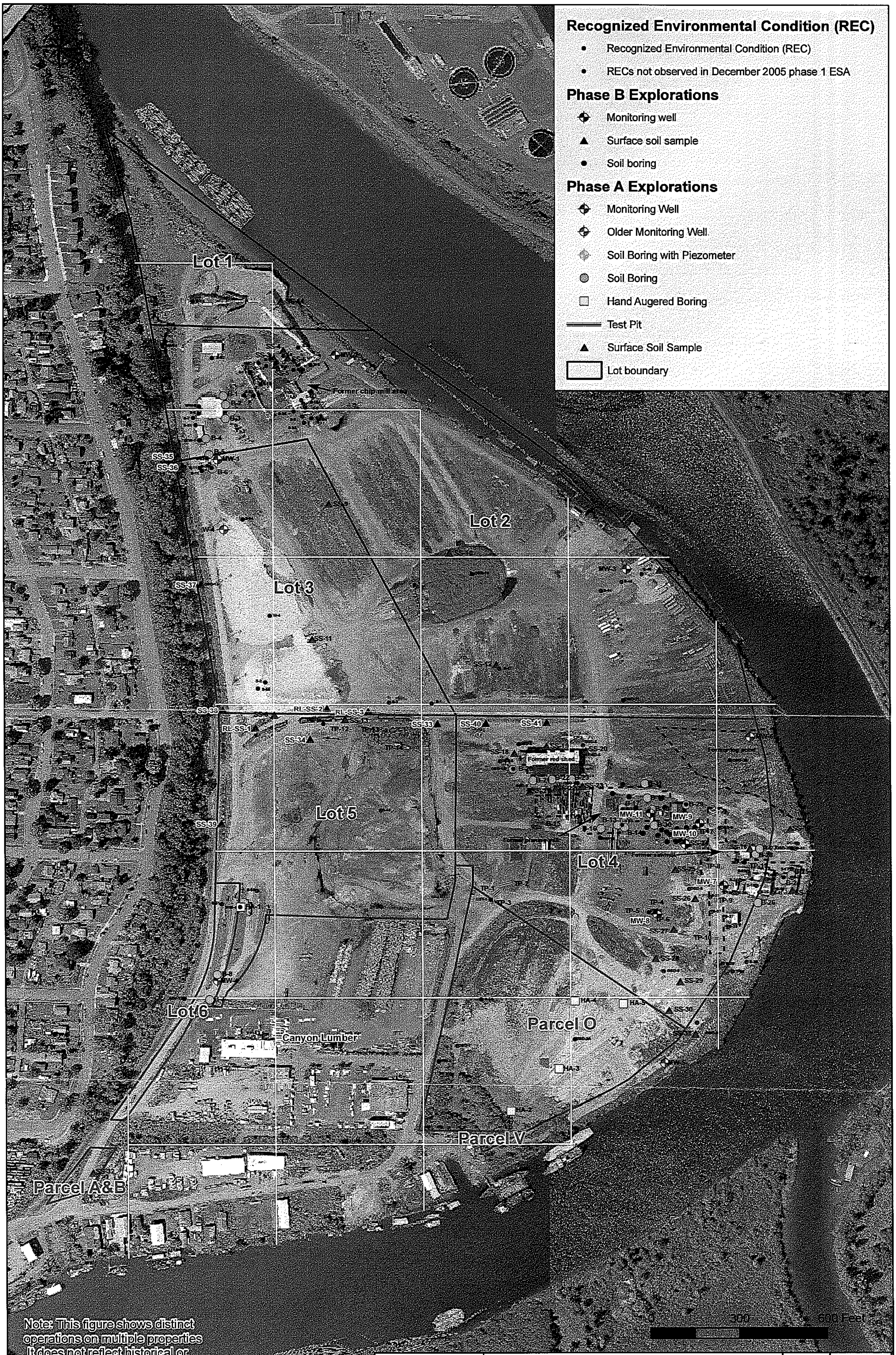

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Recent Sampling Locations
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REVIEWED BY ACM	

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