ASSOCIATED
ENVIRONMENTAL
GROUP, LLC

SUPPLEMENTAL
SITE CHARACTERIZATION

Conducted on:

ACME BULK FUEL PLANT & CARDLOCK
303 Thurston Ave. NE
Olympia, WA 98501

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1.0 INTRODUCTION

Associated Environmental Group, LLC (AEG) has completed a Supplemental Site Characterization at the Acme Bulk Fuel Plant and Cardlock facility, located at 303 Thurston Ave. NE. in Olympia, Thurston County, Washington (the Site). Tasks completed for the Supplemental Site Characterization for the Site were based on findings from AECOM's subsurface investigations and interim remedial action at the Site due to a fuel spill at the Bulk Fuel Plant facility on September 17, 2011. The Cardlock facility, located adjacent east of the Bulk Fuel Plant, is known as Fast Fuel and is operated by Acme Fuel Company.

Tasks conducted during the Supplemental Site Characterization included additional subsurface investigation of the subsurface (soil and groundwater media) at three primary areas: 1) within the bulk fuel aboveground storage tanks (AST) area where the fuel spill had occurred; 2) adjacent and inferred downgradient to the north and east of the Bulk Fuel Plant facility (within the chain-linked fence area of this facility) where AECOM had installed four of the total five monitoring wells to assess the groundwater quality at the Bulk Plant facility after the interim remedial action; and 3) directly east-northeast and inferred downgradient of the Bulk Fuel Plant facility at the Cardlock facility area. Collectively, the Site is comprised of the combined Bulk Fuel Plant and Cardlock facilities and associated area.

The scope of work for this investigation was developed in accordance with Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Cleanup Regulations. The investigation was performed in general accordance with the American Society for Testing and Materials (ASTM) Standard E 1903-97, *Standard Guide Environmental Site Assessments: Phase II Environmental Site Assessment Process,* and ASTM Standard EE 1689 – 95 (Reapproved 2008), *Standard Guide for Developing Conceptual Site Models for Contaminated Sites.*

1.1 Site & Vicinity Area Background

For the purpose of this report, the Bulk Fuel Plant facility will be referred to as Area 1, and the Cardlock facility will be referred to as Area 2 of the Site. The Site is located at the southwest corner of Thurston Ave. NE and Adams Street NE in Olympia, Washington. Its corresponding parcel number is Thurston County Parcel No. 78503100300 which is situated in Section 14, Township 18 North, and Range 2 West. Currently, Area 1 of the Site serves as the bulk fuel refueling area for Acme Fuel Company and is improved by an approximately 30,000-gallon aboveground storage tank (AST) which is contained within a 4-foot high secondary containment wall area. Formerly, the Bulk Fuel Plant facility was comprised of two ASTs which were installed in the mid 1970s. The second AST, an approximately 70,000-gallon tank, was decommissioned and removed in April 2012 due to the fuel spill. These ASTs had stored only diesel, kerosene, and/or bio-diesel fuel. A diesel fuel loading rack and a propane tank are located

adjacent north and southeast, respectively, of the AST. The Bulk Fuel Plant facility is chain-linked on all sides and occupies the western and southwestern area of the Site. Figure 1, *Site & Vicinity Aerial*, presents an aerial view of the Bulk Fuel Facility with the current single AST tank and containment wall as well as the layout of the adjacent Cardlock facility. Figure 2, *Site & Vicinity Map*, presents the general boundaries and vicinity area of the Site.

Area 2 of the Site is occupied by the Cardlock facility (known as Fast Fuel and is operated by Acme Fuel Company). The Cardlock facility, constructed in 1985, is comprised of five dispenser islands housed under two canopies and a stand-alone diesel pump island (not under canopy) on the west side of the Cardlock facility. There are four underground storage tanks (USTs) at the Facility including: 1) three 8,000-gallon capacity gasoline containing USTs; and 2) one 8,000-gallon capacity diesel containing UST. The USTs are located directly below the dispenser islands and also in between the two canopy areas. The Cardlock facility has been in operation since 1986 to the present time (refer to Figures 1 and 2). The USTs, product lines, and UST system have passed recent Ecology site inspections and required annual tank tightness tests, leak detector test, and product lines test without issues.

1.2 Previous Environmental Work Summary

A brief environmental history of the most recent environmental investigation at the Site is provided below. Details of the investigations were obtained from AECOM's reports including: 1) "*Ecology ERTS #629277 –MTCA 90-Day Report for Release at ACME Energy Services, Olympia, WA"* (dated December 14, 2011); and 2) "*Technical Memorandum – Forensic Data Interpretation, Acme Site, Olympia, Washington"* (dated January 24, 2012).

Diesel Fuel Spill - 2011

AECOM reported that on "*September 17, 2011, 2,600 gallons of diesel fuel were released during delivery by Kenan Advantage Group at the ACME Energy Services site*" (the Site) … *The released occurred during the transfer of fuel from a tanker truck to an on-site above ground storage tank (AST). The AST was under repair* …" (AECOM, 2011). NRC was mobilized to the Site on the same day and used a vacuum truck to recover fuel on the ground surface and in the AST. In addition, the vac-truck was also used to vacuum soil surrounding the AST. NRC installed a total of 51 recovery wells (8-inch diameter perforated PVC wells using the vac-truck) and two recovery trenches. AECOM reported that "*wells observed with product were primarily located within the AST berm area and to a lesser extent just beyond the berm area. Recovery wells that continue to produce diesel for recover have been retained and continue to be vacuumed on a regular basis … Closure/abandonment of the majority of these recovery wells (34) occurred on Friday November 18, 2011"* (AECOM, 2011).

As of December 2011, approximately 1,950 gallons of diesel and 37,020 gallons of hydrocarbon impacted water have been recovered. AECOM reported that approximately 140 tons of impacted soil was removed from all accessible impacted areas "*except directly beneath the AST and associated piping*". According to AECOM, "*Onsite observations indicate that the spilled product migrated downward within the berm area …The RW's* (recovery wells) *and RT's* (recovery trenches) *installed outside the* (containment) *berm have found evidence of the spilled material moving somewhat outside the berm area. However, the RW's farther from the spill area have not shown evidence of product*" (AECOM, 2011).

AECOM provided oversight to soil and groundwater investigation at the Bulk Fuel Facility via a direct-push probe drilling rig where six borings were advanced outside the concrete berm. Five monitoring wells were also installed in November 2011. Soil and groundwater samples were submitted for analysis of diesel and heavy oil range total petroleum hydrocarbons (TPH). Groundwater samples were also submitted for gasoline range TPH and associated volatile organic compounds (benzene, toluene, ethylbenzene, and total xylenes – BTEX).

AECOM reported that groundwater elevation measurements from the five monitoring wells indicate a "*potentiometric surface with a generally northerly flow. There are also indications of north-easterly and north-westerly flow*". Analytical results showed presence of elevated concentrations, at levels above the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Method A cleanup levels, in soil and groundwater samples collected from monitoring wel MW-4, located adjacent east of the containment area. Figure 3, *Site Plan & Boring Locations Map*, present the locations of AECOM monitoring wells MW-1 through MW-5. Elevated diesel range TPH (1,700 micrograms per liter - ug/L) and benzene (17 ug/L) were reported at MW-4. Ecology MTCA Method A groundwater cleanup levels for these constituents are 500 ug/L and 5 ug/L, respectively. In addition, elevated diesel range TPH were also reported at MW-5 (2,900 ug/L) and at MW-3 (1,200 ug/L) (AECOM, 2011). These wells located directly north and northeast, respectively, of the fuel spill area near the northern property boundary of the Bulk Fuel facility (refer to Figure 3).

AECOM Forensic Data Interpretation - 2012

AECOM submitted soil and groundwater samples to Friedman & Bruya Inc. for forensic analysis to "*determine if the petroleum hydrocarbons in subsurface soil and groundwater in the vicinity of the spill location are due to spill migration and are related to the material spilled on September 17, 2011*". AECOM concluded the following: "*the petroleum hydrocarbons found at other site locations in the vicinity of the recent spill are not related to the KAG spill; Migration of the spilled product has not occurred significantly beyond the original spill area; and Hydrocarbons identified in other up-and down-gradient samples at the site are sourced from one or more historical fuel releases from this site or others*" (AECOM, 2012).

1.3 Objectives and Scope of Work

The objectives of AEG's Supplemental Site Characterization were to evaluate the following:

- Whether residual petroleum hydrocarbons contamination exists at the fuel spill area: beneath and in vicinity area adjacent to the former 70,000-gallon AST tank – within the concrete containment wall (berm) area;
- Assess if the subsurface (soil and groundwater media) at areas below and adjacent to the former 70,000-gallon AST is impacted at concentrations above Ecology MTCA Method A cleanup levels;
- Further characterize areas immediately outside the containment wall area to assess whether the subsurface (soil and groundwater media) remains impacted by diesel range petroleum hydrocarbons (as formerly reported and confirmed by AECOM);
- Assess the potential for migration of petroleum hydrocarbons and associated volatile organic compounds (from the diesel fuel spill on September 17, 2011) to migrate to inferred downgradient areas east, northeast, north, and northwest of the fuel spill area based on groundwater flow information/data presented by AECOM. Assess areas within the Bulk Fuel Plant facility (Area 1 of the Site) and Area 2 of the Site (Cardlock facility);
- Assess whether the potential exists for migration of the constituents of concern (petroleum hydrocarbons and associated VOCs) offsite to the north, northwest, east, and northeast (of the fuel spill area); and
- Assess the subsurface condition (soil and groundwater media) at the Cardlock facility at locations adjacent to the dispenser islands and underground storage tanks to assess the fuel station's integrity.

AEG's scope of work for this effort included: 1) conduct subsurface investigation inside the fuel containment area (at and nearby area of the former 70,000-gallon AST) with a hand probe and remaining areas at the Bulk Fuel Plant facility and the Cardlock facility with a truck-mounted direct push probe drilling rig; 2) collect soil and groundwater samples for laboratory analyses; 3) collected additional groundwater samples at selected boring locations for potential future forensic analysis; 4) conduct groundwater monitoring and sampling activities at AECOM's existing monitoring wells at Area 1 of the Site; and 5) preparation of this report.

Specific tasks performed for the Supplemental Site Characterization included the following:

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- Conducted both public and private utilities locates for the Site and vicinity. The public right of way locates were performed by The Underground Utilities Locate Center and Applied Professional Services (APS) provided private utility locates on the Site. APS also verified locates in the public right of way.

- Advanced four borings (B-2, B-4, B-5, and B-7) within the bulk fuel containment area where the fuel spill had occurred using a rotor hammer and hand probe to 7 feet below ground surface (bgs) to assess whether residual diesel range total petroleum hydrocarbons (TPH) groundwater contamination exists after AECOM's cleanup activities. Figure 3, *Site Plan & Borings Location Map,* presents the locations of these borings with respect to the locale of the former 70,000-gallon AST. Figure 3 also shows other features of the Site including the layout of the Bulk Fuel Plant and Cardlock's underground storage tanks (USTs) and fuel canopies.

- Advanced two borings (B-1 and B-3) adjacent north and east, respectively, of the former fuel spilled area outside of the containment wall to 10 feet bgs to assess the potential for migration of TPH and associated volatile organic compounds (VOC) from the spilled fuel to migrate to areas beyond the containment and assess both soil and groundwater media for adverse impact (refer to Figure 3). The borings were advanced via a truck-mounted direct push probe drilling rig.

- Advanced a single boring (B-6) directly east, outside of the chain-link fence perimeter of the Bulk Fuel Plant facility to assess the potential of further migration of TPH and VOC (associated with the spilled fuel) to migrate farther east (refer to Figure 3). The locale of the boring was based on AECOM April 2012 groundwater potentiometric map which shows an easterly groundwater flow direction. Additionally AEG had assessed that the inferred groundwater flow direction at the Site may range from north/northeast/east/to northwesterly based on local topography and subsurface soil. Borings B-6 was placed at this area to further characterize the vertical and lateral extent of petroleum hydrocarbons impacted soil and groundwater potentially associated with the fuel spill.

- Advanced five borings (B-8 through B-12) at the Cardlock facility at areas adjacent and inferred downgradient of the dispenser islands and its USTs to assess the potential for adverse impact to the subsurface (soil and groundwater media) from the operation of a retail gasoline facility at Area 2 of the Site (refer to Figure 3). The borings were advanced via a truck-mounted direct push probe drilling rig.

- Continuously logged soil borings documenting soil lithologies encountered, lithologic contacts, moisture, density, sample depths, photoionization detection readings, and information regarding sheens and odors, as applicable. Field screen each sample utilizing a Photoionization Detector (PID) to facilitate the selection of appropriate soil samples to be submitted to the analytical laboratory. The soil samples were handled and transported in accordance with industry standard chain-of-custody protocols to ESN Northwest laboratory in Olympia, WA.

- With the exception of borings B-2, B-4, B-5, and B-7, collected soil samples from each boring (from a shallow depth through the capillary fringe and near the bottom depth of each boring advanced for this investigation) to assess subsurface condition. One soil sample was collected from each boring for laboratory analysis. Due to the presence of coarse size gravel and rock as backfill material, to at least 7 feet below ground surface, within the bulk fuel containment area, AEG was unable to collect "soil" samples at borings B-2, B-4, B-5, and B-7.

- With the exception of boring B-9, a groundwater sample was collected from each boring after the completion of soil sampling for field observation and laboratory analysis. A peristaltic pump and dedicated polyethylene tubing were used to collect groundwater samples from a temporary retractable stainless steel screen or PVC screen which was advanced below the vadose zone. At boring B-9, groundwater was not encountered during subsurface investigation activities and thereafter for at least two hours after completion of probe/drilling activities.

- Analyzed groundwater samples collected from borings B-2 and B-4 (former location of the 70,000-gallon AST and adjacent south, respectively) within the fuel containment area for the following constituents of concern as required by Ecology MTCA Cleanup Regulation Table 830-1, *Required Testing for Petroleum Releases*, on a standard laboratory turn-around-time:
    - ❖ Diesel and heavy oil range TPH by Northwest Method NWTPH-Dx/Dx Extended;
    - ❖ Selected volatile organic compounds (VOC) associated with petroleum fuel including benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260;
    - ❖ Carcinogenic polycyclic aromatic hydrocarbons (cPAHs) including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene by EPA Method 8270; and
    - ❖ Total naphthalenes by EPA Method 8270.

- Analyzed groundwater samples collected from borings B-5 and B-7 (adjacent west and northwest, respectively, of former location of the 70,000-gallon AST) within the fuel containment area for the following constituents of concern on a standard laboratory turn-around-time:
    - ❖ Diesel and heavy oil range TPH by Northwest Method NWTPH-Dx/Dx Extended; and

- ❖ Selected volatile organic compounds (VOC) associated with petroleum fuel including benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260.

- Analyzed selected soil and groundwater samples from borings B-1, B-3, and B-6 (associated with the bulk fuel plant facility) and samples collected at the Cardlock facility for the following constituents of concern on a standard laboratory turn-around-time:
  - ❖ Diesel and heavy oil range TPH by Northwest Method NWTPH-Dx/Dx Extended;
  - ❖ Gasoline range total petroleum hydrocarbons (TPH) by Northwest Method NWTPH-Gx; and
  - ❖ Selected volatile organic compounds (VOC) associated with gasoline fuel including benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260.

- Compared soil and groundwater analytical results to Ecology MTCA Method A soil and groundwater cleanup levels for the above indicated constituents of concern.

AECOM WELLS GROUNDWATER MONITORING/SAMPLING ACTIVITIES

In September 2012, AEG conducted groundwater monitoring and sampling activities at AECOM's monitoring wells MW-1 through MW-5 (installed at the Bulk Fuel Facility - Area 1 of the Site) to assess the groundwater quality condition at adjacent and inferred downgradient area from the fuel spilled area from existing monitoring wells as opposed to from grab groundwater samples collected from direct push probe borings.

- Used a Heron interface probe to gauge depth-to-water measurements and assess the potential presence of liquid phase hydrocarbons (LPH's) at MW-1 through MW-5.

- Conducted limited well development/purge via the peristaltic pump on all monitoring wells.

- Used a YSI multi-parameter probe, model 556 MPS, to record water quality field parameters including pH, conductivity, temperature, dissolved oxygen, total dissolved solids (TDS), and salinity during purging activities until field parameters such as pH, conductivity, and temperature have stabilized.

- Groundwater samples were collected via EPA low-flow purge technique once the key indicator field parameters have stabilized. Collected representative groundwater samples from MW-1 through MW-5 in laboratory provided containers which included 40

milliliter (ml) glass VOAs (vials) for gasoline range TPH and VOC analyses; and 500 ml glass amber jars for diesel and heavy oil range TPH. The containers were labeled and placed in a portable chilled ice chest and transported to Libby Environmental Chemistry Laboratory in Olympia, WA, following standard chain-of-custody procedures.

- The samples were submitted for the following constituents of concern and their respective methods of laboratory analysis:
  - ❖ Gasoline range TPH via Northwest Method NWTPH-Gx;
  - ❖ Gasoline associated VOC including benzene, toluene, ethylbenzene, total xylenes (BTEX) via EPA Method 8260; and
  - ❖ Diesel and heavy oil range TPH via Northwest Method TPH-Dx/Dx Extended.

- Compared the analytical results to Ecology MTCA Method A groundwater cleanup levels for the above indicated constituents.

- AEG retained a Professional Licensed Surveyor, Pacific Geomatic Services, Inc., to survey the elevations of monitoring wells MW-1 through MW-5. Ground surface and casing elevations at each well were surveyed to the nearest 0.01 foot relative to an assigned benchmark (refer to surveyor's site exhibit in Appendix B).

- Completed a groundwater potentiometric map based on groundwater elevations measured during the September 2012 sampling event (refer to Figure 4 and Table 4).

- Prepared this report containing a summary of the two phases of investigations including the subsurface conditions encountered, a discussion of soil and groundwater analytical laboratory results, findings, and recommendations.

1.4 Site Geology and Hydrogeology

The Site is located within the southern area of the Puget Lowland in western Washington. The Puget Lowland is a north-south trough that lies from the Canadian Border south to the Willapa Hills and between the Olympic Mountains to the west and the Cascade Mountains to the east. The topography is dominated by north-south trending valleys and low, nearly flat-topped terraces that are less than 1,000 feet in elevation. Terraces are deep and eroded by streams and rivers. The topographic surface of northern Thurston County is largely the result of erosion since the most recent glacial events (Easterbrook, 1970).

According to the *Geologic Map of the Tumwater 7.5-minute Quadrangle, Thurston County, Washington*, the surficial geology at the Site is comprised of fill material. Historical Sanborn Insurance Maps show that several fill events occurred along East Bay of Budd Inlet throughout

the late 1800s and early 1900s. Typically the fill consist of *"clay, silt, sand, gravel, organic matter, shells, rip-rap, and debris emplaced to elevate the land surface and reshape surface morphology; includes engineered and non-engineered fills; shown only where fill placement is relatively extensive, sufficiently thick to be of geotechnical significance, and readily verifiable"* (Walsh, T.J., Logan, R.L., et al., 2003). This fill is underlain by native soils consisting of sands, silts, and clays and at deeper depths a regional confining layer, which creates artesian groundwater conditions in Olympia (Pioneer, 2011).

According to a subsurface investigation conducted by AECOM in 2011 at Area 1 of the Site, soil borings were advanced to a maximum depth of 8.5 feet below ground surface (bgs) and showed that subsurface deposits, in general, consisted of poorly graded sand with silt and gravel (AECOM, 2011). Groundwater was encountered at depths ranging from 4.5 to 5.8 feet bgs

The subsurface conditions at the Site, at locations of investigation during this subsurface investigation, generally consist of fill deposits ranging from medium dense poorly graded sand to silty sand to medium stiff clay to approximately 10 feet below ground surface (bgs). Weathered wood debris/fragments ranging from several inches to at least 2 foot thick were also observed below the clayey soil at depths of approximately 8 to 10 feet bgs (refer to soil boring logs in Appendix B, *Supporting Documents*). The nature of the soils in the water-bearing zone appears to be the poorly graded sand (medium grained) to silty sand within the fill deposits. Groundwater was encountered at approximately 5 to 7 feet bgs throughout the Site during AEG's subsurface investigation activities. The depths-to-water measured at AECOM's monitoring wells during AEG's September 2012 groundwater event ranged from 5.02 to 5.29 feet bgs.

The direction of shallow groundwater flow at the Site, as drafted during AEG's September 2012 groundwater event based on professional surveyed elevations, was generally to the north (refer to Figure 4, *Groundwater Potentiometric Map – September 2012*). In comparison, AECOM's potentiometric map for the April 2012 groundwater event (based on arbitrary benchmarks for the Area 1 of the Site) shows both north and easterly components of groundwater flow direction during this event (refer to Figure 5). AECOM reported that the general direction of groundwater flow was northerly, and "*there are also indications of north-easterly and north-westerly flow*" (AECOM, 2011).

The direction of shallow groundwater flow can be highly variable due to the presence of variable depth to shallow groundwater and tidal influences in the vicinity area. In our professional opinion, the direction of regional groundwater flow in the area will likely fluctuate from generally north to northeast and northwest with tangents to the east based on surface topography and regional discharge points towards the East Bay (approximately 800 feet west of the Site) and the West Bay of Budd Inlet (within approximately 1,300 feet east from the Site).

2.0 PROBE SUBSURFACE INVESTIGATION

AEG advanced 12 soil borings (B-1 through B-12) at the Site on September 27, 2012 to further characterize the extent of petroleum hydrocarbons and associated volatile organic compounds contamination at the Bulk Fuel Plant area of the Site (Area 1) and assess the subsurface condition at the Cardlock facility area of the Site (Area 2). The locales for the subsurface investigation within the area of the former 70,000-gallon AST were also specifically to evaluate the potential for residual groundwater contamination from the spilled fuel despite of the remedial action work completed by AECOM.

The borings were advanced via two types of drilling methods: 1) a rotor hammer and hand probe were used to advance borings within the containment area of the Bulk Fuel Plant facility for borings B-2, B-4, B-5, and B-7; and 2) a truck mounted direct push probe drilling rig (Power Probe 9600) was used to advance remaining borings at Areas 1 and 2 of the Site including borings (B-1, B-3, B-6, and B-8 through B-12). ESN Northwest of Olympia, Washington, was retained for drilling services. The soil sampling procedure during the direct push probe drilling involved pushing in increments of five feet using a two-inch, inside diameter, stainless steel sample corer with a five foot long Teflon sample sleeve insert and connecting drilling rods. The maximum depth advanced was 10 feet bgs.

The constituents of concern at the Site were separated into two areas: 1) Area 1 within the containment area included diesel and heavy oil range TPH, associated VOC, total napthalenes, and carcinogenic polycyclic aromatic hydrocarbons (cPAH) as per Ecology MTCA Cleanup Regulation Table 830-1; 2) the remaining area of Area 1 and Area 2 included gasoline, diesel, and heavy oil range TPH, and associated VOC. Photo documentation of the subsurface investigation is presented in Appendix A, *Site Photographs*.

2.1 Soil Sampling Procedures

Soil samples were collected and observed to document soil lithology, color, moisture content, and sensory evidence of impairment. Samples collected via borings utilized a two-inch, inside diameter, stainless steel sample corer with a five foot long Teflon sample sleeve insert and connecting drilling rods. All soil samples were classified in the field, field screen utilizing a PID to facilitate the selection of samples for analysis, and immediately transferred to laboratory provided pre-weighted 40-mL VOA glass vials with septum sealed Teflon-lined screw caps and four ounce glass jars. All soil samples were placed in a portable chilled ice chest. Soil sampling for VOC and field preservation methods followed methods set forth by Ecology's Method 5035A, "*Collecting and Preparing Soil Samples for VOC Analysis*" which minimizes VOC losses.

The soil samples were field screened using a PID for the presence of VOC. The PID field screening results showed a maximum reading of 39.8 volumetric parts per million (Vppm) at boring B-6 at a depth of approximately 4/5 to 5.0 feet bgs. Elevated detections of VOC were also recorded at boring B-1. The PID readings are presented on the soil boring logs.

With the exception of borings advanced within the containment area, one soil sample was selected from each boring for laboratory analysis. The soil samples were transported to Libby Environmental Chemistry Laboratory (Libby), a Washington State certified analytical laboratory located in Olympia, Washington, for analysis following industry standard chain-of-custody procedures with a standard five day laboratory turn-around-time.

Table 1, *Summary of Soil Analytical Results – Supplemental Site Characterization,* presents laboratory analytical results for all borings advanced in Areas 1 and 2 of the Site. All analytical soil results were compared to Ecology MTCA Method A soil cleanup levels for the respective constituents of concern. Boring logs and soil laboratory analytical results are provided in Appendix B, *Supporting Documents.*

2.2 Groundwater Sampling Procedures

At all borings, a temporary 3-foot long retractable stainless steel screen was advanced to a depth below the vadose zone, where groundwater was encountered during drilling activities. Sufficient groundwater for sampling purposes was available at all borings except boring B-9. A peristaltic pump was utilized to collect the groundwater samples via the U.S. EPA approved low-flow purge technique using dedicated polyethylene tubing. The tubing was inserted into the retractable screen. The groundwater was purged until the discharge had been relatively free of sediment for sample collection. The groundwater samples collected were selectively analyzed for constituents of concern similar to the soil laboratory analyses. The groundwater samples were placed in laboratory provided containers including 40 milliliter (mL) glass VOAs (vials) for gasoline range TPH and VOC analyses and 500 mL ambers for diesel/heavy oil range TPH and PAH. Table 2, *Summary of Groundwater Analytical Results - Supplemental Site Characterization,* presents analytical groundwater results as compared to Ecology MTCA Method A groundwater cleanup levels.

AEG elected to collect additional groundwater samples at borings advanced within Area 1 of the Site and at boring B-6 for potential future consideration of forensic analysis on selected samples.

To reasonably ensure the quality of AEG's samples, the following actions were taken (1) nitrile gloves were used in handling all sampling jars and sampling devices; (2) the sampling equipment was scrubbed with Alconox detergent and rinsed with water prior to each sample extracted; and

(3) the containers were then placed in a chilled cooler and transported under a chain-of-custody to ESN Northwest laboratory.

2.3 Quality Controls

All soil and groundwater samples were collected in general accordance with industry protocols for the collection, documentation, and handling of samples. Descriptions of soil and sampling depths were carefully logged in the field, and the drillers and geologist confirmed sample depths as soil samples were collected. Boring location maps were completed prior to leaving the site to document sampling locations.

Soil samples were tightly packed into jars to eliminate sample headspace. Water samples were filled carefully in the sampling bottles to prevent volatilization. Upon sampling, all samples were placed immediately into chilled ice chests.

All samples were transported and submitted under standard chain-of-custody protocols and remained refrigerated until delivery to ESN Northwest analytical laboratory. The laboratory provided standard quality assurance/quality control (QA/QC) which included the following: surrogate recoveries for each sample, method blank results, duplicate analyses, matrix or blank spiked analyses, and duplicate spiked analyses.

2.4 Investigation Derived Waste

Investigation derived waste for this project consisted of soil cuttings from the subsurface exploration activities vicinity area, decontamination water from decontamination of the drilling rods and associated equipment, and purge water. These wastes were separated and placed in Washington State Department of Transportation (DOT) approved 16-gallon drums. One each 16-gallon drums containing soil and decontamination water/purge water were generated during these field services. The drums were stored onsite for subsequent characterization and disposal.

3.0 AEG SEPTEMBER 2012 GROUNDWATER EVENT

AEG conducted a groundwater monitoring and sampling event on September 19, 2012 at the Site's Bulk Fuel Plant facility monitoring wells installed by AECOM. Tasks completed for the September 2012 Groundwater Event are presented below.

3.1 Groundwater Sampling Procedures

Groundwater analytical results from AECOM's April 2012 Groundwater Event and AEG's September 2012 Groundwater Event should be used as part of a long-term groundwater quality monitoring/sampling program for the Site to assess impacted areas at the Site and the potential for off-property migration of constituents of concern.

Prior to sampling, depth-to-water measurements were obtained by using an electronic water level indicator. The depth-to-water levels were measured from the top of casing, on the north side, at each monitoring well.

Prior to sample collection, all monitoring wells were purged following U.S. EPA approved low-flow purge technique. The wells were purged until the field parameters, including pH, temperature, specific conductance, dissolved oxygen, and turbidity, have stabilized. Table 5, *Summary of Water Quality Indicator Parameters – Monitoring Wells*, presents the final stabilized field parameters at each well during the monitoring phase. The wells were sampled with dedicated 0.170″ ID x 1/4″ OD polyethylene tubing using the peristaltic pump to mitigate cross-contamination during groundwater sampling activities. To further decrease the potential for cross-contamination, the wells were sampled sequentially from the least impacted to most impacted wells (based on AECOM's groundwater analytical results).

Groundwater samples were collected in laboratory provided 40 milliliter (mL) glass VOAs (vials) for gasoline range TPH and VOC and 500 mL amber bottles for diesel/heavy oil range TPH analysis. Table 3, *Summary of Groundwater Analytical Results – Monitoring Wells*, presents a summary of analytical groundwater results for wells MW-1 through MW-5 including AECOM's September 2011 event and AEG's recent September 2012 event as compared to Ecology MTCA Method A groundwater cleanup levels. Note that AEG was not provided with AECOM's April 2012 Groundwater Event analytical results. All samples were transported the day of sample collection and submitted under standard chain-of-custody protocols to Libby Environmental Chemistry Laboratory.

To reasonably ensure the quality of AEG's samples, the following actions were taken (1) nitrile gloves were used in handling all sampling containers and sampling devices; (2) the groundwater monitoring equipment was scrubbed with Alconox detergent and rinsed with water prior to each

sample extracted; and (3) the containers were then placed in a chilled cooler and transported under a chain-of-custody to Libby Environmental Chemistry Laboratory, a Washington State certified analytical laboratory located in Olympia, Washington with a standard seven business days laboratory turn-around-time.

3.2 Quality Controls

All groundwater samples were collected in general accordance with industry protocols for the collection, documentation, and handling of samples. Water samples were filled carefully in the sampling bottles to prevent volatilization and minimize volatile organic compounds losses. Upon sampling, all samples were placed immediately into chilled ice chests.

The laboratory provided standard quality assurance/quality control (QA/QC) which included the following: surrogate recoveries for each sample, method blank results, duplicate analyses, matrix or blank spiked analyses, and duplicate spiked analyses.

3.3 Monitoring Wells Survey

AEG retained licensed surveyors from Pacific Geomatic Services of Mountlake Terrace, Washington to professionally survey AECOM monitoring wells MW-1 through MW-5 on October 17, 2012. The purpose for the survey was to establish elevation data relating the land surface to the potentiometric surface of the shallow groundwater. Vertical and horizontal data were established using the Washington State Department of Transportation monument identifiers in NAVD 88 and NAD 83/91, respectively. Horizontal datum is established using the Washington State Plane North Coordinate System. Ground surface and top of casing elevations were surveyed to the nearest 0.01 foot. The groundwater elevations were measured from the top of the PVC monitoring well casing (north side). Table 3, *Summary of Groundwater Elevations – Monitoring Wells*, presents the depth-to-water and associated groundwater elevations for all monitoring wells. An exhibit presenting the vertical and horizontal datum used by the surveyors and elevations of the wells is included in Appendix B.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The findings and conclusions derived during the Supplemental Site Characterization for the Acme Bulk Fuel Plant facility (Area 1) and Cardlock facility (Area 2) of the Site are as follows:

Bulk Plant Facility

- AEG advanced a total of six borings (four within the containment area and two immediately adjacent outside of the containment area) at Area 1 of the Site to assess the following: 1) whether residual petroleum hydrocarbons contamination exists at the fuel spill area: beneath and in vicinity area adjacent to the former 70,000-gallon AST tank; 2) further characterize areas immediately outside the containment wall area to assess whether the subsurface (soil and groundwater media) remains impacted by diesel range petroleum hydrocarbons (as formerly reported and confirmed by AECOM); and 3) the potential for migration of petroleum hydrocarbons and associated volatile organic compounds (from the diesel fuel spill on September 17, 2011) to migrate off-property.

- Laboratory analytical results for groundwater samples collected from within the containment area, specifically below the former 70,000-gallon AST tank at borings B-2 indicated presence of elevated concentrations of diesel range TPH (75,000 micrograms per liter – ug/L), cPAH (6.5 ug/L), and benzene (35 ug/L). At boring B-4, adjacent south of the former AST, elevated diesel range TPH (28,000 ug/L) and cPAH (3.0 ug/L) were also exhibited. These concentrations are above Ecology MTCA Method A groundwater cleanup levels of 500 ug/L for diesel range TPH, 0.1 ug/L for cPAH, and 5 ug/L for benzene (refer to Table 2). The remaining VOCs and total napthalenes were not detected above cleanup levels at these borings. Groundwater samples collected from these two borings were submitted for Ecology MTCA Cleanup Regulation Table 830-1 required laboratory analysis for fuel spills.

- Diesel range TPH was not exhibited in groundwater collected at borings B-1 and B-3, immediately adjacent north and east, respectively, of the former fuel spill area (outside containment wall). However, gasoline range TPH (2,600 ug/L at B-1 and 1,700 ug/L at B-3) and benzene (16 ug/L at B-1) were detected. These concentrations are above Ecology MTCA Method A groundwater cleanup levels of 800 ug/L and 5 ug/L, respectively (refer to Table 2).

- Laboratory analytical results for soil samples collected from boring B-6, located east and downgradient of the former spill area indicate presence of elevated concentrations of diesel (4,600 mg/Kg), gasoline (830 mg/Kg) range TPH, and benzene (0.06 mg/Kg). These detections are above their respective MTCA cleanup levels of 2,000 mg/Kg, 30 mg/Kg, and 0.03 mg/Kg, respectively (refer to Table 1).

- Groundwater analytical results for AECOM's monitoring wells show presence of elevated diesel range TPH and/or benzene at MW-3 (northeast), MW-4 (directly adjacent east-northeast), and MW-5 (north of the containment area) during AECOM's September 2011 Groundwater Event. In comparison, during AEG's September 2012 Groundwater Event only elevated benzene (at concentrations above Ecology Method A cleanup level) was exhibited at MW-4 and MW-5 (refer to Table 3).

- The direction of groundwater flow for the Site based on AECOM's and AEG's monitoring events appear to generally be northerly with components to the northeast and east (refer to Figure 4 and Table 4).

Cardlock Facility

- AEG advanced a total of five borings (B-8 through B-12) at Area 2 of the Site to assess the subsurface condition (soil and groundwater media) at the Cardlock facility at locations adjacent to the dispenser islands and underground storage tanks to assess the fuel station's integrity as an operational retail fuel dispensing facility.

- Laboratory analytical results indicate no detectable concentrations of all constituents of concern (gasoline, diesel, and heavy oil range TPH; and associated VOC) in all soil and groundwater samples collected for Area 2 of the Site (refer to Tables 1 and 2).

Discussions

Groundwater analytical results for borings B-2 and B-4 (advanced at the former spill area/former 70,000-gallon AST tank) show significant impact to the groundwater media due to the former fuel spill on September 17, 2011. The combined elevated concentrations of diesel range TPH (up to 75,000 ug/L) and cPAH (up to 6.5 ug/L) are associated with the fuel spill notably both in the type of contaminants detected (associated with the fuel spilled) and the high concentrations reported (i.e., not indicative of weathered/older fuel). A slight to moderate sheen with strong diesel petroleum fuel odor was also observed during groundwater sampling activities at borings B-2 and B-4.

It is significant to note that contamination remains at the former fuel spill area (within the Bulk Fuel Facility of the Site), beneath the former 70,000-gallon AST tank despite of the fuel recovery and remedial action work completed by AECOM. AECOM reported that "*diesel collection via the recovery wells, excavation of impacted soil from all accessible impacted areas has also been completed (except directly beneath the AST and associated piping)*" (AECOM, 2011). Hence, in our professional opinion the high level of contamination currently present in this area is not

unexpected. Additional cleanup action/remedial action is necessary to remediate the impacted groundwater, to concentrations below Ecology MTCA Method A cleanup levels.

The potential exists that the elevated diesel range TPH concentration detected at boring B-6 (located downgradient and east of the former fuel spill area) is related to the former fuel spill that had occurred on September 17, 2011.

Laboratory analytical results indicate elevated concentrations of gasoline range TPH in groundwater at borings B-1 and B-3 (located within the Bulk Fuel Plant facility area). The potential sources of this contamination are unclear at this point of investigation. However, gasoline groundwater contamination was not exhibited in groundwater samples collected at nearby boring B-6 or at any other borings at the Cardlock facility (B-8 through B-11).

In our professional opinion, the potential for off-property migration of the constituents of concern (TPH, VOC, and/or cPAH) exists due to the direction of groundwater flow and elevated TPH and benzene concentrations detected at perimeter monitoring wells MW-3, MW-4, and MW-5 (AECOM's September 2011 Event).

Recommendations:

Area 1 – Bulk Fuel Plant Facility

Additional cleanup action (remedial action) remains necessary to abate the contaminated groundwater within the containment area.

Due to the presence of diesel range petroleum hydrocarbons and cPAH impacted groundwater at this area of the Site, AEG recommends installation of groundwater monitoring wells within the containment area and east of the spill area in the vicinity of boring B-6 to assess the petroleum hydrocarbons plume and conducting a minimum of four consecutive quarterly groundwater monitoring/sampling events at these newly installed monitoring wells in concert with the existing AECOM wells to evaluate the following:

- The hydrogeologic regime at this area of the Site as it pertains to the direction of shallow groundwater migration and areas of concern regarding migration of petroleum hydrocarbons, associated VOCs, and cPAH to nearby off-property areas;
- The primary constituents of concern, diesel range TPH, VOC constituents, and cPAH as they relate to the groundwater quality condition and potential temporal changes over several quarters; and
- A representative understanding of the residual petroleum hydrocarbons contamination at Bulk Fuel Plant facility as it relates to the fuel spill on September 17, 2011.

AEG also recommends that groundwater monitoring/sampling activities continue at the existing AECOM's wells MW-1 through MW-5 during the additional remedial action activities and thereafter in order to monitor changes to the groundwater quality as well as continue to assess the off-property impact issue.

Ecology Voluntary Cleanup Program

AEG also recommends that the Site be enrolled into Ecology Voluntary Cleanup Program. Ecology can provide technical inputs on findings from remedial actions, subsurface investigations, and groundwater monitoring/sampling events. These inputs from Ecology will assist in future Site investigations and cleanup action and would ensure that the work completed is in agreement with Ecology Toxics Cleanup Program. Completion of Tasks under the guideline and with agreement with Ecology will enable the Site property owner to petition Ecology for a No Further Action (NFA) status upon meeting Ecology cleanup requirements for both the soil and groundwater media.

Note: it is likely that as part of the VCP, Ecology would request that monitoring wells be installed at off-property locales to ascertain the lateral extent of contamination, as associated with the September 2011 fuel spill.

5.0 LIMITATIONS

This report summarizes the findings of the services authorized under our agreement with Acme Fuel Company. It has been prepared using generally accepted professional practices, related to the nature of the work accomplished. This report was prepared for the exclusive use of Acme Fuel Company and its designated representatives for the specific application to the project purpose.

Recommendations, opinions, site history and proposed actions contained in this report apply to conditions and information available at the time this report was completed. Since conditions and regulations beyond our control can change at any time after completion of this report, or our proposed work, we are not responsible for any impacts of any changes in conditions, standards, practices and/or regulations subsequent to our performance of services. We cannot warrant or validate the accuracy of information supplied by others, in whole or part.

6.0 REFERENCES

AECOM, 2012. *Technical Memorandum – Forensic Data Interpretation, Acme Site, Olympia, WA.*

AECOM, 2011. *MTCA 90-Day Report for Release at ACME Energy Services, Olympia, Washington*.

American Society for Testing and Materials (ASTM) Standard E 1903-97, *Standard Guide Environmental Site Assessments: Phase II Environmental Site Assessment Process*.

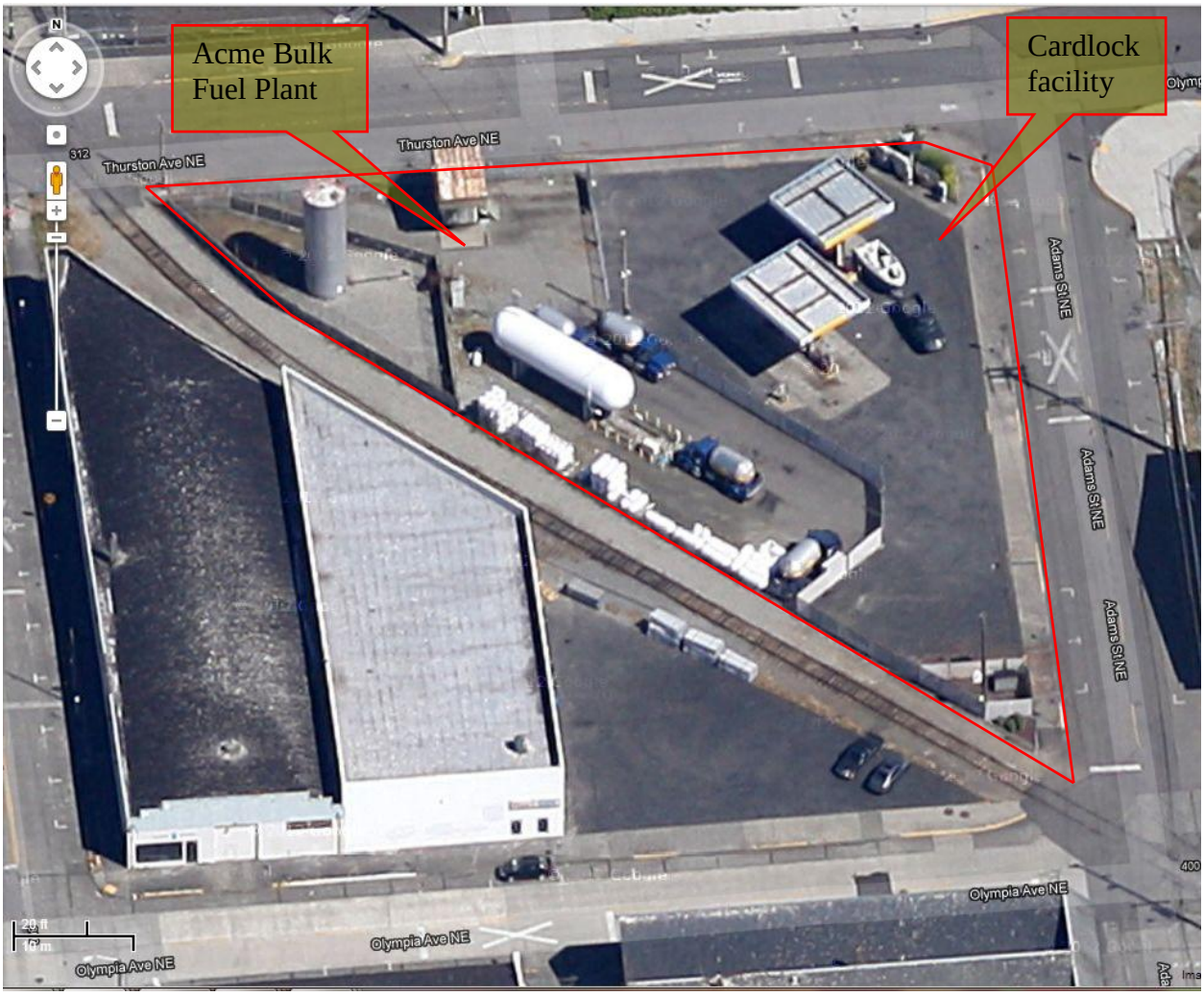
Associated Environmental Group, LLC, 2009. *Phase I ESA – Acme Fuel Company, 303 Thurston Ave. NE, Olympia, WA.*

Easterbrook, D. J., 1970. *Landforms of Washington,* Department of Geology, Western Washington State College.

Pioneer Technologies Corporation, 2011. *Empirical Evaluation of the Potential for Soil Constituents to Migrate to Surface Water Via Groundwater at the East Bay Redevelopment Site.*

Walsh, T.J., Logan, R.L., et al., 2003. *Geologic Map of the Tumwater 7.5-minute Quadrangle, Thurston County, Washington,* Washington Division of Geology and Earth Resources, Open File Report 2003-25.

FIGURES



Source: Google website, 2012

ASSOCIATED ENVIRONMENTAL GROUP, LLC

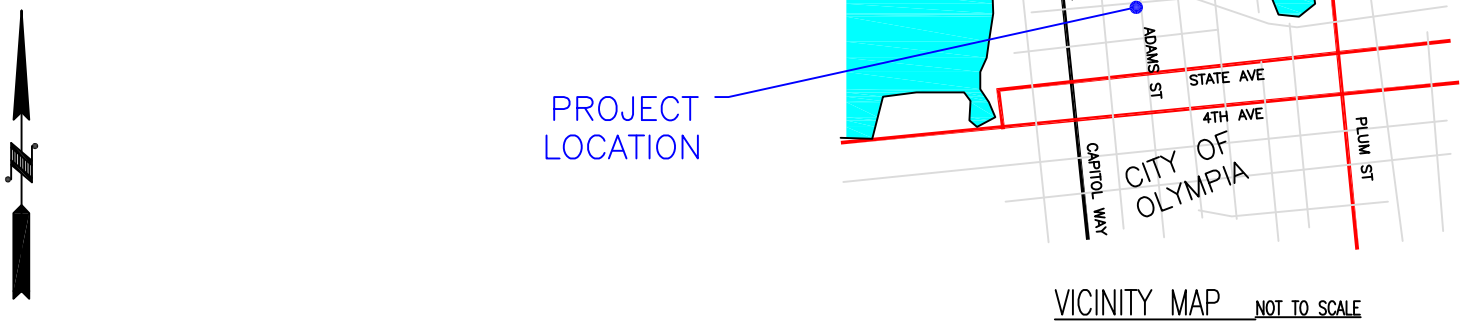
FIGURE 1 - Site & Vicinity Aerial Photo

Acme Bulk Fuel Plant & Cardlock Facilities
303 Thurston Ave. NE
Olympia, WA 98501

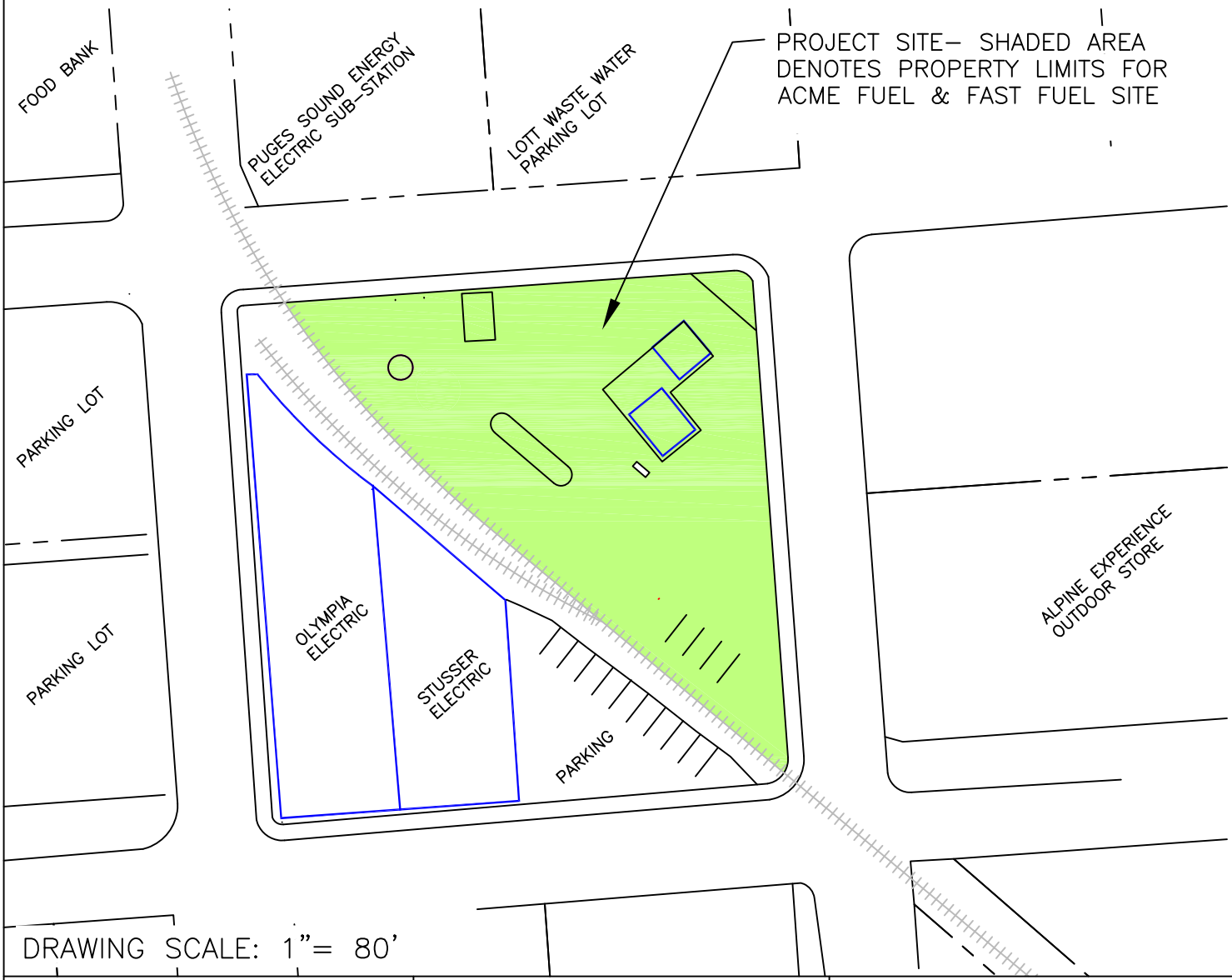
AEG Project No.: 12-114a

Notes:
(1) The locations of all features shown are approximate.
(2) This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document.

Reference: Drawing created from survey drawing by PACIFIC GEOMATIC SERVICES, INC and notes provided by AEG, LLC.



VICINITY MAP NOT TO SCALE



DRAWING SCALE: 1"= 80'

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Olympia, WA 98501-2336
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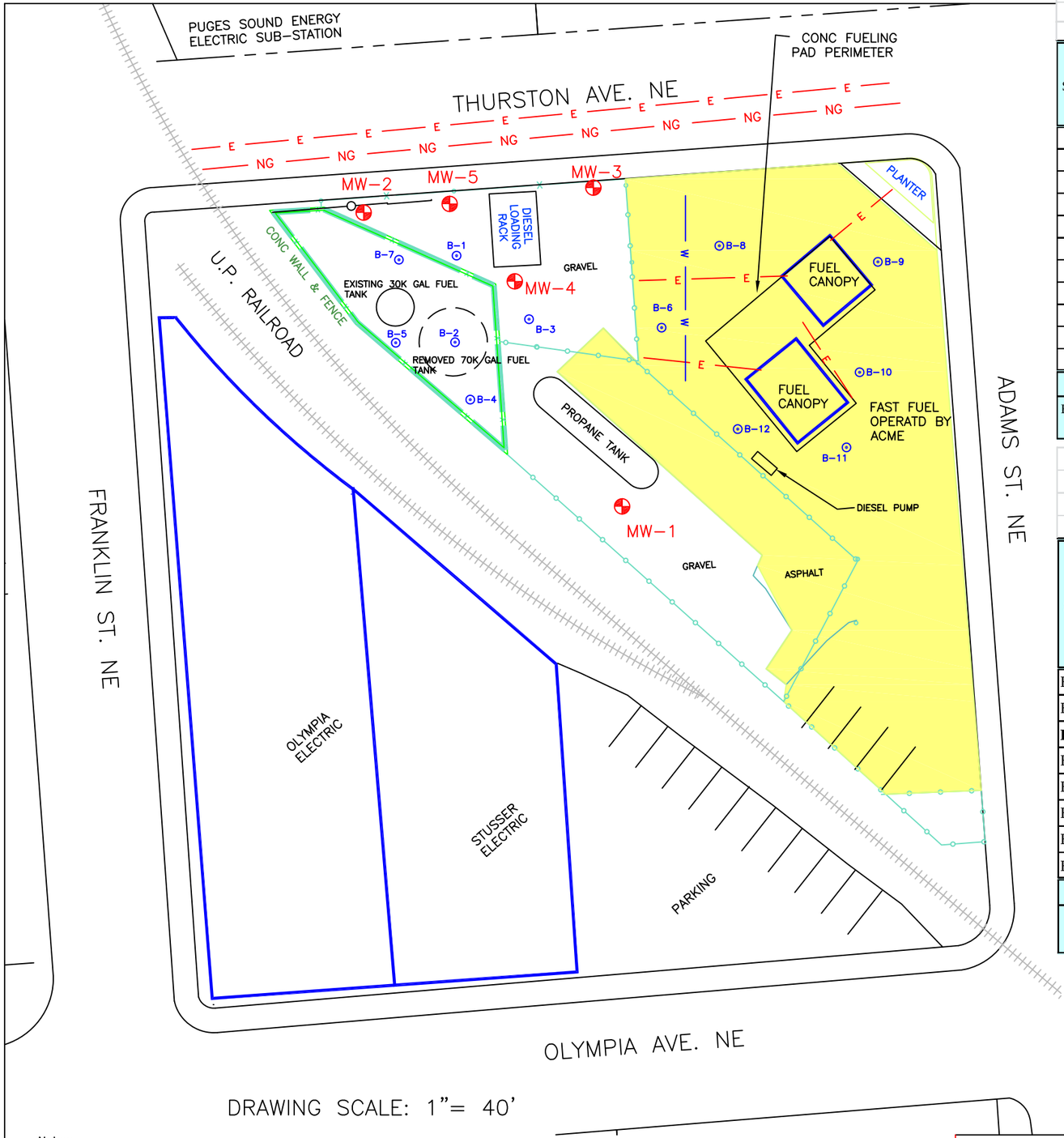
FIGURE 2

SITE & VICINITY MAP

ACME Bulk Fuel Plant & Cardlock
303 THUIRSTON AVE NE
OLYMPIA WA, WA

Project# 12-114a	Date: 10/30/2012
File:	Sheet 1 OF 3



Notes:
(1) The locations of all features shown are approximate.
(2) This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document.

Reference: Drawing created from survey drawing by PACIFIC GEOMATIC SERVICES, INC and notes provided by AEG, LLC.

Table 2 Summary of Groundwater Analytical Results - Phase II ESA
Acme Bulk Fuel Plant & Cardlock (Fast Fuel)
Olympia, WA

Sample Number[1]	Date Sampled	Diesel Extended TPH[4] (ug/L)		Gasoline TPH[2] (ug/L)	Select Volatile Organic Compounds[3] (ug/L)					cPAH[5] (ug/L)
		Diesel	Heavy Oil		**Benzene**	Toluene	Ethylbenzene	Total Xylenes	Total Napthalenes	
B1-W	9/27/2012	<250	<500	**2,600**	**16**	1.0	72	41	--	--
B2-W	9/27/2012	**75,000**	<500	--	**35**	2.3	77	340	90	**6.5**
B3-W	9/27/2012	<250	<500	**1,700**	4.2	1.2	35	120	--	--
B4-W	9/27/2012	**28,000**	<500	--	3.3	4.9	115	390	100	**3.0**
B5-W	9/27/2012	<250	<500	--	2.3	1.5	40	110	--	--
B6-W	9/27/2012	<250	<500	<100	<1.0	<1.0	<1.0	<3.0	--	--
B7-W	9/27/2012	<250	<500	--	<1.0	<1.0	<1.0	<3.0	--	--
B8-W	9/27/2012	<250	<500	<100	<1.0	<1.0	<1.0	<3.0	--	--
B10-W	9/27/2012	<250	<500	<100	<1.0	<1.0	<1.0	<3.0	--	--
B11-W	9/27/2012	<250	<500	<100	<1.0	<1.0	<1.0	<3.0	--	--
B12-W	9/27/2012	<250	<500	<100	<1.0	<1.0	<1.0	<3.0	--	--
PQL		250	500	100	1.0	1.0	1.0	3.0	5.0	0.1
Ecology MTCA Method A Clean Up Levels		500	500	800[6]	5	1,000	700	1,000	160	0.1[7]

Table 1 Summary of Soil Analytical Results - Phase II ESA
Acme Bulk Fuel Plant & Cardlock (Fast Fuel)
Olympia, WA

Sample Number[1]	Date Sampled	Depth Sampled (feet)	Diesel Extended TPH[4] (mg/Kg)		Gasoline TPH[2] (mg/Kg)	Selected Volatile Organic Compounds[2] (mg/Kg)			
			Diesel	Heavy Oil		**Benzene**	Toluene	Ethylbenzene	Total Xylenes
B1-S1-4.5/5.0	9/27/2012	4.5-5.0	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
B3-S2-6.5/7.0	9/27/2012	6.5-7.0	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
B6-S1-4.5/5.0	9/27/2012	4.5-5.0	**4,600**	<100	**830**	**0.06**	0.26	<0.05	0.29
B8-S1-4.5/5.0	9/27/2012	4.5-5.0	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
B9-S2-7.5/8.0	9/27/2012	7.5-8.0	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
B10-S1-4.5/5.0	9/27/2012	4.5-5.0	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
B11-S	9/27/2012	--	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
B12-S1-4.5/5.0	9/27/2012	4.5-5.0	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
PQL			50	100	10	0.02	0.05	0.05	0.15
Ecology MTCA Method A Clean Up Levels			2,000	2,000	30[5]	0.03	7	6	9

LEGEND

- E — SLATTED CHAIN LINK FENCE
- NG — NATURAL GAS LINE
- W — WATER LINE
- X — 4' CONCRETE WALL WITH 4' CHAIN LINK FENCE
- SLATTED CHAIN LINK FENCE
- B-1 — BORINGS TAKEN BY AEG
- MW-1 — AECOM MONITORING WELLS
- PAVED AREA OF PROPERTY

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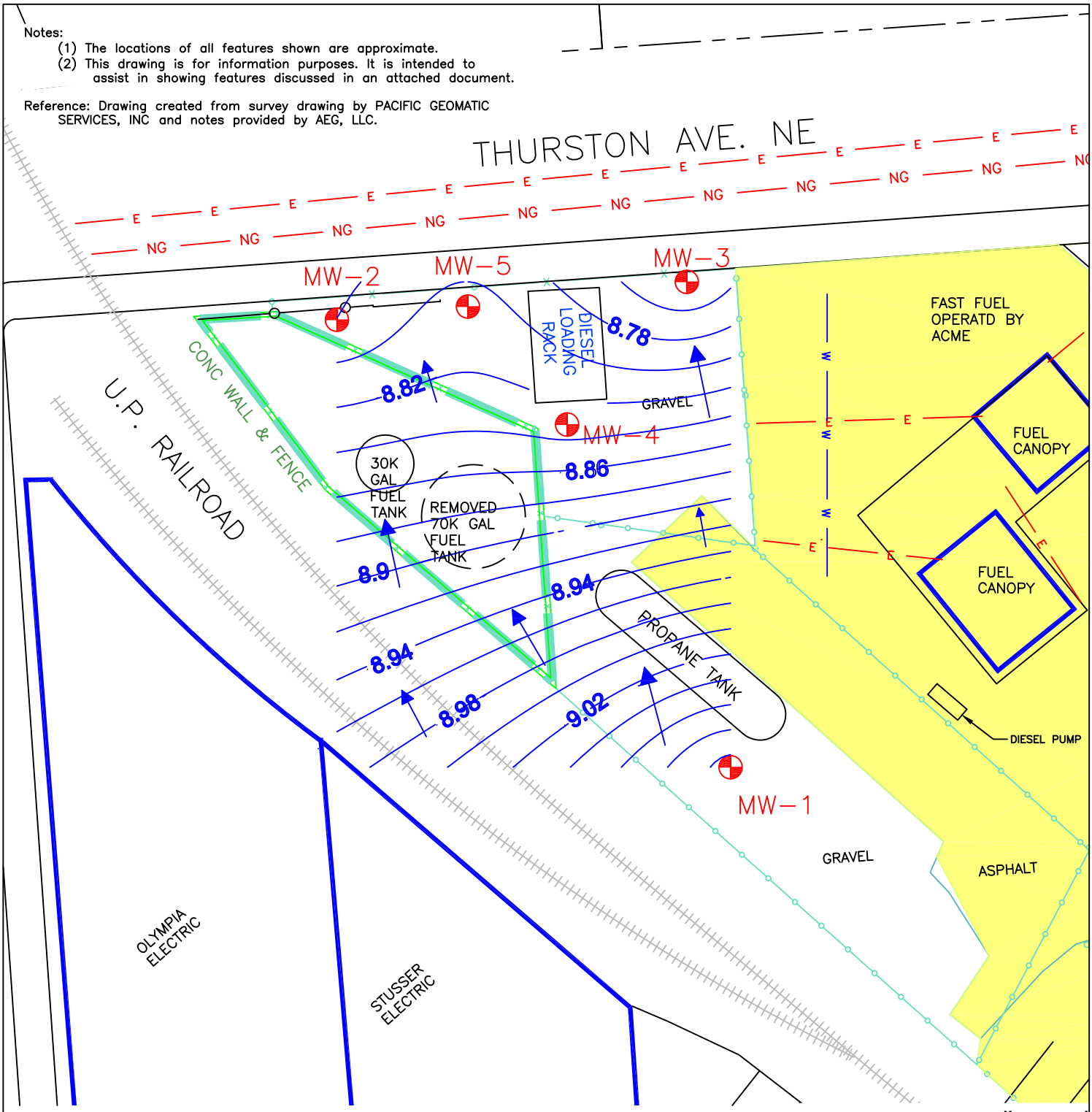
FIGURE 3
SITE PLAN &
BORINGS LOCATION MAP

ACME Bulk Fuel Plant & Cardlock
303 THURSTON AVE NE
OLYMPIA, WA

Project# 12-114a	Date: 10/30/2012
File: FILE NAME	Sheet 2 OF 3

Notes:
(1) The locations of all features shown are approximate.
(2) This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document.

Reference: Drawing created from survey drawing by PACIFIC GEOMATIC SERVICES, INC and notes provided by AEG, LLC.



DRAWING SCALE: 1"= 30'

LEGEND

- E — SLATTED CHAIN LINK FENCE
- NG — NATURAL GAS LINE
- W — WATER LINE
- X — 4' CONCRETE WALL WITH 4' CHAIN LINK FENCE
- SLATTED CHAIN LINK FENCE
- GROUNDWATER INFERRED DIRECTION
- MW-1 AECOM MONITORING WELLS
- PAVED AREA OF PROPERTY

ASSOCIATED ENVIRONMENTAL GROUP, LLC
605 11TH AVE SE, Suite 201
Olympia, WA 98501-2336
(360) 352-9835 Fax (360) 352-8164

FIGURE 4 – GROUNDWATER POTENTIOMETERIC MAP
SEPTEMBER 2012

ACME BULK FUEL PLANT
303 THURSTON AVE NE
OLYMPIA, WA

Project# 12-114a	Date: 10/30/2012
File: FILE NAME	Sheet 3 OF3

THURSTON AVE. NE

CURB

SIDEWALK

DRIVEWAY

DRIVEWAY

TBM A

TBM B

PGS #1070

PLANTER

CONC WALK

CURB

GATE

MW-2 96.76

MW-2

MW-5 96.74

MW-5

DIESEL LOADING RACK

96.70

96.60

MW-3 97.51

MW-3

GATE

GRAVEL

MW-4 96.79

MW-4

96.80

DIESEL TANK ENCLOSURE

CONC WALL & FENCE

GATE

CHAIN LINK FENCE

"FAST FUEL" OPERATED BY ACME

FUELING STATION

FUELING STATION

96.90

97.00

GATE

97.10

PROPANE TANK

97.20

97.30

MW-1 97.33

MW-1

EOA

FRANKLIN ST. NE

FRANKLIN ST. NE

U.P. RAILROAD

U.P. RAILROAD

CHAIN LINK FENCE

GRAVEL

ASPHALT

ADAMS ST. NE

ADAMS AVE NE

PARKING

N

10 0 20

SCALE IN FEET

LEGEND

MW-1 MONITORING WELL LOCATION

APRIL 2012 GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)

APPROXIMATE GROUNDWATER FLOW DIRECTION

KAG - ACME
DEISEL SPILL
60224592-007

APRIL 2012 POTENTIOMETRIC MAP

DATE: 05/11/12 | DRWN: MO/SEA | FIGURE 2

Figure 5 - AECOM April 2012 Potentiometric Map
Source: AECOM, 2012

TABLES

Table 1 Summary of Soil Analytical Results - Supplemental Site Characterization
Acme Bulk Fuel Plant & Cardlock (Fast Fuel)
Olympia, WA

Sample Number[1]	Date Sampled	Depth Sampled (feet)	**Diesel Extended TPH[2] (mg/Kg)**		**Gasoline TPH[3]** (mg/Kg)	Selected Volatile Organic Compounds[4] (mg/Kg)			
			Diesel	Heavy Oil		**Benzene**	Toluene	Ethylbenzene	Total Xylenes
B1-S1-4.5/5.0	9/27/2012	4.5-5.0	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
B3-S2-6.5/7.0	9/27/2012	6.5-7.0	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
B6-S1-4.5/5.0	9/27/2012	4.5-5.0	**4,600**	<100	**830**	**0.06**	0.26	<0.05	0.29
B8-S1-4.5/5.0	9/27/2012	4.5-5.0	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
B9-S2-7.5/8.0	9/27/2012	7.5-8.0	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
B10-S1-4.5/5.0	9/27/2012	4.5-5.0	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
B11-S2-7.0/7.5	9/27/2012	7.0-7/5	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
B12-S1-4.5/5.0	9/27/2012	4.5-5.0	<50	<100	<10	<0.02	<0.05	<0.05	<0.15
PQL			50	100	10	0.02	0.05	0.05	0.15
Ecology MTCA Method A Clean Up Levels			2,000	2,000	30 [5]	0.03	7	6	9

Notes:
[1]Approximate sample locations are shown in Figure 2
[2]Diesel and Heavy Oil range total petroleum hydrocarbons (TPH). Analyzed by Northwest Method NWTPH-Dx/Dx Extended.
[3]Gasoline range TPH. Analyzed by Northwest Method NWTPH-Gx.
[4]Select Volatile Organic Compounds. Analyzed by EPA Method 8260C.
[5]Cleanup level with presence of benzene
mg/Kg = milligrams per kilograms
MTCA = Model Toxics Control Act
PQL=Practical Quantitation Limits
-- = not analyzed for this constituent
< = not detected above laboratory limits
* Ecology has not designated a MTCA Method A cleanup level for this constituent
Bold indicates the detected concentration exceeds Ecology MTCA Method A cleanup level

Table 2 Summary of Groundwater Analytical Results - Supplemental Site Characterization
Acme Bulk Fuel Plant & Cardlock (Fast Fuel)
Olympia, WA

Sample Number[1]	Date Sampled	**Diesel Extended TPH[2]** (ug/L)		**Gasoline TPH[3] (ug/L)**	Select Volatile Organic Compounds[4] (ug/L)					**Total cPAH[5] (ug/L)**
		Diesel	Heavy Oil		**Benzene**	Toluene	Ethylbenzene	Total Xylenes	Total Napthalenes	
B1-W	9/27/2012	<250	<500	**2,600**	**16**	1.0	72	41	--	--
B2-W	9/27/2012	**75,000**	<500	--	**35**	2.3	77	340	90	**6.5**
B3-W	9/27/2012	<250	<500	**1,700**	4.2	1.2	35	120	--	--
B4-W	9/27/2012	**28,000**	<500	--	3.3	4.9	115	390	100	**3.0**
B5-W	9/27/2012	<250	<500	--	2.3	1.5	40	110	--	--
B6-W	9/27/2012	<250	<500	<100	<1.0	<1.0	<1.0	<3.0	--	--
B7-W	9/27/2012	<250	<500	--	<1.0	<1.0	<1.0	<3.0	--	--
B8-W	9/27/2012	<250	<500	<100	<1.0	<1.0	<1.0	<3.0	--	--
B10-W	9/27/2012	<250	<500	<100	<1.0	<1.0	<1.0	<3.0	--	--
B11-W	9/27/2012	<250	<500	<100	<1.0	<1.0	<1.0	<3.0	--	--
B12-W	9/27/2012	<250	<500	<100	<1.0	<1.0	<1.0	<3.0	--	--
PQL		250	500	100	1.0	1.0	1.0	3.0	5.0	0.1
Ecology MTCA Method A Clean Up Levels		500	500	800 [6]	5	1,000	700	1,000	160	0.1 [7]

Notes:
[1]Approximate sample locations are shown in figure 2
[2]Diesel and Heavy Oil range total petroleum hydrocarbons (TPH). Analyzed by Northwest Method NWTPH-Dx/Dx Extended.
[3]Gasoline range TPH. Analyzed by Northwest Method NWTPH-Gx.
[4]Select Volatile Organic Compounds. Analyzed by EPA Method 8260C.
[5] Carcinogenic Polyaromatic Hydrocarbons (cPAH). Analyzed by EPA Method 8270 (SIM)
[6]Cleanup level with presence of benzene
[7]Cleanup Level for total carcinogens of PAHs are comprised of benzo(a)anthracene through dibenzo(a,h)anthracene
ug/L= micrograms per liter
MTCA = Model Toxics Control Act
PQL=Practical Quantitation Limits
-- = not analyzed for this constituent
< = not detected above laboratory limits
* Ecology has not designated a MTCA Method A cleanup level for this constituent
Bold indicates the detected concentration exceeds Ecology MTCA Method A cleanup level

Table 3 Summary of Groundwater Analytical Results - Monitoring Wells
Acme Bulk Fuel Plant
Olympia, WA

Well Number[1]	Date Sampled	Diesel TPH Extended[2] (ug/L)		Gasoline TPH[3] (ug/L)	Selected Volatile Organic Constituents[4] (ug/L)					cPAH[5] (ug/L)
		Diesel	Heavy Oil		**Benzene**	Toluene	Ethylbenzene	Total Xylenes	Total Naphthalenes	
MW-1	11/22/2011[8]	400	<200	--	--	--	--	--	--	--
	9/19/2012[9]	<200	<400	<100	<1.0	<2.0	<1.0	<3.0	--	--
MW-2	11/22/2011[8]	240	<200	--	--	--	--	--	--	--
	9/19/2012[9]	<200	<400	117	<1.0	<2.0	<1.0	<3.0	--	--
MW-3	11/22/2011[8]	**1,200**	210	300	<0.2	<0.2	<0.2	<0.2	--	--
	9/19/2012[9]	<200	<400	--	<1.0	<2.0	<1.0	<3.0	<0.100	<0.100
MW-4	11/22/2011[8]	**1,700**	<200	670	**17**	9.6	14	47	--	--
	9/19/2012[9]	<200	<400	--	**7.4**	<2.0	64.3	171	6.03	<0.100
MW-5	11/22/2011[8]	**2,900**	<200	<250	<0.2	<0.2	<0.2	0.3	--	--
	9/19/2012[9]	<200	<400	--	**6.3**	<2.0	24.1	14.3	0.441	<0.100
PQL		200	400	100	1.0	2.0	1.0	3.0	0.100	0.100
Ecology MTCA Method A Clean Up Levels		500	500	800 [6]	5	1,000	700	1,000	160	0.1 [7]

Notes:
[1]Approximate AECOM monitoring well locations are shown in figures 2 and 3
[2]Diesel and Heavy Oil range total petroleum hydrocarbons (TPH). Analyzed by Northwest Method NWTPH-Dx/Dx Extended.
[3]Gasoline range TPH. Analyzed by Northwest Method NWTPH-Gx.
[4]Select Volatile Organic Compounds. Analyzed by EPA Method 8260C.
[5] Carcinogenic Polyaromatic Hydrocarbons (cPAH). Analyzed by EPA Method 8270 (SIM)
[6]Cleanup level with presence of benzene
[7]Cleanup Level for total carcinogens of PAHs are comprised of benzo(a)anthracene through dibenzo(a,h)anthracene
[8]Groundwater monitoring/sampling conducted by AECOM in November 2011. Analytical results presented in AECOM December 14, 2011 MTCA Release Report.
[9]Groundwater monitoring/sampling conducted by AEG in September 2012.
ug/L= micrograms per liter
MTCA = Model Toxics Control Act
PQL=Practical Quantitation Limits
-- = not analyzed for this constituent
< = not detected above laboratory limits
* Ecology has not designated a MTCA Method A cleanup level for this constituent
Bold indicates the detected concentration exceeds Ecology MTCA Method A cleanup level

Table 4 Summary of Groundwater Elevations - Monitoring Wells
Acme Bulk Fuel Plant
Olympia, Washington

Well Number/ TOC Elevation (feet)	Date of Measurement	DTW (feet)	DT LPH (feet)	LPH (feet)	GW Elevation (feet)	Change in GW Elevation (feet)
MW-1[1] 14.13	09/19/12	5.02	--	--	9.11	--
MW-2[1] 14.01	09/19/12	5.23	--	--	8.78	--
MW-3[1] 13.86	09/19/12	5.12	--	--	8.74	--
MW-4[1] 13.88	09/19/12	5.05	--	--	8.83	--
MW-5[1] 14.10	09/19/12	5.29	--	--	8.81	--

TOC = Top of casing elevation relative to assigned benchmark.
DTW = Depth to water below top of casing.
DT LPH = Depth to liquid phase hydrocarbons
LPH = Liquid phase hydrocarbons (i.e., free product) thickness.
GW Elevation = Groundwater Elevation
-- = Not applicable
[1]TOC professional surveyed elevations by Pacific Geomatic Services, Inc. in October 2012

Table 5 Summary of Water Quality Indicator Parameters - Monitoring Wells
Acme Bulk Fuel Plant
Olympia, WA

Well Number[1]	Date of Measurement	Temperature (°C)	Conductivity (mS/cm)	TDS	Salinity (%)	Dissolved Oxygen (mg/L)	pH
MW-1	9/19/2012	18.92	0.946	0.614	0.47	0.3	7.91
MW-2	9/19/2012	19.27	0.708	0.460	0.35	0.2	8.34
MW-3	9/19/2012	20.92	1.039	0.676	0.52	0.36	7.60
MW-4	9/19/2012	19.73	0.714	0.464	0.35	0.18	8.05
MW-5	9/19/2012	20.96	0.795	0.517	0.39	0.22	8.14

[1]Groundwater monitoring well locations are shown on Figures 2 and 3
[2]Selected additional parameters for TPH biodegradation assessment
-- = not analyzed for constituent
< = not detected above laboratory limits

APPENDIX A
SITE PHOTOGRAPHS

ASSOCIATED
ENVIRONMENTAL
GROUP, LLC

SITE PHOTOGRAPHIC RECORD

Project No.: 12-114a **Project Name: Acme Bulk Fuel Plant/Cardlock, Olympia, WA – Suppl. Site Characterization**

Photo #1:	View of direct push probe drilling at boring B-1 adjacent north of bulk fuel area (looking northwest).

Photo #2:	View of collecting groundwater from B-1 via peristaltic pump (looking east).

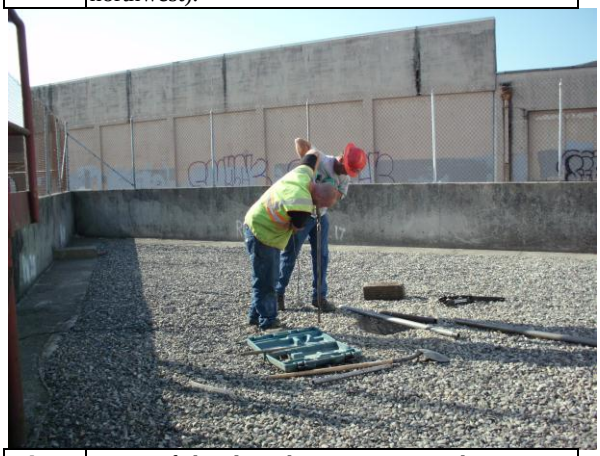


Photo #3:	View of hand probe activities at boring B-2 (where the former 70k gal fuel tank was located) via a rotor hammer (looking west).

Photo #4:	Secondary view of drilling at boring B-2, looking to the northwest. Note presence of the existing 30k gal fuel tank in background.

Photo #5:	View of secondary containment area within the bulk fuel plant area at Acme (looking southeast).

Photo #6:	View of direct push probe drilling at boring B-3 (adjacent east of bulk fuel tank/spill area). View looking west.

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SITE PHOTOGRAPHIC RECORD

Project No.: 12-114a **Project Name: Acme Bulk Fuel Plant/Cardlock, Olympia, WA – Suppl. Site Characterization**

Photo #7:	View of location of probe boring B-5, adjacent south of existing 30k gal fuel tank and west of former spill area (looking northwest).

Photo #8:	View of direct push probe drilling at boring B-6, east of bulk fuel tank/spill area on Cardlock facility area (refer to Figure 2).

Photo #9:	Secondary view of drilling at B-6, looking west-southwest towards bulk fuel plant area. Note location is outside of bulk fuel fenced area.

Photo #10:	View of the Fast Fuel Cardlock facility, operated by Acme Fuel (looking to the north).

Photo #11:	View of underground utilities markings adjacent north of Site on Thurston Ave NE sidewalk (looking to the northeast).

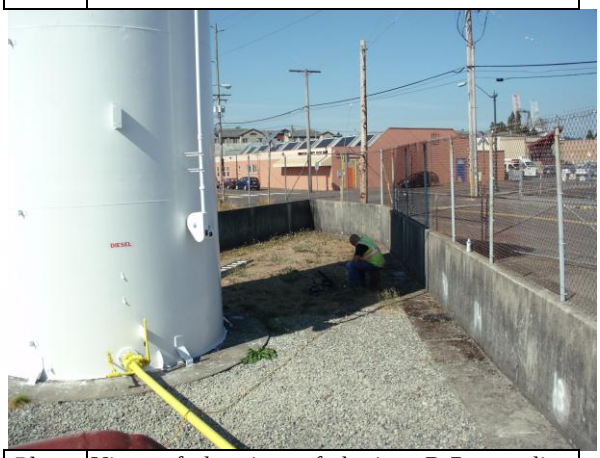

Photo #12:	View of location of boring B-7 sampling, northwest of former spill area (refer to Figure 2)

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SITE PHOTOGRAPHIC RECORD

Project No.: 12-114a **Project Name: Acme Bulk Fuel Plant/Cardlock, Olympia, WA – Suppl. Site Characterization**

Photo #13:	View of direct push probe drilling at boring B-8, north of dispenser islands and underground storage tanks at Cardlock facility (looking north)

Photo #14:	View of soil core samples collected from boring B-8. Upper cores denote soft wood debris materials from 8 to 10 feet bgs.

Photo #15:	View of peristaltic pump (in background) set up to collect grab groundwater sample at boring B-9, adjacent east of eastern dispenser island.

Photo #16:	View of direct push probe drilling at boring B-10, adjacent south of 2 dispenser islands and associated underground storage tanks Looking southeast.

Photo #17:	View of drilling at B-11, adjacent south of western dispenser island. Note groundwater sampling setup at B-9 in foreground.

Photo #18:	View of drilling at boring B-12, adjacent west of dispenser islands/associated underground storage tanks (looking north).

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APPENDIX B
SUPPORTING DOCUMENTS

BORING LOGS

ASSOCIATED ENVIRONMENTAL GROUP, LLC — LOG OF BOREHOLE

PROJECT:	Acme Bulk Fuel Plant & Cardlock - Suppl Site Characterization	**JOB #** 12-114	**BORING #** B-1	**PAGE 1 OF 1**
Location:	303 Thurston Avenue NE, Olympia, WA	**Approximate Elevation:**		
Subcontractor/Equipment:	ESN - Don Harnden	**Drilling Method/Drilling Rig:**	Direct Push Probe/Power Probe 9600	
Date:	9/27/2012	**Logged By:**	Y. Van	

Depth (ft)	Soil Description	Unified Soil Symbol	Sample Type	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well
	Gravel surface, approximately 3 inches, underlain by Base gravel backfill to approximately 2-1/2 feet. (FILL)	GW				0932	NA			NA
	Light brown, dry, medium dense, Poorly Graded SAND, medium grained, well sorted, local shell fragments.	SP								
	Gray, moist, medium stiff, CLAY, medium plasticity.	CL								
5	Gray, moist, medium dense, Poorly Graded SAND, medium grained, well sorted.	SP			B1-S1-4.5/5.0	0946		12.8		
	at 5 feet to 5-1/2 feet: becomes moist to wet. ▼									
	at 7 feet: becomes saturated. Sand with abundant shell fragments.				B1-S2-7.5/8.0	0952		8.1		
10	at 9-1/2 feet: clay with abundant weathered wood fragments. (FILL)									
	TD at 10 feet bgs. Groundwater encountered at approximately 5 feet to 5-1/2 feet bgs ATD. Temporary retractable s.s. screen installed at 5 feet to 9 feet. Collected groundwater sample at 1007. Slight sheen in purge water. Boring backfilled with bentonite chips.									
15										
20										
25										

Explanation

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- ▼ Groundwater level at time of drilling or date of measurement

Monitoring Well

- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

ASSOCIATED ENVIRONMENTAL GROUP, LLC — LOG OF BOREHOLE

PROJECT:	Acme Bulk Fuel Plant & Cardlock - Suppl Site Characterization	**JOB #** 12-114	**BORING #** B-2	**PAGE 1 OF 1**
Location:	303 Thurston Avenue NE, Olympia, WA	**Approximate Elevation:**		
Subcontractor/Equipment:	ESN - Don Harnden	**Drilling Method/Drilling Rig:**	Hand Probe and Rotor Hammer.	
Date:	9/27/2012	**Logged By:**	Y. Van	

Depth (ft)	Soil Description	Unified Soil Symbol	Sample Type	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well
	Gravel backfill to approximately 6 feet. (?) - area of former 70k gal AST. (FILL)	GW				0940	NA	NA		NA
	Drove probe rod (1/2 inch) to 7 feet bgs using rotor hammer.									
5	Pulled back to 5 feet.									
	Collected groundwater with drop point at 5-1/2 feet.	▼								
	Strong diesel fuel odor in groundwater.									
	TD at 7 feet bgs. Groundwater encountered at approximately 5 feet to 5-1/2 feet bgs ATD. Collected groundwater sample at 1026.									
10										
15										
20										
25										

Explanation

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- Groundwater level at time of drilling or date of measurement

Monitoring Well

- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

ASSOCIATED ENVIRONMENTAL GROUP, LLC — LOG OF BOREHOLE

PROJECT:	Acme Bulk Fuel Plant & Cardlock - Suppl Site Characterization	**JOB #**	**12-114**	**BORING #**	**B-3**	**PAGE 1 OF 1**
Location:	303 Thurston Avenue NE, Olympia, WA	**Approximate Elevation:**			
Subcontractor/Equipment:	ESN - Don Harnden	**Drilling Method/Drilling Rig:**	Direct Push Probe/Power Probe 9600		
Date:	9/27/2012	**Logged By:**	Y. Van		

Depth (ft)	Soil Description	Unified Soil Symbol	Sample Type	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well
	Gravel surface, approximately 3 inches, underlain by Base gravel backfill to approximately 2-1/2 feet. (FILL)	GW				1032	NA			NA
	Light brown, dry, medium dense, Poorly Graded SAND, medium grained, well sorted, local shell fragments.	SP								
	Gray, moist, medium stiff, CLAY, medium plasticity.	CL								
5	Gray, moist, medium dense, Poorly Graded SAND, medium grained, well sorted.	SP ▼			B3-S1-4.5/5.0	1042		0.4		
	at 5-1/2 feet to 7 feet: moist to wet.				B3-S2-6.5/7.0	1047		0.2		
	at 8 feet: saturated.									
10	at 9-1/2 feet: clay with abundant weathered wood fragments. (FILL)									
	TD at 10 feet bgs. Groundwater encountered at approximately 6 feet bgs ATD. Temporary retractable s.s. screen installed at 5 feet to 9 feet. Collected groundwater sample at 1104. Boring backfilled with bentonite chips.									
15										
20										
25										

Explanation

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- Groundwater level at time of drilling or date of measurement

Monitoring Well

- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

ASSOCIATED ENVIRONMENTAL GROUP, LLC — LOG OF BOREHOLE

PROJECT:	Acme Bulk Fuel Plant & Cardlock - Suppl Site Characterization	**JOB #**	**12-114**	**BORING #**	**B-4**	**PAGE 1 OF 1**
Location:	303 Thurston Avenue NE, Olympia, WA	**Approximate Elevation:**			
Subcontractor/Equipment:	ESN - Don Harnden	**Drilling Method/Drilling Rig:**	Hand Probe and Rotor Hammer.		
Date:	9/27/2012	**Logged By:**	Y. Van		

Depth (ft)	Soil Description	Unified Soil Symbol	Sample Type	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well
	Gravel backfill to approximately 6 feet. (?) - area of former 70k gal AST. (FILL)					1034	NA	NA		NA
	Drove probe rod (1/2 inch) to 7 feet bgs using rotor hammer.									
5	Pulled back to 5 feet.									
	Collected groundwater with drop point at 5-1/2 feet.	▼								
	Moderate to strong diesel fuel odor in groundwater.									
	TD at 7 feet bgs.									
	Groundwater encountered at approximately 5 feet to 5-1/2 feet bgs ATD.									
	Collected groundwater sample at 1042.									
10										
15										
20										
25										

Explanation

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- ▼ Groundwater level at time of drilling or date of measurement

Monitoring Well

- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

ASSOCIATED ENVIRONMENTAL GROUP, LLC — LOG OF BOREHOLE

PROJECT:	Acme Bulk Fuel Plant & Cardlock - Suppl Site Characterization	**JOB #**	**12-114**	**BORING #**	**B-5**	**PAGE 1 OF 1**
Location:	303 Thurston Avenue NE, Olympia, WA	**Approximate Elevation:**			
Subcontractor/Equipment:	ESN - Don Harnden	**Drilling Method/Drilling Rig:**	Hand Probe and Rotor Hammer.		
Date:	9/27/2012	**Logged By:**	Y. Van		

Depth (ft)	Soil Description	Unified Soil Symbol	Sample Type	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well
	Gravel backfill to approximately 6 feet. (?) - area of former 70k gal AST. (FILL)	GW				1050	NA	NA		NA
	Drove probe rod (1/2 inch) to 7 feet bgs using rotor hammer.									
5	Pulled back to 5 feet.									
	Collected groundwater with drop point at 5-1/2 feet.	▼								
	TD at 7 feet bgs.									
	Groundwater encountered at approximately 5 feet to 5-1/2 feet bgs ATD.									
10	Collected groundwater sample at 1124.									
15										
20										
25										

Explanation

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- Groundwater level at time of drilling or date of measurement

Monitoring Well

- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

ASSOCIATED ENVIRONMENTAL GROUP, LLC — LOG OF BOREHOLE

PROJECT:	Acme Bulk Fuel Plant & Cardlock - Suppl Site Characterization	**JOB #**	**12-114**	**BORING #**	**B-6** **PAGE 1 OF 1**
Location:	303 Thurston Avenue NE, Olympia, WA	**Approximate Elevation:**			
Subcontractor/Equipment:	ESN - Don Harnden	**Drilling Method/Drilling Rig:**	Direct Push Probe/Power Probe 9600		
Date:	9/27/2012	**Logged By:**	Y. Van		

Depth (ft)	Soil Description	Unified Soil Symbol	Sample Type	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well
	Asphalt surface, approximately 3 inches, underlain by Sand and gravel backfill to approximately 3 ft bgs (?) (FILL)	GW				1128	NA			NA
5	Gray, moist, medium dense, Poorly Graded SAND, medium grained, well sorted.	SP			B6-S1-4.5/5.0	1150		39.8		
	at 5-1/2 feet: moist to wet.	▼								
	at 8 feet: saturated.									
	at 8-1/2 feet to 9 feet: wood debris. (FILL)									
10	Gray, wet, medium stiff, CLAY.	CL			B6-S2-9.0/9.5	1153		0.2		
	TD at 10 feet bgs. Groundwater encountered at approximately 5-1/2 feet bgs ATD. Temporary retractable s.s. screen placed at 5 feet to 9 feet. Collected groundwater sample at 1201. Boring backfilled with bentonite chips.									
15										
20										
25										

Explanation

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- Groundwater level at time of drilling or date of measurement

Monitoring Well

- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

ASSOCIATED ENVIRONMENTAL GROUP, LLC — LOG OF BOREHOLE

PROJECT:	Acme Bulk Fuel Plant & Cardlock - Suppl Site Characterization	**JOB #** 12-114	**BORING #** B-7 **PAGE 1 OF 1**
Location:	303 Thurston Avenue NE, Olympia, WA	**Approximate Elevation:**	
Subcontractor/Equipment:	ESN - Don Harnden	**Drilling Method/Drilling Rig:**	Hand Probe and Rotor Hammer.
Date:	9/27/2012	**Logged By:**	Y. Van

Depth (ft)	Soil Description	Unified Soil Symbol	Sample Type	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well
	Gravel backfill to approximately 6 feet. (?) - area of former 70k gal AST. (FILL)	GW				1130	NA	NA		NA
	Drove probe rod (1/2 inch) to 7 feet using rotor hammer.									
5	Pulled back to 5 feet.									
	Collected groundwater with drop point at 5-1/2 feet.	▼								
	TD at 7 feet bgs.									
	Groundwater encountered at approximately 5 feet to 5-1/2 feet bgs ATD.									
10	Collected groundwater sample at 1145.									
15										
20										
25										

Explanation

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- ▼ Groundwater level at time of drilling or date of measurement

Monitoring Well

- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

ASSOCIATED ENVIRONMENTAL GROUP, LLC — LOG OF BOREHOLE

PROJECT:	Acme Bulk Fuel Plant & Cardlock - Suppl Site Characterization	**JOB #**	**12-114**	**BORING #**	**B-8** **PAGE 1 OF 1**
Location:	303 Thurston Avenue NE, Olympia, WA	**Approximate Elevation:**			
Subcontractor/Equipment:	ESN - Don Harnden	**Drilling Method/Drilling Rig:**	Direct Push Probe/Power Probe 9600		
Date:	9/27/2012	**Logged By:**	Y. Van		

Depth (ft)	Soil Description	Unified Soil Symbol	Sample Type	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well
	Asphalt surface, approximately 3 inches, underlain by Sand and gravel backfill to approximately 3 feet. (FILL)	GW				1218	NA			NA
	6 inches thick wood debris.	Wood								
5	Gray, dry to moist, medium stiff, Poorly Graded SAND, medium grained, well sorted. at 5 feet: moist to wet.	SP ▼			B8-S1-4.5/5.0	1230		2.7		
	at 6-1/2 feet: saturated. at 7 feet: 4 inches thick clay.									
10	2 feet thick section of weathered wood pieces/fragments (FILL)	Wood			B8-S2-8.5/9.0	1235		0.8		
15	TD at 10 feet bgs. Groundwater encountered at approximately 5 feet bgs ATD. Temporary retractable s.s. screen placed at 5 feet to 9 feet. Collected groundwater sample at 1243. Boring backfilled with bentonite chips.									
20										
25										

Explanation

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- ▼ Groundwater level at time of drilling or date of measurement

Monitoring Well

- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

ASSOCIATED ENVIRONMENTAL GROUP, LLC — LOG OF BOREHOLE

PROJECT:	Acme Bulk Fuel Plant & Cardlock - Suppl Site Characterization	**JOB #**	**12-114**	**BORING #**	**B-9**	**PAGE 1 OF 1**
Location:	303 Thurston Avenue NE, Olympia, WA	**Approximate Elevation:**				
Subcontractor/Equipment:	ESN - Don Harnden	**Drilling Method/Drilling Rig:**	Direct Push Probe/Power Probe 9600			
Date:	9/27/2012	**Logged By:**	Y. Van			

Depth (ft)	Soil Description	Unified Soil Symbol	Sample Type	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well
	Asphalt surface, approximately 3 inches, underlain by Sand and gravel backfill to approximately 3 feet. (FILL)	GW				1256	NA			NA
	Light gray, dry, medium stiff, sandy CLAY.	CL								
5	grades to green-gray CLAY.				B9-S1-4.5/5.0	1303		0.5		
	at 7 feet: CLAY with sand pockets, high plasticity, moist.				B9-S2-7.5/8.0	1307		0.3		
10	at 9-1/2 feet: abundant weathered wood fragments. (FILL)									
	TD at 10 feet bgs. No groundwater encountered ATD. Temporary PVC screen installed at 5 feet to 10 feet. Allow screen/boring to stay open for 2 hours. No observable water collected at bottom of boring. Boring backfilled with bentonite chips.									
15										
20										
25										

Explanation

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- Groundwater level at time of drilling or date of measurement

Monitoring Well

- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

ASSOCIATED ENVIRONMENTAL GROUP, LLC — LOG OF BOREHOLE

PROJECT:	Acme Bulk Fuel Plant & Cardlock - Suppl Site Characterization	**JOB #** 12-114	**BORING #** B-10	**PAGE 1 OF 1**
Location:	303 Thurston Avenue NE, Olympia, WA	**Approximate Elevation:**		
Subcontractor/Equipment:	ESN - Don Harnden	**Drilling Method/Drilling Rig:**	Direct Push Probe/Power Probe 9600	
Date:	9/27/2012	**Logged By:**	Y. Van	

Depth (ft)	Soil Description	Unified Soil Symbol	Sample Type	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well
	Asphalt surface, approximately 3 inches, underlain by Sand and gravel backfill to approximately 3 feet. (FILL)	GW				1314	NA			NA
	Gray, moist, medium dense, silty SAND.	SM								
5	Gray, moist, medium dense, Poorly Graded SAND, medium grained, well sorted. ▼	SP			B10-S1-4.5/5.0	1319		0.8		
	at 5 feet: moist to wet.									
	at 7 feet: saturated.				B10-S2-8.5/9.0	1324		0.6		
10	Abundant weathered wood pieces. (FILL)	Wood								
	TD at 10 feet bgs. Groundwater encountered at approximately 5 feet bgs ATD. Temporary retractable s.s. screen placed at 5 feet to 9 feet. Collected groundwater sample at 1340. Boring backfilled with bentonite chips.									
15										
20										
25										

Explanation

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- ▼ Groundwater level at time of drilling or date of measurement

Monitoring Well

- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

ASSOCIATED ENVIRONMENTAL GROUP, LLC — LOG OF BOREHOLE

PROJECT:	Acme Bulk Fuel Plant & Cardlock - Suppl Site Characterization	**JOB #**	**12-114**	**BORING #**	**B-11**	**PAGE 1 OF 1**
Location:	303 Thurston Avenue NE, Olympia, WA	**Approximate Elevation:**				
Subcontractor/Equipment:	ESN - Don Harnden	**Drilling Method/Drilling Rig:**	Direct Push Probe/Power Probe 9600			
Date:	9/27/2012	**Logged By:**	Y. Van			

Depth (ft)	Soil Description	Unified Soil Symbol	Sample Type	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well
	Asphalt surface, approximately 3 inches, underlain by Sand and gravel backfill to approximately 3-1/2 feet. (FILL)	GW				1350	NA			NA
5	Brown-gray, moist, medium dense, silty SAND.	SM			B11-S1-4.0/4.5	1356		0.2		
	at 7 feet: moist to wet.	▼			B11-S2-7.0/7.5	1358		0.1		
10	at 8 feet: saturated. Abundant weathered wood fragments. (FILL)	Wood								
15	TD at 10 feet bgs. Groundwater encountered at approximately 7 feet bgs ATD. Temporary retractable s.s. screen placed at 5 feet to 9 feet. Collected groundwater sample at 1407. Boring backfilled with bentonite chips.									
20										
25										

Explanation

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- Groundwater level at time of drilling or date of measurement

Monitoring Well

- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

ASSOCIATED ENVIRONMENTAL GROUP, LLC — LOG OF BOREHOLE

PROJECT:	Acme Bulk Fuel Plant & Cardlock - Suppl Site Characterization	**JOB #**	**12-114**	**BORING #**	**B-12**	**PAGE 1 OF 1**
Location:	303 Thurston Avenue NE, Olympia, WA	**Approximate Elevation:**			
Subcontractor/Equipment:	ESN - Don Harnden	**Drilling Method/Drilling Rig:**	Direct Push Probe/Power Probe 9600		
Date:	9/27/2012	**Logged By:**	Y. Van		

Depth (ft)	Soil Description	Unified Soil Symbol	Sample Type	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well
	Asphalt surface, approximately 3 inches, underlain by Sand and gravel backfill to approximately 4 feet. (FILL)	GW				1415	NA			NA
5	Gray, moist, medium dense, Poorly Graded SAND, medium grained, well sorted.	SP			B12-S1-4.5/5.0	1420		0.0		
	Gray, moist, medium dense, silty SAND.	SM ▼								
	Gray, moist to wet, medium stiff, CLAY, high plasticity.	CL			B12-S2-8.0	1426		0.0		
10	Abundant weathered wood fragments. (FILL)	Wood								
	TD at 10 feet bgs. Groundwater encountered at approximately 6-1/2 feet bgs ATD. Temporary retractable s.s. screen placed at 5 feet to 9 feet. Collected groundwater sample at 1500. Boring backfilled with bentonite chips.									
15										
20										
25										

Explanation

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- ▼ Groundwater level at time of drilling or date of measurement

Monitoring Well

- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

VERTICAL DATUM:

THE VERTICAL DATUM FOR THIS SURVEY IS NAVD 88, BASED ON PUBLISHED ELEVATIONS FOR THURSTON COUNTY MONUMENTS 1261 AND MONUMENT IS 3415.

MONUMENT 1261	ELEVATION:	14.421 FEET
MONUMENT IS 3415	ELEVATION:	14.322 FEET

DATUM CONVERSION FACTOR – NAVD88=NGVD29+3.41

HORIZONTAL DATUM:

THE HORIZONTAL DATUM FOR THIS SURVEY IS NAD 83/91, WASHINGTON STATE PLANE, SOUTH ZONE, BASED ON PUBLISHED COORDINATES FOR THURSTON COUNTY MONUMENT 1261 AND MONUMENT IS 3415.

LEGEND:

⊕	TEMPORARY BENCHMARK
✕	PGS CONTROL PK NAIL
(MW)	MONITORING WELL
●	BOLLARD
EOA	EDGE OF ASPHALT

PACIFIC GEOMATIC SERVICES, INC.

LAND SURVEYING & MAPPING SERVICES
QUALITY SERVICE - CREATIVE SOLUTIONS

6608 216TH STREET SW, STE. 304
MOUNTLAKE TERRACE, WA 98043
PHONE:(425) 778-5620 FAX:(425) 775-2849
WEB: www.PacGeoInc.com

JOB NAME: ACME BULK FUEL PLANT LOCATION: 303 THURSTON AVE. NE OLYMPIA, WASHINGTON THURSTON COUNTY	
DESCRIPTION: MONITORING WELL EXHIBIT MAP	
DRAWN BY: MRN	CHECKED BY: KDB
SCALE: 1" = 30'	
DATE: 10/18/2012	
JOB NUMBER 12–044–01	SHEET 1 OF 2

NORTH

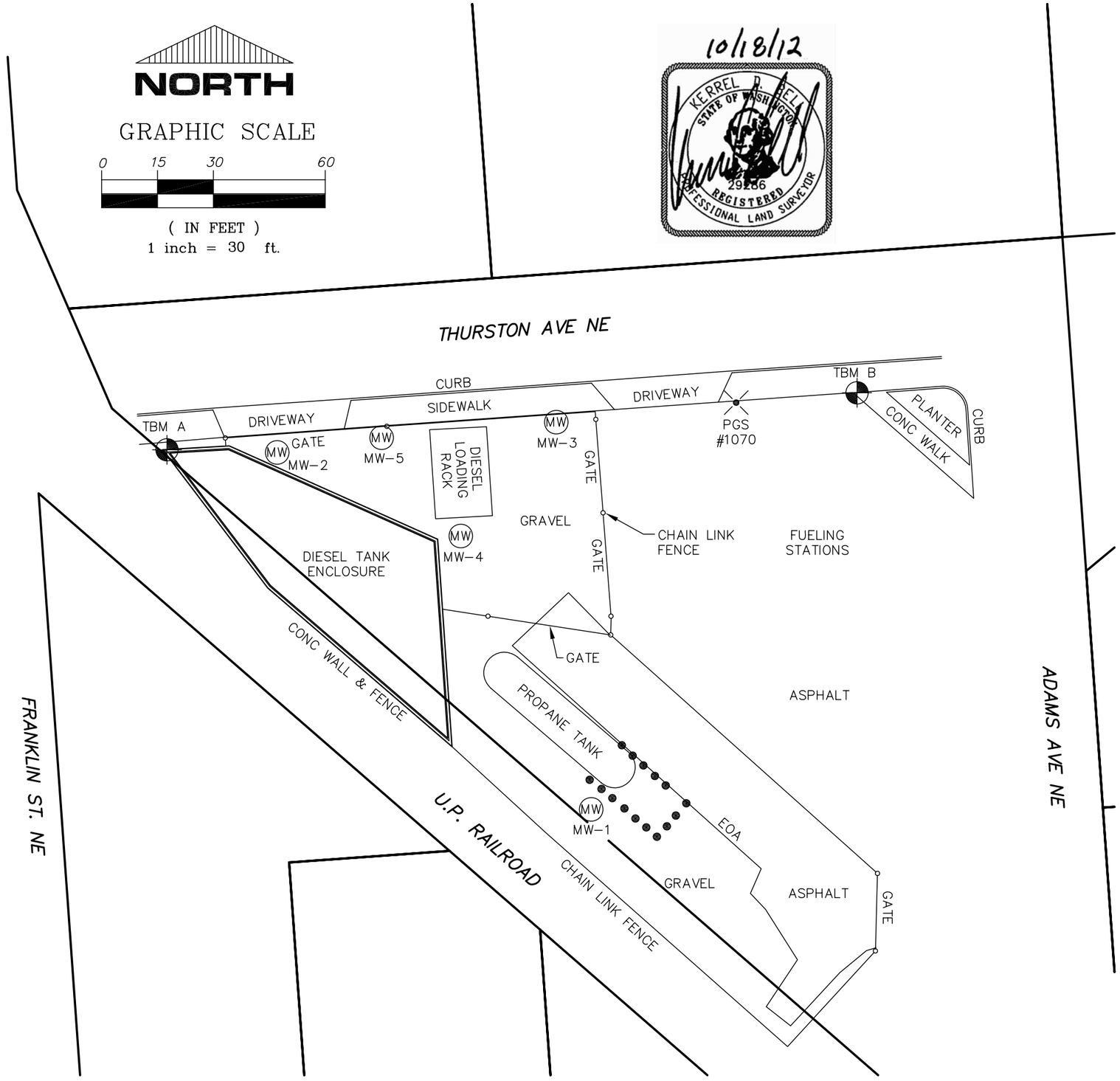
GRAPHIC SCALE

0 15 30 60

(IN FEET)
1 inch = 30 ft.

10/18/12

KERREL D. BELL
STATE OF WASHINGTON
29286
REGISTERED
PROFESSIONAL LAND SURVEYOR



APPENDIX C

LABORATORY ANALYTICAL RESULTS

Libby Environmental, Inc.

Chain of Custody Record

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Date: 9/19/12 Page: 1 of 1

Client: AEG
Project Manager: Yen-Vy Van
Address: 605 11th AVE SE, Suite 201, Olympia WA
Project Name: Acme Bulk Fuel Plant
Phone: (360) 352-9835 Fax:
Location: 303 Thurston Ave NE City: Olympia, WA
Client Project # 12-114
Collector: Jeff Wilson Date of Collection: 9/19/12

	Sample Number	Depth	Time	Sample Type	Container Type	VOA 8021B	VOA 8021B BTEX Only	VOA 8260	SEMI VOL 8270	NWTPH-HCID	NWTPH-Gx	NWTPH-Dx	NWTPH-Dx Ext.	PAH 8270	PCB's 8082	MTCA 5 Metals	DRO	Field Notes
1	MW-1W		12:22	water	VOAs/Amber		✓				✓		✓					
2	MW-2W		13:02				✓				✓		✓					
3	MW-3W		13:32													✓		
4	MW-4W		14:14													✓		
5	MW-5W		14:49	↓												✓		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		

DRO → includes Dx/Dx Ext/BTEX/Naphthalenes and cPAH Yen-Vy Van

Relinquished by:	Date / Time	Received by:	Date / Time
Jeff Wilson	9/19/12 3:25pm		9/19/12 3:25 pm

Sample Receipt:

Good Condition?	
Cold?	
Seals Intact?	
Total Number of Containers	

Remarks: STD

Distribution: White - Lab, Yellow - File, Pink - Originator

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Phone: (360) 352-2110
FAX: (360) 352-4154
Email: libbyenv@aol.com

ACME BULK FUEL PLANT PROJECT
AEG, LLC
Olympia, Washington
Libby Project # L120919-7
Client Project # 12-114

Analyses of Gasoline (NWTPH-Gx) & BTEX (EPA Method 8021B) in Water

Sample Number	Date Analyzed	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Xylenes (µg/l)	Gasoline (µg/l)	Surrogate Recovery (%)
Method Blank	9/20/12	nd	nd	nd	nd	nd	92
LCS	9/20/12	94%	89%				80
MW-1W	9/20/12	nd	nd	nd	nd	nd	99
MW-1W Dup	9/20/12	nd	nd	nd	nd	nd	100
MW-2W	9/20/12	nd	nd	nd	nd	117	95
L120919-2 MS	9/20/12	81%	87%				77
Practical Quantitation Limit		1	2	1	3	100	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Trifluorotoluene): 65% TO 135%

ANALYSES PERFORMED BY: Sherry Chilcutt

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Phone: (360) 352-2110
FAX: (360) 352-4154
Email: libbyenv@aol.com

ACME BULK FUEL PLANT PROJECT
AEG, LLC
Olympia, Washington
Libby Project # L120919-7
Client Project # 12-114

Analyses of Diesel & Oil (NWTPH-Dx/Dx Extended) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (µg/l)	Oil (µg/l)
Method Blank	9/21/12	79	nd	nd
MW-1W	9/21/12	98	nd	nd
MW-2W	9/21/12	96	nd	nd
MW-3W	9/21/12	85	nd	nd
MW-4W	9/21/12	97	nd	nd
MW-5W	9/21/12	91	nd	nd
MW-5W Dup	9/21/12	91	nd	nd
Practical Quantitation Limit			200	400

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Sherry Chilcut

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Phone: (360) 352-2110
FAX: (360) 352-4154
Email: libbyenv@aol.com

ACME BULK FUEL PLANT PROJECT
AEG, LLC
Olympia, Washington
Libby Project # L120919-7
Client Project # 12-114

Analyses of BTEX by EPA Method 8021B in Water

Sample Number	Date Analyzed	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Xylenes (µg/l)	Surrogate Recovery (%)
Method Blank	9/20/12	nd	nd	nd	nd	92
LCS	9/20/12	94%	89%			80
MW-3W	9/20/12	nd	nd	nd	nd	88
MW-4W	9/20/12	7.4	nd	64.3	171	100
MW-5W	9/20/12	6.3	nd	24.1	14.3	84
L120919-2 MS		81%	87%			77
Practical Quantitation Limit		1	2	1	3	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Trifluorotoluene): 65% TO 135%

ANALYSES PERFORMED BY: Sherry Chilcutt

1311 N. 35th St.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Libby Environmental
Jamie Deyman
4139 Libby Rd. NE
Olympia, Washington 98506

RE: Acme Bulk Fuel Plant
Lab ID: 1209120

September 24, 2012

Attention Jamie Deyman:

Fremont Analytical, Inc. received 3 sample(s) on 9/21/2012 for the analyses presented in the following report.

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Michael Dee
Sr. Chemist / Principal

Date: *09/24/2012*

CLIENT: Libby Environmental
Project: Acme Bulk Fuel Plant
Lab Order: 1209120

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1209120-001	MW-3W	09/19/2012 1:32 PM	09/21/2012 9:15 AM
1209120-002	MW-4W	09/19/2012 2:14 PM	09/21/2012 9:15 AM
1209120-003	MW-5W	09/19/2012 2:49 PM	09/21/2012 9:15 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1209120**
Date: **9/24/2012**

CLIENT: Libby Environmental
Project: Acme Bulk Fuel Plant

I. SAMPLE RECEIPT:
All samples were received intact.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Analytical Report

WO#: **1209120**
Date Reported: **9/24/2012**

Client: Libby Environmental
Collection Date: 9/19/2012 1:32:00 PM
Project: Acme Bulk Fuel Plant
Lab ID: 1209120-001
Matrix: Water
Client Sample ID: MW-3W

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 3269		Analyst: PH
Naphthalene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
2-Methylnaphthalene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
1-Methylnaphthalene	2.83	0.100		µg/L	1	9/22/2012 4:36:00 AM
Acenaphthylene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Acenaphthene	0.339	0.100		µg/L	1	9/22/2012 4:36:00 AM
Fluorene	0.326	0.100		µg/L	1	9/22/2012 4:36:00 AM
Phenanthrene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Anthracene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Fluoranthene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Pyrene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Benz(a)anthracene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Chrysene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Benzo(b)fluoranthene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Benzo(k)fluoranthene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Benzo(a)pyrene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	9/22/2012 4:36:00 AM
Surr: 2-Fluorobiphenyl	72.4	41.8-119		%REC	1	9/22/2012 4:36:00 AM
Surr: Terphenyl-d14 (surr)	155	42-158		%REC	1	9/22/2012 4:36:00 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1209120**
Date Reported: **9/24/2012**

Client: Libby Environmental
Collection Date: 9/19/2012 2:14:00 PM
Project: Acme Bulk Fuel Plant
Lab ID: 1209120-002
Matrix: Water
Client Sample ID: MW-4W

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 3269		Analyst: PH
Naphthalene	6.03	0.100		µg/L	1	9/22/2012 5:00:00 AM
2-Methylnaphthalene	2.92	0.100		µg/L	1	9/22/2012 5:00:00 AM
1-Methylnaphthalene	4.12	0.100		µg/L	1	9/22/2012 5:00:00 AM
Acenaphthylene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Acenaphthene	0.165	0.100		µg/L	1	9/22/2012 5:00:00 AM
Fluorene	0.266	0.100		µg/L	1	9/22/2012 5:00:00 AM
Phenanthrene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Anthracene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Fluoranthene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Pyrene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Benz(a)anthracene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Chrysene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Benzo(b)fluoranthene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Benzo(k)fluoranthene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Benzo(a)pyrene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	9/22/2012 5:00:00 AM
Surr: 2-Fluorobiphenyl	59.7	41.8-119		%REC	1	9/22/2012 5:00:00 AM
Surr: Terphenyl-d14 (surr)	137	42-158		%REC	1	9/22/2012 5:00:00 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1209120**
Date Reported: **9/24/2012**

Client: Libby Environmental
Collection Date: 9/19/2012 2:49:00 PM
Project: Acme Bulk Fuel Plant
Lab ID: 1209120-003
Matrix: Water
Client Sample ID: MW-5W

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 3269		Analyst: PH
Naphthalene	0.441	0.100		µg/L	1	9/22/2012 5:25:00 AM
2-Methylnaphthalene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
1-Methylnaphthalene	0.120	0.100		µg/L	1	9/22/2012 5:25:00 AM
Acenaphthylene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Acenaphthene	0.109	0.100		µg/L	1	9/22/2012 5:25:00 AM
Fluorene	0.222	0.100		µg/L	1	9/22/2012 5:25:00 AM
Phenanthrene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Anthracene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Fluoranthene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Pyrene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Benz(a)anthracene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Chrysene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Benzo(b)fluoranthene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Benzo(k)fluoranthene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Benzo(a)pyrene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	9/22/2012 5:25:00 AM
Surr: 2-Fluorobiphenyl	70.5	41.8-119		%REC	1	9/22/2012 5:25:00 AM
Surr: Terphenyl-d14 (surr)	138	42-158		%REC	1	9/22/2012 5:25:00 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Fremont Analytical

Date: *9/24/2012*

Work Order: 1209120
CLIENT: Libby Environmental
Project: Acme Bulk Fuel Plant

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **MB-3269** SampType: **MBLK** Units: **µg/L** Prep Date: **9/21/2012** RunNo: **5835**
Client ID: **MBLKW** Batch ID: **3269** Analysis Date: **9/22/2012** SeqNo: **114668**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	0.100									
2-Methylnaphthalene	ND	0.100									
1-Methylnaphthalene	ND	0.100									
Acenaphthylene	ND	0.100									
Acenaphthene	ND	0.100									
Fluorene	ND	0.100									
Phenanthrene	ND	0.100									
Anthracene	ND	0.100									
Fluoranthene	ND	0.100									
Pyrene	ND	0.100									
Benz(a)anthracene	ND	0.100									
Chrysene	ND	0.100									
Benzo(b)fluoranthene	ND	0.100									
Benzo(k)fluoranthene	ND	0.100									
Benzo(a)pyrene	ND	0.100									
Indeno(1,2,3-cd)pyrene	ND	0.100									
Dibenz(a,h)anthracene	ND	0.100									
Benzo(g,h,i)perylene	ND	0.100									
Surr: 2-Fluorobiphenyl	0.712		1.000		71.2	41.8	119				
Surr: Terphenyl-d14 (surr)	1.07		1.000		107	42	158				

Sample ID: **LCS-3269** SampType: **LCS** Units: **µg/L** Prep Date: **9/21/2012** RunNo: **5835**
Client ID: **LCSW** Batch ID: **3269** Analysis Date: **9/22/2012** SeqNo: **114669**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	2.10	0.100	4.000	0	52.5	42.7	88.8				
2-Methylnaphthalene	2.29	0.100	4.000	0	57.3	43.1	93				
1-Methylnaphthalene	2.20	0.100	4.000	0	55.1	44.8	91.9				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1209120
CLIENT: Libby Environmental
Project: Acme Bulk Fuel Plant

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **LCS-3269** SampType: **LCS** Units: **µg/L** Prep Date: **9/21/2012** RunNo: **5835**
Client ID: **LCSW** Batch ID: **3269** Analysis Date: **9/22/2012** SeqNo: **114669**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthylene	2.41	0.100	4.000	0	60.1	48.7	99.7				
Acenaphthene	2.21	0.100	4.000	0	55.3	37	116				
Fluorene	2.54	0.100	4.000	0	63.5	46.4	104				
Phenanthrene	2.60	0.100	4.000	0	65.1	49.1	108				
Anthracene	2.87	0.100	4.000	0	71.7	54.1	109				
Fluoranthene	3.71	0.100	4.000	0	92.9	63.4	118				
Pyrene	3.75	0.100	4.000	0	93.9	54.4	130				
Benz(a)anthracene	4.48	0.100	4.000	0	112	44.1	126				
Chrysene	3.25	0.100	4.000	0	81.1	50	103				
Benzo(b)fluoranthene	4.33	0.100	4.000	0	108	49.3	110				
Benzo(k)fluoranthene	4.37	0.100	4.000	0	109	42.6	105				S
Benzo(a)pyrene	4.34	0.100	4.000	0	109	35.1	112				
Indeno(1,2,3-cd)pyrene	4.24	0.100	4.000	0	106	21	97.5				S
Dibenz(a,h)anthracene	3.70	0.100	4.000	0	92.5	25.6	96.5				
Benzo(g,h,i)perylene	3.46	0.100	4.000	0	86.4	27.6	93.6				
Surr: 2-Fluorobiphenyl	0.581		1.000		58.1	41.8	119				
Surr: Terphenyl-d14 (surr)	1.21		1.000		121	42	158				

NOTES:
S - Outlying spike recoveries for Benzo(k)fluoranthene and Indeno(1,2,3-cd)pyrene were observed. The method is in control as indicated by the Initial Calibration Verification (second source).

Sample ID: **1209119-001AMS** SampType: **MS** Units: **µg/L** Prep Date: **9/21/2012** RunNo: **5835**
Client ID: **BATCH** Batch ID: **3269** Analysis Date: **9/22/2012** SeqNo: **114671**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	2.35	0.100	4.000	0	58.8	43.5	93.5				
2-Methylnaphthalene	2.67	0.100	4.000	0	66.8	53	89				
1-Methylnaphthalene	2.53	0.100	4.000	0	63.2	50.6	90.5				
Acenaphthylene	2.98	0.100	4.000	0	74.4	57.9	102				
Acenaphthene	2.44	0.100	4.000	0	61.0	35.2	107				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1209120
CLIENT: Libby Environmental
Project: Acme Bulk Fuel Plant

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **1209119-001AMS** SampType: **MS** Units: **µg/L** Prep Date: **9/21/2012** RunNo: **5835**
Client ID: **BATCH** Batch ID: **3269** Analysis Date: **9/22/2012** SeqNo: **114671**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluorene	2.92	0.100	4.000	0	73.0	38	110				
Phenanthrene	2.83	0.100	4.000	0	70.7	48.6	101				
Anthracene	3.31	0.100	4.000	0	82.7	54.8	104				
Fluoranthene	4.06	0.100	4.000	0	102	66.6	116				
Pyrene	4.01	0.100	4.000	0	100	58.6	122				
Benz(a)anthracene	5.10	0.100	4.000	0	127	56.3	130				
Chrysene	3.13	0.100	4.000	0	78.3	49.2	97.9				
Benzo(b)fluoranthene	3.83	0.100	4.000	0	95.7	59.5	113				
Benzo(k)fluoranthene	3.94	0.100	4.000	0	98.6	43.6	107				
Benzo(a)pyrene	4.58	0.100	4.000	0	115	35.7	126				
Indeno(1,2,3-cd)pyrene	4.01	0.100	4.000	0	100	28.2	102				
Dibenz(a,h)anthracene	3.86	0.100	4.000	0	96.5	32.6	101				
Benzo(g,h,i)perylene	3.32	0.100	4.000	0	83.1	28.6	90.8				
Surr: 2-Fluorobiphenyl	0.701		1.000		70.1	41.8	119				
Surr: Terphenyl-d14 (surr)	1.52		1.000		152	42	158				

Sample ID: **1209120-003ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **9/21/2012** RunNo: **5835**
Client ID: **MW-5W** Batch ID: **3269** Analysis Date: **9/22/2012** SeqNo: **114675**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	0.472	0.100						0.4409	6.87	30	
2-Methylnaphthalene	ND	0.100						0	0	30	
1-Methylnaphthalene	0.140	0.100						0.1202	15.5	30	
Acenaphthylene	ND	0.100						0	0	30	
Acenaphthene	0.117	0.100						0.1090	6.74	30	
Fluorene	0.243	0.100						0.2221	8.83	30	
Phenanthrene	ND	0.100						0	0	30	
Anthracene	ND	0.100						0	0	30	

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1209120
CLIENT: Libby Environmental
Project: Acme Bulk Fuel Plant

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **1209120-003ADUP**	SampType: **DUP**	Units: **µg/L**	Prep Date: **9/21/2012**	RunNo: **5835**
Client ID: **MW-5W**	Batch ID: **3269**		Analysis Date: **9/22/2012**	SeqNo: **114675**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoranthene	ND	0.100						0	0	30	
Pyrene	ND	0.100						0	0	30	
Benz(a)anthracene	ND	0.100						0	0	30	
Chrysene	ND	0.100						0	0	30	
Benzo(b)fluoranthene	ND	0.100						0	0	30	
Benzo(k)fluoranthene	ND	0.100						0	0	30	
Benzo(a)pyrene	ND	0.100						0	0	30	
Indeno(1,2,3-cd)pyrene	ND	0.100						0	0	30	
Dibenz(a,h)anthracene	ND	0.100						0	0	30	
Benzo(g,h,i)perylene	ND	0.100						0	0	30	
Surr: 2-Fluorobiphenyl	0.755		1.000		75.5	41.8	119		0		
Surr: Terphenyl-d14 (surr)	1.41		1.000		141	42	158		0		

Sample ID: **ICV-3269**	SampType: **ICV**	Units: **µg/L**	Prep Date: **9/21/2012**	RunNo: **5835**
Client ID: **ICV**	Batch ID: **3269**		Analysis Date: **9/22/2012**	SeqNo: **114676**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzo(k)fluoranthene	990	0.100	1,000	0	99.0	70	130				
Indeno(1,2,3-cd)pyrene	1,030	0.100	1,000	0	103	70	130				
Surr: 2-Fluorobiphenyl	471		500.0		94.1	41.8	119				
Surr: Terphenyl-d14 (surr)	467		500.0		93.4	42	158				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Libby Environmental, Inc.

Chain of Custody Record 120920

www.LibbyEnvironmental.com

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Date: 9/20/12 Page: 1 of 1

Client: Libby Environmental
Project Manager: Jamie Deyman
Address: SEE ABOVE
Project Name: Acme Bulk Fuel Plant
City: State: Zip:
Location: City, State:
Phone: Fax:
Collector: Date of Collection: 9/19/12
Client Project #
Email:

	Sample Number	Depth	Time	Sample Type	Container Type	VOA 8021B	VOA 8021B BTEX Only	VOA 8260	SEMI VOL 8270	NWTPH-HCID	NWTPH-Gx	NWTPH-Dx	NWTPH-Dx Ext.	PAH 8270 (Naph, Halenes)	PCB's 8082	MTCA 5 Metals			Field Notes
1	MW-3W		13:32	H_2O	Amber									X					
2	MW-4W		14:14	"	"									X					
3	MW-5W		14:49	"	"									X					
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			

Relinquished by:	Date / Time	Received by:	Date / Time
[signature]	9/20/12 11:20	[signature]	9/21/12 9:15
Relinquished by:	Date / Time	Received by:	Date / Time
Relinquished by:	Date / Time	Received by:	Date / Time

Sample Receipt:

Good Condition?	
Cold?	
Seals Intact?	
Total Number of Containers	

Remarks:

STD

TAT: 24HR 48HR (5-DAY)

Distribution: White - Lab, Yellow - File, Pink - Originator

ESN NORTHWEST, INC. | Environmental Services Network

CHAIN-OF-CUSTODY RECORD

CLIENT: AEA

ADDRESS: 605 11th Ave SE #201, Olympia, WA 98501

PHONE: 360-352-9835 FAX: -8164

CLIENT PROJECT #: 12-114 PROJECT MANAGER: Y. VAN

DATE: 9/27/12 PAGE 1 OF 2

PROJECT NAME: ACME BULK FUEL PLANT & CARDLOCK

LOCATION: 303 THURSTON AVE NE, OLYMPIA WA

COLLECTOR: Y. VAN DATE OF COLLECTION 9/27/12

Sample Number	Depth	Time	Sample Type	Container Type	TPH-HCID	TPH - DIESEL & OIL	TPH - GASOLINE	BTEX	VOC 8260CL	VOC 8260	SemiVol 8270	PAH's 8270	PCB's 8082	CL Pesticides 8081	RCRA 8 Metals	MTCA 5 Metals	Pb	Asbestos-PLM	GRO Suite	DRO Suite	WO Suite	NOTES	Total Number of Containers	Laboratory Note Number
1. B1-S1-4.5/5.0	4.5/5.0	0946	soil	VOA, 4oz	X	X	X																3	
2. B1-W	—	1007	H2O	VOA, amber	X	X	X																3	
3. B2-W	—	1026	H2O	VOA, amber	X		X				X								X			diesel odor	3	
4. B3-S2-6.5/7.0	6.5/7.5	1047	soil	VOA, 4oz	X	X	X																3	
5. B3-W	—	1104	H2O	VOA, amber	X	X	X																3	
6. B4-W	—	1042	H2O	VOA, amber															X				3	
7. B5-W	—	1124	H2O	VOA, amber	X		X																3	
8. B6-S1-4.5/5.0	4.5/5.0	1150	soil	VOA, 4oz	X	X	X																3	
9. B6-W	—	1201	H2O	VOA, amber	X	X	X																3	
10. B7-W	—	1145	H2O	VOA, amber	X		X																3	
11. B8-S1-4.5/5.0	4.5/5.0	1230	soil	VOA, 4oz	X	X	X																3	
12. B8-W	—	1243	H2O	VOA, amber	X	X	X																3	
13. B9-S2-7.5/8.0	7.5/8.0	1307	soil	VOA, 4oz	X	X	X																3	
NOT 14. B9-W	—	[illegible]	[illegible]	[illegible]	[illegible]																	NO SAMPLE	[illegible]	
15. B10-S1-4.5/5.0	4.5/5.0	1319	soil	VOA, 4oz	X	X	X																3	
16. B10-W	—	1340	H2O	VOA, amber	X	X	X																3	
17. B11-S	—		soil	VOA, 4oz	X	X	X																3	
18. B11-W	—	1407	H2O	VOA, amber	X	X	X																3	

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
	9/27/12 1525		9-27-12 1525
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ ESN DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time: 24 HR 48 HR (5 DAY)

ESN NORTHWEST, INC. Environmental Services Network

CHAIN-OF-CUSTODY RECORD

CLIENT: AEC

ADDRESS: 605 11th AVE SE #201, OLYMPIA, WA 98501

PHONE: 360-352-9835 FAX: 8164

CLIENT PROJECT #: 12-114 PROJECT MANAGER: Y. VAN

DATE: 9/27/12 PAGE 2 OF 2

PROJECT NAME: ACME BULK FUEL PLANT 2 CARDLOCK

LOCATION: 303 THURSTON AVE NE, OLYMPIA, 98501

COLLECTOR: Y. VAN DATE OF COLLECTION 9/27/12

Sample Number	Depth	Time	Sample Type	Container Type	TPH-HCID	TPH - DIESEL & OIL	TPH - GASOLINE	BTEX	VOC 8260CL	VOC 8260	SemiVol 8270	PAH's 8270	PCB's 8082	CL Pesticides 8081	RCRA 8 Metals	MTCA 5 Metals	Pb	Asbestos-PLM	GRO Suite	DRO Suite	WO Suite	NOTES	Total Number of Containers	Laboratory Note Number
1. B12-S1 4/5/12	8.5'	1420	SOIL	40z, VOA	X	X	X																3	
2. B12-TW	—	1600	H2O	VOA amber	X	X	X																3	
3.																								
4.																								
5.																								
6.																								
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RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
[signature]	9/27/12 1515	[signature]	9-27-12 1515
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ ESN DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time: 24 HR 48 HR 5 DAY

ESN NORTHWEST CHEMISTRY LABORATORY

Associated Environmental Group
ACME BULK FUEL PLANT & CARD LOCK PROJECT
Client Project #12-114
Olympia, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
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lab@esnnw.com

Analysis of Diesel Range Organics & Lube Oil Range Organics in Soil by Method NWTPH-Dx/Dx Extended

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Diesel Range Organics (mg/kg)	Lube Oil Range Organics (mg/kg)
Method Blank	9/28/2012	9/28/2012	94	nd	nd
LCS	9/28/2012	9/28/2012	116	99%	---
B1-S1-4.5/5.0	9/28/2012	9/28/2012	98	nd	nd
B3-S2-6.5/7.0	9/28/2012	9/28/2012	99	nd	nd
B6-S1-4.5/5.0	9/28/2012	9/28/2012	int	**4600**	nd
B8-S1-4.5/5.0	9/28/2012	9/28/2012	92	nd	nd
B9-S2-7.5/8.0	9/28/2012	9/28/2012	101	nd	nd
B10-S1-4.5/5.0	9/28/2012	9/28/2012	102	nd	nd
B11-S	9/28/2012	9/28/2012	88	nd	nd
B12-S1-4.5/5.0	9/28/2012	9/28/2012	91	nd	nd
B12-S1-4.5/5.0 Duplicate	9/28/2012	9/28/2012	95	nd	nd
Reporting Limits				50	100

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 50% TO 150%

ESN NORTHWEST CHEMISTRY LABORATORY

Associated Evironmental Group
ACME BULK FUEL PLANT & CARDLOCK PROJECT
Client Project #12-114
Olympia, WA

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Analysis of Diesel Range Organics & Lube Oil Range Organics in Water by Method NWTPH-Dx

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Diesel Range Organics (ug/L)	Lube Oil Range Organics (ug/L)
Method Blank	10/1/2012	10/1/2012	104	nd	nd
LCS	10/1/2012	10/1/2012	115	128%	---
B1-W	10/1/2012	10/1/2012	131	nd	nd
B2-W	10/1/2012	10/2/2012	Int	**75000**	nd
B3-W	10/1/2012	10/1/2012	101	nd	nd
B4-W	10/1/2012	10/2/2012	Int	**28000**	nd
B5-W	10/1/2012	10/1/2012	Int	nd	nd
B6-W	10/1/2012	10/1/2012	112	nd	nd
B7-W	10/1/2012	10/1/2012	133	nd	nd
B8-W	10/1/2012	10/1/2012	142	nd	nd
B10-W	10/1/2012	10/1/2012	Int	nd	nd
B11-W	10/1/2012	10/1/2012	150	nd	nd
B12-W	10/1/2012	10/1/2012	Int	nd	nd
Reporting Limits				250	500

M - matrix interference
"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 50% TO 150%

ESN NORTHWEST CHEMISTRY LABORATORY

Associated Environmental Group
ACME BULK FUEL PLANT & CARD LOCK PROJECT
Client Project #12-114
Olympia, Washington

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Analysis of Gasoline Range Organics & BTEX in Soil by Method NWTPH-Gx/8260

Sample Number	Date Prepared	Date Analyzed	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Gasoline Range Organics (mg/kg)	Surrogate Recovery (%)
Method Blank	9/28/2012	9/28/2012	nd	nd	nd	nd	nd	122
LCS	9/28/2012	9/28/2012	116%	114%	111%	113%	108%	111
LCSD	9/28/2012	9/28/2012	113%	110%	105%	107%	---	106
B1-S1-4.5/5.0	9/28/2012	9/28/2012	nd	nd	nd	nd	nd	121
B1-S1-4.5/5.0 Duplicate	9/28/2012	9/28/2012	nd	nd	nd	nd	nd	118
B3-S2-6.5/7.0	9/28/2012	9/28/2012	nd	nd	nd	nd	nd	112
B6-S1-4.5/5.0	9/28/2012	9/28/2012	**0.06**	**0.26**	nd	**0.29**	**830**	115
B8-S1-4.5/5.0	9/28/2012	9/28/2012	nd	nd	nd	nd	nd	117
B9-S2-7.5/8.0	9/28/2012	9/28/2012	nd	nd	nd	nd	nd	120
B10-S1-4.5/5.0	9/28/2012	9/28/2012	nd	nd	nd	nd	nd	118
B11-S	9/28/2012	9/28/2012	nd	nd	nd	nd	nd	118
B12-S1-4.5/5.0	9/28/2012	9/28/2012	nd	nd	nd	nd	nd	121
Reporting Limits			0.02	0.05	0.05	0.15	10	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Bromoflurorbenzene) & LCS: 65% TO 135%

ESN NORTHWEST CHEMISTRY LABORATORY

Associated Environmental Group
ACME BULK FUEL PLANT & CARD LOCK PROJECT
Client Project #12-114
Olympia, Washington

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1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Gasoline Range Organics & BTEX in Water by Method NWTPH-Gx/8260

Sample Number	Date Analyzed	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Gasoline Range Organics (ug/L)	Surrogate Recovery (%)
Method Blank	10/1/2012	nd	nd	nd	nd	nd	103
LCS	10/1/2012	128%	107%	107%	104%	---	98
LCSD	10/1/2012	88%	93%	96%	86%	---	106
B1-W	10/1/2012	**16**	**1.0**	**72**	**41**	**2600**	118
B3-W	10/1/2012	**4.2**	**1.2**	**35**	**120**	**1700**	104
B6-W	10/1/2012	nd	nd	nd	nd	nd	118
B8-W	10/1/2012	nd	nd	nd	nd	nd	111
B10-W	10/1/2012	nd	nd	nd	nd	nd	113
B11-W	10/1/2012	nd	nd	nd	nd	nd	101
B12-W	10/1/2012	nd	nd	nd	nd	nd	113
Reporting Limits		1.0	1.0	1.0	3.0	100	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Bromoflurorbenzene) & LCS: 65% TO 135%

ESN NORTHWEST CHEMISTRY LABORATORY

Associated Environmental Group
ACME BULK FUEL PLANT & CARD LOCK PROJECT
Client Project #12-114
Olympia, Washington

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Analyses of BTEX in Water by Method 8260

Sample Number	Date Analyzed	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Surrogate Recovery (%)
Method Blank	10/1/2012	nd	nd	nd	nd	103
LCS	10/1/2012	128%	107%	107%	104%	98
LCSD	10/1/2012	88%	93%	96%	86%	106
B2-W	10/1/2012	**35**	**2.3**	**77**	**340**	112
B4-W	10/1/2012	**3.3**	**4.9**	**115**	**390**	122
B5-W	10/1/2012	**2.3**	**1.5**	**40**	**110**	92
B7-W	10/1/2012	nd	nd	nd	nd	114
		1.0	1.0	1.0	3.0	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (4-Bromofluorobenzene) & LCS : 65% TO 135%

ESN NORTHWEST CHEMISTRY LABORATORY

Associated Environmental Group
ACME BULK FUEL PLANT & CARD LOCK PROJECT
Client Project #12-114
Olympia, Washington

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lab@esnnw.com

Analysis of Polynuclear Aromatic Hydrocarbons in Water by Method 8270

Analytical Results

	Reporting	MTH BLK	LCS	B2-W	B4-W
Date extracted	Limits	10/01/12	10/01/12	10/01/12	10/01/12
Date analyzed	(ug/L)	10/02/12	10/02/12	10/02/12	10/02/12
Acenaphthene	0.1	nd	118%	nd	nd
Acenaphthylene	0.1	nd	1.2	nd	nd
Anthracene	0.1	nd	1.2	**2.0**	nd
Benzo(a)anthracene*	0.1	nd	1.5	nd	nd
Benzo(a)pyrene*	0.1	nd	98%	**3.0**	**3.0**
Benzo(b)fluoranthene*	0.1	nd	106%	**3.0**	nd
Benzo(ghi)perylene	0.1	nd	117%	nd	nd
Benzo(k)fluoranthene*	0.1	nd	118%	nd	nd
Chrysene*	0.1	nd	118%	**0.5**	nd
Dibenzo(a,h)anthracene*	0.1	nd	122%	nd	nd
Fluorene	0.1	nd	111%	**60**	**6.0**
Fluoranthene	0.1	nd	130%	**1.0**	nd
Indeno(1,2,3-cd)pyrene*	0.1	nd	107%	nd	nd
Naphthalene	0.1	nd	125%	**90**	**100**
1-Methylnaphthalene	0.1	nd	132%	**100**	**70**
2-Methylnaphthalene	0.1	nd	126%	**150**	**110**
Phenanthrene	0.1	nd	120%	**20**	**50**
Pyrene	0.1	nd	125%	**10**	**2.0**
Total Carcinogens				6.5	3.0
Surrogate recoveries:					
2-Fluorobiphenyl		118%	111%	143%	141%
p-Terphenyl-d14		129%	111%	168%M	146%

Data Qualifiers and Analytical Comments

* - Carcinogenic Analyte
nd - not detected at listed reporting limits
na - not analyzed
C - coelution with sample peaks
M - matrix interference
J - estimated value
Results reported on dry-weight basis
Acceptable Recovery limits: 50% TO 150%
Acceptable RPD limit: 35%