SOIL VAPOR EXTRACTION WELL INSTALLATION AND PILOT TEST REPORT

PC&F Site 01-352
4200 Wheaton Way
Bremerton, Washington

prepared for

Pacific Convenience & Fuels, LLC
7180 Koll Center Parkway, Suite 100

June 21, 2011

Project No. 623

prepared by

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1.0 INTRODUCTION

Environ Strategy Consultants, Inc., (Environ Strategy) is pleased to submit to Pacific Convenience and Fuels, LLC (PC&F) this ***Soil Vapor Extraction Well Installation and Pilot Test Report*** (Report) for Station No. 01-352 located at 4200 Wheaton Way in Bremerton, Washington (Figure 1). The Report documents the field activities, observations and findings associated with the installation of four (4) soil vapor extraction (SVE) wells, identified as VE-1 through VE-4, as well as the results of a SVE pilot test.

Previous site assessment results indicate that soil samples contain detectable levels of fuel hydrocarbons exceeding the MTCA Method A Cleanup Levels. Field observations and analytical results suggest that detected fuel hydrocarbons in soil are weathered and likely associated with soil impacts identified during fuel distribution system upgrades and site assessment activities conducted in 1996 and 1997, respectively. The vertical extent of hydrocarbon-affected soil above cleanup criteria does not appear to extend beyond a depth of 30 feet.

Hydrocarbon concentration levels collected during the SVE pilot test indicate SVE to be effective at removing hydrocarbons from the soil beneath the site. Based on the results of the SVE pilot test, a full-scale SVE system is being designed.

A summary of the site background, field activities, analytical results, and conclusions are presented in the following sections.

2.0 BACKGROUND

The following sections provide a brief site description and a description of the regional geology and hydrogeology.

2.1 Site Description

The subject site is located at 4200 Wheaton Way in Bremerton, Washington and is approximately a 0.5-acre rectangular-shaped, outparcel of commercial land located on the northeast corner of Wheaton Way and Hollis Street. The site is a fuel retail station with four USTs and three pump islands that are located near (west of) a single-story convenience store. The USTs include one 6,000-gallon tank (diesel), two 12,000-gallon tanks (regular gasoline) and one 12,000-gallon tank (premium gasoline). The site is relatively flat, covered with asphalt and

concrete, and is part of a larger retail shopping center. Surrounding land use includes commercial properties including retail shops and restaurants.

The site lies at an elevation of approximately 300 feet above mean sea level (ft amsl) on a small peninsula within Puget Sound. It is located approximately 2 miles from Port Orchard Waterway, Dyes Inlet and Sinclair Inlet, which surround the peninsula to the east, west and south, respectively. Pertinent site features are shown on Figure 2.

2.2 Site Background

The following historical summary is based on a review of available documents and summaries provided in Clearwater's *Site Assessment and Closure Report*, dated October 13, 1997 and Environ Strategy's *Focused Phase II Site Assessment Report,* dated May 30, 2010. For reference, a summary of soil sample analytical results from Environ Strategy's and Clearwater's site assessment activities is provided in Table 1 and Appendix A, respectively. In addition, the soil boring locations for each assessment relative to pertinent site features are shown on Figure 2.

In September and October 1996, the fuel distribution system at the subject site was upgraded. During system upgrades, hydrocarbon-affected soil was encountered in the tank cavity and 450 tons of impacted soil was excavated and transported to a disposal facility in Tacoma, Washington. The release was reported to the Washington Department of Ecology (DOE) and five verification soil samples were collected from the tank cavity for laboratory analysis. In addition, five soil samples were collected from the beneath the product lines and pump islands. The samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds and total petroleum hydrocarbons quantified as gasoline (TPH-Gx). Hydrocarbon impacts in excess of MTCA Method A Cleanup Levels were identified in all ten soil samples. Specifically, the highest levels of fuel hydrocarbons were reported in a composite sample (identified as N&E Wall-8'), which was collected from the north and east sidewall of the diesel tank cavity at a depth of 8 feet. Sample N&E Wall-8' contained TPH-Gx at 7,220 milligrams per kilogram (mg/kg), benzene at 27.6 mg/kg, toluene at 191 mg/kg, ethylbenzene at 111 mg/kg and total xylenes at 626 mg/kg.

In June 1997, Clearwater conducted subsurface site assessment activities. During Clearwater's investigation, 17 soil borings (GP-1 through GP-17) were installed at various locations around the site to delineate the extent of hydrocarbon-affected soil. Borings were terminated at a depth of 17 feet bgs due to refusal. Twenty-six (26) soil samples collected from the borings were analyzed for TPH-Gx and BTEX compounds. Hydrocarbon-affected soil was detected in a majority of the soil borings. The highest concentration of TPH-Gx (1,410 mg/kg) was in a

10-foot sample from boring GP-7 located near the southwest corner of the tank cavity. Similarly, benzene was detected at a maximum level of 11.9 mg/kg in a 10-foot sample collected from GP-5 located east of the existing tank cavity.

In May 2010, Environ Strategy conducted an additional site assessment to evaluate subsurface conditions in the vicinity of the fuel distribution system (USTs and pump islands). Six soil borings (identified as SB-1 through SB-6) were advanced, of which, Borings SB-1, SB-2 and SB-3 were located near the existing tank cavity and advanced to a depth of 30 feet. Borings SB-4, SB-5 and SB-6 were drilled at the west end of the southern, central and northern pump islands, respectively, and extended to a depth of 25 feet at SB-4 and to 20 feet bgs at SB-5 and SB-6. Assessment findings are as follows:

- Hydrocarbon staining and/or odor were observed in subsurface soil collected from Borings SB-2 through SB-6 at depths between 10 to 25 feet bgs.
- Based on visual/olfactory observations, relatively low PID readings (up to 380 ppm at SB-4-10) and comparatively low toluene levels detected in the soil samples, fuel hydrocarbons in soil appear weathered and are likely associated with impacted soil previously identified during fuel system upgrades and Clearwater's site assessment conducted in 1996 and 1997, respectively.
- TPH-Gx was detected at a maximum concentration of 19,000 mg/kg in sample SB-4-10 (Boring SB-4 at 10 feet bgs), which exceeds the cleanup goal of 30 mg/kg. However, TPH-Gx results from deeper samples SB-4-20 (430 mg/kg) and SB-4-25 (<10 mg/kg), show that the vertical extent of impact does not extend beyond a depth of 25 feet. Note that the cleanup goal for TPH-Gx with and without the presence of benzene in the sample matrix is 30 mg/kg and 100 mg/kg, respectively.
- Benzene was detected at a maximum concentration of 2.9 mg/kg in sample SB-5-10 (Boring SB-5 at 10 feet bgs) which is above the MTCA Cleanup Level of 0.03 mg/kg. Benzene levels decrease at depth as evidenced by the analytical results for the deeper sample identified as SB-5-20 where benzene was detected at 0.08 mg/kg. Toluene was detected up to 6.5 mg/kg (sample SB-3-25), which is below the cleanup level of 7 mg/kg. Sample SB-4-10 contained the highest levels of ethylbenzene at 160 mg/kg and xylenes at 590 mg/kg, which are above the respective cleanup level of 6 mg/kg and 9 mg/kg. However, deeper soil samples (SB-4-20 and SB-4-25) contained ethylbenzene and xylenes concentrations that are below cleanup levels. Methyl tert-butyl ether (MTBE) was not detected in any of the samples analyzed.

- Soil samples SB-4-10, SB-4-20 and SB-4-25 were further analyzed for the full-list of volatile organic compounds (VOCs). Neither ethylene dibromide (EDB) nor ethylene dichloride (EDC) were detected in these samples. Naphthalene was detected at 76 mg/kg in SB-4-10, which is above the cleanup standard of 5 mg/kg. Sample SB-4-20 contained naphthalene at 0.74 mg/kg and was non-detect in sample SB-4-25. Detectable levels of "other" VOCs were reported in samples SB-4-10, SB-4-20 and SB-4-25 (see Table 1). The MTCA Cleanup regulation Table 740-1, "Method A Soil Cleanup Levels for Unrestricted Land Uses" does not designate a cleanup level for the additional VOCs detected.
- Samples SB-4-10 and SB-4-25 were further analyzed for total lead. Sample SB-4-10 contained lead at 19 mg/kg, which is below the cleanup goal of 250 mg/kg. Sample SB-4-25 was non-detect for total lead.

Due to elevated levels of TPH-Gx detected in soil samples SB-3-25, SB-4-10, SB-5-10 and SB-6-10, the samples were further analyzed for total petroleum hydrocarbons quantified as diesel (TPH-Dx) and oil-range petroleum hydrocarbons (ORPH). Neither TPH-Dx nor ORPH were detected in the samples analyzed.

2.3 Geology and Hydrogeology

The Washington Division of Geology and Earth Resources, Geologic Map of Washington – Seattle Quadrangle, indicates the property is located in an area that is primarily underlain by Quaternary Glacial Till deposits (Qgt). Glacial till deposits are typically unsorted, unstratified, highly compacted mixture of clay, silt, sand, gravel, and boulders. The region is prone to perched water table conditions because of the glacial till deposits.

The following site geology is based information provided in Clearwater's and Environ Strategy's site assessment reports and water well reports from two nearby wells.

According to Clearwater's site investigation, subsurface soils include a matrix of gravelly sands, silty and clayey sands, clays, cobbles, and sands to 17 ft bgs. Clearwater's borings did not extend beyond 17 ft bgs due to refusal. Clearwater reported that in a conversation with the City of Bremerton Engineering Department, it was stated that the site formerly was a pond that was subsequently filled. It is unknown from where the fill originated.

Soil encountered during Environ Strategy's assessment consists of a mixture of light to dark brown, fine to coarse grain, dense, moderately moist, non-plastic Silty Sand (SM) to approximately 10 feet bgs. Beyond a depth of 10 feet, subsurface soil coarsens to a light brown,

Poorly Graded Sand (SP) with lesser amounts of medium to coarse gravel to 30 feet, the maximum depth explored. The gravel content generally tends to increase with depth.

Groundwater was not encountered to a total depth of 30 ft bgs during previous assessments. A review of DOE's well log database identified a water well less than 0.1 mile south of the subject site where static water was recorded at 142 feet bgs. According to the City of Bremerton Engineering Department, the well is not in use and the water-bearing unit is classified as a non-beneficial use aquifer. However, a log for a decommissioned water well located 0.25 miles southwest of the site reports depth to static water at approximately 45 feet bgs. According to the City of Bremerton Engineering Department and the North Perry Water District, all facilities near the site are provided water either by the City of Bremerton or by the North Perry Water District.

3.0 WELL INSTALLATION

Presented in the following sections are a description of the field activities and observations and a summary of the analytical results. Before commencing field activities, a daily "tailgate" site health and safety meeting was held with Environ Strategy personnel and subcontracted employees. Site personnel were requested to read and acknowledge understanding of the health and safety plan (HASP) prior to initiating work. Upon request, an electronic copy of the HASP will be forwarded to Pacific Convenience and Fuels (PC&F) as a separate, stand-alone document.

3.1 Field Activities

Field activities consisted of drilling, soil sampling and well installation of four soil vapor extraction (SVE) wells, identified as Wells VE-1 through VE-4. The wells were installed in order to test the feasibility of SVE as a viable remedial alternative to reducing the concentrations of adsorbed-phase hydrocarbons beneath the site. Well locations are illustrated in Figure 2. The following subsections describe in detail the field activities performed.

3.1.1 Pre-marking, Permitting and Notifications

Before initiating field activities, proposed boring locations were pre-marked in white spray paint. A *Notice of Intent to Construct* permit was submitted to the DOE by the drilling contractor to install the wells. The DOE was notified 72 hours before drilling in accordance with the permit requirements. The state of Washington's mandatory underground utility locator, One-Call, was notified 72 hours before initiating field activities and requested to mark and delineate underground utilities servicing the site (One-Call Ticket No. 11050027). Additionally, a private

utility locator (CNI Locates LTD) was utilized to ensure all onsite underground utilities were identified.

As a precautionary measure, each boring was cleared of subsurface utilities using a hand auger, shovel, and other appropriate hand-held tools provided by the drilling contractor.

3.1.2 Drilling and Soil Sampling

From March 29 to 31, 2011, drilling and soil sampling activities were conducted. Holocene Drilling, Inc. (Drilling Company's Registration No.: HOLOI04KH; Driller's License No.: 2671) was retained to provide drilling and well installation services. Four well borings, VE-1 through VE-4, were drilled to an approximate depth of 25 to 30 feet and completed as SVE wells. The boring/SVE well locations are illustrated in Figure 2.

Borings were drilled using a drill rig equipped with 10-inch diameter, hollow-stem augers. Each boring location was first cleared for buried utilities and underground piping using hand-augering techniques to a depth of five feet. Soil was collected from the drill cuttings at discrete depths and used to describe lithology. Samples selected for laboratory analysis (from boring VE-1 and VE-2 only) were collected using a stainless steel, split-spoon sampler that was advanced ahead of the auger at the desired sampling depth. The soil was logged in accordance with the Unified Soil Classificaiton System (USCS) by a licensed Professional Geologist. Field screening for volatile organic hydrocarbons (VOCs) was performed by placing a disaggregated portion of each sample in a sealed container and monitoring the soil for head-space volatility using a photoionization detector (PID). Boring logs, presented as Appendix B, record the lithologic descriptions, PID readings, and other visual and olfactory observations.

Soil samples selected for laboratory analysis were collected in accordance with EPA Method 5035 using laboratory-prepared VOA vials. Each sample was comprised of four 5-gram soil capsules inserted in pre-weighed vials and one 4-ounce glass jar. The vials and jars were immediately capped, labeled, stored on ice in a cooler, and delivered to the analytical laboratory under chain-of-custody. Additional details regarding laboratory analyses are presented in Section 3.3, Analytical Results.

Down-hole drilling and sampling equipment were cleaned using a decontamination process consisting of a non-phosphate, laboratory-grade detergent wash and triple-rinsed. Tools and auger were allowed to dry prior to use.

3.1.3 Well Installation

During drilling, groundwater was not observed to 30 feet, the total depth explored during well installation activities. However, what appears to be perched water was encountered in boring VE-3 at approximately 25 feet. Wet soils were encountered between 25 and 30 feet and after leaving the boring open over night, water was gauged at approximately 25 feet. Water was not encountered in the other three wells. The borings were drilled to a depth of approximately 30 feet and completed as Soil Vapor Extraction Wells, VE-1 through VE-4.

Wells VE-1 through VE-4 are constructed of 4-inch diameter, Schedule-40, polyvinyl-chloride (PVC) casing with 0.01-inch and/or 0.03-inch, machine-slotted screen and Schedule-40, blank PVC riser pipe. Well VE-1 is installed to a total depth of 30 feet with a 0.03-inch screen from 30 up to 15 feet and 0.01-inch screen from 15 up to 5 feet bgs. Well VE-2 is installed to a total depth of 25 feet with a 0.03-screen from 25 up to 15 feet and 0.01-inch screen from 15 up to 5 feet bgs. Well VE-3 is installed to a total depth of 20 feet with 0.03-inch screen from 20 up to 10 feet bgs. Perched water was encountered at approximately 25 feet while drilling VE-3. In order to install Well VE-3 above the static water level, the bottom 5 feet of the boring (25 to 30 feet bgs) was grouted and then 5 feet of pea gravel was installed. The bottom of VE-3 sits on top of the pea gravel. Well VE-4 is installed to a total depth of 30 feet with a 0.03-inch screen from 30 up to 10 feet bgs. The filter pack for each well consists of pea gravel and extends from total depth to the top of the screened interval. The filter pack is sealed with one foot of hydrated bentonite chips, then grouted and finished with a 1-foot concrete cap. Each well is completed at the surface with a flush-mounted, traffic-rated well box set in concrete. Well completion details are presented as Appendix C.

3.1.4 Waste Management

Soil cuttings and decontamination fluid generated during drilling and well installation activities were placed into 55-gallon, DOT-approved drums, sealed, and transported to a licensed waste disposal facility. The waste manifest is presented as Appendix D.

3.2 Subsurface Conditions

The following subsections describe the geologic and hydrogeologic conditions observed beneath the site during the installation of Wells VE-1 through VE-4.

3.2.1 Site Geology

Soil encountered during the drilling of Wells VE-1 through VE-4 consists predominantly of Poorly Graded Sand (SP) with varying amounts of medium to coarse sand and some gravel to approximately 5 feet bgs. In the area of VE-1 and VE-2 (on the west side of the dispenser islands), the soil consists predominately of fine grained, red brown to brown, medium dense, moist Silty Sand (SM) to approximately 15 feet, grading to fine to coarse grained, brown to grey, medium dense, dry, Poorly Sorted Sand (SP) to 30 feet bgs. In the area of VE-3 and VE-4 (located around the tank pit and near the southern property boundary) the soil consists predominately of fine to coarse grained, grey to brown, dry to moist, medium dense Silty Sand (SM) and Silt (ML) with varying amounts of fine to coarse sand to 30 feet bgs.

3.2.2 Site Hydrogeology

Groundwater was not observed during the drilling of Wells VE-1, VE-2 and VE-4 to a depth of 30 feet, the deepest depth explored. However, perched water was encountered in boring VE-3 at approximately 25 feet.

3.3 Analytical Results

Soil samples collected during drilling activities were submitted under chain-of-custody to Environmental Services Network Northwest, a State-certified environmental laboratory located in Olympia, Washington. Soil analytical results are discussed in the following subsection.

3.3.1 Soil Analytical Results

Soil samples collected from Boring VE-1 and VE-2 at a depth of approximately 30 feet were submitted for analysis. Note that soil samples were not collected at shallower depths from VE-1 and VE-2 or from well borings VE-3 and VE-4 due to historical assessment data collected at these locations. Soil samples were analyzed for TPH-Dx/Ox by Northwest Method NWTPH-Dx/Dx extended, TPH-Gx by Northwest Method NWTPH-Gx, full-list VOCs by Method 5035/8260B. Sample VE-2-30 was also analyzed for total lead by Method 6020. Current and recent soil analytical results are summarized in Table 1. Historical soil analytical data is presented in Appendix A.

As shown in Table 1, soil samples collected from borings VE-1 and VE-2 did not contain fuel hydrocarbon concentrations exceeding MTCA Method A Cleanup Levels. Toluene was detected in VE-1-30 at a concentration of 0.082 µg/L, which is below the cleanup level of 7 mg/kg for

soil. Total xylenes were detected in VE-1-30 and VE-2-30 at concentrations of 0.17 mg/kg and 0.18 mg/kg, respectively. The cleanup level for total xylenes in soil is 9 mg/kg. Of the additional VOCs, only 1,2,4-trimethylbenzene was detected at concentrations of 0.055 mg/kg (VE-1-30) and 0.064 mg/kg (VE-2-30). MTCA Method A Table 740-1 for unrestricted landuse does not establish a cleanup level for 1,2,4-trimethylbenzene.

Analytical results for "other" VOCs detected in soil are footnoted on Table 1. For a complete list of the target VOCs, refer the laboratory analytical report presented in Appendix E.

4.0 SVE PILOT TEST

From April 4, 2011 through April 7, 2011, SVE system pilot testing was performed at the site. SVE testing was conducted to determine the effectiveness of the newly installed SVE wells and acquire data for use in the design of a permanent SVE system. The SVE pilot test field activities are summarized below.

- On April 4, 5, and 7, 2011, a five horsepower blower was connected to Well VE-2 to extract soil vapor from the subsurface-screened interval of the well (~5 to 25 feet bgs). In accordance with Puget Sound Air Quality (PSAQ) rules, the PSAQ was notified in advance of intent to extract and discharge vapor at the site. An initial vacuum of 25 inches of water was applied to the extraction well. After two hours of operation, vacuum was increased to approximately 60 inches of vacuum at the extraction well. Volatile organic compounds (petroleum hydrocarbons) in extracted vapor were measured at over 10,000 parts per million (ppm) (the maximum detection range) using a photo-ionization detection (PID) instrument calibrated to a known concentration of hexane gas.

- Dwyer magnehelic vacuum gauges were connected to Wells VE-1 and VE-3 to measure vacuum response at nearby wells. The vacuum response in Well VE-4, located in front of the convenience store, was also measured with a magnehelic vacuum gauge, but only intermittently due to its location in a high traffic area. The vacuum response was measured in the wells to determine the effective radius of influence from vapor extraction. A summary of results of soil vapor extraction from Well VE-2 is included as Table 2A.

- On April 6, 2011, the blower was connected to Well VE-3 (screened from 10 to 20 feet bgs) and the vacuum response in Wells VE-1, VE-2 and VE-4 were measured and recorded. After 30 minutes of extraction, the vacuum was increased to 70 inches of water.

The highest concentrations of petroleum hydrocarbons were again over 10,000 ppm. A summary of results of soil vapor extraction from Well VE-3 is attached as Table 2B.

- Vapor samples were collected from extraction Well VE-2 in a Tedlar bag on April 7, 2011 at the end of the test and submitted for analysis of TPH-Gx, benzene, toluene, ethylbenzene, and toluene by Method NWTPH-Gx/8260. The concentration of TPH-Gx in extracted vapor was reported as 2,200 $\mu g/m^3$. The benzene concentration was reported as 9.1 $\mu g/m^3$. The analytical results of laboratory testing will be used to design a full-scale vapor treatment system for the remediation of subsurface hydrocarbons in soil at the site. The laboratory analytical results are attached in Appendix E.

Vacuum responses in observation wells around the points of extraction ranged from 5.0 to 26.0 inches of water, indicating vacuum extraction to be effective through the subsurface of the site and indicate at least a 30-foot radius of influence. Hydrocarbon concentration levels show SVE to be effective at removing hydrocarbons from the site. The cumulative hydrocarbon mass removed from the subsurface during the pilot test was calculated to be 272 pounds (Tables 2A and 2B). Based on the results of pilot test, a full-scale SVE system will be designed and installed for the remediation of subsurface petroleum hydrocarbons in soil.

5.0 CONCLUSIONS

Four SVE wells (VE-1 through VE-4) were installed and an SVE pilot test was performed to evaluate the effectiveness of SVE as a remedial technology at the site. Findings and results from well installation and pilot test activities are as follows:

- Soil encountered during this well installation and the previous focused assessment consists of a mixture of light to dark brown and grey, fine to coarse grain, dense, moderately moist, non-plastic Silty Sand (SM) to 10 to 15 feet bgs. Beyond a depth of 15 feet, subsurface soil coarsens to a light brown to grey, Poorly Graded Sand (SP) with lesser amounts of medium to coarse gravel to 30 feet, the maximum depth explored.

- Groundwater was not encountered to 30 feet bgs, the total depth explored. Perched water was encountered in boring VE-3 at approximately 25 feet, but appears localized to the vicinity of the boring as groundwater was not encountered in VE-1 and VE-2 located to the west or VE-4 located to the east. As noted early the region is prone to perched water table conditions because of the glacial till deposits. In addition, reported depth to static water in two near-by wells is 45 and 142 feet bgs.

- Soil analytical results from Environ Strategy's Focused Phase II and the current well installation activities are presented in Table 1. As shown on Table 1, TPH-Gx was detected at a maximum concentration of 19,000 mg/kg in sample SB-4-10 (boring SB-4 at 10 feet bgs), which exceeds the cleanup goal of 100 mg/kg. However, TPH-Gx results from deeper samples SB-4-20 (430 mg/kg) and SB-4-25, VE-1-30 and VE-2-30 (all non-detect), show that the vertical extent of TPH-Gx impact does not extend beyond a depth of 25 feet.

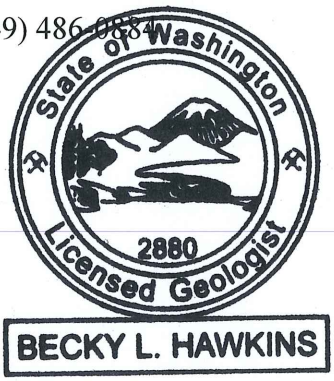
- Benzene, toluene, ethylbenzene and total xylenes also attenuate with depth to levels at or below cleanup levels by 30 feet bgs (see Table 1). Adsorbed-phase MTBE, EDB and EDC were not detected in any of the soil samples analyzed. As annotated in Table 1, the additional VOCs detected in soil also attenuate with depth to levels below the cleanup levels when specified. Note that cleanup levels are not specified for many of the additional VOCs.

- SVE Pilot Test results indicate that the SVE is effective at removing adsorbed-phase hydrocarbons from the soil beneath the site. Based on these results, a full-scale SVE system is being designed.

6.0 CLOSURE

Environ Strategy is pleased to be of service to PC&F. If there are questions regarding this report, please contact the undersigned at (949) 486-9884.

Respectfully submitted,



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Project Engineer

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Project Manager

7.0 REFERENCES

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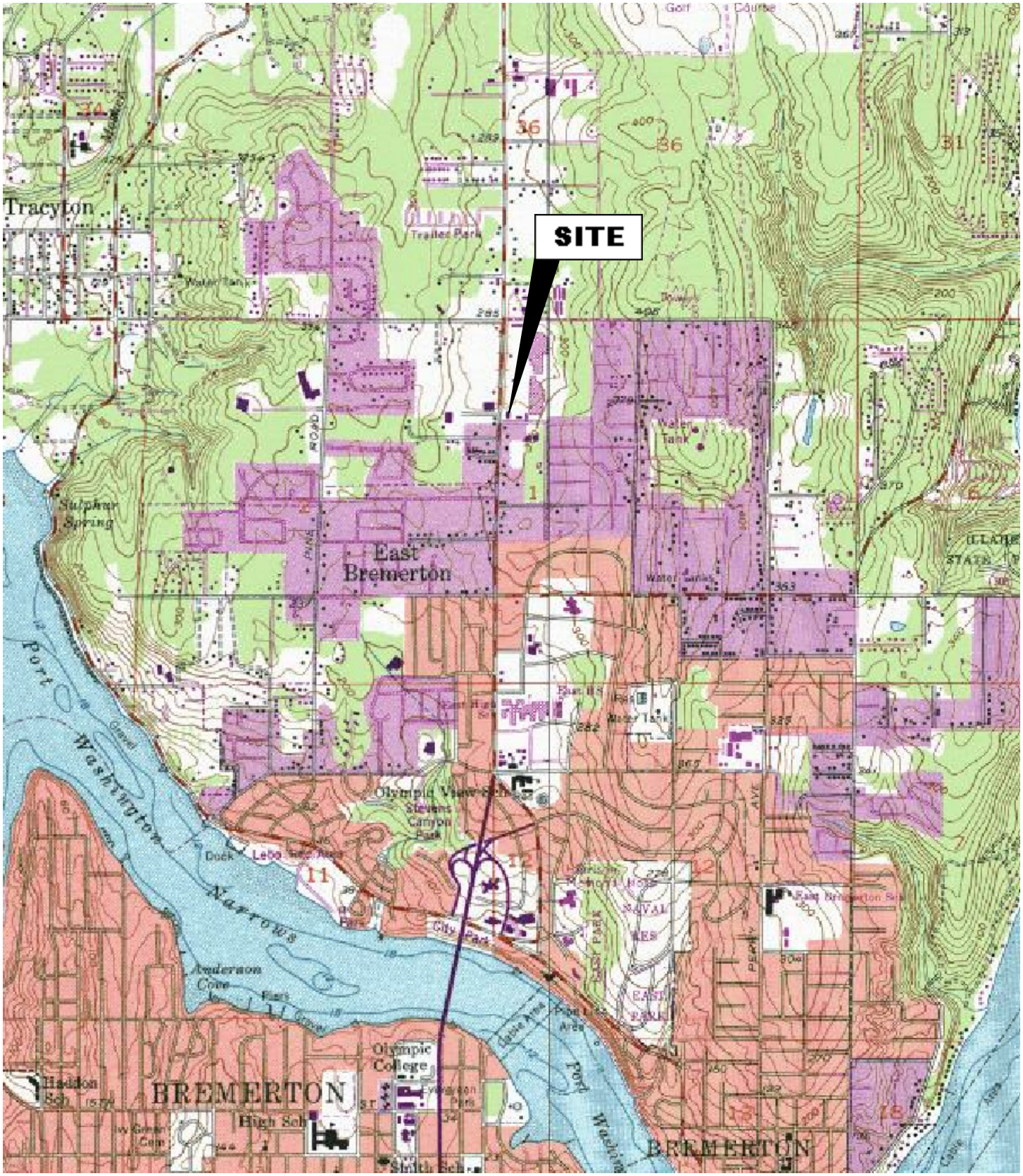
FIGURES



Map Information: Maptech
Terrain Navigator–2nd Ed.–San Juan Island
Olympic Peninsula/Sea–Tac (WA)
42°36'10"N 122°37'42"W

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N

0 2000

APPROX. SCALE: 1" = 2000'

FIGURE 1

SITE LOCATION MAP

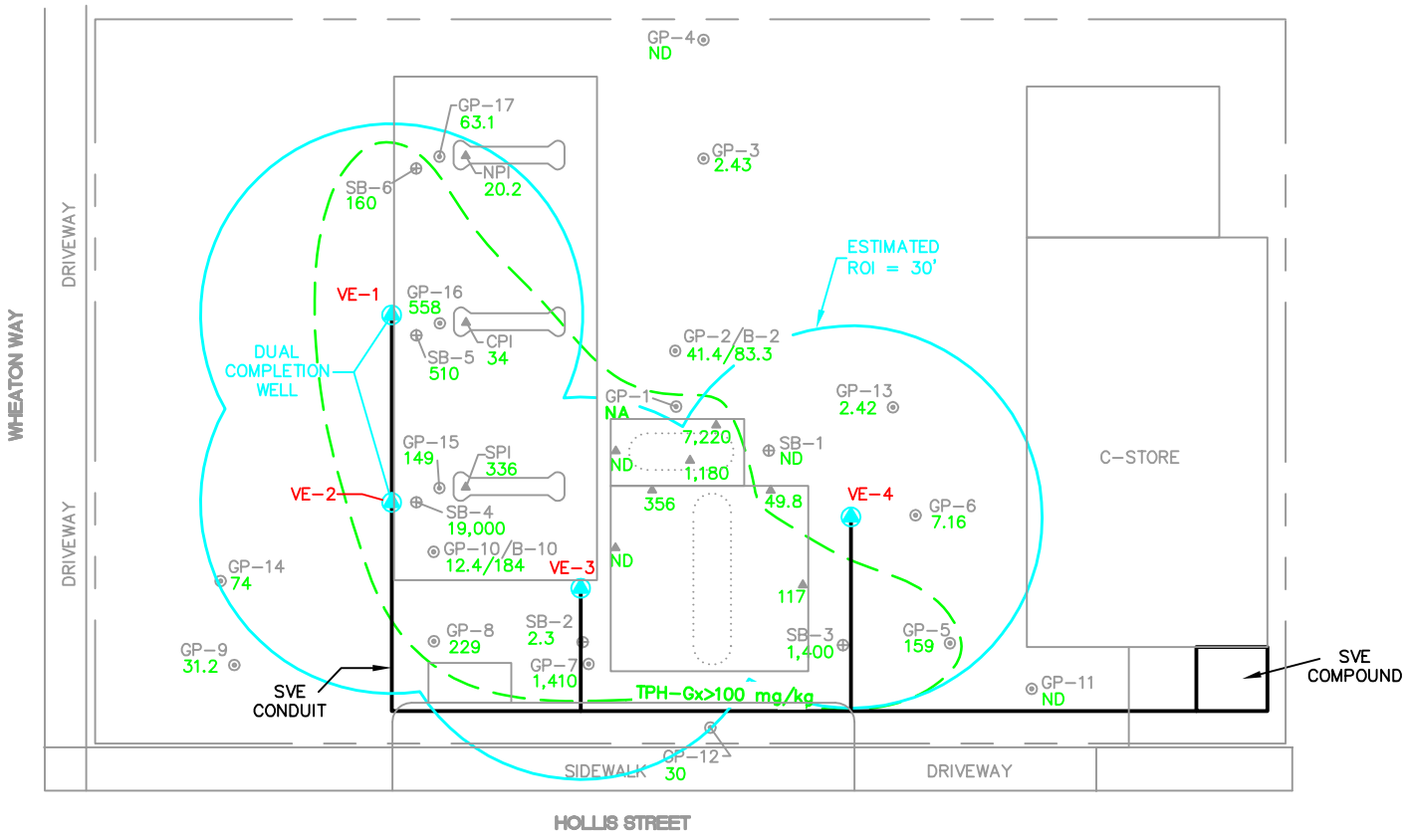
Pacific Convenience & Fuels
Site #01–352
4200 Wheaton Way
Bremerton, Washington

DATE
05/13/10

PROJECT NO.
623

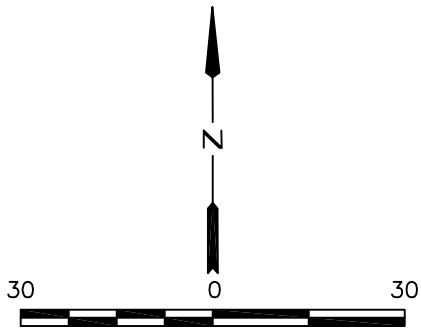
FILE NO.
623F1–SLM

\\Data\data\01_Projects\01_Site Assessment Remediation\Pacific Convenience & Fuels\01-352 - Wheaton Way, Bremerton WA (#623)\Reports\Focused Phase II\Dwgs\623F1–SLM.dwg



LEGEND

SB-1 ⊕	Soil Boring (Environ Strategy, 2010)
GP-1 ⊙	Soil Boring (Clearwater, 1997)
▲	Verification Soil Sample (Clearwater, 1997)
TPH-Gx	Total Petroleum Hydrocarbons Quantified as Gasoline
◉	SVE Well with Estimated ROI of 30 Feet
ROI	Radius of Influence
SVE	Soil Vapor Extraction
mg/kg	Milligram per Kilogram
- - -	Approximate TPH-Gx Iso-Concentration Contour
▭	Underground Storage Tank
▭	Pump Island
74	Highest TPH-Gx level in subsurface soil (See Table 1 & Table 2 for additional details)
ND	Non-Detect



APPROXIMATE SCALE: 1" = 30'

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FIGURE 2

SITE PLAN SHOWING WELL LOCATIONS

Pacific Convenience & Fuels Site #352
4200 Wheaton Way
Bremerton, Washington

DATE 06/07/10

PROJECT NO. 623

FILE NO. 623F4-SVEC

TABLES

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
Station 01-352
Bremerton, Washington
1 of 1

Sample Number	Sample Date	Depth (ft bgs)	PID Reading (ppm)	ORPH (mg/kg)	TPH-Dx (mg/kg)	TPH-Gx (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	MTBE (mg/kg)	EDB (mg/kg)	EDC (mg/kg)	Napth (mg/kg)	Other VOCs[1] (mg/kg)	Total Pb[2] (mg/kg)
				EPA 8015M		EPA Method 8260B[1]										
SB-1-15	5/11/10	15	<10	--	--	<10	0.03	<0.05	<0.05	0.09	<0.05	--	--	--	--	--
SB-1-30	5/11/10	30	<10	--	--	<10	0.02	<0.05	<0.05	0.09	<0.05	--	--	--	--	--
SB-2-15	5/11/10	15	<10	--	--	2.3	**0.20**	0.78	0.12	0.55	<0.05	--	--	--	--	--
SB-2-30	5/11/10	30	<10	--	--	<10	0.03	<0.05	<0.05	0.06	<0.05	--	--	--	--	--
SB-3-20	5/11/10	20	94	--	--	<10	<0.02	0.07	0.06	0.32	<0.05	--	--	--	--	--
SB-3-25	5/11/10	25	<10	<100	<50	**1,400**	**0.13**	6.5	**11**	**51**	<0.05	--	--	--	--	--
SB-3-30	5/11/10	30	<10	--	--	<10	0.03	0.11	0.05	0.24	<0.05	--	--	--	--	--
SB-4-10	5/11/10	10	380	<100	<50	**19,000**	**1.5**	0.19	**160**	**590**	<0.05	<0.05	<0.05	**76**	(3)	19
SB-4-20	5/11/10	20	220	--	--	**430**	0.029	0.024	0.55	3.6	<0.05	<0.05	<0.05	0.74	(4)	--
SB-4-25	5/11/10	25	<10	--	--	<10	0.021	<0.05	0.055	0.24	<0.05	<0.05	<0.05	<0.05	(5)	<5.0
SB-5-10	5/11/10	10	350	<100	<50	**510**	**2.9**	4.0	6.0	**30**	<0.05	--	--	--	--	--
SB-5-20	5/11/10	20	<10	--	--	5.0	**0.08**	0.26	0.09	0.47	<0.05	--	--	--	--	--
SB-6-10	5/11/10	10	20	<100	<50	**160**	**0.17**	<0.05	1.7	1.4	<0.05	--	--	--	--	--
SB-6-20	5/11/10	20	<10	--	--	<10	**0.05**	<0.05	<0.05	0.05	<0.05	--	--	--	--	--
VE-1-30	3/31/11	30	105	<100	<50	<10	<0.02	<0.05	<0.05	0.17	<0.05	<0.05	<0.05	<0.05	(6)	--
VE-2-30	3/31/11	30	171	<100	<50	<10	<0.02	0.082	<0.05	0.18	<0.05	<0.05	<0.05	<0.05	(7)	<5.0
MTCA Method A Cleanup Levels[8]				2,000	2,000	100/30[9]	0.03	7	6	9	0.10	0.005	ne	5	na	250

Notes:

Bold where results exceed cleanup levels
(1): select samples further analyzed for the full-list of VOCs by 8260B
(2): Total Pb analyzed by Method 6020
(3): SB-4-10: Isopropylbenzene (20 mg/kg), n-Propylbenzene (62 mg/kg), 1,3,5-Trimethylbenzene (92 mg/kg), 1,2,4-Trimethylbenzene (240 mg/kg), and Isopropyltoluene (18 mg/kg)
(4): SB-4-20: Isopropylbenzene (0.24 mg/kg), n-Propylbenzene (0.84 mg/kg), 1,3,5-Trimethylbenzene (2.1 mg/kg), 1,2,4-Trimethylbenzene (6.7 mg/kg), and Isopropyltoluene (0.7 mg/kg)
(5): SB-4-25: 1,2,4-Trimethylbenzene (0.088 mg/kg)
(6): VE-1-30: 1,2,4-Trimethylbenzene (0.055 mg/kg)
(7): VE-2-30: 1,2,4-Trimethylbenzene (0.064 mg/kg)
(8): MTCA Method A Table 740-1 for unrestricted land use, WAC 173-340-900 Tables
(9): 100 mg/kg when benzene is absent and 30 mg/kg when benzene is present
--: not analyzed
<: not detected above laboratory reporting limit
BTEX: benzene, toluene, ethylbenzene, total xylenes
EDB: 1,2-Dibromoethane
EDC: 1,2-Dichloroethane
ft bgs: feet below ground surface
mg/kg: milligrams per kilogram
MTBE: methyl tert-butyl ether
MTCA: Model Toxics Control Act
na: not applicable
Naph: naphthalene
nd: not detected
ne: no established cleaup level
ORPH: oil-range petroleum hydrocarbons, analyzed by Northwest Method NWTPH-Dx
Pb: lead
PID: photoionization detector
ppm: parts per million
TPH-Dx: total diesel-range petroleum hydrocarbons, analyzed by Northwest Method NWTPH-Dx
TPH-Gx: total gasoline-range petroleum hydrocarbons, analyzed by Northwest Method NWTPH-Gx
VOCs: volatile organic compounds

TABLE 2A
Soil Vapor Extraction Pilot Test - Extraction Well VE-2
Observation Data April 4, 5, 7, 2011
Station 01-352
Bremerton, Washington
1 of 1

Date	Time	Test Duration (min)	Extraction Point VE-2 Vacuum (in of H_2O)	VE-1 Vacuum (in of H_2O)	VE-3 Vacuum (in of H_2O)	Measured Air Velocity (ft/min)	Flow (scfm)	Influent PID Reading (ppmV)	Hydrocarbon Mass Removed (lbs)	Remarks
4/4/2011	12:50 PM	0	25	5	8	6,800	149	6,000	0	Began Extraction - VE-2
	1:00 PM	10	25.0	8.0	8.4	6,700	146	3,500	1	
	1:10 PM	20	25.0	8.0	8.4	6,500	142	>10,000	4	
	2:45 PM	115	58.0	20.0	21.0	6,250	137	>10,000	34	Full vacuum at 13:30
	3:45 PM	175	58.0	24.0	21.0	6,100	133	>10,000	52	
	4:45 PM	235	60.0	25.0	22.0	4,900	107	>10,000	67	
4/5/2011	8:00 AM	0	58.0	18.0	18.6	4,850	106	5,990	0	Begin Extraction - VE-2
	9:00 AM	60	58.0	21.0	24.0	4,730	103	>10,000	14	
	10:00 AM	120	60.0	21.0	25.0	4,480	98	>10,000	27	VE-4 = 4.5-inches W.C.
	11:00 AM	180	62.0	21.0	26.0	3,980	87	4,394	39	
	12:00 PM	240	61.0	21.0	27.0	3,940	86	3,977	51	
	1:00 PM	300	62.0	21.0	27.0	3,780	83	3,977	62	VE-4 = 5.2-inches W.C.
	2:00 PM	360	62.0	21.0	26.0	3,848	84	3,100	74	
	3:00 PM	420	64.0	22.0	26.0	3,720	81	>10,000	85	
	4:00 PM	480	64.0	22.0	26.0	3,810	83	3,990	96	VE-4 = 6.3-inches W.C.
4/7/2011	8:00 AM	0	30.0	8.0	8.5	6,800	149	1,649	0	Begin Extraction - VE-2
	8:30 AM	30	58.0	9.0	9.5	4,900	107	1,700	1	
	9:00 AM	60	58.0	11.0	15.0	4,880	107	1,525	8	VE-4 = 5.8-inches W.C.
	10:00 AM	120	59.0	11.0	16.0	4,790	105	789	23	
	11:00 AM	180	58.0	12.0	18.0	4,480	98	556	36	
	12:00 PM	240	60.0	12.0	18.0	4,460	97	531	49	VE-4 = 6.0-inches W.C.
	2:00 PM	300	60.0	14.0	20.0	4,410	96	422	62	

Notes and abbreviations:

Hydrocarbon removal rate and cumulative hydrocarbon removal were calculated using the following formula:

$$\text{lb/day} = \frac{\text{ppmv (60 min/hr) (24 hr/day) (scfm) (86 lb/lb-mole)}}{\text{(1,000,000) (379 ft}^3\text{/lb-mole)}}$$

Where: ppmv = average hydrocarbon concentration in parts per million by volume
ft/min = velocity or flow rate in standard cubic feet per minute
scfm = vapor flow rate in standard cubic feet per minute
1 Mole of air = 24.46 Liters volume at standard temperature and pressure (77° F and 29.92" w.c.)
86 lb/lb-mole = average molecular weight of gasoline
379 ft^3/lb-mole = average molar weight of air

--: not measured
>10,000: concentrations exceed the upper limit of the detection range of the PID
HC: hydrocarbons
Infl.: influent
in H_2O: inches of water
lbs/day: pounds per day
lbs: pounds
PID: photo-ionization detector calibrated to hexane
ppmv: parts per million by volume
scfm: standard cubic feet per minute; scfm is calculated using a standard temperature of 70° F
W.C.: water column

TABLE 2B
Soil Vapor Extraction Pilot Test - Extraction Well VE-3
April 6, 2011
Station 01-352
Bremerton, Washington
1 of 1

Date	Time	Test Duration (min)	Extraction Point VE-3 Vacuum (in of H_2O)	VE-1 Vacuum (in of H_2O)	VE-2 Vacuum (in of H_2O)	Measured Air Velocity (ft/min)	Flow (scfm)	Influent PID Reading (ppmV)	Hydrocarbon Mass Removed (lbs)	Remarks
4/6/2011	8:00 AM		25.0	18.0	18.6	4,850	106	5,990	0	Begin Extraction - VE-3
	8:30 AM	30	70.0	21.0	24.0	4,730	103	>10,000	7	
	9:00 AM	60	72.0	21.0	25.0	4,480	98	>10,000	14	VE-4 = 5.8-inches W.C.
	10:00 AM	120	70.0	21.0	27.0	3,940	86	3,977	18	
	11:00 AM	180	70.0	21.0	27.0	3,780	83	3,977	23	
	12:00 PM	240	72.0	21.0	26.0	3,848	84	3,100	26	
	1:00 PM	300	73.0	22.0	26.0	3,720	81	>10,000	37	
	2:00 PM	360	69.0	22.0	26.0	3,810	83	3,990	42	VE-4 = 6.0-inches W.C.
	3:00 PM	420	69.0	--	--	--	--	--	47	

Notes and abbreviations:

Hydrocarbon removal rate and cumulative hydrocarbon removal were calculated using the following formula:

$$\text{lb/day} = \frac{\text{ppmv (60 min/hr) (24 hr/day) (scfm) (86 lb/lb-mole)}}{\text{(1,000,000) (379 ft}^3\text{/lb-mole)}}$$

Where: ppmv =average hydrocarbon concentration in parts per million by volume
ft/min = velocity or flow rate in standard cubic feet per minute
scfm = vapor flow rate in standard cubic feet per minute
1 Mole of air = 24.46 Liters volume at standard temperature and pressure (77° F and 29.92" w.c.)
86 lb/lb-mole = average molecular weight of gasoline
379 ft^3/lb-mole = average molar weight of air

--: not measured
>10,000: concentrations exceed the upper limit of the detection range of the PID
HC: hydrocarbons
Infl.: influent
in H_2O: inches of water
lbs/day: pounds per day
lbs: pounds
PID: photo-ionization detector calibrated to hexane
ppmv: parts per million by volume
scfm: standard cubic feet per minute; scfm is calculated using a standard temperature of 70 degrees F
W.C.: water column

APPENDIX A

HISTORICAL SOIL SAMPLE RESULTS

Table 1

SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS
(PID/WTPHG/BTEX)
Time Oil Company No. 01-352
4200 Wheaton Way
Bremerton, Washington

Sample Designation	Sample Date	Sample Depth (Ft)	PID (ppm)	WTPHG (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)
GP-1	6/17/97	0-4	<	<	<	<	<	<
GP-1	6/17/97	4-8	<	<	<	<	<	<
GP-1	6/17/97	8-12	<	<	<	<	<	<
GP-2	6/17/97	0-4	131	<	<	<	<	<
GP-2	6/17/97	4-8	26	<	<	<	<	<
GP-2	6/17/97	8-12	1454	<	<	<	<	<
B-2 10 Ft	6/17/97	10	1454	83.3	ND	0.0886	0.141	0.14
GP-2 12-15.5 Ft	6/17/97	12-15.5	130	41.4	ND	ND	0.0846	0.854
GP-3	6/17/97	0-4	28	<	<	<	<	<
GP-3	6/17/97	4-8	12	<	<	<	<	<
GP-3 8-12 Ft	6/17/97	8-12	21	2.43	ND	ND	ND	ND
GP-3 12-14 Ft	6/17/97	12-14	13	ND	ND	ND	ND	ND
GP-4	6/17/97	0-4	7	<	<	<	<	<
GP-4	6/17/97	4-8	16	<	<	<	<	<
GP-4 8-9.5 Ft	6/17/97	8-9.5	5	ND	ND	ND	ND	ND
GP-5	6/17/97	5	40	<	<	<	<	<
GP-5 10 Ft	6/17/97	10	1489	159	11.9	26.5	2.66	14.5
GP-5 15 Ft	6/17/97	15	122	ND	ND	ND	ND	ND
GP-6	6/17/97	5	8	<	<	<	<	<
GP-6 10 Ft	6/17/97	10	74	7.16	ND	0.254	0.101	0.692
GP-7	6/17/97	5	42	<	<	<	<	<
GP-7 10 Ft	6/17/97	10	1343	1410	4.68	37.1	19.3	135
GP-7 15 Ft	6/17/97	15	256	30.8	2.12	3.95	0.492	3.19
GP-8	6/17/97	5	24	<	<	<	<	<
GP-8 10 Ft	6/17/97	10	957	166	ND	0.767	2.18	13.8
GP-8 15 Ft	6/17/97	15	96	229	ND	4.25	3.99	23.3
GP-9	6/17/97	5	15	<	<	<	<	<
GP-9 10 Ft	6/17/97	10	48	31.2	ND	ND	ND	ND
GP-10	6/17/97	5	29	<	<	<	<	<

Table 1

SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS
(PID/WTPHG/BTEX)
Time Oil Company No. 01-352
4200 Wheaton Way
Bremerton, Washington

Sample Designation	Sample Date	Sample Depth (Ft)	PID (ppm)	WTPHG (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)
B-10 10 Ft	6/17/97	10	1676	184	0.266	2.36	1.68	9.11
GP-10 15 Ft	6/17/97	15	57	12.4	0.317	2.08	0.223	1.42
GP-11	6/18/97	5	3	<	<	<	<	<
GP-11	6/18/97	10	158	<	<	<	<	<
GP-11 15 Ft	6/18/97	15	5	ND	ND	ND	ND	ND
GP-12	6/18/97	5	25	<	<	<	<	<
GP-12	6/18/97	10	207	<	<	<	<	<
GP-12 15 Ft	6/18/97	15	1044	30	2.07	6.21	0.248	3.13
GP-12 20 Ft	6/18/97	20	11	2.53	ND	0.0809	ND	0.113
GP-13	6/18/97	5	8	<	<	<	<	<
GP-13 10 Ft	6/18/97	10	9	2.42	ND	ND	ND	ND
GP-14	6/18/97	5	14	<	<	<	<	<
GP-14 10 Ft	6/18/97	10	95	74	0.186	0.298	0.819	3.52
GP-15	6/18/97	5	178	<	<	<	<	<
GP-15 10 Ft	6/18/97	10	808	149	0.799	6.1	1.61	9.59
GP-16 5 Ft	6/18/97	5	34	2.25	ND	ND	ND	ND
GP-16 10 Ft	6/18/97	10	1081	558	5.68	23.3	8.47	44.1
GP-17	6/18/97	5	126	<	<	<	<	<
GP-17 10 Ft	6/18/97	10	329	63.1	1.5	1.08	0.765	3.15
SS-1	9/26/97	<	<	2110	2.61	77.9	40.9	230
SS-2	9/26/97	<	<	11.7	ND	ND	ND	0.520
FLOOR-12'	9/26/97	12	<	1180	6.87	49.7	17.2	72.6
SW WALL-8'	9/26/97	8	<	356	4.85	13.5	5.4	30.3
SE WALL-8'	9/26/97	8	<	49.8	6.95	5.67	0.83	5.01
N&E WALL-8'	9/26/97	8	<	7220	27.6	191	111	626
E WALL-8'	9/26/97	8	<	ND	1.16	0.358	0.134	0.546
E TANK-5.5'	10/10/96	5.5	<	117	1.07	12.9	2.68	13.4

Table 1

SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS
(PID/WTPHG/BTEX)
Time Oil Company No. 01-352
4200 Wheaton Way
Bremerton, Washington

Sample Designation	Sample Date	Sample Depth (Ft)	PID (ppm)	WTPHG (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)
W TANK-5.5'	10/10/96	5.5	<	ND	0.278	0.0642	ND	1.85
SPI-2'	10/1/96	2	<	336	ND	0.246	0.54	4.75
CPI-2'	10/1/96	2	<	34	ND	ND	0.11	0.613
NPI-2'	10/1/96	2	<	20.2	ND	0.103	0.0872	1.06
Method A Cleanup Levels				200	0.5	40	20	20

Notes:

mg/kg	milligrams per kilograms (ppm)
ND	Not detected in concentrations exceeding the laboratory reporting limits
<	Not tested/analyzed
WTPH-G	Washington Method Total Petroleum Hydrocarbons as Gasoline

APPENDIX B

SOIL BORING LOGS

environ strategy consultants, inc.

BORING/WELL ID NUMBER: VE-1

SUBSURFACE EXPLORATION LOG

CLIENT: PCAF
PROJECT NUMBER: 623
LOCATION: (1.352) Bremerton, WA
SURFACE ELEVATION: —

GEOLOGIST: B. Hawkins
DATE DRILLED: 3/30/11
DRILLING COMPANY: Holocene Drilling
NORTHING: —

TOTAL DEPTH: 30'
DRILLING METHOD: HSA
SAMPLE METHOD: Drill cuttings
EASTING: —

Depth (ft)	Samples	Time (24 hr)	Sample Number	FID/PID (ppm) Sample	FID/PID (ppm) Breathing Zone	Blow Count	Recovery (ft)	% gravel	% sand	% non-plastic fines	% plastic fines	Lithologic Name	Color	Moisture	Density	Consistency	Plasticity	Angularity	Max. grain size	grading	Additonal Modifiers	Soil Class. Symbol	Lithologic Contact (ft bgs)
0												Asphalt - fill mat-cvs										
								30	70	1	/	sand w/ gravel	dk brn	M		/	/	SA	3/4	P		SP	
5		1415	/	15.3	0	/	/		95	5	/	Fine sand	Red brn		loose	/	/	SA		P			
			/	275	0	/	/	/	75	25	/	Silty sand - fine	Red brn	M	md. dense	/	/	SA	1/64	P		SM	
10			/	328	0	/	/	/	75	25	/	SAA	Red brn	M	md. dense	/	/	SA	1/64	P	slight NC odor	SM	
15			/	502	0	/	/	15	80	5	/	Poorly graded sand w/ gravel - fine sand	lt. brn	D	md. dense	/	/	SA	3/4	P	slight NC odor	SP	
20			/	985	0	/	/	15	80	5	/	SAA	lt. brn	D	md. dense	/	/	SA	3/4	P	NC odor	SP	
25			/	105	0	/	/	/	95	5	/	Poorly graded sand - fine sand	Red brn	D	md. dense	/	/	SA	1/64	P		SP	
30		1600	VE-1-30																				

Notes: Boring terminated @ 30' by field geol. Boring completed as 4' SVE well. screened w/ 0.01' slot 5 to 15' & w/ 0.03' slot from 15' to 30' bgs.

WT not encountered

	> 1/4 inch	visible -1/4 in.	visible with hand lens	not visible	See USCS flow Charts. Describe sand and gravel grading, ie, fine to coarse grained	Use Munsell color chart if available	Dry Moist Wet	Course: v. loose loose md. dense dense	Fines: v. soft soft md. Stiff v.stiff hard	high med low non	A Sa Sr R	in inches	poorly vs. well	odor, staining, minerology, stucture, cementation,		

environ strategy consultants, inc.

SUBSURFACE EXPLORATION LOG

BORING/WELL ID NUMBER: VE-2

CLIENT: PCAF
PROJECT NUMBER: 623
LOCATION: (1.352) Bremerton, WA
SURFACE ELEVATION: —

GEOLOGIST: B. Hawkins
DATE DRILLED: 3/30/11
DRILLING COMPANY: Holocene Drilling, Inc.
NORTHING: —

TOTAL DEPTH: 30'
DRILLING METHOD: HSA
SAMPLE METHOD: Drill cuttings
EASTING: —

Depth (ft)	Samples	Time (24 hr)	Sample Number	FID/PID (ppm) Sample	FID/PID (ppm) Breathing Zone	Blow Count	Recovery (ft)	% gravel	% sand	% non-plastic fines	% plastic fines	Lithologic Name	Color	Moisture	Density	Consistency	Plasticity	Angularity	Max. grain size	grading	Additonal Modifiers	Soil Class. Symbol	Lithologic Contact (ft bgs)
5		1000		25.7	0	/	/	25	75	/	/	Asphalt - sand w/ gravel fine sand/coarse sand	dk gray	M	loose	/	/	SA	3/4	P		SP	
10		1015		390	0	/	/	/	80	20	/	Silty sand - fine	lt. brn	M	md. dense	/	/	SA	≤1/64	P	slight HC odor	SM	
15		1035		525	0	/	/	T	95	5	/	Poorly graded sand fine to med sand trace gravel	brn	M	md. dense	/	/	SA	≤1/8	P	slight HC odor	SP	
20		1045		647	0	/	/	15	80	5	/	Poorly graded sand w/ gravel med to coarse sand	brn to gray	D	md. dense	/	/	SA	≤1/8	P	slight HC odor	SP	
25		1105		1540	0	/	/	15	80	5	/	SAA	brn to gray	D	md. dense	/	/	SA	≤1/8	P	strong HC odor	SP	
30		1130	VE-2-30	171	0	/	/	/	95	5	/	Poorly graded sand - fine sand	brn to gray	D	md. dense	/	/	SA	≤1/64	P	slight HC odor	SP	

Notes: Boring terminated @ 30' by field geol. Boring completed as 4" SVE well to 25'. Pea gravel from 25 to 30'. Screened w/ 0.01 slot from 5-15, 0.03 15 to 25'.

WT not encountered

GEOLOGIC DESCRIPTION

> 1/4 inch	visible -1/4 in.	visible with hand lens	not visible	See USCS flow Charts. Describe sand and gravel grading, ie, fine to coarse grained	Use Munsell color chart if available	Dry Moist Wet	Course: v. loose loose md. dense dense	Fines: v. soft soft md. Stiff v.stiff hard	high med low non	A Sa Sr R	in inches	poorly vs. well	odor, staining, minerology, stucture, cementation,

environ strategy consultants, inc. es

SUBSURFACE EXPLORATION LOG

BORING/WELL ID NUMBER: VE-3

CLIENT: PCAR
PROJECT NUMBER: 623
LOCATION: (1352) Bremerton, WA
SURFACE ELEVATION: —

GEOLOGIST: B. Hawkins
DATE DRILLED: 3/29/11
DRILLING COMPANY: Holocene Drilling
NORTHING: —

TOTAL DEPTH: 30'
DRILLING METHOD: HSA
SAMPLE METHOD: Drill cuttings
EASTING: —

Depth (ft)	Samples	Time (24 hr)	Sample Number	FID/PID (ppm) Sample	FID/PID (ppm) Breathing Zone	Blow Count	Recovery (ft)	% gravel	% sand	% non-plastic fines	% plastic fines	Lithologic Name	Color	Moisture	Density	Consistency	Plasticity	Angularity	Max. grain size	grading	Additonal Modifiers	Soil Class. Symbol	Lithologic Contact (ft bgs)
5		1430		187	0	—	—	—	95	5	—	Asphalt - Poorly graded sand - fine sand	dk grey	M	loose	—	—	SA	≤1/64	P		SP	
10		1445		536	0	—	—	—	75	25	—	Silty sand - fine sand some clay @ 8'	grey/ brn	M	md dense	—	—	—	≤1/64	P	Slight HC odor	SM	
15		1500		327	0	—	—	—	25	75	—	Silt w/ sand - fine some clay @ 15'	lt. brn	M	—	very soft	—	—	≤1/64	D	HC odor	ML	
20		1515		223	0	—	—	—	25	75	—	Silt w/ sand - med to coarse	grey/ brn	M	—	very soft	—	SA	~1/8	D	HC odor	ML	
25		1530		105	0	—	—		25	75	—	Silt w/ sand - fine to med some clay @ ~23'	grey/ brn	M	—	very soft	—	SA	≤1/8	P	HC odor	ML	
30		1600		432	0	—	—	—	95	5	—	Silty sand fine to coarse	lt. brn	W	md. dense	—	—	SA	~1/8	P	HC odor	SM	

Notes: Boring terminated @ 30' by field geol. Boring completed as 4" SVE well to 20' screened 10' to 20' w/ 0.03" slot, Pre-packed from 20 to 25'. Reached water @ 25' bgs.

								> 1/4 inch	visible -1/4 in.	visible with hand lens	not visible	See USCS flow Charts. Describe sand and gravel grading, ie, fine to coarse grained	Use Munsell color chart if available	Dry Moist Wet	Course: v. loose loose md. dense dense	Fines: v. soft soft md. Stiff v.stiff hard	high med low non	A Sa Sr R	in inches	poorly vs. well	odor, staining, minerology, stucture, cementation,		

environ strategy consultants, inc.

SUBSURFACE EXPLORATION LOG

BORING/WELL ID NUMBER: VE-4

CLIENT: PCAF
PROJECT NUMBER: 623
LOCATION: (1,352) Bremerton, WA
SURFACE ELEVATION: —

GEOLOGIST: B. Hawkins
DATE DRILLED: 3/29/11
DRILLING COMPANY: Holocene Drilling
NORTHING: —

TOTAL DEPTH: 30'
DRILLING METHOD: HSA
SAMPLE METHOD: Drill cuttings
EASTING: —

Depth (ft)	Samples	Time (24 hr)	Sample Number	FID/PID (ppm) Sample	FID/PID (ppm) Breathing Zone	Blow Count	Recovery (ft)	% gravel	% sand	% non-plastic fines	% plastic fines	Lithologic Name	Color	Moisture	Density	Consistency	Plasticity	Angularity	Max. grain size	grading	Additonal Modifiers	Soil Class. Symbol	Lithologic Contact (ft bgs)
5		845	/	40 <10	0	-	-	T	95	5	-	Asphalt - Poorly graded sand - fine to coarse T gravel	gray to lt brn	M	loose	/	/	SA	≤1/8	P		SP	
10		900	/	<10	0	-	-	-	25	75	-	Silt w/ sand fine to med	brn	M	md dense	-	-	SA	≤1/8	P		ML	
15		915	/	359	0	-	-	-	95	5		Poorly graded sand - fine to med	lt. brn	M	md dense	/	/	SA	≤1/8	P		SP	
20		930	/	49	0	-	-	T	85	15	-	Silty sand - fine to med Trace gravel	gry/ brn	D	dense	/	-	SA	≤1/8	P	slight HC odor	SM	
25		945	/	230	0	-	-	20	60	20		Silty sand w/ gravel	brn	D	md. dense	/	/	SA	≤3/4	P	slight HC odor	SM	
30		1000	/	443	0	-	-	-	85	15	-	Silty sand - fine to med	gry/ brn	D	dense	/	/	SA	≤1/8	P	slight HC odor	SM	

Notes: Boring terminated @ 30' by field geol. Boring completed as 4' SVE well. Screened 10 to 30' w/ 0.03' slot. WT not encountered

				> 1/4 inch	visible -1/4 in.	visible with hand lens	not visible	See USCS flow Charts. Describe sand and gravel grading, ie, fine to coarse grained	Use Munsell color chart if available	Dry Moist Wet	Course: v. loose loose md. dense dense	Fines: v. soft soft md. Stiff v.stiff hard	high med low non	A Sa Sr R	in inches	poorly vs. well	odor, staining, minerology, stucture, cementation,		

APPENDIX C

WELL COMPLETION LOGS

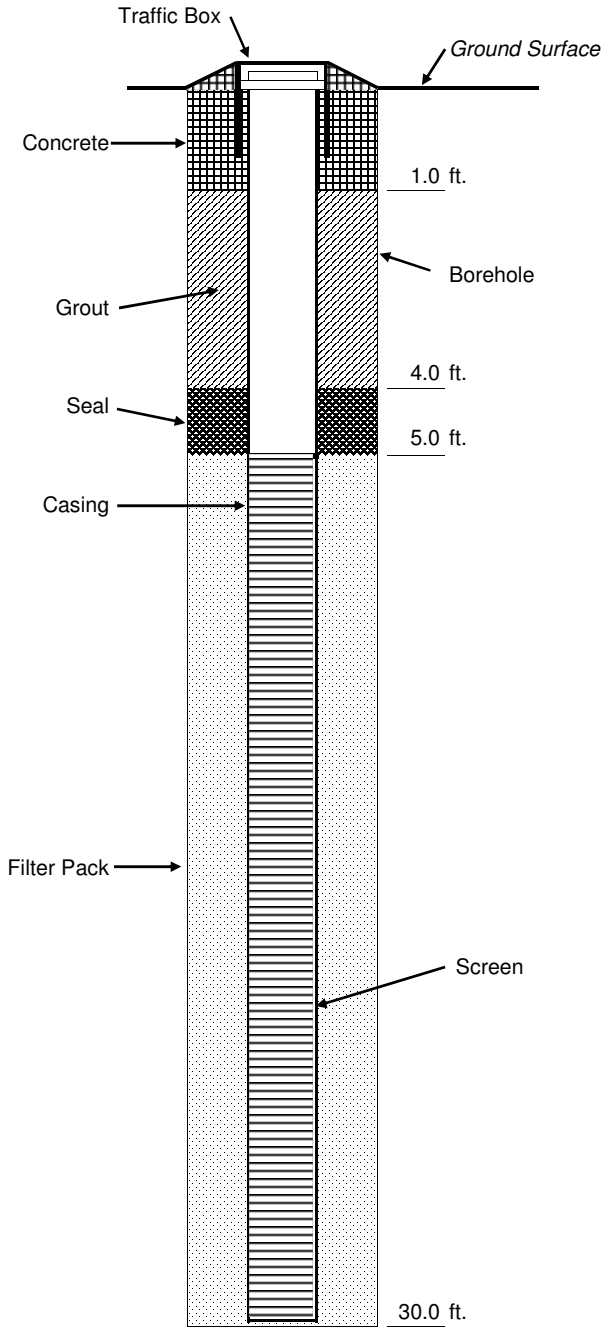
WELL CONSTRUCTION LOG

WELL NUMBER: VE-1 (BHB714)

WELL TYPE: Soil Vapor Extraction

SURFACE ELEV (ft. above MSL): Not measured

CASING ELEV (ft. above MSL): Not measured



DRILLING SUMMARY

DATE COMPLETED: 3/31/2011

DRILLING COMPANY: Holocene Drilling, Inc.

DRILLING RIG TYPE:

TOTAL DEPTH DRILLED: 30'

CONSTRUCTION DETAILS

BOREHOLE DIAMETER: 10'

TOTAL WELL DEPTH: 30'

BLANK CASING TYPE: PVC

BLANK CASING DIAMETER: 4"

TOTAL BLANK CASING LENGTH: 5'

SCREEN TYPE: PVC

SCREEN SLOT SIZE: 5' to 15' (0.01") and 15' to 30' (0.03")

SCREEN LENGTH: 25'

SUMP LENGTH: NA

PROTECTIVE CASING STICKUP: NA

GROUT MATERIAL: Neat cement

SEAL MATERIAL Bentonite chips

FILTER MATERIAL: Pea Gravel

COMMENTS:

environ strategy consultants, inc.

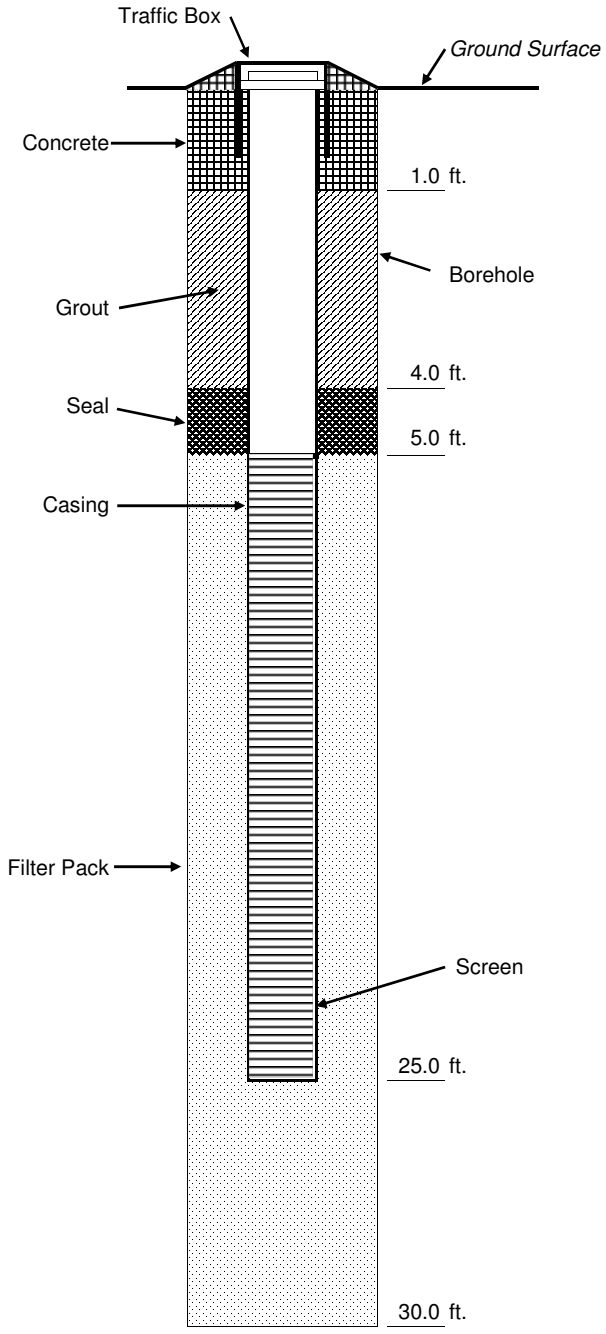
WELL CONSTRUCTION LOG

WELL NUMBER: VE-2 (BHB713)

WELL TYPE: Soil Vapor Extraction

SURFACE ELEV (ft. above MSL): Not measured

CASING ELEV (ft. above MSL): Not measured



DRILLING SUMMARY

DATE COMPLETED: 3/30/2011

DRILLING COMPANY: Holocene Drilling, Inc.

DRILLING RIG TYPE:

TOTAL DEPTH DRILLED: 30'

CONSTRUCTION DETAILS

BOREHOLE DIAMETER: 10'

TOTAL WELL DEPTH: 25'

BLANK CASING TYPE: PVC

BLANK CASING DIAMETER: 4"

TOTAL BLANK CASING LENGTH: 5'

SCREEN TYPE: PVC

SCREEN SLOT SIZE: 5' to 15' (0.01") and 15' to 25' (0.03")

SCREEN LENGTH: 25'

SUMP LENGTH: NA

PROTECTIVE CASING STICKUP: NA

GROUT MATERIAL: Neat cement

SEAL MATERIAL Bentonite chips

FILTER MATERIAL: Pea Gravel

COMMENTS:

environ strategy consultants, inc.

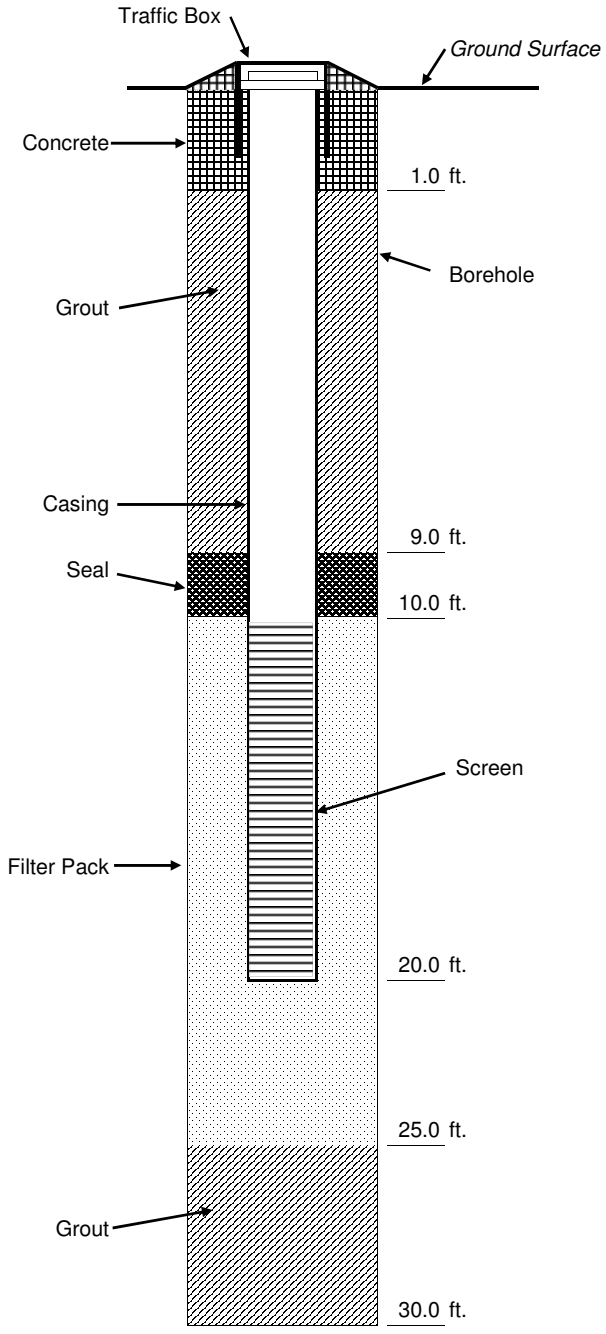
WELL CONSTRUCTION LOG

WELL NUMBER: VE-3 (BHB712)

WELL TYPE: Soil Vapor Extraction

SURFACE ELEV (ft. above MSL): Not measured

CASING ELEV (ft. above MSL): Not measured



DRILLING SUMMARY

DATE COMPLETED: 3/30/2011

DRILLING COMPANY: Holocene Drilling, Inc.

DRILLING RIG TYPE:

TOTAL DEPTH DRILLED: 30'

CONSTRUCTION DETAILS

BOREHOLE DIAMETER: 10'

TOTAL WELL DEPTH: 20'

BLANK CASING TYPE: PVC

BLANK CASING DIAMETER: 4"

TOTAL BLANK CASING LENGTH: 5'

SCREEN TYPE: PVC

SCREEN SLOT SIZE: 10' to 20' (0.03")

SCREEN LENGTH: 10'

SUMP LENGTH: NA

PROTECTIVE CASING STICKUP: NA

GROUT MATERIAL: Neat cement

SEAL MATERIAL Bentonite chips

FILTER MATERIAL: Pea Gravel

COMMENTS: Grouted 25' to 30' due to perched water. Pea gravel from 20' to 25'.

environ strategy consultants, inc.

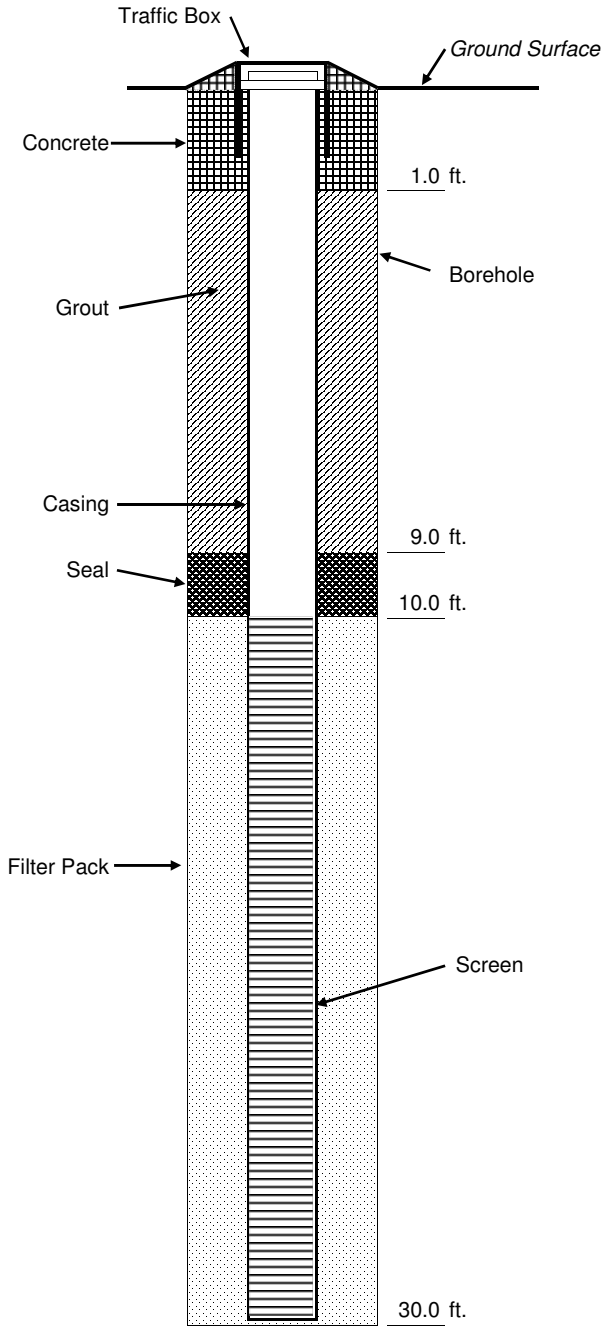
WELL CONSTRUCTION LOG

WELL NUMBER: VE-4 (BHB711)

WELL TYPE: Soil Vapor Extraction

SURFACE ELEV (ft. above MSL): Not measured

CASING ELEV (ft. above MSL): Not measured



DRILLING SUMMARY

DATE COMPLETED: 3/29/2011

DRILLING COMPANY: Holocene Drilling, Inc.

DRILLING RIG TYPE:

TOTAL DEPTH DRILLED: 30'

CONSTRUCTION DETAILS

BOREHOLE DIAMETER: 10'

TOTAL WELL DEPTH: 30'

BLANK CASING TYPE: PVC

BLANK CASING DIAMETER: 4"

TOTAL BLANK CASING LENGTH: 5'

SCREEN TYPE: PVC

SCREEN SLOT SIZE: 10' to 30' (0.03")

SCREEN LENGTH: 20'

SUMP LENGTH: NA

PROTECTIVE CASING STICKUP: NA

GROUT MATERIAL: Neat cement

SEAL MATERIAL Bentonite chips

FILTER MATERIAL: Pea Gravel

COMMENTS:

environ strategy consultants, inc.

APPENDIX D

NON-HAZARDOUS WASTE MANIFEST

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CESQG

Manifest Document No. 13097

2. Page 1 of 1

3. Generator's Name and Mailing Address c/o GUKEN STRATEGY
SITE: 4200 WHEATON WAY BREMERTON WA

4. Generator's Phone (503 224 3206

5. Transporter 1 Company Name WASTEXPRESS

6. US EPA ID Number ORQ 000 243150

A. State Transporter's ID 8891002

B. Transporter 1 Phone 503 224 3206

7. Transporter 2 Company Name

8. US EPA ID Number

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address IRM
11618 N Lombard St.
Portland, OR 97203

10. US EPA ID Number ORQ000011643

E. State Facility's ID

F. Facility's Phone 503 224 3206

11. WASTE DESCRIPTION	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. NON REGULATED MATERIAL SOLID (FDW, SOIL CUTTINGS)	15	DM	825	G
b. NON REGULATED MATERIAL LIQUIDS (FDW, PURGE WATER)	3	DM	150	G
c.				
d.				

G. Additional Descriptions for Materials Listed Above

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
A) 1-15
B) 16-18

GENERATOR

16. **GENERATOR'S CERTIFICATION:** I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name: Becky L. Hawkins | Signature: Becky L. Hawkins for pdf | Date: Month 4 Day 21 Year 11

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: SCOTT M LOVITT | Signature | Date: Month 4 Day 22 Year 11

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

IRM

Printed/Typed Name: Ryan Koup For IRM | Signature | Date: Month 4 Day 18 Year 2011

NON-HAZARDOUS WASTE

APPENDIX E

LABORATORY ANALYTICAL REPORTS

SOIL ANALYTICAL REPORT

ESN NORTHWEST
Environmental Services Network

April 8, 2011

Becky Hawkins
Environ Strategy
One Technology Drive, Ste. B-123
Irvine, CA 92618

Dear Ms. Hawkins:

Please find enclosed the analytical data report for the 1352 Bremerton Project in Bremerton, Washington. Soil samples were analyzed for Diesel Range Organics and Lube Oil Range Organics by NWTPH-Dx/Dx Extended; Gasoline Range Organics by Method NWTPH-Gx, Volatile Organic Compounds by 8260/5035, and Total Lead on March 31 through April 4, 2011.

The results of the analyses are summarized in the attached tables. All soil values are reported on a dry weight basis. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

ESN Northwest appreciates the opportunity to have provided analytical services for Environ Strategy for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A Korosec

Michael A. Korosec
President

1210 Eastside Street SE, Suite 200 ▯ Olympia, Washington 98501 ▯ 360.459.4670 ▯ FAX 360.459.3432
Web Site: *www.esnnw.com* E-Mail: *info@esnnw.com*

ESN NORTHWEST CHEMISTRY LABORATORY

Environ Strategy Consultants, Inc
1352 BREMERTON PROJECT
Client Project #623
Bremerton, Washington

ESN Northwest
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Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
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	4/1/2011	4/1/2011	108	nd	nd
VE-1-30	4/1/2011	4/1/2011	113	nd	nd
VE-2-30	4/1/2011	4/1/2011	115	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

Environ Strategy Consultants, Inc
1352 BREMERTON PROJECT
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Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Gasoline Range Organics in Soil by Method NWTPH-Gx

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Gasoline Range Organics (mg/kg)
Method Blank	3/31/2011	4/4/2011	101	nd
LCS	3/31/2011	4/4/2011	93	107%
VE-1-30	3/31/2011	4/4/2011	99	nd
VE-2-30	3/31/2011	4/4/2011	97	nd
Reporting Limits				10

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

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE: 65% TO 135%

ESN NORTHWEST CHEMISTRY LABORATORY

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1352 BREMERTON PROJECT
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lab@esnnw.com

Analysis of Volatile Organic Compounds in Soil by Method 8260/5035

Analytical Results

	Reporting	MTH BLK	LCS	LCSD	VE-1-30	VE-2-30
Date extracted	Limits	03/31/11	03/31/11	03/31/11	03/31/11	03/31/11
Date analyzed	(ug/Kg)	04/04/11	04/04/11	04/04/11	04/04/11	04/04/11
Dichlorodifluoromethane	50	nd			nd	nd
Chloromethane	50	nd			nd	nd
Vinyl chloride	50	nd			nd	nd
Bromomethane	50	nd			nd	nd
Chloroethane	50	nd			nd	nd
Trichlorofluoromethane	50	nd			nd	nd
Acetone	250	nd			nd	nd
1,1-Dichloroethene	50	nd	127%	139%	nd	nd
Methylene chloride	20	nd			nd	nd
Methyl-t-butyl ether (MTBE)	50	nd			nd	nd
trans-1,2-Dichloroethene	50	nd			nd	nd
1,1-Dichloroethane	50	nd			nd	nd
2-Butanone (MEK)	250	nd			nd	nd
cis-1,2-Dichloroethene	50	nd			nd	nd
2,2-Dichloropropane	50	nd			nd	nd
Chloroform	50	nd			nd	nd
Bromochloromethane	50	nd			nd	nd
1,1,1-Trichloroethane	50	nd			nd	nd
1,2-Dichloroethane (EDC)	50	nd			nd	nd
1,1-Dichloropropene	50	nd			nd	nd
Carbon tetrachloride	50	nd			nd	nd
Benzene	20	nd	100%	115%	nd	nd
Trichloroethene (TCE)	20	nd	96%	111%	nd	nd
1,2-Dichloropropane	50	nd			nd	nd
Dibromomethane	50	nd			nd	nd
Bromodichloromethane	50	nd			nd	nd
4-Methyl-2-pentanone (MIBK)	250	nd			nd	nd
cis-1,3-Dichloropropene	50	nd			nd	nd
Toluene	50	nd	118%	138%	nd	**82**
trans-1,3-Dichloropropene	50	nd			nd	nd
1,1,2-Trichloroethane	50	nd			nd	nd
2-Hexanone	250	nd			nd	nd
1,3-Dichloropropane	50	nd			nd	nd
Dibromochloromethane	50	nd			nd	nd
Tetrachloroethene (PCE)	20	nd			nd	nd
1,2-Dibromoethane (EDB)	50	nd			nd	nd
Chlorobenzene	50	nd	98%	113%	nd	nd
1,1,1,2-Tetrachloroethane	50	nd			nd	nd
Ethylbenzene	50	nd			nd	nd
Xylenes	150	nd			**170**	**180**
Styrene	50	nd			nd	nd
Bromoform	50	nd			nd	nd
1,1,2,2-Tetrachloroethane	50	nd			nd	nd
Isopropylbenzene	50	nd			nd	nd
1,2,3-Trichloropropane	50	nd			nd	nd
Bromobenzene	50	nd			nd	nd

ESN NORTHWEST CHEMISTRY LABORATORY

Environ Strategy Consultants, Inc
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Bremerton, Washington

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lab@esnnw.com

Analysis of Volatile Organic Compounds in Soil by Method 8260/5035

Analytical Results

	Reporting	MTH BLK	LCS	LCSD	VE-1-30	VE-2-30
Date extracted	Limits	03/31/11	03/31/11	03/31/11	03/31/11	03/31/11
Date analyzed	(ug/Kg)	04/04/11	04/04/11	04/04/11	04/04/11	04/04/11
n-Propylbenzene	50	nd			nd	nd
2-Chlorotoluene	50	nd			nd	nd
4-Chlorotoluene	50	nd			nd	nd
1,3,5-Trimethylbenzene	50	nd			nd	nd
tert-Butylbenzene	50	nd			nd	nd
1,2,4-Trimethylbenzene	50	nd			**55**	**64**
sec-Butylbenzene	50	nd			nd	nd
1,3-Dichlorobenzene	50	nd			nd	nd
1,4-Dichlorobenzene	50	nd			nd	nd
Isopropyltoluene	50	nd			nd	nd
1,2-Dichlorobenzene	50	nd			nd	nd
n-Butylbenzene	50	nd			nd	nd
1,2-Dibromo-3-Chloropropane	50	nd			nd	nd
1,2,4-Trichlorobenzene	50	nd			nd	nd
Naphthalene	50	nd			nd	nd
Hexachloro-1,3-butadiene	50	nd			nd	nd
1,2,3-Trichlorobenzene	50	nd			nd	nd
Surrogate recoveries						
Dibromofluoromethane		106%	109%	110%	115%	113%
Toluene-d8		113%	103%	107%	113%	115%
4-Bromofluorobenzene		101%	96%	93%	99%	97%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

ESN NORTHWEST CHEMISTRY LABORATORY

Environ Strategy Consultants, Inc
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Bremerton, Washington

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lab@esnnw.com

Analysis of Total Lead in Soil by Method 6020

Sample Number	Date Prepared	Date Analyzed	Lead (Pb) (mg/kg)
Method Blank	4/4/2011	4/4/2011	nd
VE-2-30	4/4/2011	4/4/2011	nd
VE-2-30 Duplicate	4/4/2011	4/4/2011	nd
Reporting Limit			5.0

"nd" Indicates not detected at listed detection limits.

ESN NORTHWEST CHEMISTRY LABORATORY

Environ Strategy Consultants, Inc
1352 BREMERTON PROJECT
Client Project #623
Bremerton, Washington

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(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

QA/QC Data - Analysis of Total Metals in Soil by Method 6020

Sample Number: VE-2-30

	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	(%)
Lead	86	85.8	100	91	91.7	101	1.00

	Laboratory Control Sample		
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Lead	100	100	100

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 80%-120%
ACCEPTABLE RPD IS 35%

ESN NORTHWEST, INC. Environmental Services Network

CHAIN-OF-CUSTODY RECORD

CLIENT: Environ Strategy Consultants, Inc.
ADDRESS: One Technology Dr. Ste B-123
PHONE: 949-486-0884 FAX: 949-486-0885
CLIENT PROJECT #: 623 PROJECT MANAGER: B. Hawkins

DATE: 3/31/11 PAGE 1 OF 1
PROJECT NAME: 1352 Bremerton
LOCATION: 4200 Wheaton Way, Bremerton, WA
COLLECTOR: B. Hawkins DATE OF COLLECTION 3/30/11

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	MTBE	Pb	NOTES	Total Number of Containers	Laboratory Note Number
1. VE-1-30	30	1600	S			X	X	~~X~~		X										GN	X				4	
2. VE-2-30	30	1130	S			X	X			X										GN	~~X~~	X		~~ESB, EDC, Naph~~, Pb	4	
3.																										
4.																										
5.																										
6.																										
7.																										
8.																										
9.																										
10.																										
11.																										
12.																										
13.																										
14.																										
15.																										
16.																										
17.																										
18.																										

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
Barbara J. Hawkins	3/31/11 1625	[signature]	3/31/11 1625
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)

SOIL VAPOR ANALYTICAL REPORT

ESN NORTHWEST CHEMISTRY LABORATORY

Environ Strategy Consultant, Inc
PCF-Bremerton PROJECT
Client Project #623
Bremerton, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
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(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

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

Sample Number	Date Analyzed	Benzene (ug/m3)	Toluene (ug/m3)	Ethylbenzene (ug/m3)	Xylenes (ug/m3)	Gasoline Range Organics (ug/m3)	Surrogate Recovery (%)
Method Blank	4/8/2011	nd	nd	nd	nd	nd	102
LCS	4/8/2011	125%	139%	115%	114%	104%	90
LCSD	4/8/2011	100%	121%	107%	101%	---	91
Air-040711	4/8/2011	**9.1**	**7.8**	**8.4**	**27**	**2200**	96
Air-040711 Dup	4/8/2011	**13**	**14**	**8.8**	**33**	**2700**	100
Reporting Limits		0.1	0.1	0.1	0.1	1.0	

"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, INC. Environmental Services Network

CHAIN-OF-CUSTODY RECORD

CLIENT: Environ Strategy Consulting, Inc
ADDRESS: One Technology Plaza, Suite B-123, CA 92618
PHONE: 949-486-0884 FAX: 949-486-0885
CLIENT PROJECT #: 623 PROJECT MANAGER: D. Wyand

DATE: 4/7/11 PAGE 1 OF 1
PROJECT NAME: PCF-Bremerton
LOCATION: Bremerton, WA
COLLECTOR: C. Swift DATE OF COLLECTION 4/7/11

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. Air-040711	~	14:10	A	Tedlar			X	X														Air Sample		
2.																								
3.																								
4.																								
5.																								
6.																								
7.																								
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18.																								

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
[signature]	4/7/11 5:05	[signature]	4/7/11 5:05
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