Quarterly Report – Third Quarter 2007
Terminal 4 Slip 3 Upland Facility

Port of Portland
Portland, Oregon 97209

November 2007

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

NEWFIELDS

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Respectfully submitted,

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1. Introduction

This Quarterly Report (Report) describes the results of groundwater monitoring and light non-aqueous phase liquid (LNAPL) monitoring and removal at the Terminal 4 Slip 3 Upland Facility (Facility; see Figure 1) during the third quarter of 2007. This work was completed in accordance with the LNAPL Removal, Groundwater Monitoring, and Contingency Plan for the Facility (Monitoring Plan; BBL/Ash Creek/Newfields, 2005a). The monitoring activities are part of a required remedial action for the Facility defined in the Record of Decision (ROD; Oregon Department of Environmental Quality [DEQ], 2003) and Explanation of Significant Difference (DEQ, 2004). The Monitoring Plan was prepared pursuant to Attachment C (Scope of Work [SOW]) Item II.I of the Consent Judgment (Circuit Court of Oregon, 2004) between DEQ and the Port of Portland (Port).

1.1 Scope

The specific tasks that are described in this Report include:

- Groundwater monitoring conducted in September 2007, including measurement of groundwater levels for estimating hydraulic gradients and collection of groundwater samples for chemical analysis; and
- LNAPL monitoring and recovery from July through September 2007.

1.2 Report Organization

The Report text provides background information about the Facility (Section 2), the results of the LNAPL removal program (Section 3), and the results of the groundwater monitoring program (Section 4). Supporting information is provided in the tables, figures, and appendices. Appendix A is the Field and Quality Assurance/Quality Control (QA/QC) Procedures. Field notes from the groundwater and LNAPL monitoring events are also included in Appendix A. Appendix B contains the Data QA/QC Review and Analytical Laboratory Reports.

2. Background

This section summarizes the physical setting and the geology and hydrogeology of the Facility.

2.1 Facility Location and Description

The Facility is part of the Port Marine Terminal 4 located at 11040 North Lombard Street in Portland, Oregon (Figure 1). Terminal 4 encompasses about 260 acres along the east bank of the Willamette River, near river mile 5. Figure 2 provides a Facility Vicinity Plan showing the boundaries of the Facility in relation to surrounding properties and Figure 3 shows a plan of the Facility. The Facility is generally bounded on the north by Terminal 4 Slip 1, on the west by the Willamette River, on the south by the Toyota Automobile Receiving Area, and on the east by the former Union Pacific Railroad tank farm facility.

The Facility is generally flat at an average elevation of about 35 feet above mean sea level (MSL). The river water elevation is typically less than 10 feet above MSL and is subject to a mean tidal range of about 2 feet (Hart Crowser, 2000). Immediately east of the Facility, the ground surface rises at about a 15 percent grade to an elevation of about 100 feet.

2.2 Geology

Lithologic logs and geologic cross-sections indicate that the Facility is underlain by approximately 10 to 30 feet of sandy fill. The sandy fill has been described as fine- to medium-grained sand with some coarse sand and fine gravel, and relatively few fines (BBL/Ash Creek/Newfields, 2005b; Hart Crowser, 2000). The sandy fill is underlain by alluvium. A laterally continuous layer of silt makes up the top of the alluvium. The silt varies in thickness from approximately 2 to 5 feet or more. This silt layer appears to be hummocky with a general slope towards the river; the silt layer rises sharply to the surface beyond the eastern boundary of the Facility and a “mound” in the silt is present in the northwestern portion of the Facility. Below the silt layer, the alluvium is comprised of layers of silt, sandy silt, silty sand, and sand, which do not appear to be laterally continuous for significant distances.

2.3 Hydrogeology

Depth to shallow groundwater in the central portion of the Facility has generally ranged from 12 to 24 feet below ground surface (bgs) during the past 10 years (BBL/Ash Creek/Newfields, 2005b). Potentiometric maps from periodic water level measurements collected during the past 10 years indicate a general site-wide gradient towards the river (BBL/Ash Creek/Newfields, 2005b). However, gradients are highly variable in the center portion of the Facility, often indicating groundwater flow directions away from the river or to the north or south.

Older wells installed at the Facility (designated by “MW”) are screened within both the sandy fill and the alluvial unit (Century West, 1994). Groundwater levels drop below the sandy fill in many of these

wells during the dry season and times when river levels are low (Hart Crowser, 2000). Groundwater levels measured in shallow wells screened only across the sand fill (e.g., HC-16 and HC-23) are several feet higher than in adjacent MW wells, suggesting the silty layer at the top of the alluvial unit acts to separate groundwater above and below (i.e., groundwater is "perched" above the silt layer).

3. LNAPL Monitoring and Removal Program

The SOW of the Consent Judgment requires periodic removal of LNAPL from existing wells. The following describes the results of the LNAPL monitoring and removal program for the third quarter of 2007. A more detailed description of the procedures used is provided in Appendix A.

3.1 LNAPL Monitoring Wells

As of March 2006, the well network for LNAPL removal was reduced to wells MW-19 and MW-20 (Figure 4), as approved by the DEQ in a letter to the Port dated April 6, 2006. To improve the efficiency of LNAPL removal from these two wells, passive skimmers were installed in June 2006. As requested by the DEQ in the April 6, 2006 letter, if wells are encountered during the quarterly groundwater monitoring (discussed in Section 4.0) that have more than 0.1 foot of product, the product will be removed (but the well will remain outside of the regular LNAPL removal program). During the second quarter 2007 groundwater monitoring event an accumulation of more than 0.1 foot of LNAPL was observed in wells BE-4 and MW-17 and product has since been removed from these wells during routine site visits, coordinated with the LNAPL removal program.

3.2 LNAPL Monitoring and Removal

The wells included in the LNAPL monitoring network were accessed for LNAPL removal on a schedule that varied from weekly to bi-weekly through the third quarter of 2007. In general, the removal frequency was based on the observations of product during each event. The removal frequency was halved (i.e., from weekly to bi-weekly or from bi-weekly to monthly) when wells contained less than 0.1 gallon of collected product during a monitoring event. When wells were observed to have more than 0.1 gallon of collected product, the monitoring frequency was doubled (i.e., from monthly to bi-weekly or from bi-weekly to weekly).

During each LNAPL monitoring event, the LNAPL was removed from wells MW-19 and MW-20 by draining accumulated product from the skimmers and reinstalling the skimmers in the wells (after adjusting the cables to account for changes in water table elevation). The results of each LNAPL monitoring event (i.e., product removal volumes) are summarized in Table 1.

During the September 2007 groundwater monitoring event, LNAPL was also observed in wells HC-10 and BE-4 at thicknesses of more than 0.1 foot. The product in these wells was removed using a peristaltic pump and disposed of with the LNAPL from wells MW-17, MW-19, and MW-20. Approximately 8 gallons of product was removed during the third quarter of 2007. More than 98 gallons of product have been removed for the year (70 percent from wells MW-19 and MW-20). The volume of product that accumulates for removal generally peaks during the wet season when water levels are high, and decreases as water levels fall with the coming of the dry season.

The total volume removed during the third quarter 2007 is slightly less than the volume removed during the third quarter 2006 (7.8 gallons in 2007 versus 8.2 gallons in 2006), and is significantly less than the volume removed during the second quarter 2007. Figure 4 shows the quarterly LNAPL

removal volume and total volumes of LNAPL removed during 2007 from each of the monitoring wells accessed for LNAPL removal.

The LNAPL was collected in a Department of Transportation (DOT)-approved 55-gallon drum for temporary storage. Full drums were transported to a local oil recycling facility as needed.

3.3 BEBRA Observations

The slip adjacent to the BEBRA bank is inspected for the presence of sheen during each LNAPL monitoring event. Sheens were not observed on water adjacent to the bank during the third quarter 2007; results are tabulated in Table 1.

LNAPL has not been observed in the three wells installed within the BEBRA area (i.e., wells BE-1 through BE-3).

4. Groundwater Monitoring

On September 18, 2007, water levels were measured in the monitoring wells included in the groundwater elevation monitoring network, and between September 18 and 19, 2007, groundwater samples were collected from the monitoring wells included in the groundwater sampling/analysis monitoring network. The groundwater elevation and sampling/analysis well networks are defined in the Monitoring Plan and listed below in Sections 4.1 and 4.2, respectively. Please refer to Appendix A for a detailed discussion of the field and sampling procedures.

4.1 Groundwater Level Measurements

Depths to groundwater and LNAPL (if present) were measured in wells HC-1 through HC-3; HC-4S and HC-4D; HC-5; HC-6S and HC-6D; HC-10; HC-12S and HC-12D; HC-13 (located in the Toyota Automobile Receiving Area); HC-16 through HC-24; and BE-1 through BE-4. Water levels were measured for the purpose of determining groundwater elevations and gradients. The wells were opened, the water levels allowed to equilibrate before measurements were taken, and LNAPL was removed from any wells that were observed to have more than 0.1 foot of product (as described in Section 3.2). The depth to groundwater was measured to the nearest 0.01 foot using an electronic interface probe. Measured depths to groundwater and estimated groundwater elevations are summarized in Table 2. Groundwater elevations and estimated groundwater elevation contours are shown on Figure 5.

As shown on Figure 5, the presence of the BEBRA-amended fill does not appear to be affecting the groundwater gradient relative to prior conditions. Groundwater contours are comparable to those observed at the Facility prior to the installation of the BEBRA.

4.2 Groundwater Sampling

Groundwater samples were collected from wells HC-19, HC-21, and BE-1 through BE-3 (in accordance with the Groundwater Monitoring Plan, a sample was not collected from well BE-4 due to the presence of LNAPL in the well [0.1 foot]). Wells HC-2 and HC-5 are sampled annually in June.

Purging. After depths to groundwater were measured, the wells were purged using a peristaltic pump. Groundwater pH, electrical conductivity, and temperature were measured during purging to assess the effectiveness of the purging. Purging was considered complete either when the water quality parameters (pH, temperature, and specific conductance) stabilized within 10 percent for three consecutive readings or the well was purged dry. Wells BE-1 through BE-3 purged dry and were allowed to recover before sampling. Sampling in these wells was conducted over a period of two days as requested by DEQ in an attempt to collect sufficient volume to complete the chemical analyses for the monitoring program. However, even with the extended sample collection period, wells BE-1 and BE-3 had insufficient volumes of water and rates of recovery to fill the full recommended sample volume (which resulted in limiting the availability of laboratory quality control parameters and disallowing the analysis of polynuclear aromatic hydrocarbons [PAHs] in the sample from well BE-3).

Sample Collection. After purging was completed, the wells were sampled. Collected groundwater samples were submitted to TestAmerica in Beaverton, Oregon, for chemical analyses. All samples were collected in laboratory-supplied sample containers, marked with identifying information, and maintained under chain-of-custody protocols.

Sample Handling and Storage. Clean sample containers were provided by the analytical laboratory ready for sample collection. Sample jars were fully filled, leaving no headspace. A label was affixed to each sample container and marked with identifying information. Sample containers were stored in a cooled ice chest until transported to the analytical laboratory. Chain-of-custody was maintained and documented at all times.

Decontamination Procedures. Sampling equipment was either disposable or was cleaned before collection of each well sample. Disposable items were replaced between each sampling event. Cleaning of non-disposable items consisted of washing in a detergent (Alconox®) solution, rinsing with tap water, and rinsing with deionized water.

4.3 Chemical Analyses Results

Groundwater samples collected from the monitoring wells were submitted for PAHs using Environmental Protection Agency (EPA) Method 8270C-SIM, and for diesel and heavy oil (residual) petroleum hydrocarbons (TPH-Dx) using Northwest Total Petroleum Hydrocarbons (NWTPH-Dx) Method with silica gel cleanup. Table 3 summarizes the results of the September 2007 groundwater sample analyses, and includes the results from previous groundwater sampling events. For reference, the ROD compliance criteria have been included in the table. Figure 6 presents the results for total petroleum hydrocarbons (TPH) and total PAHs for each sampled well. The data quality review and the laboratory report are included in Appendix B.

In accordance with the Monitoring Plan, silica gel cleanup is completed on samples analyzed for TPH-Dx (using EPA Method 3630M). However, prior to 2006, the analytical laboratory did not complete silica gel cleanup on the samples collected from wells BE-1 through BE-3 due to insufficient sample volume. Subsequent results of diesel-range total petroleum hydrocarbons (TPHd) analyses on samples from these wells (which have included a silica gel cleanup) have shown a significant decrease in concentration, supporting that the earlier results included organic interference.

Due to limited water in wells BE-1 through BE-3, it was very difficult to obtain sufficient sample volumes to complete all of the analyses of the Monitoring Plan. Therefore, it was recommended to and accepted by the DEQ that sample collection would occur over a two-day period following well purging (i.e., the well was purged dry, allowed to recover, sampled dry again, etc., over a two-day period) to maximize the volume of groundwater for sample collection from these wells. In addition, priority was given to completing the TPHd analyses with silica gel cleanup, followed by completing the PAH analyses. For the third quarter 2007 groundwater sampling event, sufficient sample volume was obtained from wells BE-1 and BE-2 to complete all of the analyses of the Monitoring Plan. Insufficient volume was available from well BE-3 to allow the analysis of PAHs. Also, there was not sufficient sample volume in wells BE-1 and BE-3 to complete the full data quality assurance analysis for the sample and the reporting limits in these samples were raised. As described in the data quality review in Appendix B, the quality of the data is not expected to have been adversely affected. With the exception of benzo(a)anthracene and benzo(a)pyrene, the reporting limits were below the ROD compliance criteria.

4.4 Evaluation of Third Quarter 2007 Results

The following two subsections provide an evaluation of, and conclusions from, the results of the third quarter 2007 activities.

4.4.1 BEBRA Area Groundwater

LNAPL was not observed in any of the wells within the BEBRA area (wells BE-1 through BE-3), but LNAPL (0.1 foot) was observed and removed from the well upgradient of the BEBRA area (well BE-4). Product was removed from wells MW-17, MW-19, and MW-20 on a weekly or bi-weekly schedule as described in Section 3.2. In addition, LNAPL was removed from wells HC-10 and BE-4 during the third quarter 2007 groundwater monitoring event. A total of approximately 8 gallons of product were removed during the third quarter 2007.

Groundwater elevation measurements demonstrate that the BEBRA-amended fill is not restricting groundwater flow (Figure 5).

The concentrations of TPHd and PAHs in the upland monitoring wells have some variability, being generally lower than historically observed concentrations. TPH was not detected in well HC-19, and was lower than the recent average in wells HC-21 and HC-24. Concentrations of PAHs were generally similar to historical norms, but were lower in well HC-21 than have been previously recorded.

4.4.2 South Slip Area

Wells in the south slip area were not sampled during the third quarter 2007 sampling event, consistent with the April 2006 letter from DEQ.

4.5 Recommendations

The current groundwater monitoring program will continue, with annual sampling of wells HC-2 and HC-5 in June. The sample collection period for the BEBRA wells (wells BE-1 through BE-3) will continue to be extended in order to collect sufficient sample volume to complete both the TPH analysis with a complete silica gel cleanup and PAH analysis from these wells.

The LNAPL removal program will also continue, with the passive skimmers operating in wells MW-19 and MW-20. Measurement of product thickness in wells BE-4 and MW-17 will be completed coincident with the LNAPL removal program, with manual product removal as needed.

5. References

BBL/Ash Creek/Newfields, 2005a. LNAPL Removal, Groundwater Monitoring, and Contingency Plan, Terminal 4 Slip 3 Upland Facility. June 16, 2005.

BBL/Ash Creek/Newfields, 2005b. Quarterly Report – Fourth Quarter 2005, Terminal 4 Slip 3 Upland Facility. February 22, 2006.

Century West, 1994. Remedial Investigation Report, Terminal 4. January 1994.

Circuit Court of Oregon, Multnomah County, 2004. Consent Judgment – State of Oregon v. Port of Portland. October 7, 2004.

DEQ, 2003. Record of Decision, Port of Portland Terminal 4 Slip 3 Upland. April 21, 2003.

DEQ, 2004. Explanation of Significant Difference, Port of Portland Terminal 4 Slip 3 Upland Facility. September 1, 2004.

Hart Crowser, 2000. Remedial Investigation Report, Terminal 4, Slip 3 Upland, Port of Portland, Portland, Oregon. January 21, 2000.

TABLE 1
GROUNDWATER AND PRODUCT LEVEL MONITORING
TERMINAL 4 SLIP 3 UPLAND FACILITY
PORT OF PORTLAND

Well ID (Casing Elevation)	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-8								
(31.13)	29-Mar-2007	15.71	NP	0.00	15.42	0.0	0.0	0.00
	27-Jun-2007	19.26	NP	0.00	11.87	0.0	0.0	0.00
	18-Sep-2007	20.99	NP	0.00	10.14	0.0	0.0	0.00
MW-14								
(31.32)	29-Mar-2007	17.03	17.01	0.02	14.31	0.0	0.0	0.02
	27-Jun-2007	19.28	18.90	0.38	12.38	2.5	2.5	0.01
	18-Sep-2007	20.46	20.41	0.05	10.90	0.0	2.5	0.05
MW-15								
(31.57)	29-Mar-2007	15.57	15.22	0.35	16.31	0.25	0.25	0.01
	27-Jun-2007	16.56	16.14	0.42	15.38	2.00	2.25	0.01
	18-Sep-2007	18.26	18.25	0.01	13.32	0.00	2.25	0.01
MW-17								
(28.40)	29-Mar-2007	17.56	13.66	3.90	14.31	4.00	4.00	0.05
	3-May-2007	16.10	14.74	1.36	13.51	7.50	11.50	0.05
	15-May-2007	15.50	14.75	0.75	13.57	2.00	13.50	0.02
	25-May-2007	15.35	14.79	0.56	13.55	1.00	14.50	0.05
	4-Jun-2007	15.90	15.53	0.37	12.83	0.75	15.25	0.10
	13-Jun-2007	16.11	15.77	0.34	12.59	0.50	15.75	0.04
	19-Jun-2007	16.02	15.84	0.18	12.54	0.25	16.00	0.05
	27-Jun-2007	16.47	16.31	0.16	12.07	1.00	17.00	0.04
	9-Jul-2007	16.75	16.66	0.09	11.73	0.00	17.00	0.09
	25-Jul-2007	17.01	16.87	0.14	11.51	0.10	17.10	0.10
	9-Aug-2007	17.42	17.24	0.18	11.14	0.15	17.25	0.10
	22-Aug-2007	17.66	17.57	0.09	10.82	0.00	17.25	0.09
	7-Sep-2007	17.97	17.90	0.07	10.49	0.00	17.25	0.07
	14-Sep-2007	17.84	17.70	0.14	10.68	0.50	17.75	0.01
	18-Sep-2007	18.23	18.19	0.04	10.21	0.00	17.75	0.04
MW-19								
(30.73)	5-Jan-2007	Skimmer Installed June 2006				1.30	1.30	--
	9-Jan-2007	--	--	--	--	1.20	2.50	--
	15-Jan-2007	--	--	--	--	1.00	3.50	--
	26-Jan-2007	--	--	--	--	1.10	4.60	--
	31-Jan-2007	--	--	--	--	1.10	5.70	--
	9-Feb-2007	--	--	--	--	1.00	6.70	--
	13-Feb-2007	--	--	--	--	1.00	7.70	--
	28-Feb-2007	--	--	--	--	1.10	8.80	--
	6-Mar-2007	--	--	--	--	1.20	10.00	--
	23-Mar-2007	--	--	--	--	4.00	14.00	--
	29-Mar-2007	--	--	--	--	5.00	19.00	--
	5-Apr-2007	--	--	--	--	0.50	19.50	--
	11-Apr-2007	--	--	--	--	0.40	19.90	--
	16-Apr-2007	--	--	--	--	8.20	28.10	--
	25-Apr-2007	--	--	--	--	0.80	28.90	--
	3-May-2007	--	--	--	--	5.00	33.90	--
	10-May-2007	--	--	--	--	0.90	34.80	--
	15-May-2007	--	--	--	--	0.50	35.30	--
	25-May-2007	--	--	--	--	0.25	35.55	--
	4-Jun-2007	--	--	--	--	0.75	36.30	--
	13-Jun-2007	--	--	--	--	0.20	36.50	--
	19-Jun-2007	--	--	--	--	0.10	36.60	--
	27-Jun-2007	--	--	--	--	1.00	37.60	--
	9-Jul-2007	--	--	--	--	1.20	38.80	--
	25-Jul-2007	--	--	--	--	0.10	38.90	--
	9-Aug-2007	--	--	--	--	0.15	39.05	--
	22-Aug-2007	--	--	--	--	0.00	39.05	--
	7-Sep-2007	--	--	--	--	0.10	39.15	--
	14-Sep-2007	--	--	--	--	0.10	39.25	--
	19-Sep-2007	--	--	--	--	0.00	39.25	--
MW-20								
(30.73)	5-Jan-2007	Skimmer Installed June 2006				1.30	1.30	--
	9-Jan-2007	--	--	--	--	1.20	2.50	--
	15-Jan-2007	--	--	--	--	0.00	2.50	--
	26-Jan-2007	--	--	--	--	1.20	3.70	--
	31-Jan-2007	--	--	--	--	1.10	4.80	--

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		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
	9-Feb-2007	--	--	--	--	1.00	5.80	--
	13-Feb-2007	--	--	--	--	1.00	6.80	--
	28-Feb-2007	--	--	--	--	1.10	7.90	--
	6-Mar-2007	--	--	--	--	1.00	8.90	--
	23-Mar-2007	--	--	--	--	1.00	9.90	--
	29-Mar-2007	--	--	--	--	4.00	13.90	--
	5-Apr-2007	--	--	--	--	1.00	14.90	--
	11-Apr-2007	--	--	--	--	1.20	16.10	--
	16-Apr-2007	--	--	--	--	2.70	18.80	--
	25-Apr-2007	--	--	--	--	0.30	19.10	--
	3-May-2007	--	--	--	--	4.10	23.20	--
	10-May-2007	--	--	--	--	0.80	24.00	--
	15-May-2007	--	--	--	--	1.20	25.20	--
	25-May-2007	--	--	--	--	0.50	25.70	--
	4-Jun-2007	--	--	--	--	0.50	26.20	--
	13-Jun-2007	--	--	--	--	0.50	26.70	--
	19-Jun-2007	--	--	--	--	0.00	26.70	--
	27-Jun-2007	--	--	--	--	1.00	27.70	--
	9-Jul-2007	--	--	--	--	0.50	28.20	--
	25-Jul-2007	--	--	--	--	0.10	28.30	--
	9-Aug-2007	--	--	--	--	0.10	28.40	--
	22-Aug-2007	--	--	--	--	0.10	28.50	--
	7-Sep-2007	--	--	--	--	0.10	28.60	--
	14-Sep-2007	--	--	--	--	0.90	29.50	--
	19-Sep-2007	--	--	--	--	0.10	29.60	--
HC-10								
(29.30)	29-Mar-2007	15.91	15.33	0.58	13.91	0.25	0.25	0.08
	27-Jun-2007	17.50	17.03	0.47	12.22	2.00	2.25	0.07
	19-Sep-2007	19.09	18.70	0.39	10.56	0.25	2.50	0.01
HC-16								
(32.83)	29-Mar-2007	14.66	NP	0.00	18.17	0.0	0.0	0.00
	27-Jun-2007	15.31	NP	0.00	17.52	0.0	0.0	0.00
	18-Sep-2007	15.95	NP	0.00	16.88	0.0	0.0	0.00
HC-17R								
(33.61)	29-Mar-2007	16.70	NP	0.00	16.91	0.0	0.0	0.00
	27-Jun-2007	17.29	NP	0.00	16.32	0.0	0.0	0.00
	18-Sep-2007	17.89	NP	0.00	15.72	0.0	0.0	0.00
HC-18								
(33.29)	29-Mar-2007	14.65	NP	0.00	18.64	0.0	0.0	0.00
	27-Jun-2007	15.35	NP	0.00	17.94	0.0	0.0	0.00
	18-Sep-2007	15.99	NP	0.00	17.30	0.0	0.0	0.00
HC-19								
(33.05)	29-Mar-2007	16.36	NP	0.00	16.69	0.0	0.0	0.00
	27-Jun-2007	17.04	NP	0.00	16.01	0.0	0.0	0.00
	18-Sep-2007	17.63	NP	0.00	15.42	0.0	0.0	0.00
HC-20								
(32.26)	29-Mar-2007	14.50	NP	0.00	17.76	0.0	0.0	0.00
	27-Jun-2007	15.15	NP	0.00	17.11	0.0	0.0	0.00
	18-Sep-2007	15.70	NP	0.00	16.56	0.0	0.0	0.00
HC-21								
(31.95)	29-Mar-2007	15.09	NP	0.00	16.86	0.0	0.0	0.00
	27-Jun-2007	16.11	NP	0.00	15.84	0.0	0.0	0.00
	18-Sep-2007	16.84	NP	0.00	15.11	0.0	0.0	0.00
HC-22								
(31.91)	29-Mar-2007	13.45	NP	0.00	18.46	0.0	0.0	0.00
	27-Jun-2007	14.14	NP	0.00	17.77	0.0	0.0	0.00
	18-Sep-2007	14.74	NP	0.00	17.17	0.0	0.0	0.00
HC-23								
(32.74)	29-Mar-2007	14.20	14.19	0.01	18.55	0.0	0.0	0.01
	27-Jun-2007	14.93	14.91	0.02	17.83	0.0	0.0	0.02
	18-Sep-2007	15.59	15.56	0.03	17.18	0.0	0.0	0.03

See Notes on Last Page of Table

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Well ID (Casing Elevation)	Date	Initial Measurements [feet]				Product Removal [gallons]		Final Product Thickness [feet]
		Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
HC-24								
(30.04)	29-Mar-2007	12.30	NP	0.00	17.74	0.0	0.0	0.00
	27-Jun-2007	13.74	13.73	0.01	16.31	0.0	0.0	0.01
	18-Sep-2007	14.99	NP	0.00	15.05	0.0	0.0	0.00
BE-1								
(19.75)	29-Mar-2007	6.23	NP	0.00	13.52	0.0	0.0	0.00
	27-Jun-2007	6.76	NP	0.00	12.99	0.0	0.0	0.00
	18-Sep-2007	7.79	NP	0.00	11.96	0.0	0.0	0.00
BE-2								
(19.69)	29-Mar-2007	8.07	NP	0.00	11.62	0.0	0.0	0.00
	27-Jun-2007	8.55	NP	0.00	11.14	0.0	0.0	0.00
	18-Sep-2007	8.90	NP	0.00	10.79	0.0	0.0	0.00
BE-3								
(17.55)	29-Mar-2007	9.44	NP	0.00	8.11	0.0	0.0	0.00
	27-Jun-2007	9.99	NP	0.00	7.56	0.0	0.0	0.00
	18-Sep-2007	10.13	NP	0.00	7.42	0.0	0.0	0.00
BE-4								
(31.16)	29-Mar-2007	15.25	15.18	0.07	15.97	0.00	0.00	0.07
	27-Jun-2007	16.51	16.31	0.20	14.83	1.00	1.00	0.01
	9-Aug-2007	16.85	16.47	0.38	14.65	0.50	1.50	0.01
	22-Aug-2007	16.82	16.58	0.24	14.55	1.00	2.50	0.01
	7-Sep-2007	17.62	16.76	0.86	14.31	1.50	4.00	0.01
	14-Sep-2007	18.16	18.06	0.10	13.09	0.25	4.25	0.00

Total Product Volume [gallons]				
Date	Event Total	Quarter Cumulative	Annual Cumulative	Bank Sheen
5-Jan-2007	**2.6**	**2.6**	**2.6**	No
9-Jan-2007	**2.4**	**5.0**	**5.0**	No
15-Jan-2007	**1.0**	**6.0**	**6.0**	No
26-Jan-2007	**2.3**	**8.3**	**8.3**	No
31-Jan-2007	**2.2**	**10.5**	**10.5**	No
9-Feb-2007	**2.0**	**12.5**	**12.5**	No
13-Feb-2007	**2.0**	**14.5**	**14.5**	No
28-Feb-2007	**2.2**	**16.7**	**16.7**	No
6-Mar-2007	**2.2**	**18.9**	**18.9**	No
23-Mar-2007	**5.0**	**23.9**	**23.9**	No
29-Mar-2007	**13.5**	**37.4**	**37.4**	No
5-Apr-2007	**1.5**	**1.5**	**38.9**	No
11-Apr-2007	**1.6**	**3.1**	**40.5**	No
16-Apr-2007	**10.9**	**14.0**	**51.4**	No
25-Apr-2007	**1.1**	**15.1**	**52.5**	No
3-May-2007	**16.6**	**31.7**	**69.1**	No
10-May-2007	**1.7**	**33.4**	**70.8**	No [6]
15-May-2007	**3.7**	**37.1**	**74.5**	No
25-May-2007	**1.8**	**38.9**	**76.3**	No
4-Jun-2007	**2.0**	**40.9**	**78.3**	No
13-Jun-2007	**1.2**	**42.1**	**79.5**	No
19-Jun-2007	**0.4**	**42.4**	**79.8**	No
27-Jun-2007	**10.5**	**52.9**	**90.3**	No [6]
9-Jul-2007	**1.7**	**1.7**	**92.0**	No
25-Jul-2007	**0.3**	**2.0**	**92.3**	No
9-Aug-2007	**0.9**	**2.9**	**93.2**	No
22-Aug-2007	**1.1**	**4.0**	**94.3**	No
7-Sep-2007	**1.7**	**5.7**	**96.0**	No
14-Sep-2007	**1.8**	**7.5**	**97.8**	No
19-Sep-2007	**0.4**	**7.8**	**98.1**	No

Notes:

1. The LNAPL monitoring program was reduced in March 2006 to include only wells MW-19 and MW-20, approved by the DEQ in an April 6, 2006 lette
2. Passive product skimmers were installed in wells MW-19 and MW-20 in June 2006 - water level measurements discontinued
3. NA = Not Available/Not Accessible.
4. NP = No Product at the time of the monitoring event.
5. * Phreatic Elevation = (Casing Elevation - Depth to Water) + S_g * (Product Thickness). S_g = 0.89
6. Sheen observed in slip, but away from bank.

TABLE 2
GROUNDWATER ELEVATIONS
TERMINAL 4 SLIP 3 UPLAND FACILITY
PORT OF PORTLAND

Monitoring Well	Top of Casing Elevation [feet]	Sample Date	Depth to LNAPL [feet]	Depth to Water [feet]	Product Thickness [feet]	Groundwater Elevation [feet MSL] [1]
HC-1	32.36	3/29/2007	--	24.85	--	7.51
		6/27/2007	--	28.33	--	4.03
		9/18/2007	--	30.65	--	1.71
HC-2	32.19	3/29/2007	--	24.43	--	7.76
		6/27/2007	--	27.44	--	4.75
		9/18/2007	--	29.99	--	2.20
HC-3	32.88	3/29/2007	--	25.79	--	7.09
		6/27/2007	--	28.92	--	3.96
		9/18/2007	--	31.32	--	1.56
HC-4S	32.35	3/29/2007	--	26.08	--	6.27
		6/27/2007	--	26.13	--	6.22
		9/18/2007	--	26.14	--	6.21
HC-4D	32.18	3/29/2007	--	26.58	--	5.60
		6/27/2007	--	29.53	--	2.65
		9/18/2007	--	32.13	--	0.05
HC-5	32.10	3/29/2007	--	18.15	--	13.95
		6/27/2007	--	18.59	--	13.51
		9/18/2007	--	19.08	--	13.02
HC-6S	33.03	3/29/2007	--	18.13	--	14.90
		6/27/2007	--	18.60	--	14.43
		9/18/2007	--	19.13	--	13.90
HC-6D	32.89	3/29/2007	--	20.42	--	12.47
		6/27/2007	--	21.43	--	11.46
		9/18/2007	--	21.96	--	10.93
HC-10	29.30	3/29/2007	15.33	15.91	0.58	13.91
		6/27/2007	17.03	17.50	0.47	12.22
		9/18/2007	18.70	19.09	0.39	10.56
HC-12S	29.60	3/29/2007	--	13.45	--	16.15
		6/27/2007	--	13.89	--	15.71
		9/18/2007	--	14.22	--	15.38
HC-12D	29.32	3/29/2007	--	15.25	--	14.07
		6/27/2007	--	17.03	--	12.29
		9/18/2007	--	18.76	--	10.56
HC-13	NS	3/29/2007	--	16.73	--	NS
		6/27/2007	--	17.01	--	NS
		9/18/2007	--	18.08	--	NS
HC-16	32.83	3/29/2007	--	14.66	--	18.17
		6/27/2007	--	15.31	--	17.52
		9/18/2007	--	15.95	--	16.88
HC-17R	33.61	3/29/2007	--	16.70	--	16.91
		6/27/2007	--	17.29	--	16.32
		9/18/2007	--	17.89	--	15.72
HC-18	33.29	3/29/2007	--	14.65	--	18.64
		6/27/2007	--	15.35	--	17.94
		9/18/2007	--	15.99	--	17.30
HC-19	33.05	3/29/2007	--	16.36	--	16.69
		6/27/2007	--	17.04	--	16.01
		9/18/2007	--	17.63	--	15.42

See Notes on Last Page of Table

TABLE 2
GROUNDWATER ELEVATIONS
TERMINAL 4 SLIP 3 UPLAND FACILITY
PORT OF PORTLAND

Monitoring Well	Top of Casing Elevation [feet]	Sample Date	Depth to LNAPL [feet]	Depth to Water [feet]	Product Thickness [feet]	Groundwater Elevation [feet MSL] [1]
HC-20	32.26	3/29/2007	--	14.50	--	
		6/27/2007	--	15.15	--	
		9/18/2007	--	15.70	--	
HC-21	31.95	3/29/2007	--	15.09	--	16.86
		6/27/2007	--	16.11	--	15.84
		9/18/2007	--	16.84	--	15.11
HC-22	31.91	3/29/2007	--	13.45	--	18.46
		6/27/2007	--	14.14	--	17.77
		9/18/2007	--	14.74	--	17.17
HC-23	32.74	3/29/2007	--	14.20	--	18.54
		6/27/2007	14.91	14.93	0.02	17.83
		9/18/2007	15.56	15.59	0.03	17.18
HC-24	30.04	3/29/2007	--	12.30	--	17.74
		6/27/2007	13.73	13.74	0.01	16.31
		9/18/2007	--	14.99	--	15.05
BE-1	19.75	3/29/2007	--	6.23	--	13.52
		6/27/2007	--	6.76	--	12.99
		9/18/2007	--	7.79	--	11.96
BE-2	19.69	3/29/2007	--	8.07	--	11.62
		6/27/2007	--	8.55	--	11.14
		9/18/2007	--	8.90	--	10.79
BE-3	17.55	3/29/2007	--	9.44	--	8.11
		6/27/2007	--	9.99	--	7.56
		9/18/2007	--	10.13	--	7.42
BE-4	31.16	3/29/2007	15.18	15.25	0.07	15.97
		6/27/2007	16.31	16.51	0.20	14.83
		9/18/2007	16.72	16.78	0.06	14.43

Notes:

1. [1]MSL = Mean sea level.
2. NS = Not surveyed.

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
TERMINAL 4 SLIP 3 UPLAND FACILITY
PORT OF PORTLAND

Sample Point	Sample Date	Analyte Concentration in µg/L (ppb)																	
		Total Petroleum Hydrocarbons		Polynuclear Aromatic Hydrocarbons (PAHs)															
		Diesel-Range	Residual-Range	Acenaphthene	Acenaphthylene	Anthracene	BAA	BAP	BBF	BGP	BKF	Chrysene	DAA	Fluoranthene	Fluorene	ICP	Naphthalene	Phenanthrene	Pyrene
South Slip 3 Area																			
HC-2	11/5/1998	--	--	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	5/10/2004	< 250	< 500	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	2/11/2005	120 J	310 J	< 0.021	--	--	0.0053	< 0.021	--	--	--	--	--	0.0084	< 0.021	--	0.14	0.0069	--
	6/2/2005	20 J	< 500	0.0058 J	0.0055 J	0.027	0.0043 J	0.0044 J	0.0056 J	0.0046 J	0.0042 J	0.0049 J	< 0.020	0.0086 J	0.0094 J	0.0052 J	0.026	0.017 J	0.0075 J
	9/15/2005	< 238	< 476	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	< 0.196	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098
	12/9/2005	< 236	< 472	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952
	6/28/2006	< 240	< 481	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.189	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943
	6/27/2007	< 238	< 476	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952
HC-5	11/12/1998	--	--	< 2.5	< 2.5	< 0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 2.5	< 0.1	< 0.1	< 0.5	< 0.1
	5/10/2004	**990,000**	< 50,000	< 25	< 25	27.6	**0.742**	< 0.5	< 0.5	< 0.5	< 0.5	1.65	< 1.0	< 25	**86.1**	< 0.5	< 37.5	**43.0**	14.9
	6/10/2004	**102,000**	< 5,000	11.4	< 10	< 10	**0.422**	< 0.25	< 0.25	< 0.5	< 0.25	0.815	< 0.25	< 10	**35.3**	< 0.25	16.8	**17.4**	4.68
	2/11/2005	**26,000 J**	**4,800 J**	0.65	--	--	< 0.02	< 0.02	--	--	--	--	--	0.07	2.9	--	< 0.19	0.28	--
	6/2/2005	**3,200 Y**	< 500	0.26	< 0.064	< 0.37	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.096	2.7	< 0.020	< 0.17	< 0.21	< 0.020
	9/15/2005	**1,510 J**	< 476	0.973	< 0.476	< 0.476	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	**4.21**	< 0.0952	< 0.952	< 0.476	< 0.143
	12/7/2005	**1,940**	< 485	< 0.143	< 0.0952	< 0.238	< 0.0952	< 0.476	< 0.476	< 0.476	< 0.476	< 0.0952	< 0.952	< 0.0952	1.15	< 0.476	< 0.143	< 0.143	< 0.238
	6/28/2006	**2,990**	< 476	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.381	< 0.190	1.10	< 0.190	< 0.190	< 0.190	< 0.190
	6/27/2007	856	< 476	0.835	< 0.288	< 0.192	< 0.192	< 0.192	< 0.192	< 0.192	< 0.192	< 0.192	< 0.385	< 0.192	3.08	< 0.192	0.421	< 0.288	< 0.192
BEBRA Area																			
HC-19	5/10/2004	**10,800**	**1,420**	< 1.5	< 0.5	< 1.25	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	< 0.5	**4.3**	< 0.5	< 1.75	< 1.0	< 0.5
	2/11/2005	**9,700 J**	**1,800 J**	1.0	--	--	0.014	**0.016**	--	--	--	--	--	0.041	3.1	--	< 0.26	0.054	--
	6/3/2005	510 Y	< 500	0.72	< 0.086	0.21	0.023	**0.034**	0.028	0.025	0.025	0.041	< 0.020	0.076	2.8	0.028	< 0.19	0.17	0.12
	9/15/2005	< 236	< 472	0.961	< 0.476	< 0.476	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	3.48	< 0.0952	< 0.714	< 0.476	< 0.0952
	12/7/2005	< 240	< 481	0.619	< 0.0962	< 0.144	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.192	< 0.0962	2.10	< 0.0962	< 0.385	< 0.0962	0.0908 J
	3/14/2006	211	< 481	0.402	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.204	< 0.102	1.02	< 0.102	< 0.102	< 0.102	< 0.102
	6/28/2006	**3,940**	598	0.939	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.190	< 0.381	< 0.190	2.95	< 0.190	< 0.190	< 0.190	< 0.190
	9/19/2006	< 238	< 476	0.583	< 0.0952	< 0.143	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	1.89	< 0.0952	< 0.143	< 0.0952	< 0.0952
	12/13/2006	610	< 481	0.283	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.192	< 0.0962	0.698	< 0.0962	< 0.0962	< 0.0962	< 0.0962
	3/29/2007	324	< 476	< 0.143	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	0.660	< 0.0952	< 0.0952	< 0.0952	< 0.0952
	6/27/2007	190 J	< 476	0.660	< 0.0962	< 0.192	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.192	< 0.0962	1.87	< 0.0962	< 0.144	< 0.0962	< 0.0962
	9/18/2007	< 236	< 472	0.775	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	1.95	< 0.0952	< 0.381	< 0.0952	< 0.0952
HC-21	5/10/2004	**1,210**	< 625	1.95	< 0.5	0.966	**1.43**	**1.63**	1.5	1.44	1.5	1.66	< 1.0	3.4	1.28	1.21	< 0.5	4.38	3.6
	2/11/2005	**13,000 J**	**3,200 J**	0.58	--	--	**3.8**	**5.7**	--	--	--	--	--	4.7	0.94	--	0.18	2.3	--
	6/3/2005	430 Y	< 500	0.30	< 0.059	0.24	**0.62**	**0.95**	0.79	0.82	0.56	0.77	0.22	1.2	0.82	1.1	0.13	0.62	1.3
	9/15/2005	179 J	< 476	< 0.485	< 0.485	< 0.485	**0.410**	**0.515**	0.577	0.283	0.470	0.521	< 0.194	0.679	1.87	0.262	< 0.485	< 0.485	0.925
	12/7/2005	652	< 481	0.495	< 0.0962	< 0.240	**0.259**	**0.397**	0.405	0.252	0.375	0.342	< 0.385	0.403	0.808	0.224	0.172	0.334	0.667
	3/14/2006	221	< 481	< 0.102	< 0.102	< 0.153	**0.242**	**0.244**	0.188	0.156 J	0.184	0.208	< 0.204	0.318	< 0.102	0.156	< 0.102	< 0.204	0.298
	6/28/2006	**2,460**	< 476	1.07	< 0.400	0.840	**4.62**	**5.37**	5.67	4.43	4.02	4.61	1.73	**7.33**	0.996	3.97	0.457	3.21	8.31
	9/19/2006	600	< 476	3.74	< 0.476	3.33	**19.6**	**21.5**	20.6	15.2	17.6	19.8	4.64	**25.1**	3.08	14.4	0.759	**14**	25.8
	12/13/2006	**1,210**	< 481	< 0.0952	< 0.0952	< 0.143	**0.135**	**0.174**	0.167	0.133	0.141	0.122	< 0.190	0.184	< 0.0952	0.125	< 0.0952	< 0.190	0.125
	3/29/2007	< 238	< 476	< 0.0952	< 0.0952	< 0.190	**0.145**	**0.202**	0.186	0.166	0.152	0.175	< 0.190	0.315	< 0.0952	0.153	< 0.0952	< 0.0952	0.192
	6/27/2007	390	< 476	0.745	< 0.476	< 0.476	< 0.476	< 0.476	< 0.476	< 0.476	< 0.476	< 0.476	< 0.952	< 0.476	2.06	< 0.476	< 0.476	< 0.476	< 0.476
	9/18/2007	261	< 472	0.247	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.190	0.622	< 0.0952	< 0.190	< 0.190	< 0.190
HC-24	5/10/2004	736	< 500	1.21	< 0.25	< 0.3	< 0.1	**0.118**	0.101	0.101	< 0.1	0.109	< 0.2	0.144	3.51	< 0.1	< 1.5	4.09	0.163
	2/11/2005	**4,500 J**	970 J	1.2	--	--	**0.11**	**0.15**	--	--	--	--	--	0.18	**5.4**	--	< 0.55	1.8	--
	6/6/2005	450 Y	30 J	1.1	< 0.25	0.13	0.021	**0.019 J**	0.019 J	0.015 J	0.018 J	0.022	< 0.020	0.053	**5.0**	0.019 J	< 0.63	2.8	0.071
	9/15/2005	**4,480 J**	536	0.594	< 0.146	< 0.243	**0.288**	**0.370**	0.342	0.247	0.363	0.353	< 0.194	0.427	3.79	0.224	< 0.874	0.698	0.462
	12/7/2005	837	< 481	0.861	< 0.144	< 0.192	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.192	< 0.0962	2.83	< 0.0962	< 1.06	1.91	< 0.0962
	3/13/2006	706	< 481	0.441	< 0.153	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.204	< 0.102	1.60	< 0.102	< 0.255	1.06	< 0.102
	6/28/2006	**1,020**	< 476	1.99	< 0.377	0.363	**0.996**	**1.10**	1.97 J	0.834	< 0.189 J	0.989	< 0.377	1.49	**6.00**	0.754	< 0.943	4.24	1.34
	9/20/2006	705	< 481	1.49	< 0.481	< 0.481	0.753	0.948	0.935	0.668	0.823	0.82	< 0.962	1.02	**4.35**	0.62	< 0.481	1.00	1.04
	12/13/2006	**1,810**	< 481	2.10	< 0.962	< 0.962	< 0.962	< 0.962	< 0.962	< 0.962	< 0.962	< 0.962	< 1.92	< 0.962	**6.99**	< 0.962	< 1.44	5.73	< 0.962
	3/29/2007	787	< 481	1.01	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	3.43	< 0.0952	< 0.524	1.10	< 0.0952
	6/27/2007 **	**--**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/18/2007	436	< 472	1.05	< 0.286	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	3.53	< 0.0952	< 1.14	1.92	0.12

See Notes on Last Page of Table

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
TERMINAL 4 SLIP 3 UPLAND FACILITY
PORT OF PORTLAND

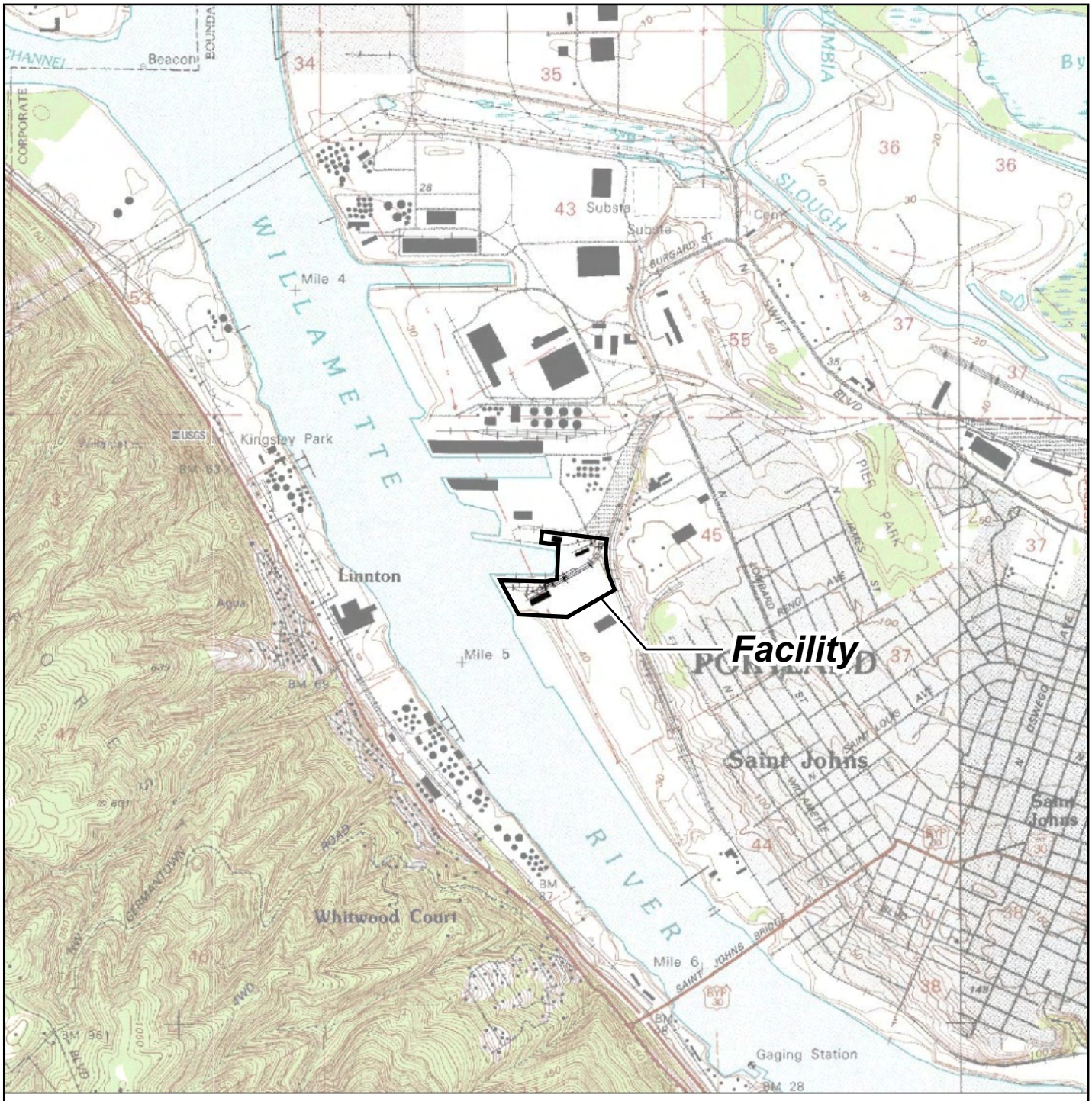
Sample Point	Sample Date	Analyte Concentration in µg/L (ppb)																	
		Total Petroleum Hydrocarbons		Polynuclear Aromatic Hydrocarbons (PAHs)															
		Diesel-Range	Residual-Range	Acenaphthene	Acenaphthylene	Anthracene	BAA	BAP	BBF	BGP	BKF	Chrysene	DAA	Fluoranthene	Fluorene	ICP	Naphthalene	Phenanthrene	Pyrene
BEBRA Area - Continued																			
BE-1	6/6/2005	**3,500 Y***	**2,300 O***	0.31	0.11	0.28	**1.7**	**2.1**	2.0	1.8	1.6	2.2	0.36	3.4	0.16	2.0	0.49	1.4	3.4
	9/15/2005	172 J*	< 515*	0.0575 J	< 0.103	0.0516 J	**0.322**	**0.385**	0.368	0.296	0.370	0.424	< 0.206	0.646	< 0.103	0.251	< 0.103	0.286	0.674
	12/7/2005	430*	< 400*	< 0.200	< 0.200	< 0.200	**0.397**	**0.449**	0.540	0.214	0.459	0.501	< 0.400	0.866	< 0.200	0.169 J	< 0.200	0.461	1.12
	3/13/2006	< 102 J	< 191 J	< 0.333	< 0.333	< 0.333	< 0.333	**0.350**	0.334	< 0.333	< 0.333	< 0.333	< 0.667	0.448	< 0.333	< 0.333	< 0.333	< 0.333	0.431
	6/28/2006	< 312	< 625	< 0.0962	< 0.0962	< 0.0962	**0.112**	**0.133**	0.137	0.105	< 0.0962	0.124	< 0.192	0.181	< 0.0962	< 0.0962	< 0.0962	< 0.0962	0.244
	9/20/2006 1	< 357	< 714	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/14/2006	801	< 476	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	0.298	< 0.0952	< 0.0952	0.503	< 0.0952
	3/30/2007	210	< 250	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0533	0.0431	0.0423
	6/27/2007	518	< 476	< 0.476	< 0.476	< 0.476	**2.19**	**2.78**	2.61	2.20	2.31	2.49	< 0.952	3.14	< 0.476	1.98	< 0.476	1.34	3.09
	9/18/2007	598	< 1,000	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.050	0.0791	< 0.0333	0.498	0.145	0.0598
BE-2	6/6/2005	660 Y*	290 J*	0.13	0.12	0.25	**1.5**	**2.3**	2.0	2.2	1.6	2.0	0.38	2.8	0.13	2.4	0.077	0.79	3.3
	9/15/2005	**1,150 J***	457*	< 0.500	< 0.500	< 0.500	**0.679**	**0.898**	0.763	0.753	0.839	0.898	< 1.00	1.47	< 0.500	0.592	< 0.500	0.571	1.69
	12/7/2005	**2,610***	**1120***	< 0.200	< 0.200	0.182 J	**0.720**	**0.987**	1.08	0.478	0.952	0.980	< 0.400	1.65	< 0.200	0.373	0.211	0.634	2.31
	3/13/2006	341 J	167 J	< 0.200	< 0.200	< 0.200	**0.849**	**0.995**	0.873	0.709	0.558	0.825	< 0.400	1.60	< 0.200	0.627	< 0.200	0.500	1.66
	6/28/2006	366	< 476	< 0.0943	< 0.0943	< 0.0943	**0.482**	**0.503**	0.527	0.413	0.296	0.506	< 0.189	0.884	< 0.0943	0.342	< 0.0943	0.290	1.12
	9/20/2006	341	< 481	< 0.0962	< 0.0962	< 0.0962	**0.158**	**0.207**	0.190	0.159	0.162	0.187	< 0.192	0.293	< 0.0962	0.132	< 0.0962	0.113	0.36
	12/13/2006	367	< 481	< 0.0952	< 0.0952	< 0.0952	**0.116**	**0.141**	0.126	0.130	0.105	0.127	< 0.190	0.215	< 0.0952	0.106	< 0.0952	< 0.0952	0.215
	3/29/2007	624	< 194	< 0.0392	< 0.0392	< 0.0392	**0.150**	**0.207**	0.183	0.183	0.124	0.194	0.0410	0.276	< 0.0392	0.140	< 0.0588	0.119	0.355
	6/27/2007	**1,440**	555	< 0.190	< 0.190	< 0.190	**0.420**	**0.486**	0.416	0.424	0.404	0.500	< 0.381	0.790	< 0.190	0.352	0.119 J	0.339	0.958
	9/18/2007	< 236	< 472	< 0.0952	< 0.0952	< 0.0952	**0.292**	**0.354**	0.332	0.554	0.322	0.376	< 0.190	0.525	< 0.0952	0.427	0.105 J	0.246	0.815
BE-3	6/6/2005	640 Y*	**1,000 O***	0.33	0.16	0.43	**2.8**	**4.2**	3.7	3.8	2.8	3.6	0.79	4.9	0.22	4.1	0.14	1.6	4.9
	9/15/2005	159 J*	< 500*	< 0.100	< 0.100	< 0.100	**0.142**	**0.188**	0.179	0.161	0.175	0.190	< 0.200	0.239	< 0.100	0.128	< 0.100	0.0966 J	0.292
	12/7/2005	< 500*	< 1,000*	< 0.200	< 0.200	< 0.200	**0.302**	**0.342**	0.371	0.170 J	0.350	0.395	< 0.400	0.612	< 0.200	0.130 J	< 0.200	0.288	0.851
	3/13/2006	91.2 J	< 250 J	< 0.250	< 0.250	< 0.250	< 0.250	< 0.250	< 0.250	< 0.250	< 0.250	< 0.250	< 0.500	0.349	< 0.250	< 0.250	< 0.250	< 0.250	0.393
	6/28/2006	< 258	< 515	< 0.515	< 0.515	< 0.515	< 0.515	< 0.515	< 0.515	< 0.515	< 0.515	< 0.515	< 1.03	< 0.515	< 0.515	< 0.515	< 0.515	< 0.515	< 0.515
	9/20/2006	< 240	< 481	< 0.130	< 0.130	< 0.130	< 0.130	< 0.130	< 0.130	< 0.130	< 0.130	< 0.130	< 0.260	< 0.130	< 0.130	< 0.130	< 0.130	< 0.130	< 0.130
	12/14/2006	522	< 476	< 0.0952	< 0.0952	< 0.0952	**0.147**	**0.193**	0.182	0.173	0.152	0.170	< 0.190	0.223	< 0.0952	0.149	< 0.0952	0.155	0.203
	3/30/2007	417	< 267	< 0.0308	< 0.0308	< 0.0308	**0.0986**	**0.131**	0.122	0.119	0.0868	0.117	0.0316	0.129	< 0.0308	0.0988	< 0.0615	0.0730	0.173
	6/27/2007	**2,270**	310 J	< 0.364	< 0.364	< 0.364	**0.391**	**0.424**	0.370	0.342 J	0.338 J	0.458	< 0.727	0.702	< 0.364	0.290 J	0.364	0.338 J	1.05
	9/18/2007	210	< 1,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	6/3/2005	590 Y	< 500	1.9	< 0.25	< 0.22	0.012 J	< 0.020	< 0.020	< 0.020	< 0.020	0.034	< 0.020	0.036	3.8	< 0.020	< 0.31	< 0.088	0.084
	9/15/2005	**1,560 J**	< 476	< 0.714	< 0.476	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.19	< 0.0952	0.844	< 0.0952	< 0.476	< 0.190	< 0.0952
	12/7/2005 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/13/2006 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/28/2006 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/20/2006 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/13/2006 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/30/2007 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/27/2007 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/18/2007 **	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ROD Compliance Criteria		1,000	1,000	520	--	--	0.027	0.014	--	--	--	--	--	6.16	3.9	--	620	6.3	--

Notes:

1. -- = Data not available or sample not analyzed for listed analyte.
2. **Boldface** data represents detected analyte concentrations exceeding compliance criteria; note, this is provided for information purposes only. Only sentinel wells have been installed to date and data is not collected at the point of compliance.
3. * = Sample did not include silica gel cleanup due to inadequate sample volume.
4. ** = Well not sampled due to presence of LNAPL in well at time of sampling.
5. ROD compliance criteria are included above; however, it is noted that the criteria is for groundwater discharge at the slip or river and is not applicable to the wells monitored during this sampling event.
6. J = Analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
7. O = The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
8. Y = The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
9. Polynuclear Aromatic Hydrocarbons (PAHs)

BAA = Benzo(a)anthracene
BAP = Benzo(a)pyrene
BBF = Benzo(b)fluoranthene
BGP = Benzo(g,h,i)perylene
BKF = Benzo(k)fluoranthene
DAA = Dibenzo(a,h)anthracene
ICP = Indeno(1,2,3-cd)pyrene

[1] Monitoring well BE-1 did not have enough sample volume to analyze for PAHs during the 3rd quarter 2006 sampling event.



Base map prepared from USGS 7.5-minute quadrangles as provided by TerraServer.

0 2,000 4,000

Scale in Feet

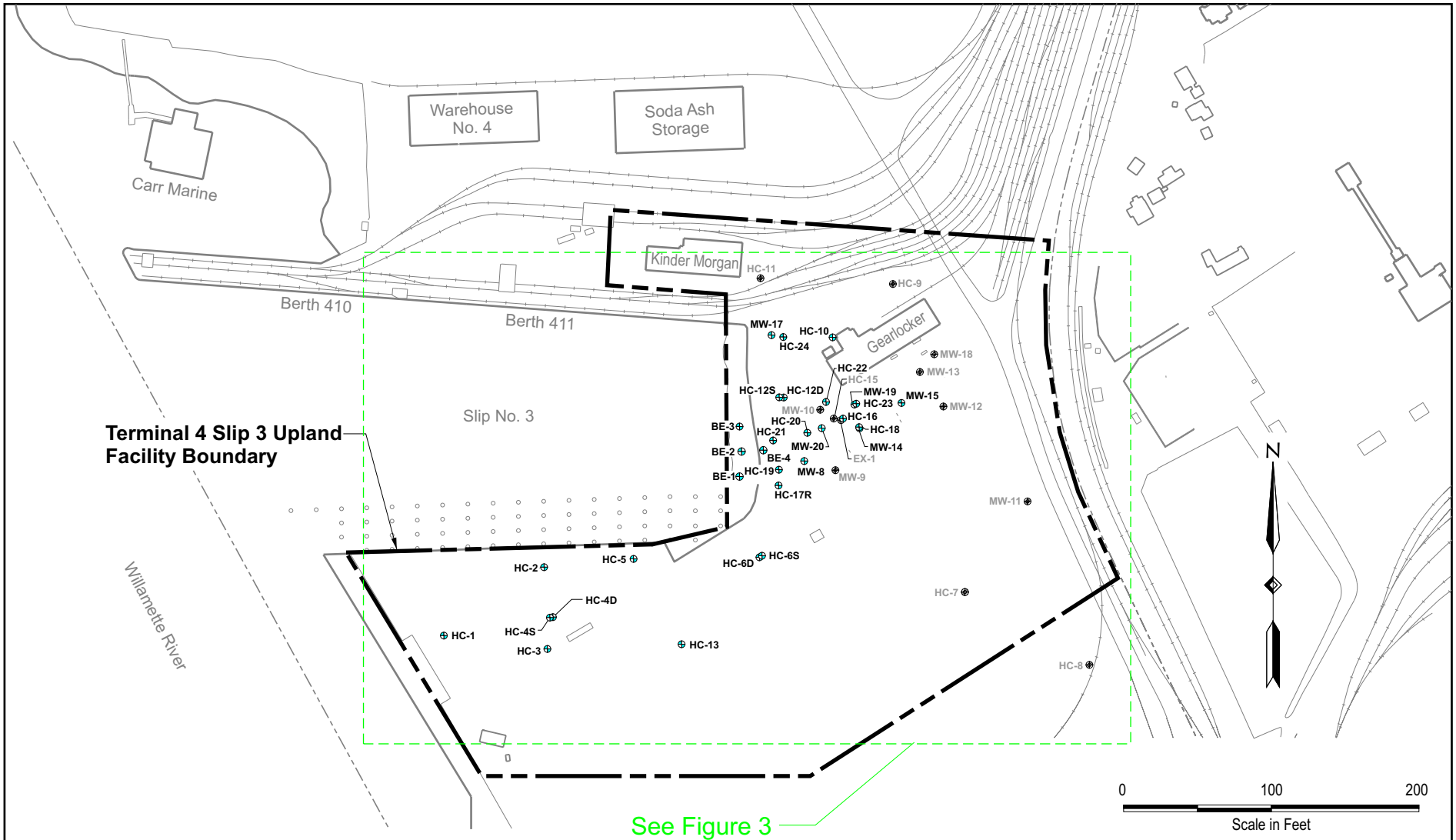
N

Facility Location Map

Quarterly Report - Third Quarter 2007
Terminal 4 Slip 3 Upland Facility
Portland, Oregon

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1007-03	Figure
November 2007		1



Facility Vicinity Plan

Quarterly Report - Third Quarter 2007
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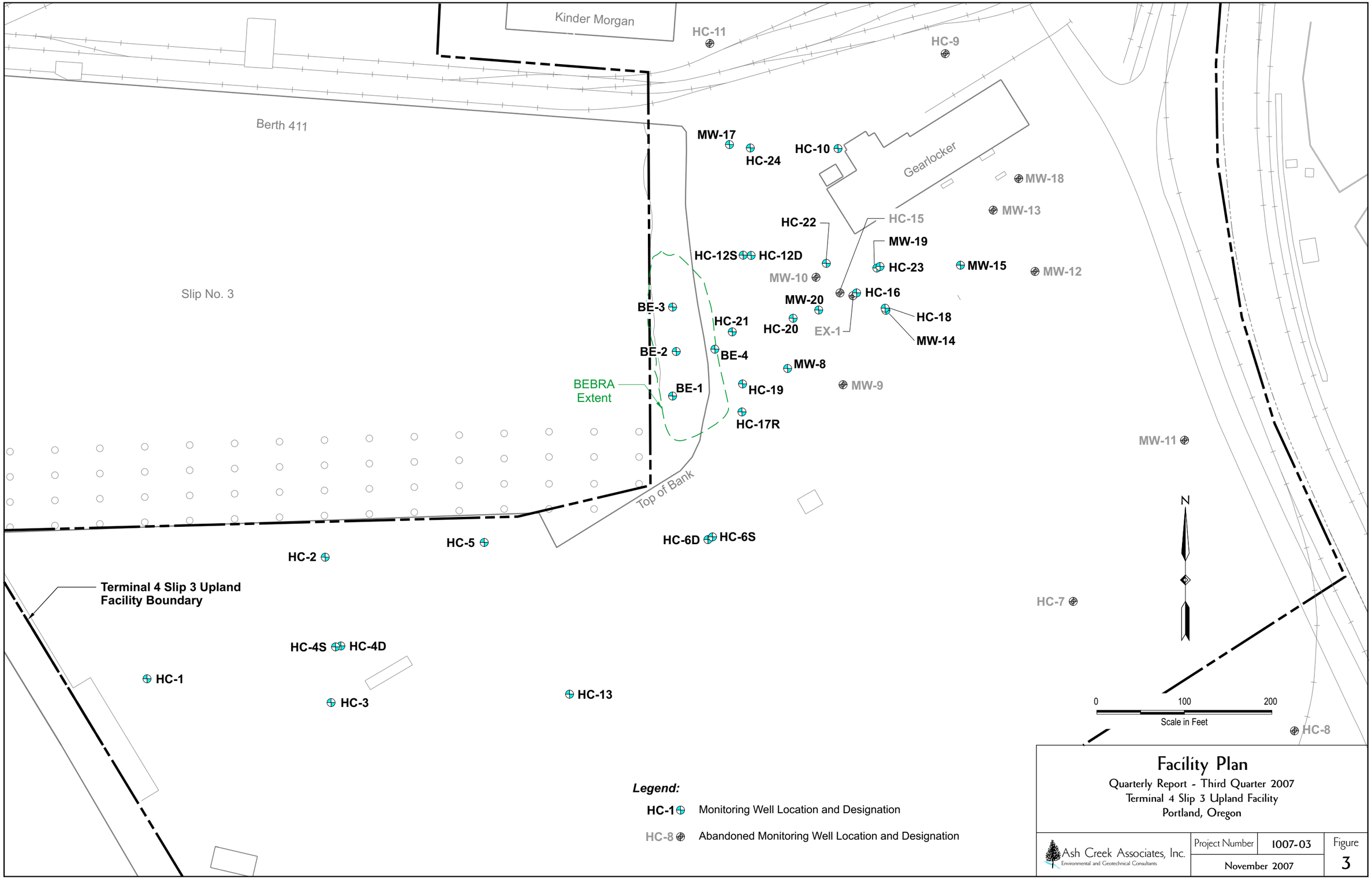
Portland, Oregon

Legend:

HC-1 ⊕ Monitoring Well Location and Designation

HC-8 ⊗ Abandoned Monitoring Well Location and Designation

Ash Creek Associates, Inc. Environmental and Geotechnical Consultants	Project Number 1007-03	Figure 2
	November 2007	



Facility Plan

Quarterly Report - Third Quarter 2007
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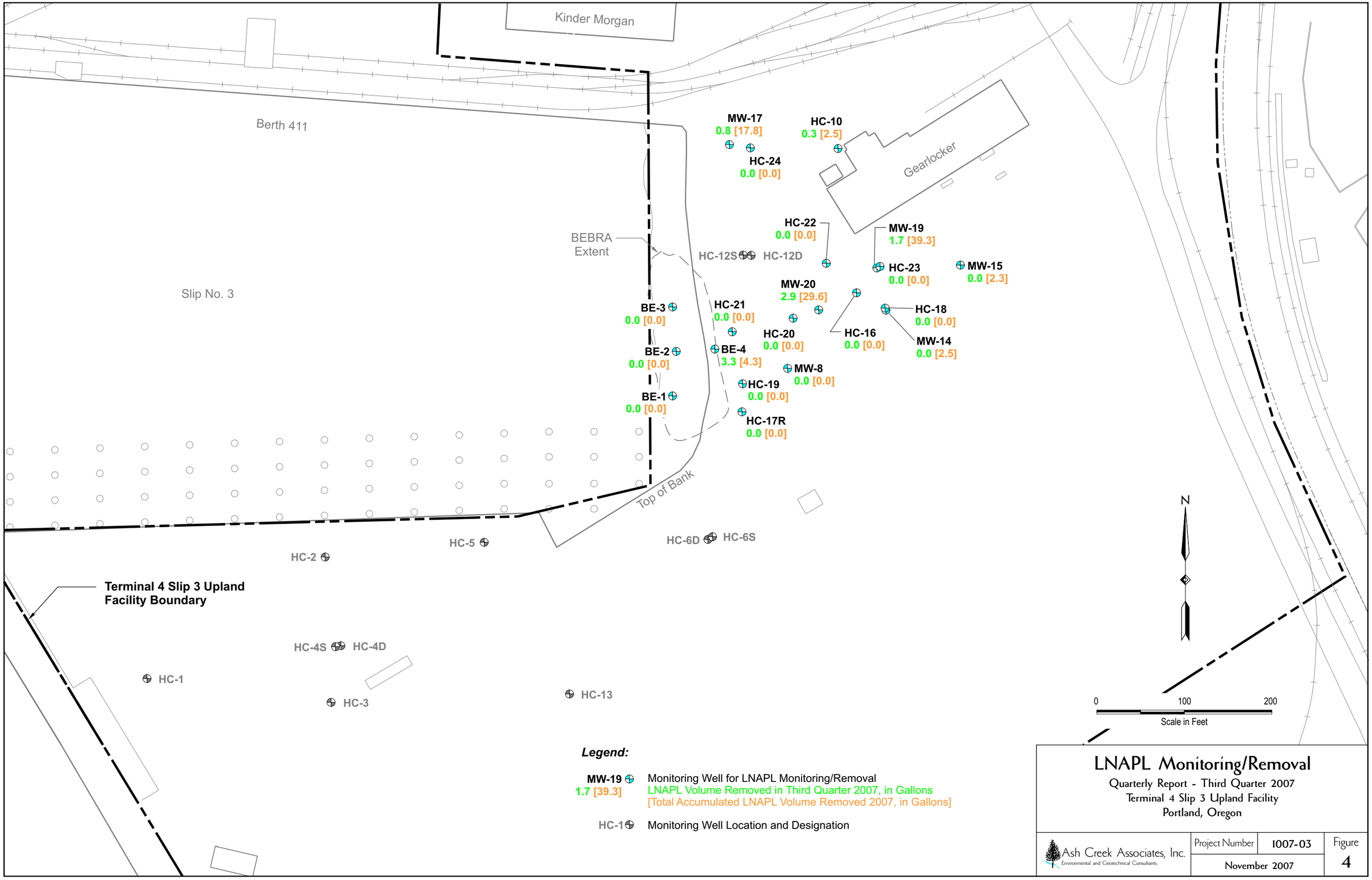
Portland, Oregon

Ash Creek Associates, Inc. Environmental and Geotechnical Consultants	Project Number 1007-03	Figure 3
	November 2007	



Legend:

MW-19 1.7 [39.3] — Monitoring Well for LNAPL Monitoring/Removal; LNAPL Volume Removed in Third Quarter 2007, in Gallons; [Total Accumulated LNAPL Volume Removed 2007, in Gallons]

HC-1 — Monitoring Well Location and Designation

LNAPL Monitoring/Removal

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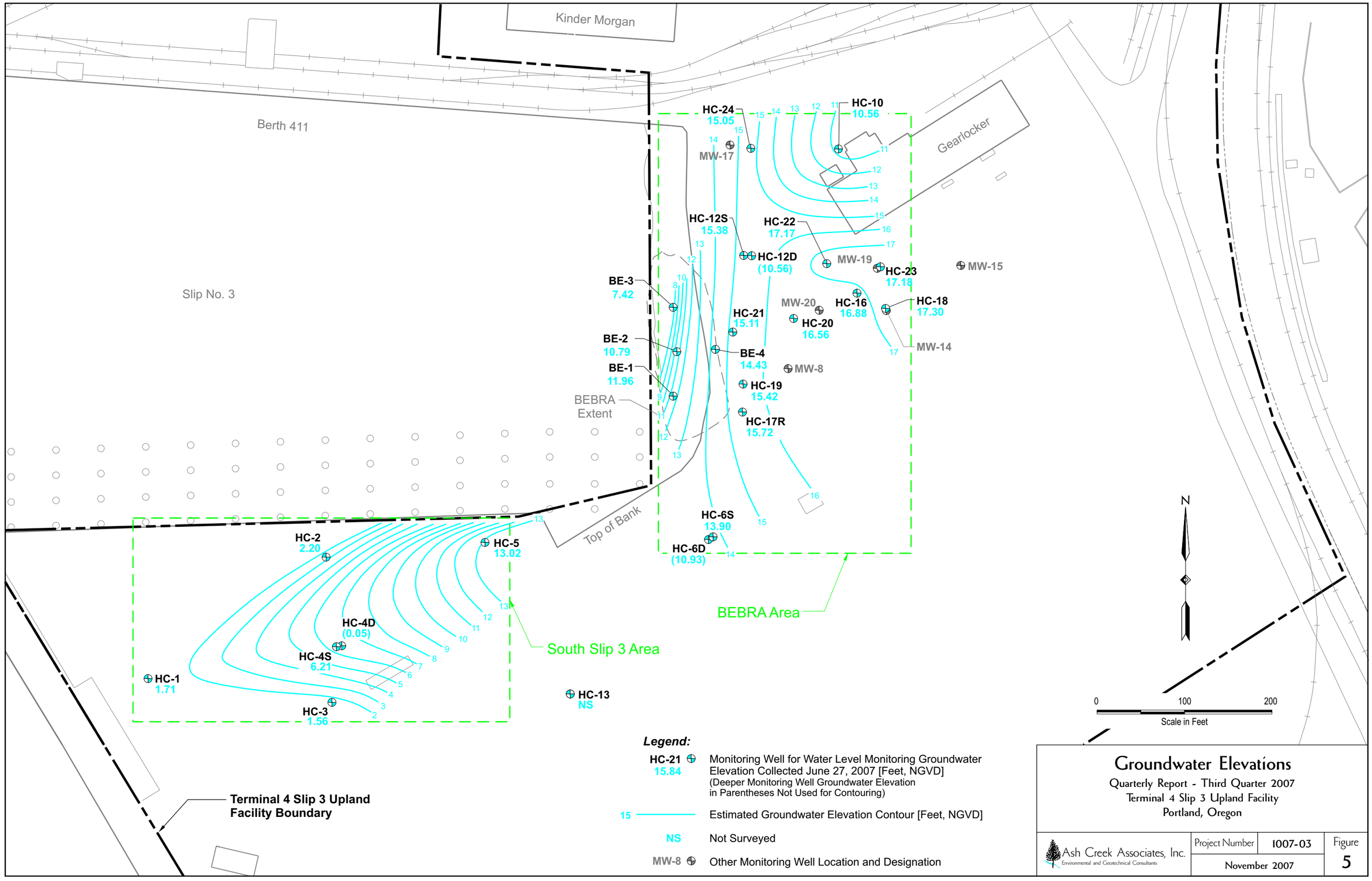
Figure 4



Legend:

HC-21 15.84	Monitoring Well for Water Level Monitoring Groundwater Elevation Collected June 27, 2007 [Feet, NGVD] (Deeper Monitoring Well Groundwater Elevation in Parentheses Not Used for Contouring)
15	Estimated Groundwater Elevation Contour [Feet, NGVD]
NS	Not Surveyed
MW-8	Other Monitoring Well Location and Designation

Groundwater Elevations

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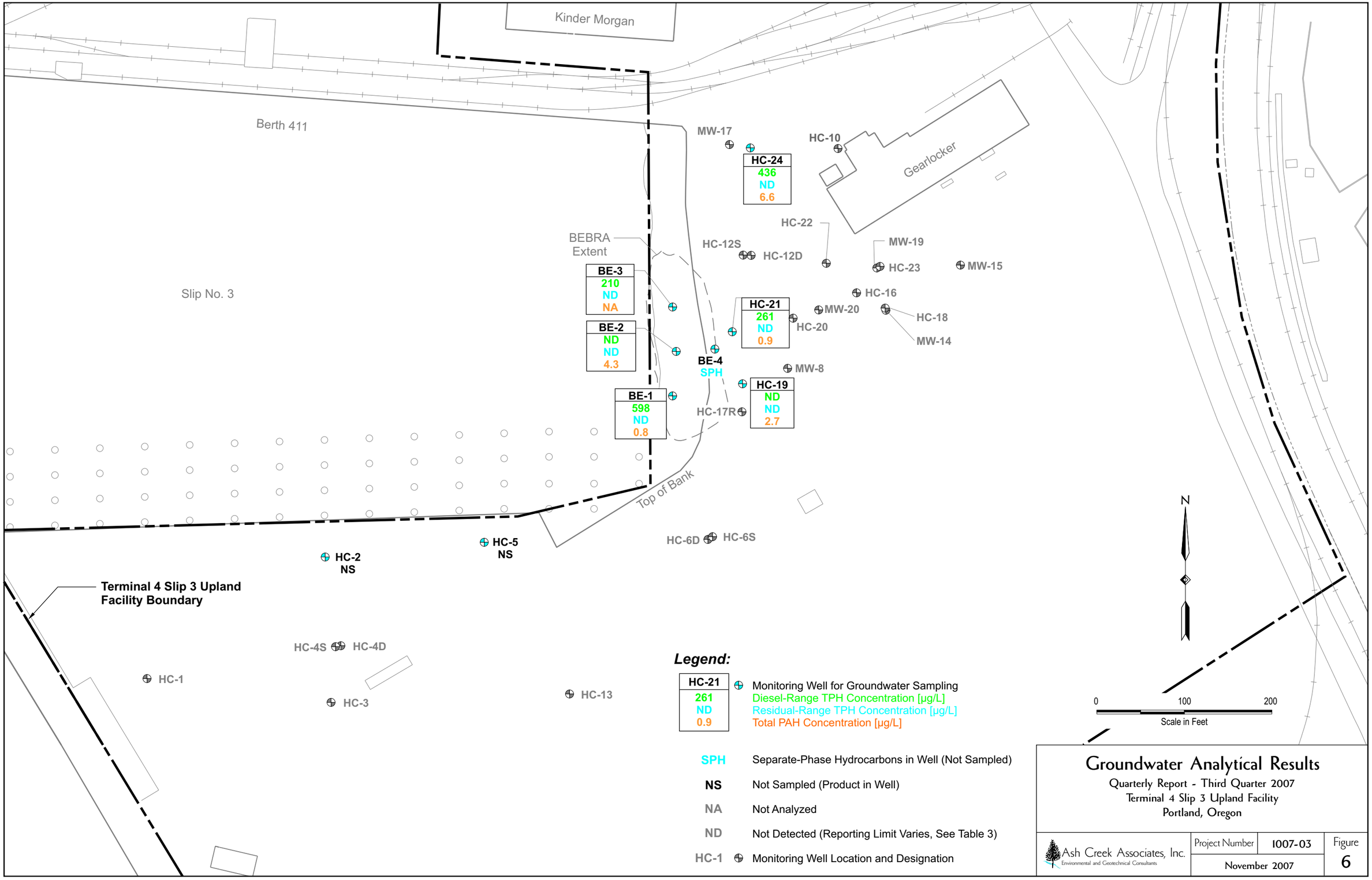
Terminal 4 Slip 3 Upland Facility
Portland, Oregon

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1007-03	Figure
November 2007		5



Legend:

HC-21 261 ND 0.9	Monitoring Well for Groundwater Sampling Diesel-Range TPH Concentration [µg/L] Residual-Range TPH Concentration [µg/L] Total PAH Concentration [µg/L]
SPH	Separate-Phase Hydrocarbons in Well (Not Sampled)
NS	Not Sampled (Product in Well)
NA	Not Analyzed
ND	Not Detected (Reporting Limit Varies, See Table 3)
HC-1	Monitoring Well Location and Designation

Groundwater Analytical Results

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Terminal 4 Slip 3 Upland Facility
Portland, Oregon

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number 1007-03

November 2007

Figure 6

Appendix A

Field and Quality Assurance/ Quality Control Procedures

1. Introduction

The Port of Portland (Port) is required to conduct groundwater and light non-aqueous phase liquid (LNAPL) monitoring in association with the remedial action of the Terminal 4 Slip 3 Upland Facility (Facility), as outlined in the Record of Decision (ROD; Department of Environmental Quality [DEQ], 2003), Explanation of Significant Difference (DEQ, 2004), and Consent Judgment (Circuit Court of Oregon, 2004). The specific implementation of the remedial action is described in the Remedial Design/Remedial Action (RD/RA) Work Plan (Hart Crowser, 2004), as amended (Port of Portland, 2004). The monitoring program is described in the LNAPL Removal, Groundwater Monitoring, and Construction Plan (BBL/Ash Creek/Newfields, June 2005). This appendix describes the field sampling procedures and quality assurance/quality control (QA/QC) procedures that were used during the quarterly monitoring and LNAPL removal events.

2. Field and Sampling Procedures

The scope of work (SOW) includes measuring water elevations, performing groundwater monitoring, and removal of LNAPL from impacted monitoring wells. The field and sampling procedures include the following:

- Measurement of water levels in monitoring wells;
- Collection of groundwater samples from monitoring wells;
- Removal of LNAPL from monitoring wells;
- Sample management (e.g., containers, storage, and shipment);
- Decontamination procedures; and
- Handling of investigation-derived waste (IDW).

2.1 Measurement of Water Levels in Monitoring Wells

Water levels in the wells were measured and recorded for the purpose of determining the groundwater gradient and elevations. The wells were first opened and the water levels allowed to equilibrate before the measurements were taken. All measurements were made to the nearest 0.01 foot using an electronic water probe. Measured water levels are shown on Tables 1 and 2.

2.2 Collection of Groundwater Samples from Monitoring Wells

Groundwater monitoring consisted of collecting groundwater samples and measuring groundwater field parameters.

After groundwater levels were measured, the selected wells were purged using a peristaltic pump. Purging was considered complete when the water quality parameters (pH, temperature, and specific conductance) stabilized within 10 percent of the previous readings or when the well purged dry (as

occurs with the BEBRA wells BE-1 through BE-3). During purging, the purge water characteristics (e.g., color, turbidity, sheens) and purge volumes were documented. After purging was completed, the wells were sampled. All groundwater samples were collected using a low-flow peristaltic pump and disposable tubing (volatile organics were not included in the sampling program). Field parameters (pH, specific conductance, and temperature) were measured upon completion of sampling activities. Purge water was placed in labeled drums pending disposal.

Equipment Cleaning. Clean tubing was used for the peristaltic pump for each collected groundwater sample to prevent cross-contamination. All other groundwater sampling equipment (such as the water level probe) was cleaned prior to use in the first well and after each subsequent well.

Duplicate Sample. For QA/QC purposes, a duplicate sample was collected from one well (HC-19) for chemical analysis. Sample containers for the primary and duplicate samples were alternately filled with water from the well.

2.3 LNAPL Monitoring and Removal from Monitoring Wells

After February 17, 2006, only wells MW-19 and MW-20 have been included in the regular LNAPL monitoring program, as approved by the DEQ in an April 6, 2006 letter to the Port. On June 9, 2006, passive product skimmers were installed in these two wells to maximize the efficiency of the product collection (as a result, the volume of product removed from these two wells is recorded as opposed to the previous practice of recording the product thicknesses). As a result of the product observed in wells MW-17 and BE-4 during the second quarter 2007 groundwater monitoring event, product monitoring (and recovery as appropriate) was also completed in these wells through the third quarter 2007.

During the quarterly groundwater monitoring event, the water and product levels were measured in the wells included in the LNAPL program (MW-8, MW-14, MW-15, MW-17, HC-10, HC-16 through HC-24, and BE-1 through BE-4; MW-19 and MW-20 were not measured due to the skimmers). Each well was monitored for the presence of LNAPL with a product interface probe. Depths to both water and product (if present) were measured and recorded. LNAPL was removed from each monitoring well that was observed to have more than 0.1 foot of accumulated LNAPL (which included wells HC-10, MW-14, MW-15, MW-17, MW-19, and MW-20 during the second quarter 2007 monitoring event). The LNAPL was removed with passive skimmers in wells MW-19 and MW-20, and with a peristaltic pump in the remaining wells (coupled with an interface probe to allow discrete removal of the LNAPL with a minimum amount of water).

Passive Skimmer Product Removal. After June 9, 2006, passive product skimmers (Keck 4-4L passive recovery canisters) have been used to collect and remove product from wells MW-19 and MW-20. The passive skimmers are maintained so that the water/LNAPL interface is within the 2-foot intake screen of the skimmer. The skimmers are manually removed from the well, drained (through the drain valve), and reinstalled in the well. If residual LNAPL remains in the well after the removal of the skimmer (i.e., the volume of LNAPL in the well was larger than the storage capacity of the skimmer), then the remaining LNAPL is removed as described above. The depth to water is measured in the well and the length of the cable support for each skimmer is adjusted as necessary to reinstall in the wells.

Manual Product Removal. For wells BE-4, HC-10, and MW-17, the product removal process generally involved the suction hose of the pump being lowered into the well together with the interface

probe (attached to the hose so that the interface point of the probe coincides with the opening of the hose) to allow the operator to judge the depth of the suction hose relative to the oil-water interface and manipulate the depth of the hose so that the floating product is preferentially extracted.

Product Storage and Disposal. The collected LNAPL is transferred to a Department of Transportation (DOT)-approved 55-gallon drum for temporary storage. Full drums will be transported to a local oil recycling facility by a subcontractor.

2.4 Sample Management

Pre-cleaned, certified sample containers were provided by the contract analytical laboratory (TestAmerica). A sample label was affixed to each sample container and was marked with a unique sample number, date of collection, project number, and sampler's initials. Chain-of-custody (COC) was maintained and documented at all times. Sample custody seals and packing materials for filled sample containers were provided by the analytical laboratory. The filled, labeled, and sealed containers were placed in a cooler on ice and carefully packed to eliminate the possibility of container breakage.

Samples were packaged by the field personnel and transported as low-concentration environmental samples. The samples were delivered to the laboratory within 48 hours of the time of collection. Shipments were accompanied by the COC form identifying the contents. The original form accompanied the shipment; copies were retained by the sampler for the sampling office records.

2.5 Decontamination Procedures

Personnel Decontamination. The Health and Safety Plan for the Facility identifies the appropriate level of protection for the type of work and expected field conditions involved in this project. In general, clothing and other protective equipment can be removed from the investigation area. Field personnel should thoroughly wash their hands and faces at the end of each day and before taking any work breaks.

Sampling Equipment Decontamination. To prevent cross-contamination between sampling events, clean, dedicated sampling equipment (e.g., groundwater sampling tubing) was used for each sampling event and was discarded after use. Cleaning of non-disposable items consisted of washing in a detergent (Alconox®) solution, rinsing with tap water, followed with a deionized water rinse.

2.6 Handling of Investigation-Derived Waste

IDW was generated from well sampling activities, including purge water, decontamination water, and discarded personal protective supplies. Generated IDW water was retained with the collected LNAPL pending disposal at a local oil recycling facility. Disposal is completed by a subcontractor.

Other wastes, such as used personal protective equipment (PPE) and trash, were collected and disposed of in a waste receptacle.

3. References

BBL/Ash Creek/Newfields, 2005. LNAPL Removal, Groundwater Monitoring, and Construction Plan. June 2005.

Hart Crowser, 2004. Remedial Design/Remedial Action Work Plan, Terminal 4, Slip 3 Upland Facility. September 27, 2004.

Port of Portland, 2004. Letter to DEQ, Terminal 4 Slip 3 Upland Facility, Response to Comments/Work Plan Addendum, Remedial Design/Remedial Action Work Plan. October 7, 2004.

Ash Creek Associates, Inc.
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PROJECT NUMBER 1007-03
FIELD REPORT NUMBER 1
PAGE 1 OF 1
DATE 9/18/07

PROJECT T453
LOCATION POP-T453
CLIENT Port of Portland
PURPOSE OF OBSERVATIONS GW Sampling (Quarterly)
ASH CREEK REPRESENTATIVE AKF
CONTRACTOR —
CONTRACTOR REP. —

ARRIVAL TIME 821
DEPARTURE TIME 1559
WEATHER Cloudy 52°
ASH CREEK PROJECT MANAGER A. Schmidt
PERMIT NO. —
JOB PHONE —

745 Leave for site;
821 Arrive on-site;
824 Start popping well cups;
929 Finish popping well cups;
934 Start gauging DTW;
1148 Finish gauging DTW;
1150 Call A. Schmidt to discuss sheen on MW-24;
1204 Set up to start sampling BE-1;
1533 Finish sampling for day;
BE-1, BE-2, BE-3 only 1L partially full.
HC-10 only well to purge product and skimmers to be completed on 9/19/07;
1546 Dump IDW
1555 Leave-site;
1631 Arrive office;

BY

ASH CREEK ASSOCIATES REPRESENTATIVE

REVIEWED BY

ASH CREEK ASSOCIATES PROJECT MANAGER

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PROJECT NUMBER 1007-03
FIELD REPORT NUMBER 2
PAGE 1 OF 2
DATE 9/19/07

PROJECT T453
LOCATION POP - T453
CLIENT Port of Portland
PURPOSE OF OBSERVATIONS GW Sampling
ASH CREEK REPRESENTATIVE AKF
CONTRACTOR —
CONTRACTOR REP. —

ARRIVAL TIME 729
DEPARTURE TIME
WEATHER Cloudy 60°
ASH CREEK PROJECT MANAGER A. Schmidt
PERMIT NO. —
JOB PHONE —

755 Leave for site;
729 Arrive on-site;
735 Check bank wells for gauging;
855 Call A.Schmidt in regards to dewatering of bank wells;
857 Purge skimmer at MW-20

Product ~ 10z.
Water ~ 2L

DTW 20.18'
DTP 20.17'

921 Purge skimmer at MW-19

Product ~ none observed, but on skimmer
Water ~ 20z.

DTW 19.80'
DTP <19.80', >19.79'
Lowered skimmer ~10"

950 Purge product from HC-10
Product 0.25L Water 1.5L
DTW 18.80' DTP 18.79'
1231 Dump purge water & decon H2O.
1415 Call A.Schmidt to discuss bank wells;

BY

REVIEWED BY

ASH CREEK ASSOCIATES REPRESENTATIVE

ASH CREEK ASSOCIATES PROJECT MANAGER

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PROJECT NUMBER 1007-03
FIELD REPORT NUMBER 2
PAGE 2 OF 2
DATE 9/19/07

PROJECT T4S3
LOCATION POP - T4S3
CLIENT Port of Portland
PURPOSE OF OBSERVATIONS GW Sampling
ASH CREEK REPRESENTATIVE AKF
CONTRACTOR —
CONTRACTOR REP. —

ARRIVAL TIME 829
DEPARTURE TIME ~~40~~ 1604
WEATHER Cloudy 60°
ASH CREEK PROJECT MANAGER A. Schmidt
PERMIT NO. —
JOB PHONE —

Andrew says to put a full day in to collect as much as possible;
1600 Finish collecting samples;
BE-1 - 2 - ½L's
BE-2 - 2 1L's
BE-3 - 1 - ½L (HCL);
1604 Leave site;

BY

ASH CREEK ASSOCIATES REPRESENTATIVE

REVIEWED BY

ASH CREEK ASSOCIATES PROJECT MANAGER

WELL GAGING DATA SHEET

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

		Job Number:	1007-03
Client:	Port of Portland	Date:	09.18.07
Project:	T4S3	Sampler:	A. Fines
Weather:	Overcast 65°	Time In/Out:	936 / 1148

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
HC-1	936		30.65				
HC-4S	953		26.14				
HC-4D	949		32.13				
HC-3	957		31.32				
HC-2	942		29.99				
HC-5	946		19.08				
HC-6D	1008		21.96				
HC-6S	1004		19.13				
HC-17R	1059		17.89				
HC-19	1056		17.63	20.99			
MW-8	~~1056~~ 1104		~~17.63~~				
HC-20	1052		15.70				
HC-16	1025		15.95				
HC-18	1131		15.99				Sheen
MW-14	1140	20.41	20.46				
MW-15	10.14	18.25	18.26				odor
HC-23	1020	15.56	15.59				
MW-19	SK	IMMER					
MW-20	SK	IMMER					
HC-22	1027		14.74				
HC-21	1053		16.84				
BE-4	1124	16.72	16.78				
HC-12S	1048		14.22				
HC-12D	1042		18.76				
MW-17	1039	18.19	18.23				
HC-24	1037		14.99				Odor; Product in probe
HC-10	1033	18.70	19.09				Odor
BE-3	1118		16.13				
BE-2	1114		8.90				
BE-1	1109		7.79				
HC-13	1146		18.08				

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Well I.D.	HC-21	Job Number:	1007-03
Client:	Port of Portland	Date:	9/18/07
Project:	TMS3	Sampler:	AKF
Weather:	Overcast 68°	Time In/Out:	1424/1505

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	16.84	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:	1L	Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	Peristaltic low flow	Pump Intake Depth:		Comments	
Sampling Method:	same	Tubing Type:	LDPE		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-10%	+/-3%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1432	0.20	0.20			5.77	17.83	296				C
1435	↓	0.40			5.99	17.67	288				C
1438	↓	0.60			5.97	17.65	284				C
1441	↓	0.80			5.88	17.64	282				C
1444	↓	1.00			5.89	17.68	280				C
1447											

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	HC-21	Sampling Flow Rate	0.07L/min	Analytical Laboratory:	
Sample Time:	1449	Final Depth to Water:	17.57	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2 x 1L Amber	HCL (1)	PAH's, TPH-d, ro	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Well I.D.	~~MW-24~~ HC-24	Job Number:	1007-03
Client:	Port of Portland	Date:	9/18/07
Project:	T453	Sampler:	A. Fines
Weather:		Time In/Out:	1355 / 1533

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	14.99	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:	1L	Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	Peristaltic low flow	Pump Intake Depth:		Comments	
Sampling Method:	same	Tubing Type:	LDPE		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-10%	+/-3%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1402	0.33	0.33			6.17	17.62	598				C
1405	↓	0.67			6.13	17.71	605				C
1408	↓	1.00			6.15	17.62	610				C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	HC-24	Sampling Flow Rate	0.1L/min	Analytical Laboratory:		
Sample Time:	1413	Final Depth to Water:	15.57	Did Well Dewater?	Yes	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2×1L Amber	HCL (1)	PAHs, TPH-d, ro	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

Well dewatered at 2.25L;

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Well I.D.	HC-19	Job Number:	1007-03
Client:	Port of Portland	Date:	9/18/07
Project:	T4S3	Sampler:	A. Fines
Weather:	Overcast 68°	Time In/Out:	1240/1345

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	17.63	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:	1L	Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	~~Bailer~~ Peristaltic low Flow	Pump Intake Depth:		Comments
Sampling Method:	~~Bailer~~ Same	Tubing Type:	LDPE	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-10%	+/-3%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1306	0.33	0.33			6.07	17.67	303				C
1309	↓	0.67			6.07	17.20	302				C
1312	↓	1.00			5.99	17.18	302				C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	HC-19	Sampling Flow Rate	0.1L/min	Analytical Laboratory:	
Sample Time:	1317	Final Depth to Water:	17.82	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2x 1L Amber	HCL (2)	PAH's, TPHd, ro	yes (no)	—		HC-19Dup
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Well I.D.	BE-1	Job Number:	1007-03
Client:	Port of Portland	Date:	9/18/07
Project:	T4S3	Sampler:	A. Fines
Weather:	Overcast 68°	Time In/Out:	1208/1400 (9/19/07)

WELL DATA

Well Depth:	9.74	Well Diameter:	0.75"	Water Height	
Depth to Water:	7.79	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	Bailer	Pump Intake Depth:							Comments		
Sampling Method:	Bailer	Tubing Type:									
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-10%	+/-3%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
No Parameters taken; Well dewatered after 0.10L;											

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	BE-3	Sampling Flow Rate		Analytical Laboratory:		
Sample Time:	1211	Final Depth to Water:	dewatered	Did Well Dewater?	No	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2 x 1L Amber	HCL (1)	PAH's, TPHd, ro	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

Well dewatered after 0.10L;

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Well I.D.	BE-2	Job Number:	1007-03
Client:	Port of Portland	Date:	9/18/07
Project:	T4S3	Sampler:	A. Fines
Weather:	Overcast 68°	Time In/Out:	1216/1400 (9/19/07)

WELL DATA

Well Depth:	12.37'	Well Diameter:	0.75"	Water Height	
Depth to Water:	8.90'	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	Bailer	Pump Intake Depth:							Comments		
Sampling Method:	Bailer	Tubing Type:									
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-10%	+/-3%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
No Parameters taken, Well dewatered after 0.10L;											

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	BE-2	Sampling Flow Rate		Analytical Laboratory:		
Sample Time:	1219	Final Depth to Water:		Did Well Dewater?	Yes	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2 x 1L Amber	HCL (1)	PAH's, TPHd, ro	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

Filled liters jars ½ full;

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Well I.D.	BE-3	Job Number:	1007-03
Client:	Port of Portland	Date:	9/18/07
Project:	T4S3	Sampler:	A. Fines
Weather:	Overcast 68°	Time In/Out:	1226 / 1400 (9/19/07

WELL DATA

Well Depth:	12.23	Well Diameter:	0.75"	Water Height	
Depth to Water:	10.13	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	Bailer			Pump Intake Depth:						Comments	
Sampling Method:	Bailer			Tubing Type:							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-10%	+/-3%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
No Parameters taken, well dewatered after <0.10L;											

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	BE-3	Sampling Flow Rate		Analytical Laboratory:		
Sample Time:	1229	Final Depth to Water:		Did Well Dewater?	Yes	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
~~2~~ 1 x 1L Amber	HCL (1)	PAH's, TPHd, ro	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

Only 1L amber filled ½ full;

Appendix B

Data QA/QC Review and Analytical Laboratory Reports

Appendix B – Data QA/QC Review

This appendix documents the results of a quality assurance (QA) review of the analytical data for groundwater samples collected during the third quarter 2007 groundwater sampling event. TestAmerica in Beaverton, Oregon, performed the analyses. A copy of the analytical laboratory report summary is included in this appendix.

The QA review included examination and validation of the laboratory summary report, including:

- Analytical methods;
- Detection limits;
- Sample holding times;
- Custody records;
- Surrogates, spikes, and blanks; and
- Duplicates.

The QA review did not include a review of raw data.

Analytical Methods and Detection Limits

Chemical analyses on all collected water samples consisted of the following:

- Total Petroleum Hydrocarbons as Diesel (TPHd) Extended by method NWTPH-Dx with silica gel cleanup; and
- Polynuclear Aromatic Hydrocarbons (PAHs) by EPA Method 8270-SIM.

Quality Assurance Objectives and Review

The general QA objectives for this project were to develop and implement procedures for obtaining and evaluating data of a quality that is suitable for comparison to regulatory compliance criteria. To collect such information, analytical data must have an appropriate degree of accuracy and reproducibility, samples collected must be representative of actual field conditions, and samples must be collected and analyzed using unbroken chain-of-custody (COC) procedures.

Quality Assurance Objectives and Review

The general QA objectives for this project were to develop and implement procedures for obtaining and evaluating data of a quality that is suitable for comparison to regulatory compliance criteria. To collect such information, analytical data must have an appropriate degree of accuracy and reproducibility, samples collected must be representative of actual field conditions, and samples must be collected and analyzed using unbroken COC procedures.

Reporting limits and analytical results were compared to action levels for each parameter in the media of concern. Precision, accuracy, representativeness, completeness, and comparability parameters used to indicate data quality are defined below.

Water levels were seasonally low during the third quarter sampling event, and sample volume was limited in wells BE-1, BE-2, and BE-3. These samples were collected over a two-day sampling event, and sample BE-3 still did not have enough sample volume to analyze for PAHs. The sample volumes from wells BE-1 and BE-2 were large enough to run both the TPH and PAH analyses, but for both samples, the analysis for PAHs was completed on the sample extract prepared for the TPH analysis. It is not expected that this would adversely affect the quality of the data, but quality control parameters for these two samples are limited.

Reporting Limits. Detection limits are set by the laboratory and are based on instrumentation abilities, sample matrix, and suggested detection limits by the Environmental Protection Agency (EPA) or the Department of Environmental Quality (DEQ). In some cases, the detection limit may be raised due to high concentrations of analytes in the samples or matrix interferences (observed in each sample for various PAH constituents) or because of limited sample volume (such as for samples BE-1 and BE-3). Detection limits were generally consistent with industry standards and all method reporting limits were below the relevant Record of Decision (ROD) cleanup standards except for benzo(a)anthracene and benzo(a)pyrene.

Reporting limits were reviewed and are generally acceptable for this project. Reporting limits for individual samples varied based on the magnitude of the chemical impact.

Holding Times. All samples were analyzed within the holding times specified for the requested analyses.

Precision. Precision measures the reproducibility of data under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average values. Analytical precision is measured through a batch laboratory control sample and duplicate (LCS and LCSD, respectively). Analytical precision is quantitatively expressed as the relative percent difference (RPD) between the LCS and LCDS. All of the LCS/LCSD results were within acceptable ranges.

Accuracy. Accuracy is the measure of error between the reported test results and the true sample concentration. “Perfect” accuracy is 100 percent recovery. True sample concentration is never known due to analytical limitations, variability, and error. Consequently, accuracy is inferred from the recovery data from spiked samples. The laboratory performed sufficient spike samples of a similar matrix (i.e., water) to allow the computation of the accuracy. The accuracy

measurements were carried out in accordance with SW-846 method requirements. All surrogate spike results were within acceptable ranges.

The field-collected duplicate sample of HC-19 (labeled as HC-19 DUP) had similar detected concentrations of compounds (TPH and PAHs) as compared to the original sample. The average percent difference between the original and duplicate sample was on the order of 7 to 18 percent, depending on the analyte. Differences likely result from matrix differences and the inherent variability in the samples. This variability is similar to or less than that observed previously, and the sample variability did not compromise the usability of the data.

Representativeness. Representativeness is a measure of how closely the results reflect the actual concentration of the chemical parameters in the medium sampled. Sampling procedures, as well as sample-handling protocols for storage, preservation, and transportation are designed to preserve the representativeness of the samples collected. Laboratory method blanks are run in accordance with established laboratory protocols.

All samples for this project were received by the laboratory in good condition and in the proper, laboratory-supplied containers. No target compounds were detected in the laboratory method blanks.

Completeness. Completeness is defined as the percentage of measurements made which are judged to be valid measurements. The completeness of the data is the number of acceptable data points divided by the total number of data points multiplied by 100. The completeness goal is essentially that a sufficient amount of valid data can be generated to allow for the evaluation of the site investigation.

No data collected during the site investigation were rejected for this project; therefore, the completeness for this phase of the project is 100 percent.

Comparability. Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Based on this QA review, the quality of the data collected during this site investigation is similar to that of previously collected data and is, therefore, comparable.

Conclusion. In conclusion, the overall QA objectives have been met, and the data (as qualified) are of adequate quality for use in this project. The laboratory also noted that the TPH analyses did not have a distinct diesel pattern (most closely resembling heavily weathered diesel).

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

October 11, 2007

Mike Stevens
Ash Creek Associates, Inc.
9615 SW Allen Blvd. Suite 106
Beaverton, OR 97005

RE: POP-T4S3

Enclosed are the results of analyses for samples received by the laboratory on 09/20/07 15:10. The following list is a summary of the Work Orders contained in this report, generated on 10/11/07 14:48.

If you have any questions concerning this report, please feel free to contact me.

Work Order	Project	ProjectNumber
PQI0697	POP-T4S3	1007-03

Callie Fahsholz For Darrell Auvil, Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**POP-T4S3**	
9615 SW Allen Blvd. Suite 106	Project Number:	1007-03	Report Created:
Beaverton, OR 97005	Project Manager:	Mike Stevens	10/11/07 14:48

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HC-21	PQI0697-01	Water	09/18/07 14:49	09/20/07 15:10
HC-24	PQI0697-02	Water	09/18/07 14:13	09/20/07 15:10
HC-19	PQI0697-03	Water	09/18/07 13:17	09/20/07 15:10
BE-1	PQI0697-04	Water	09/18/07 12:11	09/20/07 15:10
BE-1	PQI0697-05	Water	09/18/07 11:00	09/20/07 15:10
BE-2	PQI0697-06	Water	09/18/07 12:11	09/20/07 15:10
BE-3	PQI0697-07	Water	09/18/07 12:29	09/20/07 15:10
HC-19 Dup	PQI0697-08	Water	09/18/07 13:17	09/20/07 15:10
BE-2	PQI0697-09	Water	09/19/07 11:00	09/20/07 15:10

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Callie Fahsholz For Darrell Auvil, Project Manager

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BEAVERTON, OR 97008-7132
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Ash Creek Associates, Inc.	Project Name:	**POP-T4S3**	
9615 SW Allen Blvd. Suite 106	Project Number:	1007-03	Report Created:
Beaverton, OR 97005	Project Manager:	Mike Stevens	10/11/07 14:48

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method with Acid/Silica Gel Cleanup

TestAmerica - Portland, OR

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PQI0697-01 (HC-21)		**Water**			**Sampled: 09/18/07 14:49**					
Diesel Range Organics	NWTPH-Dx	**0.261**	-----	0.236	mg/l	1x	7091018	09/26/07 07:45	09/26/07 18:52	**Q11**
Heavy Oil Range Hydrocarbons	"	ND	-----	0.472	"	"	"	"	"	
Surrogate(s): 1-Chlorooctadecane			*103%*		*50 - 150 %*	"			"	
PQI0697-02 (HC-24)		**Water**			**Sampled: 09/18/07 14:13**					
Diesel Range Organics	NWTPH-Dx	**0.436**	-----	0.236	mg/l	1x	7091018	09/26/07 07:45	09/26/07 19:11	**Q9**
Heavy Oil Range Hydrocarbons	"	ND	-----	0.472	"	"	"	"	"	
Surrogate(s): 1-Chlorooctadecane			*94.1%*		*50 - 150 %*	"			"	
PQI0697-03 (HC-19)		**Water**			**Sampled: 09/18/07 13:17**					
Diesel Range Organics	NWTPH-Dx	ND	-----	0.236	mg/l	1x	7091018	09/26/07 07:45	09/26/07 19:30	
Heavy Oil Range Hydrocarbons	"	ND	-----	0.472	"	"	"	"	"	
Surrogate(s): 1-Chlorooctadecane			*92.1%*		*50 - 150 %*	"			"	
PQI0697-04 (BE-1)		**Water**			**Sampled: 09/18/07 12:11**					
Diesel Range Organics	NWTPH-Dx	**0.598**	-----	0.160	mg/l	1x	7091077	09/26/07 11:30	09/28/07 11:42	**Q9, RL4**
Heavy Oil Range Hydrocarbons	"	ND	-----	1.00	"	"	"	"	"	**RL4**
Surrogate(s): 1-Chlorooctadecane			*54.8%*		*50 - 150 %*	"			"	
PQI0697-06 (BE-2)		**Water**			**Sampled: 09/18/07 12:11**					
Diesel Range Organics	NWTPH-Dx	ND	-----	0.236	mg/l	1x	7091018	09/26/07 07:45	09/26/07 19:50	
Heavy Oil Range Hydrocarbons	"	ND	-----	0.472	"	"	"	"	"	
Surrogate(s): 1-Chlorooctadecane			*98.8%*		*50 - 150 %*	"			"	
PQI0697-07 (BE-3)		**Water**			**Sampled: 09/18/07 12:29**					
Diesel Range Organics	NWTPH-Dx	**0.210**	-----	0.160	mg/l	1x	7091077	09/26/07 11:30	09/28/07 12:02	**Q11, RL4**
Heavy Oil Range Hydrocarbons	"	ND	-----	1.00	"	"	"	"	"	**RL4**
Surrogate(s): 1-Chlorooctadecane			*97.5%*		*50 - 150 %*	"			"	
PQI0697-08 (HC-19 Dup)		**Water**			**Sampled: 09/18/07 13:17**					
Diesel Range Organics	NWTPH-Dx	**0.267**	-----	0.236	mg/l	1x	7091018	09/26/07 07:45	09/26/07 20:09	**Q9**
Heavy Oil Range Hydrocarbons	"	ND	-----	0.472	"	"	"	"	"	
Surrogate(s): 1-Chlorooctadecane			*101%*		*50 - 150 %*	"			"	

Callie Fahsholz For Darrell Auvil, Project Manager

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Ash Creek Associates, Inc.	Project Name:	**POP-T4S3**	
9615 SW Allen Blvd. Suite 106	Project Number:	1007-03	Report Created:
Beaverton, OR 97005	Project Manager:	Mike Stevens	10/11/07 14:48

Polynuclear Aromatic Compounds per EPA 8270M-SIM

TestAmerica - Portland, OR

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PQI0697-01 (HC-21)		**Water**			**Sampled: 09/18/07 14:49**					
Acenaphthene	EPA 8270m	**0.247**	-----	0.0952	ug/l	1x	7090940	09/24/07 14:00	09/26/07 23:03	
Acenaphthylene	"	ND	-----	0.0952	"	"	"	"	"	
Anthracene	"	ND	-----	0.190	"	"	"	"	"	**RL1**
Benzo (a) anthracene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	0.0952	"	"	"	"	"	
Chrysene	"	ND	-----	0.0952	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	0.190	"	"	"	"	"	
Fluoranthene	"	ND	-----	0.190	"	"	"	"	"	**RL1**
Fluorene	"	**0.622**	-----	0.0952	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	0.0952	"	"	"	"	"	
Naphthalene	"	ND	-----	0.190	"	"	"	"	"	**RL1**
Phenanthrene	"	ND	-----	0.190	"	"	"	"	"	**RL1**
Pyrene	"	ND	-----	0.190	"	"	"	"	"	**RL1**
Surrogate(s): *Fluorene-d10*			*88.5%*		*25 - 125 %*	"			"	
Pyrene-d10			*124%*		*23 - 150 %*	"			"	
Benzo (a) pyrene-d12			*76.5%*		*10 - 125 %*	"			"	
PQI0697-02 (HC-24)		**Water**			**Sampled: 09/18/07 14:13**					
Acenaphthene	EPA 8270m	**1.05**	-----	0.0952	ug/l	1x	7090940	09/24/07 14:00	09/26/07 23:30	
Acenaphthylene	"	ND	-----	0.286	"	"	"	"	"	**RL1**
Anthracene	"	ND	-----	0.190	"	"	"	"	"	**RL1**
Benzo (a) anthracene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	0.0952	"	"	"	"	"	
Chrysene	"	ND	-----	0.0952	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	0.190	"	"	"	"	"	
Fluoranthene	"	ND	-----	0.0952	"	"	"	"	"	
Fluorene	"	**3.53**	-----	0.0952	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	0.0952	"	"	"	"	"	
Naphthalene	"	ND	-----	1.14	"	"	"	"	"	**RL1**
Phenanthrene	"	**1.92**	-----	0.0952	"	"	"	"	"	
Pyrene	"	**0.120**	-----	0.0952	"	"	"	"	"	
Surrogate(s): *Fluorene-d10*			*63.0%*		*25 - 125 %*	"			"	
Pyrene-d10			*85.3%*		*23 - 150 %*	"			"	
Benzo (a) pyrene-d12			*45.6%*		*10 - 125 %*	"			"	

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Callie Fahsholz For Darrell Auvil, Project Manager

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Ash Creek Associates, Inc.	Project Name:	**POP-T4S3**	
9615 SW Allen Blvd. Suite 106	Project Number:	1007-03	Report Created:
Beaverton, OR 97005	Project Manager:	Mike Stevens	10/11/07 14:48

Polynuclear Aromatic Compounds per EPA 8270M-SIM

TestAmerica - Portland, OR

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PQI0697-03 (HC-19)		**Water**			**Sampled: 09/18/07 13:17**					
Acenaphthene	EPA 8270m	**0.775**	-----	0.0952	ug/l	1x	7090940	09/24/07 14:00	09/26/07 23:57	
Acenaphthylene	"	ND	-----	0.0952	"	"	"	"	"	
Anthracene	"	ND	-----	0.190	"	"	"	"	"	**RL1**
Benzo (a) anthracene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	0.0952	"	"	"	"	"	
Chrysene	"	ND	-----	0.0952	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	0.190	"	"	"	"	"	
Fluoranthene	"	ND	-----	0.0952	"	"	"	"	"	
Fluorene	"	**1.95**	-----	0.0952	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	0.0952	"	"	"	"	"	
Naphthalene	"	ND	-----	0.381	"	"	"	"	"	**RL1**
Phenanthrene	"	ND	-----	0.0952	"	"	"	"	"	
Pyrene	"	ND	-----	0.0952	"	"	"	"	"	
Surrogate(s): Fluorene-d10			*77.9%*		*25 - 125 %*	"			"	
Pyrene-d10			*99.8%*		*23 - 150 %*	"			"	
Benzo (a) pyrene-d12			*78.0%*		*10 - 125 %*	"			"	
PQI0697-05 (BE-1)		**Water**			**Sampled: 09/18/07 11:00**					**RL4**
Acenaphthene	EPA 8270m	ND	-----	0.0333	ug/l	1x	7090997	09/25/07 18:00	09/29/07 21:05	
Acenaphthylene	"	ND	-----	0.0333	"	"	"	"	"	
Anthracene	"	ND	-----	0.0333	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	0.0333	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	0.0333	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	0.0333	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	0.0333	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	0.0333	"	"	"	"	"	
Chrysene	"	ND	-----	0.0333	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	0.0333	"	"	"	"	"	
Fluoranthene	"	ND	-----	0.0500	"	"	"	"	"	**RL1**
Fluorene	"	**0.0791**	-----	0.0333	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	0.0333	"	"	"	"	"	
Naphthalene	"	**0.498**	-----	0.0333	"	"	"	"	"	
Phenanthrene	"	**0.145**	-----	0.0333	"	"	"	"	"	
Pyrene	"	**0.0598**	-----	0.0333	"	"	"	"	"	
Surrogate(s): Fluorene-d10			*116%*		*25 - 125 %*	"			"	
Pyrene-d10			*129%*		*23 - 150 %*	"			"	
Benzo (a) pyrene-d12			*71.8%*		*10 - 125 %*	"			"	

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Callie Fahsholz For Darrell Auvil, Project Manager

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Ash Creek Associates, Inc.	Project Name:	**POP-T4S3**	
9615 SW Allen Blvd. Suite 106	Project Number:	1007-03	Report Created:
Beaverton, OR 97005	Project Manager:	Mike Stevens	10/11/07 14:48

Polynuclear Aromatic Compounds per EPA 8270M-SIM

TestAmerica - Portland, OR

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PQI0697-08 (HC-19 Dup)		**Water**			**Sampled: 09/18/07 13:17**					
Acenaphthene	EPA 8270m	**0.635**	-----	0.0952	ug/l	1x	7090940	09/24/07 14:00	09/27/07 00:24	
Acenaphthylene	"	ND	-----	0.0952	"	"	"	"	"	
Anthracene	"	ND	-----	0.190	"	"	"	"	"	**RL1**
Benzo (a) anthracene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	0.0952	"	"	"	"	"	
Chrysene	"	ND	-----	0.0952	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	0.190	"	"	"	"	"	
Fluoranthene	"	ND	-----	0.0952	"	"	"	"	"	
Fluorene	"	**1.82**	-----	0.0952	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	0.0952	"	"	"	"	"	
Naphthalene	"	ND	-----	0.286	"	"	"	"	"	**RL1**
Phenanthrene	"	ND	-----	0.0952	"	"	"	"	"	
Pyrene	"	ND	-----	0.0952	"	"	"	"	"	
Surrogate(s): *Fluorene-d10*			*81.3%*		*25 - 125 %*	"			"	
Pyrene-d10			*101%*		*23 - 150 %*	"			"	
Benzo (a) pyrene-d12			*68.5%*		*10 - 125 %*	"			"	
PQI0697-09 (BE-2)		**Water**			**Sampled: 09/19/07 11:00**					
Acenaphthene	EPA 8270m	ND	-----	0.0952	ug/l	1x	7090997	09/25/07 18:00	10/01/07 16:36	
Acenaphthylene	"	ND	-----	0.0952	"	"	"	"	"	
Anthracene	"	ND	-----	0.0952	"	"	"	"	"	
Benzo (a) anthracene	"	**0.292**	-----	0.0952	"	"	"	"	"	
Benzo (a) pyrene	"	**0.354**	-----	0.0952	"	"	"	"	"	
Benzo (b) fluoranthene	"	**0.332**	-----	0.0952	"	"	"	"	"	
Benzo (ghi) perylene	"	**0.544**	-----	0.0952	"	"	"	"	"	
Benzo (k) fluoranthene	"	**0.322**	-----	0.0952	"	"	"	"	"	
Chrysene	"	**0.376**	-----	0.0952	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	0.190	"	"	"	"	"	
Fluoranthene	"	**0.525**	-----	0.0952	"	"	"	"	"	
Fluorene	"	ND	-----	0.0952	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	**0.427**	-----	0.0952	"	"	"	"	"	
Naphthalene	"	**0.105**	-----	0.0952	"	"	"	"	"	
Phenanthrene	"	**0.246**	-----	0.0952	"	"	"	"	"	
Pyrene	"	**0.815**	-----	0.0952	"	"	"	"	"	
Surrogate(s): *Fluorene-d10*			*93.2%*		*25 - 125 %*	"			"	
Pyrene-d10			*71.6%*		*23 - 150 %*	"			"	
Benzo (a) pyrene-d12			*39.4%*		*10 - 125 %*	"			"	

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Ash Creek Associates, Inc.	Project Name:	**POP-T4S3**	
9615 SW Allen Blvd. Suite 106	Project Number:	1007-03	Report Created:
Beaverton, OR 97005	Project Manager:	Mike Stevens	10/11/07 14:48

Polynuclear Aromatic Compounds per EPA 8270M-SIM

TestAmerica - Portland, OR

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes

Callie Fahsholz For Darrell Auvil, Project Manager

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Ash Creek Associates, Inc.	Project Name:	**POP-T4S3**	
9615 SW Allen Blvd. Suite 106	Project Number:	1007-03	Report Created:
Beaverton, OR 97005	Project Manager:	Mike Stevens	10/11/07 14:48

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method with Acid/Silica Gel Cleanup - Laboratory Quality Control Results

TestAmerica - Portland, OR

QC Batch: 7091018 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7091018-BLK1)									**Extracted: 09/26/07 07:45**					
Diesel Range Organics	NWTPH-Dx	ND	---	0.250	mg/l	1x	--	--	--	--	--	--	09/26/07 17:53	
Heavy Oil Range Hydrocarbons	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 99.1%*			*Limits: 50-150%*	"							*09/26/07 17:53*	
LCS (7091018-BS1)									**Extracted: 09/26/07 07:45**					
Diesel Range Organics	NWTPH-Dx	2.46	---	0.250	mg/l	1x	--	2.54	97.0%	(50-150)	--	--	09/26/07 18:13	
Heavy Oil Range Hydrocarbons	"	1.50	---	0.500	"	"	--	1.55	97.1%	"	--	--	"	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 95.9%*			*Limits: 50-150%*	"							*09/26/07 18:13*	
LCS Dup (7091018-BSD1)									**Extracted: 09/26/07 07:45**					
Diesel Range Organics	NWTPH-Dx	2.40	---	0.250	mg/l	1x	--	2.54	94.5%	(50-150)	2.58%	(50)	09/26/07 18:32	
Heavy Oil Range Hydrocarbons	"	1.44	---	0.500	"	"	--	1.55	93.2%	"	4.04%	"	"	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 95.3%*			*Limits: 50-150%*	"							*09/26/07 18:32*	

QC Batch: 7091077 **Water Preparation Method: EPA 3510 Fuels**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7091077-BLK1)									**Extracted: 09/26/07 11:30**					
Diesel Range Organics	NWTPH-Dx	ND	---	0.0800	mg/l	1x	--	--	--	--	--	--	09/28/07 10:42	
Heavy Oil Range Hydrocarbons	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 106%*			*Limits: 50-150%*	"							*09/28/07 10:42*	
LCS (7091077-BS1)									**Extracted: 09/26/07 11:30**					
Diesel Range Organics	NWTPH-Dx	1.20	---	0.0800	mg/l	1x	--	1.27	94.4%	(50-150)	--	--	09/28/07 11:02	
Heavy Oil Range Hydrocarbons	"	0.877	---	0.500	"	"	--	0.775	113%	"	--	--	"	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 98.0%*			*Limits: 50-150%*	"							*09/28/07 11:02*	
LCS Dup (7091077-BSD1)									**Extracted: 09/26/07 11:30**					
Diesel Range Organics	NWTPH-Dx	1.26	---	0.0800	mg/l	1x	--	1.27	99.3%	(50-150)	5.00%	(50)	09/28/07 11:22	
Heavy Oil Range Hydrocarbons	"	0.907	---	0.500	"	"	--	0.775	117%	"	3.35%	"	"	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 102%*			*Limits: 50-150%*	"							*09/28/07 11:22*	

TestAmerica - Portland, OR

Callie Fahsholz For Darrell Auvil, Project Manager

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Ash Creek Associates, Inc.	Project Name:	**POP-T4S3**	
9615 SW Allen Blvd. Suite 106	Project Number:	1007-03	Report Created:
Beaverton, OR 97005	Project Manager:	Mike Stevens	10/11/07 14:48

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

TestAmerica - Portland, OR

QC Batch: 7090940 **Water Preparation Method: 3520B Liq-Liq**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7090940-BLK1)							**Extracted: 09/24/07 14:00**							
Acenaphthene	EPA 8270m	ND	---	0.100	ug/l	1x	--	--	--	--	--	--	09/25/07 23:00	
Acenaphthylene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	---	0.200	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 123%*			*Limits: 25-125%*	"							*09/25/07 23:00*	
Pyrene-d10		*92.2%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*105%*			*10-125%*	"							"	
LCS (7090940-BS1)							**Extracted: 09/24/07 14:00**							
Acenaphthene	EPA 8270m	2.30	---	0.100	ug/l	1x	--	2.50	92.2%	(26-135)	--	--	09/25/07 23:27	
Benzo (a) pyrene	"	2.38	---	0.100	"	"	--	"	95.3%	(38-137)	--	--	"	
Pyrene	"	1.98	---	0.100	"	"	--	"	79.2%	(33-133)	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 108%*			*Limits: 25-125%*	"							*09/25/07 23:27*	
Pyrene-d10		*81.9%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*99.6%*			*10-125%*	"							"	
LCS Dup (7090940-BSD1)							**Extracted: 09/24/07 14:00**							
Acenaphthene	EPA 8270m	2.49	---	0.100	ug/l	1x	--	2.50	99.5%	(26-135)	7.66%	(60)	09/25/07 23:55	
Benzo (a) pyrene	"	2.64	---	0.100	"	"	--	"	106%	(38-137)	10.2%	"	"	
Pyrene	"	2.06	---	0.100	"	"	--	"	82.3%	(33-133)	3.80%	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 118%*			*Limits: 25-125%*	"							*09/25/07 23:55*	
Pyrene-d10		*86.0%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*112%*			*10-125%*	"							"	

Callie Fahsholz For Darrell Auvil, Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**POP-T4S3**	
9615 SW Allen Blvd. Suite 106	Project Number:	1007-03	Report Created:
Beaverton, OR 97005	Project Manager:	Mike Stevens	10/11/07 14:48

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

TestAmerica - Portland, OR

QC Batch: 7090997 **Water Preparation Method: 3520B Liq-Liq**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7090997-BLK1)							**Extracted: 09/25/07 18:00**							
2-Methylnaphthalene	EPA 8270m	ND	---	0.100	ug/l	1x	--	--	--	--	--	--	09/27/07 19:07	
1-Methylnaphthalene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Acenaphthene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Acenaphthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Acenaphthylene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Acenaphthylene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Anthracene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Anthracene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Benzo (a) anthracene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Benzo (a) anthracene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Benzo (a) pyrene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Benzo (b) fluoranthene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Benzo (b) fluoranthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Benzo (ghi) perylene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Benzo (ghi) perylene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Benzo (k) fluoranthene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Benzo (k) fluoranthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Chrysene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Chrysene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Dibenzo (a,h) anthracene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Dibenzo (a,h) anthracene	"	ND	---	0.200	"	"	--	--	--	--	--	--	09/27/07 19:07	
Fluoranthene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Fluoranthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Fluorene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Fluorene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Indeno (1,2,3-cd) pyrene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Indeno (1,2,3-cd) pyrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Naphthalene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Naphthalene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Phenanthrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	
Pyrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	09/27/07 19:07	
Pyrene	"	ND	---	0.0200	"	"	--	--	--	--	--	--	09/29/07 20:00	

Surrogate(s):	*Fluorene-d10*	*Recovery:*	*92.2%*	*Limits:*	*25-125%*	*" 09/29/07 20:00*
	Fluorene-d10		*97.4%*		*25-125%*	*" 09/27/07 19:07*
	Pyrene-d10		*116%*		*23-150%*	*" 09/29/07 20:00*
	Pyrene-d10		*96.9%*		*23-150%*	*" 09/27/07 19:07*
	Benzo (a) pyrene-d12		*95.9%*		*10-125%*	*" 09/29/07 20:00*
	Benzo (a) pyrene-d12		*97.2%*		*10-125%*	*" 09/27/07 19:07*

TestAmerica - Portland, OR

Callie Fahsholz For Darrell Auvil, Project Manager

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PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**POP-T4S3**	
9615 SW Allen Blvd. Suite 106	Project Number:	1007-03	Report Created:
Beaverton, OR 97005	Project Manager:	Mike Stevens	10/11/07 14:48

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

TestAmerica - Portland, OR

QC Batch: 7090997 **Water Preparation Method: 3520B Liq-Liq**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (7090997-BS1)									**Extracted: 09/25/07 18:00**					
Acenaphthene	EPA 8270m	2.37	---	0.200	ug/l	2x	--	2.50	94.9%	(26-135)	--	--	09/27/07 19:35	
Acenaphthene	"	2.37	---	0.0400	"	"	--	"	94.9%	(35-120)	--	--	"	
Acenaphthylene	"	2.28	---	0.0400	"	"	--	"	91.2%	(34-116)	--	--	"	
Anthracene	"	2.26	---	0.0400	"	"	--	"	90.4%	(24-119)	--	--	"	
Benzo (a) anthracene	"	2.42	---	0.0400	"	"	--	"	96.9%	(36-128)	--	--	"	
Benzo (a) pyrene	"	2.48	---	0.200	"	"	--	"	99.4%	(38-137)	--	--	"	
Benzo (a) pyrene	"	2.48	---	0.0400	"	"	--	"	99.4%	(17-128)	--	--	"	
Benzo (b) fluoranthene	"	2.61	---	0.0400	"	"	--	"	104%	(37-131)	--	--	"	
Benzo (ghi) perylene	"	2.30	---	0.0400	"	"	--	"	92.1%	(26-126)	--	--	"	
Benzo (k) fluoranthene	"	2.92	---	0.0400	"	"	--	"	117%	(18-145)	--	--	"	
Chrysene	"	2.56	---	0.0400	"	"	--	"	102%	(16-137)	--	--	"	
Dibenzo (a,h) anthracene	"	2.21	---	0.0400	"	"	--	"	88.2%	(20-141)	--	--	"	
Fluoranthene	"	2.49	---	0.0400	"	"	--	"	99.7%	(31-125)	--	--	"	
Fluorene	"	2.38	---	0.0400	"	"	--	"	95.1%	(27-124)	--	--	"	
Indeno (1,2,3-cd) pyrene	"	2.36	---	0.0400	"	"	--	"	94.4%	(30-135)	--	--	"	
Naphthalene	"	2.24	---	0.0400	"	"	--	"	89.5%	(30-113)	--	--	"	
Phenanthrene	"	2.46	---	0.0400	"	"	--	"	98.4%	(34-126)	--	--	"	
Pyrene	"	2.45	---	0.200	"	"	--	"	97.9%	(33-133)	--	--	"	
Pyrene	"	2.45	---	0.0400	"	"	--	"	97.9%	(21-141)	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 105%*			*Limits: 25-125%*	"							*09/27/07 19:35*	
Fluorene-d10		*105%*			*25-125%*	"							"	
Surrogate(s): Pyrene-d10		*Recovery: 104%*			*Limits: 23-150%*	"							*09/27/07 19:35*	
Pyrene-d10		*104%*			*23-150%*	"							"	
Surrogate(s): Benzo (a) pyrene-d12		*Recovery: 107%*			*Limits: 10-125%*	"							*09/27/07 19:35*	
Benzo (a) pyrene-d12		*107%*			*10-125%*	"							"	
LCS Dup (7090997-BSD1)									**Extracted: 09/25/07 18:00**					
Acenaphthene	EPA 8270m	2.36	---	0.0400	ug/l	2x	--	2.50	94.5%	(35-120)	0.361%	(50)	09/27/07 20:03	
Acenaphthene	"	2.36	---	0.200	"	"	--	"	94.5%	(26-135)	0.361%	(60)	"	
Acenaphthylene	"	2.25	---	0.0400	"	"	--	"	90.0%	(34-116)	1.26%	(50)	"	
Anthracene	"	2.34	---	0.0400	"	"	--	"	93.5%	(24-119)	3.45%	"	"	
Benzo (a) anthracene	"	2.39	---	0.0400	"	"	--	"	95.7%	(36-128)	1.32%	"	"	
Benzo (a) pyrene	"	2.53	---	0.0400	"	"	--	"	101%	(17-128)	1.62%	"	"	
Benzo (a) pyrene	"	2.53	---	0.200	"	"	--	"	101%	(38-137)	1.62%	(60)	"	
Benzo (b) fluoranthene	"	2.93	---	0.0400	"	"	--	"	117%	(37-131)	11.7%	(50)	"	
Benzo (ghi) perylene	"	2.48	---	0.0400	"	"	--	"	99.4%	(26-126)	7.59%	"	"	
Benzo (k) fluoranthene	"	2.68	---	0.0400	"	"	--	"	107%	(18-145)	8.56%	"	"	
Chrysene	"	2.56	---	0.0400	"	"	--	"	102%	(16-137)	0.0727%	"	"	
Dibenzo (a,h) anthracene	"	2.40	---	0.0400	"	"	--	"	96.1%	(20-141)	8.55%	"	"	

TestAmerica - Portland, OR

Callie Fahsholz For Darrell Auvil, Project Manager

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BEAVERTON, OR 97008-7132
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Ash Creek Associates, Inc.	Project Name:	**POP-T4S3**	
9615 SW Allen Blvd. Suite 106	Project Number:	1007-03	Report Created:
Beaverton, OR 97005	Project Manager:	Mike Stevens	10/11/07 14:48

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

TestAmerica - Portland, OR

QC Batch: 7090997 **Water Preparation Method: 3520B Liq-Liq**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS Dup (7090997-BSD1)							**Extracted: 09/25/07 18:00**							
Fluoranthene	EPA 8270m	2.55	---	0.0400	ug/l	2x	--	2.50	102%	(31-125)	2.21%	(50)	09/27/07 20:03	
Fluorene	"	2.38	---	0.0400	"	"	--	"	95.1%	(27-124)	0.0900%	"	"	
Indeno (1,2,3-cd) pyrene	"	2.50	---	0.0400	"	"	--	"	99.9%	(30-135)	5.69%	"	"	
Naphthalene	"	2.28	---	0.0400	"	"	--	"	91.2%	(30-113)	1.93%	"	"	
Phenanthrene	"	2.51	---	0.0400	"	"	--	"	101%	(34-126)	2.15%	"	"	
Pyrene	"	2.40	---	0.200	"	"	--	"	95.9%	(33-133)	2.11%	(60)	"	
Pyrene	"	2.40	---	0.0400	"	"	--	"	95.9%	(21-141)	2.11%	(50)	"	
Fluorene-d10			*106%*		*25-125%*	"							"	
Fluorene-d10			*106%*		*25-125%*	"							"	
Pyrene-d10			*100%*		*23-150%*	"							"	
Pyrene-d10			*100%*		*23-150%*	"							"	
Surrogate(s): *Benzo (a) pyrene-d12*		*Recovery:*	*109%*		*Limits: 10-125%*	"							*09/27/07 20:03*	
Benzo (a) pyrene-d12			*109%*		*10-125%*	"							"	

TestAmerica - Portland, OR

Callie Fahsholz For Darrell Auvil, Project Manager

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PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

Ash Creek Associates, Inc.	Project Name:	**POP-T4S3**	
9615 SW Allen Blvd. Suite 106	Project Number:	1007-03	Report Created:
Beaverton, OR 97005	Project Manager:	Mike Stevens	10/11/07 14:48

Notes and Definitions

Report Specific Notes:

Q11	-	Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel.
Q9	-	Hydrocarbon pattern most closely resembles weathered diesel.
RL1	-	Reporting limit raised due to sample matrix effects.
RL4	-	Reporting limit raised due to insufficient sample volume.

Laboratory Reporting Conventions:

DET	-	Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
ND	-	Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
NR/NA	-	Not Reported / Not Available
dry	-	Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
wet	-	Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
RPD	-	RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
MRL	-	METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
MDL*	-	METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
Dil	-	Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
Reporting Limits	-	Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
Electronic Signature	-	Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Callie Fahsholz For Darrell Auvil, Project Manager

TestAmerica
ANALYTICAL TESTING CORPORATION

11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244 425-420-9200 FAX 420-9210
11922 E. First Ave, Spokane, WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave, Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #: 7Q10697

CLIENT: Ash Creek Associates

INVOICE TO: ← SAME

REPORT TO: Mike Stevens
ADDRESS: 9105 SW Allen Blvd. Ste. 106
Beaverton, OR 97005-4814

PHONE: 503-924-4704 FAX: 503-924-4707

P.O. NUMBER: 1007

PROJECT NAME: Port of Portland - T453

PROJECT NUMBER: 1007-03

SAMPLED BY: A. Fines

TURNAROUND REQUEST
in Business Days *
Organic & Inorganic Analyses: 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE: HCL	REQUESTED ANALYSES: TPHd + residual range	PAHs 8270 SIM	MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	TA WO ID
1 HC-21	9/18/07 1449		X	X	W	2	TPHd	
2 HC-24	9/18/07 1413		X	X	W	2	w/silica	
3 HC-19	9/18/07 1317		X	X	W	2	gel clean up!!	
4 BE-1	9/18/07 1211		X		W	1	SEE DARRELL BEFORE EXTRACTION	
5 BE-1	9/19/07 1100			X	W	1	SEE DARRELL BEFORE EXTRACTION	
6 BE-2	9/18/07 ~~1219~~ 1211		X		W	1		
7 BE-3	9/18/07 1229		X		W	1	SEE DARRELL BEFORE EXTRACTION	
8 HC-19 Dup	9/18/07 1317		X	X	W	2		
9 FB-2	9/19/07 1100			X	W	1	SEE DARRELL BEFORE EXTRACTION	
10								

RELEASED BY: Ashleigh Fines — DATE: 9/20/07 — TIME: 1510
PRINT NAME: Ashleigh Fines — FIRM: ACA
RECEIVED BY: Jessica Pae — FIRM: TAP — DATE: 9-20 — TIME: 15:10
RELEASED BY: — DATE: — TIME:
PRINT NAME: — FIRM:
RECEIVED BY: — DATE:
PRINT NAME: — FIRM: — TIME:

ADDITIONAL REMARKS:

TEMP: 2.1

COC REV 05/2006

PAGE OF

Note: By relinquishing samples to TestAmerica, client agrees to pay for the services requested on this chain of custody form and for any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice unless otherwise contracted. Sample(s) will be disposed of after 30 days unless otherwise contracted.

3.2

TestAmerica Sample Receipt Checklist

Cooler ID(s): _____ _____ _____

Received by: *(section A)* Date: 9-20 Time: 15:10 Initials: MP

Unpacked by: *(section B)* Date: 9-20 Initials: MP

Logged-in by: Date: 9-20 Initials: MP

Work Order No. PQ106097

Client: Ashcreek

Project: TCP

***ESI Clients *(see Section C)*

Temperature out of range:
___No Ice
___Ice Melted
___W/in 4 Hours
___Other: _____

Cooler Temperature (IR): 2-1 3-2 °C plastic (glass) NA *(oil/air samples, ESI client)*

A

Custody Seals: (#____)

Signature: Y N Dated: _____

X None

Container Type:
- 2 #Cooler(s)
- ____#Box(s)
- ____None (___#Other:_____)

Coolant Type:
- X Gel Ice
- ____Loose Ice
- ____None

Packing Material:
- ____Bubble Bags
- ____Styrofoam Cubbies
- X None (____Other:_____)

Received from:
- ____TA Courier
- ____Senvoy
- ____UPS
- ____Fed Ex
- X Client
- ____TDP
- ____DHL
- ____SDS
- ____Mid-Valley
- ____GS/TA
- ____GS/Senvoy
- ____Other:_____

B

Sample Status:
(If N circled, see NOD)

General:
- Intact? (Y) N
- # Containers Match COC? (Y) N none given
- IDs Match COC? (Y) N

For Analyses Requested:
- Correct Type & Preservation? (Y) N
- Adequate Volume? (Y) N
- Within Hold Time? (Y) N

Volatiles:
- VOAs Free of Headspace? Y N (NA)
- TB on COC? not provided Y N (NA)

Metals:
- HNO3 Preserved? Y N (NA)

C

***ESI Clients Only:

Temperature Blank: _____°C not provided

All preserved bottles checked Y N NA *(voas/soils/all unp.)*

All preserved accordingly? Y N *(see NOD)* NA *(voas/soils/all unp.)*

Was the Tracking paper keepable? YES NO

If circled NO, what is the Tracking Number? _____

UPS FED EX DHL OTHER: _____

Project Managers:

Comments: _____

PM Reviewed: _____ *(Initial/Date)*