Groundwater Monitoring Report
April 2011 through March 2012
Cascade Pole Site
Olympia, Washington

June 20, 2012

Prepared for

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1.0 INTRODUCTION

This report summarizes groundwater monitoring activities conducted between April 1, 2011 and March 31, 2012 at the Cascade Pole Site (Site), in Olympia, Washington. This report is the fifth annual report summarizing the groundwater monitoring that has been conducted as part of the Long-Term Groundwater Compliance Monitoring (LTGCM) program outlined in the amendment to Consent Decree No. DE 00TCPSR-753 [Washington State Department of Ecology (Ecology) 2007]. The groundwater compliance monitoring plan (CMP; Landau Associates 2007) identifies the processes for the collection of groundwater samples and the measurement of groundwater elevations. The LTGCM program consists of the following elements:

- **Hydraulic Control Monitoring:** Monthly monitoring of groundwater elevations at perimeter and interior monitoring wells. The groundwater elevation data are utilized to monitor the effectiveness of the groundwater extraction and treatment systems in achieving hydraulic control. The locations of monitoring wells are shown on Figures 1 and 2.
- **Perimeter Well Monitoring:** Collection of semiannual water quality samples from paired monitoring wells located along the perimeter (inside and outside) of the slurry wall for a 5-year period. Groundwater samples are collected from the following paired wells: PZ-12 and PZ-13, LW-3 and PZ-17, LW-4R and PZ-18, and MW-02S and PZ-19. The analytical results of the water quality samples are utilized in the evaluation of the effectiveness of the extraction and treatment systems in controlling horizontal migration of contaminants. Paired groundwater monitoring well locations for the perimeter monitoring are shown on Figure 1.
- **Interior Well Monitoring:** Collection of semiannual water quality samples from paired upper and lower aquifer wells located within the interior of the containment area for a 5-year period. Groundwater samples are collected from the following paired interior wells: MW-01S and MW-01D, MW-02S and MW-02D, and MW-05S and MW-05D. In addition to the paired upper and lower aquifer wells, semiannual water quality samples are collected from well CW-13. The analytical results for the paired upper and lower aquifer wells are utilized in the evaluation of vertical containment. Paired groundwater monitoring wells for the interior monitoring program are shown on Figure 2.
- **Reporting:** Annual Reporting of the LTGCM activities are submitted to Ecology.

1.1 BACKGROUND

The former Cascade Pole Company (CPC) wood-treatment Site is located approximately 1 mile north of downtown Olympia, at the northern end of the peninsula that extends into Budd Inlet. The Port of Olympia (Port) owns the property, adjacent parcels, and adjacent in-waterway sediments. A detailed history of the Site can be found in the CPC remedial investigation (RI) and feasibility study (FS) reports for the Sediments Operable Unit (SOU; Landau Associates 1993a,b). Environmental cleanup of the Site is proceeding under the Washington State Model Toxics Control Act (MTCA).

The Port implemented several interim remedial actions in the upland area of the Site to address contamination from the former wood treatment activities. These interim actions prevented further

migration of hazardous substances from contaminated soil and groundwater into the adjacent groundwater, surface water, and sediment. A groundwater extraction and non-aqueous phase liquid (NAPL) recovery and treatment system was installed in 1991 and 1992. This system was expanded in 1999 and modified in conjunction with the construction of the upland sediment containment cell. In early 1993, a dense NAPL (DNAPL) recovery trench and an associated sheetpile cutoff wall were installed along a portion of the shoreline to eliminate the migration of DNAPL into Budd Inlet. The cutoff wall was extended to encircle the Site through installation of a soil-bentonite slurry wall in 1996 and 1997. The cutoff wall was keyed into the aquitard and encompasses the former wood treating facility and treated pole storage yards; areas where NAPL has been observed and impacted groundwater. The trench was abandoned in 2001 due to DNAPL recovery deficiencies.

Excavated and dredged sediments generated from cleanup of the SOU were placed in an upland containment cell within the cutoff wall, which was constructed within the northeast portion of the SOU. In addition, contaminated sediment and soil near the original sheetpile cutoff wall were contained during cleanup of the SOU by a second sheetpile cutoff wall. The second cutoff wall was keyed into the existing slurry wall on each end and the underlying aquitard forming a shoreline containment cell.

A major portion of the Site was paved between the fall of 1997 and the summer of 1998 to assist with stormwater runoff control and to reduce surface water infiltration. In 2004, a portion of the Site adjacent to the sediment containment cell was capped as part of the Phase I capping project. The Phase II paving and capping project of the sediment containment cell was completed in 2009. In December 2010, the Phase III capping project was conducted along the northern portion of the Site and has resulted in the completion of the planned capping projects. Upon the completion of the capping activities, a new groundwater treatment system was installed to increase the Site treatment capacity by three fold. The new system began operation after the completion of the functional testing in January 2012.

1.2 HYDRAULIC CONTROL GOALS

Both short-term and long-term goals for hydraulic containment have been identified for the Site. The short-term goals are applicable until the Site has been fully capped with a low-permeability cover, at which time the long-term goals will be implemented. Because the old treatment system was operational throughout the majority of this reporting period, the short-term goals are presently in effect for this report.

The short-term goal of the hydraulic control system at the Site is to prevent overtopping of the cutoff wall throughout the containment area. The short-term performance criterion consists of maximum groundwater elevations within the cutoff wall, depending on adjacent cutoff wall top elevations (Landau Associates 2000). The groundwater elevation performance criteria are 15.5 ft along the majority of the cutoff wall alignment, and 16.5 ft along wall alignment sections adjacent to Budd Inlet. The long-term

Site hydraulic control goal is the establishment and maintenance of inward and upward hydraulic gradients throughout the containment area.

1.3 GROUNDWATER QUALITY COMPLIANCE MONITORING GOALS

The goal of the groundwater quality compliance monitoring is to assess the effectiveness of the groundwater extraction and treatment system. The CMP identifies four pairs of shallow monitoring wells located along the perimeter (inside and outside) of the bentonite cutoff wall and three shallow and deep well pairs within the containment area to monitor the effectiveness of the containment system. One additional shallow extraction well not currently being operated, CW-13, is also being sampled at Ecology's request.

Groundwater quality results are compared to MTCA Method B values for the protection of marine surface water with the exception of petroleum hydrocarbons, which have been compared to MTCA Method A cleanup levels. To evaluate the analytical data for carcinogenic polycyclic aromatic hydrocarbons (cPAHs), the toxicity equivalency quotients (TEQ) of individual cPAHs were calculated and summed for comparison to the benzo(a)pyrene cleanup level using the methodology established in WAC 173-340-708. To calculate the TEQ, the toxicity equivalency factor (TEF) for a given cPAH compound was multiplied by the compound concentration, or half the reporting limit for compounds that were not detected above the laboratory reporting limit, and the resulting values were summed. The resulting TEQ was compared to the MTCA Method B cleanup level for benzo(a)pyrene of 0.1 micrograms per liter (µg/L). Pentachlorophenol (PCP) is initially analyzed using U.S. Environmental Protection Agency (EPA) Method 8270 with a reporting limit of 5.0 µg/L. If the initial PCP results are not detected at the reporting limits, then samples are selected for follow-up analysis using EPA Method 8041 with a reporting limit of 0.25 µg/L. The PCP analysis sequence is conducted to allow for initial screening for elevated detections of the compound without damage to laboratory equipment, and the follow-up analysis allows for comparison of results to MTCA Method B cleanup levels.

2.0 COMPLIANCE MONITORING PROCEDURES

Two groundwater quality monitoring events were conducted at the Site during this reporting period (August 2011 and March 2012) and one verification sampling event (March 2012) at well PZ-18 was conducted. In addition, monthly groundwater elevation data have been collected to evaluate system hydraulic control measures in accordance with the CMP (Landau Associates 2007). The following sections describe the collection of water level measurements and groundwater sampling methods.

2.1 HYDRAULIC CONTROL MEASUREMENTS

Monthly groundwater level measurements from the selected compliance perimeter well pairs (PZ-12 and PZ-13, LW-3 and PZ-17, LW-4R and PZ-18, and MW-02S and PZ-19) and from interior monitoring well shallow and deep aquifer pairs (MW-01S,D; MW-02S,D; and MW-05S,D) have been collected throughout the reporting period (April 2011 through March 2012). Groundwater levels were not collected from wells LW-4R (June 2011, October 2011, November 2001, December 2011, and February 2012) and PZ-18 (September 2011, October 2011, November 2011, and February 2012) because the wells were inaccessible due to log storage activities. The top elevations of well pair MW-02S,D were modified in September 2011 to allow for site capping activities. The new survey top of PVC pipe for both MW-02S,D is included in Table 1. The depths to groundwater measurements were collected using an electronic water level meter and measurements were recorded to the nearest 0.01 ft. Measurements were made from surveyed reference points on the top of the well casing. Depth to groundwater was converted to groundwater elevation for each well using a surveyed reference elevation at the top of the casing. Table 1 shows the depth to water measurements, top of casing elevations, and groundwater elevations measured during this reporting period. Historical groundwater elevation data are presented in Appendix A.

2.2 GROUNDWATER SAMPLING

Groundwater quality monitoring events were conducted in August 2011 during a time of low groundwater elevations, which corresponded to a typical "dry season", and in March 2012 at a time when high groundwater elevations corresponded to a typical "wet season." A follow-up verification sample was collected from PZ-18 in March 2012. Groundwater samples were collected using low-flow sampling techniques as described in the CMP (Landau Associates 2007). Groundwater was purged from the selected wells using non-dedicated peristaltic pumps (shallow wells) and dedicated submersible pumps (deep wells). Field parameters (pH, conductivity, redox, and temperature), along with groundwater levels, were monitored every 3 to 5 minutes during the purge process to verify the flow rate and to

minimize groundwater level drawdown. Groundwater samples were collected directly into laboratory-prepared containers, labeled, stored in a cooler with a maintained temperature of 4^{o} to 6^{o} C, and transported to the laboratory in accordance with proper chain-of-custody procedures.

A total of 14 wells were sampled as part of the LTGCM plan. The selected wells included perimeter well pairs (PZ-12 and PZ-13, LW-3 and PZ-17, LW-4R and PZ-18, and MW-02S and PZ-19) and interior wells MW-01S,D; MW-02S,D; and MW-05S,D; and CW-13).

Groundwater samples were submitted to Analytical Resources Inc. (ARI) located in Tukwila, Washington. Samples were analyzed for PAHs using EPA Method 8270 with selected ion monitoring (SIM); gasoline-range petroleum hydrocarbons (TPH-G) using Method NWTPH-G; diesel- and oil-range petroleum hydrocarbons (TPH-D and TPH-O, respectively), and creosote using Method NWTPH-Dx. Follow-up PCP analysis was conducted using low reporting limit testing, EPA Method 8041, if results from the PAH testing using EPA Method 8270 indicated results were below the associated method reporting limit.

3.0 COMPLIANCE MONITORING RESULTS

The following sections discuss the performance of the system in regards to the hydraulic control and groundwater quality criteria. Groundwater elevation data collected during this reporting period is summarized in Table 1. Groundwater quality compliance monitoring data collected during this reporting period is summarized in Table 2. Historical groundwater elevation data and historical groundwater quality data are presented in Appendix A. Laboratory reports for the August 2011 and March 2012 sampling events are presented in Appendix B.

3.1 HYDRAULIC CONTROL

The LTGCM plan indicates that hydraulic control for the Site will be maintained by a series of shallow extraction wells directing water to the onsite treatment system. The short-term groundwater elevation performance criteria are maintaining groundwater levels below the perimeter cutoff wall, which requires maintaining groundwater elevations below 15.5 ft along the majority of the cutoff wall alignment, and below 16.5 ft along wall alignment sections adjacent to Budd Inlet. Monthly groundwater elevation data collected during this reporting period indicate that the short-term elevation criteria was consistently met at well pair PZ-12 and PZ-13 (northwest portion of the Site), and LW-3 and PZ-17 (southern portion of the Site). However, the short-term groundwater elevation criteria were exceeded during the reporting period at the following times and locations:

- Groundwater elevations observed at perimeter well LW-4R exceeded the short-term goal for one of the seven measurements collected between April 2011 and March 2012. The goal exceedance occurred in May 2011. The exceedance frequency was reduced from 2010 data. Well LW-4R was not measured in June 2011, October 2011, November 2011, December 2011, and February 2012 due to the well being inaccessible.
- Groundwater elevations observed at perimeter well MW-02S exceeded the short-term goal for seven of the twelve measurements collected between April 2011 and March 2012. The goal exceedances occurred in April 2011, May 2011, June 2011, November 2012, January 2012, February 2012, and March 2012, with the majority of the exceedance occurring during the typical wet season.

Groundwater elevations observed at perimeter well MW-05S exceeded the short-term goal for three of the twelve measurements collected between April 2011 and March 2012. The goal exceedances occurred in April 2011, November 2011, and February 2012. The extraction system operated throughout the majority of the reporting period; however, extraction was ceased for periods of time during the new treatment system installation and startup period. The majority of the short-term hydraulic goal exceedances occurred during the latter part of the reporting period and are related to the change of the treatment system operation. The Port anticipates that the frequency of exceedances will be decreased with the operation of the new treatment system.

3.2 ANALYTICAL RESULTS

The groundwater analytical results for the two semiannual sampling events (August 2011 and March 2012) and the verification sampling event at well PZ-18 (March 2012) are summarized in Table 2. Analytical results for constituents detected above the cleanup screening levels during this reporting period are shown on Figure 3. Historical groundwater analytical data for compliance monitoring wells are presented in Appendix A. Laboratory reports for samples collected during this reporting period are provided in Appendix B. The following paragraphs summarize the analytical results for this reporting period.

3.2.1 SHALLOW WELLS

The results for the groundwater sampling events indicate no concentrations of the tested analytes were above the cleanup screening levels for wells located outside the slurry wall. Low-levels of TPH-G (270 µg/L), TPH-D (130 µg/L), and creosote (470 µg/L) were detected in the March 2012 sample from exterior well PZ-18, which are below the screening levels (1,000 µg/L, 500 µg/L, and 500 µg/L respectively). Historically, TPH-G and TPH-D have not been detected at levels above the laboratory reporting limits at PZ-18; creosote has been detected only once before, in March 2006 (140 µg/L). Due to the anomalous detections, a verification sample was collected in late March 2012 at PZ-18 and was analyzed for TPH-G, TPH-D, and creosote. The results of the verification sample indicate no concentrations of tested compounds were detected above the respective laboratory reporting limits. A low-level TPH-G concentration was reported for the March 2012 sample from exterior well PZ-13 (250 µg/L), which is below the screening level (1,000 µg/L). Trends and historical and current analytical results for PZ-13 indicate that TPH-G concentrations ranged from nondetect at the reporting limit (250 µg/L) to well above the screening level of 1,000 µg/L (1,900 µg/L, August 2009). The data for this reporting period appeared to be on trend with historical data trends at PZ-13; therefore, no verification sampling was warranted.

A number of analytes were detected above the screening levels in the groundwater samples collected from shallow interiors wells MW-01S, LW-3 and MW-02S as shown on Figure 3.

- At MW-01S naphthalene concentrations were detected at 6,900 µg/L (August 2011) and 5,000 µg/L (March 2012) compared to the cleanup screening level of 4,900 µg/L. PCP concentrations were detected at 4,200 µg/L (August 2011) and 3,200 µg/L (March 2012) compared to the cleanup screening level of 3 µg/L. The TEQ concentrations for cPAHs were calculated at 0.529 µg/L (August 2011) and 1.0 µg/L (March 2012) compared to the screening level of 0.1 µg/L. TPH-G concentrations at MW-01S were above the cleanup screening level (1,000 µg/L) with concentrations ranging of 55,000 µg/L (August 2012) to 26,000 µg/L (March 2012). TPH-D [9,800 (August 2011) and 4,400 µg/L (March 2012)] and creosote [31,000 (August 2011) and 18,000 µg/L (March 2012)] concentrations at MW-01S were also above the respective cleanup screening levels of 500 µg/L.

- Samples collected from well LW-3 indicate TPH-G concentrations at 1,400 µg/L (August 2011) and 1,300 µg/L (March 2012) were above the screening level (1,000 µg/L). TPH-D, motor oil, and creosote concentrations (620, 1,200, and 2,100 µg/L, respectively) were above the respective screening levels during the March 2012 sampling event.
- Samples from MW-02S indicate the motor oil concentration (990 µg/L) during the August 2011 sampling event was above the screening level (500 µg/L).

Exceedance of the cleanup screening levels at wells MW-01S, LW-3, and MW-02S is not a compliance issue because the wells are located within the groundwater containment area and represents shallow groundwater conditions.

The analytical results for other shallow wells (PZ-12, LW4R, MW-05S, and CW-13) located inside the slurry wall indicate no exceedances of the screening levels. Low-level naphthalene concentrations were reported at interior shallow wells CW-13 (5.2 µg/L during August 2011), MW-05S (2.0 µg/L during March 2012), and PZ-19 (2.8 µg/L during March 2012). Low-level PCP concentrations were reported at interior shallow wells CW-13 (1.0 µg/L during August 2011). Low-level TPH-G concentrations were reported at PZ-13 (250 µg/L during March 2012), PZ-18 (270 µg/L during March 2012), and MW-02S (480 µg/L during August 2011). Low-level TPH-D and TPH-O concentrations were detected at MW-05S (110 and 500 µg/L respectively in August 2011), TPH-D at LW-3 (170 µg/L during August 2011), TPH-D at PZ-18 (130 µg/L in March 2012), and TPH-D at MW-02S (130 µg/L during August 2011). Low-level creosote concentrations were reported at shallow wells LW-3 (390 µg/L in August 2011) and well PZ-128 (470 µg/L in March 2012).

3.2.2 DEEP WELLS

The analytical results from the sampling events indicate no concentrations of the tested analytes above the respective screening levels for the three deep interior wells during this reporting period. Low-level naphthalene concentrations were detected at well MW-02D at 110 µg/L (August 2011) and 19 µg/L (March 2012), and at well MW-05D at 2.1 µg/L (August 2011), which are well below the screening level (4,900 µg/L). A low-level PCP concentration (0.85 µg/L) was detected at MW-01D (March 2012). Low-level TPH-D at well MW-02D was detected at 140 µg/L (August 2011), which is below the screening level of 1,000 µg/L. Low level TPH-D and creosote concentrations were reported at MW-02D during the August 2011 event (140 and 440 µg/L, respectively). Low level TPH-O was reported at MW-02D during the March 2012 event (210 µg/L). Historically, creosote concentrations at MW-02D have ranged from not detected at the reporting limit to 4,200 µg/L.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Evaluations of groundwater elevations for shallow monitoring wells located along the perimeter of the bentonite slurry wall indicate that the hydraulic control system is generally preventing groundwater inside of the containment area from exceeding the short-term hydraulic containment goals, with a couple of exceptions. Perimeter well pair LW-4R and PZ-18 and well pair MW-02S and PZ-19 exceeded the goal at various times during this reporting period, typically during the wet season while construction and startup testing was being conducted for the new treatment system.

Analytical results indicate no exceedances of the groundwater screening levels in shallow wells located outside of the slurry wall; shallow interior wells PZ-12, LW-4R, MW-05s, and CW-13; or the interior deep wells. Groundwater cleanup screening levels were exceeded for a number of constituents in samples collected from shallow interior wells MW-01S, LW-3, and MW-02S, but these exceedances are not of concern because the well is located inside the containment system perimeter.

The next semiannual sampling event is currently scheduled for September 2012, to coincide with typical low groundwater elevations representative of a "dry season" event. The "wet season" event will be conducted in February or March 2013, depending on precipitation rates. Results of these sampling events will be reported following completion of the 2013 monitoring event.

5.0 LIMITATIONS

This report has been prepared for the exclusive use of the Port of Olympia for specific application to the Cascade Pole Site in Olympia, Washington. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

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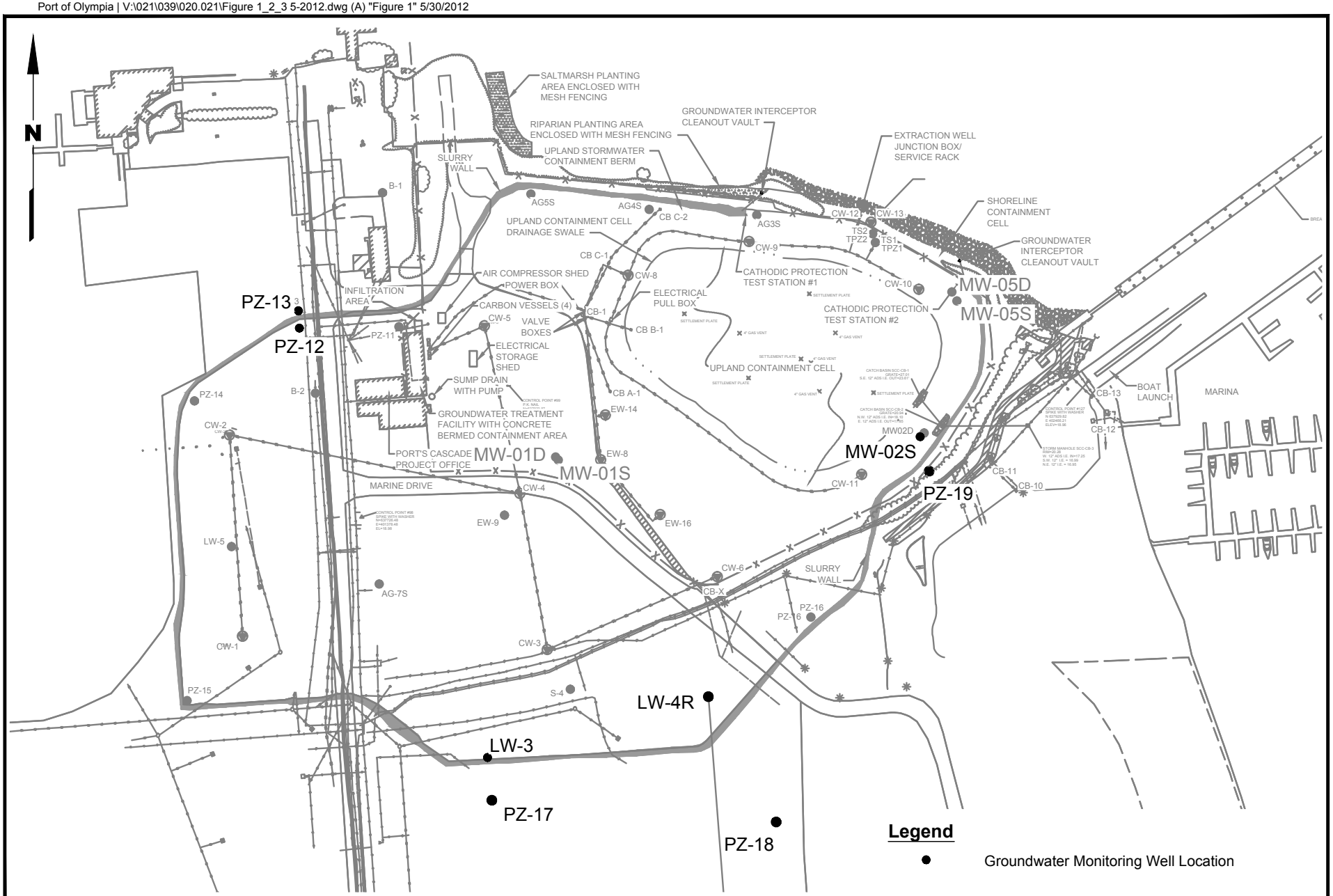

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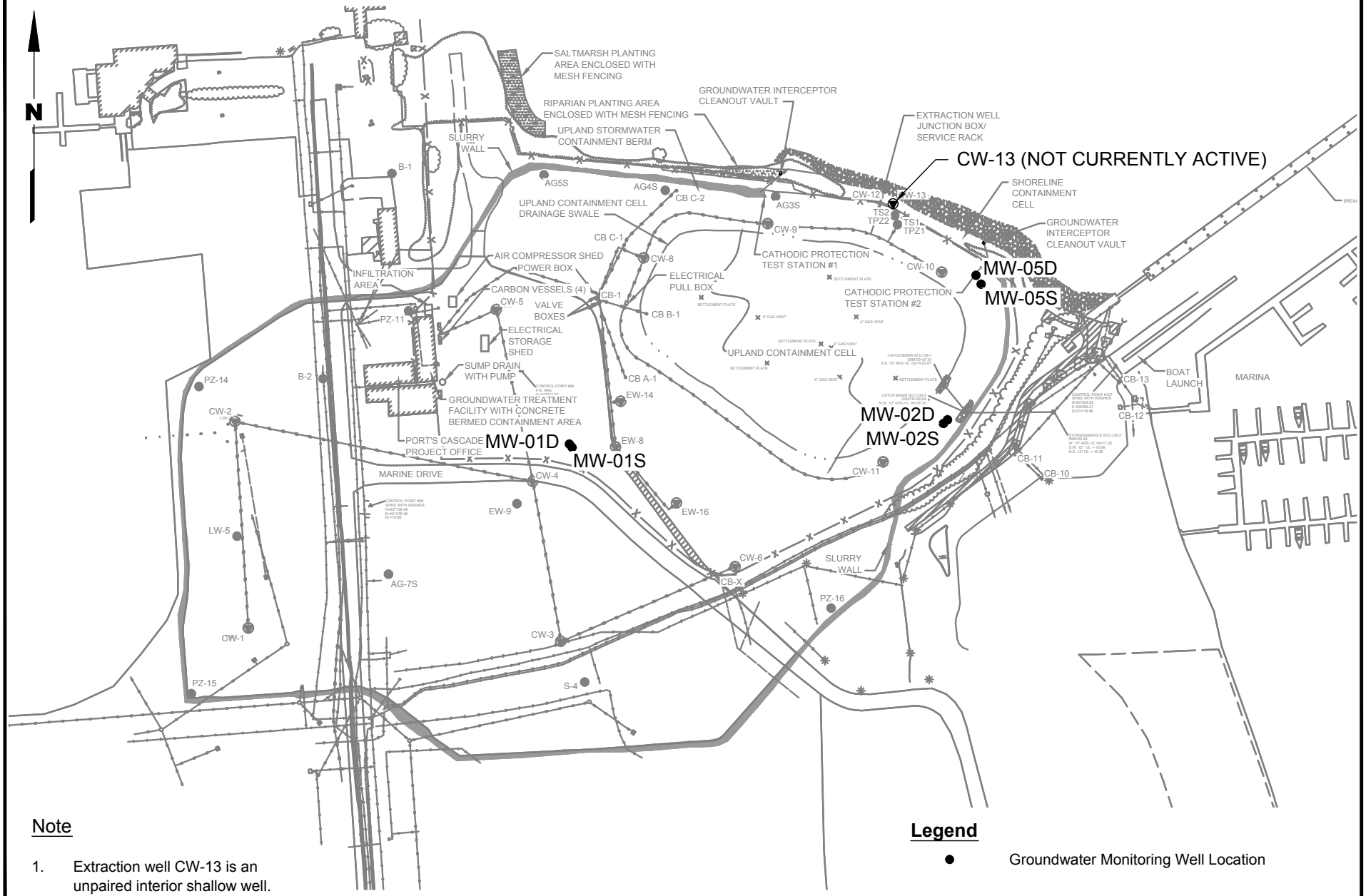
Paired Shallow Groundwater Monitoring Network Well Locations

Figure 1



Note

1. Extraction well CW-13 is an unpaired interior shallow well.

Legend

● Groundwater Monitoring Well Location

0 200 400

Scale in Feet

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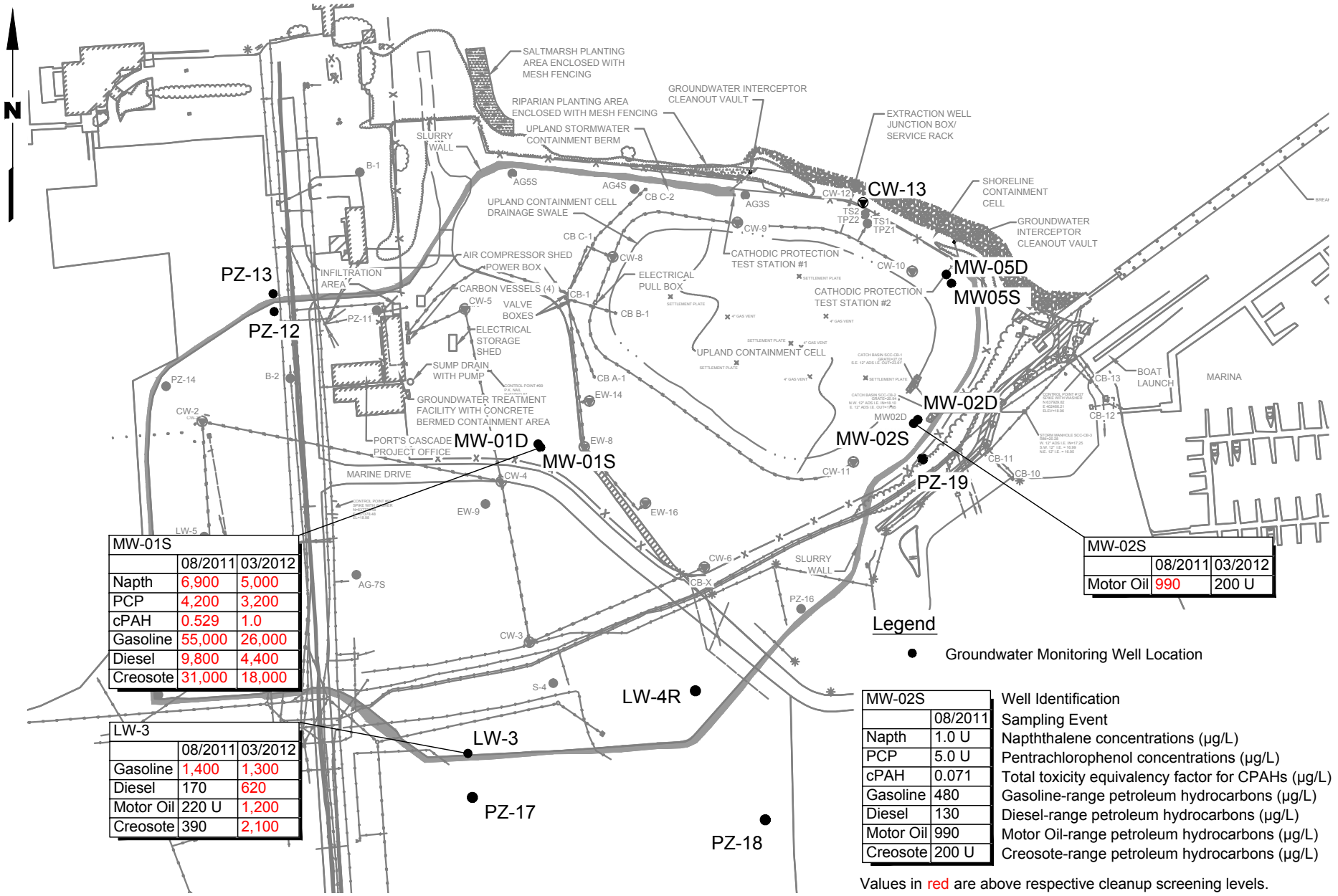
Deep and Shallow Groundwater Monitoring Well Pairs

Figure 2



MW-01S		
	08/2011	03/2012
Napth	6,900	5,000
PCP	4,200	3,200
cPAH	0.529	1.0
Gasoline	55,000	26,000
Diesel	9,800	4,400
Creosote	31,000	18,000

LW-3		
	08/2011	03/2012
Gasoline	1,400	1,300
Diesel	170	620
Motor Oil	220 U	1,200
Creosote	390	2,100

MW-02S		
	08/2011	03/2012
Motor Oil	990	200 U

Legend

● Groundwater Monitoring Well Location

MW-02S	
	08/2011
Napth	1.0 U
PCP	5.0 U
cPAH	0.071
Gasoline	480
Diesel	130
Motor Oil	990
Creosote	200 U

Well Identification
Sampling Event
Naphthalene concentrations (µg/L)
Pentrachlorophenol concentrations (µg/L)
Total toxicity equivalency factor for CPAHs (µg/L)
Gasoline-range petroleum hydrocarbons (µg/L)
Diesel-range petroleum hydrocarbons (µg/L)
Motor Oil-range petroleum hydrocarbons (µg/L)
Creosote-range petroleum hydrocarbons (µg/L)

Values in red are above respective cleanup screening levels.

0 200 400
Scale in Feet

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Olympia, Washington

Groundwater Quality Exceedances

Figure
3

TABLE 1
GROUNDWATER ELEVATIONS
APRIL 2011 THROUGH MARCH 2012
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
1	4/23/2011	PZ-13	6.18	19.50	13.32	--	
	4/23/2011	PZ-12	3.84	19.00	15.16	15.50	No
	5/30/2011	PZ-13	6.75	19.50	12.75	--	
	5/30/2011	PZ-12	4.25	19.00	14.75	15.50	No
	6/26/2011	PZ-13	7.21	19.50	12.29	--	
	6/26/2011	PZ-12	4.78	19.00	14.22	15.50	No
	7/30/2011	PZ-13	7.26	19.50	12.24	--	
	7/30/2011	PZ-12	5.00	19.00	14.00	15.50	No
	8/8/2011	PZ-13	7.17	19.50	12.33	--	
	8/8/2011	PZ-12	4.96	19.00	14.04	15.50	No
	9/24/2011	PZ-13	7.61	19.50	11.89	--	
	9/24/2011	PZ-12	5.31	19.00	13.69	15.50	No
	10/29/2011	PZ-13	6.85	19.50	12.65	--	
	10/29/2011	PZ-12	5.45	19.00	13.55	15.50	No
	11/26/2011	PZ-13	4.98	19.50	14.52	--	
	11/26/2011	PZ-12	4.05	19.00	14.95	15.50	No
	12/26/2011	PZ-13	6.87	19.50	12.63	--	
	12/26/2011	PZ-12	5.27	19.00	13.73	15.50	No
	1/28/2012	PZ-13	4.60	19.50	14.90	--	
	1/28/2012	PZ-12	3.55	19.00	15.45	15.50	No
	2/26/2012	PZ-13	5.77	19.50	13.73	--	
	2/26/2012	PZ-12	3.95	19.00	15.05	15.50	No
	3/7/2012	PZ-13	6.64	19.50	12.86	--	
	3/7/2012	PZ-12	4.20	19.00	14.80	15.50	No
2	4/23/2011	PZ-17	6.54	20.48	13.94	--	
	4/23/2011	LW-3	6.04	19.83	13.79	15.50	No
	5/30/2011	PZ-17	6.70	20.48	13.78	--	
	5/30/2011	LW-3	5.79	19.83	14.04	15.50	No
	6/26/2011	PZ-17	6.95	20.48	13.53	--	
	6/26/2011	LW-3	6.16	19.83	13.67	15.50	No
	7/30/2011	PZ-17	7.16	20.48	13.32	--	
	7/30/2011	LW-3	5.30	19.83	14.53	15.50	No

TABLE 1
GROUNDWATER ELEVATIONS
APRIL 2011 THROUGH MARCH 2012
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	8/8/2011	PZ-17	7.24	20.48	13.24	--	
	8/8/2011	LW-3	5.51	19.83	14.32	15.50	No
	9/24/2011	PZ-17	7.45	20.48	13.03	--	
	9/24/2011	LW-3	5.85	19.83	13.98	15.50	No
	10/29/2011	PZ-17	7.63	20.48	12.85	--	
	10/29/2011	LW-3	5.98	19.83	13.85	15.50	No
	11/26/2011	PZ-17	7.04	20.48	13.44	--	
	11/26/2011	LW-3	6.83	19.83	13.00	15.50	No
	12/26/2011	PZ-17	7.63	20.48	12.85	--	
	12/26/2011	LW-3	6.10	19.83	13.73	15.50	No
	1/28/2012	PZ-17	7.14	20.48	13.34	--	
	1/28/2012	LW-3	5.18	19.83	14.65	15.50	No
	2/26/2012	PZ-17	7.09	20.48	13.39	--	
	2/26/2012	LW-3	4.70	19.83	15.13	15.50	No
	3/7/2012	PZ-17	7.22	20.48	13.26	--	
	3/7/2012	LW-3	5.17	19.83	14.66	15.50	No
3	4/23/2011	PZ-18	9.44	21.20	11.76	--	
	4/23/2011	LW-4R	6.62	22.02	15.40	15.50	No
	5/30/2011	PZ-18	6.86	21.20	14.34	--	
	5/30/2011	LW-4R	6.37	22.02	15.65	15.50	Yes
	6/26/2011	PZ-18	6.01	21.20	15.19	--	
	6/26/2011	LW-4R	NA	22.02	NA	15.50	NA
	7/30/2011	PZ-18	6.43	21.20	14.77	--	
	7/30/2011	LW-4R	6.91	22.02	15.11	15.50	No
	8/8/2011	PZ-18	6.11	21.20	15.09	--	
	8/8/2011	LW-4R	6.56	22.02	15.46	15.50	No
	9/24/2011	PZ-18	NA	21.20	NA	--	
	9/24/2011	LW-4R	6.75	22.02	15.27	15.50	No
	10/29/2011	PZ-18	NA	21.20	NA	--	
	10/29/2011	LW-4R	NA	22.02	NA	15.50	NA
	11/26/2011	PZ-18	NA	21.20	NA	--	
	11/26/2011	LW-4R	NA	22.02	NA	15.50	NA

TABLE 1
GROUNDWATER ELEVATIONS
APRIL 2011 THROUGH MARCH 2012
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)		Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	12/26/2011	PZ-18	7.21	21.20		13.99	--	
	12/26/2011	LW-4R	NA	22.02		NA	15.50	NA
	1/28/2012	PZ-18	5.91	21.20		15.29	--	
	1/28/2012	LW-4R	8.35	22.02		13.67	15.50	No
	2/26/2012	PZ-18	NA	21.20		NA	--	
	2/26/2012	LW-4R	NA	22.02		NA	15.50	NA
	3/7/2012	PZ-18	6.34	21.20		14.86	--	
	3/7/2012	LW-4R	8.40	22.02		13.62	15.50	No
4	4/23/2011	PZ-19	15.81	23.67		7.86	--	
	4/23/2011	MW-02S	15.62	32.46		16.84	15.50	Yes
	5/30/2011	PZ-19	15.07	23.67		8.60	--	
	5/30/2011	MW-02S	16.23	32.46		16.23	15.50	Yes
	6/26/2011	PZ-19	13.87	23.67		9.80	--	
	6/26/2011	MW-02S	16.88	32.46		15.58	15.50	Yes
	7/30/2011	PZ-19	15.93	23.67		7.74	--	
	7/30/2011	MW-02S	17.08	32.46		15.38	15.50	No
	8/8/2011	PZ-19	16.19	23.67		7.48	--	
	8/8/2011	MW-02S	17.26	32.46		15.20	15.50	No
	9/24/2011	PZ-19	15.34	23.67		8.33	--	
	9/24/2011	MW-02S	17.52	31.96	(e)	14.44	15.50	No
	10/29/2011	PZ-19	13.66	23.67		10.01	--	
	10/29/2011	MW-02S	17.77	31.96	(e)	14.19	15.50	No
	11/26/2011	PZ-19	11.91	23.67		11.76	--	
	11/26/2011	MW-02S	16.08	31.96	(e)	15.88	15.50	Yes
	12/26/2011	PZ-19	13.50	23.67		10.17	--	
	12/26/2011	MW-02S	17.45	31.96	(e)	14.51	15.50	No
	1/28/2012	PZ-19	12.50	23.67		11.17	--	
	1/28/2012	MW-02S	15.33	31.96	(e)	16.63	15.50	Yes
	2/26/2012	PZ-19	15.09	23.67		8.58	--	
	2/26/2012	MW-02S	15.75	31.96	(e)	16.21	15.50	Yes
	3/7/2012	PZ-19	14.88	23.67		8.79	--	
	3/7/2012	MW-02S	16.28	31.96	(e)	15.68	15.50	Yes

TABLE 1
GROUNDWATER ELEVATIONS
APRIL 2011 THROUGH MARCH 2012
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)		Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
5	4/23/2011	MW-02S	15.62	32.46		16.84	--	
	4/23/2011	MW-02D	21.73	31.90		10.17	--	
	5/30/2011	MW-02S	16.23	32.46		16.23	--	
	5/30/2011	MW-02D	21.58	31.90		10.32	--	
	6/26/2011	MW-02S	16.88	32.46		15.58	--	
	6/26/2011	MW-02D	18.31	31.90		13.59	--	
	7/30/2011	MW-02S	17.08	32.46		15.38	--	
	7/30/2011	MW-02D	22.39	31.90		9.51	--	
	8/8/2011	MW-02S	17.26	32.46		15.20	--	
	8/8/2011	MW-02D	21.40	31.90		10.50	--	
	9/24/2011	MW-02S	17.52	31.96	(e)	14.44	--	
	9/24/2011	MW-02D	21.44	31.81	(e)	10.37	--	
	10/29/2011	MW-02S	17.77	31.96	(e)	14.19	--	
	10/29/2011	MW-02D	17.73	31.81	(e)	14.08	--	
	11/26/2011	MW-02S	16.08	31.96	(e)	15.88	--	
	11/26/2011	MW-02D	16.43	31.81	(e)	15.38	--	
	12/26/2011	MW-02S	17.45	31.96	(e)	14.51	--	
	12/26/2011	MW-02D	19.26	31.81	(e)	12.55	--	
	1/28/2012	MW-02S	15.33	31.96	(e)	16.63	--	
	1/28/2012	MW-02D	16.61	31.81	(e)	15.20	--	
	2/26/2012	MW-02S	15.75	31.96	(e)	16.21	--	
	2/26/2012	MW-02D	21.30	31.81	(e)	10.51	--	
	3/7/2012	MW-02S	16.28	31.96	(e)	15.68	--	
	3/7/2012	MW-02D	20.75	31.81	(e)	11.06	--	
6	4/23/2011	MW-01S	5.98	21.64		15.66	--	
	4/23/2011	MW-01D	10.67	21.87		11.20	--	
	5/30/2011	MW-01S	6.53	21.64		15.11	--	
	5/30/2011	MW-01D	10.63	21.87		11.24	--	
	6/26/2011	MW-01S	7.01	21.64		14.63	--	
	6/26/2011	MW-01D	8.44	21.87		13.43	--	
	7/30/2011	MW-01S	7.13	21.64		14.51	--	
	7/30/2011	MW-01D	10.85	21.87		11.02	--	

TABLE 1
GROUNDWATER ELEVATIONS
APRIL 2011 THROUGH MARCH 2012
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)		Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	8/8/2011	MW-01S	7.20	21.64		14.44	--	
	8/8/2011	MW-01D	10.94	21.87		10.93	--	
	9/24/2011	MW-01S	7.51	21.64		14.13	--	
	9/24/2011	MW-01D	10.65	21.87		11.22	--	
	10/29/2011	MW-01S	7.74	21.64		13.90	--	
	10/29/2011	MW-01D	7.90	21.87		13.97	--	
	11/26/2011	MW-01S	7.30	21.64		14.34	--	
	11/26/2011	MW-01D	6.53	21.87		15.34	--	
	12/26/2011	MW-01S	7.62	21.64		14.02	--	
	12/26/2011	MW-01D	8.70	21.72	(f)	13.02	--	
	1/28/2012	MW-01S	6.41	21.64		15.23	--	
	1/28/2012	MW-01D	7.24	21.72	(f)	14.48	--	
	2/26/2012	MW-01S	6.41	21.64		15.23	--	
	2/26/2012	MW-01D	10.20	21.72	(f)	11.52	--	
	3/7/2012	MW-01S	6.66	21.64		14.98	--	
	3/7/2012	MW-01D	9.18	21.72	(f)	12.54	--	
7	4/23/2011	MW-05S	12.78	29.45		16.67	16.50	Yes
	4/23/2011	MW-05D	16.44	26.50		10.06		
	5/30/2011	MW-05S	13.40	29.45		16.05	16.50	No
	5/30/2011	MW-05D	16.18	26.50		10.32		
	6/26/2011	MW-05S	13.94	29.45		15.51	16.50	No
	6/26/2011	MW-05D	12.31	26.50		14.19		
	7/30/2011	MW-05S	14.08	29.45		15.37	16.50	No
	7/30/2011	MW-05D	17.13	26.50		9.37		
	8/8/2011	MW-05S	14.27	29.45		15.18	16.50	No
	8/8/2011	MW-05D	15.50	26.50		11.00		
	9/24/2011	MW-05S	14.42	29.45		15.03	16.50	No
	9/24/2011	MW-05D	16.02	26.50		10.48		
	10/29/2011	MW-05S	14.62	29.45		14.83	16.50	No
	10/29/2011	MW-05D	11.59	26.50		14.91		
	11/26/2011	MW-05S	12.74	29.45		16.71	16.50	Yes
	11/26/2011	MW-05D	10.19	26.50		16.31		

TABLE 1
GROUNDWATER ELEVATIONS
APRIL 2011 THROUGH MARCH 2012
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	12/26/2011	MW-05S	14.43	29.45	15.02	16.50	No
	12/26/2011	MW-05D	13.68	26.50	12.82		
	1/28/2012	MW-05S	13.28	29.45	16.17	16.50	No
	1/28/2012	MW-05D	10.15	26.50	16.35		
	2/26/2012	MW-05S	12.81	29.45	16.64	16.50	Yes
	2/26/2012	MW-05D	15.87	26.50	10.63		
	3/7/2012	MW-05S	13.30	29.45	16.15	16.50	No
	3/7/2012	MW-05D	15.35	26.50	11.15		

MLLW = Mean low low water.
Groundwater elevations determined by subtracting depth to groundwater below top of casing (ft) from top of well casing elevation (MLLW, ft).
(a) Below top of PVC well casing.
(b) Hydraulic gradient direction of groundwater. Short term goal is inward for well pairs 1, 2, 3, and 4, and upwards for well pairs 5, 6, and 7.
(b) Short term hydraulic control goal is 15.5 ft along the majority of the cutoff wall alignment and 16.5 ft adjacent to Budd Inlet.
(c) Well LW-3 casing modified and re-surveyed January 2009. On 7/28/10 the well casing at LW-3 cut down 0.2 ft to make room for new well monument lid. Elevation was adjusted from 20.03 to 19.83.
(d) Wells MW-02s, MW-02d, MW-05s, and MW-05d were modified during construction activities and re-surveyed February 2009.
(e) MW-02D and MW-02S inner north rim elevations modified in September 2011.
(f) On 12/8/11 the inner well casing was cut down at MW-01D by 0.15'. Outer casing cut down corresponding amount. New MW-01D measuring point elevation is 21.72' MLLW.

NM = Not measured.
NA = Not available.

TABLE 2
SUMMARY OF CURRENT ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels (a)	PZ-12 08/08/2011 TH68B	PZ-12 03/07/2012 UL19B	PZ-13 08/08/2011 TH68A	PZ-13 03/07/2012 UL19F	PZ-17 08/08/2011 TH68C	PZ-17 03/07/2012 UL19C	PZ-18 08/08/2011 TH68F	PZ-18 03/07/2012 UL19E	PZ-18 3/30/2012 UO79A	PZ-19 08/09/2011 TI17B	PZ-19 03/08/2012 UL56G	LW-3 08/08/2011 TH68D	LW-3 03/07/2012 UL19D	LW-4R 08/08/2011 TH68E	LW-4R 03/07/2012 UL19A
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																
EPA Method 8270D / 8270D-SIM																
Naphthalene	4900	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	**2.8**	1.0 U	3.0 U	1.0 U	1.0 U
2-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U
Acenaphthylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U
Acenaphthene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U
Dibenzofuran		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U
Fluorene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U
Pentachlorophenol	3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	15 U	NA	5.0 U	5.0 U	5.0 U	15 U	5.0 U	5.0 U
Phenanthrene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U
Carbazole		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U
Anthracene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U
Fluoranthene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U
Pyrene	2600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U
Benzo(a)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(b)Fluoranthene		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)Fluoranthene		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U
1-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U
Total Benzofluoranthenes		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.071	NA	0.078	0.071	0.071	0.071	0.071	0.071
PENTACHLOROPHENOL (µg/L)																
EPA Method 8041																
Pentachlorophenol	3	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.31 U	0.25 U	NA	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
PETROLEUM HYDROCARBONS																
Method NWTPH-G (µg/L)																
Gasoline	1,000	250 U	250 U	250 U	**250**	250 U	250 U	250 U	**270**	250 U	250 U	250 U	**1400**	**1300**	250 U	250 U
Method NWTPH-Dx (µg/L)																
Diesel	500	100 U	100 U	100 U	100 U	110 U	100 U	120 U	**130**	100 U	100 U	100 U	**170**	**620**	110 U	100 U
Motor Oil	500	200 U	200 U	200 U	200 U	220 U	200 U	240 U	200 U	200 U	200 U	200 U	220 U	**1200**	220 U	200 U
Creosote Oil	500	200 U	200 U	200 U	200 U	220 U	200 U	240 U	**470**	200 U	200 U	200 U	**390**	**2100**	220 U	200 U

TABLE 2
SUMMARY OF CURRENT ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels (a)	MW-01S 08/09/2011 TI17G	MW-01S 03/08/2012 UL56H	MW-02S 08/09/2011 TI17E	MW-02S 03/08/2012 UL56D	MW-05S 08/09/2011 TI17C	Dup of MW-05S Duplicate 08/09/2011 TI17A	MW-05S 03/08/2012 UL56E	Dup of MW-05S PZ-30 03/08/2012 UL56F	MW-01D 08/09/2011 TI17F	MW-01D 03/08/2012 UL56I	MW-02D 08/09/2011 TI17D	MW-02D 03/08/2012 UL56A	MW05D 08/09/2011 TI17I	MW-05D 03/08/2012 UL56C	CW-13 08/09/2011 TI17H	CW-13 03/08/2012 UL56B
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																	
EPA Method 8270D / 8270D-SIM																	
Naphthalene	4900	**6900**	**5000**	1.0 U	1.0 U	1.0 U	1.0 U	**1.1**	**2.0**	1.0 U	1.0 U	**110**	**19**	**2.1**	1.0 U	**5.2**	1.0 U
2-Methylnaphthalene		**680**	**1100**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**9.4**	**1.5**	1.0 U	1.0 U	1.0 U	1.0 U
Acenaphthylene		1.0 U	**6.8**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Acenaphthene		**190**	**340**	1.0 U	1.0 U	**7.6**	**8.1**	**7.5**	**8.2**	1.0 U	1.0 U	**18**	**9.3**	**2.6**	**3.3**	**4.3**	1.0 U
Dibenzofuran		**79**	**79**	1.0 U	1.0 U	1.0 U	**1.0**	1.0 U	1.0 U	1.0 U	1.0 U	**6.1**	**3.2**	1.0 U	1.0 U	1.0 U	1.0 U
Fluorene		**47**	**69**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**5.8**	**3.8**	**1.2**	1.0 U	1.0 U	1.0 U
Pentachlorophenol	3	**4200**	**3200**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenanthrene		**34**	**65**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**3.9**	**2.3**	1.0 U	1.0 U	1.0 U	1.0 U
Carbazole		**24**	**53**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**4.9**	**1.4**	1.0 U	**1.1**	**1.4**	1.0 U
Anthracene		**10**	**18**	**1.1**	1.0 U	**1.1**	**1.3**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluoranthene		**2.0**	**19**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pyrene	2600	**1.7**	**14**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)Anthracene		**1.0**	**1.8**	0.10 U	0.10 U	0.12 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U
Chrysene		**1.1**	**1.8**	0.10 U	0.10 U	0.12 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U
Benzo(b)Fluoranthene		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)Fluoranthene		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)Pyrene		**0.33**	**0.65**	0.10 U	0.10 U	0.12 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.12 U	**0.14**	0.10 U	0.10 U	0.12 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.12 U	0.10 U	0.10 U	0.10 U	0.12 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1-Methylnaphthalene		**390**	**770**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**13**	**5.1**	1.0 U	1.0 U	1.0 U	1.0 U
Total Benzofluoranthenes		**0.76**	**1.4**	0.10 U	0.10 U	0.12 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U
cPAH TEQ (b)	0.1 (c)	**0.517**	**1.0**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	**0.529**	**1.0**	0.071	0.071	0.085	0.078	0.071	0.071	0.085	0.071	0.071	0.071	0.078	0.071	0.071	0.071
PENTACHLOROPHENOL (µg/L)																	
EPA Method 8041																	
Pentachlorophenol	3	NA	NA	0.25 U	0.25 U	0.28 U	0.28 U	0.25 U	0.25 U	0.29 U	**0.85**	0.26 U	0.25 U	0.25 U	0.25 U	**1.0**	0.25 U
PETROLEUM HYDROCARBONS																	
Method NWTPH-G (µg/L)																	
Gasoline	1,000	**55,000**	**26,000**	**480**	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
Method NWTPH-Dx (µg/L)																	
Diesel	500	**9800**	**4400**	**130**	100 U	100 U	**110**	100 U	100 U	100 U	100 U	**140**	100 U	100 U	100 U	100 U	100 U
Motor Oil	500	1000 U	200 U	**990**	200 U	200 UJ	**500** J	200 U	200 U	200 U	200 U	200 U	**210**	200 U	200 U	200 U	200 U
Creosote Oil	500	**31,000**	**18,000**	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	**440**	200 U	200 U	200 U	200 U	200 U

NA = Not Analyzed.
ND = Not Detected.
U = Indicates the compound was undetected at the given reporting limit.
UJ = Analyte was not detected in the sample; the reported sample detection level is an estimate.

J = Analyte was positively identified; the associated value is approximate.
Bold indicates detected compound.
Box indicates exceedance of screening level.

(a) Groundwater screening levels are MTCA Method B for marine surface water for PAHs and PCP; MTCA Method A for TPH-G/TPH-Dx.
(b) TEQ = toxicity equivalency factor as described in WAC 173-340-708 (8).
(c) cPAH cleanup screening levels based on practical quantitation limit (PQL) for individual cPAHs.

APPENDIX A

Historical Analytical Results and Groundwater Elevations

TABLE A-1
HISTORICAL ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels For Groundwater (a)	PZ12 6/27/2005 2005060439-08	PZ12 3/20/2006 2006030253-01	PZ12 11/11/2006 2006110182-02	PZ12 10/1/2007 LS10B	PZ12 3/20/2008 MO26G	PZ12 7/29/2008 NH92A	PZ12 1/8/2009 OH11B	PZ12 8/11/2009 PK28A	PZ12 1/15/2010 QF84J	PZ-12 10/18/2010 RS33A	PZ-12 03/24/2011 SO90O	PZ-12 08/08/2011 TH68B	PZ-12 03/07/2012 UL19B	PZ13 6/27/2005 2005060392-01	PZ13 3/19/2006 2006030241-01	PZ13 11/11/2006 2006110182-01
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																	
EPA Method 8270D / 8270D-SIM																	
Naphthalene	4900	0.10 U	NA	**0.30**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**3.0**	1.0 U	1.0 U	0.10 U	NA	**10.2**
2-Methylnaphthalene		NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA
Acenaphthylene		0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U
Acenaphthene		0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.75
Dibenzofuran		NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA
Fluorene		0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U
Pentachlorophenol	3	NA	NA	NA	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	NA	NA	NA
Phenanthrene		0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U
Carbazole		NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	NA	NA	NA
Anthracene		**0.20**	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U
Fluoranthene		0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U
Pyrene	2600	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U
Benzo(a)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(b)Fluoranthene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U
Benzo(k)Fluoranthene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U
1-Methylnaphthalene		NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA
Total Benzofluoranthenes											0.10 U	0.10 U	0.10 U	0.10 U			
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.071	0.071	0.071	0.071	0.076	0.076	0.076
PENTACHLOROPHENOL (µg/L)																	
EPA Method 8041/8270C,D																	
Pentachlorophenol	3	10 U	0.10 U	0.1 U	0.25 U	0.25 U	0.25 UJ	0.25 U	0.26 U	0.25 U	0.25 U	**1.8**	0.25 U	0.25 U	10 U	0.10 U	0.10 U
PETROLEUM HYDROCARBONS																	
Method NWTPH-G (µg/L)																	
Gasoline	1,000	50 U	50 U	50 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	50 U	50 U	**112**
Method NWTPH-Dx (µg/L)																	
Diesel	500	100 U	100 U	100 U	250 U	250 U	250 U	250 U	250 U	250 U	100 U	110 U	100 U	100 U	100 U	100 U	100 U
Motor Oil	500	500 U	500 U	500 U	500 U	500 U	500 U	500 U	250 U	500 U	200 U	220 U	200 U	200 U	500 U	500 U	500 U
Creosote Oil	500	NA	NA	NA	NA	250 U	500 U	250 U	500 U	250 U	100 U	220 U	200 U	200 U	NA	NA	NA
BTEX (µg/L)																	
Method SW8021B/SW021B MOD																	
Benzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m, p-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-1
HISTORICAL ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels For Groundwater (a)	PZ13 9/30/2007 LS10A	PZ13 3/19/2008 MO26H	PZ13 7/29/2008 NH92B	PZ13 1/8/2009 OH11A	PZ13 8/11/2009 PK28B	PZ13 9/21/2009 PP40A	PZ13 1/14/2010 QF84F	PZ-13 10/18/2010 RS33B	PZ-13 03/24/2011 SO90E	PZ-13 08/08/2011 TH68A	PZ-13 03/07/2012 UL19F	PZ17 6/28/2005 2005060439-04	PZ17 3/20/2006 2006030253-02	PZ17 11/13/2006 2006110200-01	PZ17 10/1/2007 LS10E	PZ17 3/19/2008 MO07B	PZ17 7/28/2008 NH70B
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																		
EPA Method 8270D / 8270D-SIM																		
Naphthalene	4900	1.0 U	1.0 U	1.0 U	1.0 U	**9.1**	**4.0**	**2.2**	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	**0.11**	1.0 U	1.0 U	1.0 U
2-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U
Acenaphthylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U
Acenaphthene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	**0.23**	1.0 U	1.0 U	1.0 U
Dibenzofuran		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U
Fluorene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U
Pentachlorophenol	3	5.0 U	5.0 U	5.0 U	5.0 U	5 U	NA	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	NA	NA	NA	5.0 U	5.0 U	5.0 U
Phenanthrene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U
Carbazole		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U
Anthracene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U
Fluoranthene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U
Pyrene	2600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U
Benzo(a)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(b)Fluoranthene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U	0.10 U	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(k)Fluoranthene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	1.0 U	0.10 U	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U
1-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U
Total Benzofluoranthenes									0.10 U	0.10 U	0.10 U	0.10 U						
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.076	0.076	0.076	0.076	0.076	0.76	0.076	0.071	0.071	0.071	0.071	0.076	0.076	0.076	0.076	0.076	0.076
PENTACHLOROPHENOL (µg/L)																		
EPA Method 8041/8270C,D																		
Pentachlorophenol	3	0.25 U	0.25 U	0.25 UJ	0.25 U	0.26 U		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	10 U	0.10 U	0.10 U	0.25 U	0.25 U	0.25 U
PETROLEUM HYDROCARBONS																		
Method NWTPH-G (µg/L)																		
Gasoline	1,000	250 U	250 U	250 U	250 U	**1,900**	**310**	250 U	250 U	250 U	250 U	**250**	50 U	50 U	50 U	250 U	250 U	250 U
Method NWTPH-Dx (µg/L)																		
Diesel	500	250 U	250 U	250 U	250 U	250 U		250 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	250 U	250 U	250 U
Motor Oil	500	500 U	500 U	500 U	500 U	250 U		500 U	200 U	200 U	200 U	200 U	500 U	500 U	500 U	500 U	500 U	500 U
Creosote Oil	500	NA	250 U	500 U	250 U	500 U		250 U	100 U	200 U	200 U	200 U	NA	NA	NA	NA	250 U	500 U
BTEX (µg/L)																		
Method SW8021B/SW021B MOD																		
Benzene	5	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,000	NA	NA	NA	NA	NA	**56**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m, p-Xylene	1,000	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	1,000	NA	NA	NA	NA	NA	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-1
HISTORICAL ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels For Groundwater (a)	PZ17 1/8/2009 OH11C	PZ17 8/10/2009 PJ99B	PZ17 1/14/2010 QF84C	PZ-17 10/18/2010 RS33D	PZ-17 03/24/2011 SO90L	PZ-17 08/08/2011 TH68C	PZ-17 03/07/2012 UL19C	PZ18 6/29/2005 2005060439-01	PZ18 3/21/2006 2006030261-01	PZ18 11/14/2006 2006110239-01	PZ18 10/1/2007 LS10C	PZ18 3/19/2008 MO07C	PZ18 7/28/2008 NH70C	PZ18 8/28/2008 NM64A	PZ18 1/8/2009 OH11E	PZ18 8/10/2009 PJ99C	PZ18 9/21/2009 PP40B
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																		
EPA Method 8270D / 8270D-SIM																		
Naphthalene	4900	1.0 U	1.2 U	1.0 U	1.0 U	**3.2**	1.0 U	1.0 U	0.10 U	NA	**0.13**	1.0 U	1.0 U	1.0 U	NA	1.0 U	**3.2**	1.0 U
2-Methylnaphthalene		1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.1 U	1.0 U
Acenaphthylene		1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.1 U	1.0 U
Acenaphthene		1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.1 U	1.0 U
Dibenzofuran		1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.1 U	1.0 U
Fluorene		1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.1 U	1.0 U
Pentachlorophenol	3	5.0 U	5.9 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	NA	NA	NA	5.0 U	5.0 U	5.0 U	NA	5.0 U	5.6 U	NA
Phenanthrene		1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.1 U	1.0 U
Carbazole		1.0 U	1.2 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.1 U	NA
Anthracene		1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.1 U	1.0 U
Fluoranthene		1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.1 U	1.0 U
Pyrene	2600	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.1 U	1.0 U
Benzo(a)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	1.0 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	1.0 U
Benzo(b)Fluoranthene		0.10 U	0.10 U	0.10 U	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	1.0 U
Benzo(k)Fluoranthene		0.10 U	0.10 U	0.10 U	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	1.0 U
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	1.0 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	1.0 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	1.0 U
Benzo(g,h,i)Perylene		1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.1 U	1.0 U
1-Methylnaphthalene		1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.1 U	1.0 U
Total Benzofluoranthenes					0.10 U	0.11 U	0.10 U	0.10 U										
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.076	0.076	0.076	0.071	0.078	0.071	0.071	0.076	0.076	0.076	0.076	0.076	0.076	NA	0.076	0.076	0.76
PENTACHLOROPHENOL (µg/L)																		
EPA Method 8041/8270C,D																		
Pentachlorophenol	3	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	10 U	0.10 U	0.10 U	0.25 U	0.25 U	**1.8** (d)	0.25 U	0.25 U	0.25 U	NA
PETROLEUM HYDROCARBONS																		
Method NWTPH-G (µg/L)																		
Gasoline	1,000	250 U	250 U	250 U	250 U	250 U	250 U	250 U	50 U	50 U	50 U	250 U	250 U	250 U	NA	250 U	250 U	NA
Method NWTPH-Dx (µg/L)																		
Diesel	500	250 U	250 U	250 U	100 U	100 U	110 U	100 U	100 UJ	100 U	100 U	250 U	250 U	250 U	NA	250 U	250 U	NA
Motor Oil	500	500 U	500 U	500 U	200 U	200 U	220 U	200 U	500 UJ	500 U	500 U	500 U	500 U	500 U	NA	500 U	500 U	NA
Creosote Oil	500	250 U	250 U	250 U	100 U	200 U	220 U	200 U	NA	**140**	NA	NA	250 U	500 U	NA	250 U	250 U	NA
BTEX (µg/L)																		
Method SW8021B/SW021B MOD																		
Benzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m, p-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-1
HISTORICAL ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels For Groundwater (a)	PZ18 1/15/2010 QF84K	PZ-18 10/19/2010 RS33L	PZ-18 03/24/2011 SO90F	PZ-18 08/08/2011 TH68F	PZ-18 03/07/2012 UL19E	PZ-18 3/30/2012 UO79A	PZ19 6/29/2005 2005060439-03	PZ19 3/22/2006 2006030294-04	PZ19 11/14/2006 2006110239-04	PZ19 10/2/2007 LS21E	PZ19 3/20/2008 MO26B	PZ19 7/28/2008 NH70E	PZ19 8/28/2008 NM64B	PZ19 1/9/2009 OH25C	PZ19 8/11/2009 PK28E	PZ19 1/18/2010 QG15C
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																	
EPA Method 8270D / 8270D-SIM																	
Naphthalene	4900	**2.8**	1.0 U	1.0 U	1.0 U	3.0 U	NA	**0.13**	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
2-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Acenaphthylene		1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Acenaphthene		1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Dibenzofuran		1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Fluorene		1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Pentachlorophenol	3	5.0 U	5.0 U	5.0 U	5.0 U	15 U	NA	NA	NA	NA	5.0 U	5.0 U	5.0 U	NA	5.0 U	5.0 U	5.0 U
Phenanthrene		1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Carbazole		1.0 U	1.0 UJ	1.0 U	1.0 U	3.0 U	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Anthracene		1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Fluoranthene		1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Pyrene	2600	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Benzo(a)Anthracene		0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	0.10 U
Chrysene		0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	0.10 U
Benzo(b)Fluoranthene		0.11 U	NA	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	0.10 U
Benzo(k)Fluoranthene		0.11 U	NA	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 UJ	0.10 U
Benzo(a)Pyrene		0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
1-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U
Total Benzofluoranthenes			0.10 U	0.10 U	0.10 U	0.10 U	NA										
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.083	0.071	0.071	0.071	0.071	NA	0.076	0.076	0.076	0.076	0.076	0.076	NA	0.076	0.076	0.076
PENTACHLOROPHENOL (µg/L)																	
EPA Method 8041/8270C,D																	
Pentachlorophenol	3	**0.41**	**0.91**	0.25 U	0.31 U	0.25 U	NA	10 U	0.10 U	0.10 U	0.21 U	0.25 U	**0.70** J (f)	0.25 U	0.25 U	0.26 U	0.25 U
PETROLEUM HYDROCARBONS																	
Method NWTPH-G (µg/L)																	
Gasoline	1,000	250 U	250 U	250 U	250 U	**270**	250 U	50 U	50 U	50 U	250 U	250 U	250 U	NA	250 U	250 U	250 U
Method NWTPH-Dx (µg/L)																	
Diesel	500	250 U	100 U	110 U	120 U	**130**	100 U	**106**	100 U	100 U	250 U	250 U	250 U	NA	250 U	250 U	250 U
Motor Oil	500	500 U	200 U	220 U	240 U	200 U	200 U	500 U	500 U	500 U	500 U	500 U	500 U	NA	500 U	250 U	500 U
Creosote Oil	500	250 U	100 U	220 U	240 U	**470**	200 U	NA	NA	NA	NA	250 U	500 U	NA	250 U	500 U	250 U
BTEX (µg/L)																	
Method SW8021B/SW021B MOD																	
Benzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m, p-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-1
HISTORICAL ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels For Groundwater (a)	PZ-19 10/19/2010 RS33H	PZ-19 03/25/2011 SO90H	PZ-19 08/09/2011 TI17B	PZ-19 03/08/2012 UL56G	LW3 6/28/2005 2005060439-05	LW3 3/23/2006 2006030316-02	LW3 11/13/2006 2006110200-02	Dup of LW3 PZ30 11/13/2006 2006110200-04	LW3 10/1/2007 LS10G	LW3 3/19/2008 MO07A	LW3 7/28/2008 NH70A	LW3 1/8/2009 OH11D	LW3 8/10/2009 PJ99A	LW3 1/14/2010 QF84E	LW-3 10/18/2010 RS33C	LW-3 03/24/2011 SO90M
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																	
EPA Method 8270D / 8270D-SIM																	
Naphthalene	4900	1.0 U	1.0 U	1.0 U	**2.8**	**0.21**	NA	**0.12**	**0.13**	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 U	**7.9**
2-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 U	1.0 U
Acenaphthylene		1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 U	1.0 U
Acenaphthene		1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 U	1.0 U
Dibenzofuran		1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 U	1.0 U
Fluorene		1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 U	1.0 U
Pentachlorophenol	3	5.0 U	5.0 U	5.0 U	5.0 U	NA	NA	NA	NA	5.0 U	5.0 U	5.0 U	5.0 U	10 UJ	5.0 U	15 U	5.0 U
Phenanthrene		1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 U	1.0 U
Carbazole		1.0 UJ	1.0 U	1.0 U	1.0 U	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 UJ	1.0 U
Anthracene		1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 U	1.0 U
Fluoranthene		1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 U	1.0 U
Pyrene	2600	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 U	1.0 U
Benzo(a)Anthracene		0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U
Chrysene		0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U
Benzo(b)Fluoranthene		NA	NA	NA	NA	0.10 U	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA
Benzo(k)Fluoranthene		NA	NA	NA	NA	0.10 U	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA
Benzo(a)Pyrene		0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 U	1.0 U
1-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	2.0 UJ	1.0 U	3.0 U	1.0 U
Total Benzofluoranthenes		0.10 U	0.10 U	0.11 U	0.10 U											0.10 U	1.0 U
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.071	0.071	0.078	0.071	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.071	0.71 U
PENTACHLOROPHENOL (µg/L)																	
EPA Method 8041/8270C,D																	
Pentachlorophenol	3	0.25 U	0.25 U	0.25 U	0.25 U	10 U	0.10 U	0.10 U	0.10 U	**3.6** J	0.25 U	**0.57**	0.25 U	0.28 U	0.25 U	0.25 U	0.25 U
PETROLEUM HYDROCARBONS																	
Method NWTPH-G (µg/L)																	
Gasoline	1,000	250 U	250 U	250 U	250 U	**1,750** (e)	**53**	50 U	50 U	250 U	250 U	250 U	250 U	**20,000**	**1800**	250 U	250 U
Method NWTPH-Dx (µg/L)																	
Diesel	500	100 U	110 U	100 U	100 U	100 U	100 U	100 U	100 U	250 U	250 U	250 U	250 U	**770**	**1200**	100 U	120 U
Motor Oil	500	200 U	230 U	200 U	200 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	**1,300**	**1200**	200 U	250 U
Creosote Oil	500	100 U	230 U	200 U	200 U	NA	NA	NA	NA	NA	250 U	500 U	250 U	**2,000**	**4400**	**170**	250 U
BTEX (µg/L)																	
Method SW8021B/SW021B MOD																	
Benzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m, p-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-1
HISTORICAL ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels For Groundwater (a)	LW-3 08/08/2011 TH68D	LW-3 03/07/2012 UL19D	LW-4R 6/29/2005 2005060439-02	LW-4R 3/23/2006 2006030316-01	LW-4R 11/14/2006 2006110239-02	LW-4R 10/1/2007 LS10D	LW-4R 3/19/2008 MO07D	LW-4R 7/28/2008 NH70D	LW-4R 1/8/2009 OH11F	LW-4R 8/10/2009 PJ99D	LW-4R 1/15/2010 QF84L	LW-4R 10/19/2010 RS33N	LW-4R 03/24/2011 SO90A	LW-4R 08/08/2011 TH68E	LW-4R 03/07/2012 UL19A	MW-01S 6/30/2005 2005070010-01
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																	
EPA Method 8270D / 8270D-SIM																	
Naphthalene	4900	1.0 U	3.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.9**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**5,130**
2-Methylnaphthalene		1.0 U	3.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA
Acenaphthylene		1.0 U	3.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**860**
Acenaphthene		1.0 U	3.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U
Dibenzofuran		1.0 U	3.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA
Fluorene		1.0 U	3.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**380**
Pentachlorophenol	3	5.0 U	15 U	NA	NA	NA	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	NA
Phenanthrene		1.0 U	3.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**23**
Carbazole		1.0 U	3.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	NA
Anthracene		1.0 U	3.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**17**
Fluoranthene		1.0 U	3.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U
Pyrene	2600	1.0 U	3.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**12**
Benzo(a)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U
Benzo(b)Fluoranthene		NA	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	NA	NA	NA	NA	10 U
Benzo(k)Fluoranthene		NA	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	NA	NA	NA	NA	10 U
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U
Benzo(g,h,i)Perylene		1.0 U	3.0 U	0.10 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U
1-Methylnaphthalene		1.0 U	3.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA
Total Benzofluoranthenes		0.10 U	0.10 U										0.10 U	0.10 U	0.10 U	0.10 U	
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.071	0.071	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.083	0.071	0.071	0.071	0.071	0.076
PENTACHLOROPHENOL (µg/L)																	
EPA Method 8041/8270C,D																	
Pentachlorophenol	3	0.25 U	0.25 U	10 U	0.10 U	0.10 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	**0.42**	0.25 U	0.25 U	0.25 U	**7,470**
PETROLEUM HYDROCARBONS																	
Method NWTPH-G (µg/L)																	
Gasoline	1,000	**1400**	**1300**	50 U	50 U	50 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	**5,830** (f)
Method NWTPH-Dx (µg/L)																	
Diesel	500	**170**	**620**	100 U	100 U	100 U	250 U	250 U	250 U	250 U	250 U	250 U	100 U	130 U	110 U	100 U	100 U
Motor Oil	500	220 U	**1200**	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	200 U	260 U	220 U	200 U	500 U
Creosote Oil	500	**390**	**2100**	NA	NA	NA	NA	250 U	500 U	250 U	250 U	250 U	100 U	260 U	220 U	200 U	**13,000**
BTEX (µg/L)																	
Method SW8021B/SW021B MOD																	
Benzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m, p-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-1
HISTORICAL ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels For Groundwater (a)	MW-01S 3/21/2006 2006030261-04	Dup of MW-01S PZ30 3/21/2006 2006030261-05	MW-01S 11/15/2006 2006110251-01	MW-01S 10/1/2007 LS10F	MW-01S 3/19/2008 MO07F	MW-01S 7/29/2008 NH92C	MW-01S 1/9/2009 OH25E	MW-01S 8/10/2009 PJ99F	MW-01S 1/15/2010 QF84H	MW-01S 10/19/2010 RS33M	MW-01S 03/25/2011 SO90N	MW-01S 08/09/2011 TI17G	MW-01S 03/08/2012 UL56H	MW-02S 7/1/2005 2005070010-05	MW-02S 3/22/2006 2006030294-01	MW-02S 11/15/2006 2006110251-04	MW-02S 10/2/2007 LS21A
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																			
EPA Method 8270D / 8270D-SIM																			
Naphthalene	4900	NA	NA	**3,120**	**11,000**	**7,100**	**11,000**	**9,000**	**9100**	**5000**	**9100**	**5400**	**6900**	**5000**	**0.29**	NA	**44.1**	1.0 U
2-Methylnaphthalene		NA	NA	NA	**920**	**1,000**	**810**	**1,000**	**890**	**900**	**750**	**740**	**680**	**1100**	NA	NA	NA	1.0 U
Acenaphthylene		NA	NA	**33**	**8.9**	**10**	**6.6**	**9.7** J	2.0 U	100 U	100 U	1.0 U	1.0 U	**6.8**	**0.10**	NA	0.10 U	1.0 U
Acenaphthene		NA	NA	**398**	**210**	**290**	**200**	**290**	**250**	**270**	**190**	**200**	**190**	**340**	**0.92**	NA	**0.36**	1.0 U
Dibenzofuran		NA	NA	NA	**73**	**130**	**98**	**110**	**99**	**120**	100 U	**64**	**79**	**79**	NA	NA	NA	1.0 U
Fluorene		NA	NA	**112**	**59**	**100**	**63**	**86**	**72**	100 U	100 U	**47**	**47**	**69**	0.10 U	NA	0.10 U	1.0 U
Pentachlorophenol	3	NA	NA	NA	**8,300**	**4,100**	**2,000**	**1,600**	**3900**	**4400**	**3500**	**4200**	**4200**	**3200**	NA	NA	NA	5.0 U
Phenanthrene		NA	NA	**132**	**46**	**98**	**53**	**76**	**44**	100 U	100 U	**44**	**34**	**65**	0.10 U	NA	0.10 U	1.0 U
Carbazole		NA	NA	NA	**120**	**120**	**69**	**80**	**86**	100 U	100 UJ	**57**	**24**	**53**	NA	NA	NA	1.0 U
Anthracene		NA	NA	**96**	**14**	**26**	**14**	**17**	**40**	100 U	100 U	**12**	**10**	**18**	**1.19** E	NA	**1.65**	1.0 U
Fluoranthene		NA	NA	**172**	**6.3**	**30**	**11**	**13**	**14**	100 U	100 U	**7.8**	**2.0**	**19**	**0.28**	NA	0.10 U	1.0 U
Pyrene	2600	NA	NA	**24**	**7.8**	**15**	**5.2**	**11**	**7.4**	100 U	100 U	**3.9**	**1.7**	**14**	**0.18**	NA	0.10 U	1.0 U
Benzo(a)Anthracene		**0.84**	**0.86**	10 U	**1.6**	**2.1**	5.0 U	**1.5** J	**3.6** J	**4.2**	**0.58**	1.0 U	**1.0**	**1.8**	0.10 U	0.10 U	0.10 U	0.10 U
Chrysene		**0.55**	**0.57**	10 U	**1.7**	**2.2**	5.0 U	**1.6** J	**3.8** J	**4.4**	**0.51**	1.0 U	**1.1**	**1.8**	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(b)Fluoranthene		**0.98**	**1.05**	10 U	**0.88**	**1.1**	5.0 U	1.0 U	**1.0**	**1.3**	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(k)Fluoranthene		**0.55**	**0.59**	10 U	**0.32**	1.0 U	5.0 U	1.0 U	**1.0**	**1.3**	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(a)Pyrene		**0.74**	**0.80**	10 U	**0.53**	1.0 U	5.0 U	1.0 U	**1.3**	**1.6**	**0.18**	1.0 U	**0.33**	**0.65**	0.10 U	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		**0.22**	**0.24**	10 U	**0.12**	1.0 U	5.0 U	1.0 U	**0.34**	**0.35**	0.10 U	1.0 U	0.12 U	**0.14**	0.10 U	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	10 U	0.10 U	1.0 U	5.0 U	1.0 U	**0.20**	**0.17**	0.10 U	1.0 U	0.12 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		NA	NA	10 U	1.0 U	10 U	5.0 U	10 U	2.0 U	100 U	100 U	1.0 U	1.0 U	1.0 U	0.10 U	NA	0.10 U	1.0 U
1-Methylnaphthalene		NA	NA	NA	**470**	**640**	**570**	**610**	**520**	**520**	**400**	**380**	**390**	**770**	NA	NA	NA	1.0 U
Total Benzofluoranthenes											**0.35**	1.0 U	**0.76**	**1.4**				
cPAH TEQ (b)	0.1 (c)	**1.00**	**1.08**	ND	**0.839**	**0.342**	ND	**0.166**	**1.95**	**2.38**	**0.278**	ND	**0.517**	**1.0**	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	**1.01**	**1.08**	0.076	**0.84**	**0.992**	**3.78**	**0.866**	**1.95**	**2.38**	**0.288**	0.71 U	**0.529**	**1.0**	0.076	0.076	0.076	0.076
PENTACHLOROPHENOL (µg/L)																		
EPA Method 8041/8270C,D																		
Pentachlorophenol	3	**3,440**	**3,330**	**9,120**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.50 U	0.10 U	**0.63**	0.21 U
PETROLEUM HYDROCARBONS																		
Method NWTPH-G (µg/L)																		
Gasoline	1,000	**9,620**	**9,580**	**28,000**	**52,000**	**16,000**	**40,000**	**41,000**	**14,000**	**23,000**	**36,000**	**57,000**	**55,000**	**26,000**	50 U	50 U	**99**	250 U
Method NWTPH-Dx (µg/L)																		
Diesel	500	100 U	100 U	100 U	**9,100**	**9,300**	**7,800**	**5,600**	**7,600**	**6000**	**4800**	**5100**	**9800**	**4400**	100 U	100 U	100 U	250 U
Motor Oil	500	500 U	500 U	500 U	2500 U	5000 U	5,000 U	5,000 U	2500 U	5000 U	2000 U	**500**	1000 U	200 U	500 U	500 U	500 U	500 U
Creosote Oil	500	**6530** J	**5,090** J	**8,370**	NA	**48,000**	**46,000**	**48,000**	**22,000**	**24,000**	**35,000**	**24,000**	**31,000**	**18,000**	NA	NA	NA	NA
BTEX (µg/L)																		
Method SW8021B/SW021B MOD																		
Benzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m, p-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-1
HISTORICAL ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels For Groundwater (a)	MW-02S 3/20/2008 MO26E	MW-02S 7/28/2008 NH70G	MW-02S 1/7/2009 OG76B	Dup of MW-02S MW30 1/7/2009 OG76A	MW-02S 8/11/2009 PK28C	MW-02S 1/18/2010 QG15B	MW-02S 10/18/2010 RS33E	MW-02S 03/25/2011 SO90I	MW-02S 08/09/2011 TI17E	MW-02S 03/08/2012 UL56D	MW-05S 6/30/2005 2005070010-03	Dup of MW-05S PZ30 6/30/2005 2005070010-04	MW-05S 3/22/2006 2006030294-07	MW-05S 11/16/2006 2006110275-01	MW-05S 10/2/2007 LS21C
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																
EPA Method 8270D / 8270D-SIM																
Naphthalene	4900	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**10.8** E	**11.8** E	NA	**29.1**	**92**
2-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA	NA	**2.5**
Acenaphthylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**0.29**	**0.27**	NA	**0.14**	1.0 U
Acenaphthene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**5.25** E	**5.13** E	NA	**5.91**	**9.2**
Dibenzofuran		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA	NA	**3.2**
Fluorene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.26** E	**2.26** E	NA	**1.00**	**2.8**
Pentachlorophenol	3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	NA	NA	NA	NA	5.0 U
Phenanthrene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.45** E	**1.76** E	NA	**1.18**	**1.9**
Carbazole		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	NA	NA	NA	NA	**1.9**
Anthracene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.1**	1.0 U	**1.23** E	**1.25** E	NA	**1.02**	1.0 U
Fluoranthene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.71** E	**1.75** E	NA	**0.90**	1.0 U
Pyrene	2600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.64** E	**1.71** E	NA	**0.41**	1.0 U
Benzo(a)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U	**0.28**	**0.33**	0.10 U	**0.18**	0.10 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U	**0.20**	**0.22**	0.10 U	0.10 U	0.10 U
Benzo(b)Fluoranthene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(k)Fluoranthene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	0.10 U	NA	0.10 U	1.0 U
1-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA	NA	**5.2**
Total Benzofluoranthenes								0.10 U	0.12 U	0.10 U	0.10 U					
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.030**	**0.035**	ND	**0.018**	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.076	0.076	0.076	0.076	0.076	0.076	0.071	0.085	0.071	0.071	**0.039**	**0.044**	0.076	**0.089**	0.076
PENTACHLOROPHENOL (µg/L)																
EPA Method 8041/8270C,D																
Pentachlorophenol	3	0.25 U	**1.0**	0.25 U	0.25 U	0.26 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.10 U	0.50 U	0.10 U	0.10 U	0.25 U
PETROLEUM HYDROCARBONS																
Method NWTPH-G (µg/L)																
Gasoline	1,000	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	**480**	250 U	50 U	50 U	50 U	50 U	**530**
Method NWTPH-Dx (µg/L)																
Diesel	500	250 U	250 U	250 U	250 U	250 U	250 U	100 U	120 U	**130**	100 U	100 U	100 U	**430**	100 U	250 U
Motor Oil	500	500 U	500 U	500 U	500 U	250 U	500 U	200 U	240 U	**990**	200 U	500 U	500 U	500 U	500 U	500 U
Creosote Oil	500	250 U	500 U	250 U	250 U	500 U	250 U	100 U	240 U	200 U	200 U	NA	NA	NA	NA	NA
BTEX (µg/L)																
Method SW8021B/SW021B MOD																
Benzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m, p-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-1
HISTORICAL ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels For Groundwater (a)	MW-05S 3/20/2008 MO26C	Dup of MW-05S PZ30 3/20/2008 MO26A	MW-05S 7/29/2008 NH92E	Dup of MW-05S PZ30 7/29/2008 NH92F	MW-05S 1/7/2009 OG76C	MW-05S 8/11/2009 PK28H	Dup of MW-05S PZ30 8/11/2009 PK28I	MW-05S 1/14/2010 QF84B	Dup of MW-05S PZ30 1/14/2010 QF84G	MW-05S 10/19/2010 RS33I	Dup of MW-05S Duplicate 10/19/2010 RS33J	MW-05S 03/25/2011 SO90C	Dup of MW-05S Duplicate 03/25/2011 SO90B	MW-05S 08/09/2011 TI17C	Dup of MW-05S Duplicate 08/09/2011 TI17A	MW-05S 03/08/2012 UL56E
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																	
EPA Method 8270D / 8270D-SIM																	
Naphthalene	4900	**48**	**43**	**46**	**39**	**17**	1.0 U	1.0 U	**5.3**	**5.3**	**1.8** J	**4.8** J	1.0 U	1.0 U	1.0 U	1.0 U	**1.1**
2-Methylnaphthalene		**2.0**	**1.8**	**2.0**	**2.1**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Acenaphthylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Acenaphthene		**8.8**	**7.6**	**8.3**	**7.3**	**6.6**	**4.3**	**4.4**	**13**	**11**	**9.0**	**8.3**	**6.0**	**6.1**	**7.6**	**8.1**	**7.5**
Dibenzofuran		**2.9**	**2.5**	**2.6**	**2.3**	**1.6**	1.0 U	1.0 U	**3.1**	**2.2**	**2.0**	**2.0**	1.0 U	1.0 U	1.0 U	**1.0**	1.0 U
Fluorene		**2.6**	**2.2**	**2.0**	**1.7**	1.0 U	1.0 U	1.0 U	**1.0**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pentachlorophenol	3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenanthrene		**1.8**	**1.6**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbazole		**1.1**	1.0 U	**1.0**	1.0 U	**1.2**	1.0 U	1.0 U	**1.9**	**1.3**	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene		1.0 U	1.0 U	1.0 U	1.0 U	**1.0**	**1.2**	**1.3**	**1.4**	**1.5**	1.0 U	1.0 U	**1.2**	**1.2**	**1.1**	**1.3**	1.0 U
Fluoranthene		**1.1**	**1.0**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pyrene	2600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)Anthracene		**0.10**	**0.10**	**0.11**	0.10 U	**0.13**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.12 U	0.12 U	0.11 U	0.10 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U	**0.13**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.12 U	0.12 U	0.11 U	0.10 U
Benzo(b)Fluoranthene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA	NA	NA	NA	NA
Benzo(k)Fluoranthene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 UJ	0.10 U	0.10 U	NA	NA	NA	NA	NA	NA	NA
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	**0.12**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.12 U	0.12 U	0.11 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.12 U	0.12 U	0.11 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.12 U	0.12 U	0.11 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1-Methylnaphthalene		**3.9**	**3.4**	**4.0**	**3.6**	**1.7**	1.0 U	1.0 U	**2.6** J	**1.5** J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Total Benzofluoranthenes											0.10 U	0.10 U	0.12 U	0.12 U	0.12 U	0.11 U	0.10 U
cPAH TEQ (b)	0.1 (c)	0.010	0.010	0.011	ND	**0.134**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.081	0.081	0.082	0.076	**0.154**	0.076	0.076	0.076	0.076	0.071	0.071	0.085	0.085	0.085	0.078	0.071
PENTACHLOROPHENOL (µg/L)																	
EPA Method 8041/8270C,D																	
Pentachlorophenol	3	0.25 U	0.25 U	0.25 UJ	0.25 UJ	0.25 U	0.25 U	0.27 U	0.25 U	0.25 U	0.25 U	0.27 U	0.25 U	0.25 U	0.28 U	0.28 U	0.25 U
PETROLEUM HYDROCARBONS																	
Method NWTPH-G (µg/L)																	
Gasoline	1,000	**320**	250 U	**270**	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
Method NWTPH-Dx (µg/L)																	
Diesel	500	250 U	250 U	250 U	NA	250 U	250 U	250 U	250 U	250 U	100 U	100 U	120 U	120 U	100 U	**110**	100 U
Motor Oil	500	500 U	500 U	500 U	NA	500 U	250 U	250 U	500 U	500 U	200 U	200 U	250 U	230 U	200 UJ	**500** J	200 U
Creosote Oil	500	**410**	**390**	500 U	NA	250 U	500 U	500 U	250 U	250 U	100 U	100 U	250 U	230 U	200 U	200 U	200 U
BTEX (µg/L)																	
Method SW8021B/SW021B MOD																	
Benzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m, p-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-1
HISTORICAL ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels For Groundwater (a)	Dup of MW-05S PZ-30 03/08/2012 UL56F	MW-01D 10/7/1998	MW-01D 3/21/2006 2006030261-02	MW-01D 11/15/2006 2006110251-02	MW-01D 10/1/2007 LS10H	MW-01D 3/19/2008 MO07E	MW-01D 7/29/2008 NH92D	MW-01D 1/9/2009 OH25D	MW-01D 8/10/2009 PJ99E	MW-01D 1/15/2010 QF84I	MW-01D 10/19/2010 RS33O	MW-01D 03/25/2011 SO90J	MW-01D 08/09/2011 TI17F	MW-01D 03/08/2012 UL56I	MW-02D 10/7/1998	MW-02D 3/22/2006 2006030294-02	MW-02D 11/15/2006 2006110251-05
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																		
EPA Method 8270D / 8270D-SIM																		
Naphthalene	4900	**2.0**	**91**	NA	**1.24**	1.0 U	1.0 U	**2.2**	**0.7** J	**1.8**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**600**	NA	**143**
2-Methylnaphthalene		1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA
Acenaphthylene		1.0 U	0.2 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.0**	NA	**0.95**
Acenaphthene		**8.2**	**58**	NA	**0.48**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**54**	NA	**96**
Dibenzofuran		1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA
Fluorene		1.0 U	**30**	NA	**0.31**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**18**	NA	**40**
Pentachlorophenol	3	5.0 U	NA	NA	NA	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	NA	NA	NA
Phenanthrene		1.0 U	**56**	NA	**1.42**	1.0 U	1.0 U	1.0 U	**0.6** J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**7.1**	NA	**27**
Carbazole		1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	NA	NA	NA
Anthracene		1.0 U	**8.7**	NA	**0.39**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	**0.50**
Fluoranthene		1.0 U	**9.4**	NA	**0.89**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.0**	NA	0.10 U
Pyrene	2600	1.0 U	**7.6**	NA	**0.39**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.7**	NA	0.10 U
Benzo(a)Anthracene		0.10 U	**1.0**	0.10 U	0.10 U	**0.11**	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	1.0 U	0.10 U	0.10 U
Chrysene		0.10 U	**1.2**	0.10 U	0.10 U	**0.11**	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	1.0 U	0.10 U	0.10 U
Benzo(b)Fluoranthene		NA	**0.3**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	NA	NA	NA	NA	1.0 U	0.10 U	0.10 U
Benzo(k)Fluoranthene		NA	**0.3**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	NA	NA	NA	NA	1.0 U	0.10 U	0.10 U
Benzo(a)Pyrene		0.10 U	0.2 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	1.0 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.2 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	1.0 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.2 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	1.0 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	0.2 U	NA	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	0.10 U
1-Methylnaphthalene		1.0 U	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	NA	NA
Total Benzofluoranthenes		0.10 U										0.10 U	0.10 U	0.12 U	0.10 U			
cPAH TEQ (b)	0.1 (c)	ND	**0.172**	ND	ND	**0.0121**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**15**	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.071	**0.292**	0.076	0.076	**0.082**	0.076	0.076	0.076	0.076	0.083	0.071	0.071	0.085	0.071	ND	0.076	0.076
PENTACHLOROPHENOL (µg/L)																		
EPA Method 8041/8270C,D																		
Pentachlorophenol	3	0.25 U	**18**	0.10 U	0.10 U	**0.2** UJ	0.25 U	0.25 UJ	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.29 U	**0.85**	5.0 U	0.10 U	10 U
PETROLEUM HYDROCARBONS																		
Method NWTPH-G (µg/L)																		
Gasoline	1,000	250 U	NA	50 U	50 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	NA	**495**	**830**
Method NWTPH-Dx (µg/L)																		
Diesel	500	100 U	**2500**	100 U	100 U	250 U	250 U	250 U	250 U	250 U	250 U	100 U	100 U	100 U	100 U	**1800**	100 U	100 U
Motor Oil	500	200 U	**2800**	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	200 U	200 U	200 U	200 U	**5200**	500 U	500 U
Creosote Oil	500	200 U	NA	**106**	NA	NA	250 U	500 U	250 U	250 U	250 U	100 U	200 U	200 U	200 U	NA	**790**	**1,710**
BTEX (µg/L)																		
Method SW8021B/SW021B MOD																		
Benzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m, p-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-1
HISTORICAL ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
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	Cleanup Screening Levels For Groundwater (a)	MW-02D 10/2/2007 LS21B	Dup of MW-02D PZ30 10/2/2007 LS21F	MW-02D 3/19/2008 MO26I	MW-02D 7/29/2008 NH92H	MW-02D 1/9/2009 OH25A	MW-02D 8/11/2009 PK28D	MW-02D 1/18/2010 QG15A	MW-02D 10/18/2010 RS33F	MW-02D 03/25/2011 SO90G	MW-02D 08/09/2011 TI17D	MW-02D 03/08/2012 UL56A	MW-05D 10/7/1998	MW-05D 3/22/2006 2006030294-06	MW-05D 11/16/2006 2006110275-02	MW-05D 10/2/2007 LS21D	MW-05D 3/20/2008 MO26F
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																	
EPA Method 8270D / 8270D-SIM																	
Naphthalene	4900	**680** J	**500** J	**380**	1.1 U	**210**	**230**	**180**	1.0 U	**76**	**110**	**19**	**4.0**	NA	**21.0**	**28**	**27**
2-Methylnaphthalene		**120**	**85**	**94**	1.1 U	**26**	**38**	**36**	1.0 U	**13**	**9.4**	**1.5**	NA	NA	NA	**3.0**	**3.0**
Acenaphthylene		**1.6**	**1.3**	**1.2**	1.1 U	1.0 U	1.0 U	1.0 U	**1.9**	1.0 U	1.0 U	1.0 U	**4.1**	NA	**0.10**	1.0 U	1.0 U
Acenaphthene		**86** J	**67** J	**70**	1.1 U	**26**	**35**	**34**	**8.8**	**21**	**18**	**9.3**	**15**	NA	**6.39**	**5.8**	**6.7**
Dibenzofuran		**35**	**26**	**30**	1.1 U	**8.1**	**12**	**14**	**3.0**	**7.9**	**6.1**	**3.2**	NA	NA	NA	**2.2**	**2.5**
Fluorene		**37** J	**28** J	**30**	1.1 U	**9.3**	**12**	**15**	**11**	**8.4**	**5.8**	**3.8**	**5.0**	NA	**2.60**	**1.8**	**2.3**
Pentachlorophenol	3	5.0 U	5.0 U	5.0 U	5.5 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	NA	NA	NA	5.0 U	5.0 U
Phenanthrene		**23** J	**18** J	**22**	1.1 U	**6.0**	**7.2**	**9.1**	**5.0**	**5.1**	**3.9**	**2.3**	**8.5**	NA	**0.89**	**1.1**	**1.2**
Carbazole		**23**	**16**	**21**	**1.5**	**8.0**	**9.0**	**9.1**	**8.3** J	**5.7**	**4.9**	**1.4**	NA	NA	NA	**1.5**	**1.6**
Anthracene		1.0 U	1.0 U	**1.0**	1.1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	**0.25**	1.0 U	1.0 U
Fluoranthene		1.0 U	1.0 U	1.0 U	1.1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**8.5**	NA	**0.60**	1.0 U	1.0 U
Pyrene	2600	1.0 U	1.0 U	1.0 U	1.1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**7.0**	NA	**0.27**	1.0 U	1.0 U
Benzo(a)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U	0.10 U	0.10 U	1.0 U	0.10 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(b)Fluoranthene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA	NA	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(k)Fluoranthene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	NA	NA	NA	NA	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	0.10 U	1.0 U	1.0 U
1-Methylnaphthalene		**77**	**68**	**66**	1.1 U	**22**	**32**	**30**	1.0 U	**15**	**13**	**5.1**	NA	NA	NA	**2.8**	**3.1**
Total Benzofluoranthenes									0.10 U	0.10 U	0.10 U	0.10 U					
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.0**	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.071	0.071	0.071	0.071	ND	0.076	0.076	0.076	0.076
PENTACHLOROPHENOL (µg/L)																	
EPA Method 8041/8270C,D																	
Pentachlorophenol	3	0.23 U	0.25 U	0.25 U	0.25 UJ	0.25 U	0.26 U	0.25 U	0.25 U	0.25 U	0.26 U	0.25 U	5.0 U	0.10 U	0.10 U	0.22 U	0.25 U
PETROLEUM HYDROCARBONS																	
Method NWTPH-G (µg/L)																	
Gasoline	1,000	**3,100**	**2,900**	**1,700**	**980**	**760**	**790**	**600**	**420**	**620**	250 U	250 U	NA	50 U	50 U	250 U	250 U
Method NWTPH-Dx (µg/L)																	
Diesel	500	**290**	**280**	**540**	250 U	250 U	250 U	250 U	100 U	120 U	**140**	100 U	**440**	100 U	100 U	250 U	250 U
Motor Oil	500	500 U	500 U	500 U	500 U	500 U	250 U	500 U	200 U	230 U	200 U	**210**	**520**	500 U	500 U	500 U	500 U
Creosote Oil	500	NA	NA	**4,200**	500 U	**990**	**600**	**700**	**270**	**280**	**440**	200 U	NA	NA	NA	NA	**370**
BTEX (µg/L)																	
Method SW8021B/SW021B MOD																	
Benzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m, p-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-1
HISTORICAL ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels For Groundwater (a)	MW-05D 7/29/2008 NH92G	MW-05D 1/9/2009 OH25B	MW-05D 8/11/2009 PK28G	MW-05D 1/14/2010 QF84A	MW-05D 10/19/2010 RS33K	MW-05D 03/25/2011 SO90D	MW05D 08/09/2011 TI17I	MW-05D 03/08/2012 UL56C	CW-13 11/16/2006 2006110275-04	CW-13 10/2/2007 LS22A	CW-13 3/20/2008 MO26D	CW-13 7/28/2008 NH70F	CW-13 8/11/2009 PK28F	CW-13 1/14/2010 QF84D	CW-13 10/19/2010 RS33G	CW-13 03/25/2011 SO90K	CW-13 08/09/2011 TI17H	CW-13 03/08/2012 UL56B
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)																			
EPA Method 8270D / 8270D-SIM																			
Naphthalene	4900	**2.2**	**1.2**	**3.4**	1.0 U	1.0 U	1.0 U	**2.1**	1.0 U	**1.54**	**8.7**	**11**	**30**	**4.8**	1.0 U	1.0 U	1.0 U	**5.2**	1.0 U
2-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Acenaphthylene		1.0 U	1.0 U	1.0 U	**1.1**	1.0 U	1.0 U	1.0 U	1.0 U	**0.48**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Acenaphthene		**3.9**	**0.6** J	**3.7**	1.0 U	**4.2**	**1.3**	**2.6**	**3.3**	**50.0**	**64**	**44**	**51**	**25**	1.0 U	**5.4**	1.0 U	**4.3**	1.0 U
Dibenzofuran		**1.4**	1.0 U	**1.1**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	**19**	**15**	**18**	**7.6**	1.0 U	**1.5**	1.0 U	1.0 U	1.0 U
Fluorene		**1.0**	1.0 U	**1.2**	1.0 U	1.0 U	1.0 U	**1.2**	1.0 U	**20.7**	**25**	**16**	**21**	**8.7**	1.0 U	**2.4**	1.0 U	1.0 U	1.0 U
Pentachlorophenol	3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	NA	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenanthrene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**34.5**	**31**	**14**	**21**	**8.2**	1.0 U	**1.2**	1.0 U	1.0 U	1.0 U
Carbazole		**1.4**	1.0 U	**1.5**	1.0 U	**1.6** J	1.0 U	1.0 U	**1.1**	NA	**14**	**11**	**13**	**3.0**	1.0 U	1.0 UJ	1.0 U	**1.4**	1.0 U
Anthracene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**4.38**	**3.3**	**1.8**	**2.8**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluoranthene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**5.47**	**5.9**	**1.8**	**3.2**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pyrene	2600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.44**	**2.2**	1.0 U	**1.4**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.11 U	0.10 U	**0.37**	**0.24**	**0.14**	**0.13**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.11 U	0.10 U	**0.25**	**0.24**	**0.10**	**0.12**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(b)Fluoranthene		0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	NA	NA	NA	NA
Benzo(k)Fluoranthene		0.10 U	0.10 U	0.10 UJ	0.10 U	NA	NA	NA	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	NA	NA	NA	NA
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.11 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1-Methylnaphthalene		1.0 U	1.0 U	**1.0**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NA	**34**	**27**	**34**	**12**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Total Benzofluoranthenes						0.10 U	0.12 U	0.11 U	0.10 U							0.10 U	0.10 U	0.10 U	0.10 U
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	ND	ND	ND	**0.040**	**0.0264**	**0.015**	**0.014**	ND	ND	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.076	0.076	0.076	0.076	0.071	0.085	0.078	0.071	**0.110**	**0.096**	**0.085**	**0.084**	0.076	0.076	0.071	0.071	0.071	0.071
PENTACHLOROPHENOL (µg/L)																			
EPA Method 8041/8270C,D																			
Pentachlorophenol	3	0.25 UJ	0.25 U	0.25 U	0.25 U	0.26 U	0.25 U	0.25 U	0.25 U	0.10 U	0.22 U	0.25 U	**2.9**	0.26 U	0.25 U	0.25 U	0.25 U	**1.0**	0.25 U
PETROLEUM HYDROCARBONS																			
Method NWTPH-G (µg/L)																			
Gasoline	1,000	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	**83**	**750**	**630**	**1,000**	250 U	250 U	250 U	250 U	250 U	250 U
Method NWTPH-Dx (µg/L)																			
Diesel	500	250 U	250 U	250 U	250 U	100 U	110 U	100 U	100 U	100 U	250 U	**290**	**270**	250 U	250 U	100 U	100 U	100 U	100 U
Motor Oil	500	500 U	500 U	250 U	500 U	200 U	220 U	200 U	200 U	500 U	500 U	500 U	500 U	250 U	500 U	200 U	200 U	200 U	200 U
Creosote Oil	500	500 U	250 U	500 U	250 U	100 U	220 U	200 U	200 U	**471**	NA	**1,100**	**960**	500 U	250 U	100 U	200 U	200 U	200 U
BTEX (µg/L)																			
Method SW8021B/SW021B MOD																			
Benzene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m, p-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

U = Indicates the compound was undetected at the given reporting limit.
UJ = The analyte was not detected in the sample; the reported sample detection limit is an estimate.
J = Indicates the analyte was positively identified; the associated value is approximate.
E = The reported concentration is an estimate; the result exceeded the instrument calibration range.
NA = Not analyzed.
ND = Not Detected.
Bold indicates detected compound. Box indicates exceedance of screening levels.
Box indicates exceedance of screening level.

(a) Groundwater screening levels are MTCA Method B for marine surface water for cPAHs and PCP; MTCA Method A for TPH-G/TPH-Dx.
(b) TEQ = toxicity equivalency factor as described in WAC 173-340-708 (8).
(c) cPAH cleanup screening levels based on practical quantitation limit (PQL) for individual cPAHs.
(d) PCP results on 7/28/08 for PZ-18 and PZ-19 were not consistent with historical results. Confirmation verification samples were collected on 8/28/08. Both sets of data are presented in this table.
(e) The gasoline-range hydrocarbon result for this sample consisted of a solitary peak, identified by GCMS as toluene.
(f) The sample contains gasoline-range hydrocarbons which C not appear to be automotive gasoline.

Note: Beginning with October 2010 data, lab no longer reports benzo(b)fluoranthenes or benzo(k)fluoranthenes but does report total benzofluoranthenes.

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
1	11/8/2006	PZ-13	4.67	19.50	14.83	--	
	11/8/2006	PZ-12	4.02	19.00	14.98	15.50	No
	12/31/2006	PZ-13	5.56	19.50	13.94	--	
	12/31/2006	PZ-12	3.91	19.00	15.09	15.50	No
	3/2/2007	PZ-13	6.06	19.50	13.44	--	
	3/2/2007	PZ-12	4.04	19.00	14.96	15.50	No
	3/31/2007	PZ-13	6.39	19.50	13.11	--	
	3/31/2007	PZ-12	4.03	19.00	14.97	15.50	No
	4/23/2007	PZ-13	6.58	19.50	12.92	--	
	4/23/2007	PZ-12	4.42	19.00	14.58	15.50	No
	5/28/2007	PZ-13	7.36	19.50	12.14	--	
	5/28/2007	PZ-12	4.88	19.00	14.12	15.50	No
	6/30/2007	PZ-13	7.33	19.50	12.17	--	
	6/30/2007	PZ-12	5.11	19.00	13.89	15.50	No
	8/1/2007	PZ-13	7.19	19.50	12.31	--	
	8/1/2007	PZ-12	5.10	19.00	13.90	15.50	No
	9/29/2007	PZ-13	7.32	19.50	12.18	--	
	9/29/2007	PZ-12	5.63	19.00	13.37	15.50	No
	11/22/2007	PZ-13	6.91	19.50	12.59	--	
	11/22/2007	PZ-12	5.27	19.00	13.73	15.50	No
	1/26/2008	PZ-13	5.99	19.50	13.51	--	
	1/26/2008	PZ-12	3.93	19.00	15.07	15.50	No
	2/28/2008	PZ-13	6.44	19.50	13.06	--	
	2/28/2008	PZ-12	3.69	19.00	15.31	15.50	No
	3/19/2008	PZ-13	6.71	19.50	12.79	--	
	3/19/2008	PZ-12	3.84	19.00	15.16	15.50	No
	4/28/2008	PZ-13	7.19	19.50	12.31	--	
	4/28/2008	PZ-12	4.00	19.00	15.00	15.50	No
	5/31/2008	PZ-13	7.39	19.50	12.11	--	
	5/31/2008	PZ-12	4.43	19.00	14.57	15.50	No
	6/30/2008	PZ-13	7.26	19.50	12.24	--	
	6/30/2008	PZ-12	4.58	19.00	14.42	15.50	No
	7/12/2008	PZ-13	7.36	19.50	12.14	--	
	7/12/2008	PZ-12	4.72	19.00	14.28	15.50	No

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	8/28/2008	PZ-13	7.34	19.50	12.16	--	
	8/28/2008	PZ-12	5.23	19.00	13.77	15.50	No
	9/20/2008	PZ-13	7.32	19.50	12.18	--	
	9/20/2008	PZ-12	5.39	19.00	13.61	15.50	No
	10/12/2008	PZ-13	8.36	19.50	11.14	--	
	10/12/2008	PZ-12	5.51	19.00	13.49	15.50	No
	11/30/2008	PZ-13	6.42	19.50	13.08	--	
	11/30/2008	PZ-12	4.83	19.00	14.17	15.50	No
	12/31/2008	PZ-13	6.42	19.50	13.08	--	
	12/31/2008	PZ-12	4.83	19.00	14.17	15.50	No
	1/31/2009	PZ-13	6.57	19.50	12.93	--	
	1/31/2009	PZ-12	4.39	19.00	14.61	15.50	No
	2/23/2009	PZ-13	6.95	19.50	12.55	--	
	2/23/2009	PZ-12	4.59	19.00	14.41	15.50	No
	3/29/2009	PZ-13	6.68	19.50	12.82	--	
	3/29/2009	PZ-12	4.28	19.00	14.72	15.50	No
	4/18/2009	PZ-13	7.61	19.50	11.89	--	
	4/18/2009	PZ-12	4.31	19.00	14.69	15.50	No
	5/16/2009	PZ-13	6.62	19.50	12.88	--	
	5/16/2009	PZ-12	4.10	19.00	14.90	15.50	No
	6/21/2009	PZ-13	7.03	19.50	12.47	--	
	6/21/2009	PZ-12	4.58	19.00	14.42	15.50	No
	7/20/2009	PZ-13	7.09	19.50	12.41	--	
	7/20/2009	PZ-12	4.94	19.00	14.06	15.50	No
	8/10/2009	PZ-13	7.31	19.50	12.19	--	
	8/10/2009	PZ-12	5.18	19.00	13.82	15.50	No
	9/7/2009	PZ-13	7.91	19.50	11.59	--	
	9/7/2009	PZ-12	5.33	19.00	13.67	15.50	No
	10/10/2009	PZ-13	7.45	19.50	12.05	--	
	10/10/2009	PZ-12	5.85	19.00	13.15	15.50	No
	11/28/2009	PZ-13	5.99	19.50	13.51	--	
	11/28/2009	PZ-12	4.74	19.00	14.26	15.50	No
	12/31/2009	PZ-13	6.06	19.50	13.44	--	
	12/31/2009	PZ-12	4.70	19.00	14.30	15.50	No

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	1/14/2010	PZ-13	5.20	19.50	14.30	--	
	1/14/2010	PZ-12	4.16	19.00	14.84	15.50	No
	2/21/2010	PZ-13	6.04	19.50	13.46	--	
	2/21/2010	PZ-12	4.01	19.00	14.99	15.50	No
	3/17/2010	PZ-13	6.40	19.50	13.10	--	
	3/17/2010	PZ-12	3.98	19.00	15.02	15.50	No
	4/25/2010	PZ-13	6.65	19.50	12.85	--	
	4/25/2010	PZ-12	4.06	19.00	14.94	15.50	No
	5/16/2010	PZ-13	6.99	19.50	12.51	--	
	5/16/2010	PZ-12	4.15	19.00	14.85	15.50	No
	6/26/2010	PZ-13	6.83	19.50	12.67	--	
	6/26/2010	PZ-12	4.47	19.00	14.53	15.50	No
	7/23/2010	PZ-13	7.33	19.50	12.17	--	
	7/23/2010	PZ-12	4.91	19.00	14.09	15.50	No
	8/30/2010	PZ-13	7.49	19.50	12.01	--	
	8/30/2010	PZ-12	5.17	19.00	13.83	15.50	No
	9/30/2010	PZ-13	6.98	19.50	12.52	--	
	9/30/2010	PZ-12	5.17	19.00	13.83	15.50	No
	10/18/2010	PZ-13	7.11	19.50	12.39	--	
	10/18/2010	PZ-12	4.91	19.00	14.09	15.50	No
	11/29/2010	PZ-13	6.23	19.50	13.27	--	
	11/29/2010	PZ-12	4.40	19.00	14.60	15.50	No
	12/25/2010	PZ-13	5.21	19.50	14.29	--	
	12/25/2010	PZ-12	4.08	19.00	14.92	15.50	No
	1/29/2011	PZ-13	6.01	19.50	13.49	--	
	1/29/2011	PZ-12	4.18	19.00	14.82	15.50	No
	2/20/2011	PZ-13	6.13	19.50	13.37	--	
	2/20/2011	PZ-12	4.28	19.00	14.72	15.50	No
	3/24/2011	PZ-13	5.23	19.50	14.27	--	
	3/24/2011	PZ-12	3.72	19.00	15.28	15.50	No
	4/23/2011	PZ-13	6.18	19.50	13.32	--	
	4/23/2011	PZ-12	3.84	19.00	15.16	15.50	No
	5/30/2011	PZ-13	6.75	19.50	12.75	--	
	5/30/2011	PZ-12	4.25	19.00	14.75	15.50	No

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CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
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Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	6/26/2011	PZ-13	7.21	19.50	12.29	--	
	6/26/2011	PZ-12	4.78	19.00	14.22	15.50	No
	7/30/2011	PZ-13	7.26	19.50	12.24	--	
	7/30/2011	PZ-12	5.00	19.00	14.00	15.50	No
	8/8/2011	PZ-13	7.17	19.50	12.33	--	
	8/8/2011	PZ-12	4.96	19.00	14.04	15.50	No
	9/24/2011	PZ-13	7.61	19.50	11.89	--	
	9/24/2011	PZ-12	5.31	19.00	13.69	15.50	No
	10/29/2011	PZ-13	6.85	19.50	12.65	--	
	10/29/2011	PZ-12	5.45	19.00	13.55	15.50	No
	11/26/2011	PZ-13	4.98	19.50	14.52	--	
	11/26/2011	PZ-12	4.05	19.00	14.95	15.50	No
	12/26/2011	PZ-13	6.87	19.50	12.63	--	
	12/26/2011	PZ-12	5.27	19.00	13.73	15.50	No
	1/28/2012	PZ-13	4.60	19.50	14.90	--	
	1/28/2012	PZ-12	3.55	19.00	15.45	15.50	No
	2/26/2012	PZ-13	5.77	19.50	13.73	--	
	2/26/2012	PZ-12	3.95	19.00	15.05	15.50	No
	3/7/2012	PZ-13	6.64	19.50	12.86	--	
	3/7/2012	PZ-12	4.20	19.00	14.80	15.50	No
2	11/8/2006	PZ-17	7.58	20.48	12.90	--	
	11/8/2006	LW-3	5.62	20.36	14.74	15.50	No
	12/31/2006	PZ-17	6.98	20.48	13.50	--	
	12/31/2006	LW-3	4.97	20.36	15.39	15.50	No
	3/2/2007	PZ-17	6.94	20.48	13.54	--	
	3/2/2007	LW-3	4.97	20.36	15.39	15.50	No
	3/31/2007	PZ-17	6.87	20.48	13.61	--	
	3/31/2007	LW-3	4.79	20.36	15.57	15.50	Yes
	4/23/2007	PZ-17	7.05	20.48	13.43	--	
	4/23/2007	LW-3	4.84	20.36	15.52	15.50	Yes
	5/28/2007	PZ-17	7.31	20.48	13.17	--	
	5/28/2007	LW-3	5.43	20.36	14.93	15.50	No
	6/30/2007	PZ-17	7.48	20.48	13.00	--	
	6/30/2007	LW-3	5.35	20.36	15.01	15.50	No

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CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)		Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	8/1/2007	PZ-17	7.73	20.48		12.75	--	
	8/1/2007	LW-3	5.78	20.36		14.58	15.50	No
	9/29/2007	PZ-17	7.83	20.48		12.65	--	
	9/29/2007	LW-3	6.38	20.36		13.98	15.50	No
	11/22/2007	PZ-17	7.89	20.48		12.59	--	
	11/22/2007	LW-3	6.18	20.36		14.18	15.50	No
	1/26/2008	PZ-17	6.87	20.48		13.61	--	
	1/26/2008	LW-3	4.70	20.36		15.66	15.50	Yes
	2/28/2008	PZ-17	6.69	20.48		13.79	--	
	2/28/2008	LW-3	4.47	20.36		15.89	15.50	Yes
	3/19/2008	PZ-17	6.84	20.48		13.64	--	
	3/19/2008	LW-3	4.58	20.36		15.78	15.50	Yes
	4/28/2008	PZ-17	7.13	20.48		13.35	--	
	4/28/2008	LW-3	4.63	20.36		15.73	15.50	Yes
	5/31/2008	PZ-17	7.68	20.48		12.80	--	
	5/31/2008	LW-3	5.34	20.36		15.02	15.50	No
	6/30/2008	PZ-17	7.57	20.48		12.91	--	
	6/30/2008	LW-3	5.54	20.36		14.82	15.50	No
	7/12/2008	PZ-17	7.63	20.48		12.85	--	
	7/12/2008	LW-3	5.70	20.36		14.66	15.50	No
	8/28/2008	PZ-17	7.91	20.48		12.57	--	
	8/28/2008	LW-3	5.31	20.36		15.05	15.50	No
	9/20/2008	PZ-17	7.99	20.48		12.49	--	
	9/20/2008	LW-3	6.37	20.36		13.99	15.50	No
	10/12/2008	PZ-17	8.21	20.48		12.27	--	
	10/12/2008	LW-3	6.59	20.36		13.77	15.50	No
	11/30/2008	PZ-17	8.01	20.48		12.47	--	
	11/30/2008	LW-3	5.73	20.36		14.63	15.50	No
	12/31/2008	PZ-17	7.95	20.48		12.53	--	
	12/31/2008	LW-3	NM	20.36		--	15.50	--
	1/31/2009	PZ-17	7.77	20.48		12.71	--	
	1/31/2009	LW-3	5.07	20.03	(c)	14.96	15.50	No
	2/23/2009	PZ-17	7.71	20.48		12.77	--	
	2/23/2009	LW-3	5.58	20.03	(c)	14.45	15.50	No

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CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)		Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	3/29/2009	PZ-17	NM	20.48		--	--	
	3/29/2009	LW-3	6.62	20.03	(c)	13.41	15.50	--
	4/18/2009	PZ-17	7.73	20.48		12.75	--	
	4/18/2009	LW-3	6.63	20.03	(c)	13.40	15.50	No
	5/16/2009	PZ-17	7.60	20.48		12.88	--	
	5/16/2009	LW-3	5.05	20.03	(c)	14.98	15.50	No
	6/21/2009	PZ-17	7.61	20.48		12.87	--	
	6/21/2009	LW-3	7.28	20.03	(c)	12.75	15.50	No
	7/20/2009	PZ-17	7.79	20.48		12.69	--	
	7/20/2009	LW-3	6.07	20.03	(c)	13.96	15.50	No
	8/10/2009	PZ-17	7.86	20.48		12.62	--	
	8/10/2009	LW-3	6.55	20.03	(c)	13.48	15.50	No
	9/7/2009	PZ-17	8.04	20.48		12.44	--	
	9/7/2009	LW-3	6.69	20.03	(c)	13.34	15.50	No
	10/10/2009	PZ-17	8.13	20.48		12.35	--	
	10/10/2009	LW-3	7.01	20.03	(c)	13.02	15.50	No
	11/28/2009	PZ-17	7.77	20.48		12.71	--	
	11/28/2009	LW-3	7.26	20.03	(c)	12.77	15.50	No
	12/31/2009	PZ-17	7.61	20.48		12.87	--	
	12/31/2009	LW-3	7.06	20.03	(c)	12.97	15.50	No
	1/14/2010	PZ-17	7.46	20.48		13.02	--	
	1/14/2010	LW-3	6.81	20.03	(c)	13.22	15.50	No
	2/21/2010	PZ-17	7.17	20.48		13.31	--	
	2/21/2010	LW-3	6.94	20.03	(c)	13.09	15.50	No
	3/17/2010	PZ-17	7.22	20.48		13.26	--	
	3/17/2010	LW-3	6.37	20.03	(c)	13.66	15.50	--
	4/25/2010	PZ-17	7.04	20.48		13.44	--	
	4/25/2010	LW-3	6.18	20.03	(c)	13.85	15.50	No
	5/16/2010	PZ-17	7.14	20.48		13.34	--	
	5/16/2010	LW-3	6.22	20.03	(c)	13.81	15.50	No
	6/26/2010	PZ-17	7.21	20.48		13.27	--	
	6/26/2010	LW-3	6.87	20.03	(c)	13.16	15.50	No
	7/23/2010	PZ-17	7.35	20.48		13.13	--	
	7/23/2010	LW-3	6.26	20.03	(c)	13.77	15.50	No

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CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)		Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	8/30/2010	PZ-17	7.61	20.48		12.87	--	
	8/30/2010	LW-3	NA	19.83	(c)	NA	15.50	NA
	9/30/2010	PZ-17	7.64	20.48		12.84	--	
	9/30/2010	LW-3	6.63	19.83	(c)	13.20	15.50	No
	10/18/2010	PZ-17	7.76	20.48		12.72	--	
	10/18/2010	LW-3	5.90	19.83		13.93	15.50	No
	11/29/2010	PZ-17	7.50	20.48		12.98	--	
	11/29/2010	LW-3	NA	19.83		NA	15.50	NA
	12/25/2010	PZ-17	7.00	20.48		13.48	--	
	12/25/2010	LW-3	6.63	19.83		13.20	15.50	No
	1/29/2011	PZ-17	7.00	20.48		13.48	--	
	1/29/2011	LW-3	6.13	19.83		13.70	15.50	No
	2/20/2011	PZ-17	7.02	20.48		13.46	--	
	2/20/2011	LW-3	5.96	19.83		13.87	15.50	No
	3/24/2011	PZ-17	6.55	20.48		13.93	--	
	3/24/2011	LW-3	5.72	19.83		14.11	15.50	No
	4/23/2011	PZ-17	6.54	20.48		13.94	--	
	4/23/2011	LW-3	6.04	19.83		13.79	15.50	No
	5/30/2011	PZ-17	6.70	20.48		13.78	--	
	5/30/2011	LW-3	5.79	19.83		14.04	15.50	No
	6/26/2011	PZ-17	6.95	20.48		13.53	--	
	6/26/2011	LW-3	6.16	19.83		13.67	15.50	No
	7/30/2011	PZ-17	7.16	20.48		13.32	--	
	7/30/2011	LW-3	5.30	19.83		14.53	15.50	No
	8/8/2011	PZ-17	7.24	20.48		13.24	--	
	8/8/2011	LW-3	5.51	19.83		14.32	15.50	No
	9/24/2011	PZ-17	7.45	20.48		13.03	--	
	9/24/2011	LW-3	5.85	19.83		13.98	15.50	No
	10/29/2011	PZ-17	7.63	20.48		12.85	--	
	10/29/2011	LW-3	5.98	19.83		13.85	15.50	No
	11/26/2011	PZ-17	7.04	20.48		13.44	--	
	11/26/2011	LW-3	6.83	19.83		13.00	15.50	No
	12/26/2011	PZ-17	7.63	20.48		12.85	--	
	12/26/2011	LW-3	6.10	19.83		13.73	15.50	No

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CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	1/28/2012	PZ-17	7.14	20.48	13.34	--	
	1/28/2012	LW-3	5.18	19.83	14.65	15.50	No
	2/26/2012	PZ-17	7.09	20.48	13.39	--	
	2/26/2012	LW-3	4.70	19.83	15.13	15.50	No
	3/7/2012	PZ-17	7.22	20.48	13.26	--	
	3/7/2012	LW-3	5.17	19.83	14.66	15.50	No
3	11/8/2006	PZ-18	6.31	21.20	14.89	--	
	11/8/2006	LW-4R	7.73	22.02	14.29	15.50	No
	12/31/2006	PZ-18	7.95	21.20	13.25	--	
	12/31/2006	LW-4R	6.77	22.02	15.25	15.50	No
	3/2/2007	PZ-18	7.28	21.20	13.92	--	
	3/2/2007	LW-4R	4.91	22.02	17.11	15.50	Yes
	3/31/2007	PZ-18	9.47	21.20	11.73	--	
	3/31/2007	LW-4R	6.07	22.02	15.95	15.50	Yes
	4/23/2007	PZ-18	4.31	21.20	16.89	--	
	4/23/2007	LW-4R	5.32	22.02	16.70	15.50	Yes
	5/28/2007	PZ-18	9.82	21.20	11.38	--	
	5/28/2007	LW-4R	8.12	22.02	13.90	15.50	No
	6/30/2007	PZ-18	8.85	21.20	12.35	--	
	6/30/2007	LW-4R	6.07	22.02	15.95	15.50	Yes
	8/1/2007	PZ-18	5.16	21.20	16.04	--	
	8/1/2007	LW-4R	5.21	22.02	16.81	15.50	Yes
	9/29/2007	PZ-18	4.84	21.20	16.36	--	
	9/29/2007	LW-4R	5.66	22.02	16.36	15.50	Yes
	11/22/2007	PZ-18	5.87	21.20	15.33	--	
	11/22/2007	LW-4R	6.25	22.02	15.77	15.50	Yes
	1/26/2008	PZ-18	6.42	21.20	14.78	--	
	1/26/2008	LW-4R	4.74	22.02	17.28	15.50	Yes
	2/28/2008	PZ-18	6.86	21.20	14.34	--	
	2/28/2008	LW-4R	4.92	22.02	17.10	15.50	Yes
	3/19/2008	PZ-18	7.58	21.20	13.62	--	
	3/19/2008	LW-4R	7.70	22.02	14.32	15.50	No
	4/28/2008	PZ-18	6.72	21.20	14.48	--	

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CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	4/28/2008	LW-4R	4.85	22.02	17.17	15.50	Yes
	5/31/2008	PZ-18	7.46	21.20	13.74	--	
	5/31/2008	LW-4R	5.26	22.02	16.76	15.50	Yes
	6/30/2008	PZ-18	7.44	21.20	16.36	--	
	6/30/2008	LW-4R	5.24	22.02	16.36	15.50	Yes
	7/12/2008	PZ-18	6.52	21.20	14.68	--	
	7/12/2008	LW-4R	5.33	22.02	16.69	15.50	Yes
	8/28/2008	PZ-18	6.55	21.20	14.65	--	
	8/28/2008	LW-4R	5.67	22.02	16.35	15.50	Yes
	9/20/2008	PZ-18	6.53	21.20	14.67	--	
	9/20/2008	LW-4R	5.63	22.02	16.39	15.50	Yes
	10/12/2008	PZ-18	7.83	21.20	13.37	--	
	10/12/2008	LW-4R	6.11	22.02	15.91	15.50	Yes
	11/30/2008	PZ-18	6.52	21.20	14.68	--	
	11/30/2008	LW-4R	6.18	22.02	15.84	15.50	Yes
	12/31/2008	PZ-18	7.01	21.20	14.19	--	
	12/31/2008	LW-4R	6.44	22.02	15.58	15.50	Yes
	1/31/2009	PZ-18	6.46	21.20	14.74	--	
	1/31/2009	LW-4R	6.17	22.02	15.85	15.50	Yes
	2/23/2009	PZ-18	6.26	21.20	14.94	--	
	2/23/2009	LW-4R	6.35	22.02	15.67	15.50	Yes
	3/29/2009	PZ-18	6.29	21.20	14.91	--	
	3/29/2009	LW-4R	6.42	22.02	15.60	15.50	Yes
	4/18/2009	PZ-18	6.28	21.20	14.92	--	
	4/18/2009	LW-4R	6.35	22.02	15.67	15.50	Yes
	5/16/2009	PZ-18	6.21	21.20	14.99	--	
	5/16/2009	LW-4R	6.18	22.02	15.84	15.50	Yes
	6/21/2009	PZ-18	6.66	21.20	14.54	--	
	6/21/2009	LW-4R	6.23	22.02	15.79	15.50	Yes
	7/20/2009	PZ-18	9.93	21.20	11.27	--	
	7/20/2009	LW-4R	5.81	22.02	16.21	15.50	Yes
	8/10/2009	PZ-18	6.55	21.20	14.65	--	
	8/10/2009	LW-4R	7.47	22.02	14.55	15.50	No
	9/7/2009	PZ-18	8.77	21.20	12.43	--	

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CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
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Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	9/7/2009	LW-4R	6.10	22.02	15.92	15.50	Yes
	10/10/2009	PZ-18	6.88	21.20	14.32	--	
	10/10/2009	LW-4R	6.09	22.02	15.93	15.50	Yes
	11/28/2009	PZ-18	9.25	21.20	11.95	--	
	11/28/2009	LW-4R	7.31	22.02	14.71	15.50	No
	12/31/2009	PZ-18	7.61	21.20	13.59	--	
	12/31/2009	LW-4R	NM	22.02	--	15.50	--
	1/14/2010	PZ-18	9.21	21.20	11.99	--	
	1/14/2010	LW-4R	7.46	22.02	14.56	15.50	No
	2/21/2010	PZ-18	6.50	21.20	14.70	--	
	2/21/2010	LW-4R	6.66	22.02	15.36	15.50	No
	3/17/2010	PZ-18	6.40	21.20	14.80	--	
	3/17/2010	LW-4R	7.07	22.02	14.95	15.50	No
	4/25/2010	PZ-18	9.57	21.20	11.63	--	
	4/25/2010	LW-4R	NA	22.02	NA	15.50	NA
	5/16/2010	PZ-18	NA	21.20	NA	--	
	5/16/2010	LW-4R	6.30	22.02	15.72	15.50	Yes
	6/26/2010	PZ-18	9.35	21.20	11.85	--	
	6/26/2010	LW-4R	6.68	22.02	15.34	15.50	No
	7/23/2010	PZ-18	9.62	21.20	11.58	--	
	7/23/2010	LW-4R	6.73	22.02	15.29	15.50	No
	8/30/2010	PZ-18	9.43	21.20	11.77	--	
	8/30/2010	LW-4R	6.57	22.02	15.45	15.50	No
	9/30/2010	PZ-18	8.62	21.20	12.58	--	
	9/30/2010	LW-4R	6.24	22.02	15.78	15.50	Yes
	10/18/2010	PZ-18	7.37	21.20	13.83	--	
	10/18/2010	LW-4R	6.36	22.02	15.66	15.50	Yes
	11/29/2010	PZ-18	9.77	21.20	11.43	--	
	11/29/2010	LW-4R	7.06	22.02	14.96	15.50	No
	12/25/2010	PZ-18	NA	21.20	NA	--	
	12/25/2010	LW-4R	7.11	22.02	14.91	15.50	No
	1/29/2011	PZ-18	10.14	21.20	11.06	--	
	1/29/2011	LW-4R	NA	22.02	NA	15.50	NA
	2/20/2011	PZ-18	9.44	21.20	11.76	--	

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	2/20/2011	LW-4R	NA	22.02	NA	15.50	NA
	3/24/2011	PZ-18	10.24	21.20	10.96	--	
	3/24/2011	LW-4R	6.45	22.02	15.57	15.50	Yes
	4/23/2011	PZ-18	9.44	21.20	11.76	--	
	4/23/2011	LW-4R	6.62	22.02	15.40	15.50	No
	5/30/2011	PZ-18	6.86	21.20	14.34	--	
	5/30/2011	LW-4R	6.37	22.02	15.65	15.50	Yes
	6/26/2011	PZ-18	6.01	21.20	15.19	--	
	6/26/2011	LW-4R	NA	22.02	NA	15.50	NA
	7/30/2011	PZ-18	6.43	21.20	14.77	--	
	7/30/2011	LW-4R	6.91	22.02	15.11	15.50	No
	8/8/2011	PZ-18	6.11	21.20	15.09	--	
	8/8/2011	LW-4R	6.56	22.02	15.46	15.50	No
	9/24/2011	PZ-18	NA	21.20	NA	--	
	9/24/2011	LW-4R	6.75	22.02	15.27	15.50	No
	10/29/2011	PZ-18	NA	21.20	NA	--	
	10/29/2011	LW-4R	NA	22.02	NA	15.50	NA
	11/26/2011	PZ-18	NA	21.20	NA	--	
	11/26/2011	LW-4R	NA	22.02	NA	15.50	NA
	12/26/2011	PZ-18	7.21	21.20	13.99	--	
	12/26/2011	LW-4R	NA	22.02	NA	15.50	NA
	1/28/2012	PZ-18	5.91	21.20	15.29	--	
	1/28/2012	LW-4R	8.35	22.02	13.67	15.50	No
	2/26/2012	PZ-18	NA	21.20	NA	--	
	2/26/2012	LW-4R	NA	22.02	NA	15.50	NA
	3/7/2012	PZ-18	6.34	21.20	14.86	--	
	3/7/2012	LW-4R	8.40	22.02	13.62	15.50	No
4	11/8/2006	PZ-19	12.64	23.67	11.03	--	
	11/8/2006	MW-02S	12.71	30.47	17.76	15.50	Yes
	12/31/2006	PZ-19	11.22	23.67	12.45	--	
	12/31/2006	MW-02S	11.96	30.47	18.51	15.50	Yes
	3/2/2007	PZ-19	13.81	23.67	9.86	--	
	3/2/2007	MW-02S	13.04	30.47	17.43	15.50	Yes

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	3/31/2007	PZ-19	14.79	23.67	8.88	--	
	3/31/2007	MW-02S	12.93	30.47	17.54	15.50	Yes
	4/23/2007	PZ-19	12.72	23.67	10.95	--	
	4/23/2007	MW-02S	14.42	30.47	16.05	15.50	Yes
	5/28/2007	PZ-19	16.43	23.67	7.24	--	
	5/28/2007	MW-02S	15.51	30.47	14.96	15.50	No
	6/30/2007	PZ-19	16.80	23.67	6.87	--	
	6/30/2007	MW-02S	15.92	30.47	14.55	15.50	No
	8/1/2007	PZ-19	14.85	23.67	8.82	--	
	8/1/2007	MW-02S	16.02	30.47	14.45	15.50	No
	9/29/2007	PZ-19	14.17	23.67	9.50	--	
	9/29/2007	MW-02S	16.89	30.47	13.58	15.50	No
	11/22/2007	PZ-19	13.95	23.67	9.72	--	
	11/22/2007	MW-02S	15.13	30.47	15.34	15.50	No
	1/26/2008	PZ-19	12.86	23.67	10.81	--	
	1/26/2008	MW-02S	13.68	30.47	16.79	15.50	Yes
	2/28/2008	PZ-19	14.95	23.67	8.72	--	
	2/28/2008	MW-02S	13.56	30.47	16.91	15.50	Yes
	3/19/2008	PZ-19	13.33	23.67	10.34	--	
	3/19/2008	MW-02S	13.92	30.47	16.55	15.50	Yes
	4/28/2008	PZ-19	14.03	23.67	9.64	--	
	4/28/2008	MW-02S	14.54	30.47	15.93	15.50	Yes
	5/31/2008	PZ-19	14.13	23.67	9.54	--	
	5/31/2008	MW-02S	15.12	30.47	15.35	15.50	No
	6/30/2008	PZ-19	13.22	23.67	9.50	--	
	6/30/2008	MW-02S	15.60	30.47	13.58	15.50	No
	7/12/2008	PZ-19	16.34	23.67	7.33	--	
	7/12/2008	MW-02S	15.73	30.47	14.74	15.50	No
	8/28/2008	PZ-19	15.77	23.67	7.90	--	
	8/28/2008	MW-02S	16.43	30.47	14.04	15.50	No
	9/20/2008	PZ-19	13.78	23.67	9.89	--	
	9/20/2008	MW-02S	NM	30.47	--	15.50	--
	10/12/2008	PZ-19	14.42	23.67	9.25	--	
	10/12/2008	MW-02S	NM	30.47	--	15.50	--

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	11/30/2008	PZ-19	13.42	23.67	10.25	--	
	11/30/2008	MW-02S	NM	30.47	--	15.50	--
	12/31/2008	PZ-19	12.70	23.67	10.97	--	
	12/31/2008	MW-02S	NM	30.47	--	15.50	--
	1/31/2009	PZ-19	15.00	23.67	8.67	--	
	1/31/2009	MW-02S	16.81	32.46	15.65	15.50	Yes
	2/23/2009	PZ-19	13.63	23.67	10.04	--	
	2/23/2009	MW-02S	17.22	32.46	15.24	15.50	No
	3/29/2009	PZ-19	16.13	23.67	7.54	--	
	3/29/2009	MW-02S	17.20	32.46	15.26	15.50	No
	4/18/2009	PZ-19	14.78	23.67	8.89	--	
	4/18/2009	MW-02S	17.13	32.46	15.33	15.50	No
	5/16/2009	PZ-19	14.16	23.67	9.51	--	
	5/16/2009	MW-02S	16.79	32.46	15.67	15.50	Yes
	6/21/2009	PZ-19	14.53	23.67	9.14	--	
	6/21/2009	MW-02S	17.65	32.46	14.81	15.50	No
	7/20/2009	PZ-19	12.42	23.67	11.25	--	
	7/20/2009	MW-02S	18.00	32.46	14.46	15.50	No
	8/10/2009	PZ-19	13.47	23.67	10.20	--	
	8/10/2009	MW-02S	18.37	32.46	14.09	15.50	No
	9/7/2009	PZ-19	13.74	23.67	9.93	--	
	9/7/2009	MW-02S	18.85	32.46	13.61	15.50	No
	10/10/2009	PZ-19	13.67	23.67	10.00	--	
	10/10/2009	MW-02S	19.26	32.46	13.20	15.50	No
	11/28/2009	PZ-19	14.26	23.67	9.41	--	
	11/28/2009	MW-02S	18.17	32.46	14.29	15.50	No
	12/31/2009	PZ-19	11.39	23.67	12.28	--	
	12/31/2009	MW-02S	18.02	32.46	14.44	15.50	No
	1/14/2010	PZ-19	11.61	23.67	12.06	--	
	1/14/2010	MW-02S	17.27	32.46	15.19	15.50	No
	2/21/2010	PZ-19	11.51	23.67	12.16	--	
	2/21/2010	MW-02S	16.79	32.46	15.67	15.50	Yes
	3/17/2010	PZ-19	14.65	23.67	9.02	--	
	3/17/2010	MW-02S	16.39	32.46	16.07	15.50	Yes

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	4/25/2010	PZ-19	13.67	23.67	10.00	--	
	4/25/2010	MW-02S	17.23	32.46	15.23	15.50	No
	5/16/2010	PZ-19	16.69	23.67	6.98	--	
	5/16/2010	MW-02S	17.59	32.46	14.87	15.50	No
	6/26/2010	PZ-19	13.67	23.67	10.00	--	
	6/26/2010	MW-02S	18.16	32.46	14.30	15.50	No
	7/23/2010	PZ-19	16.86	23.67	6.81	--	
	7/23/2010	MW-02S	18.51	32.46	13.95	15.50	No
	8/30/2010	PZ-19	14.23	23.67	9.44	--	
	8/30/2010	MW-02S	18.04	32.46	14.42	15.50	No
	9/30/2010	PZ-19	13.67	23.67	10.00	--	
	9/30/2010	MW-02S	17.27	32.46	15.19	15.50	No
	10/18/2010	PZ-19	15.84	23.67	7.83	--	
	10/18/2010	MW-02S	17.72	32.46	14.74	15.50	No
	11/29/2010	PZ-19	12.89	23.67	10.78	--	
	11/29/2010	MW-02S	17.13	32.46	15.33	15.50	No
	12/25/2010	PZ-19	10.81	23.67	12.86	--	
	12/25/2010	MW-02S	15.90	32.46	16.56	15.50	Yes
	1/29/2011	PZ-19	11.97	23.67	11.70	--	
	1/29/2011	MW-02S	16.18	32.46	16.28	15.50	Yes
	2/20/2011	PZ-19	15.01	23.67	8.66	--	
	2/20/2011	MW-02S	16.99	32.46	15.47	15.50	No
	3/24/2011	PZ-19	10.93	23.67	12.74	--	
	3/24/2011	MW-02S	15.15	32.46	17.31	15.50	Yes
	4/23/2011	PZ-19	15.81	23.67	7.86	--	
	4/23/2011	MW-02S	15.62	32.46	16.84	15.50	Yes
	5/30/2011	PZ-19	15.07	23.67	8.60	--	
	5/30/2011	MW-02S	16.23	32.46	16.23	15.50	Yes
	6/26/2011	PZ-19	13.87	23.67	9.80	--	
	6/26/2011	MW-02S	16.88	32.46	15.58	15.50	Yes
	7/30/2011	PZ-19	15.93	23.67	7.74	--	
	7/30/2011	MW-02S	17.08	32.46	15.38	15.50	No
	8/8/2011	PZ-19	16.19	23.67	7.48	--	
	8/8/2011	MW-02S	17.26	32.46	15.20	15.50	No

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)		Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	9/24/2011	PZ-19	15.34	23.67		8.33	--	
	9/24/2011	MW-02S	17.52	31.96	(e)	14.44	15.50	No
	10/29/2011	PZ-19	13.66	23.67		10.01	--	
	10/29/2011	MW-02S	17.77	31.96	(e)	14.19	15.50	No
	11/26/2011	PZ-19	11.91	23.67		11.76	--	
	11/26/2011	MW-02S	16.08	31.96	(e)	15.88	15.50	Yes
	12/26/2011	PZ-19	13.50	23.67		10.17	--	
	12/26/2011	MW-02S	17.45	31.96	(e)	14.51	15.50	No
	1/28/2012	PZ-19	12.50	23.67		11.17	--	
	1/28/2012	MW-02S	15.33	31.96	(e)	16.63	15.50	Yes
	2/26/2012	PZ-19	15.09	23.67		8.58	--	
	2/26/2012	MW-02S	15.75	31.96	(e)	16.21	15.50	Yes
	3/7/2012	PZ-19	14.88	23.67		8.79	--	
	3/7/2012	MW-02S	16.28	31.96	(e)	15.68	15.50	Yes
5	11/8/2006	MW-02S	12.74	30.47		17.76	--	
	11/8/2006	MW-02D	18.24	31.79		13.55	--	
	12/31/2006	MW-02S	11.96	30.47		18.51	--	
	12/31/2006	MW-02D	16.29	31.79		15.50	--	
	3/2/2007	MW-02S	13.04	30.47		17.43	--	
	3/2/2007	MW-02D	19.51	31.79		12.28	--	
	3/31/2007	MW-02S	12.93	30.47		17.54	--	
	3/31/2007	MW-02D	20.11	31.79		11.68	--	
	4/23/2007	MW-02S	14.42	30.47		16.05	--	
	4/23/2007	MW-02D	17.72	31.79		14.07	--	
	5/28/2007	MW-02S	15.51	30.47		14.96	--	
	5/28/2007	MW-02D	20.60	31.79		11.19	--	
	6/30/2007	MW-02S	15.92	30.47		14.55	--	
	6/30/2007	MW-02D	22.15	31.79		9.64	--	
	8/1/2007	MW-02S	16.02	30.47		14.45	--	
	8/1/2007	MW-02D	21.70	31.79		10.09	--	
	9/29/2007	MW-02S	16.89	30.47		13.58	--	
	9/29/2007	MW-02D	19.82	31.79		11.97	--	
							--	
	11/22/2007	MW-02S	15.13	30.47		15.34	--	
	11/22/2007	MW-02D	17.61	31.79		14.18	--	

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)		Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	1/26/2008	MW-02S	13.68	30.47		16.79	--	
	1/26/2008	MW-02D	18.57	31.79		13.22	--	
	2/28/2008	MW-02S	13.56	30.47		16.91	--	
	2/28/2008	MW-02D	21.25	31.79		10.54	--	
	3/19/2008	MW-02S	13.92	30.47		16.55	--	
	3/19/2008	MW-02D	17.87	31.79		13.92	--	
	4/28/2008	MW-02S	14.54	30.47		15.93	--	
	4/28/2008	MW-02D	19.45	31.79		12.34	--	
	5/31/2008	MW-02S	15.12	30.47		15.35	--	
	5/31/2008	MW-02D	19.16	31.79		12.63	--	
	6/30/2008	MW-02S	15.60	30.47		13.58	--	
	6/30/2008	MW-02D	17.79	31.79		11.97	--	
							--	
	7/12/2008	MW-02S	15.73	30.47		14.74	--	
	7/12/2008	MW-02D	20.75	31.79		11.04	--	
	8/28/2008	MW-02S	16.43	30.47		14.04	--	
	8/28/2008	MW-02D	22.24	31.79		9.55	--	
	9/20/2008	MW-02S	NM	30.47		--	--	
	9/20/2008	MW-02D	NM	31.79		--	--	
	10/12/2008	MW-02S	NM	30.47		--	--	
	10/12/2008	MW-02D	NM	31.79		--	--	
	11/30/2008	MW-02S	NM	30.47		--	--	
	11/30/2008	MW-02D	NM	31.79		--	--	
	12/31/2008	MW-02S	NM	30.47		--	--	
	12/31/2008	MW-02D	NM	31.79		--	--	
	1/31/2009	MW-02S	16.81	32.46	(d)	15.65	--	
	1/31/2009	MW-02D	21.38	31.90	(d)	10.52	--	
	2/23/2009	MW-02S	17.22	32.46		15.24	--	
	2/23/2009	MW-02D	18.30	31.90		13.60	--	
	3/29/2009	MW-02S	17.20	32.46		15.26	--	
	3/29/2009	MW-02D	20.02	31.90		11.88	--	
	4/18/2009	MW-02S	17.13	32.46		15.33	--	
	4/18/2009	MW-02D	19.96	31.90		11.94	--	
	5/16/2009	MW-02S	16.79	32.46		15.67	--	
	5/16/2009	MW-02D	19.43	31.90		12.47	--	

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	6/21/2009	MW-02S	17.65	32.46	14.81	--	
	6/21/2009	MW-02D	17.62	31.90	14.28	--	
	7/20/2009	MW-02S	18.00	32.46	14.46	--	
	7/20/2009	MW-02D	18.25	31.90	13.65	--	
	8/10/2009	MW-02S	18.37	32.46	14.09	--	
	8/10/2009	MW-02D	17.91	31.90	13.99	--	
	9/7/2009	MW-02S	18.85	32.46	13.61	--	
	9/7/2009	MW-02D	19.53	31.90	12.37	--	
	10/10/2009	MW-02S	19.26	32.46	13.20	--	
	10/10/2009	MW-02D	18.87	31.90	13.03	--	
	11/28/2009	MW-02S	18.17	32.46	14.29	--	
	11/28/2009	MW-02D	18.98	31.90	12.92	--	
	12/31/2009	MW-02S	18.02	32.46	14.44	--	
	12/31/2009	MW-02D	15.98	31.90	15.92	--	
	1/14/2010	MW-02S	17.27	32.46	15.19	--	
	1/14/2010	MW-02D	17.30	31.90	14.60	--	
	2/21/2010	MW-02S	16.79	32.46	15.67	--	
	2/21/2010	MW-02D	16.63	31.90	15.27	--	
	3/17/2010	MW-02S	16.39	32.46	16.07	--	
	3/17/2010	MW-02D	18.12	31.90	13.78	--	
	4/25/2010	MW-02S	17.23	32.46	15.23	--	
	4/25/2010	MW-02D	18.31	31.90	13.59	--	
	5/16/2010	MW-02S	17.59	32.46	14.87	--	
	5/16/2010	MW-02D	20.96	31.90	10.94	--	
	6/26/2010	MW-02S	18.16	32.46	14.30	--	
	6/26/2010	MW-02D	20.48	31.90	11.42	--	
	7/23/2010	MW-02S	18.51	32.46	13.95	--	
	7/23/2010	MW-02D	21.13	31.90	10.77	--	
	8/30/2010	MW-02S	18.04	32.46	14.42	--	
	8/30/2010	MW-02D	18.14	31.90	13.76	--	
	9/30/2010	MW-02S	17.27	32.46	15.19	--	
	9/30/2010	MW-02D	18.48	31.90	13.42	--	
	10/18/2010	MW-02S	17.72	32.46	14.74	--	
	10/18/2010	MW-02D	21.20	31.90	10.70	--	

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)		Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	11/29/2010	MW-02S	17.13	32.46		15.33	--	
	11/29/2010	MW-02D	16.71	31.90		15.19	--	
	12/25/2010	MW-02S	15.90	32.46		16.56	--	
	12/25/2010	MW-02D	15.44	31.90		16.46	--	
	1/29/2011	MW-02S	16.18	32.46		16.28	--	
	1/29/2011	MW-02D	17.61	31.90		14.29	--	
	2/20/2011	MW-02S	16.99	32.46		15.47	--	
	2/20/2011	MW-02D	19.95	31.90		11.95	--	
	3/24/2011	MW-02S	15.15	32.46		17.31	--	
	3/24/2011	MW-02D	15.34	31.90		16.56	--	
	4/23/2011	MW-02S	15.62	32.46		16.84	--	
	4/23/2011	MW-02D	21.73	31.90		10.17	--	
	5/30/2011	MW-02S	16.23	32.46		16.23	--	
	5/30/2011	MW-02D	21.58	31.90		10.32	--	
	6/26/2011	MW-02S	16.88	32.46		15.58	--	
	6/26/2011	MW-02D	18.31	31.90		13.59	--	
	7/30/2011	MW-02S	17.08	32.46		15.38	--	
	7/30/2011	MW-02D	22.39	31.90		9.51	--	
	8/8/2011	MW-02S	17.26	32.46		15.20	--	
	8/8/2011	MW-02D	21.40	31.90		10.50	--	
	9/24/2011	MW-02S	17.52	31.96	(e)	14.44	--	
	9/24/2011	MW-02D	21.44	31.81	(e)	10.37	--	
	10/29/2011	MW-02S	17.77	31.96	(e)	14.19	--	
	10/29/2011	MW-02D	17.73	31.81	(e)	14.08	--	
	11/26/2011	MW-02S	16.08	31.96	(e)	15.88	--	
	11/26/2011	MW-02D	16.43	31.81	(e)	15.38	--	
	12/26/2011	MW-02S	17.45	31.96	(e)	14.51	--	
	12/26/2011	MW-02D	19.26	31.81	(e)	12.55	--	
	1/28/2012	MW-02S	15.33	31.96	(e)	16.63	--	
	1/28/2012	MW-02D	16.61	31.81	(e)	15.20	--	
	2/26/2012	MW-02S	15.75	31.96	(e)	16.21	--	
	2/26/2012	MW-02D	21.30	31.81	(e)	10.51	--	
	3/7/2012	MW-02S	16.28	31.96	(e)	15.68	--	
	3/7/2012	MW-02D	20.75	31.81	(e)	11.06	--	

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
6	11/8/2006	MW-01S	7.51	21.64	14.13	--	
	11/8/2006	MW-01D	7.94	21.87	13.93	--	
	12/31/2006	MW-01S	5.59	21.64	16.05	--	
	12/31/2006	MW-01D	6.78	21.87	15.09	--	
	3/2/2007	MW-01S	5.81	21.64	15.83	--	
	3/2/2007	MW-01D	8.92	21.87	12.95	--	
	3/31/2007	MW-01S	5.71	21.64	15.93	--	
	3/31/2007	MW-01D	9.51	21.87	12.36	--	
	4/23/2007	MW-01S	6.17	21.64	15.47	--	
	4/23/2007	MW-01D	7.89	21.87	13.98	--	
	5/28/2007	MW-01S	6.78	21.64	14.86	--	
	5/28/2007	MW-01D	11.02	21.87	10.85	--	
	6/30/2007	MW-01S	7.12	21.64	14.52	--	
	6/30/2007	MW-01D	11.74	21.87	10.13	--	
	8/1/2007	MW-01S	7.29	21.64	14.35	--	
	8/1/2007	MW-01D	9.57	21.87	12.30	--	
	9/29/2007	MW-01S	8.03	21.64	13.61	--	
	9/29/2007	MW-01D	8.83	21.87	13.04	--	
	11/22/2007	MW-01S	7.79	21.64	13.85	--	
	11/22/2007	MW-01D	8.89	21.87	12.98	--	
	1/26/2008	MW-01S	7.69	21.64	13.95	--	
	1/26/2008	MW-01D	5.63	21.87	16.24	--	
	2/28/2008	MW-01S	5.41	21.64	16.23	--	
	2/28/2008	MW-01D	9.87	21.87	12.00	--	
	3/19/2008	MW-01S	5.76	21.64	15.88	--	
	3/19/2008	MW-01D	9.62	21.87	12.25	--	
	4/28/2008	MW-01S	6.06	21.64	15.58	--	
	4/28/2008	MW-01D	8.65	21.87	13.22	--	
	5/31/2008	MW-01S	6.53	21.64	15.11	--	
	5/31/2008	MW-01D	8.72	21.87	13.15	--	
	6/30/2008	MW-01S	6.74	21.64	13.61	--	
	6/30/2008	MW-01D	7.94	21.87	13.04	--	
	7/12/2008	MW-01S	6.92	21.64	14.72	--	

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	7/12/2008	MW-01D	10.94	21.87	10.93	--	
	8/28/2008	MW-01S	7.62	21.64	14.02	--	
	8/28/2008	MW-01D	11.03	21.87	10.84	--	
	9/20/2008	MW-01S	7.75	21.64	13.89	--	
	9/20/2008	MW-01D	8.58	21.87	13.29	--	
	10/12/2008	MW-01S	7.76	21.64	13.88	--	
	10/12/2008	MW-01D	8.59	21.87	13.28	--	
	11/30/2008	MW-01S	6.93	21.64	14.71	--	
	11/30/2008	MW-01D	8.44	21.87	13.43	--	
	12/31/2008	MW-01S	6.86	21.64	14.78	--	
	12/31/2008	MW-01D	7.81	21.87	14.06	--	
	1/31/2009	MW-01S	6.54	21.64	15.10	--	
	1/31/2009	MW-01D	9.94	21.87	11.93	--	
	2/23/2009	MW-01S	6.73	21.64	14.91	--	
	2/23/2009	MW-01D	9.27	21.87	12.60	--	
	3/29/2009	MW-01S	6.67	21.64	14.97	--	
	3/29/2009	MW-01D	11.20	21.87	10.67	--	
	4/18/2009	MW-01S	6.61	21.64	15.03	--	
	4/18/2009	MW-01D	10.30	21.87	11.57	--	
	5/16/2009	MW-01S	6.34	21.64	15.30	--	
	5/16/2009	MW-01D	9.21	21.87	12.66	--	
	6/21/2009	MW-01S	6.81	21.64	14.83	--	
	6/21/2009	MW-01D	8.52	21.87	13.35	--	
	7/20/2009	MW-01S	7.21	21.64	14.43	--	
	7/20/2009	MW-01D	7.12	21.87	14.75	--	
	8/10/2009	MW-01S	7.40	21.64	14.24	--	
	8/10/2009	MW-01D	8.36	21.87	13.51	--	
	9/7/2009	MW-01S	7.79	21.64	13.85	--	
	9/7/2009	MW-01D	9.28	21.87	12.59	--	
	10/10/2009	MW-01S	8.19	21.64	13.45	--	
	10/10/2009	MW-01D	8.67	21.87	13.20	--	
	11/28/2009	MW-01S	7.48	21.64	14.16	--	
	11/28/2009	MW-01D	8.76	21.87	13.11	--	
	12/31/2009	MW-01S	7.22	21.64	14.42	--	

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	12/31/2009	MW-01D	6.35	21.87	15.52	--	
	1/14/2010	MW-01S	6.96	21.64	14.68	--	
	1/14/2010	MW-01D	6.94	21.87	14.93	--	
	2/21/2010	MW-01S	6.41	21.64	15.23	--	
	2/21/2010	MW-01D	7.15	21.87	14.72	--	
	3/17/2010	MW-01S	6.28	21.64	15.36	--	
	3/17/2010	MW-01D	8.24	21.87	13.63	--	
	4/25/2010	MW-01S	6.31	21.64	15.33	--	
	4/25/2010	MW-01D	8.61	21.87	13.26	--	
	5/16/2010	MW-01S	6.52	21.64	15.12	--	
	5/16/2010	MW-01D	10.69	21.87	11.18	--	
	6/26/2010	MW-01S	6.84	21.64	14.80	--	
	6/26/2010	MW-01D	10.04	21.87	11.83	--	
	7/23/2010	MW-01S	7.03	21.64	14.61	--	
	7/23/2010	MW-01D	10.75	21.87	11.12	--	
	8/30/2010	MW-01S	7.48	21.64	14.16	--	
	8/30/2010	MW-01D	8.82	21.87	13.05	--	
	9/30/2010	MW-01S	7.26	21.64	14.38	--	
	9/30/2010	MW-01D	8.00	21.87	13.87	--	
	10/18/2010	MW-01S	7.24	21.64	14.40		
	10/18/2010	MW-01D	12.53	21.87	9.34		
	11/29/2010	MW-01S	6.84	21.64	14.80	--	
	11/29/2010	MW-01D	9.66	21.87	12.21	--	
	12/25/2010	MW-01S	6.54	21.64	15.10	--	
	12/25/2010	MW-01D	6.41	21.87	15.46	--	
	1/29/2011	MW-01S	6.49	21.64	15.15	--	
	1/29/2011	MW-01D	7.72	21.87	14.15	--	
	2/20/2011	MW-01S	6.48	21.64	15.16	--	
	2/20/2011	MW-01D	9.40	21.87	12.47	--	
	3/24/2011	MW-01S	5.86	21.64	15.78	--	
	3/24/2011	MW-01D	5.93	21.87	15.94	--	
	4/23/2011	MW-01S	5.98	21.64	15.66	--	
	4/23/2011	MW-01D	10.67	21.87	11.20	--	
	5/30/2011	MW-01S	6.53	21.64	15.11	--	

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)		Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	5/30/2011	MW-01D	10.63	21.87		11.24	--	
	6/26/2011	MW-01S	7.01	21.64		14.63	--	
	6/26/2011	MW-01D	8.44	21.87		13.43	--	
	7/30/2011	MW-01S	7.13	21.64		14.51	--	
	7/30/2011	MW-01D	10.85	21.87		11.02	--	
	8/8/2011	MW-01S	7.20	21.64		14.44	--	
	8/8/2011	MW-01D	10.94	21.87		10.93	--	
	9/24/2011	MW-01S	7.51	21.64		14.13	--	
	9/24/2011	MW-01D	10.65	21.87		11.22	--	
	10/29/2011	MW-01S	7.74	21.64		13.90	--	
	10/29/2011	MW-01D	7.90	21.87		13.97	--	
	11/26/2011	MW-01S	7.30	21.64		14.34	--	
	11/26/2011	MW-01D	6.53	21.87		15.34	--	
	12/26/2011	MW-01S	7.62	21.64		14.02	--	
	12/26/2011	MW-01D	8.70	21.72	(f)	13.02	--	
	1/28/2012	MW-01S	6.41	21.64		15.23	--	
	1/28/2012	MW-01D	7.24	21.72	(f)	14.48	--	
	2/26/2012	MW-01S	6.41	21.64		15.23	--	
	2/26/2012	MW-01D	10.20	21.72	(f)	11.52	--	
	3/7/2012	MW-01S	6.66	21.64		14.98	--	
	3/7/2012	MW-01D	9.18	21.72	(f)	12.54	--	
7	11/8/2006	MW-05S	12.29	29.25		16.96	16.50	Yes
	11/8/2006	MW-05D	14.36	28.10		13.74	--	--
	12/31/2006	MW-05S	11.07	29.25		18.18	16.50	Yes
	12/31/2006	MW-05D	11.96	28.10		16.14	--	--
	3/2/2007	MW-05S	12.53	29.25		16.72	16.50	Yes
	3/2/2007	MW-05D	16.18	28.10		11.92	--	--
	3/31/2007	MW-05S	12.19	29.25		17.06	16.50	Yes
	3/31/2007	MW-05D	16.22	28.10		11.88	--	--
	4/23/2007	MW-05S	13.63	29.25		15.62	16.50	No
	4/23/2007	MW-05D	13.93	28.10		14.17	--	--
	5/28/2007	MW-05S	15.03	29.25		14.22	16.50	No
	5/28/2007	MW-05D	16.01	28.10		12.09	--	--

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)		Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	6/30/2007	MW-05S	15.12	29.25		14.13	16.50	No
	6/30/2007	MW-05D	17.80	28.10		10.30	--	--
	8/1/2007	MW-05S	15.15	29.25		14.10	16.50	No
	8/1/2007	MW-05D	18.67	28.10		9.43	--	--
	9/29/2007	MW-05S	16.55	29.25		12.70	16.50	No
	9/29/2007	MW-05D	16.50	28.10		11.60	--	--
	11/22/2007	MW-05S	15.04	29.25		14.21	16.50	No
	11/22/2007	MW-05D	12.63	28.10		15.47	--	--
	1/26/2008	MW-05S	13.25	29.25		16.00	16.50	No
	1/26/2008	MW-05D	15.45	28.10		12.65	--	
	2/28/2008	MW-05S	12.56	29.25		16.69	16.50	Yes
	2/28/2008	MW-05D	17.81	28.10		10.29	--	--
	3/19/2008	MW-05S	13.44	29.25		15.81	16.50	No
	3/19/2008	MW-05D	17.97	28.10		10.13	--	--
	4/28/2008	MW-05S	13.79	29.25		15.46	16.50	No
	4/28/2008	MW-05D	16.16	28.10		11.94	--	--
	5/31/2008	MW-05S	14.08	29.25		15.17	16.50	No
	5/31/2008	MW-05D	15.63	28.10		12.47	--	--
	6/30/2008	MW-05S	15.02	29.25		12.70	16.50	No
	6/30/2008	MW-05D	14.00	28.10		11.60	--	--
	7/12/2008	MW-05S	15.22	29.25		14.03	16.50	No
	7/12/2008	MW-05D	16.33	28.10		11.77	--	--
	8/28/2008	MW-05S	16.03	29.25		13.22	16.50	No
	8/28/2008	MW-05D	18.98	28.10		9.12	--	--
	9/20/2008	MW-05S	NM	29.25		--	16.50	--
	9/20/2008	MW-05D	NM	28.10		--	--	--
	10/12/2008	MW-05S	NM	29.25		--	16.50	--
	10/12/2008	MW-05D	NM	28.10		--	--	--
	11/30/2008	MW-05S	NM	29.25		--	16.50	--
	11/30/2008	MW-05D	NM	28.10		--	--	--
	12/31/2008	MW-05S	NM	29.25		--	16.50	--
	12/31/2008	MW-05D	NM	28.10		--	--	--
	1/31/2009	MW-05S	15.38	29.45	(d)	14.07	16.50	No
	1/31/2009	MW-05D	16.77	26.50	(d)	9.73	--	--

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)		Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	2/23/2009	MW-05S	15.85	29.45	(d)	13.60	16.50	No
	2/23/2009	MW-05D	12.01	26.50	(d)	14.49	--	--
	3/29/2009	MW-05S	15.17	29.45	(d)	14.28	16.50	No
	3/29/2009	MW-05D	13.86	26.50	(d)	12.64	--	--
	4/18/2009	MW-05S	15.63	29.45	(d)	13.82	16.50	No
	4/18/2009	MW-05D	14.41	26.50	(d)	12.09	--	--
	5/16/2009	MW-05S	15.09	29.45	(d)	14.36	16.50	No
	5/16/2009	MW-05D	13.88	26.50	(d)	12.62	--	--
	6/21/2009	MW-05S	16.38	29.45	(d)	13.07	16.50	No
	6/21/2009	MW-05D	11.01	26.50	(d)	15.49	--	--
	7/20/2009	MW-05S	16.95	29.45	(d)	12.50	16.50	No
	7/20/2009	MW-05D	12.71	26.50	(d)	13.79	--	--
	8/10/2009	MW-05S	16.82	29.45		12.63	16.50	No
	8/10/2009	MW-05D	12.10	26.50		14.40	--	--
	9/7/2009	MW-05S	18.33	29.45	(d)	11.12	16.50	No
	9/7/2009	MW-05D	14.02	26.50	(d)	12.48	--	--
	10/10/2009	MW-05S	19.16	29.45	(d)	10.29	16.50	No
	10/10/2009	MW-05D	13.31	26.50	(d)	13.19	--	--
	11/28/2009	MW-05S	17.31	29.45	(d)	12.14	16.50	No
	11/28/2009	MW-05D	13.14	26.50	(d)	13.36	--	--
	12/31/2009	MW-05S	16.66	29.45	(d)	12.79	16.50	No
	12/31/2009	MW-05D	9.69	26.50	(d)	16.81	--	--
	1/14/2010	MW-05S	14.89	29.45		14.56	16.50	No
	1/14/2010	MW-05D	11.81	26.50		14.69	--	--
	2/21/2010	MW-05S	14.71	29.45		14.74	16.50	No
	2/21/2010	MW-05D	10.63	26.50		15.87	--	--
	3/17/2010	MW-05S	13.53	29.45		15.92	16.50	No
	3/17/2010	MW-05D	11.63	26.50		14.87	--	--
	4/25/2010	MW-05S	16.11	29.45		13.34	16.50	No
	4/25/2010	MW-05D	12.26	26.50		14.24	--	--
	5/16/2010	MW-05S	16.14	29.45		13.31	16.50	No
	5/16/2010	MW-05D	14.97	26.50		11.53	--	--
	6/26/2010	MW-05S	17.07	29.45		12.38	16.50	No
	6/26/2010	MW-05D	15.20	26.50		11.30	--	--

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	7/23/2010	MW-05S	17.73	29.45	11.72	16.50	No
	7/23/2010	MW-05D	15.31	26.50	11.19	--	--
	8/30/2010	MW-05S	15.58	29.45	13.87	16.50	No
	8/30/2010	MW-05D	12.01	26.50	14.49	--	--
	9/30/2010	MW-05S	14.32	29.45	15.13	16.50	No
	9/30/2010	MW-05D	12.83	26.50	13.67	--	--
	10/18/2010	MW-05S	15.52	29.45	13.93	16.50	No
	10/18/2010	MW-05D	15.58	26.50	10.92	--	--
	11/29/2010	MW-05S	15.14	29.45	14.31	16.50	No
	11/29/2010	MW-05D	10.32	26.50	16.18	--	--
	12/25/2010	MW-05S	13.03	29.45	16.42	16.50	No
	12/25/2010	MW-05D	9.02	26.50	17.48	--	--
	1/29/2011	MW-05S	13.29	29.45	16.16	16.50	No
	1/29/2011	MW-05D	11.80	26.50	14.70	--	--
	2/20/2011	MW-05S	13.22	29.45	16.23	16.50	No
	2/20/2011	MW-05D	14.33	26.50	12.17	--	--
	3/24/2011	MW-05S	13.15	29.45	16.30	16.50	No
	3/24/2011	MW-05D	9.11	26.50	17.39	--	--
	4/23/2011	MW-05S	12.78	29.45	16.67	16.50	Yes
	4/23/2011	MW-05D	16.44	26.50	10.06	--	--
	5/30/2011	MW-05S	13.40	29.45	16.05	16.50	No
	5/30/2011	MW-05D	16.18	26.50	10.32	--	--
	6/26/2011	MW-05S	13.94	29.45	15.51	16.50	No
	6/26/2011	MW-05D	12.31	26.50	14.19	--	--
	7/30/2011	MW-05S	14.08	29.45	15.37	16.50	No
	7/30/2011	MW-05D	17.13	26.50	9.37	--	--
	8/8/2011	MW-05S	14.27	29.45	15.18	16.50	No
	8/8/2011	MW-05D	15.50	26.50	11.00	--	--
	9/24/2011	MW-05S	14.42	29.45	15.03	16.50	No
	9/24/2011	MW-05D	16.02	26.50	10.48	--	--
	10/29/2011	MW-05S	14.62	29.45	14.83	16.50	No
	10/29/2011	MW-05D	11.59	26.50	14.91	--	--
	11/26/2011	MW-05S	12.74	29.45	16.71	16.50	Yes
	11/26/2011	MW-05D	10.19	26.50	16.31	--	--

TABLE A-2
CUMULATIVE GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
	12/26/2011	MW-05S	14.43	29.45	15.02	16.50	No
	12/26/2011	MW-05D	13.68	26.50	12.82	--	--
	1/28/2012	MW-05S	13.28	29.45	16.17	16.50	No
	1/28/2012	MW-05D	10.15	26.50	16.35	--	--
	2/26/2012	MW-05S	12.81	29.45	16.64	16.50	Yes
	2/26/2012	MW-05D	15.87	26.50	10.63	--	--
	3/7/2012	MW-05S	13.30	29.45	16.15	16.50	No
	3/7/2012	MW-05D	15.35	26.50	11.15	--	--

MLLW = Mean low low water.
Groundwater elevations determined by subtracting depth to groundwater below top of casing (ft) from top of well casing elevation (MLLW, ft).
(a) Below top of PVC well casing.
(b) Hydraulic gradient direction of groundwater. Short term goal is inward for well pairs 1, 2, 3, and 4, and upwards for well pairs 5, 6, and 7.
(b) Short term hydraulic control goal is 15.5 ft along the majority of the cutoff wall alignment and 16.5 ft adjacent to Budd Inlet.
(c) Well LW-3 casing modified and re-surveyed January 2009. On 7/28/10 the well casing at LW-3 cut down 0.2 ft to make room for new well monument lid. Elevation was adjusted from 20.03 to 19.83.
(d) Wells MW-02s, MW-02d, MW-05s, and MW-05d were modified during construction activities and re-surveyed February 2009.
(e) MW-02D and MW-02S inner north rim elevations modified in September 2011.
(f) On 12/8/11 the inner well casing was cut down at MW-01D by 0.15'. Outer casing cut down corresponding amount. New MW-01D measuring point elevation is 21.72' MLLW.

NM = Not measured.
NA = Not available.

APPENDIX B

Laboratory Analytical Results

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 24, 2011

Chris Kimmel
Landau Associates, Inc.
130 2nd Avenue S.
Edmonds, WA 98020

RE: Project: Port of Olympia
ARI Job No: TH68

Dear Chris:

Please find enclosed the original *Chain of Custody*, sample receipt documentation, and final results for the project referenced above. Analytical Resources, Inc. accepted six water samples and a trip blank in good condition on August 9, 2011.

The samples were analyzed for NWTPH-Gx, NWTPH-Dx, cPAHs by method 8270 SIM, PAHs by method 8270 and PCP on select samples by method 8041, as requested on the *Chain of Custody*.

Please refer to the *Case Narrative* for analytical details regarding the sample.

A copy of this report and all associated ARI raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to contact me at any time.

Sincerely,
ANALYTICAL RESOURCES, INC.

Eric Branson
Project Manager
-for-
Kelly Bottem
Client Services Manager
(206) 695-6211

Enclosures

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Case Narrative

Project: 0021035.010
ARI Job No.: TH68
August 24, 2011

Sample Receipt

Please find enclosed the original *Chain of Custody (COC)* record and analytical results for the project referenced above. Analytical Resources, Inc. accepted six water samples and a trip blank in good condition on August 9, 2011. The samples were received at cooler temperatures between 3.4 and 5.8°C. Please see the *Cooler Receipt Form* for further details. Per Landau Associates, select samples were allowed to settle and sample volume was collected from the clear portion.

The following tests were performed on selected samples, as requested on the *Chain of Custody*.

Semivolatile Organics by method 8270D Water

The samples were extracted on 8/11/11. The samples were analyzed on 8/16/11 and 8/17/11 - within the method recommended holding time.

Samples: Sample **LW-3-20110808** was analyzed at an additional 3x dilution when the original had no detections at regular strength because the nature of the sample matrix caused one surrogate to be recovered out of control low.

There were no other anomalies associated with these samples.

Surrogates: d14-p-Terphenyl was out of control in the original analytical run of sample **LW-3-20110808**. It was in control in the diluted reanalysis, and no further corrective action was taken.

All other surrogate recoveries were in control.

LCS/LSCD (s): Are in control.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

SIM PNA by method 8270-SIM Water

The samples were extracted on 8/11/11 and analyzed on 8/16/11 and 8/17/11 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LSCD (s): The relative percent difference (RPD) between recoveries for the LCS and LCSD for Dibenz(a,h)anthracene exceeded the 40% allowable limit. The individual percent recoveries were in control. No further corrective action was taken.

All percent recoveries and other RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Case Narrative

Project: 0021035.010
ARI Job No.: TH68
August 24, 2011
Page 2 of 3

Continuing Calibrations: Are in control.

PCP Only by method 8041

The samples were extracted on 8/12/11 and analyzed on 8/17/11 and 8/18/11 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LSCD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Gx

The samples were analyzed on 8/11/11 - within the method recommended holding time.

Samples: The vial for sample **LW-3-20110808** contained headspace (significant air). Per method recommendations, the vial should contain little to no air.

There were no other anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Dx

The samples were extracted on 8/10/11 and analyzed on 8/17/11 - within the method recommended holding time.

Surrogates: All surrogate recoveries were in control.

Samples: There were no anomalies associated with these samples.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Case Narrative

Project: 0021035.010
ARI Job No.: TH68
August 24, 2011

Continuing Calibrations: Are in control.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: TH68
Client: Landau Associates, Inc.
Project Event: 0021035.010
Project Name: Port of Olympia

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	PZ-13-20110808	TH68A	11-17282	Water	08/08/11 14:31	08/09/11 08:20
2.	PZ-12-20110808	TH68B	11-17283	Water	08/08/11 14:30	08/09/11 08:20
3.	PZ-17-20110808	TH68C	11-17284	Water	08/08/11 16:35	08/09/11 08:20
4.	LW-3-20110808	TH68D	11-17285	Water	08/08/11 16:30	08/09/11 08:20
5.	LW-4R-20110808	TH68E	11-17286	Water	08/08/11 18:30	08/09/11 08:20
6.	PZ-18-20110808	TH68F	11-17287	Water	08/08/11 18:31	08/09/11 08:20
7.	Trip Blanks	TH68G	11-17288	Water	08/08/11	08/09/11 08:20

Printed 08/09/11

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).

S — Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA — The flagged analyte was not analyzed for

NR — Spiked compound recovery is not reported due to chromatographic interference

NS — The flagged analyte was not spiked into the sample

M — Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

M2 — The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.

N — The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y — The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC — Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C — The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P — The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X — Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z — Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A	The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
F	Samples were frozen prior to particle size determination
SM	Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
SS	Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
W	Weight of sample in some pipette aliquots was below the level required for accurate weighting

LANDAU ASSOCIATES

☒ **Seattle/Edmonds** (425) 778-0907
☐ **Tacoma** (253) 926-2493
☐ **Spokane** (509) 327-9737
☐ **Portland** (503) 542-1080
☐ _____

TH68

Chain-of-Custody Record

Date 08/8/11
Page 1 of 1

Project Name Port of Olympia Project No. 0021035.010
Project Location/Event Cascade Pole, Dry-season
Sampler's Name Jessica Stone, Toni Smith
Project Contact Chris Kimmel
Send Results To Chris Kimmel

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Sample I.D.	Date	Time	Matrix	No. of Containers	TPH-Gx	TPH-Dx + Creosote	PAHs (8270)	cPAHs SIM	PCP (8270)	PCP (8041)	Observations/Comments
PZ-13-20110808	8/8/11	1431	H_2O	10	X	X	X	X	X	X	
PZ-12-20110808	8/8/11	1430	H_2O	10	X	X	X	X	X	X	
TRIP BLANKS	8/8/11	—	H_2O	2	X						
PZ-17-20110808	8/8/11	1635	H_2O	10	X	X	X	X	X	X	
LW-3-20110808	8/8/11	1630	H_2O	10	X	X	X	X	X	X	
LW-4R-20110808	8/8/11	1830	H_2O	10	X	X	X	X	X	X	
PZ-18-20110808	8/8/11	1831	H_2O	10	X	X	X	X	X	X	

Observations/Comments:
- X Allow water samples to settle, collect aliquot from clear portion
- X NWTPH-Dx - run acid wash/silica gel cleanup
- ___ run samples standardized to _____ product
- ___ Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
- ___ non-preserved
- ___ preserved w/methanol
- ___ preserved w/sodium bisulfate
- ___ Freeze upon receipt

- ___ Dissolved metal water samples field filtered

Other Run all samples for PCP using 8270-SIM IF result = ND, then = and only then run PCP by 8041

Special Shipment/Handling or Storage Requirements 4 coolers + ice

Method of Shipment Delivery

Relinquished by	Received by	Relinquished by	Received by
Signature Sarah Weeks	Signature A. Volgardsen	Signature	Signature
Printed Name Sarah Weeks	Printed Name ARI	Printed Name	Printed Name
Company Landau Assoc. Inc	Company	Company	Company
Date 08/8/11 Time 2105	Date 8/9/11 Time 820	Date Time	Date Time

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

Rev 8/09

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Landau

Project Name: Port of Olympia

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: Night Box

Assigned ARI Job No: TH168

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? (YES) NO

Were custody papers properly filled out (ink, signed, etc.) (YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 5.8 4.9 3.4 4.6 ___ ___

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941161 9

Cooler Accepted by: AV Date: 8/9/11 Time: 820

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? (Bubble Wrap) (Wet Ice) Gel Packs (Baggies) Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA (YES) NO

Were all bottles sealed in individual plastic bags? (YES) NO

Did all bottles arrive in good condition (unbroken)? (YES) NO

Were all bottle labels complete and legible? (YES) NO

Did the number of containers listed on COC match with the number of containers received? (YES) NO

Did all bottle labels and tags agree with custody papers? (YES) NO

Were all bottles used correct for the requested analyses? (YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... (NA) YES NO

Were all VOC vials free of air bubbles? NA YES (NO)

Was sufficient amount of sample sent in each bottle? (YES) NO

Date VOC Trip Blank was made at ARI NA 8/3/11

Was Sample Split by ARI: (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: AV Date: 8/9/11 Time: 1020

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

PZ-12 = 1SM LW-4R = 2PB TB = 2PB
LW-3 = 2LG PZ-18 = 2PB

By AV Date 8/9/11

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
• • •	• • • •	● ● ●

Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: PZ-13-20110808
SAMPLE

Lab Sample ID: TH68A
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 22:49
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	56.4%
d14-p-Terphenyl	49.6%
2,4,6-Tribromophenol	65.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: PZ-12-20110808
SAMPLE

Lab Sample ID: TH68B
LIMS ID: 11-17283
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 23:22
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	62.8%
d14-p-Terphenyl	66.0%
2,4,6-Tribromophenol	73.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: PZ-17-20110808
SAMPLE

Lab Sample ID: TH68C
LIMS ID: 11-17284
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 23:55
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	66.0%
d14-p-Terphenyl	66.8%
2,4,6-Tribromophenol	77.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: LW-3-20110808
SAMPLE

Lab Sample ID: TH68D
LIMS ID: 11-17285
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 00:27
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	66.4%
d14-p-Terphenyl	23.1%
2,4,6-Tribromophenol	76.8%

ANALYTICAL RESOURCES INCORPORATED

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Semivolatiles by SW8270D GC/MS
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Sample ID: LW-3-20110808
DILUTION

Lab Sample ID: TH68D
LIMS ID: 11-17285
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 18:29
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 3.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	3.0	< 3.0 U
208-96-8	Acenaphthylene	3.0	< 3.0 U
83-32-9	Acenaphthene	3.0	< 3.0 U
132-64-9	Dibenzofuran	3.0	< 3.0 U
86-73-7	Fluorene	3.0	< 3.0 U
87-86-5	Pentachlorophenol	15	< 15 U
85-01-8	Phenanthrene	3.0	< 3.0 U
86-74-8	Carbazole	3.0	< 3.0 U
120-12-7	Anthracene	3.0	< 3.0 U
206-44-0	Fluoranthene	3.0	< 3.0 U
129-00-0	Pyrene	3.0	< 3.0 U
56-55-3	Benzo(a)anthracene	3.0	< 3.0 U
218-01-9	Chrysene	3.0	< 3.0 U
50-32-8	Benzo(a)pyrene	3.0	< 3.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	< 3.0 U
53-70-3	Dibenz(a,h)anthracene	3.0	< 3.0 U
191-24-2	Benzo(g,h,i)perylene	3.0	< 3.0 U
90-12-0	1-Methylnaphthalene	3.0	< 3.0 U
TOTBFA	Total Benzofluoranthenes	3.0	< 3.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	70.8%
d14-p-Terphenyl	30.7%
2,4,6-Tribromophenol	76.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: LW-4R-20110808
SAMPLE

Lab Sample ID: TH68E
LIMS ID: 11-17286
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 01:00
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	67.6%
d14-p-Terphenyl	65.2%
2,4,6-Tribromophenol	80.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: PZ-18-20110808
SAMPLE

Lab Sample ID: TH68F
LIMS ID: 11-17287
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 01:33
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	62.0%
d14-p-Terphenyl	61.2%
2,4,6-Tribromophenol	75.2%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010

Client ID	FBP	TPH	TBP	TOT OUT
PZ-13-20110808	56.4%	49.6%	65.6%	0
MB-081111	73.2%	91.2%	76.8%	0
LCS-081111	65.6%	82.0%	78.4%	0
LCSD-081111	63.2%	82.8%	75.5%	0
PZ-12-20110808	62.8%	66.0%	73.3%	0
PZ-17-20110808	66.0%	66.8%	77.9%	0
LW-3-20110808	66.4%	23.1%*	76.8%	1
LW-3-20110808 DL	70.8%	30.7%	76.4%	0
LW-4R-20110808	67.6%	65.2%	80.8%	0
PZ-18-20110808	62.0%	61.2%	75.2%	0

	LCS/MB LIMITS	QC LIMITS
(FBP) = 2-Fluorobiphenyl	(49-100)	(42-100)
(TPH) = d14-p-Terphenyl	(53-119)	(26-114)
(TBP) = 2,4,6-Tribromophenol	(52-123)	(48-118)

Prep Method: SW3520C
Log Number Range: 11-17282 to 11-17287

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: LCS-081111
LCS/LCSD

Lab Sample ID: LCS-081111
LIMS ID: 11-17283
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted LCS/LCSD: 08/11/11

Date Analyzed LCS: 08/16/11 21:43
LCSD: 08/16/11 22:16
Instrument/Analyst LCS: NT6/JZ
LCSD: NT6/JZ
GPC Cleanup: NO

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	14.6	25.0	58.4%	14.7	25.0	58.8%	0.7%
2-Methylnaphthalene	14.8	25.0	59.2%	14.8	25.0	59.2%	0.0%
Acenaphthylene	15.6	25.0	62.4%	15.9	25.0	63.6%	1.9%
Acenaphthene	16.0	25.0	64.0%	16.9	25.0	67.6%	5.5%
Dibenzofuran	16.7	25.0	66.8%	17.4	25.0	69.6%	4.1%
Fluorene	16.5	25.0	66.0%	17.0	25.0	68.0%	3.0%
Pentachlorophenol	61.9	75.0	82.5%	62.9	75.0	83.9%	1.6%
Phenanthrene	18.7	25.0	74.8%	19.1	25.0	76.4%	2.1%
Carbazole	17.4	25.0	69.6%	18.4	25.0	73.6%	5.6%
Anthracene	17.6	25.0	70.4%	18.1	25.0	72.4%	2.8%
Fluoranthene	18.6	25.0	74.4%	18.8	25.0	75.2%	1.1%
Pyrene	19.9	25.0	79.6%	20.7	25.0	82.8%	3.9%
Benzo(a)anthracene	19.2	25.0	76.8%	19.8	25.0	79.2%	3.1%
Chrysene	18.5	25.0	74.0%	19.2	25.0	76.8%	3.7%
Benzo(a)pyrene	17.2	25.0	68.8%	17.8	25.0	71.2%	3.4%
Indeno(1,2,3-cd)pyrene	19.9	25.0	79.6%	22.4	25.0	89.6%	11.8%
Dibenz(a,h)anthracene	19.1	25.0	76.4%	22.0	25.0	88.0%	14.1%
Benzo(g,h,i)perylene	20.5	25.0	82.0%	23.8	25.0	95.2%	14.9%
1-Methylnaphthalene	15.3	25.0	61.2%	15.4	25.0	61.6%	0.7%
Total Benzofluoranthenes	38.4	50.0	76.8%	39.6	50.0	79.2%	3.1%

Semivolatile Surrogate Recovery

	LCS	LCSD
2-Fluorobiphenyl	65.6%	63.2%
d14-p-Terphenyl	82.0%	82.8%
2,4,6-Tribromophenol	78.4%	75.5%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: MB-081111
METHOD BLANK

Lab Sample ID: MB-081111
LIMS ID: 11-17283
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: NA
Date Received: NA

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 21:10
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	73.2%
d14-p-Terphenyl	91.2%
2,4,6-Tribromophenol	76.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-13-20110808
SAMPLE

Lab Sample ID: TH68A
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 19:59
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	64.3%
d14-Dibenzo(a,h)anthracene	49.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-12-20110808
SAMPLE

Lab Sample ID: TH68B
LIMS ID: 11-17283
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 20:34
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	62.7%
d14-Dibenzo(a,h)anthracene	46.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-17-20110808
SAMPLE

Lab Sample ID: TH68C
LIMS ID: 11-17284
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 21:50
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	61.0%
d14-Dibenzo(a,h)anthracene	29.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LW-3-20110808
SAMPLE

Lab Sample ID: TH68D
LIMS ID: 11-17285
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 22:24
Instrument/Analyst: NT4/JZ

Sample Amount: 480 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	68.3%
d14-Dibenzo(a,h)anthracene	20.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LW-4R-20110808
SAMPLE

Lab Sample ID: TH68E
LIMS ID: 11-17286
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 22:58
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	60.7%
d14-Dibenzo(a,h)anthracene	32.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-18-20110808
SAMPLE

Lab Sample ID: TH68F
LIMS ID: 11-17287
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 23:32
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	55.0%
d14-Dibenzo(a,h)anthracene	21.7%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010

Client ID	MNP	DBA	TOT OUT
MB-081111	68.0%	67.3%	0
LCS-081111	66.0%	47.0%	0
LCSD-081111	62.0%	70.0%	0
PZ-13-20110808	64.3%	49.0%	0
PZ-12-20110808	62.7%	46.0%	0
PZ-17-20110808	61.0%	29.7%	0
LW-3-20110808	68.3%	20.7%	0
LW-4R-20110808	60.7%	32.7%	0
PZ-18-20110808	55.0%	21.7%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(40-110)	(33-107)
(DBA) = d14-Dibenzo(a,h)anthracene	(33-140)	(10-142)

Prep Method: SW3520C
Log Number Range: 11-17282 to 11-17287

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LCS-081111
LAB CONTROL SAMPLE

Lab Sample ID: LCS-081111
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 08/11/11

Date Analyzed LCS: 08/16/11 18:17
LCSD: 08/16/11 18:51
Instrument/Analyst LCS: NT4/JZ
LCSD: NT4/JZ

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)anthracene	2.04	3.00	68.0%	2.01	3.00	67.0%	1.5%
Chrysene	2.18	3.00	72.7%	2.18	3.00	72.7%	0.0%
Benzo(a)pyrene	1.98	3.00	66.0%	2.15	3.00	71.7%	8.2%
Indeno(1,2,3-cd)pyrene	1.58	3.00	52.7%	2.08	3.00	69.3%	27.3%
Dibenz(a,h)anthracene	1.38	3.00	46.0%	2.14	3.00	71.3%	43.2%
Total Benzofluoranthenes	4.75	6.00	79.2%	5.51	6.00	91.8%	14.8%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	66.0%	62.0%
d14-Dibenzo(a,h)anthracene	47.0%	70.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MB-081111
METHOD BLANK

Lab Sample ID: MB-081111
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: NA
Date Received: NA

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 17:43
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	68.0%
d14-Dibenzo(a,h)anthracene	67.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: PZ-13-20110808
SAMPLE

Lab Sample ID: TH68A
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/12/11
Date Analyzed: 08/17/11 23:23
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	68.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: PZ-12-20110808
SAMPLE

Lab Sample ID: TH68B
LIMS ID: 11-17283
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/12/11
Date Analyzed: 08/17/11 23:59
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	75.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: PZ-17-20110808
SAMPLE

Lab Sample ID: TH68C
LIMS ID: 11-17284
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 00:36
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	74.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: LW-3-20110808
SAMPLE

Lab Sample ID: TH68D
LIMS ID: 11-17285
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 01:12
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	67.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: LW-4R-20110808
SAMPLE

Lab Sample ID: TH68E
LIMS ID: 11-17286
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 01:48
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	66.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041 **Sample ID: PZ-18-20110808**
Page 1 of 1 **SAMPLE**

Lab Sample ID: TH68F
LIMS ID: 11-17287
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 02:25
Instrument/Analyst: ECD1/AAR

Sample Amount: 400 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.31	< 0.31 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	51.6%

ANALYTICAL RESOURCES INCORPORATED

SW8041 CHLOROPHENOLICS SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010

Client ID	TBP	TOT OUT
MB-081211	93.6%	0
LCS-081211	86.0%	0
LCSD-081211	90.0%	0
PZ-13-20110808	68.0%	0
PZ-12-20110808	75.2%	0
PZ-17-20110808	74.8%	0
LW-3-20110808	67.6%	0
LW-4R-20110808	66.0%	0
PZ-18-20110808	51.6%	0

	LCS/MB LIMITS	QC LIMITS
(TBP) = 2,4,6-Tribromophenol	(40-130)	(11-156)

Prep Method: SW3510C
Log Number Range: 11-17282 to 11-17287

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: LCS-081211
LCS/LCSD

Lab Sample ID: LCS-081211
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted LCS/LCSD: 08/12/11

Date Analyzed LCS: 08/17/11 20:21
LCSD: 08/17/11 20:58
Instrument/Analyst LCS: ECD1/AAR
LCSD: ECD1/AAR

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 50 mL
LCSD: 50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Pentachlorophenol	2.29	2.50	91.6%	2.40	2.50	96.0%	4.7%

Chlorophenols Surrogate Recovery

	LCS	LCSD
2,4,6-Tribromophenol	86.0%	90.0%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: MB-081211
METHOD BLANK

Lab Sample ID: MB-081211
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: NA
Date Received: NA

Date Extracted: 08/12/11
Date Analyzed: 08/17/11 19:45
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	93.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 08/24/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

ARI ID	Client ID	Analysis Date	DL	Range	Result
MB-081111	Method Blank	08/11/11	1.0	Gasoline	< 250 U
11-17282		PID2		HC ID	---
				Trifluorotoluene	96.3%
				Bromobenzene	100%
TH68A	PZ-13-20110808	08/11/11	1.0	Gasoline	< 250 U
11-17282		PID2		HC ID	---
				Trifluorotoluene	104%
				Bromobenzene	104%
TH68B	PZ-12-20110808	08/11/11	1.0	Gasoline	< 250 U
11-17283		PID2		HC ID	---
				Trifluorotoluene	101%
				Bromobenzene	101%
TH68C	PZ-17-20110808	08/11/11	1.0	Gasoline	< 250 U
11-17284		PID2		HC ID	---
				Trifluorotoluene	101%
				Bromobenzene	101%
TH68D	LW-3-20110808	08/11/11	1.0	**Gasoline**	**1400**
11-17285		PID2		HC ID	GRO
				Trifluorotoluene	99.6%
				Bromobenzene	101%
TH68E	LW-4R-20110808	08/11/11	1.0	Gasoline	< 250 U
11-17286		PID2		HC ID	---
				Trifluorotoluene	97.8%
				Bromobenzene	100%
TH68F	PZ-18-20110808	08/11/11	1.0	Gasoline	< 250 U
11-17287		PID2		HC ID	---
				Trifluorotoluene	99.5%
				Bromobenzene	100%
TH68G	Trip Blanks	08/11/11	1.0	Gasoline	< 250 U
11-17288		PID2		HC ID	---
				Trifluorotoluene	104%
				Bromobenzene	103%

Gasoline values reported in µg/L (ppb)

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

ANALYTICAL RESOURCES INCORPORATED

TPHG WATER SURROGATE RECOVERY SUMMARY

ARI Job: TH68
Matrix: Water

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010

Client ID	TFT	BBZ	TOT OUT
MB-081111	96.3%	100%	0
LCS-081111	105%	104%	0
LCSD-081111	106%	107%	0
PZ-13-20110808	104%	104%	0
PZ-12-20110808	101%	101%	0
PZ-17-20110808	101%	101%	0
LW-3-20110808	99.6%	101%	0
LW-4R-20110808	97.8%	100%	0
PZ-18-20110808	99.5%	100%	0
Trip Blanks	104%	103%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(80-120)
(BBZ) = Bromobenzene	(80-120)	(80-120)

Log Number Range: 11-17282 to 11-17288

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: LCS-081111
LAB CONTROL SAMPLE

Lab Sample ID: LCS-081111
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/24/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 08/11/11 06:24
LCSD: 08/11/11 06:52
Instrument/Analyst LCS: PID2/PKC
LCSD: PID2/PKC

Purge Volume: 5.0 mL

Dilution Factor LCS: 1.0
LCSD: 1.0

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	950	1000	95.0%	940	1000	94.0%	1.1%

Reported in ug/L (ppb)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	105%	106%
Bromobenzene	104%	107%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 1 of 1
Matrix: Water

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010

Data Release Authorized:
Reported: 08/22/11

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
MB-081011	Method Blank	08/10/11	08/17/11	1.00	Diesel	100	< 100 U
11-17282	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		88.9%
TH68A	PZ-13-20110808	08/10/11	08/17/11	1.00	Diesel	100	< 100 U
11-17282	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		103%
TH68B	PZ-12-20110808	08/10/11	08/17/11	1.00	Diesel	100	< 100 U
11-17283	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		107%
TH68C	PZ-17-20110808	08/10/11	08/17/11	1.00	Diesel	110	< 110 U
11-17284	HC ID: ---		FID4A	1.0	Motor Oil	220	< 220 U
					Creosote	220	< 220 U
					o-Terphenyl		111%
TH68D	LW-3-20110808	08/10/11	08/17/11	1.00	**Diesel**	**110**	**170**
11-17285	HC ID: **DRO**		FID4A	1.0	Motor Oil	220	< 220 U
					Creosote	**220**	**390**
					o-Terphenyl		108%
TH68E	LW-4R-20110808	08/10/11	08/17/11	1.00	Diesel	110	< 110 U
11-17286	HC ID: ---		FID4A	1.0	Motor Oil	220	< 220 U
					Creosote	220	< 220 U
					o-Terphenyl		107%
TH68F	PZ-18-20110808	08/10/11	08/17/11	1.00	Diesel	120	< 120 U
11-17287	HC ID: ---		FID4A	1.0	Motor Oil	240	< 240 U
					Creosote	240	< 240 U
					o-Terphenyl		89.5%

Reported in ug/L (ppb)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.
Creosote quantitation on total peaks in the range from C12 to C22.
HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010

Client ID	OTER	TOT OUT
MB-081011	88.9%	0
LCS-081011	109%	0
LCSD-081011	103%	0
PZ-13-20110808	103%	0
PZ-12-20110808	107%	0
PZ-17-20110808	111%	0
LW-3-20110808	108%	0
LW-4R-20110808	107%	0
PZ-18-20110808	89.5%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: SW3510C
Log Number Range: 11-17282 to 11-17287

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-081011**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-081011
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/24/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted LCS/LCSD: 08/10/11
Date Analyzed LCS: 08/17/11 02:39
LCSD: 08/17/11 03:02
Instrument/Analyst LCS: FID/AAR
LCSD: FID/AAR

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	3060	3000	102%	2990	3000	99.7%	2.3%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	109%	103%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: TH68
Matrix: Water Project: Port of Olympia
Date Received: 08/09/11 0021035.010

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
11-17282-081011MB1	Method Blank	500 mL	1.00 mL	08/10/11
11-17282-081011LCS1	Lab Control	500 mL	1.00 mL	08/10/11
11-17282-081011LCSD1	Lab Control Dup	500 mL	1.00 mL	08/10/11
11-17282-TH68A	PZ-13-20110808	500 mL	1.00 mL	08/10/11
11-17283-TH68B	PZ-12-20110808	500 mL	1.00 mL	08/10/11
11-17284-TH68C	PZ-17-20110808	450 mL	1.00 mL	08/10/11
11-17285-TH68D	LW-3-20110808	460 mL	1.00 mL	08/10/11
11-17286-TH68E	LW-4R-20110808	445 mL	1.00 mL	08/10/11
11-17287-TH68F	PZ-18-20110808	410 mL	1.00 mL	08/10/11

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 24, 2011

Chris Kimmel
Landau Associates, Inc.
130 2nd Avenue S.
Edmonds, WA 98020

RE: Project: Port of Olympia
ARI Job No: TI17

Dear Chris:

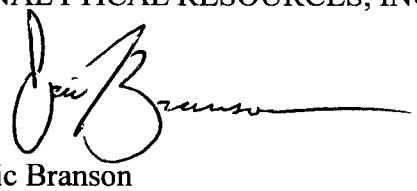
Please find enclosed the original *Chain of Custody*, sample receipt documentation, and final results for the project referenced above. Analytical Resources, Inc. accepted nine water samples and a trip blank in good condition on August 10, 2011.

The samples were analyzed for NWTPH-Gx, NWTPH-Dx, cPAHs by method 8270 SIM, PAHs by method 8270 and PCP on select samples by method 8041, as requested on the *Chain of Custody*.

Please refer to the *Case Narrative* for analytical details regarding the sample.

A copy of this report and all associated ARI raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to contact me at any time.

Sincerely,
ANALYTICAL RESOURCES, INC.



Eric Branson
Project Manager
-for-
Kelly Bottem
Client Services Manager
(206) 695-6211

Enclosures

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Case Narrative

Project: 0021035.010
ARI Job No.: TI17
August 24, 2011
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Sample Receipt

Please find enclosed the original *Chain of Custody (COC)* record and analytical results for the project referenced above. Analytical Resources, Inc. accepted nine water samples and a trip blank in good condition on August 10, 2011. The samples were received at cooler temperatures between 1.2 and 5.9°C. Please see the *Cooler Receipt Form* for further details. Per Landau Associates, select samples were allowed to settle and sample volume was collected from the clear portion.

The following tests were performed on selected samples, as requested on the *Chain of Custody*.

Semivolatile Organics by method 8270D Water

The samples were extracted on 8/11/11. The samples were analyzed on 8/16/11 and 8/17/11 - within the method recommended holding time.

Samples: Samples **MW-02D-20110809** and **MW-01S-20110809** required additional analytical runs at dilution in order to properly quantify select detections within a reportable range. Both runs have been reported.

There were no other anomalies associated with these samples.

Surrogates: The surrogates were diluted beyond recovery in the diluted analysis of sample **MW-01S-20110809**. They were recovered in control in the original run.

All other surrogate recoveries were in control.

LCS/LSCD (s): Are in control.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

SIM PNA by method 8270-SIM Water

The samples were extracted on 8/15/11 and analyzed between 8/19/11 and 8/22/11 - within the method recommended holding time.

Samples: Internal Standard Naphthalene-d8 was not recoverable for the original analysis of sample **MW-01S-20110809**. It was in control in the follow-up analysis at dilution. Both runs have been reported.

There were no other anomalies associated with these samples.

Surrogates: d10-2-Methylnaphthalene was out of control low in the original analysis of sample. **MW-01s-20110809**. Both surrogates were diluted beyond recovery in the diluted analysis. No further corrective action was taken.

All other surrogate recoveries were in control.

Case Narrative

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LCS/LSCD (s): All percent recoveries and other RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

PCP Only by method 8041

The samples were extracted on 8/12/11 and analyzed on 8/17/11 and 8/18/11 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LSCD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Gx

The samples were analyzed on 8/12/11 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Dx

The samples were extracted on 8/12/11 and analyzed on 8/16/11 and 8/17/11 - within the method recommended holding time.

Surrogates: All surrogate recoveries were in control.

Samples: There were no anomalies associated with these samples.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Case Narrative

Project: 0021035.010
ARI Job No.: TI17
August 24, 2011
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Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: TI17
Client: Landau Associates, Inc.
Project Event: 0021035-010
Project Name: Port of Olympia

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	PZ-30-20110809	TI17A	11-17528	Water	08/09/11 09:45	08/10/11 14:30
2.	PZ-19-20110809	TI17B	11-17529	Water	08/09/11 09:40	08/10/11 14:30
3.	MW-05S-20110809	TI17C	11-17530	Water	08/09/11 09:49	08/10/11 14:30
4.	MW-02D-20110809	TI17D	11-17531	Water	08/09/11 11:10	08/10/11 14:30
5.	MW-02S-20110809	TI17E	11-17532	Water	08/09/11 11:27	08/10/11 14:30
6.	MW-01D-20110809	TI17F	11-17533	Water	08/09/11 14:20	08/10/11 14:30
7.	MW-01S-20110809	TI17G	11-17534	Water	08/09/11 13:59	08/10/11 14:30
8.	CW-13-20110809	TI17H	11-17535	Water	08/09/11 17:00	08/10/11 14:30
9.	MW05D-20110809	TI17I	11-17536	Water	08/09/11 17:41	08/10/11 14:30
10.	Trip Blanks	TI17J	11-17537	Water	08/09/11	08/10/11 14:30

Printed 08/10/11

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).

S	Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
NA	The flagged analyte was not analyzed for
NR	Spiked compound recovery is not reported due to chromatographic interference
NS	The flagged analyte was not spiked into the sample
M	Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
M2	The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
Y	The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
EMPC	Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**
C	The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
P	The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference
X	Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**
Z	Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A	The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
F	Samples were frozen prior to particle size determination
SM	Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
SS	Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
W	Weight of sample in some pipette aliquots was below the level required for accurate weighting

LANDAU ASSOCIATES

☒ Seattle/Edmonds (425) 778-0907
☐ Tacoma (253) 926-2493
☐ Spokane (509) 327-9737
☐ Portland (503) 542-1080
☐ _____

Chain-of-Custody Record

Date 8/9/2011
Page 1 of 1

Project Name Port of Olympia Project No. 002035.010
Project Location/Event Cascade Pole, Dry-Season
Sampler's Name Jessica Stone, Tori Smith
Project Contact Chris Kimmel
Send Results To Chris Kimmel

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Sample I.D.	Date	Time	Matrix	No. of Containers	Testing Parameters: TPH-Gx	TPH-Dx + (Acid/Silica)	PAHs (8270)	cPAHs SIM	PCP (8270)	PCP (8041)	Observations/Comments
PZ-30-20110809	8/9/11	0945	H_2O	10	X	X	X	X	X	X	
PZ-19-20110809		0940		10	X	X	X	X	X	X	
MW-05S-20110809		0949		10	X	X	X	X	X	X	
Trip Blanks		–		4	X						
MW-02D-20110809		1110		10	X	X	X	X	X	X	
MW-02S-20110809		1127		10	X	X	X	X	X	X	
MW-01D-20110809		1420		10	X	X	X	X	X	X	
MW-01S-20110809		1359		10	X	X	X	X	X	X	
CW-13-20110809		1700		10	X	X	X	X	X	X	
MW050-20110809		1741		10	X	X	X	X	X	X	

Observations/Comments:
- X Allow water samples to settle, collect aliquot from clear portion
- X NWTPH-Dx - run acid wash/silica gel cleanup
- ___ run samples standardized to _____ product
- ___ Analyze for EPH if no specific product identified
- VOC/BTEX/VPH (soil):
  - ___ non-preserved
  - ___ preserved w/methanol
  - ___ preserved w/sodium bisulfate
  - ___ Freeze upon receipt
- ___ Dissolved metal water samples field filtered
- Other Run all samples for PCP using 8270-SIM. IF result = ND, then and only then run PCP by 8041

Special Shipment/Handling or Storage Requirements: 6 coolers with ice

Method of Shipment: Delivery

Relinquished by	Received by	Relinquished by	Received by
Signature: Sarah Weeks	Signature: A. Volgardsen	Signature:	Signature:
Printed Name: Sarah Weeks	Printed Name: ARI	Printed Name:	Printed Name:
Company: Landau Associates, Inc.	Company:	Company:	Company:
Date: 8/9/2011 Time: 2000	Date: 8/10/11 Time: 1430	Date: Time:	Date: Time:

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

Rev 8/09

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Landau
Project Name: Port of Olympia
COC No(s): _____ (NA)
Delivered by: Fed-Ex UPS Courier (Hand Delivered) Other: Night Drop
Assigned ARI Job No: TII7
Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 1.9 3.8 3.0 5.9 1.2 3.3
If cooler temperature is out of compliance fill out form 00070F — Temp Gun ID#: 90941619

Cooler Accepted by: AV Date: 8/10/11 Time: 1430

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ... (Bubble Wrap) (Wet Ice) Gel Packs Baggies (Foam Block) Paper Other: _____			
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		YES	(NO)
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ..	(NA)	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	(NO)
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI...	NA	8/3/11	

Was Sample Split by ARI : (NA) YES Date/Time._____ Equipment._____ Split by:_____

Samples Logged by: JM Date: 8/10/11 Time: 1547

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

PZ-30 = sm in 1 of 2
PZ-19 = pb in 1 of 2
MW-055 = sm in 1 of 2
MW-025 = sm in 1 of 2
Trip Blank - pb in 4 of 4
MW-025 = 20110809 had 8 Containers

By: JM Date: 8/10/11

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
• • •	• • •	● ● ●

Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: PZ-30-20110809
SAMPLE

Lab Sample ID: TI17A
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 02:06
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**8.1**
132-64-9	**Dibenzofuran**	**1.0**	**1.0**
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	**Anthracene**	**1.0**	**1.3**
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	75.6%
d14-p-Terphenyl	54.8%
2,4,6-Tribromophenol	86.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: PZ-19-20110809
SAMPLE

Lab Sample ID: TI17B
LIMS ID: 11-17529
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 14:07
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	71.6%
d14-p-Terphenyl	88.0%
2,4,6-Tribromophenol	78.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: MW-05S-20110809**
Page 1 of 1 **SAMPLE**

Lab Sample ID: TI17C
LIMS ID: 11-17530
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 14:39
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**7.6**
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	**Anthracene**	**1.0**	**1.1**
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	70.4%
d14-p-Terphenyl	60.0%
2,4,6-Tribromophenol	76.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: MW-02D-20110809
SAMPLE

Lab Sample ID: TI17D
LIMS ID: 11-17531
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 15:12
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**92 ES**
91-57-6	**2-Methylnaphthalene**	**1.0**	**9.4**
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**18**
132-64-9	**Dibenzofuran**	**1.0**	**6.1**
86-73-7	**Fluorene**	**1.0**	**5.8**
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	**Phenanthrene**	**1.0**	**3.9**
86-74-8	**Carbazole**	**1.0**	**4.9**
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	**1-Methylnaphthalene**	**1.0**	**13**
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	62.0%
d14-p-Terphenyl	83.6%
2,4,6-Tribromophenol	68.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: MW-02D-20110809
DILUTION

Lab Sample ID: TI17D
LIMS ID: 11-17531
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 19:02
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 3.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**3.0**	**110**
91-57-6	**2-Methylnaphthalene**	**3.0**	**9.2**
208-96-8	Acenaphthylene	3.0	< 3.0 U
83-32-9	**Acenaphthene**	**3.0**	**18**
132-64-9	**Dibenzofuran**	**3.0**	**5.8**
86-73-7	**Fluorene**	**3.0**	**6.1**
87-86-5	Pentachlorophenol	15	< 15 U
85-01-8	**Phenanthrene**	**3.0**	**3.9**
86-74-8	**Carbazole**	**3.0**	**4.9**
120-12-7	Anthracene	3.0	< 3.0 U
206-44-0	Fluoranthene	3.0	< 3.0 U
129-00-0	Pyrene	3.0	< 3.0 U
56-55-3	Benzo(a)anthracene	3.0	< 3.0 U
218-01-9	Chrysene	3.0	< 3.0 U
50-32-8	Benzo(a)pyrene	3.0	< 3.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	< 3.0 U
53-70-3	Dibenz(a,h)anthracene	3.0	< 3.0 U
191-24-2	Benzo(g,h,i)perylene	3.0	< 3.0 U
90-12-0	**1-Methylnaphthalene**	**3.0**	**13**
TOTBFA	Total Benzofluoranthenes	3.0	< 3.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	63.0%
d14-p-Terphenyl	80.2%
2,4,6-Tribromophenol	67.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: MW-02S-20110809
SAMPLE

Lab Sample ID: TI17E
LIMS ID: 11-17532
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 15:45
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	**Anthracene**	**1.0**	**1.1**
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	70.8%
d14-p-Terphenyl	52.4%
2,4,6-Tribromophenol	72.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: MW-01D-20110809
SAMPLE

Lab Sample ID: TI17F
LIMS ID: 11-17533
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 16:18
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	68.0%
d14-p-Terphenyl	84.4%
2,4,6-Tribromophenol	74.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: MW-01S-20110809
SAMPLE

Lab Sample ID: TI17G
LIMS ID: 11-17534
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 16:51
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**1,200 ES**
91-57-6	**2-Methylnaphthalene**	**1.0**	**560 ES**
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**190 ES**
132-64-9	**Dibenzofuran**	**1.0**	**79**
86-73-7	**Fluorene**	**1.0**	**47**
87-86-5	**Pentachlorophenol**	**5.0**	**6,200 ES**
85-01-8	**Phenanthrene**	**1.0**	**34**
86-74-8	**Carbazole**	**1.0**	**24**
120-12-7	**Anthracene**	**1.0**	**10**
206-44-0	**Fluoranthene**	**1.0**	**2.0**
129-00-0	**Pyrene**	**1.0**	**1.7**
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	**1-Methylnaphthalene**	**1.0**	**370 ES**
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	70.8%
d14-p-Terphenyl	33.0%
2,4,6-Tribromophenol	77.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: MW-01S-20110809
DILUTION

Lab Sample ID: TI17G
LIMS ID: 11-17534
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 20:40
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 100

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**100**	**6,900**
91-57-6	**2-Methylnaphthalene**	**100**	**680**
208-96-8	Acenaphthylene	100	< 100 U
83-32-9	**Acenaphthene**	**100**	**190**
132-64-9	Dibenzofuran	100	< 100 U
86-73-7	Fluorene	100	< 100 U
87-86-5	**Pentachlorophenol**	**500**	**4,200**
85-01-8	Phenanthrene	100	< 100 U
86-74-8	Carbazole	100	< 100 U
120-12-7	Anthracene	100	< 100 U
206-44-0	Fluoranthene	100	< 100 U
129-00-0	Pyrene	100	< 100 U
56-55-3	Benzo(a)anthracene	100	< 100 U
218-01-9	Chrysene	100	< 100 U
50-32-8	Benzo(a)pyrene	100	< 100 U
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100 U
53-70-3	Dibenz(a,h)anthracene	100	< 100 U
191-24-2	Benzo(g,h,i)perylene	100	< 100 U
90-12-0	**1-Methylnaphthalene**	**100**	**390**
TOTBFA	Total Benzofluoranthenes	100	< 100 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	D
d14-p-Terphenyl	D
2,4,6-Tribromophenol	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: CW-13-20110809
SAMPLE

Lab Sample ID: TI17H
LIMS ID: 11-17535
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 20:08
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**5.2**
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**4.3**
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	**Carbazole**	**1.0**	**1.4**
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	58.0%
d14-p-Terphenyl	76.4%
2,4,6-Tribromophenol	69.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: MW05D-20110809
SAMPLE

Lab Sample ID: TI17I
LIMS ID: 11-17536
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 17:56
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**2.1**
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**2.6**
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	**Fluorene**	**1.0**	**1.2**
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	56.8%
d14-p-Terphenyl	53.2%
2,4,6-Tribromophenol	69.3%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010

Client ID	FBP	TPH	TBP	TOT OUT
MB-081111	73.2%	91.2%	76.8%	0
LCS-081111	65.6%	82.0%	78.4%	0
LCSD-081111	63.2%	82.8%	75.5%	0
PZ-30-20110809	75.6%	54.8%	86.7%	0
PZ-19-20110809	71.6%	88.0%	78.7%	0
MW-05S-20110809	70.4%	60.0%	76.5%	0
MW-02D-20110809	62.0%	83.6%	68.8%	0
MW-02D-20110809 DL	63.0%	80.2%	67.1%	0
MW-02S-20110809	70.8%	52.4%	72.3%	0
MW-01D-20110809	68.0%	84.4%	74.1%	0
MW-01S-20110809	70.8%	33.0%	77.9%	0
MW-01S-20110809 DL	D	D	D	0
CW-13-20110809	58.0%	76.4%	69.9%	0
MW05D-20110809	56.8%	53.2%	69.3%	0

	LCS/MB LIMITS	QC LIMITS
(FBP) = 2-Fluorobiphenyl	(49-100)	(42-100)
(TPH) = d14-p-Terphenyl	(53-119)	(26-114)
(TBP) = 2,4,6-Tribromophenol	(52-123)	(48-118)

Prep Method: SW3520C
Log Number Range: 11-17528 to 11-17536

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: LCS-081111
LCS/LCSD

Lab Sample ID: LCS-081111
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted LCS/LCSD: 08/11/11

Date Analyzed LCS: 08/16/11 21:43
LCSD: 08/16/11 22:16
Instrument/Analyst LCS: NT6/JZ
LCSD: NT6/JZ
GPC Cleanup: NO

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	14.6	25.0	58.4%	14.7	25.0	58.8%	0.7%
2-Methylnaphthalene	14.8	25.0	59.2%	14.8	25.0	59.2%	0.0%
Acenaphthylene	15.6	25.0	62.4%	15.9	25.0	63.6%	1.9%
Acenaphthene	16.0	25.0	64.0%	16.9	25.0	67.6%	5.5%
Dibenzofuran	16.7	25.0	66.8%	17.4	25.0	69.6%	4.1%
Fluorene	16.5	25.0	66.0%	17.0	25.0	68.0%	3.0%
Pentachlorophenol	61.9	75.0	82.5%	62.9	75.0	83.9%	1.6%
Phenanthrene	18.7	25.0	74.8%	19.1	25.0	76.4%	2.1%
Carbazole	17.4	25.0	69.6%	18.4	25.0	73.6%	5.6%
Anthracene	17.6	25.0	70.4%	18.1	25.0	72.4%	2.8%
Fluoranthene	18.6	25.0	74.4%	18.8	25.0	75.2%	1.1%
Pyrene	19.9	25.0	79.6%	20.7	25.0	82.8%	3.9%
Benzo(a)anthracene	19.2	25.0	76.8%	19.8	25.0	79.2%	3.1%
Chrysene	18.5	25.0	74.0%	19.2	25.0	76.8%	3.7%
Benzo(a)pyrene	17.2	25.0	68.8%	17.8	25.0	71.2%	3.4%
Indeno(1,2,3-cd)pyrene	19.9	25.0	79.6%	22.4	25.0	89.6%	11.8%
Dibenz(a,h)anthracene	19.1	25.0	76.4%	22.0	25.0	88.0%	14.1%
Benzo(g,h,i)perylene	20.5	25.0	82.0%	23.8	25.0	95.2%	14.9%
1-Methylnaphthalene	15.3	25.0	61.2%	15.4	25.0	61.6%	0.7%
Total Benzofluoranthenes	38.4	50.0	76.8%	39.6	50.0	79.2%	3.1%

Semivolatile Surrogate Recovery

	LCS	LCSD
2-Fluorobiphenyl	65.6%	63.2%
d14-p-Terphenyl	82.0%	82.8%
2,4,6-Tribromophenol	78.4%	75.5%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-081111
METHOD BLANK

Lab Sample ID: MB-081111
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: NA
Date Received: NA

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 21:10
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	73.2%
d14-p-Terphenyl	91.2%
2,4,6-Tribromophenol	76.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-30-20110809
SAMPLE

Lab Sample ID: TI17A
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 20:18
Instrument/Analyst: NT4/JZ

Sample Amount: 440 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.11	< 0.11 U
218-01-9	Chrysene	0.11	< 0.11 U
50-32-8	Benzo(a)pyrene	0.11	< 0.11 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.11	< 0.11 U
53-70-3	Dibenz(a,h)anthracene	0.11	< 0.11 U
TOTBFA	Total Benzofluoranthenes	0.11	< 0.11 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	66.7%
d14-Dibenzo(a,h)anthracene	52.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-19-20110809
SAMPLE

Lab Sample ID: TI17B
LIMS ID: 11-17529
Matrix: Water
Data Release Authorized: MW
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 20:52
Instrument/Analyst: NT4/JZ

Sample Amount: 460 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.11	< 0.11 U
218-01-9	Chrysene	0.11	< 0.11 U
50-32-8	Benzo(a)pyrene	0.11	< 0.11 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.11	< 0.11 U
53-70-3	Dibenz(a,h)anthracene	0.11	< 0.11 U
TOTBFA	Total Benzofluoranthenes	0.11	< 0.11 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	63.0%
d14-Dibenzo(a,h)anthracene	80.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-05S-20110809
SAMPLE

Lab Sample ID: TI17C
LIMS ID: 11-17530
Matrix: Water
Data Release Authorized: MW
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 21:27
Instrument/Analyst: NT4/JZ

Sample Amount: 430 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.12	< 0.12 U
218-01-9	Chrysene	0.12	< 0.12 U
50-32-8	Benzo(a)pyrene	0.12	< 0.12 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.12	< 0.12 U
53-70-3	Dibenz(a,h)anthracene	0.12	< 0.12 U
TOTBFA	Total Benzofluoranthenes	0.12	< 0.12 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	57.7%
d14-Dibenzo(a,h)anthracene	45.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-02D-20110809
SAMPLE

Lab Sample ID: TI17D
LIMS ID: 11-17531
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 22:01
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	59.3%
d14-Dibenzo(a,h)anthracene	61.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-02S-20110809
SAMPLE

Lab Sample ID: TI17E
LIMS ID: 11-17532
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 22:35
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	65.7%
d14-Dibenzo(a,h)anthracene	45.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-01D-20110809
SAMPLE

Lab Sample ID: TI17F
LIMS ID: 11-17533
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 23:09
Instrument/Analyst: NT4/JZ

Sample Amount: 430 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.12	< 0.12 U
218-01-9	Chrysene	0.12	< 0.12 U
50-32-8	Benzo(a)pyrene	0.12	< 0.12 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.12	< 0.12 U
53-70-3	Dibenz(a,h)anthracene	0.12	< 0.12 U
TOTBFA	Total Benzofluoranthenes	0.12	< 0.12 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	67.0%
d14-Dibenzo(a,h)anthracene	61.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-01S-20110809
SAMPLE

Lab Sample ID: TI17G
LIMS ID: 11-17534
Matrix: Water
Data Release Authorized: MW
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 23:44
Instrument/Analyst: NT4/JZ

Sample Amount: 425 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	**Benzo(a)anthracene**	**0.12**	**1.0**
218-01-9	**Chrysene**	**0.12**	**1.1**
50-32-8	**Benzo(a)pyrene**	**0.12**	**0.33**
193-39-5	Indeno(1,2,3-cd)pyrene	0.12	< 0.12 U
53-70-3	Dibenz(a,h)anthracene	0.12	< 0.12 U
TOTBFA	**Total Benzofluoranthenes**	**0.12**	**0.76**

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	3.3%
d14-Dibenzo(a,h)anthracene	26.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-01S-20110809
DILUTION

Lab Sample ID: TI17G
LIMS ID: 11-17534
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/22/11 15:35
Instrument/Analyst: NT4/JZ

Sample Amount: 425 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 100

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	12	< 12 U
218-01-9	Chrysene	12	< 12 U
50-32-8	Benzo(a)pyrene	12	< 12 U
193-39-5	Indeno(1,2,3-cd)pyrene	12	< 12 U
53-70-3	Dibenz(a,h)anthracene	12	< 12 U
TOTBFA	Total Benzofluoranthenes	12	< 12 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: CW-13-20110809
SAMPLE

Lab Sample ID: TI17H
LIMS ID: 11-17535
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/20/11 00:18
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	60.7%
d14-Dibenzo(a,h)anthracene	54.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW05D-20110809
SAMPLE

Lab Sample ID: TI17I
LIMS ID: 11-17536
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/20/11 00:52
Instrument/Analyst: NT4/JZ

Sample Amount: 440 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.11	< 0.11 U
218-01-9	Chrysene	0.11	< 0.11 U
50-32-8	Benzo(a)pyrene	0.11	< 0.11 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.11	< 0.11 U
53-70-3	Dibenz(a,h)anthracene	0.11	< 0.11 U
TOTBFA	Total Benzofluoranthenes	0.11	< 0.11 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	64.0%
d14-Dibenzo(a,h)anthracene	66.0%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010

Client ID	MNP	DBA	TOT OUT
MB-081511	58.7%	57.0%	0
LCS-081511	59.0%	57.7%	0
LCSD-081511	46.3%	69.3%	0
PZ-30-20110809	66.7%	52.3%	0
PZ-19-20110809	63.0%	80.7%	0
MW-05S-20110809	57.7%	45.3%	0
MW-02D-20110809	59.3%	61.0%	0
MW-02S-20110809	65.7%	45.0%	0
MW-01D-20110809	67.0%	61.7%	0
MW-01S-20110809	3.3%*	26.7%	1
MW-01S-20110809 DL	D	D	0
CW-13-20110809	60.7%	54.0%	0
MW05D-20110809	64.0%	66.0%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(40-110)	(33-107)
(DBA) = d14-Dibenzo(a,h)anthracene	(33-140)	(10-142)

Prep Method: SW3520C
Log Number Range: 11-17528 to 11-17536

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LCS-081511
LAB CONTROL SAMPLE

Lab Sample ID: LCS-081511
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 08/15/11

Date Analyzed LCS: 08/19/11 18:02
LCSD: 08/19/11 18:36
Instrument/Analyst LCS: NT4/JZ
LCSD: NT4/JZ

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)anthracene	2.26	3.00	75.3%	2.34	3.00	78.0%	3.5%
Chrysene	2.46	3.00	82.0%	2.54	3.00	84.7%	3.2%
Benzo(a)pyrene	2.17	3.00	72.3%	2.06	3.00	68.7%	5.2%
Indeno(1,2,3-cd)pyrene	1.87	3.00	62.3%	2.13	3.00	71.0%	13.0%
Dibenz(a,h)anthracene	1.79	3.00	59.7%	2.13	3.00	71.0%	17.3%
Total Benzofluoranthenes	5.02	6.00	83.7%	5.73	6.00	95.5%	13.2%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	59.0%	46.3%
d14-Dibenzo(a,h)anthracene	57.7%	69.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MB-081511
METHOD BLANK

Lab Sample ID: MB-081511
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized: MW
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: NA
Date Received: NA

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 17:28
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	58.7%
d14-Dibenzo(a,h)anthracene	57.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: PZ-30-20110809
SAMPLE

Lab Sample ID: TI17A
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 13:34
Instrument/Analyst: ECD1/AAR

Sample Amount: 450 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.28	< 0.28 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	74.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: PZ-19-20110809
SAMPLE

Lab Sample ID: TI17B
LIMS ID: 11-17529
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 14:11
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	89.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: MW-05S-20110809
SAMPLE

Lab Sample ID: TI17C
LIMS ID: 11-17530
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 14:47
Instrument/Analyst: ECD1/AAR

Sample Amount: 450 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.28	< 0.28 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	78.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: MW-02D-20110809
SAMPLE

Lab Sample ID: TI17D
LIMS ID: 11-17531
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 15:23
Instrument/Analyst: ECD1/AAR

Sample Amount: 475 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.26	< 0.26 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	94.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: MW-02S-20110809
SAMPLE

Lab Sample ID: TI17E
LIMS ID: 11-17532
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 16:00
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	72.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: MW-01D-20110809
SAMPLE

Lab Sample ID: TI17F
LIMS ID: 11-17533
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 16:36
Instrument/Analyst: ECD1/AAR

Sample Amount: 425 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.29	< 0.29 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	88.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: CW-13-20110809
SAMPLE

Lab Sample ID: TI17H
LIMS ID: 11-17535
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 17:12
Instrument/Analyst: ECD1/AAR

Sample Amount: 425 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	**Pentachlorophenol**	**0.29**	**1.0**

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	83.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: MW05D-20110809
SAMPLE

Lab Sample ID: TI17I
LIMS ID: 11-17536
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 17:48
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	92.8%

ANALYTICAL RESOURCES INCORPORATED

SW8041 CHLOROPHENOLICS SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010

Client ID	TBP	TOT OUT
MB-081211	93.6%	0
LCS-081211	86.0%	0
LCSD-081211	90.0%	0
PZ-30-20110809	74.8%	0
PZ-19-20110809	89.6%	0
MW-05S-20110809	78.4%	0
MW-02D-20110809	94.0%	0
MW-02S-20110809	72.4%	0
MW-01D-20110809	88.4%	0
CW-13-20110809	83.6%	0
MW05D-20110809	92.8%	0

	LCS/MB LIMITS	QC LIMITS
(TBP) = 2,4,6-Tribromophenol	(40-130)	(11-156)

Prep Method: SW3510C
Log Number Range: 11-17528 to 11-17536

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: LCS-081211
LCS/LCSD

Lab Sample ID: LCS-081211
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted LCS/LCSD: 08/12/11

Date Analyzed LCS: 08/17/11 20:21
LCSD: 08/17/11 20:58
Instrument/Analyst LCS: ECD1/AAR
LCSD: ECD1/AAR

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 50 mL
LCSD: 50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Pentachlorophenol	2.29	2.50	91.6%	2.40	2.50	96.0%	4.7%

Chlorophenols Surrogate Recovery

	LCS	LCSD
2,4,6-Tribromophenol	86.0%	90.0%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: MB-081211
METHOD BLANK

Lab Sample ID: MB-081211
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: NA
Date Received: NA

Date Extracted: 08/12/11
Date Analyzed: 08/17/11 19:45
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	93.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 08/22/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

ARI ID	Client ID	Analysis Date	DL	Range	Result
MB-081211	Method Blank	08/12/11	1.0	Gasoline	< 250 U
11-17528		PID1		HC ID	---
				Trifluorotoluene	97.6%
				Bromobenzene	97.8%
TI17A	PZ-30-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17528		PID1		HC ID	---
				Trifluorotoluene	97.6%
				Bromobenzene	95.7%
TI17B	PZ-19-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17529		PID1		HC ID	---
				Trifluorotoluene	98.3%
				Bromobenzene	99.3%
TI17C	MW-05S-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17530		PID1		HC ID	---
				Trifluorotoluene	98.5%
				Bromobenzene	98.3%
TI17D	MW-02D-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17531		PID1		HC ID	---
				Trifluorotoluene	100%
				Bromobenzene	99.3%
TI17E	MW-02S-20110809	08/12/11	1.0	**Gasoline**	**480**
11-17532		PID1		HC ID	GAS/GRO
				Trifluorotoluene	98.8%
				Bromobenzene	99.3%
TI17F	MW-01D-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17533		PID1		HC ID	---
				Trifluorotoluene	99.4%
				Bromobenzene	98.4%
TI17G	MW-01S-20110809	08/12/11	50	**Gasoline**	**55000**
11-17534		PID1		HC ID	GAS/GRO
				Trifluorotoluene	89.1%
				Bromobenzene	93.1%
TI17H	CW-13-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17535		PID1		HC ID	---
				Trifluorotoluene	96.8%
				Bromobenzene	97.1%
TI17I	MW05D-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17536		PID1		HC ID	---
				Trifluorotoluene	98.3%
				Bromobenzene	98.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 08/22/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

ARI ID	Client ID	Analysis Date	DL	Range	Result
TI17J	Trip Blanks	08/12/11	1.0	Gasoline	< 250 U
11-17537		PID1		HC ID	---
				Trifluorotoluene	99.3%
				Bromobenzene	98.4%

Gasoline values reported in µg/L (ppb)

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

ANALYTICAL RESOURCES INCORPORATED

TPHG WATER SURROGATE RECOVERY SUMMARY

ARI Job: TI17
Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010

Client ID	TFT	BBZ	TOT OUT
MB-081211	97.6%	97.8%	0
LCS-081211	103%	97.9%	0
LCSD-081211	102%	99.9%	0
PZ-30-20110809	97.6%	95.7%	0
PZ-19-20110809	98.3%	99.3%	0
MW-05S-20110809	98.5%	98.3%	0
MW-02D-20110809	100%	99.3%	0
MW-02S-20110809	98.8%	99.3%	0
MW-01D-20110809	99.4%	98.4%	0
MW-01S-20110809	89.1%	93.1%	0
CW-13-20110809	96.8%	97.1%	0
MW05D-20110809	98.3%	98.7%	0
Trip Blanks	99.3%	98.4%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(80-120)
(BBZ) = Bromobenzene	(80-120)	(80-120)

Log Number Range: 11-17528 to 11-17537

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG

Sample ID: LCS-081211
LAB CONTROL SAMPLE

Lab Sample ID: LCS-081211
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/22/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 08/12/11 06:28
LCSD: 08/12/11 06:57
Instrument/Analyst LCS: PID1/MS
LCSD: PID1/MS

Purge Volume: 5.0 mL

Dilution Factor LCS: 1.0
LCSD: 1.0

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	1130	1000	113%	1060	1000	106%	6.4%

Reported in ug/L (ppb)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	103%	102%
Bromobenzene	97.9%	99.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 1 of 2
Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010

Data Release Authorized:
Reported: 08/22/11

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
MB-081211	Method Blank	08/12/11	08/16/11	1.00	Diesel	100	< 100 U
11-17528	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		98.6%
TI17A	PZ-30-20110809	08/12/11	08/16/11	1.00	**Diesel**	**100**	**110**
11-17528	HC ID: **DRO/MOTOR OIL**		FID4A	1.0	**Motor Oil**	**200**	**500**
					Creosote	200	< 200 U
					o-Terphenyl		117%
TI17B	PZ-19-20110809	08/12/11	08/16/11	1.00	Diesel	100	< 100 U
11-17529	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		121%
TI17C	MW-05S-20110809	08/12/11	08/16/11	1.00	Diesel	100	< 100 U
11-17530	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		91.1%
TI17D	MW-02D-20110809	08/12/11	08/16/11	1.00	**Diesel**	**100**	**140**
11-17531	HC ID: **CREOSOTE**		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	**200**	**440**
					o-Terphenyl		126%
TI17E	MW-02S-20110809	08/12/11	08/16/11	1.00	**Diesel**	**100**	**130**
11-17532	HC ID: **DRO/MOTOR OIL**		FID4A	1.0	**Motor Oil**	**200**	**990**
					Creosote	200	< 200 U
					o-Terphenyl		108%
TI17F	MW-01D-20110809	08/12/11	08/16/11	1.00	Diesel	100	< 100 U
11-17533	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		105%
TI17G	MW-01S-20110809	08/12/11	08/16/11	1.00	**Diesel**	**500**	**9800**
11-17534	HC ID: **CREOSOTE**		FID4A	5.0	Motor Oil	1000	< 1000 U
					Creosote	**1000**	**31000**
					o-Terphenyl		104%
TI17H	CW-13-20110809	08/12/11	08/17/11	1.00	Diesel	100	< 100 U
11-17535	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		116%
TI17I	MW05D-20110809	08/12/11	08/17/11	1.00	Diesel	100	< 100 U
11-17536	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		115%

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS

ANALYTICAL RESOURCES INCORPORATED

NWTPHD by GC/FID-Silica and Acid Cleaned
Page 2 of 2
Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010

Data Release Authorized:
Reported: 08/22/11

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result

Reported in ug/L (ppb)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.
Creosote quantitation on total peaks in the range from C12 to C22.
HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010

Client ID	OTER	TOT OUT
MB-081211	98.6%	0
LCS-081211	103%	0
LCSD-081211	114%	0
PZ-30-20110809	117%	0
PZ-19-20110809	121%	0
MW-05S-20110809	91.1%	0
MW-02D-20110809	126%	0
MW-02S-20110809	108%	0
MW-01D-20110809	105%	0
MW-01S-20110809	104%	0
CW-13-20110809	116%	0
MW05D-20110809	115%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: SW3510C
Log Number Range: 11-17528 to 11-17536

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-081211**
 LCS/LCSD

Lab Sample ID: LCS-081211
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/22/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted LCS/LCSD: 08/12/11
Date Analyzed LCS: 08/16/11 20:24
LCSD: 08/16/11 20:48
Instrument/Analyst LCS: FID/MS
LCSD: FID/MS

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	2860	3000	95.3%	3110	3000	104%	8.4%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	103%	114%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Water
Date Received: 08/10/11

ARI Job: TI17
Project: Port of Olympia
0021035-010

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
11-17528-081211MB1	Method Blank	500 mL	1.00 mL	08/12/11
11-17528-081211LCS1	Lab Control	500 mL	1.00 mL	08/12/11
11-17528-081211LCSD1	Lab Control Dup	500 mL	1.00 mL	08/12/11
11-17528-TI17A	PZ-30-20110809	500 mL	1.00 mL	08/12/11
11-17529-TI17B	PZ-19-20110809	500 mL	1.00 mL	08/12/11
11-17530-TI17C	MW-05S-20110809	500 mL	1.00 mL	08/12/11
11-17531-TI17D	MW-02D-20110809	500 mL	1.00 mL	08/12/11
11-17532-TI17E	MW-02S-20110809	500 mL	1.00 mL	08/12/11
11-17533-TI17F	MW-01D-20110809	500 mL	1.00 mL	08/12/11
11-17534-TI17G	MW-01S-20110809	500 mL	1.00 mL	08/12/11
11-17535-TI17H	CW-13-20110809	500 mL	1.00 mL	08/12/11
11-17536-TI17I	MW05D-20110809	500 mL	1.00 mL	08/12/11

Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 22, 2012

Chris Kimmel
Landau Associates, Inc.
130 2nd Avenue S.
Edmonds, WA 98020

RE: Project: Port of Olympia
ARI Job No: UL19

Dear Chris:

Please find enclosed the original *Chain of Custody*, sample receipt documentation, and final results for the project referenced above. Analytical Resources, Inc. accepted six water samples and a trip blank in good condition on March 8, 2012.

The samples were analyzed for NWTPH-Gx, NWTPH-Dx, cPAHs by method 8270 SIM, PAHs by method 8270 and PCP on select samples by method 8041, as requested on the *Chain of Custody*.

Please refer to the *Case Narrative* for analytical details regarding the sample.

A copy of this report and all associated ARI raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to contact me at any time.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211

Enclosures

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

LANDAU ASSOCIATES

☒ **Seattle/Edmonds** (425) 778-0907
☐ **Tacoma** (253) 926-2493
☐ **Spokane** (509) 327-9737
☐ **Portland** (503) 542-1080
☐ ____________

Date 3/7/[illegible]

Page ____ of ____

Chain-of-Custody Record

Project Name Port of Olympia

Project No. [illegible]

Project Location/Event [illegible]

Sampler's Name [illegible] Smith, Sarah Weeks

Project Contact Chris Kimmel

Send Results To Chris Kimmel

Turnaround Time
☒ Standard
☐ Accelerated
☐ ____________

Testing Parameters

Sample I.D.	Date	Time	Matrix	No. of Containers	NWTPH-Gx	NWTPH-Dx	PAHs (8270 [illegible])	[illegible] (SIM)	ICP (60[illegible])	ICP (60[illegible])
LW-4R-20120307	3/7/12	1626	H2O	10	X	X	X	X	X	X
PZ-12-20120307	3/7/12	1444	H2O	10	X	X	X	X	X	X
PZ-17-20120307	3/7/12	[illegible]	H2O	10	X	X	X	X	X	X
LW-3-20120307	3/7/12	1759	H2O	10	X	X	X	X	X	X
PZ-18-20120307	3/7/12	1621	H2O	10	X	X	X	X	X	X
PZ-13-20120307	3/7/12	1441	H2O	10	X	X	X	X	X	X
Trip Blanks	3/7/12	—	H2O	2	X					

Observations/Comments

X Allow water samples to settle, collect aliquot from clear portion

X NWTPH-Dx - run acid wash/silica gel cleanup

___ run samples standardized to ____________ product

___ Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
___ non-preserved
___ preserved w/methanol
___ preserved w/sodium bisulfate
___ Freeze upon receipt

___ Dissolved metal water samples field filtered

Other [illegible] 8270 [illegible] 41

Special Shipment/Handling or Storage Requirements

Method of Shipment Delivery

Relinquished by	Received by	Relinquished by	Received by
Signature: [signature]	Signature: [signature]	Signature	Signature
Printed Name: Sarah Weeks	Printed Name: Jennifer Millsap	Printed Name	Printed Name
Company: Landau Associates Inc	Company: HRI	Company	Company
Date 3/7/2012 Time 2100	Date 3/8/12 Time 640	Date ____ Time ____	Date ____ Time ____

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Landau Project Name: Port of Olympia

COC No(s): _____ (NA) Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: ULI9 Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry): 3.5 2.9 3.5 3.7

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90411679

Cooler Accepted by: JM Date: 3/9/12 Time: 640

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used?	Bubble Wrap (Wet Ice) Gel Packs Baggies (Foam Block) Paper Other: _____		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	YES	(NO)
Were all VOC vials free of air bubbles?	NA	YES	(NO)
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	3/2/12	

Was Sample Split by ARI: (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JM Date: 3/8/12 Time: 702

***** Notify Project Manager of discrepancies or concerns *****

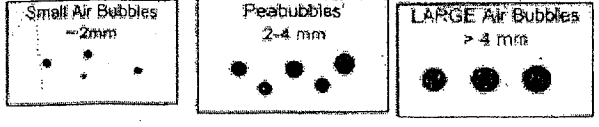
Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

LW-3-20120307 = 5m in 2 of 2

PZ-18-20120307 = 5m in 2 of 2

By: JM Date: 3/8/12



Small → "sm"	
Peabubbles → "pb"	
Large → "lg"	
Headspace → "hs"	

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: UL19
Client: Landau Associates, Inc.
Project Event: 0021039.0220.021
Project Name: Port of Olympia

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	LW-4R-20120307	UL19A	12-3914	Water	03/07/12 16:26	03/08/12 06:40
2.	PZ-12-20120307	UL19B	12-3915	Water	03/07/12 14:44	03/08/12 06:40
3.	PZ-17-20120307	UL19C	12-3916	Water	03/07/12 18:00	03/08/12 06:40
4.	LW-3-20120307	UL19D	12-3917	Water	03/07/12 17:59	03/08/12 06:40
5.	PZ-18-20120307	UL19E	12-3918	Water	03/07/12 16:21	03/08/12 06:40
6.	PZ-13-20120307	UL19F	12-3919	Water	03/07/12 14:41	03/08/12 06:40
7.	Trip Blanks	UL19G	12-3920	Water	03/07/12	03/08/12 06:40

Case Narrative

Project: 0021039.020.021
ARI Job No.: UL19
March 21, 2012

Sample Receipt

Please find enclosed the original *Chain of Custody (COC)* record and analytical results for the project referenced above. Analytical Resources, Inc. accepted six water samples and a trip blank in good condition on March 8, 2012. The samples were received at cooler temperatures between 2.9 and 3.7°C. Please see the *Cooler Receipt Form* for further details. Per Landau Associates, select samples were allowed to settle and sample volume was collected from the clear portion.

The following tests were performed on selected samples, as requested on the *Chain of Custody*.

Semivolatile Organics by method 8270D Water

The samples were extracted on 3/8/12. The samples were analyzed between 3/12/12 and 3/13/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: The surrogate TPH was out of control low in the initial analysis of sample LW-3-20120307. The sample was re-analyzed at a dilution with the surrogate TBP out of control high likely due to matrix effects. Both sets of data have been included for your review.

LCS/LSCD (s): Are in control.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

SIM PNA by method 8270-SIM Water

The samples were extracted on 3/8/12 and analyzed between 3/12/12 and 3/13/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LSCD (s): All percent recoveries and other RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: The CCAL is out of control high for Dibenzo (a,h) anthracene. All associated samples that contain analyte have been flagged with a "Q" qualifier.

PCP Only by method 8041

The samples were extracted on 3/9/12 and analyzed on 3/13/12 and 3/14/12 - within the method recommended holding time.

Case Narrative

Project: 0021039.020.021
ARI Job No.: UL19
March 21, 2012

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LSCD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Gx

The samples were analyzed on 3/9/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Dx

The samples were extracted on 3/8/12 and analyzed on 3/12/12 - within the method recommended holding time.

Surrogates: All surrogate recoveries were in control.

Samples: There were no anomalies associated with these samples.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: LW-4R-20120307
SAMPLE

Lab Sample ID: UL19A
LIMS ID: 12-3914
Matrix: Water
Data Release Authorized:
Reported: 03/21/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/12/12 19:23
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	67.6%
d14-p-Terphenyl	70.0%
2,4,6-Tribromophenol	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: PZ-12-20120307
SAMPLE

Lab Sample ID: UL19B
LIMS ID: 12-3915
Matrix: Water
Data Release Authorized:
Reported: 03/21/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/12/12 19:55
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	64.0%
d14-p-Terphenyl	74.0%
2,4,6-Tribromophenol	96.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: PZ-17-20120307
SAMPLE

Lab Sample ID: UL19C
LIMS ID: 12-3916
Matrix: Water
Data Release Authorized:
Reported: 03/21/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/12/12 20:28
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	73.2%
d14-p-Terphenyl	78.4%
2,4,6-Tribromophenol	112%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: LW-3-20120307
SAMPLE

Lab Sample ID: UL19D
LIMS ID: 12-3917
Matrix: Water
Data Release Authorized:
Reported: 03/21/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/13/12 13:52
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 3.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	3.0	< 3.0 U
208-96-8	Acenaphthylene	3.0	< 3.0 U
83-32-9	Acenaphthene	3.0	< 3.0 U
132-64-9	Dibenzofuran	3.0	< 3.0 U
86-73-7	Fluorene	3.0	< 3.0 U
87-86-5	Pentachlorophenol	15	< 15 U
85-01-8	Phenanthrene	3.0	< 3.0 U
86-74-8	Carbazole	3.0	< 3.0 U
120-12-7	Anthracene	3.0	< 3.0 U
206-44-0	Fluoranthene	3.0	< 3.0 U
129-00-0	Pyrene	3.0	< 3.0 U
56-55-3	Benzo(a)anthracene	3.0	< 3.0 U
218-01-9	Chrysene	3.0	< 3.0 U
50-32-8	Benzo(a)pyrene	3.0	< 3.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	< 3.0 U
53-70-3	Dibenz(a,h)anthracene	3.0	< 3.0 U
191-24-2	Benzo(g,h,i)perylene	3.0	< 3.0 U
90-12-0	1-Methylnaphthalene	3.0	< 3.0 U
TOTBFA	Total Benzofluoranthenes	3.0	< 3.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	48.0%
d14-p-Terphenyl	13.6%
2,4,6-Tribromophenol	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: LW-3-20120307
DILUTION

Lab Sample ID: UL19D
LIMS ID: 12-3917
Matrix: Water
Data Release Authorized:
Reported: 03/21/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/13/12 15:47
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	10	< 10 U
91-57-6	2-Methylnaphthalene	10	< 10 U
208-96-8	Acenaphthylene	10	< 10 U
83-32-9	Acenaphthene	10	< 10 U
132-64-9	Dibenzofuran	10	< 10 U
86-73-7	Fluorene	10	< 10 U
87-86-5	Pentachlorophenol	50	< 50 U
85-01-8	Phenanthrene	10	< 10 U
86-74-8	Carbazole	10	< 10 U
120-12-7	Anthracene	10	< 10 U
206-44-0	Fluoranthene	10	< 10 U
129-00-0	Pyrene	10	< 10 U
56-55-3	Benzo(a)anthracene	10	< 10 U
218-01-9	Chrysene	10	< 10 U
50-32-8	Benzo(a)pyrene	10	< 10 U
193-39-5	Indeno(1,2,3-cd)pyrene	10	< 10 U
53-70-3	Dibenz(a,h)anthracene	10	< 10 U
191-24-2	Benzo(g,h,i)perylene	10	< 10 U
90-12-0	1-Methylnaphthalene	10	< 10 U
TOTBFA	Total Benzofluoranthenes	10	< 10 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	73.6%
d14-p-Terphenyl	31.2%
2,4,6-Tribromophenol	125%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: PZ-18-20120307
SAMPLE

Lab Sample ID: UL19E
LIMS ID: 12-3918
Matrix: Water
Data Release Authorized:
Reported: 03/21/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/13/12 14:25
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 3.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	3.0	< 3.0 U
208-96-8	Acenaphthylene	3.0	< 3.0 U
83-32-9	Acenaphthene	3.0	< 3.0 U
132-64-9	Dibenzofuran	3.0	< 3.0 U
86-73-7	Fluorene	3.0	< 3.0 U
87-86-5	Pentachlorophenol	15	< 15 U
85-01-8	Phenanthrene	3.0	< 3.0 U
86-74-8	Carbazole	3.0	< 3.0 U
120-12-7	Anthracene	3.0	< 3.0 U
206-44-0	Fluoranthene	3.0	< 3.0 U
129-00-0	Pyrene	3.0	< 3.0 U
56-55-3	Benzo(a)anthracene	3.0	< 3.0 U
218-01-9	Chrysene	3.0	< 3.0 U
50-32-8	Benzo(a)pyrene	3.0	< 3.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	< 3.0 U
53-70-3	Dibenz(a,h)anthracene	3.0	< 3.0 U
191-24-2	Benzo(g,h,i)perylene	3.0	< 3.0 U
90-12-0	1-Methylnaphthalene	3.0	< 3.0 U
TOTBFA	Total Benzofluoranthenes	3.0	< 3.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	67.0%
d14-p-Terphenyl	28.3%
2,4,6-Tribromophenol	114%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: PZ-13-20120307
SAMPLE

Lab Sample ID: UL19F
LIMS ID: 12-3919
Matrix: Water
Data Release Authorized:
Reported: 03/21/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/12/12 22:07
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	68.8%
d14-p-Terphenyl	56.4%
2,4,6-Tribromophenol	108%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-030812
METHOD BLANK

Lab Sample ID: MB-030812
LIMS ID: 12-3914
Matrix: Water
Data Release Authorized:
Reported: 03/21/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: NA
Date Received: NA

Date Extracted: 03/08/12
Date Analyzed: 03/12/12 17:11
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	68.4%
d14-p-Terphenyl	86.8%
2,4,6-Tribromophenol	98.7%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021

Client ID	FBP	TPH	TBP	TOT OUT
MB-030812	68.4%	86.8%	98.7%	0
LCS-030812	71.2%	87.2%	110%	0
LCSD-030812	71.6%	80.4%	109%	0
LW-4R-20120307	67.6%	70.0%	101%	0
PZ-12-20120307	64.0%	74.0%	96.0%	0
PZ-17-20120307	73.2%	78.4%	112%	0
LW-3-20120307	48.0%	13.6%*	104%	1
LW-3-20120307 DL	73.6%	31.2%	125%*	1
PZ-18-20120307	67.0%	28.3%	114%	0
PZ-13-20120307	68.8%	56.4%	108%	0

	LCS/MB LIMITS	QC LIMITS
(FBP) = 2-Fluorobiphenyl	(49-100)	(42-100)
(TPH) = d14-p-Terphenyl	(53-119)	(26-114)
(TBP) = 2,4,6-Tribromophenol	(52-123)	(48-118)

Prep Method: SW3520C
Log Number Range: 12-3914 to 12-3919

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: LCS-030812
LCS/LCSD

Lab Sample ID: LCS-030812
LIMS ID: 12-3914
Matrix: Water
Data Release Authorized:
Reported: 03/21/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted LCS/LCSD: 03/08/12

Date Analyzed LCS: 03/12/12 17:44
LCSD: 03/12/12 18:17
Instrument/Analyst LCS: NT6/JZ
LCSD: NT6/JZ
GPC Cleanup: NO

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	14.4	25.0	57.6%	15.4	25.0	61.6%	6.7%
2-Methylnaphthalene	15.0	25.0	60.0%	15.9	25.0	63.6%	5.8%
Acenaphthylene	16.4	25.0	65.6%	17.0	25.0	68.0%	3.6%
Acenaphthene	16.4	25.0	65.6%	17.0	25.0	68.0%	3.6%
Dibenzofuran	16.9	25.0	67.6%	17.5	25.0	70.0%	3.5%
Fluorene	17.9	25.0	71.6%	18.5	25.0	74.0%	3.3%
Pentachlorophenol	62.2	75.0	82.9%	64.1	75.0	85.5%	3.0%
Phenanthrene	18.1	25.0	72.4%	18.8	25.0	75.2%	3.8%
Carbazole	20.6	25.0	82.4%	21.3	25.0	85.2%	3.3%
Anthracene	17.5	25.0	70.0%	18.2	25.0	72.8%	3.9%
Fluoranthene	20.2	25.0	80.8%	20.4	25.0	81.6%	1.0%
Pyrene	17.9	25.0	71.6%	18.4	25.0	73.6%	2.8%
Benzo(a)anthracene	18.7	25.0	74.8%	18.8	25.0	75.2%	0.5%
Chrysene	18.9	25.0	75.6%	19.1	25.0	76.4%	1.1%
Benzo(a)pyrene	17.9	25.0	71.6%	17.8	25.0	71.2%	0.6%
Indeno(1,2,3-cd)pyrene	17.7	25.0	70.8%	17.4	25.0	69.6%	1.7%
Dibenz(a,h)anthracene	17.9	25.0	71.6%	17.6	25.0	70.4%	1.7%
Benzo(g,h,i)perylene	17.3	25.0	69.2%	17.2	25.0	68.8%	0.6%
1-Methylnaphthalene	19.6	25.0	78.4%	20.8	25.0	83.2%	5.9%
Total Benzofluoranthenes	37.8	50.0	75.6%	37.5	50.0	75.0%	0.8%

Semivolatile Surrogate Recovery

	LCS	LCSD
2-Fluorobiphenyl	71.2%	71.6%
d14-p-Terphenyl	87.2%	80.4%
2,4,6-Tribromophenol	110%	109%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LW-4R-20120307
SAMPLE

Lab Sample ID: UL19A
LIMS ID: 12-3914
Matrix: Water
Data Release Authorized:
Reported: 03/14/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/12/12 22:53
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	61.7%
d14-Dibenzo(a,h)anthracene	50.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-12-20120307
SAMPLE

Lab Sample ID: UL19B
LIMS ID: 12-3915
Matrix: Water
Data Release Authorized:
Reported: 03/14/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/12/12 23:21
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	59.0%
d14-Dibenzo(a,h)anthracene	75.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-17-20120307
SAMPLE

Lab Sample ID: UL19C
LIMS ID: 12-3916
Matrix: Water
Data Release Authorized:
Reported: 03/14/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/12/12 23:48
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	58.7%
d14-Dibenzo(a,h)anthracene	71.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LW-3-20120307
SAMPLE

Lab Sample ID: UL19D
LIMS ID: 12-3917
Matrix: Water
Data Release Authorized:
Reported: 03/14/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/13/12 00:16
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	52.0%
d14-Dibenzo(a,h)anthracene	24.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-18-20120307
SAMPLE

Lab Sample ID: UL19E
LIMS ID: 12-3918
Matrix: Water
Data Release Authorized:
Reported: 03/14/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/13/12 00:43
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	63.7%
d14-Dibenzo(a,h)anthracene	18.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-13-20120307
SAMPLE

Lab Sample ID: UL19F
LIMS ID: 12-3919
Matrix: Water
Data Release Authorized:
Reported: 03/14/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/08/12
Date Analyzed: 03/13/12 16:40
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	37.0%
d14-Dibenzo(a,h)anthracene	86.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MB-030812
METHOD BLANK

Lab Sample ID: MB-030812
LIMS ID: 12-3914
Matrix: Water
Data Release Authorized:
Reported: 03/14/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.0220.021
Date Sampled: NA
Date Received: NA

Date Extracted: 03/08/12
Date Analyzed: 03/12/12 21:03
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	68.0%
d14-Dibenzo(a,h)anthracene	66.0%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021

Client ID	MNP	DBA	TOT OUT
MB-030812	68.0%	66.0%	0
LCS-030812	64.3%	70.0%	0
LCSD-030812	68.3%	94.7%	0
LW-4R-20120307	61.7%	50.7%	0
PZ-12-20120307	59.0%	75.3%	0
PZ-17-20120307	58.7%	71.3%	0
LW-3-20120307	52.0%	24.3%	0
PZ-18-20120307	63.7%	18.0%	0
PZ-13-20120307	37.0%	86.0%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(40-110)	(33-107)
(DBA) = d14-Dibenzo(a,h)anthracene	(33-140)	(10-142)

Prep Method: SW3520C
Log Number Range: 12-3914 to 12-3919

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LCS-030812
LAB CONTROL SAMPLE

Lab Sample ID: LCS-030812
LIMS ID: 12-3914
Matrix: Water
Data Release Authorized:
Reported: 03/14/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.0220.021
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 03/08/12

Date Analyzed LCS: 03/12/12 21:31
LCSD: 03/12/12 21:58
Instrument/Analyst LCS: NT4/JZ
LCSD: NT4/JZ

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)anthracene	2.42	3.00	80.7%	2.51	3.00	83.7%	3.7%
Chrysene	2.33	3.00	77.7%	2.44	3.00	81.3%	4.6%
Benzo(a)pyrene	1.96	3.00	65.3%	2.05	3.00	68.3%	4.5%
Indeno(1,2,3-cd)pyrene	2.24	3.00	74.7%	2.58	3.00	86.0%	14.1%
Dibenz(a,h)anthracene	2.06 Q	3.00	68.7%	2.78 Q	3.00	92.7%	29.8%
Total Benzofluoranthenes	4.54	6.00	75.7%	4.76	6.00	79.3%	4.7%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	64.3%	68.3%
d14-Dibenzo(a,h)anthracene	70.0%	94.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: LW-4R-20120307
SAMPLE

Lab Sample ID: UL19A
LIMS ID: 12-3914
Matrix: Water
Data Release Authorized: MW
Reported: 03/19/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/09/12
Date Analyzed: 03/14/12 23:13
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	66.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: PZ-12-20120307
SAMPLE

Lab Sample ID: UL19B
LIMS ID: 12-3915
Matrix: Water
Data Release Authorized: MW
Reported: 03/19/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/09/12
Date Analyzed: 03/14/12 23:49
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	72.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: PZ-17-20120307
SAMPLE

Lab Sample ID: UL19C
LIMS ID: 12-3916
Matrix: Water
Data Release Authorized: MW
Reported: 03/19/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/09/12
Date Analyzed: 03/14/12 00:24
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	75.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: LW-3-20120307
SAMPLE

Lab Sample ID: UL19D
LIMS ID: 12-3917
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/09/12
Date Analyzed: 03/14/12 03:59
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	92.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: PZ-18-20120307
SAMPLE

Lab Sample ID: UL19E
LIMS ID: 12-3918
Matrix: Water
Data Release Authorized: MW
Reported: 03/19/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/09/12
Date Analyzed: 03/14/12 04:35
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	51.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: PZ-13-20120307
SAMPLE

Lab Sample ID: UL19F
LIMS ID: 12-3919
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted: 03/09/12
Date Analyzed: 03/14/12 02:12
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	72.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: MB-030912
METHOD BLANK

Lab Sample ID: MB-030912
LIMS ID: 12-3914
Matrix: Water
Data Release Authorized: MW
Reported: 03/19/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: NA
Date Received: NA

Date Extracted: 03/09/12
Date Analyzed: 03/13/12 20:50
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	78.0%

ANALYTICAL RESOURCES INCORPORATED

SW8041 CHLOROPHENOLICS SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021

Client ID	TBP	TOT OUT
MB-030912	78.0%	0
LCS-030912	79.0%	0
LCSD-030912	75.2%	0
LW-4R-20120307	66.8%	0
PZ-12-20120307	72.8%	0
PZ-17-20120307	75.2%	0
LW-3-20120307	92.8%	0
PZ-18-20120307	51.2%	0
PZ-13-20120307	72.8%	0

	LCS/MB LIMITS	QC LIMITS
(TBP) = 2,4,6-Tribromophenol	(41-98)	(26-113)

Prep Method: SW3510C
Log Number Range: 12-3914 to 12-3919

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: LCS-030912
LCS/LCSD

Lab Sample ID: LCS-030912
LIMS ID: 12-3914
Matrix: Water
Data Release Authorized: MW
Reported: 03/19/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted LCS/LCSD: 03/09/12

Date Analyzed LCS: 03/13/12 21:25
LCSD: 03/13/12 22:01
Instrument/Analyst LCS: ECD1/AAR
LCSD: ECD1/AAR

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 50 mL
LCSD: 50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Pentachlorophenol	2.19	2.50	87.6%	2.17	2.50	86.8%	0.9%

Chlorophenols Surrogate Recovery

	LCS	LCSD
2,4,6-Tribromophenol	79.0%	75.2%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 03/20/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

ARI ID	Client ID	Analysis Date	DL	Range	Result
MB-030912	Method Blank	03/09/12	1.0	Gasoline	< 250 U
12-3914		PID1		HC ID	---
				Trifluorotoluene	103%
				Bromobenzene	101%
UL19A	LW-4R-20120307	03/09/12	1.0	Gasoline	< 250 U
12-3914		PID1		HC ID	---
				Trifluorotoluene	101%
				Bromobenzene	97.2%
UL19B	PZ-12-20120307	03/09/12	1.0	Gasoline	< 250 U
12-3915		PID1		HC ID	---
				Trifluorotoluene	107%
				Bromobenzene	104%
UL19C	PZ-17-20120307	03/09/12	1.0	Gasoline	< 250 U
12-3916		PID1		HC ID	---
				Trifluorotoluene	107%
				Bromobenzene	105%
UL19D	LW-3-20120307	03/09/12	1.0	**Gasoline**	**1300**
12-3917		PID1		HC ID	GRO
				Trifluorotoluene	104%
				Bromobenzene	100%
UL19E	PZ-18-20120307	03/09/12	1.0	**Gasoline**	**270**
12-3918		PID1		HC ID	GRO
				Trifluorotoluene	103%
				Bromobenzene	102%
UL19F	PZ-13-20120307	03/09/12	1.0	**Gasoline**	**250**
12-3919		PID1		HC ID	GRO
				Trifluorotoluene	102%
				Bromobenzene	98.9%
UL19G	Trip Blanks	03/09/12	1.0	Gasoline	< 250 U
12-3920		PID1		HC ID	---
				Trifluorotoluene	102%
				Bromobenzene	97.2%

Gasoline values reported in µg/L (ppb)

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

ANALYTICAL RESOURCES INCORPORATED

TPHG WATER SURROGATE RECOVERY SUMMARY

ARI Job: UL19
Matrix: Water

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.0220.021

Client ID	TFT	BBZ	TOT OUT
MB-030912	103%	101%	0
LCS-030912	111%	102%	0
LCSD-030912	108%	100%	0
LW-4R-20120307	101%	97.2%	0
PZ-12-20120307	107%	104%	0
PZ-17-20120307	107%	105%	0
LW-3-20120307	104%	100%	0
PZ-18-20120307	103%	102%	0
PZ-13-20120307	102%	98.9%	0
Trip Blanks	102%	97.2%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(80-120)
(BBZ) = Bromobenzene	(80-120)	(80-120)

Log Number Range: 12-3914 to 12-3920

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG

Sample ID: LCS-030912
LAB CONTROL SAMPLE

Lab Sample ID: LCS-030912
LIMS ID: 12-3914
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.0220.021
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 03/09/12 09:02
LCSD: 03/09/12 09:31
Instrument/Analyst LCS: PID1/MH
LCSD: PID1/MH

Purge Volume: 5.0 mL

Dilution Factor LCS: 1.0
LCSD: 1.0

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	1000	1000	100%	940	1000	94.0%	6.2%

Reported in ug/L (ppb)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	111%	108%
Bromobenzene	102%	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 1 of 1
Matrix: Water

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021

Data Release Authorized:
Reported: 03/20/12

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range/Surrogate	RL	Result
MB-030812	Method Blank	03/08/12	03/12/12	1.00	Diesel Range	100	< 100 U
12-3914	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		76.1%
UL19A	LW-4R-20120307	03/08/12	03/12/12	1.00	Diesel Range	100	< 100 U
12-3914	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		84.8%
UL19B	PZ-12-20120307	03/08/12	03/12/12	1.00	Diesel Range	100	< 100 U
12-3915	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		83.4%
UL19C	PZ-17-20120307	03/08/12	03/12/12	1.00	Diesel Range	100	< 100 U
12-3916	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		85.0%
UL19D	LW-3-20120307	03/08/12	03/12/12	1.00	**Diesel Range**	**100**	**620**
12-3917	HC ID: **DRO/MOTOR OIL**		FID4A	1.0	**Motor Oil Range**	**200**	**1200**
					Creosote Range	**200**	**2100**
					o-Terphenyl		64.6%
UL19E	PZ-18-20120307	03/08/12	03/12/12	1.00	**Diesel Range**	**100**	**130**
12-3918	HC ID: **DRO/MOTOR OIL**		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	**200**	**470**
					o-Terphenyl		77.4%
UL19F	PZ-13-20120307	03/08/12	03/12/12	1.00	Diesel Range	100	< 100 U
12-3919	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		82.6%

Reported in ug/L (ppb)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel range quantitation on total peaks in the range from C12 to C24.
Motor Oil range quantitation on total peaks in the range from C24 to C38.
Creosote range quantitation on total peaks in the range from C12 to C22.
HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021

Client ID	OTER	TOT OUT
MB-030812	76.1%	0
LCS-030812	87.3%	0
LCSD-030812	86.4%	0
LW-4R-20120307	84.8%	0
PZ-12-20120307	83.4%	0
PZ-17-20120307	85.0%	0
LW-3-20120307	64.6%	0
PZ-18-20120307	77.4%	0
PZ-13-20120307	82.6%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: SW3510C
Log Number Range: 12-3914 to 12-3919

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-030812**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-030812
LIMS ID: 12-3914
Matrix: Water
Data Release Authorized:
Reported: 03/21/12

QC Report No: UL19-Landau Associates, Inc.
Project: Port of Olympia
0021039.0220.021
Date Sampled: 03/07/12
Date Received: 03/08/12

Date Extracted LCS/LCSD: 03/08/12

Date Analyzed LCS: 03/12/12 08:09
LCSD: 03/12/12 08:33
Instrument/Analyst LCS: FID/MH
LCSD: FID/MH

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	2560	3000	85.3%	2560	3000	85.3%	0.0%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	87.3%	86.4%

Results reported in ug/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: UL19
Matrix: Water Project: Port of Olympia
Date Received: 03/08/12 0021039.0220.021

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
12-3914-030812MB1	Method Blank	500 mL	1.00 mL	03/08/12
12-3914-030812LCS1	Lab Control	500 mL	1.00 mL	03/08/12
12-3914-030812LCSD1	Lab Control Dup	500 mL	1.00 mL	03/08/12
12-3914-UL19A	LW-4R-20120307	500 mL	1.00 mL	03/08/12
12-3915-UL19B	PZ-12-20120307	500 mL	1.00 mL	03/08/12
12-3916-UL19C	PZ-17-20120307	500 mL	1.00 mL	03/08/12
12-3917-UL19D	LW-3-20120307	500 mL	1.00 mL	03/08/12
12-3918-UL19E	PZ-18-20120307	500 mL	1.00 mL	03/08/12
12-3919-UL19F	PZ-13-20120307	500 mL	1.00 mL	03/08/12

Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 21, 2012

Chris Kimmel
Landau Associates, Inc.
130 2nd Avenue S.
Edmonds, WA 98020

RE: Project: Port of Olympia
ARI Job No: UL56

Dear Chris:

Please find enclosed the original *Chain of Custody*, sample receipt documentation, and final results for the project referenced above. Analytical Resources, Inc. accepted nine water samples and a trip blank in good condition on March 9, 2012.

The samples were analyzed for NWTPH-Gx, NWTPH-Dx, cPAHs by method 8270 SIM, PAHs by method 8270 and PCP on select samples by method 8041, as requested on the *Chain of Custody*.

Please refer to the *Case Narrative* for analytical details regarding the sample.

A copy of this report and all associated ARI raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to contact me at any time.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211

Enclosures

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

☒ **Seattle/Edmonds** (425) 778-0907
☐ **Tacoma** (253) 926-2493
☐ **Spokane** (509) 327-9737
☐ **Portland** (503) 542-1080
☐ ____________

LANDAU ASSOCIATES

Chain-of-Custody Record

Date 3/8/2012
Page 1 of 1

Project Name Port of Olympia
Project No. 022139.020.021
Project Location/Event [illegible]
Sampler's Name T. Smith, Sarah Weeks
Project Contact Chris Kimmel
Send Results To Chris Kimmel

Turnaround Time
☒ Standard
☐ Accelerated
☐ ____________

Sample I.D.	Date	Time	Matrix	No. of Containers	Testing Parameters: TPH-G	TPH-Dx	[illegible]	[illegible]	[illegible]	[illegible]						
MW-02D-20120308	3/8/12	1414	H2O	10	X	X	X	X	X	X						
CW-15-20120308	3/8/12	1226	H2O	10	X	X	X	X	X	X						
MW-05D-20120308	3/8/12	1032	H2O	10	X	X	X	X	X	X						
MW-02S-20120308	3/8/12	1347	H2O	10	X	X	X	X	X	X						
MW-05S-20120308	3/8/12	1537	H2O	10	X	X	X	X	X	X						
PZ-30-20120308	3/8/12	1041	H2O	10	X	X	X	X	X	X						
PZ-19-20120308	3/8/12	1453	H2O	10	X	X	X	X	X	X						
Trip Blanks	3/8/12	—	H2O	3	X											
MW-01S-20120308	3/8/12	1132	H2O	10	X	X	X	X	X	X						
MW-01D-20120308	3/8/12	1615	H2O	10	X	X	X	X	X	X						

Observations/Comments

X Allow water samples to settle, collect aliquot from clear portion

X NWTPH-Dx - run acid wash/silica gel cleanup

___ run samples standardized to ____________ product

___ Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
___ non-preserved
___ preserved w/methanol
___ preserved w/sodium bisulfate
___ Freeze upon receipt

___ Dissolved metal water samples field filtered

Other [illegible]

Special Shipment/Handling or Storage Requirements: 5 coolers with ice

Method of Shipment: [illegible]

Relinquished by	Received by	Relinquished by	Received by
Signature: [signature]	Signature: [signature]	Signature	Signature
Printed Name: Sarah Weeks	Printed Name: A. Volgardsen	Printed Name	Printed Name
Company: Landau Associates, Inc	Company: ARI	Company	Company
Date 3/8/2012 Time 1945	Date 3/9/12 Time 940	Date ____ Time ____	Date ____ Time ____

WHITE COPY - Project File **YELLOW COPY - Laboratory** **PINK COPY - Client Representative**

Rev 8/09

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Landau Project Name: Port of Olympia

COC No(s): (NA) Delivered by: Fed-Ex UPS Courier Hand Delivered Other: Night Drop

Assigned ARI Job No: UL56 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry): 1.3 4.3 2.7 2.9 5.0

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941619

Cooler Accepted by: AV Date: 3/9/12 Time: 940

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used?	Bubble Wrap, Wet Ice, Gel Packs, Baggies, Foam Block, Paper, Other:		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	(NA)	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	(NO)
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	3/2/12	

Was Sample Split by ARI : (NA) YES Date/Time:_____ Equipment:_____ Split by:_____

Samples Logged by: JM Date: 3/9/12 Time: 1235

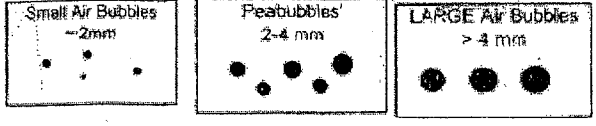
***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

Trip Blanks = sm in 2 of 3

By: JM Date: 3/9/12



Small → "sm"	
Peabubbles → "pb"	
Large → "lg"	
Headspace → "hs"	

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: UL56
Client: Landau Associates, Inc.
Project Event: 0021039.020.021
Project Name: Port of Olympia

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-02D-02120308	UL56A	12-4080	Water	03/08/12 14:04	03/09/12 09:40
2.	CW-13-20120308	UL56B	12-4081	Water	03/08/12 12:00	03/09/12 09:40
3.	MW-05D-20120308	UL56C	12-4082	Water	03/08/12 10:32	03/09/12 09:40
4.	MW-02S-20120308	UL56D	12-4083	Water	03/08/12 13:47	03/09/12 09:40
5.	MW-05S-20120308	UL56E	12-4084	Water	03/08/12 10:39	03/09/12 09:40
6.	PZ-30-20120308	UL56F	12-4085	Water	03/08/12 10:41	03/09/12 09:40
7.	PZ-19-20120308	UL56G	12-4086	Water	03/08/12 14:53	03/09/12 09:40
8.	MW-01S-20120308	UL56H	12-4087	Water	03/08/12 16:32	03/09/12 09:40
9.	MW-01D-20120308	UL56I	12-4088	Water	03/08/12 16:15	03/09/12 09:40
10.	Trip Blanks	UL56J	12-4089	Water	03/08/12	03/09/12 09:40

Case Narrative

Project: 0021039.020.021
ARI Job No.: UL56
March 21, 2012

Sample Receipt

Please find enclosed the original *Chain of Custody (COC)* record and analytical results for the project referenced above. Analytical Resources, Inc. accepted nine water samples and a trip blank in good condition on March 9, 2012. The samples were received at cooler temperatures between 1.3 and 5.0°C. Please see the *Cooler Receipt Form* for further details. Per Landau Associates, select samples were allowed to settle and sample volume was collected from the clear portion.

The following tests were performed on selected samples, as requested on the *Chain of Custody*.

Semivolatile Organics by method 8270D Water

The samples were extracted on 3/14/12. The samples were analyzed between 3/16/12 and 3/19/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LSCD (s): Are in control.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

SIM PNA by method 8270-SIM Water

The samples were extracted on 3/14/12 and analyzed between 3/16/12 and 3/19/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: The surrogate MNP is out of control low for sample MW-01S-20120308. The sample was re-analyzed at a dilution and both sets of data have been included for your review.

LCS/LSCD (s): All percent recoveries and other RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

PCP Only by method 8041

The samples were extracted on 3/14/12 and analyzed on 3/18/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Case Narrative

Project: 0021039.020.021
ARI Job No.: UL56
March 21, 2012

Surrogates: All surrogate recoveries were in control.

LCS/LSCD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Gx

The samples were analyzed on 3/12/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Dx

The samples were extracted on 3/14/12 and analyzed on 3/15/12 and 3/16/12 - within the method recommended holding time.

Surrogates: All surrogate recoveries were in control.

Samples: There were no anomalies associated with these samples.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MW-02D-20120308
SAMPLE

Lab Sample ID: UL56A
LIMS ID: 12-4080
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 16:50
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**19**
91-57-6	**2-Methylnaphthalene**	**1.0**	**1.5**
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**9.3**
132-64-9	**Dibenzofuran**	**1.0**	**3.2**
86-73-7	**Fluorene**	**1.0**	**3.8**
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	**Phenanthrene**	**1.0**	**2.3**
86-74-8	**Carbazole**	**1.0**	**1.4**
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	**1-Methylnaphthalene**	**1.0**	**5.1**
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	77.2%
d14-p-Terphenyl	88.4%
2,4,6-Tribromophenol	90.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: CW-13-20120308
SAMPLE

Lab Sample ID: UL56B
LIMS ID: 12-4081
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 17:23
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	71.2%
d14-p-Terphenyl	90.8%
2,4,6-Tribromophenol	86.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MW-05D-20120308
SAMPLE

Lab Sample ID: UL56C
LIMS ID: 12-4082
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 17:56
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**3.3**
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	**Carbazole**	**1.0**	**1.1**
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	76.0%
d14-p-Terphenyl	88.4%
2,4,6-Tribromophenol	89.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: MW-02S-20120308
SAMPLE

Lab Sample ID: UL56D
LIMS ID: 12-4083
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 18:29
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	72.0%
d14-p-Terphenyl	62.8%
2,4,6-Tribromophenol	96.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: MW-05S-20120308
SAMPLE

Lab Sample ID: UL56E
LIMS ID: 12-4084
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 19:02
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**1.1**
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**7.5**
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	71.2%
d14-p-Terphenyl	68.0%
2,4,6-Tribromophenol	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: PZ-30-20120308
SAMPLE

Lab Sample ID: UL56F
LIMS ID: 12-4085
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 19:34
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**2.0**
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**8.2**
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	80.0%
d14-p-Terphenyl	73.2%
2,4,6-Tribromophenol	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: PZ-19-20120308
SAMPLE

Lab Sample ID: UL56G
LIMS ID: 12-4086
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 20:07
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**2.8**
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	73.6%
d14-p-Terphenyl	86.0%
2,4,6-Tribromophenol	94.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MW-01S-20120308
SAMPLE

Lab Sample ID: UL56H
LIMS ID: 12-4087
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 20:40
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**410 ES**
91-57-6	**2-Methylnaphthalene**	**1.0**	**290 ES**
208-96-8	**Acenaphthylene**	**1.0**	**6.8**
83-32-9	**Acenaphthene**	**1.0**	**150 ES**
132-64-9	**Dibenzofuran**	**1.0**	**79**
86-73-7	**Fluorene**	**1.0**	**69**
87-86-5	**Pentachlorophenol**	**5.0**	**1,000 ES**
85-01-8	**Phenanthrene**	**1.0**	**65**
86-74-8	**Carbazole**	**1.0**	**53**
120-12-7	**Anthracene**	**1.0**	**18**
206-44-0	**Fluoranthene**	**1.0**	**19**
129-00-0	**Pyrene**	**1.0**	**14**
56-55-3	**Benzo(a)anthracene**	**1.0**	**3.0**
218-01-9	**Chrysene**	**1.0**	**3.1**
50-32-8	**Benzo(a)pyrene**	**1.0**	**1.2**
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	**1-Methylnaphthalene**	**1.0**	**260 ES**
TOTBFA	**Total Benzofluoranthenes**	**1.0**	**2.2**

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	76.0%
d14-p-Terphenyl	68.4%
2,4,6-Tribromophenol	93.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MW-01S-20120308
DILUTION

Lab Sample ID: UL56H
LIMS ID: 12-4087
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/19/12 20:46
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 100

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**100**	**5,000**
91-57-6	**2-Methylnaphthalene**	**100**	**1,100**
208-96-8	Acenaphthylene	100	< 100 U
83-32-9	**Acenaphthene**	**100**	**340**
132-64-9	**Dibenzofuran**	**100**	**140**
86-73-7	**Fluorene**	**100**	**110**
87-86-5	**Pentachlorophenol**	**500**	**3,200**
85-01-8	**Phenanthrene**	**100**	**120**
86-74-8	Carbazole	100	< 100 U
120-12-7	Anthracene	100	< 100 U
206-44-0	Fluoranthene	100	< 100 U
129-00-0	Pyrene	100	< 100 U
56-55-3	Benzo(a)anthracene	100	< 100 U
218-01-9	Chrysene	100	< 100 U
50-32-8	Benzo(a)pyrene	100	< 100 U
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100 U
53-70-3	Dibenz(a,h)anthracene	100	< 100 U
191-24-2	Benzo(g,h,i)perylene	100	< 100 U
90-12-0	**1-Methylnaphthalene**	**100**	**770**
TOTBFA	Total Benzofluoranthenes	100	< 100 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	D
d14-p-Terphenyl	D
2,4,6-Tribromophenol	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MW-01D-20120308
SAMPLE

Lab Sample ID: UL56I
LIMS ID: 12-4088
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 21:13
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	76.0%
d14-p-Terphenyl	84.4%
2,4,6-Tribromophenol	93.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-031412
METHOD BLANK

Lab Sample ID: MB-031412
LIMS ID: 12-4080
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: NA
Date Received: NA

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 15:12
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	72.0%
d14-p-Terphenyl	94.4%
2,4,6-Tribromophenol	94.4%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021

Client ID	FBP	TPH	TBP	TOT OUT
MB-031412	72.0%	94.4%	94.4%	0
LCS-031412	72.4%	81.6%	96.8%	0
LCSD-031412	74.8%	83.2%	100%	0
MW-02D-20120308	77.2%	88.4%	90.7%	0
CW-13-20120308	71.2%	90.8%	86.7%	0
MW-05D-20120308	76.0%	88.4%	89.9%	0
MW-02S-20120308	72.0%	62.8%	96.5%	0
MW-05S-20120308	71.2%	68.0%	102%	0
PZ-30-20120308	80.0%	73.2%	102%	0
PZ-19-20120308	73.6%	86.0%	94.7%	0
MW-01S-20120308	76.0%	68.4%	93.3%	0
MW-01S-20120308 DL	D	D	D	0
MW-01D-20120308	76.0%	84.4%	93.9%	0

	LCS/MB LIMITS	QC LIMITS
(FBP) = 2-Fluorobiphenyl	(49-100)	(42-100)
(TPH) = d14-p-Terphenyl	(53-119)	(26-114)
(TBP) = 2,4,6-Tribromophenol	(52-123)	(48-118)

Prep Method: SW3520C
Log Number Range: 12-4080 to 12-4088

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: LCS-031412
LCS/LCSD

Lab Sample ID: LCS-031412
LIMS ID: 12-4080
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted LCS/LCSD: 03/14/12

Date Analyzed LCS: 03/16/12 15:45
LCSD: 03/16/12 16:18
Instrument/Analyst LCS: NT6/JZ
LCSD: NT6/JZ

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: NO

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	15.7	25.0	62.8%	15.8	25.0	63.2%	0.6%
2-Methylnaphthalene	15.5	25.0	62.0%	15.6	25.0	62.4%	0.6%
Acenaphthylene	17.8	25.0	71.2%	18.8	25.0	75.2%	5.5%
Acenaphthene	17.5	25.0	70.0%	18.2	25.0	72.8%	3.9%
Dibenzofuran	17.8	25.0	71.2%	18.5	25.0	74.0%	3.9%
Fluorene	18.6	25.0	74.4%	19.4	25.0	77.6%	4.2%
Pentachlorophenol	61.6	75.0	82.1%	66.3	75.0	88.4%	7.3%
Phenanthrene	19.5	25.0	78.0%	20.5	25.0	82.0%	5.0%
Carbazole	21.1	25.0	84.4%	22.5	25.0	90.0%	6.4%
Anthracene	18.9	25.0	75.6%	19.7	25.0	78.8%	4.1%
Fluoranthene	20.8	25.0	83.2%	21.9	25.0	87.6%	5.2%
Pyrene	19.3	25.0	77.2%	19.8	25.0	79.2%	2.6%
Benzo(a)anthracene	18.8	25.0	75.2%	19.8	25.0	79.2%	5.2%
Chrysene	19.0	25.0	76.0%	20.0	25.0	80.0%	5.1%
Benzo(a)pyrene	18.1	25.0	72.4%	19.2	25.0	76.8%	5.9%
Indeno(1,2,3-cd)pyrene	18.9	25.0	75.6%	20.2	25.0	80.8%	6.6%
Dibenz(a,h)anthracene	18.3	25.0	73.2%	19.6	25.0	78.4%	6.9%
Benzo(g,h,i)perylene	19.2	25.0	76.8%	20.5	25.0	82.0%	6.5%
1-Methylnaphthalene	20.3	25.0	81.2%	20.5	25.0	82.0%	1.0%
Total Benzofluoranthenes	39.1	50.0	78.2%	41.2	50.0	82.4%	5.2%

Semivolatile Surrogate Recovery

	LCS	LCSD
2-Fluorobiphenyl	72.4%	74.8%
d14-p-Terphenyl	81.6%	83.2%
2,4,6-Tribromophenol	96.8%	100%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-02D-20120308
SAMPLE

Lab Sample ID: UL56A
LIMS ID: 12-4080
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 22:50
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	61.7%
d14-Dibenzo(a,h)anthracene	60.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: CW-13-20120308
SAMPLE

Lab Sample ID: UL56B
LIMS ID: 12-4081
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 23:19
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	62.7%
d14-Dibenzo(a,h)anthracene	72.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
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Sample ID: MW-05D-20120308
SAMPLE

Lab Sample ID: UL56C
LIMS ID: 12-4082
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/19/12 12:03
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	56.3%
d14-Dibenzo(a,h)anthracene	69.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-02S-20120308
SAMPLE

Lab Sample ID: UL56D
LIMS ID: 12-4083
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/19/12 12:32
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	59.7%
d14-Dibenzo(a,h)anthracene	36.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-05S-20120308
SAMPLE

Lab Sample ID: UL56E
LIMS ID: 12-4084
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/19/12 13:00
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	58.0%
d14-Dibenzo(a,h)anthracene	41.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-30-20120308
SAMPLE

Lab Sample ID: UL56F
LIMS ID: 12-4085
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/19/12 13:29
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	63.7%
d14-Dibenzo(a,h)anthracene	42.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
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Sample ID: PZ-19-20120308
SAMPLE

Lab Sample ID: UL56G
LIMS ID: 12-4086
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/19/12 13:58
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	60.0%
d14-Dibenzo(a,h)anthracene	43.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-01S-20120308
SAMPLE

Lab Sample ID: UL56H
LIMS ID: 12-4087
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/19/12 14:27
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	**Benzo(a)anthracene**	**0.10**	**1.8**
218-01-9	**Chrysene**	**0.10**	**1.8**
50-32-8	**Benzo(a)pyrene**	**0.10**	**0.65**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**0.10**	**0.14**
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	**Total Benzofluoranthenes**	**0.10**	**1.4**

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	13.7%
d14-Dibenzo(a,h)anthracene	39.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-01S-20120308
DILUTION

Lab Sample ID: UL56H
LIMS ID: 12-4087
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/19/12 15:42
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 5.00

CAS Number	Analyte	RL	Result
56-55-3	**Benzo(a)anthracene**	**0.50**	**1.7**
218-01-9	**Chrysene**	**0.50**	**1.9**
50-32-8	**Benzo(a)pyrene**	**0.50**	**0.53**
193-39-5	Indeno(1,2,3-cd)pyrene	0.50	< 0.50 U
53-70-3	Dibenz(a,h)anthracene	0.50	< 0.50 U
TOTBFA	**Total Benzofluoranthenes**	**0.50**	**1.2**

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	76.7%
d14-Dibenzo(a,h)anthracene	35.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: MW-01D-20120308
SAMPLE

Lab Sample ID: UL56I
LIMS ID: 12-4088
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/19/12 14:56
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	59.7%
d14-Dibenzo(a,h)anthracene	29.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MB-031412
METHOD BLANK

Lab Sample ID: MB-031412
LIMS ID: 12-4081
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: NA
Date Received: NA

Date Extracted: 03/14/12
Date Analyzed: 03/16/12 20:55
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	63.3%
d14-Dibenzo(a,h)anthracene	80.0%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021

Client ID	MNP	DBA	TOT OUT
MW-02D-20120308	61.7%	60.3%	0
MB-031412	63.3%	80.0%	0
LCS-031412	62.3%	66.7%	0
LCSD-031412	60.3%	52.7%	0
CW-13-20120308	62.7%	72.3%	0
MW-05D-20120308	56.3%	69.0%	0
MW-02S-20120308	59.7%	36.7%	0
MW-05S-20120308	58.0%	41.0%	0
PZ-30-20120308	63.7%	42.3%	0
PZ-19-20120308	60.0%	43.7%	0
MW-01S-20120308	13.7%*	39.7%	1
MW-01S-20120308 DL	76.7%	35.0%	0
MW-01D-20120308	59.7%	29.3%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(40-110)	(33-107)
(DBA) = d14-Dibenzo(a,h)anthracene	(33-140)	(10-142)

Prep Method: SW3520C
Log Number Range: 12-4080 to 12-4088

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
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Sample ID: LCS-031412
LAB CONTROL SAMPLE

Lab Sample ID: LCS-031412
LIMS ID: 12-4081
Matrix: Water
Data Release Authorized:
Reported: 03/19/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 03/14/12

Date Analyzed LCS: 03/16/12 21:24
LCSD: 03/16/12 21:52
Instrument/Analyst LCS: NT4/JZ
LCSD: NT4/JZ

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)anthracene	2.28	3.00	76.0%	2.15	3.00	71.7%	5.9%
Chrysene	2.26	3.00	75.3%	2.16	3.00	72.0%	4.5%
Benzo(a)pyrene	1.84	3.00	61.3%	1.70	3.00	56.7%	7.9%
Indeno(1,2,3-cd)pyrene	1.99	3.00	66.3%	1.84	3.00	61.3%	7.8%
Dibenz(a,h)anthracene	1.89	3.00	63.0%	1.40	3.00	46.7%	29.8%
Total Benzofluoranthenes	4.25	6.00	70.8%	4.37	6.00	72.8%	2.8%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	62.3%	60.3%
d14-Dibenzo(a,h)anthracene	66.7%	52.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
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Sample ID: MW-02D-20120308
SAMPLE

Lab Sample ID: UL56A
LIMS ID: 12-4080
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/18/12 02:10
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	72.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: CW-13-20120308
SAMPLE

Lab Sample ID: UL56B
LIMS ID: 12-4081
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/18/12 02:46
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	74.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: MW-05D-20120308
SAMPLE

Lab Sample ID: UL56C
LIMS ID: 12-4082
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/18/12 03:21
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	80.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: MW-02S-20120308
SAMPLE

Lab Sample ID: UL56D
LIMS ID: 12-4083
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/18/12 03:57
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	58.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: MW-05S-20120308
SAMPLE

Lab Sample ID: UL56E
LIMS ID: 12-4084
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/18/12 04:33
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	56.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: PZ-30-20120308
SAMPLE

Lab Sample ID: UL56F
LIMS ID: 12-4085
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/18/12 05:09
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	56.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: PZ-19-20120308
SAMPLE

Lab Sample ID: UL56G
LIMS ID: 12-4086
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/18/12 05:45
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	68.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: MW-01D-20120308
SAMPLE

Lab Sample ID: UL56I
LIMS ID: 12-4088
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted: 03/14/12
Date Analyzed: 03/18/12 06:56
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	**Pentachlorophenol**	**0.25**	**0.85**

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	76.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: MB-031412
METHOD BLANK

Lab Sample ID: MB-031412
LIMS ID: 12-4080
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: NA
Date Received: NA

Date Extracted: 03/14/12
Date Analyzed: 03/18/12 23:11
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	77.2%

ANALYTICAL RESOURCES INCORPORATED

SW8041 CHLOROPHENOLICS SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021

Client ID	TBP	TOT OUT
MB-031412	77.2%	0
LCS-031412	76.2%	0
LCSD-031412	74.2%	0
MW-02D-20120308	72.8%	0
CW-13-20120308	74.0%	0
MW-05D-20120308	80.8%	0
MW-02S-20120308	58.4%	0
MW-05S-20120308	56.8%	0
PZ-30-20120308	56.4%	0
PZ-19-20120308	68.4%	0
MW-01D-20120308	76.8%	0

	LCS/MB LIMITS	QC LIMITS
(TBP) = 2,4,6-Tribromophenol	(41-98)	(26-113)

Prep Method: SW3510C
Log Number Range: 12-4080 to 12-4088

FORM-II SW8041

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: LCS-031412
LCS/LCSD

Lab Sample ID: LCS-031412
LIMS ID: 12-4080
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted LCS/LCSD: 03/14/12

Date Analyzed LCS: 03/18/12 23:46
LCSD: 03/18/12 00:22

Instrument/Analyst LCS: ECD1/AAR
LCSD: ECD1/AAR

Sample Amount LCS: 500 mL
LCSD: 500 mL

Final Extract Volume LCS: 50 mL
LCSD: 50 mL

Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Pentachlorophenol	2.08	2.50	83.2%	2.04	2.50	81.6%	1.9%

Chlorophenols Surrogate Recovery

	LCS	LCSD
2,4,6-Tribromophenol	76.2%	74.2%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

ARI ID	Client ID	Analysis Date	DL	Range	Result
MB-031212	Method Blank	03/12/12	1.0	Gasoline	< 250 U
12-4080		PID1		HC ID	---
				Trifluorotoluene	107%
				Bromobenzene	104%
UL56A	MW-02D-20120308	03/12/12	1.0	Gasoline	< 250 U
12-4080		PID1		HC ID	---
				Trifluorotoluene	108%
				Bromobenzene	105%
UL56B	CW-13-20120308	03/12/12	1.0	Gasoline	< 250 U
12-4081		PID1		HC ID	---
				Trifluorotoluene	107%
				Bromobenzene	103%
UL56C	MW-05D-20120308	03/12/12	1.0	Gasoline	< 250 U
12-4082		PID1		HC ID	---
				Trifluorotoluene	107%
				Bromobenzene	104%
UL56D	MW-02S-20120308	03/12/12	1.0	Gasoline	< 250 U
12-4083		PID1		HC ID	---
				Trifluorotoluene	105%
				Bromobenzene	103%
UL56E	MW-05S-20120308	03/12/12	1.0	Gasoline	< 250 U
12-4084		PID1		HC ID	---
				Trifluorotoluene	108%
				Bromobenzene	105%
UL56F	PZ-30-20120308	03/12/12	1.0	Gasoline	< 250 U
12-4085		PID1		HC ID	---
				Trifluorotoluene	107%
				Bromobenzene	106%
UL56G	PZ-19-20120308	03/12/12	1.0	Gasoline	< 250 U
12-4086		PID1		HC ID	---
				Trifluorotoluene	107%
				Bromobenzene	105%
MB-031312	Method Blank	03/13/12	1.0	Gasoline	< 250 U
12-4087		PID1		HC ID	---
				Trifluorotoluene	104%
				Bromobenzene	104%
UL56H	MW-01S-20120308	03/13/12	5.0	**Gasoline**	**26000**
12-4087		PID1		HC ID	GAS/GRO
				Trifluorotoluene	88.1%
				Bromobenzene	90.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

ARI ID	Client ID	Analysis Date	DL	Range	Result
UL56I 12-4088	MW-01D-20120308	03/12/12 PID1	1.0	Gasoline HC ID Trifluorotoluene Bromobenzene	< 250 U --- 106% 103%
UL56J 12-4089	Trip Blanks	03/12/12 PID1	1.0	Gasoline HC ID Trifluorotoluene Bromobenzene	< 250 U --- 104% 98.4%

Gasoline values reported in µg/L (ppb)

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

ANALYTICAL RESOURCES INCORPORATED

TPHG WATER SURROGATE RECOVERY SUMMARY

ARI Job: UL56
Matrix: Water

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021

Client ID	TFT	BBZ	TOT OUT
MB-031212	107%	104%	0
LCS-031212	115%	105%	0
LCSD-031212	110%	104%	0
MW-02D-20120308	108%	105%	0
CW-13-20120308	107%	103%	0
MW-05D-20120308	107%	104%	0
MW-02S-20120308	105%	103%	0
MW-05S-20120308	108%	105%	0
PZ-30-20120308	107%	106%	0
PZ-19-20120308	107%	105%	0
MB-031312	104%	104%	0
LCS-031312	107%	100%	0
LCSD-031312	111%	106%	0
MW-01S-20120308	88.1%	90.2%	0
MW-01D-20120308	106%	103%	0
Trip Blanks	104%	98.4%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(80-120)
(BBZ) = Bromobenzene	(80-120)	(80-120)

Log Number Range: 12-4080 to 12-4089

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG

Sample ID: LCS-031212
LAB CONTROL SAMPLE

Lab Sample ID: LCS-031212
LIMS ID: 12-4080
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 03/12/12 09:32
LCSD: 03/12/12 10:01
Instrument/Analyst LCS: PID1/MH
LCSD: PID1/MH

Purge Volume: 5.0 mL

Dilution Factor LCS: 1.0
LCSD: 1.0

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	1120	1000	112%	1060	1000	106%	5.5%

Reported in ug/L (ppb)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	115%	110%
Bromobenzene	105%	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG

Sample ID: LCS-031312
LAB CONTROL SAMPLE

Lab Sample ID: LCS-031312
LIMS ID: 12-4087
Matrix: Water
Data Release Authorized:
Reported: 03/20/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 03/13/12 08:16
LCSD: 03/13/12 08:45
Instrument/Analyst LCS: PID1/MH
LCSD: PID1/MH

Purge Volume: 5.0 mL

Dilution Factor LCS: 1.0
LCSD: 1.0

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	1010	1000	101%	1020	1000	102%	1.0%

Reported in ug/L (ppb)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	107%	111%
Bromobenzene	100%	106%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 1 of 2
Matrix: Water

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021

Data Release Authorized:
Reported: 03/20/12

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range/Surrogate	RL	Result
MB-031412	Method Blank	03/14/12	03/15/12	1.00	Diesel Range	100	< 100 U
12-4080	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		83.4%
UL56A	MW-02D-20120308	03/14/12	03/15/12	1.00	Diesel Range	100	< 100 U
12-4080	HC ID: **MOTOR OIL**		FID4A	1.0	**Motor Oil Range**	**200**	**210**
					Creosote Range	200	< 200 U
					o-Terphenyl		81.4%
UL56B	CW-13-20120308	03/14/12	03/15/12	1.00	Diesel Range	100	< 100 U
12-4081	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		81.8%
UL56C	MW-05D-20120308	03/14/12	03/15/12	1.00	Diesel Range	100	< 100 U
12-4082	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		78.9%
UL56D	MW-02S-20120308	03/14/12	03/15/12	1.00	Diesel Range	100	< 100 U
12-4083	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		82.2%
UL56E	MW-05S-20120308	03/14/12	03/15/12	1.00	Diesel Range	100	< 100 U
12-4084	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		83.2%
UL56F	PZ-30-20120308	03/14/12	03/15/12	1.00	Diesel Range	100	< 100 U
12-4085	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		82.5%
UL56G	PZ-19-20120308	03/14/12	03/15/12	1.00	Diesel Range	100	< 100 U
12-4086	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		78.9%
UL56H	MW-01S-20120308	03/14/12	03/15/12	1.00	**Diesel Range**	**100**	**4400**
12-4087	HC ID: **CREOSOTE**		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	**200**	**18000**
					o-Terphenyl		78.0%
UL56H DIL	MW-01S-20120308	03/14/12	03/16/12	1.00	**Diesel Range**	**500**	**4000**
12-4087	HC ID: **CREOSOTE**		FID4A	5.0	Motor Oil Range	1000	< 1000 U
					Creosote Range	**1000**	**16000**
					o-Terphenyl		64.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 2 of 2
Matrix: Water

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021

Data Release Authorized:
Reported: 03/20/12

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range/Surrogate	RL	Result
UL56I	MW-01D-20120308	03/14/12	03/15/12	1.00	Diesel Range	100	< 100 U
12-4088	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		80.6%

Reported in ug/L (ppb)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel range quantitation on total peaks in the range from C12 to C24.
Motor Oil range quantitation on total peaks in the range from C24 to C38.
Creosote range quantitation on total peaks in the range from C12 to C22.
HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021

Client ID	OTER	TOT OUT
MB-031412	83.4%	0
LCS-031412	86.4%	0
LCSD-031412	89.4%	0
MW-02D-20120308	81.4%	0
CW-13-20120308	81.8%	0
MW-05D-20120308	78.9%	0
MW-02S-20120308	82.2%	0
MW-05S-20120308	83.2%	0
PZ-30-20120308	82.5%	0
PZ-19-20120308	78.9%	0
MW-01S-20120308	78.0%	0
MW-01S-20120308 DL	64.6%	0
MW-01D-20120308	80.6%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: SW3510C
Log Number Range: 12-4080 to 12-4088

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-031412**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-031412
LIMS ID: 12-4080
Matrix: Water
Data Release Authorized:
Reported: 03/21/12

QC Report No: UL56-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/08/12
Date Received: 03/09/12

Date Extracted LCS/LCSD: 03/14/12

Date Analyzed LCS: 03/15/12 14:47
LCSD: 03/15/12 15:12
Instrument/Analyst LCS: FID/MH
LCSD: FID/MH

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	2370	3000	79.0%	2460	3000	82.0%	3.7%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	86.4%	89.4%

Results reported in ug/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: UL56
Matrix: Water Project: Port of Olympia
Date Received: 03/09/12 0021039.020.021

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
12-4080-031412MB1	Method Blank	500 mL	1.00 mL	03/14/12
12-4080-031412LCS1	Lab Control	500 mL	1.00 mL	03/14/12
12-4080-031412LCSD1	Lab Control Dup	500 mL	1.00 mL	03/14/12
12-4080-UL56A	MW-02D-20120308	500 mL	1.00 mL	03/14/12
12-4081-UL56B	CW-13-20120308	500 mL	1.00 mL	03/14/12
12-4082-UL56C	MW-05D-20120308	500 mL	1.00 mL	03/14/12
12-4083-UL56D	MW-02S-20120308	500 mL	1.00 mL	03/14/12
12-4084-UL56E	MW-05S-20120308	500 mL	1.00 mL	03/14/12
12-4085-UL56F	PZ-30-20120308	500 mL	1.00 mL	03/14/12
12-4086-UL56G	PZ-19-20120308	500 mL	1.00 mL	03/14/12
12-4087-UL56H	MW-01S-20120308	500 mL	1.00 mL	03/14/12
12-4088-UL56I	MW-01D-20120308	500 mL	1.00 mL	03/14/12

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 9, 2012

Chris Kimmel
Landau Associates, Inc.
130 2nd Avenue S.
Edmonds, WA 98020

RE: Project: Port of Olympia
ARI Job No: UO79

Dear Chris:

Please find enclosed the original *Chain of Custody*, sample receipt documentation, and final results for the project referenced above. Analytical Resources, Inc. accepted one water sample and a trip blank in good condition on March 31, 2012.

The sample was analyzed for NWTPH-Gx, NWTPH-Dx, as requested on the *Chain of Custody*.

Please refer to the *Case Narrative* for analytical details regarding the sample.

A copy of this report and all associated ARI raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to contact me at any time.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211

Enclosures

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

LANDAU ASSOCIATES

☒ **Seattle/Edmonds** (425) 778-0907
☐ **Tacoma** (253) 926-2493
☐ **Spokane** (509) 327-9737
☐ **Portland** (503) 542-1080
☐ _____

Date _____

Page _____ of _____

Chain-of-Custody Record

Project Name [illegible] Project No. [illegible]

Project Location/Event [illegible]

Sampler's Name Tom Smith

Project Contact Chris Kimmel

Send Results To Chris Kimmel, Anne Kelsey

Testing Parameters

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Sample I.D.	Date	Time	Matrix	No. of Containers	TPH-Dx	TPH-Dx SGC		Observations/Comments
[illegible]	3/30/12	1125	water	4	X	X		
Trip blanks	-	-	water	2	X			

_X_ Allow water samples to settle, collect aliquot from clear portion

_X_ NWTPH-Dx - run acid wash/silica gel cleanup

___ run samples standardized to _____ product

___ Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
___ non-preserved
___ preserved w/methanol
___ preserved w/sodium bisulfate
___ Freeze upon receipt

___ Dissolved metal water samples field filtered

Other [illegible]

Special Shipment/Handling or Storage Requirements 1 cooler on hand

Method of Shipment Delivery

Relinquished by	**Received by**	**Relinquished by**	**Received by**
Signature	Signature	Signature	Signature
Printed Name Tom Smith	Printed Name Jennifer Millsap	Printed Name	Printed Name
Company Landau Associates	Company HRI	Company	Company
Date 3/30/2012 Time 19:43	Date 3/31/12 Time 1200	Date _____ Time _____	Date _____ Time _____

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

Rev 8/09

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Landau

Project Name: Port of Olympia

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier (Hand Delivered) Other: _____

Assigned ARI Job No: U079

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry): 1.9

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90946179

Cooler Accepted by: JM Date: 3/31/12 Time: 1200

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used?	(Bubble Wrap) (Wet Ice) Gel Packs (Baggies) Foam Block Paper Other:		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	YES	(NO)
Were all VOC vials free of air bubbles?	NA	(YES)	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	3/26/12	

Was Sample Split by ARI: (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

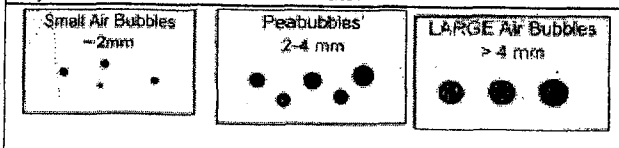
Samples Logged by: JM Date: 4/2/12 Time: 710

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: U079
Client: Landau Associates, Inc.
Project Event: 0021039.020.021
Project Name: Port of Olympia

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	PZ-18-20120330	U079A	12-5718	Water	03/30/12 16:25	03/31/12 12:00
2.	Trip Blanks	U079B	12-5719	Water	03/30/12	03/31/12 12:00

Case Narrative

Project: 0021039.020.021
ARI Job No.: UO79
April 9, 2012

Sample Receipt

Please find enclosed the original *Chain of Custody (COC)* record and analytical results for the project referenced above. Analytical Resources, Inc. accepted one water sample and a trip blank in good condition on March 31, 2012. The samples were received at a cooler temperature of 1.9°C. Please see the *Cooler Receipt Form* for further details. Per Landau Associates, select samples were allowed to settle and sample volume was collected from the clear portion.

The following tests were performed on selected samples, as requested on the *Chain of Custody*.

NWTPH-Gx

The samples were analyzed on 4/5/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Dx

The samples were extracted on 4/2/12 and analyzed on 4/3/12 - within the method recommended holding time.

Surrogates: All surrogate recoveries were in control.

Samples: There were no anomalies associated with these samples.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 04/09/12

QC Report No: UO79-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: 03/30/12
Date Received: 03/31/12

ARI ID	Client ID	Analysis Date	DL	Range	Result
MB-040512	Method Blank	04/05/12	1.0	Gasoline	< 250 U
12-5718		PID1		HC ID	---
				Trifluorotoluene	94.1%
				Bromobenzene	93.1%
UO79A	PZ-18-20120330	04/05/12	1.0	Gasoline	< 250 U
12-5718		PID1		HC ID	---
				Trifluorotoluene	101%
				Bromobenzene	99.9%
UO79B	Trip Blanks	04/05/12	1.0	Gasoline	< 250 U
12-5719		PID1		HC ID	---
				Trifluorotoluene	101%
				Bromobenzene	97.3%

Gasoline values reported in µg/L (ppb)

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

ANALYTICAL RESOURCES INCORPORATED

TPHG WATER SURROGATE RECOVERY SUMMARY

ARI Job: UO79
Matrix: Water

QC Report No: UO79-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021

Client ID	TFT	BBZ	TOT OUT
MB-040512	94.1%	93.1%	0
LCS-040512	106%	100%	0
LCSD-040512	102%	97.6%	0
PZ-18-20120330	101%	99.9%	0
Trip Blanks	101%	97.3%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(80-120)
(BBZ) = Bromobenzene	(80-120)	(80-120)

Log Number Range: 12-5718 to 12-5719

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG

Sample ID: LCS-040512
LAB CONTROL SAMPLE

Lab Sample ID: LCS-040512
LIMS ID: 12-5718
Matrix: Water
Data Release Authorized: MW
Reported: 04/09/12

QC Report No: UO79-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021039.020.021
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 04/05/12 06:02
LCSD: 04/05/12 06:31
Instrument/Analyst LCS: PID1/JLW
LCSD: PID1/JLW

Purge Volume: 5.0 mL

Dilution Factor LCS: 1.0
LCSD: 1.0

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	1040	1000	104%	980	1000	98.0%	5.9%

Reported in ug/L (ppb)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	106%	102%
Bromobenzene	100%	97.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 1 of 1
Matrix: Water

QC Report No: UO79-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021

Data Release Authorized: MW
Reported: 04/09/12

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range/Surrogate	RL	Result
MB-040212	Method Blank	04/02/12	04/03/12	1.00	Diesel Range	100	< 100 U
12-5718	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		80.9%
UO79A	PZ-18-20120330	04/02/12	04/03/12	1.00	Diesel Range	100	< 100 U
12-5718	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	200	< 200 U
					o-Terphenyl		71.8%

Reported in ug/L (ppb)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel range quantitation on total peaks in the range from C12 to C24.
Motor Oil range quantitation on total peaks in the range from C24 to C38.
Creosote range quantitation on total peaks in the range from C12 to C22.
HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UO79-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021

Client ID	OTER	TOT OUT
MB-040212	80.9%	0
LCS-040212	82.5%	0
LCSD-040212	84.5%	0
PZ-18-20120330	71.8%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: SW3510C
Log Number Range: 12-5718 to 12-5718

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Water
Date Received: 03/31/12

ARI Job: UO79
Project: Port of Olympia
0021039.020.021

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
12-5718-040212MB1	Method Blank	500 mL	1.00 mL	04/02/12
12-5718-040212LCS1	Lab Control	500 mL	1.00 mL	04/02/12
12-5718-040212LCSD1	Lab Control Dup	500 mL	1.00 mL	04/02/12
12-5718-UO79A	PZ-18-20120330	500 mL	1.00 mL	04/02/12

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-040212**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-040212
LIMS ID: 12-5718
Matrix: Water
Data Release Authorized:
Reported: 04/09/12

QC Report No: UO79-Landau Associates, Inc.
Project: Port of Olympia
0021039.020.021
Date Sampled: 03/30/12
Date Received: 03/31/12

Date Extracted LCS/LCSD: 04/02/12

Date Analyzed LCS: 04/03/12 21:17
LCSD: 04/03/12 21:41
Instrument/Analyst LCS: FID/AAR
LCSD: FID/AAR

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	2460	3000	82.0%	2610	3000	87.0%	5.9%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	82.5%	84.5%

Results reported in ug/L
RPD calculated using sample concentrations per SW846.