

GROUNDWATER MONITORING REPORT: APRIL 2016

PNEC Corp Former Bulk Petroleum Facility
Shepard Way NW & Bromley Place NW
Bainbridge Island, Kitsap County, Washington

May 23, 2016
Project No. 81167198

Prepared for:
PNEC Corp dba SC Fuels
Orange, California

Prepared by:
Terracon Consultants, Inc.
Mountlake Terrace, WA

Offices Nationwide
Employee-Owned

Established in 1965
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Terracon

Geotechnical ■ Environmental ■ Construction Materials ■ Facilities



May 23, 2016

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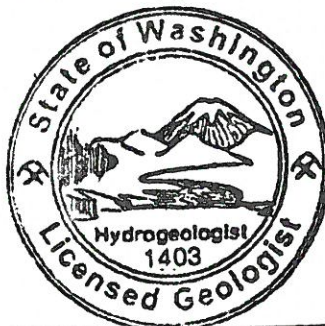
Re: Groundwater Monitoring Report – April 2016
PNEC Corp Former Bulk Petroleum Facility
Shepard Way NW & Bromley Place NW
Bainbridge Island, Kitsap County, Washington
Terracon Project No. 81167198

Dear Mr. Holbrook:

Terracon Consultants, Inc. (Terracon) is pleased to submit this Groundwater Monitoring Report for the above referenced site. This work was performed in general accordance with Terracon Proposal No. P81167198, dated April 4, 2016, and the terms, conditions and limitations in the Environmental Consulting Agreement between Terracon Consultants, Inc. and Pacific Northwest Energy Corporation (PNEC Corp), d.b.a. SC Fuels, signed April 13, 2016.

We appreciate the opportunity to perform these services for SC Fuels/PNEC Corp. In addition to sampling services, our professionals provide geotechnical, environmental, construction materials, and facilities services on a wide variety of projects locally, regionally and nationally. For more detailed information on all of Terracon's services please visit our website at www.terracon.com. If there are any questions regarding this report or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,
Terracon Consultants, Inc.



FOR Emily Blakeway
S. Kyle Long
Environmental Technician

MICHAEL D. NOLL

Michael D. Noll
Michael D. Noll, L.G., L.H.G.
Senior Project Manager

Terracon Consultants, Inc. 21905 64th Avenue West, Suite 100 Mountlake Terrace, WA 98043

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GROUNDWATER MONITORING REPORT – APRIL 2016
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Shepard Way NW & Bromley Place NW
Bainbridge Island, Kitsap County, Washington

Terracon Project No. 81167198
May 23, 2016

1.0 INTRODUCTION

This groundwater monitoring report documents additional post-treatment groundwater sampling activities that were conducted at the PNEC Corp Former Bulk Petroleum Facility located on the southwest corner of Shepard Way NW & Bromley Place NW in Bainbridge Island, Kitsap County, Washington. Groundwater sampling was performed on April 20, 2016. The property (Kitsap County Parcel No. 272502-4-005-2011) covers approximately 0.9 acres. A Topographic Map is included as Figure 1 that shows the site in relation to the surrounding area. Figure 2 presents the locations of the monitoring wells and former features at the site. Figure 3 depicts the April 2016 groundwater contour map.

The site is listed in the Washington Department of Ecology (Ecology) Confirmed and Suspected Contaminated Sites List (CSCSL) as Tosco Bainbridge Island Bulk Plant 1784 (Facility Site ID 26595127, Cleanup Site ID 3960). The CSCSL lists confirmed concentrations of Priority Pollutant Metals, Non-Halogenated Solvents, and Unspecified Petroleum Products in groundwater at levels exceeding the Washington State Model Toxics Control Act (MTCA) cleanup levels, and concentrations of Unspecified Petroleum Products in soil at levels exceeding MTCA cleanup levels at the site. The CSCSL also lists suspected concentrations of Unspecified Petroleum Products in surface water at the site.

1.1 Scope of Work

Terracon completed a Washington Department of Ecology (Ecology) underground injection control (UIC) site well registration for remediation well RW-1, and injected Regenesys RegenOx® Part A and Part B solution into RW-1 in January 2015, in an effort to treat site groundwater for residual diesel-range total petroleum hydrocarbons (TPH) impacts at nearby site groundwater monitoring wells MW-2A and MW-5. After a period of approximately three weeks, Terracon began follow-up groundwater monitoring at wells MW-2A, MW-5, and RW-1 to further evaluate concentrations of diesel-range TPH at the site.

The groundwater remedial treatment work was performed as an independent action intended to meet the requirements of the MTCA Cleanup Regulation, as established in Chapter 173-340 of the Washington Administrative Code (WAC), in order to achieve regulatory closure. Work was performed in general accordance with MTCA and the *Guidance for Remediation of Petroleum Contaminated Sites*, Ecology Publication No. 10-09-057, dated September 2011.

This report includes a description of the groundwater sample collection activities, tables showing current and historical depth to groundwater measurements and analytical results, a copy of the analytical laboratory report with chain-of-custody documentation, and a risk-based evaluation of laboratory results for samples collected from select wells.

1.2 Standard of Care

Terracon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. Please note that Terracon does not warrant the work of laboratories, regulatory agencies or other third parties supplying information used in the preparation of the report. These groundwater monitoring services were performed in accordance with the scope of work agreed with you, our client, as reflected in our proposal.

1.3 Additional Scope Limitations

This report was intended to reduce, but not eliminate, uncertainty regarding the existence of recognized environmental conditions in connection with the subject site. Findings, conclusions and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, non-detectable or not present during these services, and we cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this groundwater sampling event. Subsurface conditions may vary from those encountered at the time of construction or at specific borings or wells or during other surveys, tests, assessments, investigations or exploratory services. The data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services. If, during future site development, different subsurface conditions from those encountered during our explorations are observed or appear to be present, we must be advised promptly so that we can review these conditions and reconsider or modify our conclusions and recommendations where necessary.

1.4 Reliance

This report has been prepared for the exclusive use and reliance of PNEC Corp/SC Fuels. Use or reliance by any other party (except a governmental entity having jurisdiction over the site) is prohibited without the written authorization of PNEC Corp/SC Fuels and Terracon. Reliance on this report by the client and all authorized parties will be subject to the terms, conditions and limitations stated in this report and Terracon's agreement for services. The limitation of liability defined in the terms and conditions is the aggregate limit of Terracon's liability to the client and all relying parties unless otherwise agreed in writing.

2.0 SITE HISTORY AND PREVIOUS SAMPLING EVENTS

A bulk petroleum storage facility was constructed on the site by Union Oil Company of California (UNOCAL) in about 1970, and was used primarily for heating oil storage. Tosco Corporation (Tosco) acquired the site in March 1997 from UNOCAL as part of a portfolio of Western US assets. PNEC Corp purchased the site from Tosco in June 1997. PNEC removed the facility aboveground storage tanks (ASTs), pumping station, and overhead loading rack structures from the site in 1997. The attached Figure 2 Site Diagram shows the approximate locations of former site features. Neither Tosco nor PNEC Corp operated the facility.

Tosco conducted a subsurface investigation at the site in 1997. Soil and groundwater impacts exceeding the MTCA Method A cleanup levels were detected and the site was listed in the Ecology CSCSL. Tosco continued to perform assessment, remediation, and monitoring work at the site until June 2007, when environmental responsibility for the site was transferred to PNEC Corp.

Five groundwater monitoring wells (MW-1 through MW-5) were installed at the site by others in June 2001 (Figure 2). Well MW-2 was excavated and removed during petroleum-contaminated soil (PCS) excavation work in March 2003, and replacement well MW-2A and remediation well RW-1 were installed at that time. Measured depth to groundwater in the wells has ranged from approximately 4 to 11 feet below the top of the well casing (TOC), with an inferred groundwater flow direction that has varied, but has flowed mainly toward the south and southwest. Groundwater samples were collected from the wells on a quarterly or annual basis between 2001 and 2007. Samples were analyzed for gasoline-, diesel-, and oil-range TPH; benzene, toluene, ethylbenzene, and xylenes (BTEX); volatile organic hydrocarbons (VOCs); polycyclic aromatic hydrocarbons (PAHs); and/or total and dissolved lead. Diesel-range TPH (1,100 micrograms per liter [µg/L]) was detected in well MW-5 in June 2007, at a concentration exceeding the MTCA Method A cleanup level (500 µg/L). All other laboratory analytical results for the groundwater samples collected from the site wells in

June 2007 were below the MTCA Method A or Method B cleanup levels. Historical groundwater data collected from the site in 2006 and 2007 are included in Table 1 and Table 2.

Terracon collected groundwater samples from wells MW-1, MW-2A, MW-3, MW-4, MW-5, and RW-1 in August 2014. Prior to that sampling event, no groundwater samples had been collected from the site since June 2007. The results were documented in our report, *Groundwater Monitoring Report: August 2014*, dated September 30, 2014. Diesel-range TPH was identified in the samples collected from groundwater monitoring wells MW-2A and MW-5 at concentrations of 920 µg/L and 800 µg/L, respectively, exceeding the MTCA Method A cleanup level. Gasoline-range TPH, BTEX compounds, and total lead were not identified above the laboratory method reporting limits (MRLs) in the samples collected. The groundwater flow direction was generally toward the south and southwest, consistent with previous sampling events.

In January 2015, Terracon completed remedial injections on the site. Approximately 360 pounds of RegenOx® Part A and 240 pounds of RegenOx® Part B were mixed with 1,325 gallons of potable water, to create a solution with a concentration of approximately 3.5% to 4.5% of RegenOx®. The RegenOx® Part A and Part B mixtures were pumped into well RW-1 at a pumping rate of approximately 4 gallons per minute (gpm). After a period of approximately three weeks following the RegenOx® Part A and Part B injections, Terracon measured depth to groundwater and collected groundwater samples from wells MW-2A, MW-5, and RW-1. The results were documented in our report, *Remedial Treatment Report: January 2015*, dated April 2, 2015. The groundwater sample collected from MW-5 had a diesel-range TPH concentration of 1,200 µg/L and an oil-range TPH concentration of 560 µg/L, both exceeding the MTCA Method A cleanup level of 500 µg/L.

In April and July 2015, Terracon measured depth to groundwater and collected groundwater samples from wells MW-2A, MW-5, and RW-1. The results were documented in our report, *Groundwater Monitoring Report: April and July 2015*, dated August 21, 2015. The groundwater sample collected from MW-2A in July 2015 contained a diesel-range TPH concentration of 510 µg/L, exceeding the MTCA Method A cleanup level. The groundwater samples collected from MW-5 in April and July 2015 contained diesel-range TPH concentrations of 940 µg/L and 610 µg/L, respectively, exceeding the MTCA Method A cleanup level. The groundwater samples collected from RW-1 in April and July 2015 contained diesel-range TPH at concentrations of 540 µg/L and 870 µg/L, respectively, exceeding the MTCA Method A cleanup level.

In February 2016, Terracon measured depth to groundwater and collected groundwater samples from wells MW-2A, MW-5, and RW-1. The results were documented in our report, *Groundwater Monitoring Report: February 2016*, dated April 14, 2016. The

groundwater sample collected from MW-5 in February 2016 contained a diesel-range TPH concentration of 810 µg/L, exceeding the MTCA Method A cleanup level.

The groundwater samples collected from wells MW-2A, MW-5, and RW-1 in February 2016 were additionally analyzed for extractable petroleum hydrocarbons (EPH) and PAHs in order to calculate TPH groundwater cleanup levels for the samples using the Ecology MTCA Method B Workbook, *MTCATPH11.1*. The EPH method evaluates diesel- and oil-range TPH based on carbon range fractions. Specifically, the EPH method quantifies the presence of both aromatic and aliphatic hydrocarbon molecules in a sample, in the 8 to 10 carbon atom range (C8-C10), C10-C12, C12-C16, C16-C21, and C21-C34. Analysis for EPH is used to determine the chemical composition of the petroleum product(s) present and allow for calculations to establish alternative site specific cleanup levels for those contaminants in groundwater at that location.

The groundwater sample collected from well MW-5 contained 81 µg/L of aromatic hydrocarbons in the C8–C12 equivalent carbon range using the EPH analytical method, and one non-carcinogenic PAH (fluorene) at a concentration of 3.1 µg/L, which is well below the MTCA Method B cleanup level of 640 µg/L. EPH carbon ranges and PAHs were not detected in the remaining groundwater samples.

The MTCA Method B Workbook stipulates that a value equal to ½ of the laboratory MRL be entered into the workbook for all contaminants that were not detected but are suspected to be present at the site. The workbook provides an evaluation as to whether the TPH contaminants in the site groundwater represent a risk to human health if used as a drinking water source. The calculated groundwater TPH concentrations for the samples collected from wells MW-2A, MW-5, and RW-1 failed the most stringent groundwater criteria due to the elevated laboratory MRL (50 µg/L) used for reporting the PAH concentrations, which was the result of an insufficient sample volume.

Based on the findings of the February 2016 sampling event, Terracon recommended beginning quarterly groundwater monitoring in order to pursue closure for the site. Terracon also recommended that the site be enrolled in Ecology's Voluntary Cleanup Program (VCP).

3.0 GROUNDWATER SAMPLING

On April 20, 2016, Terracon measured depth to groundwater and collected groundwater samples from wells MW-1, MW-2A, MW-3 through MW-5, and RW-1. Depth to groundwater in each well was measured prior to sample collection. The water level probe was cleaned using an Alconox® wash and distilled water rinse before use in each well.

The wells were purged using a peristaltic pump equipped with clean tubing. Low-flow groundwater discharge rates were maintained during purging in order to minimize the drawdown of the groundwater level in the wells. Groundwater parameters (pH, temperature, specific conductance, and dissolved oxygen) were measured during well purging using a multifunction meter and a flow-through cell. Samples were collected when all parameters were within 10% for two consecutive readings.

The purge water was stored onsite in a Department of Transportation (DOT) approved 55-gallon steel drum. The drum was properly labeled and left onsite near well MW-1 pending receipt of laboratory analytical results. Following the stabilization of measured groundwater parameters, samples were collected utilizing the peristaltic pump. Discharge from the peristaltic pump was directed into laboratory provided glassware. Each sample container was labeled with the site name, date, time, and well/sample number.

Measured depth to groundwater ranged from 4.32 feet below TOC at well MW-3 to 5.65 feet below TOC at well RW-1 (Table 1). Measured depth to groundwater and TOC elevation data relative to a site datum were used to determine the relative groundwater elevation at each well. Based on groundwater level measurements collected during the April 2016 groundwater sampling event, groundwater flow direction at the site was generally to the south and southwest (Figure 3), consistent with previous findings.

Purge volumes were approximately 2 gallons each from wells MW-1, MW-2A, MW-3 through MW-5, and RW-1. The purge water from the monitoring wells was clear, with no apparent sediment. Hydrocarbon-like odors were not observed in the purge water from the wells.

3.1 Analytical Laboratory Testing

Groundwater samples from the April 2016 sampling event were delivered to ALS Environmental Laboratory, a Washington-accredited analytical laboratory located in Everett, Washington.

The groundwater samples were submitted for laboratory analysis for the following:

- Gasoline-, diesel-, and oil-range TPH via Northwest Method NWTPH-HCID; and
- BTEX by EPA Method 8260.

Based on oil-range TPH detections by NWTPH-HCID (identified by ALS as likely a light oil product), the groundwater samples collected from wells MW-2A, MW-4, and MW-5 were further analyzed for diesel- and oil-range TPH via Northwest Method NWTPH-Dx.

Based on the oil-range TPH concentrations reported for the groundwater samples collected from wells MW-2A and MW-5, those samples were further analyzed for the following:

- EPH by the Northwest Method NWEPH, and
- PAHs by EPA Method 8270D with selected ion monitoring (SIM).

The executed chain-of-custody forms and laboratory analytical certificates are provided in Appendix A. All analyses were completed using standard turnaround times.

3.2 Quality Assurance/Quality Control Results

The analytical results for the current investigation were checked for completeness immediately upon receipt from the laboratory to ensure that data and QA/QC information requested were present. Data quality was assessed by considering hold times, surrogate recovery, method blanks, matrix spike and matrix spike duplicate (MS/MSD) recovery, and detection limits. QA/QC review was completed using guidance described in *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (Draft Final, USEPA, 2005). Our evaluation assumes that the QA/QC is correct as reported by the laboratory, and merely provides an interpretation of the QA/QC results.

- Hold Times: All analyses were completed within specified hold times.
- Surrogate Recoveries: All surrogate recoveries were within laboratory limits.
- Method Blanks: Analytes were not detected in any of the laboratory method blanks.
- MS/MSD Results: MS and MSD recoveries were all within laboratory limits, and Relative Percent Differences (RPDs) between MS and MSD recoveries were all within laboratory limits.
- Laboratory Reporting Limits: Reporting limits were below relevant MTCA cleanup levels.

Based upon our interpretation of quality control information provided by the laboratory, it is our opinion that the overall dataset is useable as qualified for the purposes of this groundwater sampling event.

4.0 LABORATORY ANALYTICAL RESULTS

A summary of analytical results for groundwater quality from the April 2016 sampling event is presented in Table 2. The results are tabulated, with the state cleanup levels included for comparison. The complete laboratory reports and chain-of-custody forms for analytical results from this sampling event are included in Appendix A.

Diesel- and Oil-Range Organics

Oil-range TPH was identified above the laboratory MRL in the samples collected from monitoring wells MW-2A, MW-4, and MW-5. Oil-range TPH was detected in the sample collected from MW-5 at a concentration of 1,300 µg/L, exceeding the MTCA Method A cleanup level of 500 µg/L. Oil-range TPH was detected in the samples collected from wells MW-2A and MW-4 at concentrations of 470 µg/L and 320 µg/L, respectively, below the MTCA Method A cleanup level. Diesel-range TPH was not detected in the samples above the laboratory MRL.

Extractable Petroleum Hydrocarbons

Aromatic hydrocarbons in the C12-C16 range were identified at a concentration of 84 µg/L in the sample collected from monitoring well MW-5. EPH results were below the laboratory MRLs for the remaining carbon chain fractions in MW-5 and for all carbon chain fractions from the sample collected from well MW-2A.

Polycyclic Aromatic Hydrocarbons

Carcinogenic PAHs (cPAHs) were not detected in the groundwater samples. Naphthalene was detected in the groundwater sample collected from well MW-5 at a concentration of 0.27 µg/L, well below the MTCA Method A cleanup level of 160 µg/L. Pyrene was detected in the groundwater samples collected from wells MW-2A and MW-5 at concentrations of 0.21 µg/L and 0.045 µg/L, respectively, well below the MTCA Method B cleanup level of 480 µg/L. Benzo(g,h,i)perylene was detected in the groundwater samples collected from wells MW-2A and MW-5 at concentrations of 0.25 µg/L and 0.025 µg/L. Ecology has not established a cleanup level for benzo(g,h,i)perylene in groundwater. The remaining PAHs were not detected above the laboratory MRLs in the samples.

5.0 FINDINGS AND CONCLUSIONS

Wells MW-1, MW-2A, MW-3 through MW-5, and RW-1 were sampled in April 2016, approximately 15 months following RegenOx® injections at well RW-1. Based on the results of the groundwater sampling events completed in April 2016, the findings and conclusions of this report are as follows:

- Oil-range TPH was identified in the sample collected from well MW-5 at a concentration of 1,300 µg/L, exceeding the MTCA Method A cleanup level of 500 µg/L.
- The groundwater flow direction is generally toward the south and southwest, consistent with previous findings.

The groundwater samples collected from wells MW-2A and MW-5 were additionally analyzed for EPH and PAHs in order to calculate TPH groundwater cleanup levels for the samples using the Ecology MTCA Method B Workbook, *MTCATPH11.1*. The groundwater sample collected from well MW-5 contained 84 µg/L of aromatic hydrocarbons in the C8–C12 range using the EPH analytical method. EPH carbon ranges were not detected in the groundwater sample collected from well MW-2A. Three non-carcinogenic PAHs (naphthalene, pyrene, and benzo(g,h,i)perylene) were detected in the groundwater samples collected from well MW-2A and MW-5. The remaining PAHs, including all cPAHs, were not detected above the laboratory MRLs in the samples.

The MTCA Method B Workbook stipulates that a value equal to ½ of the laboratory MRL be entered into the workbook for all contaminants that were not detected but are suspected to be present at the site. For contaminants not suspected to be present (i.e., the gasoline additive methyl tert butyl ether [MTBE]), a value of 0 can be entered into the workbook. The workbook calculates a total TPH groundwater result for each sample, and provides an evaluation as to whether the TPH contaminants in the site groundwater represent a risk to human health if used as a drinking water source.

The calculated groundwater TPH concentrations for the samples collected from wells MW-2A and MW-5 were 250.1 µg/L and 309.36 µg/L, respectively. Both groundwater sample calculations passed the MTCA Method B TPH criteria for protection of direct exposure (ingestion) of groundwater. Copies of the MTCA Method B Groundwater TPH Calculation Worksheets for the groundwater samples collected from wells MW-2A and MW-5 are included in Appendix B.

6.0 RECOMMENDATIONS

Based on the results of the April 2016 groundwater monitoring event conducted at the site, Terracon recommends that a No Further Action (NFA) determination for the site be requested from Ecology through the Voluntary Cleanup Program (VCP). Terracon recommends that quarterly groundwater sampling be continued in 2016 until Ecology grants an NFA determination for the site.

FIGURES

Figure 1 - Topographic Map

Figure 2 - Site Diagram

Figure 3 – Groundwater Contour Map – April 20, 2016



USGS Suquamish, WA, 7.5-minute Quadrangles, 1981.

LEGEND:



APPROXIMATE SITE
BOUNDARY

Project Mngr:	MDN
Drawn By:	SAB
Checked By:	MDN
Approved By:	MYW
Project No.	81147093
Scale:	Not to Scale
File No.	
Date:	September 2014

Terracon
Consulting Engineers and Scientists

21905 64th Avenue W., Ste 100 Mountlake Terrace, WA 98043
PH. (425) 771-3304 FAX. (425) 771-3549

TOPOGRAPHIC MAP

Former PNEC Bulk Petroleum Facility
Shepard Way NW & Bromley Place NW
Bainbridge Island, Kitsap County, Washington

FIG. No.

1



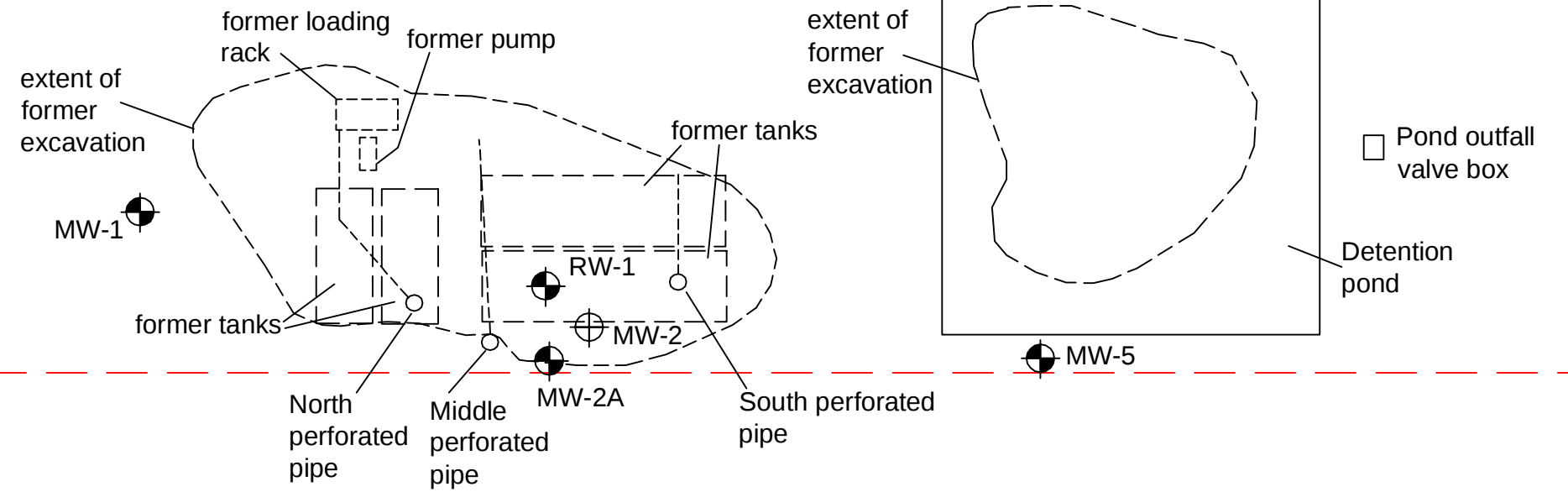
Bromley Place NW

Leslie Landing residences

Eagle Harbor

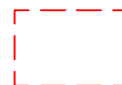
gravel path / trail

Shepard Way NW



City of Bainbridge Island
Strawberry Plant Park

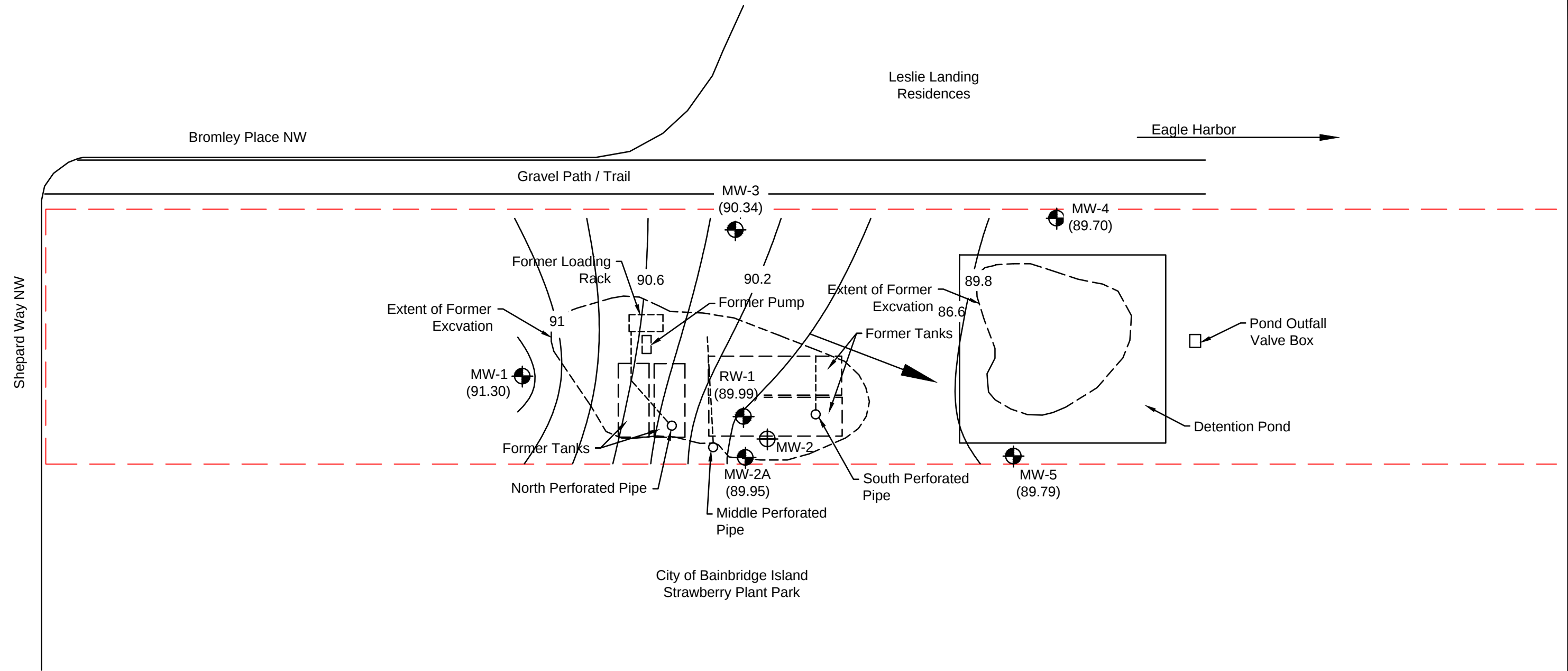
LEGEND:

 APPROXIMATE SITE BOUNDARY

 MW-1 MONITORING WELL NUMBER AND APPROXIMATE LOCATION

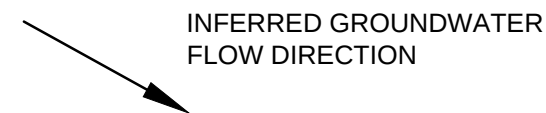
 MW-2 FORMER MONITORING WELL LOCATION

Project Mngr: MDN		Project No. 81167198		Terracon Consulting Engineers and Scientists 21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043 PH: (425) 771-3304 FAX: (425) 771-3549	SITE DIAGRAM		FIG. No.
Drawn By: SAB		Scale: Not to Scale			Former PNEC Bulk Petroleum Facility Shepard Way NW & Bromley Place NW Bainbridge Island, Kitsap County, Washington		2
Checked By: MDN		File No.					
Approved By: MYW		Date: April 2016					



LEGEND:

-  APPROXIMATE SITE BOUNDARY
-  **MW-1**
(91.30) MONITORING WELL NUMBER AND APPROXIMATE LOCATION
(Groundwater elevation, April 20, 2016)
-  **MW-2** FORMER MONITORING WELL LOCATION



— 91 — GROUNDWATER CONTOUR (feet)

Project Mng'r: MDN		Project No. 81167198		GROUNDWATER CONTOUR MAP - April 20, 2016		FIG. No. 3
Drawn By: SAB/RMS		Scale: AS SHOWN				
Checked By: MDN		File No. gwcontFeb2016.dwg				
Approved By: MYW		Date: April 2016				
 Consulting Engineers and Scientists 21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043 PH. (425) 771-3304 FAX. (425) 771-3549				Former PNEC Bulk Petroleum Facility Shepard Way NW & Bromley Place NW Bainbridge Island, Kitsap County, Washington		

TABLES

Table 1 – Summary of Depth to Groundwater Measurements

Table 2 – Summary of Groundwater Analytical Results

TABLE 1**SUMMARY OF DEPTH TO GROUNDWATER MEASUREMENTS****PNEC Former Bulk Petroleum Facility****Shepard Way NW and Bromley Place NW****Bainbridge Island, Kitsap County, Washington**

Well Number	Sampling Date	TOC Elevation (Feet)	Depth to Water (Feet)	Relative Groundwater Elevation (Feet)
MW-1 screened 4.8-14.8 feet	4/20/2016	96.62	5.32	91.30
	2/11/2016	96.62	4.33	92.29
	7/1/2015	96.62	8.53	88.09
	4/9/2015	96.62	4.88	91.74
	8/21/2014	96.62	9.09	87.53
	8/19/2014	96.62	9.00	87.62
	6/18/2007	96.62	7.08	89.54
	3/26/2007	96.62	4.49	92.13
	12/20/2006	96.62	3.85	92.77
	9/13/2006	96.62	9.40	87.22
MW-2A screened 4.8-14.8 feet	4/20/2016	95.37	5.42	89.95
	2/11/2016	95.37	4.46	90.91
	7/1/2015	95.37	7.61	87.76
	4/9/2015	95.37	4.97	90.40
	2/11/2015	95.37	3.83	91.54
	8/21/2014	95.37	8.31	87.06
	8/19/2014	95.37	8.24	87.13
	6/18/2007	95.37	6.78	88.59
	3/26/2007	95.37	4.79	90.58
	12/20/2006	95.37	4.46	90.91
	9/13/2006	95.37	8.88	86.49

TABLE 1**SUMMARY OF DEPTH TO GROUNDWATER MEASUREMENTS****PNEC Former Bulk Petroleum Facility****Shepard Way NW and Bromley Place NW****Bainbridge Island, Kitsap County, Washington**

Well Number	Sampling Date	TOC Elevation (Feet)	Depth to Water (Feet)	Relative Groundwater Elevation (Feet)
MW-3 screened 5-15 feet	4/20/2016	94.66	4.32	90.34
	2/11/2016	94.66	2.96	91.70
	7/1/2015	94.66	6.93	87.73
	4/9/2015	94.66	3.85	90.81
	8/21/2014	94.66	7.30	87.36
	8/19/2014	94.66	7.19	87.47
	6/18/2007	94.66	5.77	88.89
	3/26/2007	94.66	3.41	91.25
	12/20/2006	94.66	3.95	90.71
	9/13/2006	94.66	7.40	87.26
MW-4 screened 4.9-14.9 feet	4/20/2016	94.15	4.45	89.70
	2/11/2016	94.15	3.67	90.48
	7/1/2015	94.15	8.33	85.82
	4/9/2015	94.15	4.20	89.95
	8/21/2014	94.15	8.94	85.21
	8/19/2014	94.15	8.76	85.39
	6/18/2007	94.15	6.90	87.25
	3/26/2007	94.15	3.91	90.24
	12/20/2006	94.15	3.34	90.81
	9/13/2006	94.15	9.65	84.50

TABLE 1**SUMMARY OF DEPTH TO GROUNDWATER MEASUREMENTS****PNEC Former Bulk Petroleum Facility****Shepard Way NW and Bromley Place NW****Bainbridge Island, Kitsap County, Washington**

Well Number	Sampling Date	TOC Elevation (Feet)	Depth to Water (Feet)	Relative Groundwater Elevation (Feet)
MW-5 screened 5.2-15.2 feet	4/20/2016	94.64	4.85	89.79
	2/11/2016	94.64	4.09	90.55
	7/1/2015	94.64	8.01	86.63
	4/9/2015	94.64	4.61	90.03
	2/11/2015	94.64	3.82	90.82
	8/21/2014	94.64	10.71	83.93
	8/19/2014	94.64	10.48	84.16
	6/18/2007	94.64	6.10	88.54
	3/26/2007	94.64	4.28	90.36
	12/20/2006	94.64	3.97	90.67
	9/13/2006	94.64	11.60	83.04
RW-1 screened 4.7-14.7 feet	4/20/2016	95.64	5.65	89.99
	2/11/2016	95.64	4.70	90.94
	7/1/2015	95.64	7.79	87.85
	4/9/2015	95.64	5.21	90.43
	2/11/2015	95.64	4.06	91.58
	8/21/2014	95.64	8.45	87.19
	8/19/2014	95.64	8.40	87.24
	6/18/2007	95.64	7.02	88.62
	3/26/2007	95.64	5.03	90.61
	12/20/2006	95.64	4.70	90.94
	9/13/2006	95.64	8.80	86.84

TOC: top of casing

All the monitoring wells are 2-inch diameter; remediation well RW-1 is 4-inch diameter

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

PNEC Former Bulk Petroleum Facility
 Shepard Way NW and Bromley Place NW
 Bainbridge Island, Kitsap County, Washington

all concentrations are in µg/l (micrograms per liter)

Sample Name	Sample Date	TPH			Total EPH	Total PAHs	BTEX				MTBE
		Gasoline-Range	Diesel-Range	Oil-Range			Benzene	Toluene	Ethylbenzene	Xylenes	
MW-1	4/20/2016	ND (<130)	ND (<310)	ND (<310)	--	--	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<4.0)	--
	8/21/2014	ND (<100)	ND (<100)	ND (<250)	--	--	ND (<0.50)	ND (<5.0)	ND (<0.50)	ND (<1.5)	--
	6/18/2007	ND (<50)	ND (<76)	ND (<95)	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
	3/26/2007	ND (<240)	ND (<75)	ND (<94)	--	--	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)
	12/20/2006	ND (<48)	ND (<76)	ND (<95)	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
	9/13/2006	ND (<48)	160	150	--	--	ND (<0.5)	ND (<0.7)	ND (<0.7)	ND (<0.8)	ND (<0.5)
MW-2A	4/20/2016	ND (<130)	ND (<310)	470	ND (<50)	0.46***	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<4.0)	--
	2/11/2016	--	210	ND (<250)	ND (<50)	ND (<0.50)	--	--	--	--	--
	7/1/2015	--	510	ND (<250)	--	--	--	--	--	--	--
	4/9/2015	--	ND (<400)	ND (<400)	--	--	--	--	--	--	--
	2/11/2015	--	330	ND <250	--	--	--	--	--	--	--
	8/21/2014	ND (<100)	920	360	--	--	ND (<0.50)	ND (<5.0)	ND (<0.50)	ND (<1.5)	--
	6/18/2007	ND (<50)	330	ND (<95)	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
	3/26/2007	ND (<48)	300	120	--	--	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)
	12/20/2006	ND (<48)	280	ND (<95)	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
	9/13/2006	300	2,700	530	--	--	ND (<0.5)	ND (<0.7)	2	ND (<0.8)	ND (<0.5)
MW-3	4/20/2016	ND (<130)	ND (<310)	ND (<310)	--	--	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<4.0)	--
	8/21/2014	ND (<100)	ND (<100)	ND (<250)	--	--	ND (<0.50)	ND (<5.0)	ND (<0.50)	ND (<1.5)	--
	6/18/2007	ND (<50)	ND (<76)	ND (<95)	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
	3/26/2007	ND (<48)	ND (<75)	ND (<94)	--	--	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)
	12/20/2006	ND (<48)	88	ND (<95)	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
	9/13/2006	ND (<48)	88	97	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

PNEC Former Bulk Petroleum Facility
 Shepard Way NW and Bromley Place NW
 Bainbridge Island, Kitsap County, Washington

all concentrations are in µg/l (micrograms per liter)

Sample Name	Sample Date	TPH			Total EPH	Total PAHs	BTEX				MTBE
		Gasoline-Range	Diesel-Range	Oil-Range			Benzene	Toluene	Ethylbenzene	Xylenes	
MW-4	4/20/2016	ND (<130)	ND (<310)	320	--	--	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<4.0)	--
	8/21/2014	ND (<100)	410	270	--	--	ND (<0.50)	ND (<5.0)	ND (<0.50)	ND (<1.5)	--
	6/18/2007	ND (<50)	430	ND (<95)	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
	3/26/2007	ND (<48)	150	ND (<95)	--	--	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)
	12/20/2006	ND (<48)	230	110	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
	9/13/2006	ND (<48)	390	200	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
MW-5	4/20/2016	ND (<130)	ND (<310)	1,300	84*	0.34****	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<4.0)	--
	2/11/2016	--	810	ND (<250)	81*	1.3**	--	--	--	--	--
	7/1/2015	--	620	ND (<250)	--	--	--	--	--	--	--
	4/9/2015	--	940	ND (<400)	--	--	--	--	--	--	--
	2/11/2015	--	1200	560	--	--	--	--	--	--	--
	8/21/2014	ND (<100)	800	ND (<500)	--	--	ND (<0.50)	ND (<5.0)	ND (<0.50)	ND (<1.5)	--
	6/18/2007	130	1,100	120	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
	3/26/2007	250	1,300	300	--	--	ND (<0.5)	0.7	ND (<0.5)	ND (<0.5)	ND (<0.5)
	12/20/2006	200	2,000	390	--	--	ND (<0.5)	8	ND (<0.8)	ND (<0.8)	ND (<0.5)
	9/13/2006	61	840	230	--	--	ND (<0.5)	12	ND (<0.8)	ND (<0.8)	ND (<0.5)

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

PNEC Former Bulk Petroleum Facility
 Shepard Way NW and Bromley Place NW
 Bainbridge Island, Kitsap County, Washington

all concentrations are in µg/l (micrograms per liter)

Sample Name	Sample Date	TPH			Total EPH	Total PAHs	BTEX				MTBE
		Gasoline-Range	Diesel-Range	Oil-Range			Benzene	Toluene	Ethylbenzene	Xylenes	
RW-1	4/20/2016	ND (<130)	ND (<310)	ND (<310)	--	--	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<4.0)	--
	2/11/2016	--	290	ND (<250)	ND (<50)	ND (<0.50)	--	--	--	--	--
	7/1/2015	--	870	ND (<250)	--	--	--	--	--	--	--
	4/9/2015	--	540	ND (<400)	--	--	--	--	--	--	--
	2/11/2015	--	410	ND (<250)	--	--	--	--	--	--	--
	8/21/2014	ND (<100)	210	ND (<250)	--	--	ND (<0.50)	ND (<5.0)	ND (<0.50)	ND (<1.5)	--
	6/18/2007	ND (<50)	280	ND (<96)	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
	3/26/2007	ND (<48)	210	ND (<95)	--	--	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)
	12/20/2006	ND (<48)	180	ND (<96)	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
	9/13/2006	ND (<48)	ND (<77)	ND (<96)	--	--	ND (<0.5)	ND (<0.7)	ND (<0.8)	ND (<0.8)	ND (<0.5)
MTCA Method A Cleanup Level		1,000 ¹	500	500	NA	NA	5	1,000	700	1,000	20

- Note:
- Concentrations detected are in **BOLD** type.
 - Shaded and **BOLD** concentrations are above MTCA cleanup levels.
- TPH - Total petroleum hydrocarbons
- EPH - Extractable petroleum hydrocarbons
- PAH - Polycyclic aromatic hydrocarbons
- MTBE - Methyl tert butyl ether
- MTCA - Model Toxics Control Act
- 1 - No detectable benzene in groundwater
- - Not tested
- ND - Not detected above laboratory reporting limit
- * - >C12-C16 aromatics carbon range only
- ** - Fluorene only
- *** - 0.21 µg/L pyrene and 0.25 µg/L benzo(g,h,i)perylene
- **** - 0.27 µg/L naphthalene, 0.045 µg/L pyrene, and 0.025 µg/L benzo(g,h,i)perylene

Appendix A

Analytical Report and Chain-of-Custody Documentation



May 2, 2016

Mr. Mike Noll
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Noll,

On April 20th, 6 samples were received by our laboratory and assigned our laboratory project number EV16040124. The project was identified as your 81167198. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	5/2/2016
		ALS JOB#:	EV16040124
		ALS SAMPLE#:	EV16040124-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	04/20/2016
CLIENT PROJECT:	81167198	COLLECTION DATE:	4/20/2016 8:47:00 AM
CLIENT SAMPLE ID	MW-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	130	1	UG/L	04/21/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	310	1	UG/L	04/21/2016	EBS
HCID-Oil Range	NWTPH-HCID	U	310	1	UG/L	04/21/2016	EBS
Benzene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	04/21/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	74.5	04/21/2016	EBS
C25	NWTPH-HCID	87.0	04/21/2016	EBS
C25 (conc)	NWTPH-HCID	76.8	04/21/2016	EBS
Toluene-d8	EPA-8260	110	04/21/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	5/2/2016
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV16040124
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV16040124-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	04/20/2016
CLIENT PROJECT:	81167198	COLLECTION DATE:	4/20/2016 12:11:00 PM
CLIENT SAMPLE ID	MW-2A	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	130	1	UG/L	04/21/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	310	1	UG/L	04/21/2016	EBS
HCID-Oil Range	NWTPH-HCID	>310	310	1	UG/L	04/21/2016	EBS
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	04/26/2016	EBS
TPH-Oil Range	NWTPH-DX	470	250	1	UG/L	04/26/2016	EBS
>C8-C10 Aliphatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C10-C12 Aliphatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C12-C16 Aliphatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C16-C21 Aliphatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C21-C34 Aliphatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C8-C10 Aromatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C10-C12 Aromatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C12-C16 Aromatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C16-C21 Aromatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C21-C34 Aromatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
Benzene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	04/21/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Naphthalene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
2-Methylnaphthalene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
1-Methylnaphthalene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Acenaphthylene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Acenaphthene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Fluorene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Phenanthrene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Anthracene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Fluoranthene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Pyrene	EPA-8270 SIM	0.21	0.020	1	UG/L	04/26/2016	GAP
Benzo[A]Anthracene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Chrysene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Benzo[G,H,I]Perylene	EPA-8270 SIM	0.25	0.020	1	UG/L	04/26/2016	GAP

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	5/2/2016
		ALS JOB#:	EV16040124
CLIENT CONTACT:	Mike Noll	ALS SAMPLE#:	EV16040124-02
CLIENT PROJECT:	81167198	DATE RECEIVED:	04/20/2016
CLIENT SAMPLE ID	MW-2A	COLLECTION DATE:	4/20/2016 12:11:00 PM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS	ANALYSIS
			DATE	BY
BCB	NWTPH-HCID	76.0	04/21/2016	EBS
C25	NWTPH-HCID	91.1	04/21/2016	EBS
C25 (conc)	NWTPH-HCID	78.1	04/21/2016	EBS
C25	NWTPH-DX	94.6	04/26/2016	EBS
C25	NWEPH	113	04/27/2016	EBS
p-Terphenyl	NWEPH	102	04/27/2016	EBS
Toluene-d8	EPA-8260	112	04/21/2016	DLC
Terphenyl-d14	EPA-8270 SIM	113	04/26/2016	GAP

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains light oil.

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	5/2/2016
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV16040124
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV16040124-03
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	04/20/2016
CLIENT PROJECT:	81167198	COLLECTION DATE:	4/20/2016 9:28:00 AM
CLIENT SAMPLE ID	MW-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	130	1	UG/L	04/21/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	310	1	UG/L	04/21/2016	EBS
HCID-Oil Range	NWTPH-HCID	U	310	1	UG/L	04/21/2016	EBS
Benzene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	04/21/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	65.0	04/21/2016	EBS
C25	NWTPH-HCID	83.4	04/21/2016	EBS
C25 (conc)	NWTPH-HCID	74.6	04/21/2016	EBS
Toluene-d8	EPA-8260	111	04/21/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	5/2/2016
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV16040124
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV16040124-04
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	04/20/2016
CLIENT PROJECT:	81167198	COLLECTION DATE:	4/20/2016 10:09:00 AM
CLIENT SAMPLE ID	MW-4	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	130	1	UG/L	04/21/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	310	1	UG/L	04/21/2016	EBS
HCID-Oil Range	NWTPH-HCID	>310	310	1	UG/L	04/21/2016	EBS
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	04/26/2016	EBS
TPH-Oil Range	NWTPH-DX	320	250	1	UG/L	04/26/2016	EBS
Benzene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	04/21/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	75.1	04/21/2016	EBS
C25	NWTPH-HCID	99.0	04/21/2016	EBS
C25 (conc)	NWTPH-HCID	76.8	04/21/2016	EBS
C25	NWTPH-DX	89.6	04/26/2016	EBS
Toluene-d8	EPA-8260	110	04/21/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains light oil.



CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	5/2/2016
		ALS JOB#:	EV16040124
		ALS SAMPLE#:	EV16040124-05
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	04/20/2016
CLIENT PROJECT:	81167198	COLLECTION DATE:	4/20/2016 10:58:00 AM
CLIENT SAMPLE ID	MW-5	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	130	1	UG/L	04/21/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	310	1	UG/L	04/21/2016	EBS
HCID-Oil Range	NWTPH-HCID	>310	310	1	UG/L	04/21/2016	EBS
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	04/26/2016	EBS
TPH-Oil Range	NWTPH-DX	1300	250	1	UG/L	04/26/2016	EBS
>C8-C10 Aliphatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C10-C12 Aliphatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C12-C16 Aliphatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C16-C21 Aliphatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C21-C34 Aliphatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C8-C10 Aromatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C10-C12 Aromatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C12-C16 Aromatics	NWEPH	84	50	1	UG/L	04/27/2016	EBS
>C16-C21 Aromatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
>C21-C34 Aromatics	NWEPH	U	50	1	UG/L	04/27/2016	EBS
Benzene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	04/21/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Naphthalene	EPA-8270 SIM	0.27	0.020	1	UG/L	04/26/2016	GAP
2-Methylnaphthalene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
1-Methylnaphthalene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Acenaphthylene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Acenaphthene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Fluorene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Phenanthrene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Anthracene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Fluoranthene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Pyrene	EPA-8270 SIM	0.045	0.020	1	UG/L	04/26/2016	GAP
Benzo[A]Anthracene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Chrysene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	0.020	1	UG/L	04/26/2016	GAP
Benzo[G,H,I]Perylene	EPA-8270 SIM	0.025	0.020	1	UG/L	04/26/2016	GAP

CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	5/2/2016
		ALS JOB#:	EV16040124
CLIENT CONTACT:	Mike Noll	ALS SAMPLE#:	EV16040124-05
CLIENT PROJECT:	81167198	DATE RECEIVED:	04/20/2016
CLIENT SAMPLE ID	MW-5	COLLECTION DATE:	4/20/2016 10:58:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS	ANALYSIS
			DATE	BY
BCB	NWTPH-HCID	73.3	04/21/2016	EBS
C25	NWTPH-HCID	90.5	04/21/2016	EBS
C25 (conc)	NWTPH-HCID	78.7	04/21/2016	EBS
C25	NWTPH-DX	108	04/26/2016	EBS
C25	NWEPH	111	04/27/2016	EBS
p-Terphenyl	NWEPH	106	04/27/2016	EBS
Toluene-d8	EPA-8260	109	04/21/2016	DLC
Terphenyl-d14	EPA-8270 SIM	118	04/26/2016	GAP

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains light oil.



CERTIFICATE OF ANALYSIS

CLIENT:	Terracon	DATE:	5/2/2016
	21905 - 64th Ave W, Suite 100	ALS JOB#:	EV16040124
	Mountlake Terrace, WA 98043	ALS SAMPLE#:	EV16040124-06
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	04/20/2016
CLIENT PROJECT:	81167198	COLLECTION DATE:	4/20/2016 1:20:00 PM
CLIENT SAMPLE ID	RW-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	130	1	UG/L	04/21/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	310	1	UG/L	04/21/2016	EBS
HCID-Oil Range	NWTPH-HCID	U	310	1	UG/L	04/21/2016	EBS
Benzene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	04/21/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	04/21/2016	DLC

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	87.2	04/21/2016	EBS
C25	NWTPH-HCID	101	04/21/2016	EBS
C25 (conc)	NWTPH-HCID	78.4	04/21/2016	EBS
Toluene-d8	EPA-8260	110	04/21/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043
CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81167198

DATE: 5/2/2016
ALS SDG#: EV16040124
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-042116W - Batch 103552 - Water by NWTPH-HCID

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	UG/L	130	04/21/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	UG/L	310	04/21/2016	EBS
HCID-Oil Range	NWTPH-HCID	U	UG/L	310	04/21/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-041816W - Batch 103385 - Water by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	UG/L	130	04/18/2016	EBS
TPH-Oil Range	NWTPH-DX	U	UG/L	250	04/18/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-4272016 - Batch R273599 - Water by NWEPH

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
>C8-C10 Aliphatics	NWEPH	U	UG/L	50	04/27/2016	EBS
>C10-C12 Aliphatics	NWEPH	U	UG/L	50	04/27/2016	EBS
>C12-C16 Aliphatics	NWEPH	U	UG/L	50	04/27/2016	EBS
>C16-C21 Aliphatics	NWEPH	U	UG/L	50	04/27/2016	EBS
>C21-C34 Aliphatics	NWEPH	U	UG/L	50	04/27/2016	EBS
>C8-C10 Aromatics	NWEPH	U	UG/L	50	04/27/2016	EBS
>C10-C12 Aromatics	NWEPH	U	UG/L	50	04/27/2016	EBS
>C12-C16 Aromatics	NWEPH	U	UG/L	50	04/27/2016	EBS
>C16-C21 Aromatics	NWEPH	U	UG/L	50	04/27/2016	EBS
>C21-C34 Aromatics	NWEPH	U	UG/L	50	04/27/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-041916W - Batch 103439 - Water by EPA-8260

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
1,1-Dichloroethene	EPA-8260	U	UG/L	2.0	04/19/2016	DLC
Benzene	EPA-8260	U	UG/L	2.0	04/19/2016	DLC
Toluene	EPA-8260	U	UG/L	2.0	04/19/2016	DLC
Ethylbenzene	EPA-8260	U	UG/L	2.0	04/19/2016	DLC
m,p-Xylene	EPA-8260	U	UG/L	4.0	04/19/2016	DLC
o-Xylene	EPA-8260	U	UG/L	2.0	04/19/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

DATE: 5/2/2016
ALS SDG#: EV16040124
WDOE ACCREDITATION: C601

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81167198

LABORATORY BLANK RESULTS

MB-042616W - Batch 103709 - Water by EPA-8270 SIM

ANALYTE	METHOD	RESULTS	UNITS	REPORTING	ANALYSIS	ANALYSIS
				LIMITS	DATE	BY
Naphthalene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
2-Methylnaphthalene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
1-Methylnaphthalene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Acenaphthylene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Acenaphthene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Fluorene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Phenanthrene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Anthracene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Fluoranthene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Pyrene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Benzo[A]Anthracene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Chrysene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP
Benzo[G,H,I]Perylene	EPA-8270 SIM	U	UG/L	0.020	04/26/2016	GAP

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	5/2/2016
		ALS SDG#:	EV16040124
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81167198		

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 103385 - Water by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS		ANALYSIS DATE	ANALYSIS BY
					MIN	MAX		
TPH-Diesel Range - BS	NWTPH-DX	87.1			67	125.2	04/18/2016	EBS
TPH-Diesel Range - BSD	NWTPH-DX	86.3	1		67	125.2	04/19/2016	EBS

ALS Test Batch ID: R273599 - Water by NWEPH

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS		ANALYSIS DATE	ANALYSIS BY
					MIN	MAX		
>C8-C10 Aliphatics - BS	NWEPH	74.0			70	130	04/27/2016	EBS
>C8-C10 Aliphatics - BSD	NWEPH	83.0	11		70	130	04/27/2016	EBS
>C10-C12 Aliphatics - BS	NWEPH	81.0			70	130	04/27/2016	EBS
>C10-C12 Aliphatics - BSD	NWEPH	89.0	9		70	130	04/27/2016	EBS
>C12-C16 Aliphatics - BS	NWEPH	87.0			70	130	04/27/2016	EBS
>C12-C16 Aliphatics - BSD	NWEPH	93.0	7		70	130	04/27/2016	EBS
>C16-C21 Aliphatics - BS	NWEPH	91.0			70	130	04/27/2016	EBS
>C16-C21 Aliphatics - BSD	NWEPH	94.0	3		70	130	04/27/2016	EBS
>C21-C34 Aliphatics - BS	NWEPH	96.0			70	130	04/27/2016	EBS
>C21-C34 Aliphatics - BSD	NWEPH	99.0	3		70	130	04/27/2016	EBS
>C8-C10 Aromatics - BS	NWEPH	73.0			70	130	04/27/2016	EBS
>C8-C10 Aromatics - BSD	NWEPH	78.0	7		70	130	04/27/2016	EBS
>C10-C12 Aromatics - BS	NWEPH	90.0			70	130	04/27/2016	EBS
>C10-C12 Aromatics - BSD	NWEPH	92.0	2		70	130	04/27/2016	EBS
>C12-C16 Aromatics - BS	NWEPH	98.0			70	130	04/27/2016	EBS
>C12-C16 Aromatics - BSD	NWEPH	99.0	1		70	130	04/27/2016	EBS
>C16-C21 Aromatics - BS	NWEPH	101			70	130	04/27/2016	EBS
>C16-C21 Aromatics - BSD	NWEPH	102	1		70	130	04/27/2016	EBS
>C21-C34 Aromatics - BS	NWEPH	91.0			70	130	04/27/2016	EBS
>C21-C34 Aromatics - BSD	NWEPH	92.0	1		70	130	04/27/2016	EBS

ALS Test Batch ID: 103439 - Water by EPA-8260

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS		ANALYSIS DATE	ANALYSIS BY
					MIN	MAX		
1,1-Dichloroethene - BS	EPA-8260	104			72.5	136	04/19/2016	DLC
1,1-Dichloroethene - BSD	EPA-8260	101	3		72.5	136	04/19/2016	DLC
Benzene - BS	EPA-8260	123			74.7	143	04/19/2016	DLC
Benzene - BSD	EPA-8260	118	4		74.7	143	04/19/2016	DLC
Toluene - BS	EPA-8260	109			71.7	139	04/19/2016	DLC
Toluene - BSD	EPA-8260	104	5		71.7	139	04/19/2016	DLC

CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

DATE: 5/2/2016
ALS SDG#: EV16040124
WDOE ACCREDITATION: C601

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81167198

LABORATORY CONTROL SAMPLE RESULTS
ALS Test Batch ID: 103709 - Water by EPA-8270 SIM

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS		ANALYSIS DATE	ANALYSIS BY
					MIN	MAX		
Naphthalene - BS	EPA-8270 SIM	52.9			36	118	04/26/2016	GAP
Naphthalene - BSD	EPA-8270 SIM	43.9	19		36	118	04/26/2016	GAP
Acenaphthene - BS	EPA-8270 SIM	68.8			37	125	04/26/2016	GAP
Acenaphthene - BSD	EPA-8270 SIM	59.6	14		37	125	04/26/2016	GAP
Pyrene - BS	EPA-8270 SIM	120			59	156	04/26/2016	GAP
Pyrene - BSD	EPA-8270 SIM	100	18		59	156	04/26/2016	GAP
Benzo[G,H,I]Perylene - BS	EPA-8270 SIM	95.0			43	140	04/26/2016	GAP
Benzo[G,H,I]Perylene - BSD	EPA-8270 SIM	83.6	13		43	140	04/26/2016	GAP

APPROVED BY



Laboratory Director



ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only)

EV16040124

Date 4/20/16 Page 1 Of 1

PROJECT ID: 81167198					ANALYSIS REQUESTED															OTHER (Specify)												
REPORT TO COMPANY: Terracon																																
PROJECT MANAGER: Mike Noll																																
ADDRESS: 21905 64th Ave W Ste 100																																
Moonlake Terrace, WA 98045																																
PHONE: 425-771-3304 FAX:																																
P.O. #: E-MAIL: mindie@terracon																																
INVOICE TO COMPANY:																																
ATTENTION: Same																																
ADDRESS:																																
SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX (400)	NWTPH-GX	BTEX by EPA 8021	BTEX by EPA 8260	MTBE by EPA 8021	MTBE by EPA 8260	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA 8270 SIM	PCB by EPA 8082	Pesticides by EPA 8081	Metals-MTCA-5	RCRA-8	Pri Pol	TAL	Metals Other (Specify)	TCLP-Metals	VOA	Semi-Vol	Pest	Herbs	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?	
1. MW-1	4/20/16	8:47	GW	1	X			X																						4		
2. MW-2A		12:11		2	X	X		X									X													7		
3. MW-3		9:28		3	X			X																						4		
4. MW-4		10:09		4	X	X		X																						4		
5. MW-5		10:58		5	X	X		X									X													7		
6. RW-1		13:20		6	X			X																						7		
7.																																
8.																																
9.																																
10.																																

SPECIAL INSTRUCTIONS Run NWTPH-DX if HClD detections of diesel or oil. Hold PAHs & EPH for instruction

SIGNATURES (Name/Company/Date, Time):

1. Relinquished By: Shawn Robinson Terracon 4/20/16 4:30

Received By: Shawn Robinson ALW 4/20/16 4:30

2. Relinquished By: _____

Received By: _____

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis

10 5 3 2 1 SAME DAY

Fuels & Hydrocarbon Analysis

5 1 SAME DAY

OTHER: 3-Day JAT on ACID samples

*Turnaround request less than standard may incur Rush Charges

Appendix B

MTCA Method B Groundwater TPH Cleanup Level Calculation Worksheets

B. Worksheet for Calculating Potable Ground Water Cleanup Levels (Method B only) WAC 173-340-720

1. Enter Site Information

Date: 4/20/2016
 Site Name: Former Tosco BI Bulk Plant 1784
 Sample info: MW-2A

2. Enter Ground Water Concentration Measured

Notes for Data Entry

Chemical of Concern or EC Group	Measured GW Conc	GW Cleanup Level	Current Condition			Adjusted Condition			
			HQ	RISK	Pass or Fail?	GW Conc being tested	HQ	RISK	Pass or Fail?
	ug/L	ug/L	unitless	unitless		ug/L	unitless	unitless	
Petroleum EC Fraction									
AL_EC >5-6	0								
AL_EC >6-8	0								
AL_EC >8-10	25		1.04E-01			2.50E+01	1.04E-01		
AL_EC >10-12	25		1.04E-01			2.50E+01	1.04E-01		
AL_EC >12-16	25		5.21E-02			2.50E+01	5.21E-02		
AL_EC >16-21	25		7.81E-04			2.50E+01	7.81E-04		
AL_EC >21-34	25		7.81E-04			2.50E+01	7.81E-04		
AR_EC >8-10	25		3.13E-02			2.50E+01	3.12E-02		
AR_EC >10-12	25		1.56E-01			2.50E+01	1.56E-01		
AR_EC >12-16	25		3.13E-02			2.50E+01	3.12E-02		
AR_EC >16-21	25		5.21E-02			2.50E+01	5.21E-02		
AR_EC >21-34	25		3.91E-02			2.50E+01	3.90E-02		
Benzene	0	5							
Toluene	0	1000							
Ethylbenzene	0	700							
Total Xylenes	0	1000							
Naphthalene	0.01	160	6.25E-05			1.00E-02	6.25E-05		
1-Methyl Naphthalene	0.01		2.50E-05			1.00E-02	2.50E-05		
2-Methyl Naphthalene	0.01		3.13E-04			1.00E-02	3.12E-04		
n-Hexane	0								
MTBE	0	20							
Ethylene Dibromide (EDB)	0	0.01							
1,2 Dichloroethane (EDC)	0	5							
Benzo(a)anthracene	0.01	for		8.34E-08	for	1.00E-02		8.34E-08	for
Benzo(b)fluoranthene	0.01	all		8.34E-08	all	1.00E-02		8.34E-08	all
Benzo(k)fluoranthene	0.01	cPAHs		8.34E-08	cPAHs	1.00E-02		8.34E-08	cPAHs
Benzo(a)pyrene	0.01	Risk =		8.34E-07		1.00E-02		8.34E-07	
Chrysene	0.01	1E-05		8.34E-09		1.00E-02		8.34E-09	
Dibenz(a,h)anthracene	0.01			8.34E-08	S Risk=	1.00E-02		8.34E-08	S Risk=
Indeno(1,2,3-cd)pyrene	0.01			8.34E-08	1.26E-06	1.00E-02		8.34E-08	1.26E-06
Sum	250.1		5.72E-01	1.26E-06		2.50E+02	5.72E-01	1.26E-06	

TEST CURRENT CONDITION

Measured TPH GW Conc, ug/L = 250.1
 HI = 5.723E-01
 RISK = 1.260E-06
 Pass or Fail? Pass

CALCULATE PROTECTIVE CONDITION

This tool allows the user to calculate a protective TPH ground water concentration based on various ground water quality criteria. The Workbook uses the same composition ratio as for the measured data.

**Calculate Protective
TPH GW Conc**

Selected Criterion: HI = 1

Most Stringent? YES

Protective TPH GW Conc, ug/L = 437.03

HI = 1.00E+00

RISK = 2.20E-06

SUMMARY OF PROTECTIVE GW CONCENTRATIONS

Protective GW TPH Conc, ug/L		437.03		
Most Stringent Criterion		HI = 1		
Ground Water Criteria	Most Stringent?	GW TPH, ug/L	RISK @	HI @
HI = 1	YES	4.37E+02	2.20E-06	1.00E+00
Total Risk = 1E-5	NO	1.99E+03	1.00E-05	4.54E+00
Total Risk = 1E-6	YES	1.99E+02	1.00E-06	4.54E-01
Benzene MCL = 5 ug/L	NA	NA	NA	NA
MTBE = 20 ug/L	NA	NA	NA	NA
Risk of cPAHs = 1E-5	NO	1.99E+03	1.00E-05	4.54E+00
Toluene = 1000 ug/L	NA	NA	NA	NA
Ethylbenzene = 700 ug/L	NA	NA	NA	NA
Total Xylenes = 1000 ug/L	NA	NA	NA	NA

TEST ADJUSTED CONDITION

This tool allows the user to test whether a particular TPH soil concentration is protective of human health. The Workbook uses the same composition ratio as for the measured data.

**Test Adjusted TPH
GW Conc**

Tested TPH GW Conc, ug/L= 250

HI= 5.72E-01

RISK= 1.26E-06

Pass or Fail? Pass

B. Worksheet for Calculating Potable Ground Water Cleanup Levels (Method B only) WAC 173-340-720

1. Enter Site Information

Date: 4/20/2016
 Site Name: Former Tosco BI Bulk Plant 1784
 Sample info: MW-5

2. Enter Ground Water Concentration Measured

Notes for Data Entry

Chemical of Concern or EC Group	Measured GW Conc	GW Cleanup Level	Current Condition			Adjusted Condition			
			HQ	RISK	Pass or Fail?	GW Conc being tested	HQ	RISK	Pass or Fail?
	ug/L	ug/L	unitless	unitless		ug/L	unitless	unitless	
Petroleum EC Fraction									
AL_EC >5-6	0								
AL_EC >6-8	0								
AL_EC >8-10	25		1.04E-01			2.50E+01	1.04E-01		
AL_EC >10-12	25		1.04E-01			2.50E+01	1.04E-01		
AL_EC >12-16	25		5.21E-02			2.50E+01	5.21E-02		
AL_EC >16-21	25		7.81E-04			2.50E+01	7.81E-04		
AL_EC >21-34	25		7.81E-04			2.50E+01	7.81E-04		
AR_EC >8-10	25		3.13E-02			2.50E+01	3.13E-02		
AR_EC >10-12	25		1.56E-01			2.50E+01	1.56E-01		
AR_EC >12-16	84		1.05E-01			8.40E+01	1.05E-01		
AR_EC >16-21	25		5.21E-02			2.50E+01	5.21E-02		
AR_EC >21-34	25		3.91E-02			2.50E+01	3.91E-02		
Benzene	0	5							
Toluene	0	1000							
Ethylbenzene	0	700							
Total Xylenes	0	1000							
Naphthalene	0.27	160	1.69E-03			2.70E-01	1.69E-03		
1-Methyl Naphthalene	0.01		2.50E-05			1.00E-02	2.50E-05		
2-Methyl Naphthalene	0.01		3.13E-04			1.00E-02	3.13E-04		
n-Hexane	0								
MTBE	0	20							
Ethylene Dibromide (EDB)	0	0.01							
1,2 Dichloroethane (EDC)	0	5							
Benzo(a)anthracene	0.01	for		8.34E-08	for	1.00E-02		8.34E-08	for
Benzo(b)fluoranthene	0.01	all		8.34E-08	all	1.00E-02		8.34E-08	all
Benzo(k)fluoranthene	0.01	cPAHs		8.34E-08	cPAHs	1.00E-02		8.34E-08	cPAHs
Benzo(a)pyrene	0.01	Risk =		8.34E-07		1.00E-02		8.34E-07	
Chrysene	0.01	1E-05		8.34E-09		1.00E-02		8.34E-09	
Dibenz(a,h)anthracene	0.01			8.34E-08	S Risk=	1.00E-02		8.34E-08	S Risk=
Indeno(1,2,3-cd)pyrene	0.01			8.34E-08	1.26E-06	1.00E-02		8.34E-08	1.26E-06
Sum	309.36		6.48E-01	1.26E-06		3.09E+02	6.48E-01	1.26E-06	

TEST CURRENT CONDITION

Measured TPH GW Conc, ug/L = 309.36
 HI = 6.477E-01
 RISK = 1.260E-06
 Pass or Fail? Pass

CALCULATE PROTECTIVE CONDITION

This tool allows the user to calculate a protective TPH ground water concentration based on various ground water quality criteria. The Workbook uses the same composition ratio as for the measured data.

**Calculate Protective
TPH GW Conc**

Selected Criterion: HI = 1

Most Stringent? YES

Protective TPH GW Conc, ug/L = 477.67

HI = 1.00E+00

RISK = 1.95E-06

SUMMARY OF PROTECTIVE GW CONCENTRATIONS

Protective GW TPH Conc, ug/L		477.67		
Most Stringent Criterion		HI = 1		
Ground Water Criteria	Most Stringent?	GW TPH, ug/L	RISK @	HI @
HI = 1	YES	4.78E+02	1.95E-06	1.00E+00
Total Risk = 1E-5	NO	2.46E+03	1.00E-05	5.14E+00
Total Risk = 1E-6	YES	2.46E+02	1.00E-06	5.14E-01
Benzene MCL = 5 ug/L	NA	NA	NA	NA
MTBE = 20 ug/L	NA	NA	NA	NA
Risk of cPAHs = 1E-5	NO	2.46E+03	1.00E-05	5.14E+00
Toluene = 1000 ug/L	NA	NA	NA	NA
Ethylbenzene = 700 ug/L	NA	NA	NA	NA
Total Xylenes = 1000 ug/L	NA	NA	NA	NA

TEST ADJUSTED CONDITION

This tool allows the user to test whether a particular TPH soil concentration is protective of human health. The Workbook uses the same composition ratio as for the measured data.

**Test Adjusted TPH
GW Conc**

Tested TPH GW Conc, ug/L = 309.36

HI = 6.48E-01

RISK = 1.26E-06

Pass or Fail? Pass