# QUARTERLY GROUNDWATER SAMPLING

July 2017

## Former Round The Clock Deli

### 722 South Lincoln Street, Port Angeles, WA

**WA DOE Facility ID: 63427274**
**VCP Project No. SW0962**

*Prepared for:*

Washington State Department of Ecology

SW Regional Office – Toxics Cleanup Program
P.O. Box 47775
Olympia, WA 98504

*Prepared By:*

GeoPro Environmental Services LLC

Post Office Box 26
Battle Ground, WA 98604

July 21, 2017

## Contents



## TABLES



## FIGURES



## APPENDICES

# 1 PROJECT DESCRIPTION

## 1.1 Location

The Site is located at 722 South Lincoln Street, Port Angeles, Clallam County, Washington (Figure 1). The Site is currently unoccupied and was most recently occupied by Around The Clock Deli which operated as a food and gasoline fuel business. The Site is listed by the Washington Department of Ecology (DOE) as Facility 63427274, a Hazardous Waste Generator and a LUST facility. The Site is listed with the DOE Voluntary Cleanup Program as Project No. SW0962 to perform independent remedial activities related to known petroleum hydrocarbon contamination.

The Site is located at the southeast corner of South Lincoln Street (Highway 101) and Southeast 8th Street. South Lincoln Street is oriented northeast-southwest and Southeast 8th Street is oriented northwest-southeast. The Site is located in Section 1, Township 36N, and Range 6W. The Site is Clallam County tax assessor ID number 58030 encompassing about 16,900 square feet. The elevation of the Site is approximately 120 feet above MSL.

The Site is underlain by glacial outwash consisting of sand, pebbly sand, and interbedded silt as shown on the Geologic Map (Figure 2).

## 1.2 Purpose

GeoPro Environmental Services LLC (GeoPro) was requested by Blue Mountain Environmental Consultants (BMEC), Waitsburg, WA to collect and evaluate the July 2017 quarterly groundwater samples from monitor wells GES-1, GES-2, GES-3, GES-4, and GES-5. The wells were purged and sampled on July 11, 2017 by GeoPro.

The Site is adjacent to an area for which previous groundwater investigations by GeoPro and others have concluded that petroleum contaminated groundwater plumes are co-mingled from near the intersection of Southeast 8th Street and South Lincoln Street, and northeasterly along South Lincoln Street. Therefore, some of the onsite detected contamination in groundwater appears to be from offsite sources which have migrated onto the Site.

# 2 FIELD INVESTIGATION

## 2.1 Objectives

The objectives of this investigation include:

- Purge each monitor well and collect groundwater samples for analysis of gasoline, benzene, toluene, ethylbenze, xylenes (BTEX) and total lead.
- Prepare a summary report on findings.

## 2.2 Monitor Well Locations

Five monitor wells were installed by GeoPro in April 2015 based on anticipated future site uses within parking areas and away from border landscaping. GeoPro located the monitor wells approximately 23-feet from the existing sidewalk and the existing building on the adjacent property to the northeast. The groundwater monitor well locations are shown in Figure 3.

- Monitor wells GES-1 and GES-2 are located upgradient adjacent to Southeast 8th Street.
- Monitor well GES-3 is located side-gradient adjacent to South Lincoln Street.
- Monitor well GES-4 is located side and downgradient along South Lincoln Street, south of the existing building on the adjacent property.
- Monitor well GES-5 is located downgradient, and south of the existing building on the adjacent property.

During drilling, a continuous geologic log was prepared describing the subsurface materials encountered, depth to groundwater, presence of saturated zones, and any other pertinent geologic or environmental observations. Geologic Logs are presented in the first quarterly report dated April 17, 2015 by GeoPro.

## 2.3 Well Installation

Probe holes were drilled and well installations were completed by ESN Northwest, Olympia, Washington in accordance with Chapter 173-160 WAC. The screen and blank well casings are constructed of two-inch diameter Schedule 40, polyvinyl chloride (PVC) flush coupled, threaded pipe. The screens are slotted with machine cuts of 0.010-inch width. The filter packs consist of clean graded Colorado silica #10-20 sand. The well casing consists of a threaded end cap on a 15-foot section of screen, which is threaded fit into blank casing.

The filter pack was placed to approximately one-foot above the well screen. An aquifer seal of bentonite pellets was placed from above the filter pack to 0.5-feet depth. A surface seal of Portland Type II cement was placed from about 0.5-feet to the surface. A water tight well plug was installed over the casing and a vault traffic box was cemented around the well at the surface. Each well construction is depicted on the Geologic Logs in the first quarterly report dated April 17, 2015 by GeoPro.

## 2.4 Bioremediation Pipe Repair

In 2009, Kane Environmental installed four vertical pipes with slotted horizontal laterals for use as injection points for bioremediation compounds and/or bioventing wells[1]. The pipes were installed in the northern and southern ends of the gasoline dispenser excavation. Each pipe extended vertically to 14-15 feet bgs, connected with the lateral of slotted piping at this depth. A second slotted piping lateral was also installed on each vertical pipe at 7-8 feet bgs. GeoPro referenced the broken pipes in the last quarter report and stated that the PVC cap on injection pipe #3 was broken off and the vertical standing pipe is open to the subsurface. During sampling for this quarter, Geopro observed that pipe #2 and pipe #3 were damaged by apparent vandalism. GeoPro repaired pipe #2 and pipe #3 by cutting the pipes at the ground surface and gluing a cap to the top of each PVC pipe.

## 2.5 Well Survey and Gradient

Each well was surveyed accurate on August 19, 2016 by Wengler Surveying & Mapping, Port Angeles. The following Table 1 lists the well casing elevations and groundwater static water levels measured prior to sampling on July 11, 2017. The groundwater flow direction is north-northeast as shown in Figure 3. The general flow direction is northward toward the Strait of Juan de Fuca.

**Table 1 – Groundwater Elevations – July 2017**

| Monitor Well | Northing | Easting | Elevation Top of Traffic Vault Cover | Elevation Top of PVC Casing At Notch | SWL Elevation at Notch |
|---|---|---|---|---|---|
| GES-1 | 416572.66235 | 1004369.00383 | 115.73 | 115.31 | 98.88 |
| GES-2 | 416541.97701 | 1004414.84563 | 114.27 | 113.59 | 99.33 |
| GES-3 | 416551.58119 | 1004439.37257 | 113.43 | 113.20 | 98.45 |
| GES-4 | 416580.79931 | 1004456.65577 | 113.12 | 112.76 | 98.02 |
| GES-5 | 416612.19022 | 1004415.01876 | 113.92 | 113.38 | 98.54 |

[1] See Figure 2, "Injection Point Locations", report by Kane Environmental Inc. titled 'Remediation Product Injection & Groundwater Performance Monitoring' date January 20, 2012 for the Site.

## 2.6 Chemicals of Concern and Analytical Methods

Site Chemicals Of Potential Concern (COPCs) include gasoline-related constituents BTEX and lead. These chemicals were detected during previous investigations and remedial measures. The chemical analyses shown in Table 2 were completed on groundwater samples from monitor wells GES-1, GES-2, GES-3, GES-4, and GES-5 and compared to method detection limit goals and MTCA Method A unrestricted land use cleanup levels.

**Table 2 – Analytical Methods**

| | | | |
|---|---|---|---|
| **Groundwater** | Gasoline<br>Method NWTPH-Gx | BTEX<br>Method EPA 8021B | Total Lead<br>Method EPA 200.8 |

## 2.7 Sampling Procedures

### 2.7.1 Groundwater Sampling Procedures

Samples of groundwater were collected according to standard field methods and prepared in accordance with protocol established by the analytical laboratory for containers, preserving, storage and transport to the laboratory. A chain of custody was prepared for all samples (OnSite Environmental Inc. laboratory Number 07-095).

Groundwater sampling was conducted with a submersible pump and new tubing using low-flow purge sampling techniques. During sampling, new tubing attached to the pump was lowered down the well casing. The pump intake was positioned at the approximate middle of the well screen. The wells were purged until measured groundwater quality parameters were reasonably stable.

During purging, measured water quality parameters included temperature, pH, conductivity and turbidity. After stabilization was reached, a groundwater sample was collected. Groundwater samples were prepared according to protocol established by the analytical laboratory. The samples were placed in an iced cooler along with the chain of custody and shipped to OnSite Environmental Inc. laboratory, Redmond, Washington.

During sampling, the odors from upgradient monitor well GES-2 and side gradient monitor well GES-3 were exceptionally strong with a ‘fresh gasoline’ odor this sampling round. The petroleum source for the consistent odor in these monitor wells is apparently offsite. The appearance of the groundwater during sampling of GES-2 and GES-3 during this sampling round was cloudy.

# 3 DATA EVALUATION

## 3.1 Groundwater Analytical Results

The following Table 3 is a summary of the quarterly groundwater sample analyses. All groundwater samples contained constituents which exceed DOE MTCA Method A for Unlimited Land Use cleanup levels and are consistent with historical data of the Site. A duplicate sample from monitor well GES-4 was analyzed.

The laboratory analytical reports are included in Appendix A.

**Table 3 – Groundwater Analytical Results – July 2017**

| | | Units: µg/L | | | | |
|---|---|---|---|---|---|---|
| **Monitor Well** | **Gasoline** | **Benzene** | **Toluene** | **Ethylbenzene** | **Total Xylenes** | **Total Lead** |
| GES-1 | 3200 | 55 | 9.2 | 170 | 67.6 | 4.5 |
| GES-2[2] | 6400 | 590 | 120 | 260 | 404 | 4.9 |
| GES-3[3] | 160000 | 14000 | 19000 | 3200 | 15700 | 27 |
| GES-4 | 13000 | 340 | 190 | 1100 | 1192 | 3.0 |
| GES-4D | 13000 | 360 | 180 | 1000 | 1092 | 11 |
| GES-5 | 59000 | 1200 | 1500 | 1900 | 6800 | 38 |
| MTCA Method A Cleanup Level Unrestricted Land Use | 800 if benzene present; 1000 if no benzene | 5 | 1000 | 700 | 1000 | 15 |

Notes:
Yellow highlight indicates concentration is above MTCA Method A Cleanup Levels.

## 3.2 Groundwater Analytical Results Trend

COPC concentrations increased this quarter in all monitor wells samples, GES-1, GES-2, GES-3, GES-4, and GES-5. The detection of COPC's in monitor wells GES-1 and GES-2 could be primarily due to continued contributions of upgradient, offsite sources with a minor petroleum related contributions in GES-2 from soil left in place during remediation. Gasoline, for example, detected in GES-2 appeared to be on a decreasing trend possibly due to natural degradation. The increase in gasoline concentration could indicate that potential offsite sources have entered the Site near GES-2. The concentrations detected in GES-1

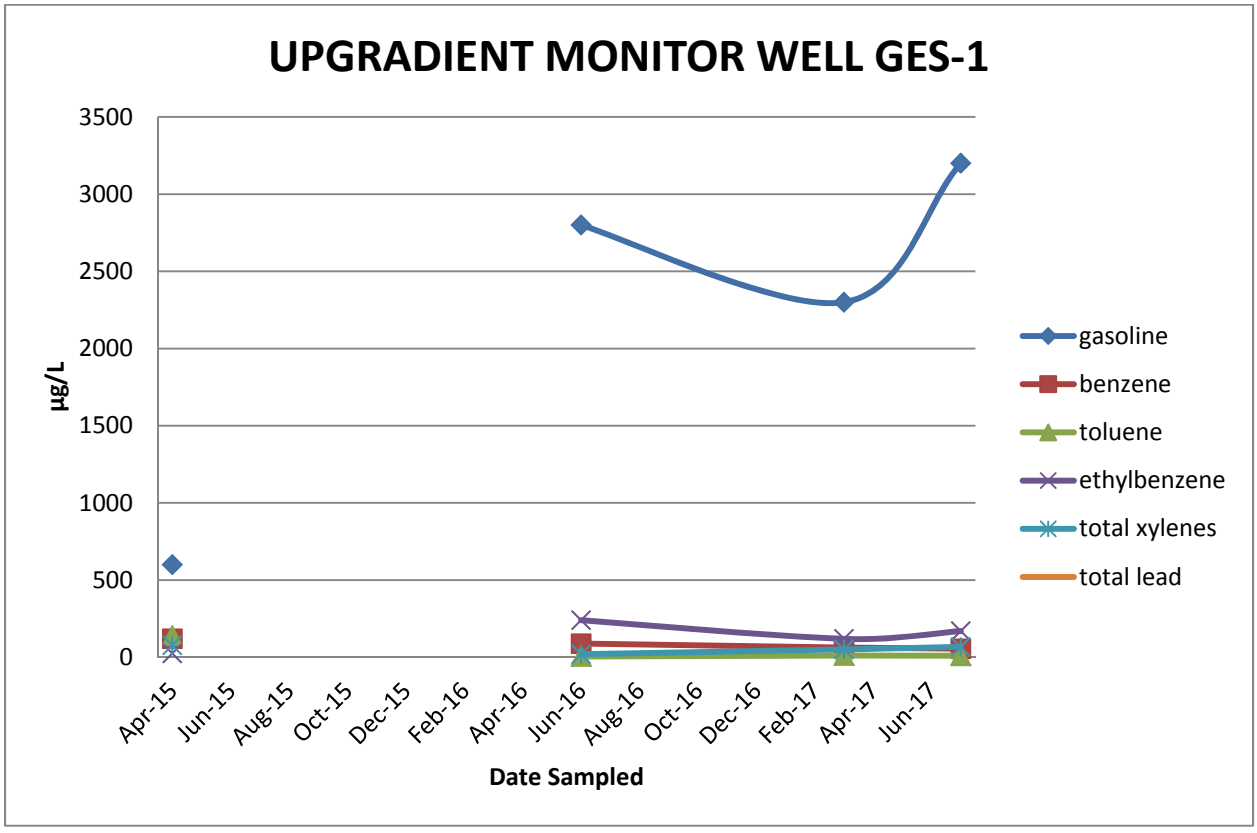
[2] The petroleum odor, notably fresh gasoline, was much stronger during this sampling round.
[3] ibid

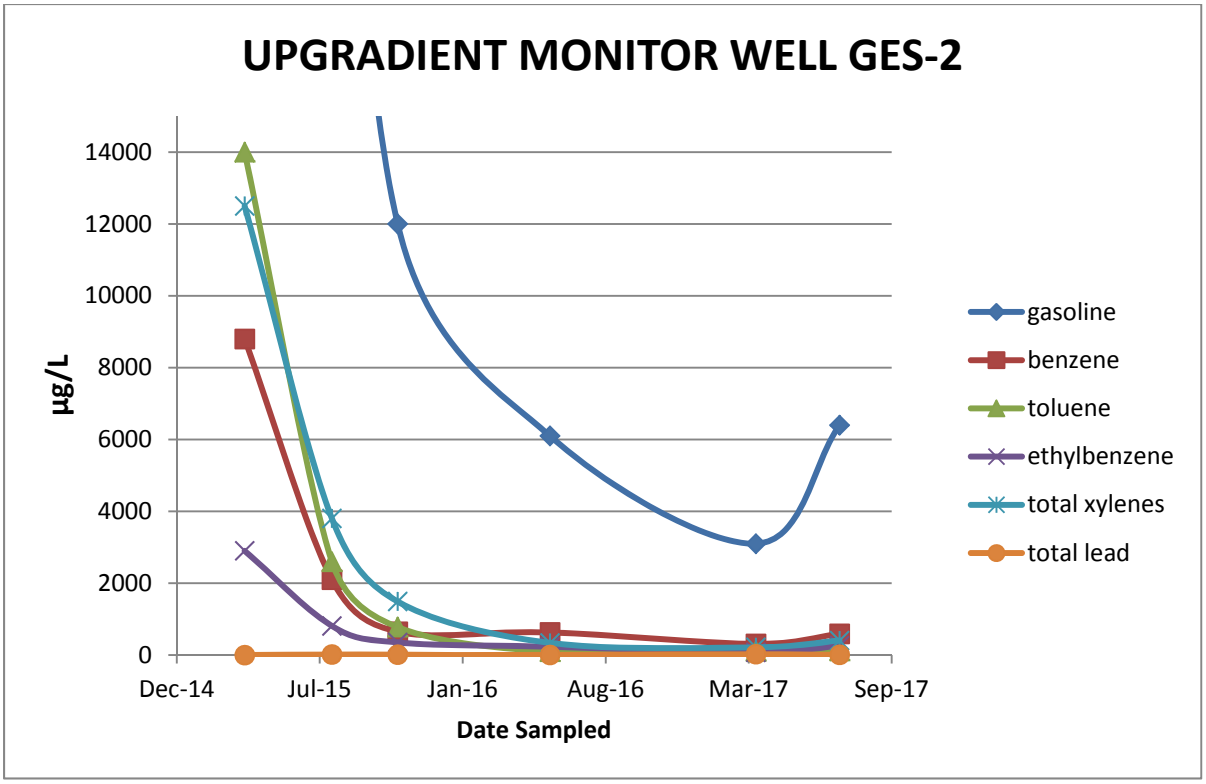
appear to be from offsite sources. The detection of COPCs in monitor wells GES-3 and GES-4 could be due to contaminated soils left in place along the S. Lincoln Street boundary during remediation. The increase in gasoline concentrations and lead in GES-3 this quarter could be due to offsite source contributions entering from upgradient along S. Lincoln Street. As in GES-2, the gasoline detected in groundwater in GES-5 this round increased. The driest precipitation month in Port Angeles is July. It is probably that the plume of hydrocarbons that apparently entered the Site since the last sampling round is *not* due to increased rainfall.

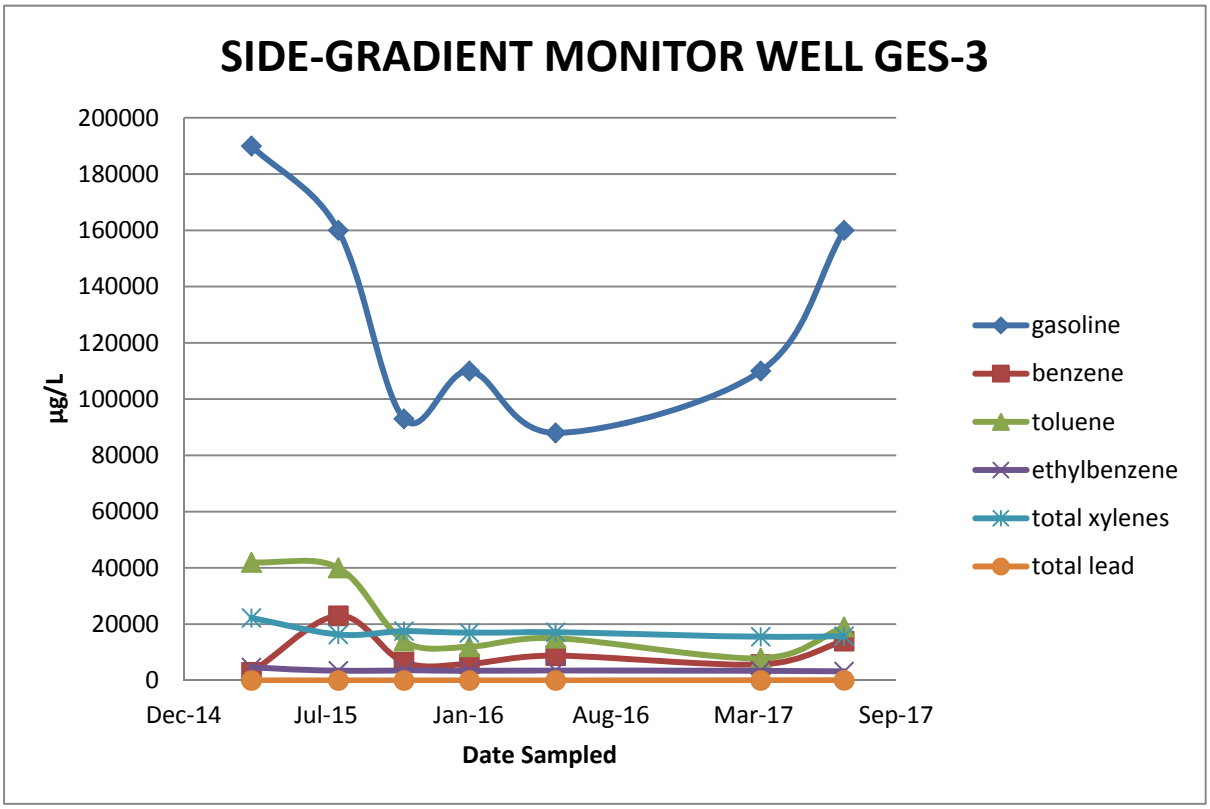
## Trend Graphs

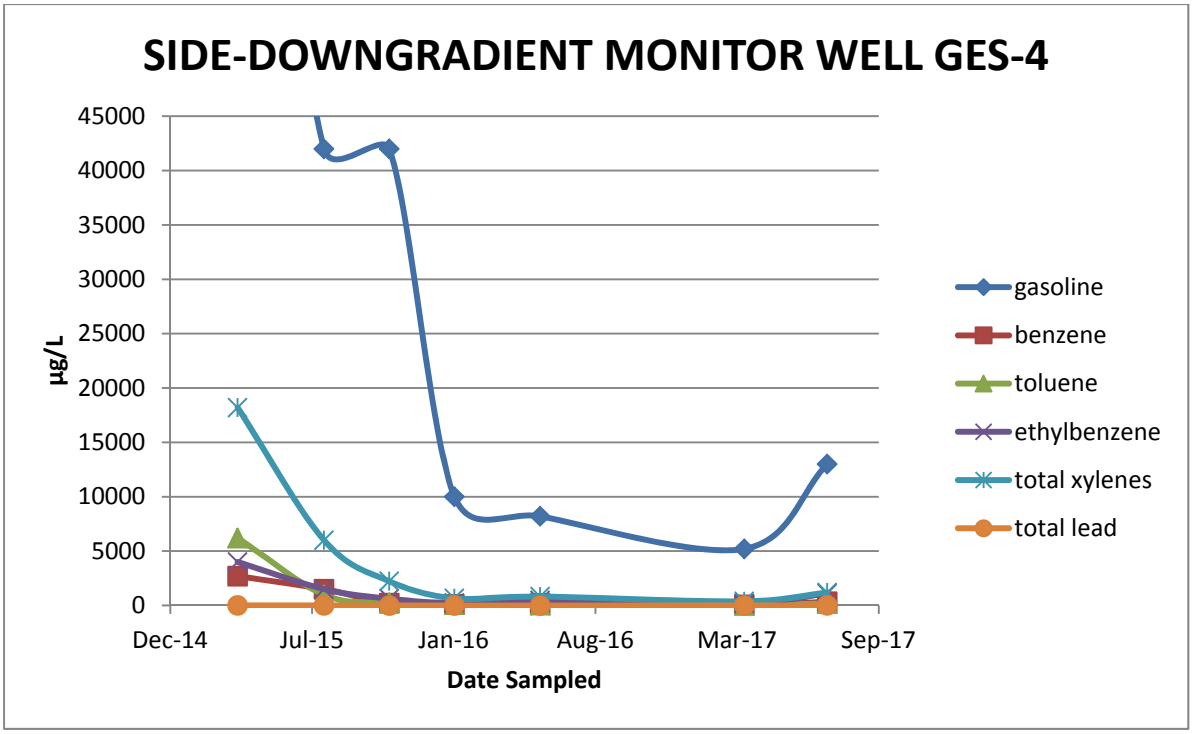
The following are detected constituent trend charts for groundwater samples from the monitor wells for this quarter.

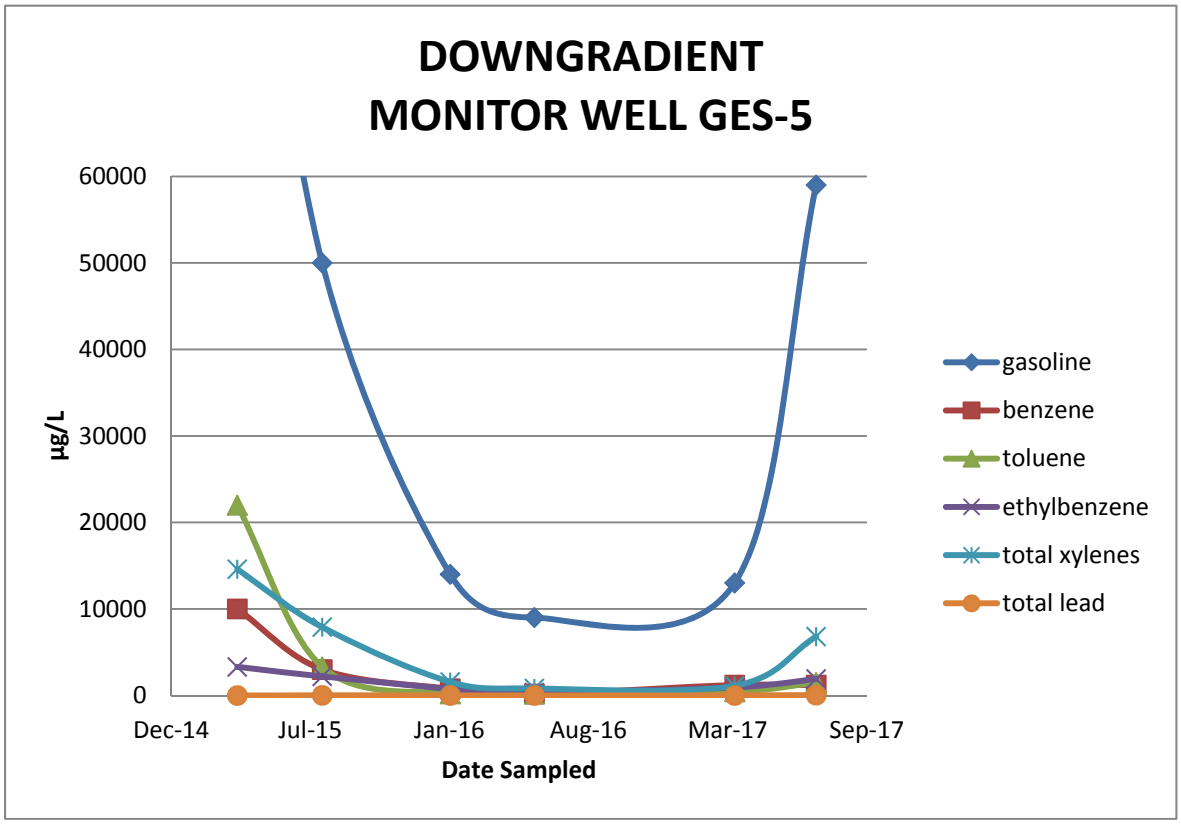
**Charts: Groundwater Analytical Results Trends (Month/Year)**




UPGRADIENT MONITOR WELL GES-2
µg/L
14000
12000
10000
8000
6000
4000
2000
0
Dec-14
Jul-15
Jan-16
Aug-16
Mar-17
Sep-17
Date Sampled
gasoline
benzene
toluene
ethylbenzene
total xylenes
total lead


SIDE-GRADIENT MONITOR WELL GES-3
µg/L
200000
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
Dec-14
Jul-15
Jan-16
Aug-16
Mar-17
Sep-17
Date Sampled
gasoline
benzene
toluene
ethylbenzene
total xylenes
total lead


SIDE-DOWNGRADIENT MONITOR WELL GES-4
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
µg/L
Dec-14
Jul-15
Jan-16
Aug-16
Mar-17
Sep-17
Date Sampled
gasoline
benzene
toluene
ethylbenzene
total xylenes
total lead


DOWNGRADIENT
MONITOR WELL GES-5
60000
50000
40000
30000
20000
10000
0
µg/L
Dec-14
Jul-15
Jan-16
Aug-16
Mar-17
Sep-17
Date Sampled
gasoline
benzene
toluene
ethylbenzene
total xylenes
total lead

# 4 PREVIOUS INVESTIGATIONS

The following is a summary of historical Site occupations and investigations from available reports by Kane (2008, 2009, 2012), GeoEngineers (2013), and GeoPro (2012, 2014, 2015a,b).

The potential sources of contamination within the Site were likely associated with leaks from several USTs and associated dispensers and pipelines. Historic data indicates gasoline and BTEX were detected onsite above MTCA cleanup levels.

- The Site has been a petroleum service station since about 1924, with at least 3 building and UST configurations (Kane reports).
    - 1924 – the Sanborn Map shows a gas station exists onsite.
    - 1939-1947 – Historical directories list Raymond J. Lain gas station onsite.
    - 1949 – The Lain gas station replaced by larger gas station but site listed as vacant in 1956.
    - 1964 - Sanborn Map shows onsite gas station configuration similar to the 2008 layout without canopies.
- 1985 – Aerial photo depicts gas station with two canopies (apparently dispenser islands). (Kane report)
- 1993 – Petroleum Construction and Environment, Chehalis, WA decommissioned three USTs in October within the northeast area of the site and lined the excavation with visqueen, leaving contaminated soil in-place. One UST was decommissioned in-place by filling with cement. The decommissioning could have been in response to a DOE soil gas survey in June 1993 which concluded the Site could be one of the sources of petroleum contamination migrating into the basement of the Lincoln Apartments in the early 1980's. (Kane report)
- 2007 – Kane completed Phase I and Limited Phase II Environmental Site Assessments. A heating oil underground storage tank was located and decommissioned adjacent to the northwest side of the Round The Clock Deli building.
- 2008 – Kane completed a remedial investigation including sampling of soil and groundwater in 16 borings and 28 groundwater monitoring wells in the vicinity of the Site and identified potential areas of co-mingled plumes.
- 2008 – Round The Clock Deli business became non-operational.
- 2009 – Kane completed remedial excavations.

- 2012 - GeoPro completed forensic groundwater sampling of co-mingled plumes and developed the following conclusions.
    - ❖ A co-mingled plume of gasoline contaminated groundwater extends from approximately the northern boundary of the ARCO property on Southeast 8th Street for at least 400 feet under South Lincoln Street, and is approximately 300 feet wide (northwest to southeast).
    - ❖ Gasoline contaminated groundwater is migrating north-northeasterly in a distribution pattern probably influenced by a historic drainage channel now buried beneath South Lincoln Street.
    - ❖ Up and/or side gradient offsite sources contributing to the area contaminated groundwater plumes may be, or have been, service station or auto repair facilities located to the east and south across South Lincoln and Southeast 8th Streets.
- 2013 – GeoEngineers completed an investigation to sample on and offsite soil and groundwater and conduct slug tests.
- 2015/17 – GeoPro Environmental Services installation and 1st, 2nd, 3rd, 4th, 5th, and 1st – 2nd Quarters-2017 sampling of monitor wells located within site boundaries.

# 5 CONCLUSIONS

- Five groundwater monitor wells were previously installed by GeoPro at the Site as long term monitoring sampling points within an area proposed for asphalt parking development. The wells are located in the upgradient, side-gradient, and downgradient groundwater flow directions relative to the Site.
- The analyses of groundwater samples for gasoline and gasoline constituents from each of five onsite monitor wells during this quarterly sampling event continue to exceed DOE MTCA Method A Unlimited Land Use cleanup levels.
- Trends continue to indicate that petroleum contamination is entering the Site from offsite sources.
- Petroleum contamination continues to probably exist near 15 feet depth beneath South Lincoln Street (State Highway 101), SE 8th Street, and the nearby commercial businesses.

# 6 RECOMMENDATIONS

The following are recommendations based on the results of this investigation.

- Maintain the five new monitor wells as a minimum number of sampling points within the Site without compromising the ability to monitor the onsite impact of offsite contamination. These points include upgradient, side-gradient, and downgradient groundwater flow directions.
- Maintain a forensic sampling program that will allow comparison of Site groundwater and free product analyses to offsite analyses with the objective of estimating co-mingled contaminant plume migration characteristics, such as, flow rates, directions, volumes and plume differentiation ratios.
- Free product sampled from Site or offsite wells should be considered for forensic analysis to evaluate age and migration differentiation within the co-mingled contaminant plumes. Such forensic evaluation should include PIANO analyses and the distribution of these hydrocarbon classes which usually span the range $C_3$ to $C_{12}$. Additional forensic analysis can be used to provide estimates gasoline grades, possible different biodegradation among the co-mingled plumes, and rates of migration.
- Maintain a frequency of sampling by collecting groundwater samples including during the season with the declining highest head levels. Occasional infrequent sampling may allow sufficient free product collection for forensic analysis.
- Continue to collect and evaluate groundwater samples in accordance with DOE MTCA standards and regulations and discussions with DOE.

# 7 REFERENCES

Friedman & Bruya, Inc., August 28, 2012, "Letter Report on Port Angeles Fingerprint 120605, Forensic Evaluation and Chemical Analyses", prepared for GeoPro LLC, Battle Ground, WA.

GeoEngineers, December 2013, Former Round the Clock Deli Property, Drafts of "Vicinity Map", "Site Plan with Groundwater Monitoring Locations" (map), Groundwater Analytical Results" (map), "Soil Exploration Locations with Analytical Results" (map), "Groundwater Analysis – Aquifer Slug Tests" (table), "Groundwater Field Screening and Chemical Analytical Data (Petroleum Hydrocarbons and BTEX)" (table), and "Soil Field Screening and Chemical Analytical Data (Petroleum Hydrocarbons and BTEX)" (table).

GeoPro LLC, September 4, 2012, "Initial Groundwater Forensic Evaluation Report, Proposed Rite Aid Property, Former Round The Clock Deli, 722 South Lincoln Street, Port Angeles, WA", prepared for Port Angeles Retail, LLC, Seattle, WA.

GeoPro LLC, September 9, 2014, "Groundwater Review With Excel Charts, Former Round The Clock Deli, 722 South Lincoln Street, Port Angeles, WA", prepared for BMEC, Richland, WA.

GeoPro Environmental Services LLC, November 7, 2014, "Work Plan, Onsite Groundwater Monitor Well Installations and Sampling, Former Round The Clock Deli, 722 South Lincoln Street, Port Angeles, WA", prepared for Washington Department of Ecology, SW Regional Office, Olympia, WA.

GeoPro Environmental Services LLC, April 17, 2015, "Groundwater Monitor Well Installations and Sampling, Former Round The Clock Deli, 722 South Lincoln Street, Port Angeles, WA", prepared for Washington Department of Ecology, SW Regional Office, Olympia, WA.

Kane Environmental Inc., April 11, 2008, "Remedial Investigation, Proposed Rite Aid Store, 710 and 722 South Lincoln Street, 107-121 East Eight Street and 717 South Laurel Street, Portland Angeles, Washington 98362", prepared for Stantec, Inc., Kirkland, WA.

Kane Environmental Inc., September 15, 2009, "Interim Remedial Action Report, 722 South Lincoln Street, Port Angeles, Washington", prepared for Marginal Properties, LLC, Kirkland, Washington.

Kane Environmental Inc., January 20, 2012, "Remediation Product Injection & Groundwater Performance Monitoring, Former Round the Clock Deli, 722 South Lincoln Street, Port Angeles, Washington", prepared for Mr. Bruce Groom, Seattle Bank, Seattle, Washington.

Washington State Department of Ecology, June 1993, "Lincoln Apartment Soil Gas Survey, Port Angeles Washington, March and April 1993", by Pamela B. Marti.

Washington State Department of Ecology, 2015, Toxics Cleanup Program, Integrated Site Information System, "Round The Clock Deli Grocery", CleanupSite ID 6415, FS ID 63427274.

# 8 LIMITATIONS

This report has been prepared for use by the landowner or responsible regulatory agency and is not intended for use by others. Each project and project site is unique and the information contained in this report is not applicable to other sites. Only the landowner or responsible regulatory agency should rely upon this report and all others should contact GeoPro Environmental Services LLC (GeoPro) before applying or interpreting any information in this report.

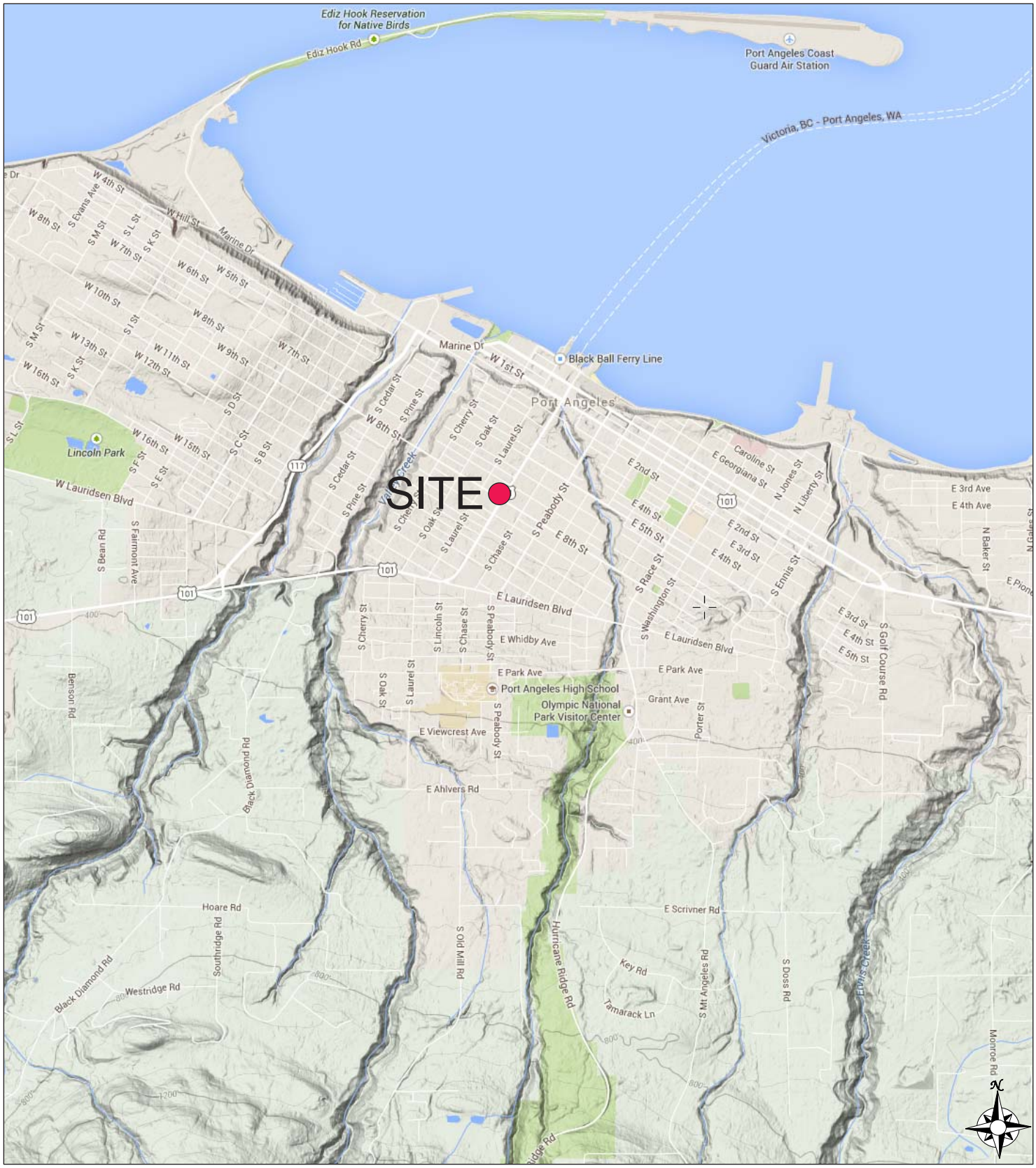
GeoPro does not accept liability or responsibility for use of this report by third parties, including but not limited to, detachment, partial use, separation, or reproduction without color, if used, which may depict significant information. Such use shall be at user's sole risk and GeoPro shall have no liability for such use.

Records, documentation, and personal communication have been relied upon in good faith; however, GeoPro accepts no responsibility or liability for errors or omissions of work by others. Services are performed in accordance with generally accepted professional practices, in the same or similar localities, related to the nature of the work accomplished, at the time services are rendered. GeoPro is not responsible for references to regulatory terms, practices, numeric data, practices or conditions that may lead to other conclusions if such references are not in final form.

Conclusions and findings apply only to present conditions, and opinions expressed are subject to revision when additional or new information is presented and reviewed. This warranty is in lieu of all other warranties, either expressed or implied. It is possible that explorations failed to reveal the presence of hazardous materials at areas where hazardous materials were assumed, suspected or expected to exist (hazardous as used herein shall also mean contaminated and polluted). Through use of this report it is understood that failure to sample soil or water, or install groundwater monitor wells at locations through appropriate and mutually agreed-upon techniques does not guarantee that hazardous materials have, or will be, detected at such locations. Similarly, areas which in fact are unaffected by hazardous materials at the time of this report, may later, due to natural causes or human intervention, become contaminated. GeoPro is not responsible for failing to locate hazardous materials which have not been discovered at the time of this report or in the future. In the event of changes in future development plans as understood at the time of this report, the conclusions and recommendations made herein shall be invalid until GeoPro is given the opportunity to review and modify this report in writing. Portions of an Agreement to perform professional services may or may not be disclosed in this report.

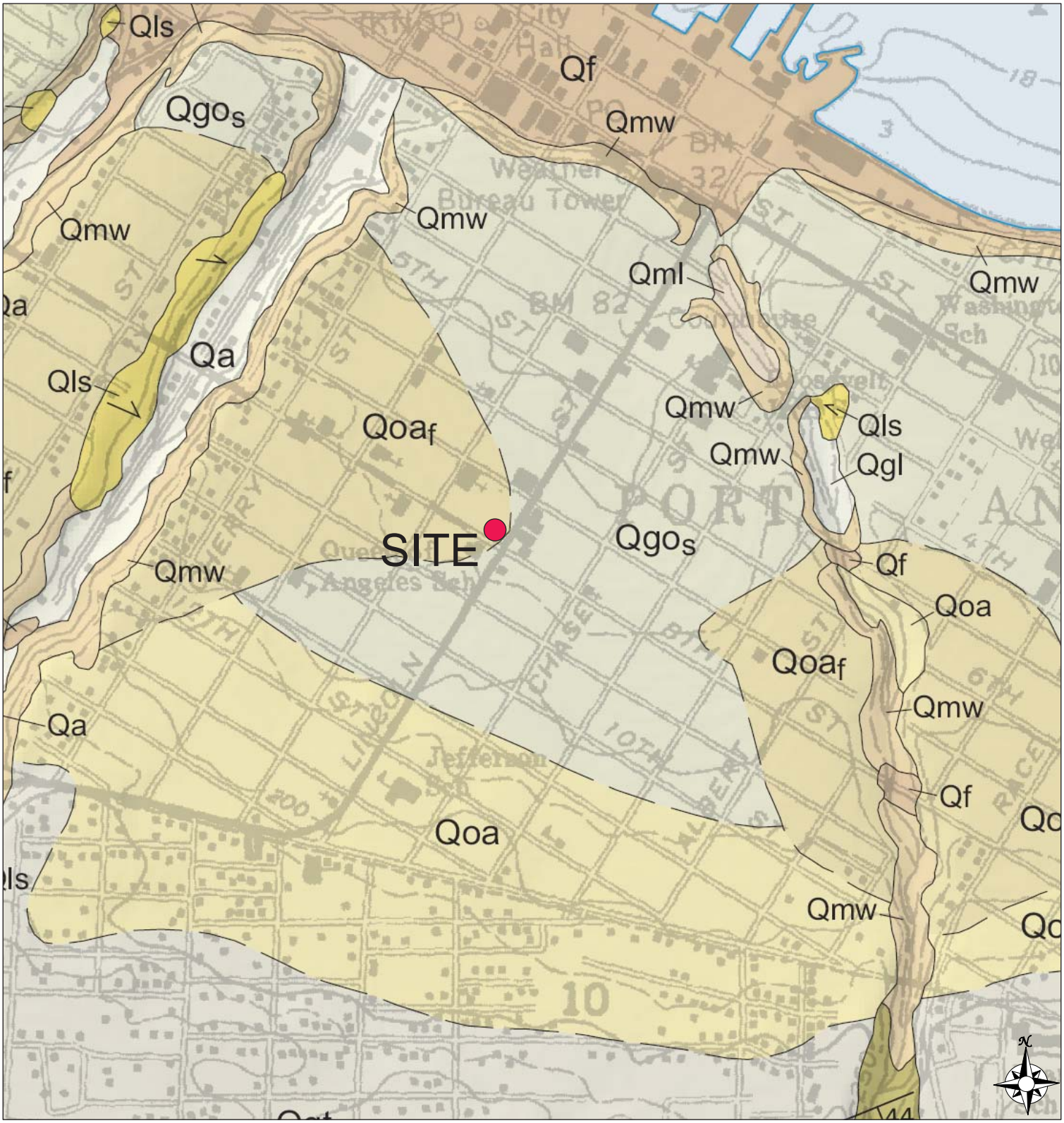
Richard C. Kent, L.G.


cc: BMEC




Source: Clallam County GIS

| | | | |
|---|---|---|---|
| Prepared by<br>**GeoPro LLC**<br>PO Box 26<br>Battle Ground, WA 98604<br>geopro@comcast.net | **Former Round The Clock Deli**<br>722 South Lincoln St., Port Angeles, WA<br>WA DOE Facility ID 63427274<br>July 2017 | **LOCATION MAP** | **Figure 1** |




Source: Geologic Map of the Port Angeles and Ediz Hook 7.5-minute Quadrangles, Clallam County, Washington, June 2004, WA Dept Natural Resources

**Qgos: Recessional outwash and glaciomarine drift (Pleistocene)**—Gravel, sand, silt, clay, and locally peat; characterized by northern rock types; typically well rounded; loose; generally well sorted; mostly stratified; deposited by glacial meltwater as opposed to nonglacial streams; locally grades up into or interfingers with post-glacial alluvium (units Qoa and Qa).

**Qoaf: Older alluvium (Pleistocene–early Holocene)—**Gravel, sand, silt, clay, and peat; variably sorted; loose; generally bedded and permeable; unit Qoa deposited in stream beds and estuaries, and on flood plains; may include some lacustrine and beach deposits. Unit Qoaf deposited as fans; locally grades down into or interfingers with unit Qgo.

| | | | |
|---|---|---|---|
| Prepared by<br>**GeoPro LLC**<br>PO Box 26<br>Battle Ground, WA 98604<br>geopro@comcast.net | **Former Round The Clock Deli**<br>722 South Lincoln St., Port Angeles, WA<br>WA DOE Facility ID 63427274<br>July 2017 | **GEOLOGIC MAP** | **Figure 2** |

Groundwater monitor well
Installed by GeoPro LLC
4-6/7-15

Contaminated soil excavations
1-26-09 to 2-3-09
2057 tons

Previous Locations:
300 gal. HOT
(decommissioned 1-26-09)
and 4000 gal. gasoline UST
(decommissioned 1-28-09)

Approximate location
3 USTs decommissioned
10-27-93

Prepared by
**GeoPro LLC**
PO Box 26
Battle Ground, WA 98604
geopro@comcast.net

**Former Round The Clock Deli**
722 South Lincoln St., Port Angeles, WA
WA DOE Facility ID 63427274
July 2017

**MONITOR WELL LOCATIONS & GRADIENT**

**Figure 3**

# Appendix A
# LABORATORY REPORT
# July 2017

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

July 20, 2017

Richard Kent
GeoPro, LLC
611 NW 5th Avenue
Battle Ground, WA 98604

Re: Analytical Data for Project 170730
Laboratory Reference No. 1707-095

Dear Richard:

Enclosed are the analytical results and associated quality control data for samples submitted on July 12, 2017.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: July 20, 2017
Samples Submitted: July 12, 2017
Laboratory Reference: 1707-095
Project: 170730

**Case Narrative**

Samples were collected on July 11, 2017 and received by the laboratory on July 12, 2017. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: July 20, 2017
Samples Submitted: July 12, 2017
Laboratory Reference: 1707-095
Project: 170730

**NWTPH-Gx/BTEX**

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GES-1** | | | | | |
| Laboratory ID: | 07-095-01 | | | | | |
| Benzene | **55** | 1.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Toluene | **9.2** | 1.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Ethyl Benzene | **170** | 10 | EPA 8021B | 7-14-17 | 7-14-17 | |
| m,p-Xylene | **62** | 1.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| o-Xylene | **5.6** | 1.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Gasoline | **3200** | 100 | NWTPH-Gx | 7-12-17 | 7-12-17 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *80* | *61-118* | | | | |
| **Client ID:** | **GES-2** | | | | | |
| Laboratory ID: | 07-095-02 | | | | | |
| Benzene | **590** | 20 | EPA 8021B | 7-14-17 | 7-14-17 | |
| Toluene | **120** | 4.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Ethyl Benzene | **260** | 4.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| m,p-Xylene | **310** | 4.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| o-Xylene | **94** | 4.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Gasoline | **6400** | 400 | NWTPH-Gx | 7-12-17 | 7-12-17 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *76* | *61-118* | | | | |
| **Client ID:** | **GES-3** | | | | | |
| Laboratory ID: | 07-095-03 | | | | | |
| Benzene | **14000** | 500 | EPA 8021B | 7-14-17 | 7-14-17 | |
| Toluene | **19000** | 500 | EPA 8021B | 7-14-17 | 7-14-17 | |
| Ethyl Benzene | **3200** | 500 | EPA 8021B | 7-14-17 | 7-14-17 | |
| m,p-Xylene | **11000** | 500 | EPA 8021B | 7-14-17 | 7-14-17 | |
| o-Xylene | **4700** | 500 | EPA 8021B | 7-14-17 | 7-14-17 | |
| Gasoline | **160000** | 50000 | NWTPH-Gx | 7-14-17 | 7-14-17 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *96* | *61-118* | | | | |

Date of Report: July 20, 2017
Samples Submitted: July 12, 2017
Laboratory Reference: 1707-095
Project: 170730

**NWTPH-Gx/BTEX**

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GES-4** | | | | | |
| Laboratory ID: | 07-095-04 | | | | | |
| Benzene | **340** | 4.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Toluene | **190** | 4.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Ethyl Benzene | **1100** | 50 | EPA 8021B | 7-14-17 | 7-14-17 | |
| m,p-Xylene | **1100** | 50 | EPA 8021B | 7-14-17 | 7-14-17 | |
| o-Xylene | **92** | 4.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Gasoline | **13000** | 400 | NWTPH-Gx | 7-12-17 | 7-12-17 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *95* | *61-118* | | | | |
| **Client ID:** | **GES-4D** | | | | | |
| Laboratory ID: | 07-095-05 | | | | | |
| Benzene | **360** | 4.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Toluene | **180** | 4.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Ethyl Benzene | **1000** | 50 | EPA 8021B | 7-14-17 | 7-14-17 | |
| m,p-Xylene | **1000** | 50 | EPA 8021B | 7-14-17 | 7-14-17 | |
| o-Xylene | **92** | 4.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Gasoline | **13000** | 400 | NWTPH-Gx | 7-12-17 | 7-12-17 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *97* | *61-118* | | | | |
| **Client ID:** | **GES-5** | | | | | |
| Laboratory ID: | 07-095-06 | | | | | |
| Benzene | **1200** | 100 | EPA 8021B | 7-14-17 | 7-14-17 | |
| Toluene | **1500** | 100 | EPA 8021B | 7-14-17 | 7-14-17 | |
| Ethyl Benzene | **1900** | 100 | EPA 8021B | 7-14-17 | 7-14-17 | |
| m,p-Xylene | **5100** | 100 | EPA 8021B | 7-14-17 | 7-14-17 | |
| o-Xylene | **1700** | 100 | EPA 8021B | 7-14-17 | 7-14-17 | |
| Gasoline | **59000** | 10000 | NWTPH-Gx | 7-14-17 | 7-14-17 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *96* | *61-118* | | | | |

Date of Report: July 20, 2017
Samples Submitted: July 12, 2017
Laboratory Reference: 1707-095
Project: 170730

**NWTPH-Gx/BTEX**
**QUALITY CONTROL**

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB0712W2 | | | | | |
| Benzene | **ND** | 1.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Toluene | **ND** | 1.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Ethyl Benzene | **ND** | 1.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| m,p-Xylene | **ND** | 1.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| o-Xylene | **ND** | 1.0 | EPA 8021B | 7-12-17 | 7-12-17 | |
| Gasoline | **ND** | 100 | NWTPH-Gx | 7-12-17 | 7-12-17 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *82* | *61-118* | | | | |
| Laboratory ID: | MB0714W1 | | | | | |
| Benzene | **ND** | 1.0 | EPA 8021B | 7-14-17 | 7-14-17 | |
| Toluene | **ND** | 1.0 | EPA 8021B | 7-14-17 | 7-14-17 | |
| Ethyl Benzene | **ND** | 1.0 | EPA 8021B | 7-14-17 | 7-14-17 | |
| m,p-Xylene | **ND** | 1.0 | EPA 8021B | 7-14-17 | 7-14-17 | |
| o-Xylene | **ND** | 1.0 | EPA 8021B | 7-14-17 | 7-14-17 | |
| Gasoline | **ND** | 100 | NWTPH-Gx | 7-14-17 | 7-14-17 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *90* | *61-118* | | | | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | | | | | |
| Laboratory ID: | 07-055-02 | | | | | | | | | | |
| | ORIG | DUP | | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *81* | *91* | *61-118* | | | |
| Laboratory ID: | 07-055-01 | | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | | |
| Benzene | **46.9** | **47.4** | 50.0 | 50.0 | ND | **94** | **95** | 80-120 | 1 | 13 | |
| Toluene | **48.4** | **48.6** | 50.0 | 50.0 | ND | **97** | **97** | 81-115 | 0 | 14 | |
| Ethyl Benzene | **48.3** | **48.8** | 50.0 | 50.0 | ND | **97** | **98** | 81-114 | 1 | 12 | |
| m,p-Xylene | **48.9** | **48.9** | 50.0 | 50.0 | ND | **98** | **98** | 81-114 | 0 | 13 | |
| o-Xylene | **48.7** | **48.8** | 50.0 | 50.0 | ND | **97** | **98** | 81-113 | 0 | 11 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *95* | *97* | *61-118* | | | |

Date of Report: July 20, 2017
Samples Submitted: July 12, 2017
Laboratory Reference: 1707-095
Project: 170730

**TOTAL LEAD**
**EPA 200.8**

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 07-095-01 | | | | | |
| **Client ID:** | **GES-1** | | | | | |
| Lead | **4.5** | 1.1 | 200.8 | 7-18-17 | 7-18-17 | |
| Lab ID: | 07-095-02 | | | | | |
| **Client ID:** | **GES-2** | | | | | |
| Lead | **4.9** | 1.1 | 200.8 | 7-18-17 | 7-18-17 | |
| Lab ID: | 07-095-03 | | | | | |
| **Client ID:** | **GES-3** | | | | | |
| Lead | **27** | 1.1 | 200.8 | 7-18-17 | 7-18-17 | |
| Lab ID: | 07-095-04 | | | | | |
| **Client ID:** | **GES-4** | | | | | |
| Lead | **3.0** | 1.1 | 200.8 | 7-18-17 | 7-18-17 | |
| Lab ID: | 07-095-05 | | | | | |
| **Client ID:** | **GES-4D** | | | | | |
| Lead | **11** | 1.1 | 200.8 | 7-18-17 | 7-18-17 | |
| Lab ID: | 07-095-06 | | | | | |
| **Client ID:** | **GES-5** | | | | | |
| Lead | **38** | 1.1 | 200.8 | 7-18-17 | 7-18-17 | |

Date of Report: July 20, 2017
Samples Submitted: July 12, 2017
Laboratory Reference: 1707-095
Project: 170730

**TOTAL LEAD**
**EPA 200.8**
**METHOD BLANK QUALITY CONTROL**

| | |
|---|---|
| Date Extracted: | 7-18-17 |
| Date Analyzed: | 7-18-17 |
| Matrix: | Water |
| Units: | ug/L (ppb) |
| Lab ID: | MB0718WM1 |

| Analyte | Method | Result | PQL |
|---|---|---|---|
| Lead | 200.8 | **ND** | 1.1 |

Date of Report: July 20, 2017
Samples Submitted: July 12, 2017
Laboratory Reference: 1707-095
Project: 170730

**TOTAL LEAD**
**EPA 200.8**
**DUPLICATE QUALITY CONTROL**

Date Extracted: 7-18-17
Date Analyzed: 7-18-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: 07-119-07

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---|---|---|---|---|---|
| Lead | **ND** | **ND** | NA | 1.1 | |

Date of Report: July 20, 2017
Samples Submitted: July 12, 2017
Laboratory Reference: 1707-095
Project: 170730

**TOTAL LEAD**
**EPA 200.8**
**MS/MSD QUALITY CONTROL**

Date Extracted: 7-18-17
Date Analyzed: 7-18-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: 07-119-07

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---|---|---|---|---|---|---|---|
| Lead | 222 | **216** | 97 | **216** | 97 | 0 | |

OnSite Environmental Inc.

**Data Qualifiers and Abbreviations**

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

# Chain of Custody

Page 1 of 1

**OnSite Environmental Inc.**
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: GeoPro LLC
Project Number: 170730
Project Name: Round the Clock
Project Manager: Richard Kent
Sampled by: Angela Piller

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number:** 07-095

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx (☐ Acid / SG Clean-up) | Volatiles 8260C | Halogenated Volatiles 8260C | EDB EPA 8011 (Waters Only) | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082A | Organochlorine Pesticides 8081B | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA Metals | Total MTCA Metals | TCLP Metals | HEM (oil and grease) 1664A | Total Pb (200.8) | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GES-1 | 7/11/17 | 1330 | W | 3 | | X | | | | | | | | | | | | | | | | X | | | | |
| 2 | GES-2 | ↓ | 1415 | ↓ | ↓ | | X | | | | | | | | | | | | | | | | X | | | | |
| 3 | GES-3 | | 1450 | | | | X | | | | | | | | | | | | | | | | X | | | | |
| 4 | GES-4 | | 1530 | | | | X | | | | | | | | | | | | | | | | X | | | | |
| 5 | GES-4D | | 1530 | | | | X | | | | | | | | | | | | | | | | X | | | | |
| 6 | GES-5 | | 1610 | | | | X | | | | | | | | | | | | | | | | X | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GeoPro LLC | 7/11/17 | 1630 |
| Received | | | 7/12/17 | 1100 |
| Relinquished | | | | |
| Received | | | | |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**
Invoice BMEC using PO# PZ017/0606

Data Package: Standard ☒ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☒