PBS | Engineering + Environmental Est. 1982

Groundwater Monitoring Report December 2014 Event

3740 Shelton Springs Road
Shelton, Washington

Prepared for:
Mason County Transportation Cooperative
Attn: Sandi Thompson
700 South First Street
Shelton, Washington 98584

January 2015
Project No. 41271.002

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1.0 INTRODUCTION

PBS Engineering and Environmental Inc. (PBS) completed the December 2014 collection of groundwater samples at the Mason County Transportation Cooperative facility located at 3740 Shelton Springs Road in Shelton, Washington (site or subject property). The work was completed at the request of Sandi Thompson with Mason County Transportation Cooperative. This investigation was conducted to further characterize groundwater quality in conjunction with ongoing monitoring of the 1994 underground storage tank (UST) release at the project site.

The December 2014 groundwater sampling event represents the second consecutive quarterly event for the project site.

Site Description and Usage

The subject property is the site of Mason County Transportation Cooperative, located at 3740 Shelton Springs Road, Shelton, Washington 98584-9105 in Mason County (Township 20 North, Range 4, Section 12). The triangular-shaped land is identified as Parcel Number 420124160000.

The site building includes bus maintenance bays, wash bays and personal offices. A fueling area is located on the south side of the building and includes a pump island and associated USTs. Buses are parked around the building to the north and west.

Site Ownership

The property is currently owned by Mason County Transportation.

2.0 BACKGROUND

The property was purchased as a vacant lot by the school district in 1984. Shortly after purchase, the school bus maintenance building and fueling facility were built. In 1994, the USTs were upgraded to conform to EPA standards. During the upgrade, a leaking pipe and contaminated soil were encountered during excavation. Mason County then initiated remedial actions to fulfill Ecology's Model Toxics Control Act (MTCA) requirements to obtain a determination of "no further action" (NFA) for the site.

Mason County removed approximately 600 cubic yards of soil from the excavation and aerated the soil material on-site in 1995. New double-walled fiberglass tanks were installed. Some impacted soils were left in place due to inaccessibility due to site structures. Two groundwater monitoring wells were installed adjacent to the UST system.

As required by Ecology, in June 2007, a total of five borings were drilled with two of the borings completed as groundwater monitoring wells. Subsurface soil samples were collected from the borings, just above the saturated groundwater zone. Analytical results indicated no detections of gasoline-range hydrocarbons in the six soil samples; only one location had any hydrocarbon detection (a heavy oil-range at low concentrations). All subsurface soil concentrations of petroleum hydrocarbons and/or constituents were below the applicable MTCA Method A or Method B levels.

In addition, all four existing on-site monitoring wells developed and sampled. Analytical results indicated no impacts to groundwater from petroleum hydrocarbon related constituents above the laboratory MRLs. Based on the dataset, PBS recommended no further environmental investigation was necessary and that Ecology should issue a determination of NFA. However, Ecology requested additional site characterization data, which was communicated in their May 22, 2009 letter to Mason County.

The October 2009 environmental media monitoring event was then performed specifically to address Ecology's May 22, 2009 request for additional site soils and groundwater data. Soil and groundwater samples from across the site were analyzed for gasoline-range hydrocarbons. Sample analysis indicated no contaminants of concern were above the laboratory method reporting limit (MRL).

Based on the October 2009 additional soil and groundwater data, PBS recommended that Mason County submit the findings to Ecology and request NFA determination for the site. However, the placement of additional monitoring wells and quarterly groundwater sampling was requested by Ecology in a letter dated May 26, 2010 in order to further characterize groundwater quality.

In May 2014, two additional monitoring wells were installed on the project site. The weels were placed to capture the down gradient groundwater flow locations, and a replacement well was near the western portion of the existing underground storage tank basin and dispenser area, to replace MW-1. The well installation and sampling results were presented in the Well Installation and Groundwater Sampling Report, PBS, dated October 10, 2014. (?check dates and revise)

3.0 SITE INVESTIGATIONS

Groundwater Monitoring Event

The December 2014 Groundwater Monitoring Event (GME) was conducted on December 10, and included the sampling of four on site groundwater monitoring wells (MW3 through MW6). MW2 was not sampled this quarter, due to low water levels, but will be captured during the next two sampling events. Well locations are presented in Figure 2 - Site Plan. Monitoring well information is summarized in the following Table 1:

Table 1: Summary of Monitoring Well Construction

Monitoring Well Identification	Installation Date	Screened Interval (feet bgs)	Well Depth (feet bgs)
*MW1 (not used) replaced with MW5	1995	5-14	14.42
MW2	1995	5 – 15	14.72
MW3	2007	10 – 20	18.91
MW4	2007	10 – 20	19.24
MW5	2014	10 - 25	23.47
MW6	2014	9.6 – 19.6	19.22

* Observation well that has been historically reported as dry and unable to be sampled

Prior to sampling the wells were gauged using an interface probe. Static water levels (SWLs) ranged from 10.55 feet below top of casing (fbTOC) in MW6 to 12.7 fbTOC in MW5.

Groundwater purging and sampling was conducted using a peristaltic pump, employing low flow sampling methodology with pumping rates not exceeding 0.5 liters/minute and creating minimal drawdown in the well. Groundwater field parameters (conductivity, pH, temperature, dissolved

oxygen and oxidation-reduction potential) were recorded during purging using a YSI Model 556MSP water-quality analyzer equipped with a flow-through cell.

Once groundwater parameters stabilized, which indicates groundwater is representative of the aquifer formation and is not well column water, a sample was collected. PBS personnel wore new disposable nitrile gloves when collecting samples. Detailed groundwater sampling information is presented in Attachment II - Groundwater Sampling Forms.

All samples were collected in laboratory-supplied containers, placed on ice in a cooler and transported Fremont Analytical Laboratory in Seattle, Washington, within specified holding times and under chain-of-custody documentation. Analyses were conducted under a 5-day turnaround time and included the following:

- Gasoline range Total Petroleum Hydrocarbons (TPH) by method NWTPH-Gx
- Diesel range TPHs by method NWTPH-Dx
- Benzene, toluene, ethylbenzene and xylenes by EPA method 8021
- Polycyclic Aromatic Hydrocarbons (PAHs) by EPA Method 8270D SIM

4.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

Contaminated site assessment and cleanup is conducted under the MTCA, Chapter 70.105D Revised Code of Washington [RCW]. Chapter 173-340 of the Washington Administrative Code (WAC) provides a workable process for MTCA to accomplish effective and expeditious cleanups in a manner that protects human health and the environment. The applicable standards for this Site are the MTCA Method A groundwater cleanup levels (Table 720-1).

Site assessment and cleanup on Site has been and will continue to be performed in accordance with MTCA regulations.

5.0 FINDINGS

Groundwater Elevation and Flow Direction

Groundwater elevation was slightly lower in the four well sampled during this monitoring period, as compared to the prior monitoring period. The water elevations, which were approximately 2.5 feet lower, may correspond to decreased rainwater infiltration to the groundwater during this period.

Groundwater flow direction was determined graphically on a scaled site plan, using the tabulated groundwater elevations. Groundwater flow direction was determined to be east southeast. Groundwater elevation data from June and September 2014, calculated groundwater flow direction and hydraulic gradient are presented in Table 2. A copy of the survey report is included in Attachment III.

Groundwater Analytical Results

The analyzed groundwater samples indicated no contaminant concentrations in groundwater were reported above the laboratory MRL or the adopted regulatory cleanup levels.

Groundwater analytical results are presented in Table 3. A copy of laboratory report is included in Attachment IV.

Quality Control Samples

Quality control (QC) sampling conducted during the investigation is described below:

One blind duplicate sample was submitted to the laboratory for analysis without notification to the laboratory which sample was duplicated. The duplicate groundwater sample (DUP_12.10.2014) from MW1 was analyzed for BTEX. Results from both samples were below the respective laboratory MRLs.

A trip blank sample was shipped with groundwater samples collected during the investigation and analyzed for BTEX. Trip blank results were below the laboratory MRLs.

6.0 CONCLUSIONS AND RECOMMENDATIONS

With regard to the findings of GME conducted on site, the following recommendations are made:

- The analyzed groundwater samples indicated no contaminant concentrations in groundwater were reported above the laboratory MRL or the adopted regulatory cleanup levels (i.e. non-detect levels).
- The December 2014 GME represents the second consecutive groundwater sampling with no detected concentrations of contaminants above the MRL in analyzed samples.
- Continue quarter annual GMEs with analysis for contaminants of concern. PBS recommends removing analysis for gasoline range hydrocarbons and BTEX from the analytical suite.
- Submit a copy of this report to Ecology
- Retain a copy of this report.

7.0 LIMITATIONS

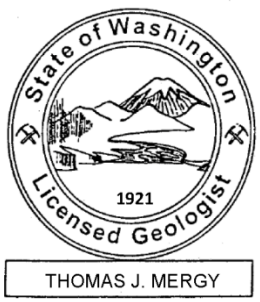
PBS has prepared this report for use by Mason County Transportation Cooperative. This report is for the exclusive use of the client and is not to be relied upon by other parties. It is not to be photographed, photocopied, or similarly reproduced, in total or in part, without the expressed written consent of the client and PBS.

This study was limited to the tests, locations, and depths as indicated to determine the absence or presence of certain contaminants. The site as a whole may have other contamination that was not characterized by this study. The findings and conclusions of this report are not scientific certainties but, rather, are probabilities based on professional judgment concerning the significance of the data gathered during the course of this investigation. PBS is not able to represent that the site or adjoining land contain no hazardous waste, oil or other latent conditions beyond that detected or observed by PBS.

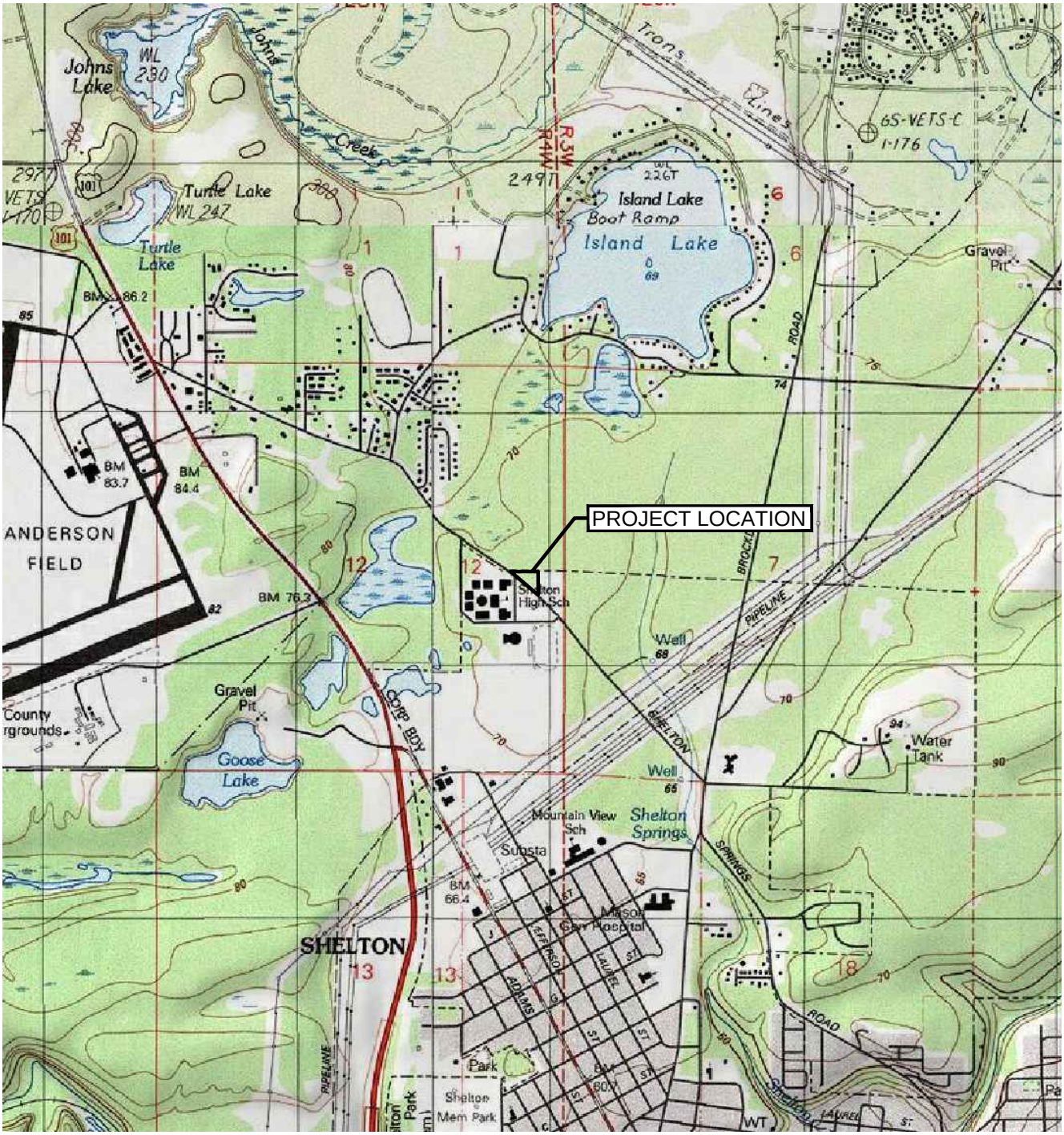
PBS Engineering and Environmental Inc.

January 21, 2014
Megan Nogeire Date
Project Scientist

January 21, 2014
Tom Mergy, LG Date
Senior Geologist



FIGURES



SOURCE: USGS SHELTON, WA QUADRANGLE 1975, PHOTO REVISED 1981.

WASHINGTON

0' 1000' 2000' 4000'

SCALE: 1" = 2,000'

PREPARED FOR: MASON COUNTY TRANSPORTATION COOPERATIVE

PBS	PROJECT # 41271.002 DATE JAN 2015	VICINITY MAP 3740 SHELTON SPRING ROAD SHELTON, WASHINGTON	FIGURE 1

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SOURCE: © 2011 GOOGLE EARTH PRO, © 2012 GOOGLE

LEGEND

- MW-5 MONITORING WELL NUMBER AND LOCATION
- MW-1 EXISTING MONITORING WELL NUMBER AND LOCATION
- FENCE

0' 15' 30' 60'

SCALE: 1" = 30'

PREPARED FOR: MASON COUNTY TRANSPORTATION COOPERATIVE

PBS

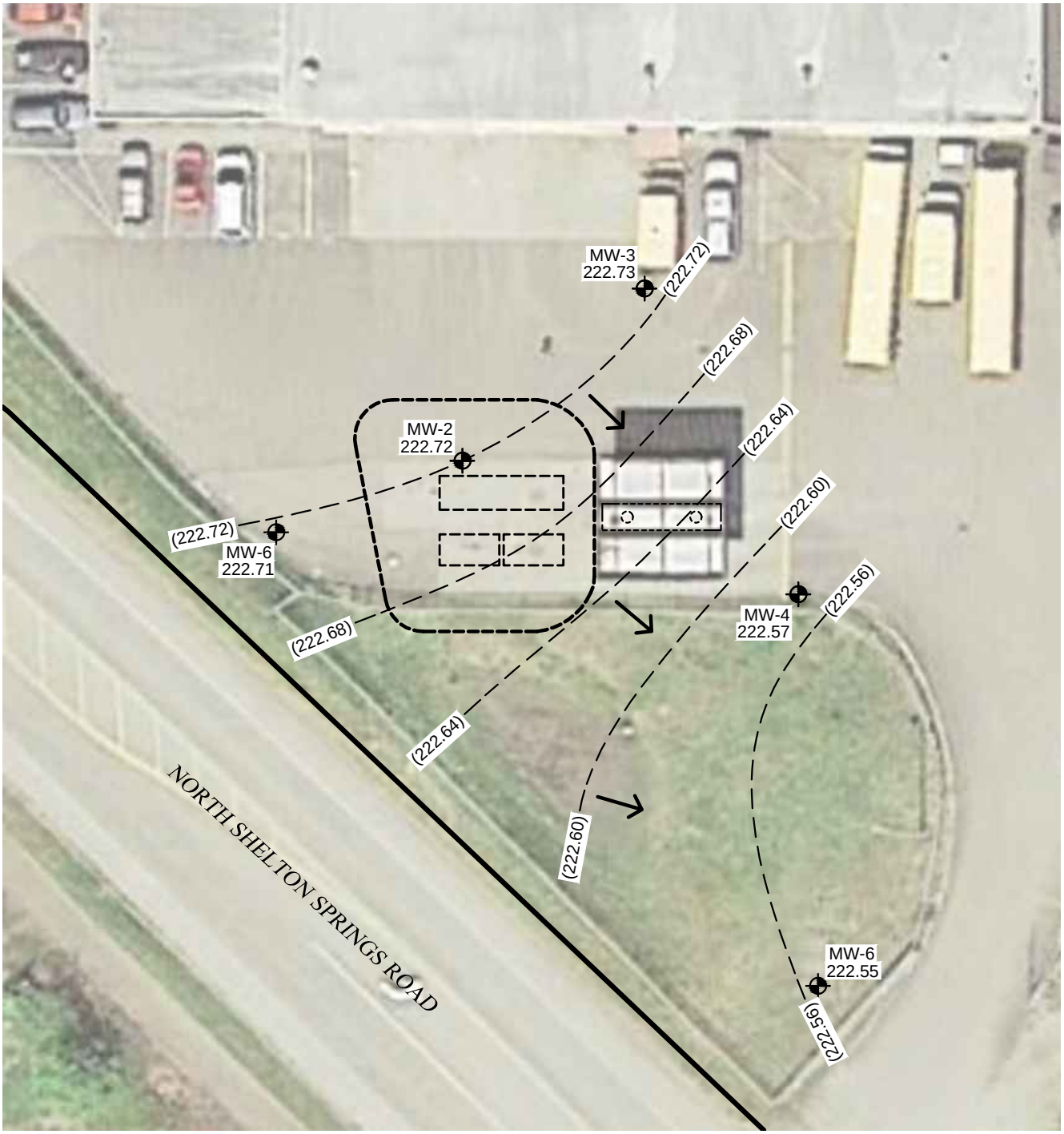
PROJECT # 41271.002

DATE JAN 2015

SITE PLAN

3740 SHELTON SPRING ROAD
SHELTON, WASHINGTON

FIGURE 2



SOURCE: © 2011 GOOGLE EARTH PRO, © 2012 GOOGLE

LEGEND

- MW-5 MONITORING WELL NUMBER AND LOCATION
- GROUNDWATER FLOW DIRECTION
- GOUNDWATER CONTOUR
- (222.72) GOUNDWATER ELEVATION (FEET AMSL)

APPROXIMATE HYDRAULIC GRADIENT - 0.0025 ft/ft

0' 15' 30' 60'

SCALE: 1" = 30'

PREPARED FOR: MASON COUNTY TRANSPORTATION COOPERATIVE

PBS

PROJECT # 41271.002

DATE NOV 2014

GROUNDWATER CONTOUR MAP

3740 SHELTON SPRING ROAD
SHELTON, WASHINGTON

FIGURE 3

TABLES

TABLE 2 GROUNDWATER ELEVATION AND FLOW DIRECTION

Site: Mason County Transportation, Shelton, Washington
Project No: 41271.002

Monitoring Well Identification	Groundwater Monitoring Event	Top of Casing (TOC) elevation (feet)	Depth to water (feet)	Groundwater Elevation (feet)
MW2	September 30, 2014	236.2	13.48	222.72
MW3	September 30, 2014	236.21	13.48	222.73
	December 10, 2014		10.80	225.41
MW4	September 30, 2014	236.35	13.78	222.57
	December 10, 2014		11.50	224.85
MW5	September 30, 2014	237.87	15.32	222.55
	December 10, 2014		12.70	225.17
MW6	September 30, 2014	235.92	13.21	222.71
	December 10, 2014		10.55	225.37

Survey report included in Attachment III

Date of Depth to Water Measurement	Groundwater Flow Direction	Hydrualic Gradient (feet/feet)
September 30, 2014	Southeast	0.0025
December 10, 2014	East Southeast	0.004

Groundwater flow direction was determined graphically on a scaled site plan, using the tabulated groundwater elevations and survey data

TABLE 3 GROUNDWATER ANALYTICAL RESULTS

SITE: Mason County Department of Transportation

PROJECT NO: 41271.002

Result ug/L (parts per billion)											
Criteria		TPHs			VOCs by EPA method 8260[1]				PAHs		
		Gx	Dx	Heavy Oil	Benzene	Toluene	Ethyl Benzene	Xylene	B(a)P	Naph	Carcinogenic PAHs
Adopted Criteria	**MTCA Method A Cleanup Levels for Groundwater**	**800**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**0.1**	**160**	**0.1****
Location/ Depth	**Groundwater Monitoring Event**	**Gx**	**Dx**	**Heavy Oil**	**Benzene**	**Toluene**	**Ethyl Benzene**	**Xylene**	**B(a)P**	**Naph**	**Carcinogenic PAHs**
MW2	September 30, 2014	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100
MW3	September 30, 2014	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100
MW3	December 10, 2014	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100
MW4	September 30, 2014	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100
MW4	December 10, 2014	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100
MW5	September 30, 2014	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100
MW5	December 10, 2014	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100
MW6	September 30, 2014	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100
MW6	December 10, 2014	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100

BOLD indicates above MTCA Method A Cleanup Levels for Groundwater

TPH - total petroleum hydrocarbons

Gx - gasoline range hydrocarbons

Dx - diesel range hydrocarbons

ug/L - micrograms per litre

<50 - less than the laboratory method reporting limit

B(a)P - benzo(a)pyrene

Naph - naphthalene

** Value for carcinogenic PAHs by toxicity equivalency methodology in WAC 173-340-708(8) and table 708.2

APPENDIX I

Soil Boring and Well Construction Logs

PBS Engineering + Environmental
1310 Main St.
Vancouver, WA 98660
Phone: (360) 690-4331
Fax: (360) 696-9064

MASON COUNTY TRANSPORTATION
SHELTON, WA

PBS PROJECT NUMBER:
007167.000

BORING TB-4/MW-3

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION AND COMMENTS	GROUND-WATER	HEADSPACE VAPOR (PPM)	SAMPLE NUMBER	SAMPLE	DRIVE/ RECOVERY
0		ASPHALT					
		Loose, light brown, medium to coarse SAND with some silt and gravels; dry, gravels are fine and subrounded		11.0			
5		Loose, light brown, fine SAND with some coarse sand, gravels and silts are fine and subrounded		6.5			
		Loose, light brown, medium to coarse gravelly SAND with some silt, dry, gravels and sands range from subangular to rounded		25.0			
10		Becomes slightly damp		11.0 17.0			
		Loose, light brown, fine to coarse GRAVELS with well graded sands and silts, damp	ATD	20.0	TB4-13-15		
15		Loose, brown, silty fine SAND with trace fine gravels and medium to coarse sands; wet			MW-3/19		
20		Final depth 20.0 feet below ground surface					
25							
30							
35							
40							

WELL INSTALLATION

Start Card/Tag ID# R65249/APF863

- Expandable locking cap
- Hydrated bentonite chips (3/8")
- Riser pipe: 1-inch, PVC Schedule 80
- *Ambient air is approximately 7 ppm*
- 10/20 Silica Sand & Native
- *Ambient air is 14 ppm*
- Screen: 0.010" Slots, 1-inch PVC Schedule 80

BORING METHOD:Direct Push
DRILLED BY:ESN Northwest
BORING BIT DIAMETER2-inch

LOGGED BY:C. Johnson
COMPLETED:6/27/07

NOTES:
PID not functioning on Borings TB-2, TB-3, and TB-5

BORING LOG-ENV CORE & MW 007167 BORINGTB1-5.GPJ DATATMPL.GDT PRINT DATE: 8/10/07.RSD

PBS Engineering + Environmental
1310 Main St.
Vancouver, WA 98660
Phone: (360) 690-4331
Fax: (360) 696-9064

MASON COUNTY TRANSPORTATION
SHELTON, WA

PBS PROJECT NUMBER:
007167.000

BORING TB-5/MW-4

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION AND COMMENTS	GROUND-WATER	HEADSPACE VAPOR (PPM)	SAMPLE NUMBER	SAMPLE	DRIVE/ RECOVERY	WELL INSTALLATION
0		ASPHALT with loose, brown, fine to coarse sand and trace gravels, dry						Start Card/Tag ID# R65249/APF864
		Loose, brown, fine to coarse gravelly SAND with trace silts and cobbles						Expandable locking cap
		2" plug of organic - smelling sandy SILT with trace coarse sand; dry, low plasticity						Hydrated bentonite chips (3/8")
5		Loose, brown, fine SAND with trace medium to coarse gravel and trace cobbles; dry						Riser Pipe: 1-inch PVC Schedule 80
		Loose, brown, sandy GRAVEL with some silt; dry						
10		Loose, brown, fine SAND with some coarse sand, fine gravel and trace silt; moist						10/20 Silica Sand & Native
		Medium dense, brown, sandy fine GRAVEL with some silt; damp	ATD		TB-5-12-14			
15		Loose, brown, sandy fine GRAVEL with some silts; wet						Screen: 0.010" Slots, 1-inch PVC Schedule 80
		Loose, brown, fine to medium SAND with trace silts; wet			MW-4-19			
20		Final depth 20.0 feet below ground surface						
25								
30								
35								
40								

BORING METHOD:Direct Push
DRILLED BY:ESN Northwest
BORING BIT DIAMETER2-inch

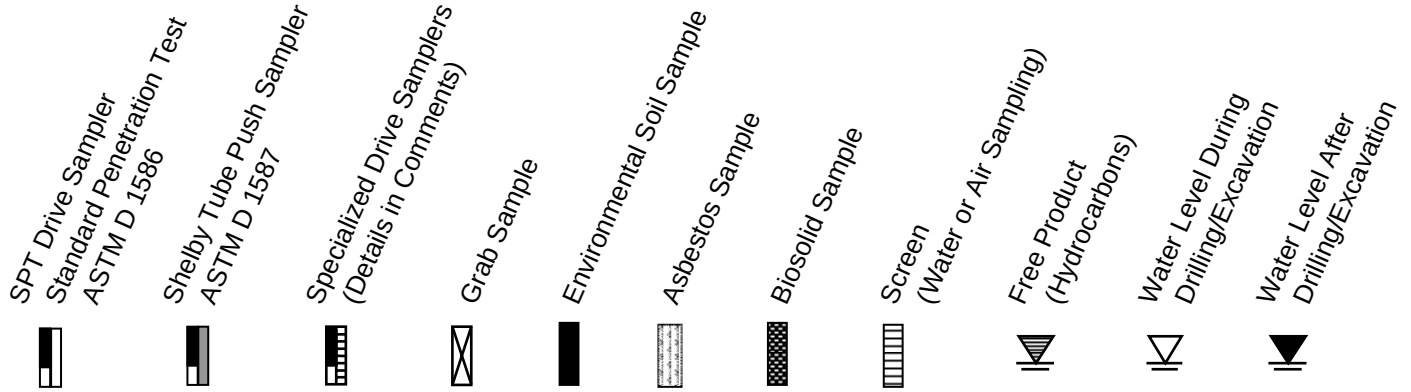
LOGGED BY:C. Johnson
COMPLETED:6/27/07

NOTES:
PID not functioning on Borings TB-2, TB-3, and TB-5

PBS Engineering + Environmental

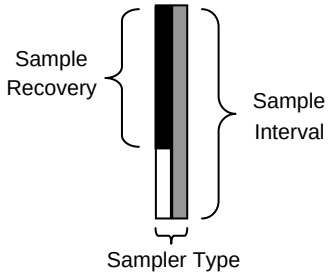
Key To Test Pit and Boring Log Symbols

SAMPLING DESCRIPTIONS

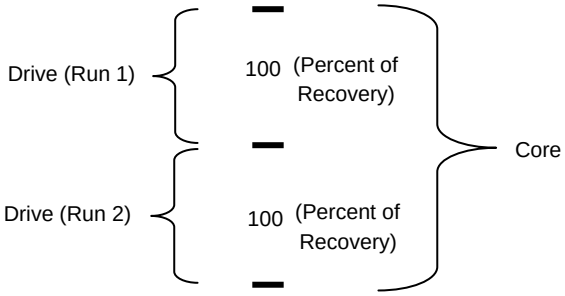


LOG GRAPHICS

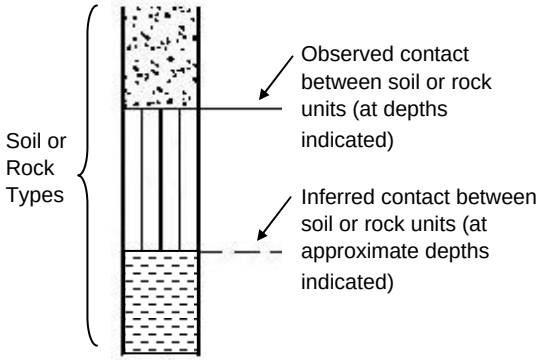
Sampling Symbols



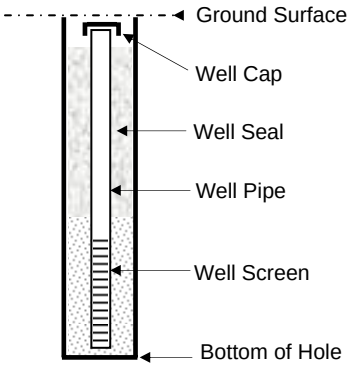
Direct Push, Geoprobe®, Sonic, Vibracore Drilling



Soil and Rock



Well Detail



ENVIRONMENTAL TESTING EXPLANATIONS

ATD	At Time of Drilling	PPM	Parts Per Million
BGS	Below Ground Surface	VOC	Volatile Organic Compounds
MSL	Mean Sea Level	ND	Not Detected
MW	Monitoring Well (Water Sampling)	NS	No Sheen
NWTPH-Gx	Gasoline-Range Petroleum Hydrocarbon Testing	SS	Slight Sheen
OD	Outside Diameter	MS	Moderate Sheen
PID	Photoionization Detector Headspace Analysis	HS	High Sheen

PBS Engineering + Environmental
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Phone: 206.233.9639
Fax: 866.727.0140

MASON COUNTY TRANSPORTATION
3740 SHELTON SPRINGS ROAD
SHELTON, WASHINGTON

PBS PROJECT NUMBER:
41271.002

BORING MW-5

BORING MW-5 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	% RECOVERY/ SAMPLE/ BLOWS	COMMENTS
0.0		GRASS					Flush-mount monument with 3 feet of concrete backfill
		Very fine, brown, very fine SAND with some gravel; dry, no odor		0.2		25 8-24-34	PVC Pipe
4.0							
		Loose, brown, gravelly fine to medium SAND; dry, no odor		0.3		35 9-14-15	Bentonite
8.0		Loose, orange-brown, gravelly medium to coarse SAND; moist, gravels are subrounded to subangular; no odor		0.2	MW5 7.5-9.0	20 24-10-10	10/20 Sand
10.0				0.3		2 8-8-6	
12.0		becomes gravelly; wet					
14.0			Final ▽	0.0		40 8-11-12	
16.0				0.0	MW5 15-16.5	40 6-9-12	PVC Screen
18.0							
20.0						20 6-9-10	
22.0						95 8-9-9	
24.0		Final depth 25.0 feet bgs; monitoring well installed					
26.0							
28.0							
30.0							

BORING METHOD: Hollow-Stem Auger
DRILLED BY: Holocene Drilling Inc.
BORING BIT DIAMETER:

LOGGED BY: M. Nogeire
COMPLETED: 9/04/14

BORING LOG-ENV HSA 41271.002_MW5-6_102014-DRAFT.GPJ DATATMPL.GDT PRINT DATE: 10/21/14 RSD

PBS Engineering + Environmental
2517 Eastlake Avenue East
Suite100
Seattle, Washington 98102
Phone: 206.233.9639
Fax: 866.727.0140

MASON COUNTY TRANSPORTATION
3740 SHELTON SPRINGS ROAD
SHELTON, WASHINGTON

PBS PROJECT NUMBER:
41271.002

BORING MW-6

BORING MW-6 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	% RECOVERY/ SAMPLE/ BLOWS	COMMENTS
0.0		ASPHALT 2 inches thick					Flush-mount monument with 3 feet of concrete backfill
2.0		NO RECOVERY					PVC Pipe
4.0							
6.0		Loose, orange-brown, gravelly medium to coarse SAND; damp, gravel is subrounded to subangular (.5 inch to 2 inches), no odor		0.0		40 0-7-7	Bentonite
8.0				0.2		20 5-4-3	10/20 Sand
10.0		Loose, blackish-brown, fine to medium SAND; wet, no odor grades to moist		0.0	MW-6 10-11.5	20 2-1-1	
12.0		gravel increasing in size (.5 to 3.5 inches); wet	Final ▽	0.1	MW-6 12.5-14	30 6-9-15	
14.0							PVC Screen
16.0		Loose, brown, sandy GRAVEL; wet, gravel is very small to large (up to 3 inches) and subrounded to subangular, no odor		0.0		5-5-10	
18.0				0.0		60 7-10-14	
20.0		Final depth 20.0 feet bgs; monitoring well installed					
22.0							
24.0							
26.0							
28.0							
30.0							

BORING METHOD: Hollow-Stem Auger
DRILLED BY: Holocene Drilling Inc.
BORING BIT DIAMETER:

LOGGED BY: M. Nogeire
COMPLETED: 9/04/14

BORING LOG-ENV HSA 41271.002 MW5-6 102014-DRAFT.GPJ DATATMPL.GDT PRINT DATE: 10/21/14 RSD

APPENDIX II

Groundwater Sampling Forms

PBS	**PBS Engineering and Environmental**	**Project No:**	41271.002
	GROUNDWATER SAMPLING FORM	**Location:**	Mason County Transportation 3740 Shelton Springs Road
		Date:	12/10/2014

Field Personnel:	M. Bagley	**Monitoring Well ID:**	MW3
		Initial DTW (feet bgs):	10.8
Weather Conditions:	Heavy rain	**Screen Interval(feet bgs):**	Unknown
Time:	1126	**Well depth (feet bgs):**	18.91
Sampling method	Low flow - peristaltic pump	**Depth of pump inlet (feet bgs):**	15
Purge Rate (L/m)	1L/3m	**Sample ID**	MW3
GW volume purged (L)	5.0L	**QC sample(s)**	N/A

Purge Rate (L/m)

Elapsed Time (min)	Volume purged (liters)	DTW (feet)	Temperature (C)	Specific Conductivity (ms/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbity*	Observations
3	2	10.8	11.7	0.108	8.04	6.14	122.4	N/A	N/A
6	3	10.8	11.7	0.108	6.36	6.13	120.6	N/A	N/A
9	4	10.8	11.7	0.108	6.40	6.13	119.5	N/A	N/A
12	5	10.8	11.7	0.108	6.30	6.13	119.1	N/A	N/A

* only needed when analyzing for metals - stabalized or less than or equal to 10 NTU

FIELD OBSERVATIONS / NOTES (i.e. well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment functionality)

Well head is missing both screws. Groundwater is clear, good recovery, no sediment, no odor.

PBS	**PBS Engineering and Environmental**	**Project No:**	41271.002
	GROUNDWATER SAMPLING FORM	**Location:**	Mason County Transportation 3740 Shelton Springs Road
		Date:	12/10/2014

Field Personnel:	M. Bagley	**Monitoring Well ID:**	MW4
		Initial DTW (feet bgs):	11.5
Weather Conditions:	Heavy rain	**Screen Interval(feet bgs):**	Unknown
Time:	1158	**Well depth (feet bgs):**	19.24
Sampling method	Low flow - peristaltic pump	**Depth of pump inlet (feet bgs):**	16
Purge Rate (L/m)	1L/3m	**Sample ID**	MW4
GW volume purged (L)	5L	**QC sample(s)**	DUP_12.10.14

Purge Rate (L/m)

Elapsed Time (min)	Volume purged (liters)	DTW (feet)	Temperature (C)	Specific Conductivity (ms/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbity*	Observations
3	2	11.5	11.8	0.103	5.17	6.18	132.0	N/A	N/A
6	3	11.5	11.8	0.103	5.04	6.14	131.7	N/A	N/A
9	4	11.5	11.8	0.103	4.99	6.13	131.5	N/A	N/A
12	5	11.5	11.8	0.103	4.98	6.13	131.7	N/A	N/A

* only needed when analyzing for metals - stabalized or less than or equal to 10 NTU

FIELD OBSERVATIONS / NOTES (i.e. well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment functionality)

Well head is missing one screw. Water in casing was removed prior to opening well. Groundwater is clear, good recovery, no sediment, no odor.

PBS	**PBS Engineering and Environmental**	**Project No:**	41271.002
	GROUNDWATER SAMPLING FORM	**Location:**	Mason County Transportation 3740 Shelton Springs Road
		Date:	12/10/2014

Field Personnel:	M. Bagley	**Monitoring Well ID:**	MW5
		Initial DTW (feet bgs):	12.7
Weather Conditions:	Heavy rain	**Screen Interval(feet bgs):**	10 to 25
Time:	952	**Well depth (feet bgs):**	23.47
Sampling method	Low flow - peristaltic pump	**Depth of pump inlet (feet bgs):**	17
Purge Rate (L/m)	1L/3m	**Sample ID**	MW5
GW volume purged (L)	7L	**QC sample(s)**	N/A

Purge Rate (L/m)

Elapsed Time (min)	Volume purged (liters)	DTW (feet)	Temperature (C)	Specific Conductivity (ms/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbity*	Observations
3	2	12.7	10.9	0.056	7.35	6.32	94.7	N/A	N/A
6	3	12.7	10.8	0.055	7.24	6.25	84.9	N/A	N/A
9	4	12.7	10.9	0.057	7.09	6.20	77.7	N/A	N/A
12	5	12.7	10.8	0.056	6.88	6.13	75.4	N/A	N/A
15	6	12.7	10.9	0.057	6.82	6.00	75.2	N/A	N/A
18	7	12.7	10.8	0.056	6.81	6.05	77.4	N/A	N/A

* only needed when analyzing for metals - stabalized or less than or equal to 10 NTU

FIELD OBSERVATIONS / NOTES (i.e. well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment functionality)

Well head in good condition. Groundwater is clear, good recover, no sediment, no odor.

	PBS Engineering and Environmental	Project No:	41271.002
PBS	GROUNDWATER SAMPLING FORM	Location:	Mason County Transportation 3740 Shelton Springs Road
		Date:	12/10/2014

Field Personnel:	M. Nogeire	**Monitoring Well ID:**	MW6
		Initial DTW (feet bgs):	10.55
Weather Conditions:	Heavy rain	**Screen Interval(feet bgs):**	10 to 20
Time:	1040	**Well depth (feet bgs):**	19.22
Sampling method	Low flow - peristaltic pump	**Depth of pump inlet (feet bgs):**	15
Purge Rate (L/m)	1L/3m	**Sample ID**	MW6
GW volume purged (L)	5L	**QC sample(s)**	N/A

Purge Rate (L/m)

Elapsed Time (min)	Volume purged (liters)	DTW (feet)	Temperature (C)	Specific Conductivity (ms/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbity*	Observations
3	2	10.55	12.0	0.108	5.75	6.10	103.4	N/A	N/A
6	3	10.55	12.0	0.107	5.01	6.09	101.4	N/A	N/A
9	4	10.55	12.0	0.107	4.90	6.12	98.4	N/A	N/A
12	5	10.55	12.0	0.107	4.90	6.12	97.7	N/A	N/A

* only needed when analyzing for metals - stabalized or less than or equal to 10 NTU

FIELD OBSERVATIONS / NOTES (i.e. well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment functionality)

Well head in good condition. Groundwater is clear, good recovery, no sediment, no odor.

APPENDIX III

Well Surveyor's Report

-CONSTRUCTION SERVICES
-TOPOGRAPHIC MAPPING
-ENGINEERING DATA COLLECTION
-LAND SURVEYS AND SUBDIVISIONS

CON SERVE INC.
LAND SURVEYING

P. O. BOX 1611
PORT ORCHARD, WA 98366

TEL (360) 874 - 9031
FAX (360) 874 - 9032

TO: - PBS Engineering,

ATTN: - Megan Nogeire

RE; - Shelton Bus Barn (PBS Project 41271.002)

ENC: - Well Site Survey Data

Site Data collected November 5, 2014

GPS observation (Lat/Long) and ground ties (vertical relationship)

ON-SITE BENCH MARK (PK nail in pavement) Based on NAVD '88

TBM-North: **LAT-** 47°14'13.5471" **LONG-** 123°07'14.7205" **ELEV-** 236.25'

TBM-South: **LAT-** 47°14'12.9378" **LONG-** 123°07'12.3603" **ELEV-**236.28'

MONITOR WELL	LATITUDE	LONGITUDE	CASING ELEV.	PIPE ELEV.
MW-2	N47°14'13.2500"	W123°07'13.8725"	236.66'	236.20'
MW-3	N47°14'13.6161"	W123°07'13.6771"	236.50'	236.21'
MW-4	N47°14'13.0110"	W123°07'13.2413"	236.75'	236.35'
MW-5	N47°14'12.2753"	W123°07'13.4236"	238.18'	237.87'
MW-6	N47°14'13.0765"	W123°07'14.4826"	236.15'	235.92'

David S. Proctor, PLS

APPENDIX IV

Laboratory Reports and
Chain-of-Custody Documentation

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

PBS Engineering & Environmental
Megan Nogeire
2517 Eastlake Ave, E #100
Seattle, WA 98102

RE: 41271.002
Lab ID: 1412129

December 16, 2014

Attention Megan Nogeire:

Fremont Analytical, Inc. received 6 sample(s) on 12/10/2014 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Gasoline by NWTPH-Gx
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)
Volatile Organic Compounds by EPA Method 8260

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Chelsea Ward
Project Manager

Date: *12/16/2014*

CLIENT: PBS Engineering & Environmental
Project: 41271.002
Lab Order: 1412129

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1412129-001	MW-3	12/10/2014 11:26 AM	12/10/2014 3:45 PM
1412129-002	MW-4	12/10/2014 11:58 AM	12/10/2014 3:45 PM
1412129-003	MW-5	12/10/2014 9:52 AM	12/10/2014 3:45 PM
1412129-004	MW-6	12/10/2014 10:40 AM	12/10/2014 3:45 PM
1412129-005	DUP 12.10.14	12/10/2014 12:00 AM	12/10/2014 3:45 PM
1412129-006	Trip Blank	12/08/2014 9:30 AM	12/10/2014 3:45 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1412129**
Date: **12/16/2014**

CLIENT: PBS Engineering & Environmental
Project: 41271.002

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Analytical Report

WO#: **1412129**

Date Reported: **12/16/2014**

Client: PBS Engineering & Environmental

Collection Date: 12/10/2014 11:26:00 AM

Project: 41271.002

Lab ID: 1412129-001

Matrix: Groundwater

Client Sample ID: MW-3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 9557		Analyst: EC
Diesel (Fuel Oil)	ND	50.0		µg/L	1	12/12/2014 3:07:00 PM
Heavy Oil	ND	100		µg/L	1	12/12/2014 3:07:00 PM
Surr: 2-Fluorobiphenyl	71.1	50-150		%REC	1	12/12/2014 3:07:00 PM
Surr: o-Terphenyl	77.1	50-150		%REC	1	12/12/2014 3:07:00 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 9554		Analyst: NG
Naphthalene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
2-Methylnaphthalene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
1-Methylnaphthalene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Acenaphthylene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Acenaphthene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Fluorene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Phenanthrene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Anthracene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Fluoranthene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Pyrene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Benz(a)anthracene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Chrysene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Benzo(b)fluoranthene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Benzo(k)fluoranthene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Benzo(a)pyrene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	12/15/2014 9:44:00 PM
Surr: 2-Fluorobiphenyl	65.4	23.9-122		%REC	1	12/15/2014 9:44:00 PM
Surr: Terphenyl-d14	79.1	33.4-135		%REC	1	12/15/2014 9:44:00 PM
Gasoline by NWTPH-Gx				Batch ID: R18583		Analyst: BC
Gasoline	ND	50.0		µg/L	1	12/12/2014 6:32:00 PM
Surr: 4-Bromofluorobenzene	99.5	65-135		%REC	1	12/12/2014 6:32:00 PM
Surr: Toluene-d8	98.7	65-135		%REC	1	12/12/2014 6:32:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1412129**

Date Reported: **12/16/2014**

Client: PBS Engineering & Environmental

Collection Date: 12/10/2014 11:26:00 AM

Project: 41271.002

Lab ID: 1412129-001

Matrix: Groundwater

Client Sample ID: MW-3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: R18582		Analyst: BC
Benzene	ND	1.00		µg/L	1	12/12/2014 6:32:00 PM
Toluene	ND	1.00		µg/L	1	12/12/2014 6:32:00 PM
Ethylbenzene	ND	1.00		µg/L	1	12/12/2014 6:32:00 PM
m,p-Xylene	ND	1.00		µg/L	1	12/12/2014 6:32:00 PM
o-Xylene	ND	1.00		µg/L	1	12/12/2014 6:32:00 PM
Surr: Dibromofluoromethane	96.5	61.7-130		%REC	1	12/12/2014 6:32:00 PM
Surr: Toluene-d8	99.6	40.1-139		%REC	1	12/12/2014 6:32:00 PM
Surr: 1-Bromo-4-fluorobenzene	99.5	76.2-130		%REC	1	12/12/2014 6:32:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1412129**

Date Reported: **12/16/2014**

Client: PBS Engineering & Environmental

Collection Date: 12/10/2014 11:58:00 AM

Project: 41271.002

Lab ID: 1412129-002

Matrix: Groundwater

Client Sample ID: MW-4

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 9557		Analyst: EC
Diesel (Fuel Oil)	ND	50.0		µg/L	1	12/12/2014 3:39:00 PM
Heavy Oil	ND	100		µg/L	1	12/12/2014 3:39:00 PM
Surr: 2-Fluorobiphenyl	59.2	50-150		%REC	1	12/12/2014 3:39:00 PM
Surr: o-Terphenyl	68.0	50-150		%REC	1	12/12/2014 3:39:00 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 9554		Analyst: NG
Naphthalene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
2-Methylnaphthalene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
1-Methylnaphthalene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Acenaphthylene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Acenaphthene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Fluorene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Phenanthrene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Anthracene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Fluoranthene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Pyrene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Benz(a)anthracene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Chrysene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Benzo(b)fluoranthene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Benzo(k)fluoranthene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Benzo(a)pyrene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	12/15/2014 10:09:00 PM
Surr: 2-Fluorobiphenyl	74.6	23.9-122		%REC	1	12/15/2014 10:09:00 PM
Surr: Terphenyl-d14	90.7	33.4-135		%REC	1	12/15/2014 10:09:00 PM
Gasoline by NWTPH-Gx				Batch ID: R18583		Analyst: BC
Gasoline	ND	50.0		µg/L	1	12/12/2014 7:25:00 PM
Surr: 4-Bromofluorobenzene	101	65-135		%REC	1	12/12/2014 7:25:00 PM
Surr: Toluene-d8	98.5	65-135		%REC	1	12/12/2014 7:25:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1412129**

Date Reported: **12/16/2014**

Client: PBS Engineering & Environmental

Collection Date: 12/10/2014 11:58:00 AM

Project: 41271.002

Lab ID: 1412129-002

Matrix: Groundwater

Client Sample ID: MW-4

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: R18582		Analyst: BC
Benzene	ND	1.00		µg/L	1	12/12/2014 7:25:00 PM
Toluene	ND	1.00		µg/L	1	12/12/2014 7:25:00 PM
Ethylbenzene	ND	1.00		µg/L	1	12/12/2014 7:25:00 PM
m,p-Xylene	ND	1.00		µg/L	1	12/12/2014 7:25:00 PM
o-Xylene	ND	1.00		µg/L	1	12/12/2014 7:25:00 PM
Surr: Dibromofluoromethane	98.8	61.7-130		%REC	1	12/12/2014 7:25:00 PM
Surr: Toluene-d8	100	40.1-139		%REC	1	12/12/2014 7:25:00 PM
Surr: 1-Bromo-4-fluorobenzene	101	76.2-130		%REC	1	12/12/2014 7:25:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1412129**

Date Reported: **12/16/2014**

Client: PBS Engineering & Environmental

Collection Date: 12/10/2014 9:52:00 AM

Project: 41271.002

Lab ID: 1412129-003

Matrix: Groundwater

Client Sample ID: MW-5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 9557		Analyst: EC
Diesel (Fuel Oil)	ND	50.0		µg/L	1	12/12/2014 4:10:00 PM
Heavy Oil	ND	100		µg/L	1	12/12/2014 4:10:00 PM
Surr: 2-Fluorobiphenyl	66.8	50-150		%REC	1	12/12/2014 4:10:00 PM
Surr: o-Terphenyl	73.5	50-150		%REC	1	12/12/2014 4:10:00 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 9554		Analyst: NG
Naphthalene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
2-Methylnaphthalene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
1-Methylnaphthalene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Acenaphthylene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Acenaphthene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Fluorene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Phenanthrene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Anthracene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Fluoranthene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Pyrene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Benz(a)anthracene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Chrysene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Benzo(b)fluoranthene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Benzo(k)fluoranthene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Benzo(a)pyrene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	12/15/2014 10:33:00 PM
Surr: 2-Fluorobiphenyl	82.9	23.9-122		%REC	1	12/15/2014 10:33:00 PM
Surr: Terphenyl-d14	92.2	33.4-135		%REC	1	12/15/2014 10:33:00 PM
Gasoline by NWTPH-Gx				Batch ID: R18583		Analyst: BC
Gasoline	ND	50.0		µg/L	1	12/12/2014 7:52:00 PM
Surr: 4-Bromofluorobenzene	100	65-135		%REC	1	12/12/2014 7:52:00 PM
Surr: Toluene-d8	99.0	65-135		%REC	1	12/12/2014 7:52:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1412129**

Date Reported: **12/16/2014**

Client: PBS Engineering & Environmental

Collection Date: 12/10/2014 9:52:00 AM

Project: 41271.002

Lab ID: 1412129-003

Matrix: Groundwater

Client Sample ID: MW-5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: R18582		Analyst: BC
Benzene	ND	1.00		µg/L	1	12/12/2014 7:52:00 PM
Toluene	ND	1.00		µg/L	1	12/12/2014 7:52:00 PM
Ethylbenzene	ND	1.00		µg/L	1	12/12/2014 7:52:00 PM
m,p-Xylene	ND	1.00		µg/L	1	12/12/2014 7:52:00 PM
o-Xylene	ND	1.00		µg/L	1	12/12/2014 7:52:00 PM
Surr: Dibromofluoromethane	98.1	61.7-130		%REC	1	12/12/2014 7:52:00 PM
Surr: Toluene-d8	103	40.1-139		%REC	1	12/12/2014 7:52:00 PM
Surr: 1-Bromo-4-fluorobenzene	101	76.2-130		%REC	1	12/12/2014 7:52:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1412129**

Date Reported: **12/16/2014**

Client: PBS Engineering & Environmental

Collection Date: 12/10/2014 10:40:00 AM

Project: 41271.002

Lab ID: 1412129-004

Matrix: Groundwater

Client Sample ID: MW-6

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 9557		Analyst: EC
Diesel (Fuel Oil)	ND	50.0		µg/L	1	12/12/2014 4:41:00 PM
Heavy Oil	ND	100		µg/L	1	12/12/2014 4:41:00 PM
Surr: 2-Fluorobiphenyl	70.5	50-150		%REC	1	12/12/2014 4:41:00 PM
Surr: o-Terphenyl	76.7	50-150		%REC	1	12/12/2014 4:41:00 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 9554		Analyst: NG
Naphthalene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
2-Methylnaphthalene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
1-Methylnaphthalene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Acenaphthylene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Acenaphthene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Fluorene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Phenanthrene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Anthracene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Fluoranthene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Pyrene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Benz(a)anthracene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Chrysene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Benzo(b)fluoranthene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Benzo(k)fluoranthene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Benzo(a)pyrene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	12/15/2014 10:57:00 PM
Surr: 2-Fluorobiphenyl	73.9	23.9-122		%REC	1	12/15/2014 10:57:00 PM
Surr: Terphenyl-d14	90.1	33.4-135		%REC	1	12/15/2014 10:57:00 PM
Gasoline by NWTPH-Gx				Batch ID: R18583		Analyst: BC
Gasoline	ND	50.0		µg/L	1	12/12/2014 8:19:00 PM
Surr: 4-Bromofluorobenzene	96.7	65-135		%REC	1	12/12/2014 8:19:00 PM
Surr: Toluene-d8	97.8	65-135		%REC	1	12/12/2014 8:19:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1412129**

Date Reported: **12/16/2014**

Client: PBS Engineering & Environmental

Collection Date: 12/10/2014 10:40:00 AM

Project: 41271.002

Lab ID: 1412129-004

Matrix: Groundwater

Client Sample ID: MW-6

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: R18582		Analyst: BC
Benzene	ND	1.00		µg/L	1	12/12/2014 8:19:00 PM
Toluene	ND	1.00		µg/L	1	12/12/2014 8:19:00 PM
Ethylbenzene	ND	1.00		µg/L	1	12/12/2014 8:19:00 PM
m,p-Xylene	ND	1.00		µg/L	1	12/12/2014 8:19:00 PM
o-Xylene	ND	1.00		µg/L	1	12/12/2014 8:19:00 PM
Surr: Dibromofluoromethane	97.9	61.7-130		%REC	1	12/12/2014 8:19:00 PM
Surr: Toluene-d8	102	40.1-139		%REC	1	12/12/2014 8:19:00 PM
Surr: 1-Bromo-4-fluorobenzene	96.7	76.2-130		%REC	1	12/12/2014 8:19:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1412129**

Date Reported: **12/16/2014**

Client: PBS Engineering & Environmental

Collection Date: 12/10/2014

Project: 41271.002

Lab ID: 1412129-005

Matrix: Groundwater

Client Sample ID: DUP 12.10.14

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: R18582		Analyst: BC
Benzene	ND	1.00		µg/L	1	12/12/2014 8:46:00 PM
Toluene	ND	1.00		µg/L	1	12/12/2014 8:46:00 PM
Ethylbenzene	ND	1.00		µg/L	1	12/12/2014 8:46:00 PM
m,p-Xylene	ND	1.00		µg/L	1	12/12/2014 8:46:00 PM
o-Xylene	ND	1.00		µg/L	1	12/12/2014 8:46:00 PM
Surr: Dibromofluoromethane	96.1	61.7-130		%REC	1	12/12/2014 8:46:00 PM
Surr: Toluene-d8	96.9	40.1-139		%REC	1	12/12/2014 8:46:00 PM
Surr: 1-Bromo-4-fluorobenzene	102	76.2-130		%REC	1	12/12/2014 8:46:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1412129**

Date Reported: **12/16/2014**

Client: PBS Engineering & Environmental

Collection Date: 12/8/2014 9:30:00 AM

Project: 41271.002

Lab ID: 1412129-006

Matrix: Groundwater

Client Sample ID: Trip Blank

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: R18582		Analyst: BC
Benzene	ND	1.00		µg/L	1	12/12/2014 5:38:00 PM
Toluene	ND	1.00		µg/L	1	12/12/2014 5:38:00 PM
Ethylbenzene	ND	1.00		µg/L	1	12/12/2014 5:38:00 PM
m,p-Xylene	ND	1.00		µg/L	1	12/12/2014 5:38:00 PM
o-Xylene	ND	1.00		µg/L	1	12/12/2014 5:38:00 PM
Surr: Dibromofluoromethane	99.4	61.7-130		%REC	1	12/12/2014 5:38:00 PM
Surr: Toluene-d8	102	40.1-139		%REC	1	12/12/2014 5:38:00 PM
Surr: 1-Bromo-4-fluorobenzene	96.4	76.2-130		%REC	1	12/12/2014 5:38:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1412129
CLIENT: PBS Engineering & Environmental
Project: 41271.002

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: **MB-9557**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/11/2014**		RunNo: **18562**			
Client ID: **MBLKW**	Batch ID: **9557**					Analysis Date: **12/12/2014**		SeqNo: **370195**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	50.0									
Heavy Oil	ND	100									
Surr: 2-Fluorobiphenyl	50.0		80.00		62.5	50	150				
Surr: o-Terphenyl	54.6		80.00		68.2	50	150				

Sample ID: **LCS-9557**	SampType: **LCS**			Units: **µg/L**		Prep Date: **12/11/2014**		RunNo: **18562**			
Client ID: **LCSW**	Batch ID: **9557**					Analysis Date: **12/12/2014**		SeqNo: **370347**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	908	50.0	1,000	0	90.8	65	135				
Surr: 2-Fluorobiphenyl	52.4		80.00		65.5	50	150				
Surr: o-Terphenyl	53.4		80.00		66.8	50	150				

Sample ID: **1412140-001BDUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **12/11/2014**		RunNo: **18562**			
Client ID: **BATCH**	Batch ID: **9557**					Analysis Date: **12/12/2014**		SeqNo: **370603**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	50.0						0		30	
Heavy Oil	ND	100						0		30	
Surr: 2-Fluorobiphenyl	49.1		80.00		61.4	50	150		0		
Surr: o-Terphenyl	51.5		80.00		64.4	50	150		0		

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1412129
CLIENT: PBS Engineering & Environmental
Project: 41271.002

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **1412103-031BMS** SampType: **MS** Units: **µg/L** Prep Date: **12/11/2014** RunNo: **18620**
Client ID: **BATCH** Batch ID: **9554** Analysis Date: **12/15/2014** SeqNo: **371389**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	3.36	0.100	4.000	0.8690	62.2	31.2	104				
2-Methylnaphthalene	2.72	0.100	4.000	0.1454	64.5	33.9	109				
1-Methylnaphthalene	2.64	0.100	4.000	0.09782	63.7	33.2	110				
Acenaphthylene	2.49	0.100	4.000	0	62.2	40.5	98.7				
Acenaphthene	3.19	0.100	4.000	0.5970	64.9	30.6	117				
Fluorene	2.95	0.100	4.000	0	73.6	35.2	99.1				
Phenanthrene	2.97	0.100	4.000	0	74.2	42.7	111				
Anthracene	2.09	0.100	4.000	0	52.2	43.9	103				
Fluoranthene	3.05	0.100	4.000	0	76.2	56.1	115				
Pyrene	2.92	0.100	4.000	0	72.9	44.2	134				
Benz(a)anthracene	2.53	0.100	4.000	0	63.2	50.4	128				
Chrysene	2.71	0.100	4.000	0	67.7	41.4	118				
Benzo(b)fluoranthene	2.95	0.100	4.000	0	73.8	50.8	121				
Benzo(k)fluoranthene	2.35	0.100	4.000	0	58.8	43.4	113				
Benzo(a)pyrene	2.54	0.100	4.000	0	63.5	40.8	128				
Indeno(1,2,3-cd)pyrene	2.47	0.100	4.000	0	61.7	29.5	126				
Dibenz(a,h)anthracene	2.56	0.100	4.000	0	63.9	31.4	120				
Benzo(g,h,i)perylene	2.52	0.100	8.000	0	31.5	30	116				
Surr: 2-Fluorobiphenyl	1.44		2.000		71.8	23.9	122				
Surr: Terphenyl-d14	1.56		2.000		78.2	33.4	135				

Sample ID: **MB-9554** SampType: **MBLK** Units: **µg/L** Prep Date: **12/11/2014** RunNo: **18620**
Client ID: **MBLKW** Batch ID: **9554** Analysis Date: **12/13/2014** SeqNo: **371401**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	0.100									
2-Methylnaphthalene	ND	0.100									
1-Methylnaphthalene	ND	0.100									

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1412129
CLIENT: PBS Engineering & Environmental
Project: 41271.002

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **MB-9554** SampType: **MBLK** Units: **µg/L** Prep Date: **12/11/2014** RunNo: **18620**
Client ID: **MBLKW** Batch ID: **9554** Analysis Date: **12/13/2014** SeqNo: **371401**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthylene	ND	0.100									
Acenaphthene	ND	0.100									
Fluorene	ND	0.100									
Phenanthrene	ND	0.100									
Anthracene	ND	0.100									
Fluoranthene	ND	0.100									
Pyrene	ND	0.100									
Benz(a)anthracene	ND	0.100									
Chrysene	ND	0.100									
Benzo(b)fluoranthene	ND	0.100									
Benzo(k)fluoranthene	ND	0.100									
Benzo(a)pyrene	ND	0.100									
Indeno(1,2,3-cd)pyrene	ND	0.100									
Dibenz(a,h)anthracene	ND	0.100									
Benzo(g,h,i)perylene	ND	0.100									
Surr: 2-Fluorobiphenyl	1.52		2.000		76.2	23.9	122				
Surr: Terphenyl-d14	1.70		2.000		85.2	33.4	135				

Sample ID: **LCS-9554** SampType: **LCS** Units: **µg/L** Prep Date: **12/11/2014** RunNo: **18620**
Client ID: **LCSW** Batch ID: **9554** Analysis Date: **12/13/2014** SeqNo: **371402**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	2.45	0.100	4.000	0	61.4	13.7	121				
2-Methylnaphthalene	2.46	0.100	4.000	0	61.4	35.4	110				
1-Methylnaphthalene	2.44	0.100	4.000	0	61.0	37.5	116				
Acenaphthylene	2.54	0.100	4.000	0	63.6	39.2	114				
Acenaphthene	2.68	0.100	4.000	0	67.1	37	113				
Fluorene	2.78	0.100	4.000	0	69.4	40.3	117				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1412129
CLIENT: PBS Engineering & Environmental
Project: 41271.002

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **LCS-9554** SampType: **LCS** Units: **µg/L** Prep Date: **12/11/2014** RunNo: **18620**
Client ID: **LCSW** Batch ID: **9554** Analysis Date: **12/13/2014** SeqNo: **371402**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenanthrene	2.83	0.100	4.000	0	70.7	35.1	118				
Anthracene	2.77	0.100	4.000	0	69.2	45.4	115				
Fluoranthene	2.93	0.100	4.000	0	73.4	49.7	126				
Pyrene	2.89	0.100	4.000	0	72.3	48.1	123				
Benz(a)anthracene	2.94	0.100	4.000	0	73.4	48.7	126				
Chrysene	2.94	0.100	4.000	0	73.5	45.1	114				
Benzo(b)fluoranthene	3.17	0.100	4.000	0	79.2	52.2	126				
Benzo(k)fluoranthene	3.17	0.100	4.000	0	79.2	45.5	121				
Benzo(a)pyrene	3.14	0.100	4.000	0	78.5	38.4	121				
Indeno(1,2,3-cd)pyrene	2.87	0.100	4.000	0	71.8	23.9	143				
Dibenz(a,h)anthracene	2.92	0.100	4.000	0	73.0	24.9	141				
Benzo(g,h,i)perylene	2.64	0.100	4.000	0	66.0	35.9	139				
Surr: 2-Fluorobiphenyl	1.41		2.000		70.6	23.9	122				
Surr: Terphenyl-d14	1.66		2.000		83.1	33.4	135				

Sample ID: **1412103-030BDUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/11/2014** RunNo: **18620**
Client ID: **BATCH** Batch ID: **9554** Analysis Date: **12/13/2014** SeqNo: **371404**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	2.39	0.100						2.287	4.33	30	
2-Methylnaphthalene	0.532	0.100						0.5053	5.08	30	
1-Methylnaphthalene	0.328	0.100						0.3177	3.33	30	
Acenaphthylene	ND	0.100						0		30	
Acenaphthene	0.414	0.100						0.4059	1.93	30	
Fluorene	0.286	0.100						0.2769	3.19	30	
Phenanthrene	0.512	0.100						0.4126	21.5	30	
Anthracene	ND	0.100						0		30	
Fluoranthene	0.208	0.100						0.1096	62.2	30	

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Date: *12/16/2014*

Work Order: 1412129
CLIENT: PBS Engineering & Environmental
Project: 41271.002

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: **1412103-030BDUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/11/2014** RunNo: **18620**
Client ID: **BATCH** Batch ID: **9554** Analysis Date: **12/13/2014** SeqNo: **371404**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Pyrene	0.193	0.100						0.08120	81.4	30	R
Benz(a)anthracene	ND	0.100						0		30	
Chrysene	ND	0.100						0		30	
Benzo(b)fluoranthene	ND	0.100						0		30	
Benzo(k)fluoranthene	ND	0.100						0		30	
Benzo(a)pyrene	ND	0.100						0		30	
Indeno(1,2,3-cd)pyrene	ND	0.100						0		30	
Dibenz(a,h)anthracene	ND	0.100						0		30	
Benzo(g,h,i)perylene	ND	0.100						0		30	
Surr: 2-Fluorobiphenyl	1.44		2.000		72.2	23.9	122		0		
Surr: Terphenyl-d14	1.50		2.000		75.2	33.4	135		0		

NOTES:
R - High RPD observed. The method is in control as indicated by the Laboratory Control Sample (LCS).

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Date: *12/16/2014*

Work Order: 1412129
CLIENT: PBS Engineering & Environmental
Project: 41271.002

QC SUMMARY REPORT

Gasoline by NWTPH-Gx

Sample ID: **1412129-001CDUP**	SampType: **DUP**	Units: **µg/L**	Prep Date: **12/12/2014**	RunNo: **18583**
Client ID: **MW-3**	Batch ID: **R18583**		Analysis Date: **12/12/2014**	SeqNo: **370658**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	50.0						0		30	
Surr: Toluene-d8	49.1		50.00		98.2	65	135		0	0	
Surr: 4-Bromofluorobenzene	50.9		50.00		102	65	135		0	0	

Sample ID: **MB-R18583**	SampType: **MBLK**	Units: **µg/L**	Prep Date: **12/12/2014**	RunNo: **18583**
Client ID: **MBLKW**	Batch ID: **R18583**		Analysis Date: **12/12/2014**	SeqNo: **370673**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	50.0									
Surr: Toluene-d8	49.6		50.00		99.1	65	135				
Surr: 4-Bromofluorobenzene	50.2		50.00		100	65	135				

Sample ID: **LCS-R18583**	SampType: **LCS**	Units: **µg/L**	Prep Date: **12/12/2014**	RunNo: **18583**
Client ID: **LCSW**	Batch ID: **R18583**		Analysis Date: **12/12/2014**	SeqNo: **370674**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	368	50.0	500.0	0	73.6	65	135				
Surr: Toluene-d8	48.4		50.00		96.8	65	135				
Surr: 4-Bromofluorobenzene	49.4		50.00		98.7	65	135				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1412129
CLIENT: PBS Engineering & Environmental
Project: 41271.002

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260

Sample ID: **1412129-001CDUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/12/2014** RunNo: **18582**
Client ID: **MW-3** Batch ID: **R18582** Analysis Date: **12/12/2014** SeqNo: **370640**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	1.00						0		30	
Toluene	ND	1.00						0		30	
Ethylbenzene	ND	1.00						0		30	
m,p-Xylene	ND	1.00						0		30	
o-Xylene	ND	1.00						0		30	
Surr: Dibromofluoromethane	49.2		50.00		98.3	61.7	130		0		
Surr: Toluene-d8	49.6		50.00		99.3	40.1	139		0		
Surr: 1-Bromo-4-fluorobenzene	51.0		50.00		102	76.2	130		0		

Sample ID: **1412129-005AMS** SampType: **MS** Units: **µg/L** Prep Date: **12/12/2014** RunNo: **18582**
Client ID: **DUP 12.10.14** Batch ID: **R18582** Analysis Date: **12/12/2014** SeqNo: **370645**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	17.0	1.00	20.00	0	84.8	65.4	138				
Toluene	18.4	1.00	20.00	0	92.2	64	139				
Ethylbenzene	17.6	1.00	20.00	0	87.8	64.5	136				
m,p-Xylene	35.3	1.00	40.00	0	88.2	63.3	135				
o-Xylene	17.0	1.00	20.00	0	85.0	65.4	134				
Surr: Dibromofluoromethane	50.3		50.00		101	61.7	130				
Surr: Toluene-d8	50.7		50.00		101	40.1	139				
Surr: 1-Bromo-4-fluorobenzene	49.8		50.00		99.7	76.2	130				

Sample ID: **LCS-R18582** SampType: **LCS** Units: **µg/L** Prep Date: **12/12/2014** RunNo: **18582**
Client ID: **LCSW** Batch ID: **R18582** Analysis Date: **12/12/2014** SeqNo: **370654**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	19.2	1.00	20.00	0	95.9	69.3	132				
Toluene	20.0	1.00	20.00	0	99.9	61.3	145				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1412129
CLIENT: PBS Engineering & Environmental
Project: 41271.002

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260

Sample ID: **LCS-R18582** SampType: **LCS** Units: **µg/L** Prep Date: **12/12/2014** RunNo: **18582**
Client ID: **LCSW** Batch ID: **R18582** Analysis Date: **12/12/2014** SeqNo: **370654**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ethylbenzene	20.0	1.00	20.00	0	100	72	130				
m,p-Xylene	39.4	1.00	40.00	0	98.6	73	131				
o-Xylene	18.9	1.00	20.00	0	94.6	72.1	131				
Surr: Dibromofluoromethane	49.1		50.00		98.2	61.7	130				
Surr: Toluene-d8	50.7		50.00		101	40.1	139				
Surr: 1-Bromo-4-fluorobenzene	50.2		50.00		100	76.2	130				

Sample ID: **MB-R18582** SampType: **MBLK** Units: **µg/L** Prep Date: **12/12/2014** RunNo: **18582**
Client ID: **MBLKW** Batch ID: **R18582** Analysis Date: **12/12/2014** SeqNo: **370655**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	1.00									
Toluene	ND	1.00									
Ethylbenzene	ND	1.00									
m,p-Xylene	ND	1.00									
o-Xylene	ND	1.00									
Surr: Dibromofluoromethane	48.0		50.00		96.1	61.7	130				
Surr: Toluene-d8	49.0		50.00		98.1	40.1	139				
Surr: 1-Bromo-4-fluorobenzene	50.2		50.00		100	76.2	130				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Sample Log-In Check List

Client Name:	**PBS**	Work Order Number:	**1412129**
Logged by:	**Erica Silva**	Date Received:	**12/10/2014 3:45:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Client		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all coolers received at a temperature of >0°C to 10.0°C	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is the headspace in the VOA vials?	Yes ☐	No ☑	NA ☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified:		Date:	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

19. Additional remarks:

Item Information

Item #	Temp ºC	Condition
Cooler	8.8	Good
Sample	11.2	
Temp Blank	11.1	

Fremont Analytical

Chain of Custody Record

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (internal): 1412129

Date: 12/10/14

Page: 1 of: 1

Client: PBS

Address: 2517 Eastlake Ave

City, State, Zip: Seattle, WA 98102 Tel: 206.233.9639

Reports To (PM): M. Nogaire Fax:

Project Name: 41271.002

Location:

Collected by: M. Bagley

Email: megan.nogaire@pbsenv.com Project No:

*Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, WW = Waste Water

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (EPA 8260)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SEMI VOL (EPA 8270)	PAH (EPA 8270 - SIM)	PCBs (EPA 8082)	Metals** (6020 / 200.8)	Total (T) | Dissolved (D)	Anions (IC)***	EDB (8011)	Comments/Depth
1	MW-3	12/10	11:26	GW			X	X		X		X						
2	MW-4	12/10	11:58	"			X	X		X		X						
3	MW-5	12/10	9:52	"			X	X		X		X						
4	MW-6	12/10	10:40	"			X	X		X		X						
5	DUP 12.10.14	12/10	—	"			X											
6	Trip Blank	12/10	09:30	"			X											
7																		
8																		
9																		
10																		

**Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Special Remarks:

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Relinquished	Date/Time	Received	Date/Time
x [signature], PBS	12/10/14, 3.45	x [signature]	12/10/14 3:45 PM
Relinquished	Date/Time	Received	Date/Time
x			

TAT -> SameDay^ NextDay^ 2 Day 3 Day STD

^Please coordinate with the lab in advance

Distribution: White - Lab, Yellow - File, Pink - Originator