PBS | Engineering + Environmental Est. 1982

Groundwater Monitoring Report
July 2015 Event

VCP # 0579

3740 Shelton Springs Road
Shelton, Washington

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

August 2015
Project No. 41271.002

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1.0 INTRODUCTION

PBS Engineering and Environmental Inc. (PBS) completed the July 2015 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 July 2015 groundwater sampling event represents the fourth and final consecutive quarterly-annual 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 between approximately 600 and 1,000 cubic yards of diesel contaminated soil from the excavation and aerated the soil material on-site in 1995. New double-walled fiberglass tanks were installed. Some diesel impacted soils were left in place beneath the pump island and to the north of the excavation towards the maintenance office building. These locations were deemed inaccessible due to site structures.

As required by Ecology, in June 2007, a total of five borings were drilled with two of the borings completed as groundwater monitoring wells (MW3 and MW4). These two wells were installed to supplement two existing monitoring wells (MW1 and MW2) that were installed at an unknown time. 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 September 2014, two additional monitoring wells were installed on the project site. The first well (MW5) was advanced along Shelton Springs Road to capture down gradient groundwater flow. The second well (MW6) was advanced near the western portion of the existing underground storage tank basin and dispenser area, to replace MW1. The well installation and sampling results were presented in the Well Installation and Groundwater Sampling Report, PBS, dated October 2014.

The second quarter groundwater sampling was completed in December 2014. All wells (MW3 to MW6) were sampled with the exception of MW2, which did not have sufficient water to sample. The analyzed groundwater samples indicated no contaminant concentrations above the laboratory MRL or the adopted regulatory cleanup levels.

The third quarter groundwater sampling was completed March 4, 2015. All wells (MW2 to MW6) were sampled. The analyzed groundwater samples indicated no contaminant concentrations above the laboratory MRL or adopted regulatory cleanup levels.

3.0 SITE INVESTIGATIONS

Groundwater Monitoring Event

The July 2015 Groundwater Monitoring Event (GME) was conducted on July 23, 2015, and included the sampling of five on site groundwater monitoring wells (MW2 through MW6). 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

Monitoring Well Identification	Installation Date	Screened Interval (feet bgs)	Well Depth (feet bgs)
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 13.22 feet below top of casing (fbTOC) in MW6 to 15.31 fbTOC in MW5.

Groundwater purging and sampling was conducted using a peristaltic pump, employing low flow sampling methodology with pumping rates not exceeding 0.2 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 to 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 lower in the wells sampled during this monitoring period, as compared to the prior monitoring period. The water elevations, which were approximately 2.8 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 southeast. Groundwater elevation data from the October/December 2014/March 2015 and July 2015 sampling events,

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 were 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_7.23.2015) from MW4 was analyzed for BTEX. Results from both samples were below the respective laboratory MRLs.

6.0 CONCLUSIONS AND RECOMMENDATIONS

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

- Groundwater monitoring results indicated that no analyzed contaminant concentrations in groundwater exceeded the laboratory method detection limits and/or adopted criteria in four consecutive quarter-annual monitoring events. The groundwater monitoring results meet the adopted cleanup criteria.

- Based on the analytical results PBS is seeking a no further action determination.

- PBS will submit a copy of this report to Ecology

- Retain a copy of this report.

7.0 LIMITATIONS

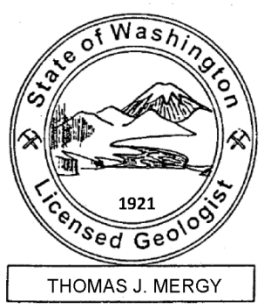
PBS has prepared this report for use by Mason County Transportation Cooperative. This report is for the exclusive use of the client and is not to be relied upon by other parties. It is not to be photographed, photocopied, or similarly reproduced, in total or in part, without the expressed written consent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

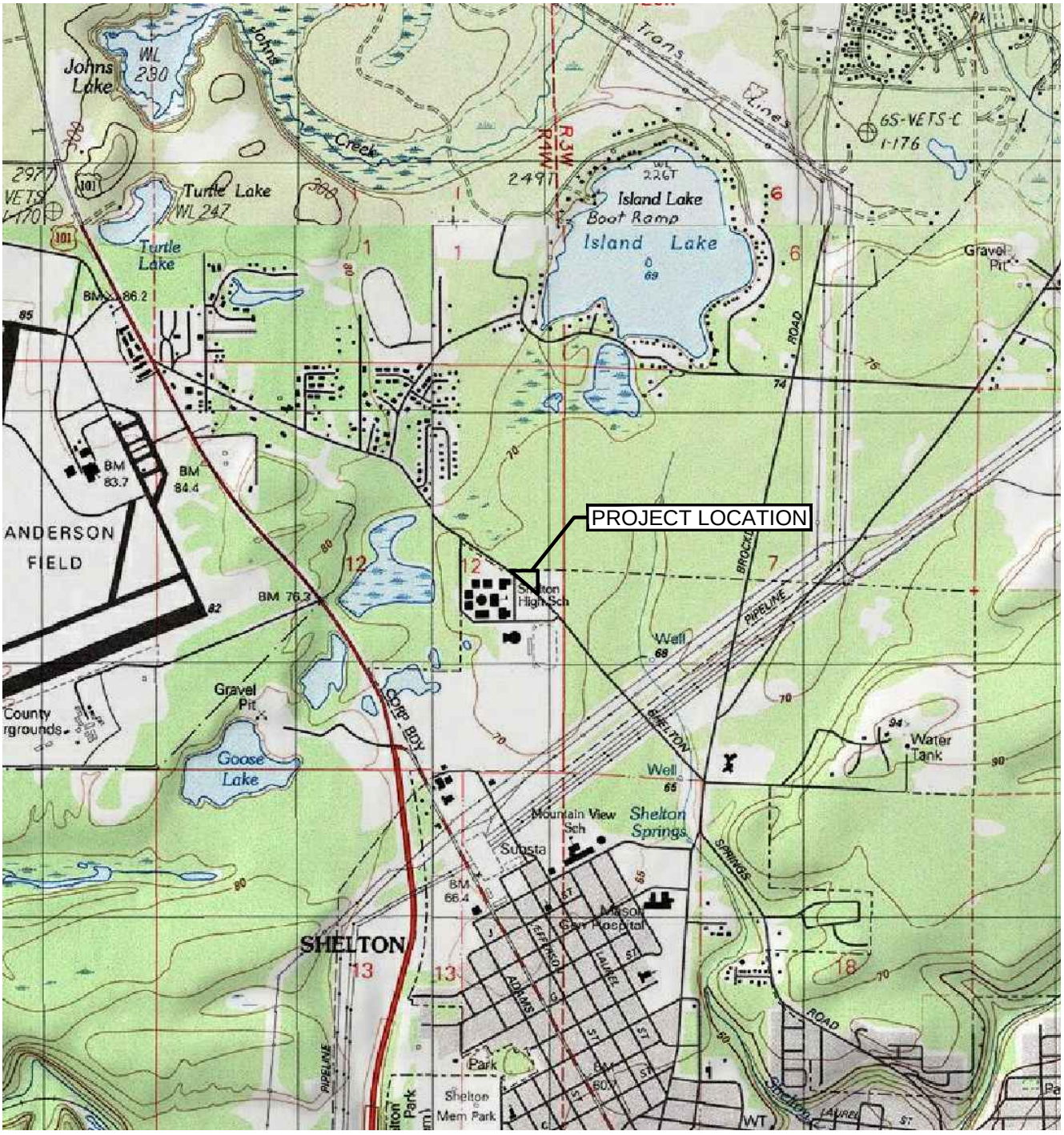
PBS Engineering and Environmental Inc.

August 21, 2015
Megan Nogeire Date
Project Scientist

August 21, 2015
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 AUG 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

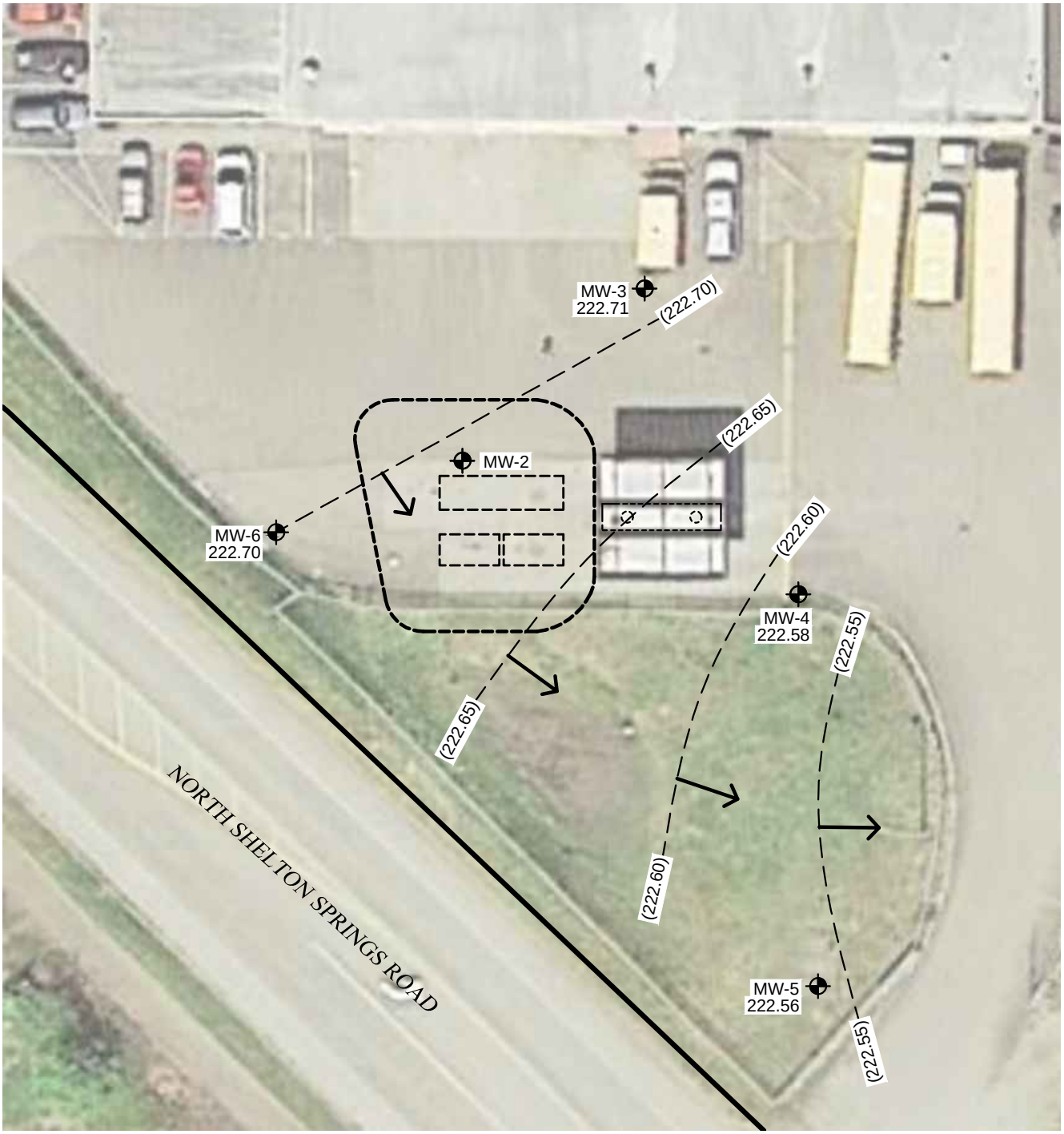
PROJECT # 41271.002

DATE AUG 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
- (222.55) GOUNDWATER ELEVATION (FEET AMSL)

APPROXIMATE HYDRAULIC GRADIENT - 0.002 ft/ft

0' 15' 30' 60'

SCALE: 1" = 30'

PREPARED FOR: MASON COUNTY TRANSPORTATION COOPERATIVE

PBS

PROJECT # 41271.002

DATE AUG 2015

JULY - GROUNDWATER CONTOUR MAP

3740 SHELTON SPRING ROAD
SHELTON, WASHINGTON

FIGURE 3

L:\Projects\41000\41271 Mason County Transportation\41271.002 Mason County Coop\DWG\41271.002_FIG-3.dwg Sep 01, 2015 03:45pm justind

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	236.20	13.48	222.72
	March 4, 2015		10.65	225.55
	July 23, 2015		13.48	222.72
MW3	September 30, 2014	236.21	13.48	222.73
	December 10, 2014		10.80	225.41
	March 4, 2015		10.65	225.56
	July 23, 2015		13.50	222.71
MW4	September 30, 2014	236.35	13.78	222.57
	December 10, 2014		11.50	224.85
	March 4, 2015		10.98	225.37
	July 23, 2015		13.77	222.58
MW5	September 30, 2014	237.87	15.32	222.55
	December 10, 2014		12.70	225.17
	March 4, 2015		12.55	225.32
	July 23, 2015		15.31	222.56
MW6	September 30, 2014	235.92	13.21	222.71
	December 10, 2014		10.55	225.37
	March 4, 2015		10.38	225.54
	July 23, 2015		13.22	222.70

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
March 4, 2015	Southeast	0.002
July 23, 2015	Southeast	0.002

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				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
MW2	March 4, 2015	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.099	<0.099	<0.099
MW2	July 23, 2015	<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
MW3	March 4, 2015	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100
MW3	July 23, 2015	<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
MW4	March 4, 2015	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100
MW4	July 23, 2015	<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
MW5	March 4, 2015	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.099	<0.099	<0.099
MW5	July 23, 2015	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.099	<0.099	<0.099
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
MW6	March 4, 2015	<50.0	<50.0	<100	<1.00	<1.00	<1.00	<1.00	<0.100	<0.100	<0.100
MW6	July 23, 2015	<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			TB-5-12-14			
		Loose, brown, sandy fine GRAVEL with some silts; wet	ATD					
15		Loose, brown, fine to medium SAND with trace silts; wet			MW-4-19			Screen: 0.010" Slots, 1-inch PVC Schedule 80
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

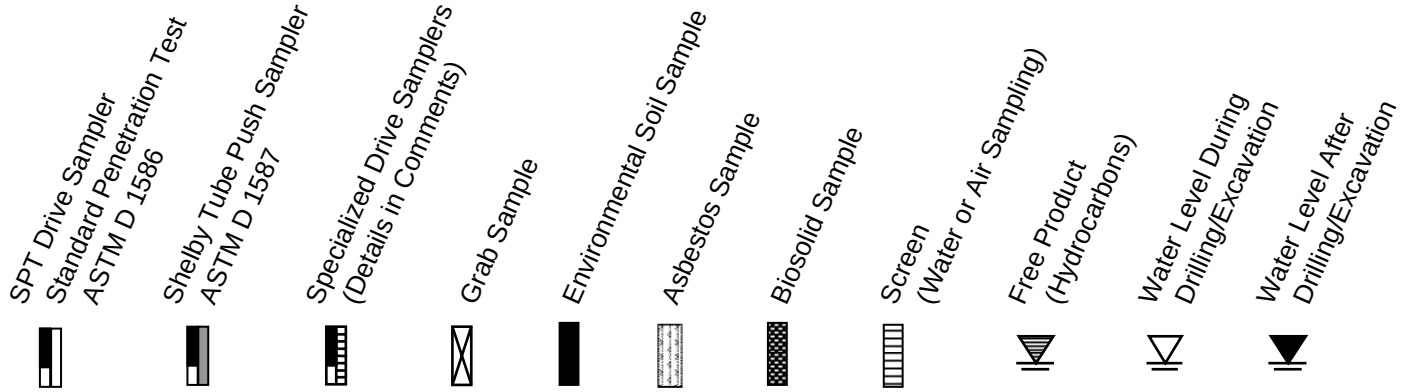
LOGGED BY:C. Johnson
COMPLETED:6/27/07

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

PBS Engineering + Environmental

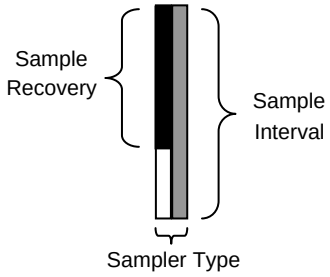
Key To Test Pit and Boring Log Symbols

SAMPLING DESCRIPTIONS

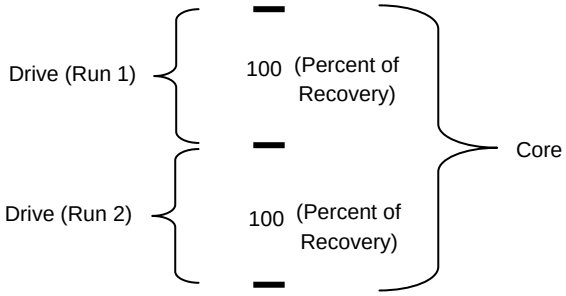


LOG GRAPHICS

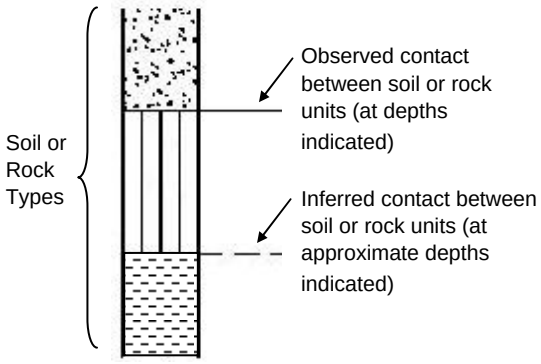
Sampling Symbols



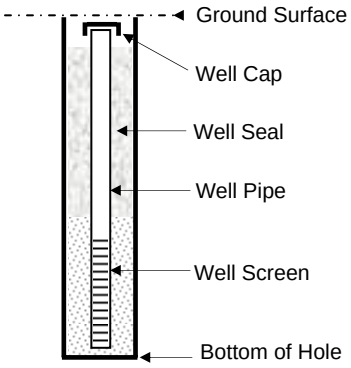
Direct Push, Geoprobe®, Sonic, Vibracore Drilling



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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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-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			MW-6 10-11.5		
12.0		grades to moist		0.0		20 2-1-1	
14.0		gravel increasing in size (.5 to 3.5 inches); wet	Final ▽	0.1	MW-6 12.5-14	30 6-9-15	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							
20.0		Final depth 20.0 feet bgs; monitoring well installed		0.0		60 7-10-14	
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 Engineering and Environmental **GROUNDWATER SAMPLING FORM (YSI 556)**	**Project No:** 41271.002 **Project Name/ Location:** Mason County Transportation Shelton, WA **Date:** July 23, 2015	
Initial DTW (feet bgs)	13.48	**Monitoring Well ID**	**MW2**
Screen Interval (feet bgs)	Unknown	**Sample ID (if not well ID)**	
Well depth (feet bgs)	14.72	**QC Sample type:** _____	☒ Not collected
Depth of pump/tubing inlet (feet bgs)	14		ID_____ Time_____
Sampling method (describe pump or sampler)	Peristaltic	**Field Personnel**	**MN**
Purge Rate (L/min)	1L/4min	**Weather Conditions**	**Sunny, warm**

WELL PURGING INFORMATION

Time ☐ elapsed ☒ actual	DTW (feet)	Temp. (C)	Specific conductivity ☐ mS/cm ☒ µS/cm	Dissolved oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ☒ ltr ☐ gal
1056	**13.5**	**14.22**	**43**	**1.03**	**5.43**	**75.2**	**-**	**-**	**1**
1100	**13.5**	**14.59**	**82**	**1.27**	**5.19**	**76.1**	**-**	**-**	**2**
1104	**13.5**	**14.67**	**81**	**1.53**	**5.12**	**78.3**	**-**	**-**	**3**
1108	**13.5**	**14.34**	**80**	**1.54**	**5.12**	**75.5**	**-**	**-**	**4**
1112	**13.5**	**14.4**	**80**	**1.50**	**5.15**	**73.0**	**-**	**-**	**5**
								Total Volume Purged	**5**

FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Well head in good condition. Groundwater is clear, no sediment, fast recovery and no sheen/odor.

Signature of Field Personnel: MN

	PBS Engineering and Environmental **GROUNDWATER SAMPLING FORM (YSI 556)**	**Project No:** 41271.002 **Project Name/ Location:** Mason County Transportation Shelton, WA **Date:** July 23, 2015	
Initial DTW (feet bgs)	13.5	**Monitoring Well ID**	**MW3**
Screen Interval (feet bgs)	9 to 20	**Sample ID (if not well ID)**	
Well depth (feet bgs)	18.91	**QC Sample type:** _____	☒ Not collected
Depth of pump/tubing inlet (feet bgs)	15		ID_____ Time_____
Sampling method (describe pump or sampler)	Peristaltic	**Field Personnel**	**MN**
Purge Rate (L/min)	1L/4min	**Weather Conditions**	**Sunny, warm**

WELL PURGING INFORMATION

Time ☐ elapsed ☒ actual	DTW (feet)	Temp. (C)	Specific conductivity ☐ mS/cm ☒ µS/cm	Dissolved oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ☒ ltr ☐ gal
1129	**13.5**	**14.63**	**52**	**4.33**	**5.39**	**63.2**	**-**	**-**	**1**
1133	**13.5**	**14.53**	**76**	**4.25**	**5.10**	**59.0**	**-**	**-**	**2**
1137	**13.5**	**14.41**	**75**	**4.30**	**5.14**	**57.2**	**-**	**-**	**3**
1141	**13.5**	**14.49**	**77**	**4.34**	**5.05**	**56.5**	**-**	**-**	**4**
1144	**13.5**	**14.38**	**77**	**4.29**	**5.00**	**56.4**	**-**	**-**	**5**
								Total Volume Purged	**5**

FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Well head missing both screws. Groundwater is clear, no sediment, fast recovery and no sheen/odor.

Signature of Field Personnel: MN

	PBS Engineering and Environmental **GROUNDWATER SAMPLING FORM (YSI 556)**	**Project No:**	**41271.002**
		Project Name/ Location:	**Mason County Transportation Shelton, WA**
		Date:	**July 23, 2015**
Initial DTW (feet bgs)	13.77	**Monitoring Well ID**	**MW4**
Screen Interval (feet bgs)	10 to 20	**Sample ID (if not well ID)**	
Well depth (feet bgs)	19.24	**QC Sample type: __Duplicate___**	☐ Not collected ID_DUP_7.23.15_
Depth of pump/tubing inlet (feet bgs)	16		
Sampling method (describe pump or sampler)	Peristaltic	**Field Personnel**	**MN**
Purge Rate (L/min)	1L/4min	**Weather Conditions**	**Sunny, warm**

WELL PURGING INFORMATION

Time ☐ elapsed ☒ actual	DTW (feet)	Temp. (C)	Specific conductivity ☐ mS/cm ☒ µS/cm	Dissolved oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ☒ ltr ☐ gal
1202	**13.79**	**13.96**	**81**	**4.64**	**5.57**	**45.0**	**-**	**-**	**1**
1206	**13.79**	**14.40**	**81**	**4.40**	**5.32**	**37.6**	**-**	**-**	**2**
1210	**13.79**	**14.45**	**82**	**4.43**	**4.96**	**43.9**	**-**	**-**	**3**
1214	**13.79**	**13.88**	**80**	**4.46**	**5.06**	**24.3**	**-**	**-**	**4**
1218	**13.79**	**14.24**	**78**	**4.48**	**4.40**	**26.1**	**-**	**-**	**5**
1222	**13.79**	**14.33**	**80**	**4.35**	**4.49**	**26.8**	**-**	**-**	**6**
								Total Volume Purged	**6**

FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Well head is missing both screws. Groundwater is clear, no sediment, fast recovery and no sheen/odor.

Signature of Field Personnel: MN

	PBS Engineering and Environmental **GROUNDWATER SAMPLING FORM (YSI 556)**	**Project No:** 41271.002 **Project Name/ Location:** Mason County Transportation Shelton, WA **Date:** July 23, 2015	
Initial DTW (feet bgs)	15.31	**Monitoring Well ID**	**MW5**
Screen Interval (feet bgs)	10 to 25	**Sample ID (if not well ID)**	
Well depth (feet bgs)	25	**QC Sample type:** _____	☒ Not collected
Depth of pump/tubing inlet (feet bgs)	17		ID_____ Time_____
Sampling method (describe pump or sampler)	Peristaltic	**Field Personnel**	**MN**
Purge Rate (L/min)	1L/4min	**Weather Conditions**	**Sunny, warm**

WELL PURGING INFORMATION

Time ☐ elapsed ☒ actual	DTW (feet)	Temp. (C)	Specific conductivity ☐ mS/cm ☒ µS/cm	Dissolved oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ☒ ltr ☐ gal
1238	**15.31**	**14.40**	**80**	**6.36**	**5.52**	**23.7**	**-**	**-**	**1**
1241	**15.31**	**14.34**	**79**	**6.21**	**5.21**	**18.0**	**-**	**-**	**2**
1244	**15.31**	**14.53**	**79**	**6.09**	**5.15**	**16.5**	**-**	**-**	**3**
1247	**15.31**	**14.56**	**80**	**6.00**	**5.10**	**10.0**	**-**	**-**	**4**
								Total Volume Purged	**4**

FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Well head in good condition. Groundwater is clear, no sediment, fast recovery and no sheen/odor.

Signature of Field Personnel: MN

PBS	**PBS Engineering and Environmental** **GROUNDWATER SAMPLING FORM (YSI 556)**	**Project No:**	**41271.002**
		Project Name/ Location:	**Mason County Transportation Shelton, WA**
		Date:	**July 23, 2015**

Initial DTW (feet bgs)	13.22	**Monitoring Well ID**	**MW6**
Screen Interval (feet bgs)	10 to 20	**Sample ID (if not well ID)**	
Well depth (feet bgs)	19.22	**QC Sample type:** _____	☒ Not collected
Depth of pump/tubing inlet (feet bgs)	15		ID_____ Time_____
Sampling method (describe pump or sampler)	Peristaltic	**Field Personnel**	**MN**
Purge Rate (L/min)	1L/4min	**Weather Conditions**	**Sunny, warm**

WELL PURGING INFORMATION

Time ☐ elapsed ☒ actual	DTW (feet)	Temp. (C)	Specific conductivity ☐ mS/cm ☒ µS/cm	Dissolved oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ☒ ltr ☐ gal
1013	**13.3**	**13.61**	**78**	**5.23**	**4.71**	**111.0**	**-**	**-**	**1**
1017	**13.3**	**13.60**	**78**	**5.19**	**4.67**	**155.8**	**-**	**-**	**2**
1021	**13.3**	**13.52**	**78**	**5.22**	**4.67**	**146.9**	**-**	**-**	**3**
1025	**13.3**	**13.65**	**79**	**5.25**	**4.87**	**132.0**	**-**	**-**	**4**
1029	**13.3**	**13.59**	**79**	**5.26**	**4.90**	**130.1**	**-**	**-**	**5**
1033	**13.3**	**13.58**	**79**	**5.25**	**4.94**	**130.2**	**-**	**-**	**6**
								Total Volume Purged	**6**

FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor, equipment)

Well head in good condition. Groundwater is clear, no sediment, fast recovery and no sheen/odor.

Signature of Field Personnel: MN

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: Mason County Transportation
Lab ID: 1507250

July 30, 2015

Attention Megan Nogeire:

Fremont Analytical, Inc. received 7 sample(s) on 7/23/2015 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: *07/30/2015*

CLIENT: PBS Engineering & Environmental
Project: Mason County Transportation
Lab Order: 1507250

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1507250-001	MW2	07/23/2015 11:12 AM	07/23/2015 3:40 PM
1507250-002	MW3	07/23/2015 11:44 AM	07/23/2015 3:40 PM
1507250-003	MW4	07/23/2015 12:22 PM	07/23/2015 3:40 PM
1507250-004	MW5	07/23/2015 12:47 PM	07/23/2015 3:40 PM
1507250-005	MW6	07/23/2015 10:32 AM	07/23/2015 3:40 PM
1507250-006	Dup.7.23.15	07/23/2015 12:00 AM	07/23/2015 3:40 PM
1507250-007	Trip Blank	07/22/2015 10:35 AM	07/23/2015 3:40 PM

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

Case Narrative

WO#: **1507250**
Date: **7/30/2015**

CLIENT: PBS Engineering & Environmental
Project: Mason County Transportation

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.

Qualifiers:

* - Flagged value is not within established control limits
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
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below LOQ
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

WO#: **1507250**

Date Reported: **7/30/2015**

Client: PBS Engineering & Environmental

Collection Date: 7/23/2015 11:12:00 AM

Project: Mason County Transportation

Lab ID: 1507250-001

Matrix: Groundwater

Client Sample ID: MW2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 11423		Analyst: EC
Diesel (Fuel Oil)	ND	50.0		µg/L	1	7/28/2015 12:38:00 PM
Heavy Oil	ND	99.9		µg/L	1	7/28/2015 12:38:00 PM
Surr: 2-Fluorobiphenyl	67.9	50-150		%REC	1	7/28/2015 12:38:00 PM
Surr: o-Terphenyl	71.0	50-150		%REC	1	7/28/2015 12:38:00 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 11437		Analyst: NG
Naphthalene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
2-Methylnaphthalene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
1-Methylnaphthalene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Acenaphthylene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Acenaphthene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Fluorene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Phenanthrene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Anthracene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Fluoranthene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Pyrene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Benz(a)anthracene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Chrysene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Benzo(b)fluoranthene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Benzo(k)fluoranthene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Benzo(a)pyrene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Dibenz(a,h)anthracene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Benzo(g,h,i)perylene	ND	0.0995		µg/L	1	7/29/2015 12:56:00 PM
Surr: 2-Fluorobiphenyl	85.9	23.9-122		%REC	1	7/29/2015 12:56:00 PM
Surr: Terphenyl-d14	94.6	33.4-135		%REC	1	7/29/2015 12:56:00 PM
Gasoline by NWTPH-Gx				Batch ID: R23826		Analyst: BC
Gasoline	ND	50.0		µg/L	1	7/25/2015 12:44:00 AM
Surr: 4-Bromofluorobenzene	101	65-135		%REC	1	7/25/2015 12:44:00 AM
Surr: Toluene-d8	103	65-135		%REC	1	7/25/2015 12:44:00 AM
Volatile Organic Compounds by EPA Method 8260				Batch ID: R23824		Analyst: BC
Benzene	ND	1.00		µg/L	1	7/25/2015 12:44:00 AM
Toluene	ND	1.00		µg/L	1	7/25/2015 12:44:00 AM
Ethylbenzene	ND	1.00		µg/L	1	7/25/2015 12:44:00 AM

Analytical Report

WO#: **1507250**

Date Reported: **7/30/2015**

Client: PBS Engineering & Environmental

Collection Date: 7/23/2015 11:12:00 AM

Project: Mason County Transportation

Lab ID: 1507250-001

Matrix: Groundwater

Client Sample ID: **MW2**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: R23824		Analyst: BC
m,p-Xylene	ND	1.00		µg/L	1	7/25/2015 12:44:00 AM
o-Xylene	ND	1.00		µg/L	1	7/25/2015 12:44:00 AM
Surr: Dibromofluoromethane	92.0	77.4-147		%REC	1	7/25/2015 12:44:00 AM
Surr: Toluene-d8	103	40.1-139		%REC	1	7/25/2015 12:44:00 AM
Surr: 1-Bromo-4-fluorobenzene	99.5	64.2-128		%REC	1	7/25/2015 12:44:00 AM

Analytical Report

WO#: **1507250**
Date Reported: **7/30/2015**

Client: PBS Engineering & Environmental
Collection Date: 7/23/2015 11:44:00 AM
Project: Mason County Transportation
Lab ID: 1507250-002
Matrix: Groundwater
Client Sample ID: **MW3**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 11423		Analyst: EC
Diesel (Fuel Oil)	ND	49.9		µg/L	1	7/28/2015 1:10:00 PM
Heavy Oil	ND	99.8		µg/L	1	7/28/2015 1:10:00 PM
Surr: 2-Fluorobiphenyl	67.2	50-150		%REC	1	7/28/2015 1:10:00 PM
Surr: o-Terphenyl	69.8	50-150		%REC	1	7/28/2015 1:10:00 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 11437		Analyst: NG
Naphthalene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
2-Methylnaphthalene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
1-Methylnaphthalene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Acenaphthylene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Acenaphthene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Fluorene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Phenanthrene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Anthracene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Fluoranthene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Pyrene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Benz(a)anthracene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Chrysene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Benzo(b)fluoranthene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Benzo(k)fluoranthene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Benzo(a)pyrene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	7/29/2015 1:24:00 PM
Surr: 2-Fluorobiphenyl	80.2	23.9-122		%REC	1	7/29/2015 1:24:00 PM
Surr: Terphenyl-d14	80.9	33.4-135		%REC	1	7/29/2015 1:24:00 PM
Gasoline by NWTPH-Gx				Batch ID: R23826		Analyst: BC
Gasoline	ND	50.0		µg/L	1	7/25/2015 1:50:00 AM
Surr: 4-Bromofluorobenzene	99.8	65-135		%REC	1	7/25/2015 1:50:00 AM
Surr: Toluene-d8	103	65-135		%REC	1	7/25/2015 1:50:00 AM
Volatile Organic Compounds by EPA Method 8260				Batch ID: R23824		Analyst: BC
Benzene	ND	1.00		µg/L	1	7/25/2015 1:50:00 AM
Toluene	ND	1.00		µg/L	1	7/25/2015 1:50:00 AM
Ethylbenzene	ND	1.00		µg/L	1	7/25/2015 1:50:00 AM

Analytical Report

WO#: **1507250**
Date Reported: **7/30/2015**

Client: PBS Engineering & Environmental
Collection Date: 7/23/2015 11:44:00 AM
Project: Mason County Transportation
Lab ID: 1507250-002
Matrix: Groundwater
Client Sample ID: **MW3**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: R23824		Analyst: BC
m,p-Xylene	ND	1.00		µg/L	1	7/25/2015 1:50:00 AM
o-Xylene	ND	1.00		µg/L	1	7/25/2015 1:50:00 AM
Surr: Dibromofluoromethane	97.8	77.4-147		%REC	1	7/25/2015 1:50:00 AM
Surr: Toluene-d8	104	40.1-139		%REC	1	7/25/2015 1:50:00 AM
Surr: 1-Bromo-4-fluorobenzene	98.8	64.2-128		%REC	1	7/25/2015 1:50:00 AM

Analytical Report

WO#: **1507250**
Date Reported: **7/30/2015**

Client: PBS Engineering & Environmental
Collection Date: 7/23/2015 12:22:00 PM
Project: Mason County Transportation
Lab ID: 1507250-003
Matrix: Groundwater
Client Sample ID: **MW4**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 11423		Analyst: EC
Diesel (Fuel Oil)	ND	49.5		µg/L	1	7/28/2015 1:42:00 PM
Heavy Oil	ND	99.1		µg/L	1	7/28/2015 1:42:00 PM
Surr: 2-Fluorobiphenyl	68.6	50-150		%REC	1	7/28/2015 1:42:00 PM
Surr: o-Terphenyl	76.3	50-150		%REC	1	7/28/2015 1:42:00 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 11437		Analyst: NG
Naphthalene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
2-Methylnaphthalene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
1-Methylnaphthalene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Acenaphthylene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Acenaphthene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Fluorene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Phenanthrene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Anthracene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Fluoranthene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Pyrene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Benz(a)anthracene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Chrysene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Benzo(b)fluoranthene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Benzo(k)fluoranthene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Benzo(a)pyrene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Dibenz(a,h)anthracene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Benzo(g,h,i)perylene	ND	0.0999		µg/L	1	7/29/2015 1:52:00 PM
Surr: 2-Fluorobiphenyl	57.6	23.9-122		%REC	1	7/29/2015 1:52:00 PM
Surr: Terphenyl-d14	80.5	33.4-135		%REC	1	7/29/2015 1:52:00 PM
Gasoline by NWTPH-Gx				Batch ID: R23826		Analyst: BC
Gasoline	ND	50.0		µg/L	1	7/25/2015 4:33:00 AM
Surr: 4-Bromofluorobenzene	101	65-135		%REC	1	7/25/2015 4:33:00 AM
Surr: Toluene-d8	103	65-135		%REC	1	7/25/2015 4:33:00 AM
Volatile Organic Compounds by EPA Method 8260				Batch ID: R23824		Analyst: BC
Benzene	ND	1.00		µg/L	1	7/25/2015 4:33:00 AM
Toluene	ND	1.00		µg/L	1	7/25/2015 4:33:00 AM
Ethylbenzene	ND	1.00		µg/L	1	7/25/2015 4:33:00 AM

Analytical Report

WO#: **1507250**
Date Reported: **7/30/2015**

Client: PBS Engineering & Environmental
Collection Date: 7/23/2015 12:22:00 PM
Project: Mason County Transportation
Lab ID: 1507250-003
Matrix: Groundwater
Client Sample ID: **MW4**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: R23824		Analyst: BC
m,p-Xylene	ND	1.00		µg/L	1	7/25/2015 4:33:00 AM
o-Xylene	ND	1.00		µg/L	1	7/25/2015 4:33:00 AM
Surr: Dibromofluoromethane	106	77.4-147		%REC	1	7/25/2015 4:33:00 AM
Surr: Toluene-d8	105	40.1-139		%REC	1	7/25/2015 4:33:00 AM
Surr: 1-Bromo-4-fluorobenzene	100	64.2-128		%REC	1	7/25/2015 4:33:00 AM

Analytical Report

WO#: **1507250**

Date Reported: **7/30/2015**

Client: PBS Engineering & Environmental

Collection Date: 7/23/2015 12:47:00 PM

Project: Mason County Transportation

Lab ID: 1507250-004

Matrix: Groundwater

Client Sample ID: MW5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 11423		Analyst: EC
Diesel (Fuel Oil)	ND	49.8		µg/L	1	7/28/2015 2:15:00 PM
Heavy Oil	ND	99.7		µg/L	1	7/28/2015 2:15:00 PM
Surr: 2-Fluorobiphenyl	57.8	50-150		%REC	1	7/28/2015 2:15:00 PM
Surr: o-Terphenyl	57.3	50-150		%REC	1	7/28/2015 2:15:00 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 11437		Analyst: NG
Naphthalene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
2-Methylnaphthalene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
1-Methylnaphthalene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Acenaphthylene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Acenaphthene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Fluorene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Phenanthrene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Anthracene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Fluoranthene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Pyrene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Benz(a)anthracene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Chrysene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Benzo(b)fluoranthene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Benzo(k)fluoranthene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Benzo(a)pyrene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Dibenz(a,h)anthracene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Benzo(g,h,i)perylene	ND	0.0999		µg/L	1	7/29/2015 2:20:00 PM
Surr: 2-Fluorobiphenyl	76.6	23.9-122		%REC	1	7/29/2015 2:20:00 PM
Surr: Terphenyl-d14	84.3	33.4-135		%REC	1	7/29/2015 2:20:00 PM
Gasoline by NWTPH-Gx				Batch ID: R23826		Analyst: BC
Gasoline	ND	50.0		µg/L	1	7/25/2015 5:05:00 AM
Surr: 4-Bromofluorobenzene	101	65-135		%REC	1	7/25/2015 5:05:00 AM
Surr: Toluene-d8	103	65-135		%REC	1	7/25/2015 5:05:00 AM
Volatile Organic Compounds by EPA Method 8260				Batch ID: R23824		Analyst: BC
Benzene	ND	1.00		µg/L	1	7/25/2015 5:05:00 AM
Toluene	ND	1.00		µg/L	1	7/25/2015 5:05:00 AM
Ethylbenzene	ND	1.00		µg/L	1	7/25/2015 5:05:00 AM

Analytical Report

WO#: **1507250**
Date Reported: **7/30/2015**

Client: PBS Engineering & Environmental
Collection Date: 7/23/2015 12:47:00 PM
Project: Mason County Transportation
Lab ID: 1507250-004
Matrix: Groundwater
Client Sample ID: **MW5**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: R23824		Analyst: BC
m,p-Xylene	ND	1.00		µg/L	1	7/25/2015 5:05:00 AM
o-Xylene	ND	1.00		µg/L	1	7/25/2015 5:05:00 AM
Surr: Dibromofluoromethane	100	77.4-147		%REC	1	7/25/2015 5:05:00 AM
Surr: Toluene-d8	103	40.1-139		%REC	1	7/25/2015 5:05:00 AM
Surr: 1-Bromo-4-fluorobenzene	99.6	64.2-128		%REC	1	7/25/2015 5:05:00 AM

Analytical Report

WO#: **1507250**

Date Reported: **7/30/2015**

Client: PBS Engineering & Environmental

Collection Date: 7/23/2015 10:32:00 AM

Project: Mason County Transportation

Lab ID: 1507250-005

Matrix: Groundwater

Client Sample ID: **MW6**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 11423		Analyst: EC
Diesel (Fuel Oil)	ND	49.5		µg/L	1	7/28/2015 2:47:00 PM
Heavy Oil	ND	99.0		µg/L	1	7/28/2015 2:47:00 PM
Surr: 2-Fluorobiphenyl	68.5	50-150		%REC	1	7/28/2015 2:47:00 PM
Surr: o-Terphenyl	71.6	50-150		%REC	1	7/28/2015 2:47:00 PM
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)				Batch ID: 11437		Analyst: NG
Naphthalene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
2-Methylnaphthalene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
1-Methylnaphthalene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Acenaphthylene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Acenaphthene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Fluorene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Phenanthrene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Anthracene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Fluoranthene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Pyrene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Benz(a)anthracene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Chrysene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Benzo(b)fluoranthene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Benzo(k)fluoranthene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Benzo(a)pyrene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Dibenz(a,h)anthracene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Benzo(g,h,i)perylene	ND	0.0998		µg/L	1	7/29/2015 2:49:00 PM
Surr: 2-Fluorobiphenyl	59.3	23.9-122		%REC	1	7/29/2015 2:49:00 PM
Surr: Terphenyl-d14	80.0	33.4-135		%REC	1	7/29/2015 2:49:00 PM
Gasoline by NWTPH-Gx				Batch ID: R23826		Analyst: BC
Gasoline	ND	50.0		µg/L	1	7/25/2015 6:11:00 AM
Surr: 4-Bromofluorobenzene	101	65-135		%REC	1	7/25/2015 6:11:00 AM
Surr: Toluene-d8	103	65-135		%REC	1	7/25/2015 6:11:00 AM
Volatile Organic Compounds by EPA Method 8260				Batch ID: R23824		Analyst: BC
Benzene	ND	1.00		µg/L	1	7/25/2015 6:11:00 AM
Toluene	ND	1.00		µg/L	1	7/25/2015 6:11:00 AM
Ethylbenzene	ND	1.00		µg/L	1	7/25/2015 6:11:00 AM

Analytical Report

WO#: **1507250**
Date Reported: **7/30/2015**

Client: PBS Engineering & Environmental
Collection Date: 7/23/2015 10:32:00 AM
Project: Mason County Transportation
Lab ID: 1507250-005
Matrix: Groundwater
Client Sample ID: **MW6**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: R23824		Analyst: BC
m,p-Xylene	ND	1.00		µg/L	1	7/25/2015 6:11:00 AM
o-Xylene	ND	1.00		µg/L	1	7/25/2015 6:11:00 AM
Surr: Dibromofluoromethane	101	77.4-147		%REC	1	7/25/2015 6:11:00 AM
Surr: Toluene-d8	104	40.1-139		%REC	1	7/25/2015 6:11:00 AM
Surr: 1-Bromo-4-fluorobenzene	99.5	64.2-128		%REC	1	7/25/2015 6:11:00 AM

Analytical Report

WO#: **1507250**
Date Reported: **7/30/2015**

Client: PBS Engineering & Environmental
Collection Date: 7/23/2015
Project: Mason County Transportation
Lab ID: 1507250-006
Matrix: Groundwater
Client Sample ID: **Dup.7.23.15**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: R23824		Analyst: BC
Benzene	ND	1.00		µg/L	1	7/25/2015 6:43:00 AM
Toluene	ND	1.00		µg/L	1	7/25/2015 6:43:00 AM
Ethylbenzene	ND	1.00		µg/L	1	7/25/2015 6:43:00 AM
m,p-Xylene	ND	1.00		µg/L	1	7/25/2015 6:43:00 AM
o-Xylene	ND	1.00		µg/L	1	7/25/2015 6:43:00 AM
Surr: Dibromofluoromethane	102	77.4-147		%REC	1	7/25/2015 6:43:00 AM
Surr: Toluene-d8	103	40.1-139		%REC	1	7/25/2015 6:43:00 AM
Surr: 1-Bromo-4-fluorobenzene	100	64.2-128		%REC	1	7/25/2015 6:43:00 AM

Work Order: 1507250
CLIENT: PBS Engineering & Environmental
Project: Mason County Transportation

QC SUMMARY REPORT

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

Sample ID **1507254-005ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **7/24/2015** RunNo: **23870**
Client ID: **BATCH** Batch ID: **11423** Analysis Date: **7/28/2015** SeqNo: **452133**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	49.9						0		30	
Heavy Oil	ND	99.8						0		30	
Surr: 2-Fluorobiphenyl	64.2		79.81		80.4	50	150		0		
Surr: o-Terphenyl	68.9		79.81		86.4	50	150		0		

Sample ID **LCS-11423** SampType: **LCS** Units: **µg/L** Prep Date: **7/24/2015** RunNo: **23870**
Client ID: **LCSW** Batch ID: **11423** Analysis Date: **7/28/2015** SeqNo: **452143**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	765	49.9	998.0	0	76.7	65	135				
Surr: 2-Fluorobiphenyl	60.4		79.84		75.7	50	150				
Surr: o-Terphenyl	52.9		79.84		66.2	50	150				

Sample ID **MB-11423** SampType: **MBLK** Units: **µg/L** Prep Date: **7/24/2015** RunNo: **23870**
Client ID: **MBLKW** Batch ID: **11423** Analysis Date: **7/28/2015** SeqNo: **452144**

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	99.9									
Surr: 2-Fluorobiphenyl	54.0		79.96		67.5	50	150				
Surr: o-Terphenyl	60.7		79.96		75.9	50	150				

Work Order: 1507250
CLIENT: PBS Engineering & Environmental
Project: Mason County Transportation

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID **LCS-11437** SampType: **LCS** Units: **µg/L** Prep Date: **7/28/2015** RunNo: **23905**
Client ID: **LCSW** Batch ID: **11437** Analysis Date: **7/29/2015** SeqNo: **452711**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	2.18	0.100	4.000	0	54.5	26.7	106				
2-Methylnaphthalene	2.45	0.100	4.000	0	61.2	35.4	110				
1-Methylnaphthalene	2.11	0.100	4.000	0	52.7	37.5	116				
Acenaphthylene	2.44	0.100	4.000	0	61.0	39.2	114				
Acenaphthene	2.40	0.100	4.000	0	60.0	37	113				
Fluorene	2.61	0.100	4.000	0	65.3	40.3	117				
Phenanthrene	2.35	0.100	4.000	0	58.7	35.1	118				
Anthracene	2.29	0.100	4.000	0	57.4	45.4	115				
Fluoranthene	2.65	0.100	4.000	0	66.3	47.1	123				
Pyrene	2.53	0.100	4.000	0	63.3	47.6	123				
Benz(a)anthracene	2.71	0.100	4.000	0	67.9	48.7	126				
Chrysene	3.05	0.100	4.000	0	76.2	45.1	114				
Benzo(b)fluoranthene	3.13	0.100	4.000	0	78.2	52.2	126				
Benzo(k)fluoranthene	2.75	0.100	4.000	0	68.8	45.5	121				
Benzo(a)pyrene	2.83	0.100	4.000	0	70.7	38.4	121				
Indeno(1,2,3-cd)pyrene	2.63	0.100	4.000	0	65.7	23.9	143				
Dibenz(a,h)anthracene	3.07	0.100	4.000	0	76.7	24.9	141				
Benzo(g,h,i)perylene	2.35	0.100	4.000	0	58.8	35.9	139				
Surr: 2-Fluorobiphenyl	1.54		2.000		77.2	23.9	122				
Surr: Terphenyl-d14	1.79		2.000		89.5	33.4	135				

Sample ID **LCSD-11437** SampType: **LCSD** Units: **µg/L** Prep Date: **7/28/2015** RunNo: **23905**
Client ID: **LCSW02** Batch ID: **11437** Analysis Date: **7/29/2015** SeqNo: **452712**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	2.68	0.0998	3.991	0	67.1	26.7	106	2.178	20.6	30	
2-Methylnaphthalene	2.99	0.0998	3.991	0	74.9	35.4	110	2.446	20.0	30	
1-Methylnaphthalene	3.04	0.0998	3.991	0	76.2	37.5	116	2.106	36.3	30	R
Acenaphthylene	2.94	0.0998	3.991	0	73.6	39.2	114	2.438	18.5	30	
Acenaphthene	2.86	0.0998	3.991	0	71.7	37	113	2.402	17.5	30	
Fluorene	2.48	0.0998	3.991	0	62.1	40.3	117	2.612	5.24	30	

Work Order: 1507250
CLIENT: PBS Engineering & Environmental
Project: Mason County Transportation

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID **LCSD-11437** SampType: **LCSD** Units: **µg/L** Prep Date: **7/28/2015** RunNo: **23905**
Client ID: **LCSW02** Batch ID: **11437** Analysis Date: **7/29/2015** SeqNo: **452712**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenanthrene	2.76	0.0998	3.991	0	69.1	35.1	118	2.350	16.0	30	
Anthracene	2.70	0.0998	3.991	0	67.6	45.4	115	2.294	16.2	30	
Fluoranthene	3.03	0.0998	3.991	0	75.9	47.1	123	2.652	13.3	30	
Pyrene	2.89	0.0998	3.991	0	72.3	47.6	123	2.531	13.1	30	
Benz(a)anthracene	3.16	0.0998	3.991	0	79.2	48.7	126	2.714	15.2	30	
Chrysene	2.97	0.0998	3.991	0	74.5	45.1	114	3.047	2.40	30	
Benzo(b)fluoranthene	4.20	0.0998	3.991	0	105	52.2	126	3.126	29.3	30	
Benzo(k)fluoranthene	3.18	0.0998	3.991	0	79.7	45.5	121	2.751	14.5	30	
Benzo(a)pyrene	3.41	0.0998	3.991	0	85.4	38.4	121	2.829	18.5	30	
Indeno(1,2,3-cd)pyrene	3.15	0.0998	3.991	0	78.8	23.9	143	2.626	18.0	30	
Dibenz(a,h)anthracene	3.70	0.0998	3.991	0	92.6	24.9	141	3.069	18.5	30	
Benzo(g,h,i)perylene	2.86	0.0998	3.991	0	71.6	35.9	139	2.353	19.4	30	
Surr: 2-Fluorobiphenyl	1.64		1.995		82.0	23.9	122		0	0	
Surr: Terphenyl-d14	1.86		1.995		93.3	33.4	135		0	0	

NOTES:
R - High RPD observed, spike recoveries are within range.

Sample ID **MB-11437** SampType: **MBLK** Units: **µg/L** Prep Date: **7/28/2015** RunNo: **23905**
Client ID: **MBLKW** Batch ID: **11437** Analysis Date: **7/29/2015** SeqNo: **452713**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	0.0993									
2-Methylnaphthalene	ND	0.0993									
1-Methylnaphthalene	ND	0.0993									
Acenaphthylene	ND	0.0993									
Acenaphthene	ND	0.0993									
Fluorene	ND	0.0993									
Phenanthrene	ND	0.0993									
Anthracene	ND	0.0993									
Fluoranthene	ND	0.0993									
Pyrene	ND	0.0993									
Benz(a)anthracene	ND	0.0993									

Work Order: 1507250
CLIENT: PBS Engineering & Environmental
Project: Mason County Transportation

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID **MB-11437** SampType: **MBLK** Units: **µg/L** Prep Date: **7/28/2015** RunNo: **23905**
Client ID: **MBLKW** Batch ID: **11437** Analysis Date: **7/29/2015** SeqNo: **452713**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chrysene	ND	0.0993									
Benzo(b)fluoranthene	ND	0.0993									
Benzo(k)fluoranthene	ND	0.0993									
Benzo(a)pyrene	ND	0.0993									
Indeno(1,2,3-cd)pyrene	ND	0.0993									
Dibenz(a,h)anthracene	ND	0.0993									
Benzo(g,h,i)perylene	ND	0.0993									
Surr: 2-Fluorobiphenyl	1.49		1.987		75.0	23.9	122				
Surr: Terphenyl-d14	1.73		1.987		87.0	33.4	135				

Work Order: 1507250
CLIENT: PBS Engineering & Environmental
Project: Mason County Transportation

QC SUMMARY REPORT

Gasoline by NWTPH-Gx

Sample ID **1507250-001ADUP**	SampType: **DUP**	Units: **µg/L**	Prep Date: **7/25/2015**	RunNo: **23826**
Client ID: **MW2**	Batch ID: **R23826**		Analysis Date: **7/25/2015**	SeqNo: **451575**

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	25.6		25.00		102	65	135		0	0	
Surr: 4-Bromofluorobenzene	25.2		25.00		101	65	135		0	0	

Sample ID **1507250-004ADUP**	SampType: **DUP**	Units: **µg/L**	Prep Date: **7/25/2015**	RunNo: **23826**
Client ID: **MW5**	Batch ID: **R23826**		Analysis Date: **7/25/2015**	SeqNo: **451579**

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	25.7		25.00		103	65	135		0	0	
Surr: 4-Bromofluorobenzene	25.2		25.00		101	65	135		0	0	

Sample ID **LCS-R23826**	SampType: **LCS**	Units: **µg/L**	Prep Date: **7/24/2015**	RunNo: **23826**
Client ID: **LCSW**	Batch ID: **R23826**		Analysis Date: **7/24/2015**	SeqNo: **451591**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	545	50.0	500.0	0	109	65	135				
Surr: Toluene-d8	25.8		25.00		103	65	135				
Surr: 4-Bromofluorobenzene	25.4		25.00		102	65	135				

Sample ID **MB-R23826**	SampType: **MBLK**	Units: **µg/L**	Prep Date: **7/24/2015**	RunNo: **23826**
Client ID: **MBLKW**	Batch ID: **R23826**		Analysis Date: **7/24/2015**	SeqNo: **451592**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	50.0									
Surr: Toluene-d8	25.6		25.00		102	65	135				
Surr: 4-Bromofluorobenzene	25.1		25.00		101	65	135				

Work Order: 1507250
CLIENT: PBS Engineering & Environmental
Project: Mason County Transportation

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260

Sample ID **1507250-001ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **7/25/2015** RunNo: **23824**
Client ID: **MW2** Batch ID: **R23824** Analysis Date: **7/25/2015** SeqNo: **451516**

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	23.4		25.00		93.8	77.4	147		0		
Surr: Toluene-d8	25.9		25.00		104	40.1	139		0		
Surr: 1-Bromo-4-fluorobenzene	24.9		25.00		99.7	64.2	128		0		

Sample ID **1507250-002AMS** SampType: **MS** Units: **µg/L** Prep Date: **7/25/2015** RunNo: **23824**
Client ID: **MW3** Batch ID: **R23824** Analysis Date: **7/25/2015** SeqNo: **451518**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	23.5	1.00	20.00	0	118	65.4	138				
Toluene	22.6	1.00	20.00	0	113	64	139				
Ethylbenzene	22.3	1.00	20.00	0	111	64.5	136				
m,p-Xylene	43.1	1.00	40.00	0	108	63.3	135				
o-Xylene	21.7	1.00	20.00	0	109	65.4	134				
Surr: Dibromofluoromethane	27.9		25.00		112	77.4	147				
Surr: Toluene-d8	26.6		25.00		106	40.1	139				
Surr: 1-Bromo-4-fluorobenzene	24.9		25.00		99.7	64.2	128				

Sample ID **LCS-R23824** SampType: **LCS** Units: **µg/L** Prep Date: **7/24/2015** RunNo: **23824**
Client ID: **LCSW** Batch ID: **R23824** Analysis Date: **7/24/2015** SeqNo: **451535**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	20.3	1.00	20.00	0	102	69.3	132				
Toluene	19.2	1.00	20.00	0	96.0	61.3	145				
Ethylbenzene	19.4	1.00	20.00	0	97.0	72	130				
m,p-Xylene	37.6	1.00	40.00	0	94.0	70.3	134				

Work Order: 1507250
CLIENT: PBS Engineering & Environmental
Project: Mason County Transportation

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260

Sample ID **LCS-R23824** SampType: **LCS** Units: **µg/L** Prep Date: **7/24/2015** RunNo: **23824**
Client ID: **LCSW** Batch ID: **R23824** Analysis Date: **7/24/2015** SeqNo: **451535**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
o-Xylene	19.1	1.00	20.00	0	95.4	72.1	131				
Surr: Dibromofluoromethane	24.6		25.00		98.6	77.4	147				
Surr: Toluene-d8	26.2		25.00		105	40.1	139				
Surr: 1-Bromo-4-fluorobenzene	25.4		25.00		102	64.2	128				

Sample ID **MB-R23824** SampType: **MBLK** Units: **µg/L** Prep Date: **7/24/2015** RunNo: **23824**
Client ID: **MBLKW** Batch ID: **R23824** Analysis Date: **7/24/2015** SeqNo: **451536**

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	23.5		25.00		94.0	77.4	147				
Surr: Toluene-d8	25.7		25.00		103	40.1	139				
Surr: 1-Bromo-4-fluorobenzene	24.8		25.00		99.3	64.2	128				

Sample Log-In Check List

Client Name:	**PBS**	Work Order Number:	**1507250**
Logged by:	**Mike Ridgeway**	Date Received:	**7/23/2015 3:40:00 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 present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☐	No ☑	NA ☐
	Please refer to item information.			
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 there 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:

Most samples received straight from field.

Item Information

Item #	Temp ºC
Cooler	5.7
Sample	13.9
Temp Blank	15.5

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

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): 1507250

Date: 7.23.15

Page: 1 of: 1

Client: PBS

Address:

City, State, Zip: Seattle

Tel: Fax:

Project Name: Mason County Transportation

Project No: 41271.002

Location: Shelton, WA

Collected by: MN

Reports To (PM): MN

Email:

*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, SW = Strom 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 VOC (EPA 8270)	PAH (EPA 8270 - SIM)	PCBs (EPA 8082)	Metals** (6020 / 200.8)	Total (T) / Dissolved (D)	Anions (IC)***	EDB (8011)	Comments/Depth
1	[illegible]																	
2	MW2	7/23	1112	GW		X				X		X						
3	MW3	"	1144	"		X				X		X						
4	MW4	"	1222	"		X				X		X						
5	MW5	"	1247	"		X				X		X						
6	MW6	"	1032	"		X				X		X						
7	DUP. 7.23.15	7/23	—	GW			X											
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

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

Turn-around times for samples received after 4:00pm will begin on the following business day.

Special Remarks:

Relinquished	Date/Time	Received	Date/Time
x [signature]	7/23/15 1540	x [signature] for	7/23/15 15:40
Relinquished	Date/Time	Received	Date/Time
x		x	

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

^Please coordinate with the lab in advance

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