PBS Engineering + Environmental Est. 1982

October 7, 2014

Roy Farms, Inc.
Attn: John Reeves
401 Walters Road
Moxee, Washington 98936

Re: August 2014 Biannual Monitoring Report
Yakima County Parcel #201208-31001
PBS Project No. 62357.005

Dear Mr. Reeves:

PBS Engineering and Environmental Inc. (PBS) is pleased to provide the results of the groundwater sampling event conducted at the above-referenced location on August 5-6th, 2014. As part of the biannual monitoring program adopted for the site, this was the first sampling event of the year.

Background

A gasoline and diesel fuel release was discovered during a Phase II Environmental Site Assessment conducted by PBS in the spring of 2009. Once the release was discovered, Roy Farms excavated contaminated soil and removed two aboveground fuel storage tanks in the spring of 2009. A limited amount of petroleum-contaminated soil was left in place due to structural concerns at the adjacent shop building foundation. After removing contaminated soil, the pit was backfilled with clean soil. Contaminated soil from the remedial action is currently on site, and has been the subject of land farming, bio-remediation and ongoing sampling and analysis.

In June 2009, three monitoring wells were installed, designated as MW-1 through MW-3. A fourth well was installed in 2010 due to petroleum constituents detected above state cleanup levels in all three wells. Monitoring well MW-4, installed several hundred feet down gradient, serves as a sentry well to help determine if petroleum contaminated groundwater is moving off-site.

August 2014 Groundwater Sampling

The four on-site monitoring wells are sampled twice annually. Monitoring wells MW-1 and M-2 are located northeast and southeast of the former excavated area, respectively. Monitoring well MW-3 is located within the contaminated groundwater plume downgradient of the former excavated area. Monitoring well MW-4 is a downgradient well placed near a seasonal irrigation canal. Figure 1 is a site plan showing the wells and is included as Attachment I.

Prior to sampling each individual monitoring well, the water table elevation was recorded by PBS using an interface meter. PBS sampled the monitoring wells following PBS' standard operating procedure for low-flow sampling, which is included as Attachment II to this report. Also included with this report are the low flow field data sheets in Attachment III. Sampling was completed in accordance with the sampling plan for the site.

Groundwater samples were collected in laboratory-prepared sample containers and stored in a cooler with ice. Groundwater parameters for conductivity, pH, temperature, oxidation reduction potential (ORP), and dissolved oxygen were collected at the time of sampling.

Sample Analysis

The collected samples were submitted to the Friedman and Bruya Laboratory in Seattle, Washington, within specified holding times. The samples were analyzed for gasoline (method NWTPH-Gx), benzene, toluene, ethylbenzene, and xylenes (BTEX, EPA Method 8260C) and diesel (Method NWTPH-Dx). Samples were also analyzed for volatile organic compounds (VOCs) methyl-tertiary-butyl ether (MTBE), ethylene dibromide (EDB), ethylene dichloroethane (EDC), and naphthalene by Method 8260C.

The laboratory analytical report is included with this report as Attachment IV.

Results

Sample results for MW-1 – MW-4 are presented in Table 1 in Attachment V along with the historical analytical results. Results from monitoring wells MW-2 and MW-3 were found to exceed the Model Toxics Control Act (MTCA) Method A cleanup level of 5 micrograms per liter (µg/L) for benzene. Gasoline was detected in both these monitoring well; however the concentration of gasoline in monitoring well MW-2 was below the MTCA Method A cleanup value of 800 µg/L when benzene is present.

Gasoline, BTEX, gasoline additive MTBE, and naphthalene all exceeded the respective MTCA Method A cleanup levels in well MW-3. Diesel range hydrocarbons were also detected in this monitoring well at a concentration exceeding the Method A cleanup level. However, the diesel result was flagged by the lab and the diesel is likely due to overlap of gasoline range hydrocarbons. Refer to Figure 1 for monitoring well locations and a plume diagram based on August 2014 gasoline concentrations.

Groundwater elevations were used to determine the direction of groundwater flow, which was found to be approximately North 53º West. The northwest direction of flow was in agreement with observed flow directions during previous sampling events. The gradient was calculated as .007 foot per foot.

Discussion

Gasoline and BTEX concentrations from monitoring well MW-3 continue to significantly exceed MTCA Method A cleanup levels. Gasoline concentrations in this well were identical to the previous sampling event, which had occurred in September 2013. BTEX concentrations were little changed between September 2013 and August 2014.

Gasoline and benzene concentrations in monitoring well MW-2 decreased in August 2014 as compared to September 2013, and both were at the lowest concentrations yet observed in this well. This is the first sampling event in which gasoline did not exceed the Method A cleanup level of 800 ug/L, however benzene continued to exceed the Method A cleanup level in this well.

All results from monitoring well MW-1 were below the respective laboratory MRL. This is the fourth consecutive six month sampling period with all the results below the laboratory MRL.

Groundwater at monitoring well MW-4, installed in 2010 after the first three wells had been installed, had no petroleum concentrations above the laboratory MRL. This is consistent with previous findings.

The water level elevations in each of the four monitoring wells had risen as compared to the previous sampling event. Monitoring well MW-4 showed the greatest increase in water level as compared to September 2013. As mentioned in previous reports, this well appears to be under the influence of the nearby irrigation canal, with water levels higher during the irrigation season.

Conclusion

The elevated concentrations of benzene and gasoline in monitoring wells MW-2 and MW-3 are high enough that cleanup levels may be exceeded for a number of years. The Department of Ecology (Ecology) guidelines typically require that four consecutive quarters over a one-year period of results below cleanup levels be documented before Ecology will consider a no further action (NFA) letter for a site.

PBS had presented a discussion of additional wells to better characterize the plume and recommended joining the Ecology Voluntary Cleanup Program in the May 2012 sampling report. PBS would also suggest that interim actions, such as in-situ treatments, be considered to reduce hydrocarbon concentrations in monitoring well MW-3.

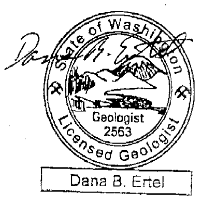
PBS understands that continued sampling on a twice yearly schedule is preferred by Roy Farms at this point in time. One additional sampling event is planned for 2014.

Limitations

This work was performed in accordance with the generally accepted practices of consultants undertaking similar studies at the same time and in the same geographical area. PBS observed a degree of care and skill generally exercised by other consultants under similar circumstances and conditions. Findings and conclusions must be considered not as scientific certainties, but as opinions based on professional judgment concerning the significance of the data gathered during the course of monitoring. The site as a whole may have other contamination that was not characterized by this study. 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. Other than this, no warranty is implied or intended.

We appreciate the opportunity to provide this report. If you have any questions or need further services please contact us at 509.735.2698.

Prepared and submitted by:



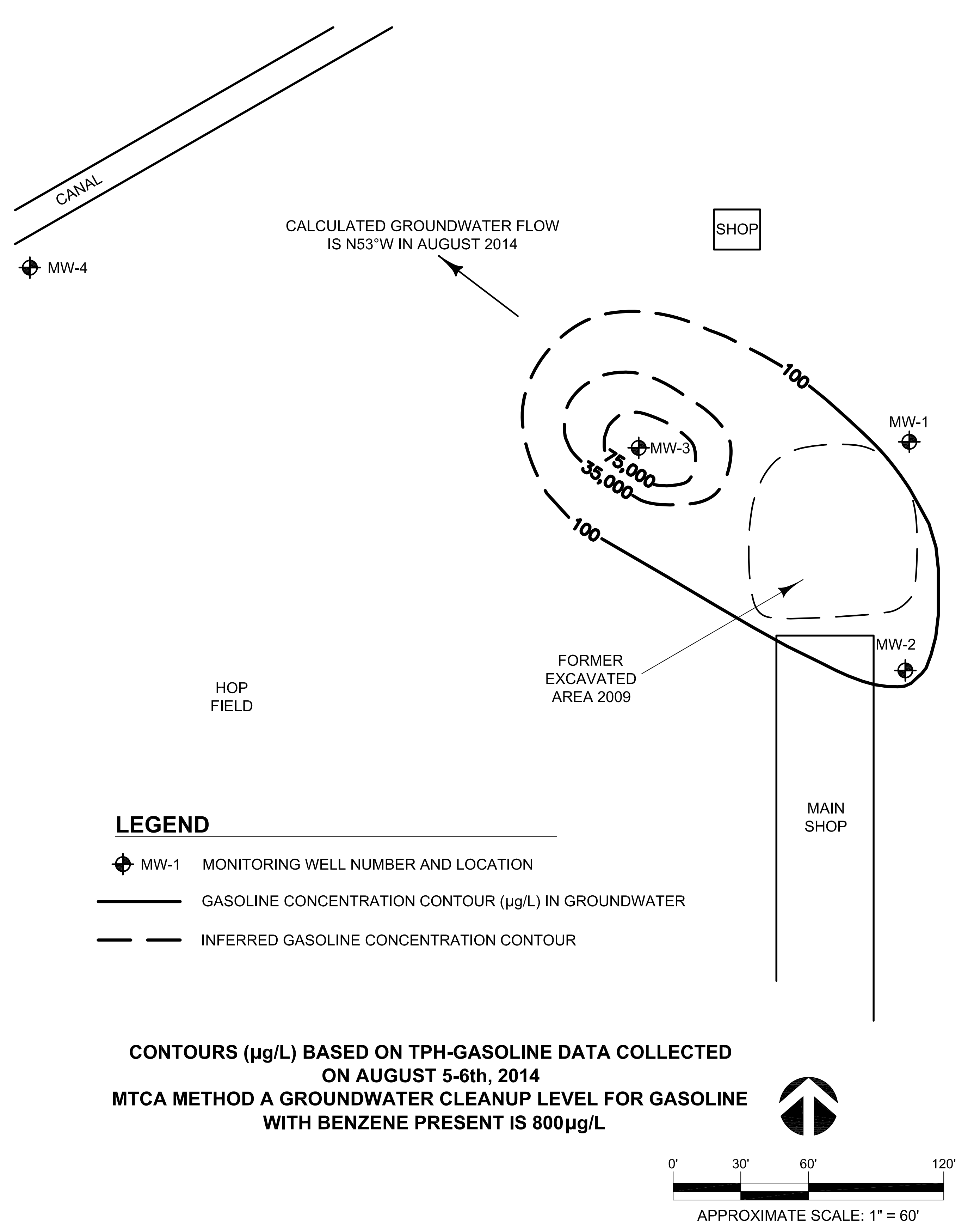
Dana Ertel, LG
PBS Project Manager
October 7, 2014

Reviewed by:
Tom Mergy, LG
PBS Senior Geologist

Attachments: Figure 1. Site Plan
PBS SOP: Low Flow Groundwater Sampling
August 2014 Groundwater Sampling Forms MW1-MW4
Table 1. Roy Farms Groundwater Parameters and Petroleum Constituents for 2009-2014
Laboratory Data and COC Form

ATTACHMENT I

Figure 1: Site Plan



PREPARED FOR: ROY FARMS

PBS	PROJECT # 62357.003	WELL LOCATION MAP/PLUME MAP	FIGURE
	DATE OCT 2014	ROY FARMS MOXEE, WASHINGTON	1

C:\Users\dana\Documents\CAD Files\62357 Aug 2014 Fig 1.dwg Oct 03, 2014 12:02pm dana

ATTACHMENT II

PBS SOP: Low Flow Groundwater Sampling

STANDARD OPERATING PROCEDURE
GROUNDWATER SAMPLING USING LOW-FLOW SAMPLING TECHNIQUES

1.0 BACKGROUND AND PURPOSE

Groundwater samples are collected from monitoring wells and temporary borings for analysis of physical and chemical parameters, either by using field observations and portable equipment and/or using off-site laboratory analytical methods. Groundwater is typically purged prior to sample collection to ensure that water sampled is representative of the formation. Traditional groundwater sampling methods required removal of multiple casing volumes of water, resulting in large quantities of water requiring disposal and increasing the potential for volatilization of organic compounds due to a high pump rate. The agitation from this removal could increase turbidity as well.

Low-flow purging and sampling methods were developed to minimize purge water volume and reduce the potential for contaminant volatilization. Low-flow techniques have become the industry standard for collecting a groundwater sample because the method minimizes turbidity and produces a more representative groundwater sample. Although it is preferable to use pumps dedicated to specific wells, low-flow techniques can be achieved with a portable pump.

The procedures in this Standard Operating Procedure (SOP) are specific to standard monitoring wells with a single-slotted interval. This SOP is generally acceptable for use with temporary borings.

2.0 EQUIPMENT LIST

1. Well lock keys
2. Groundwater Sampling Field Form
3. Electronic water level probe
4. Interface probe (if dense or light non-aqueous phase liquids are [DNAPL or LNAPL] is present)
5. Knife or scissors
6. Decontamination equipment
7. Site map and health and safety plan
8. Personal Protection Equipment (PPE) appropriate for the site
9. Submersible pump or peristaltic pump and associated equipment
10. Compressed gas source (Nitrogen or air compressor), battery source, or generator and fuel
11. Control box
12. Disposable tubing, if necessary
13. Field water quality monitoring equipment
14. Buckets or containers for purge water and drum labels
15. Sample containers, labels, packaging material

3.0 PROCEDURE

Low-flow techniques rely on stabilization of field water quality parameters to determine when groundwater is representative of aquifer conditions. Measurement of groundwater quality parameters occurs in a closed system in which groundwater does not come in contact with open air; dissolved oxygen (DO), oxygen-reduction potential (ORP), and pH measurements are sensitive to reactions with the atmosphere. A flow-through cell (flow cell) serves as this closed system and is used to measure field parameters prior to collecting groundwater samples. Stabilization of selected parameters indicated that conditions are suitable for sampling to begin.

This method requires care when placing a portable pump and/or tubing in the well to minimize disturbance to the water column. Low-flow purge and sample methods call for low pumping rates (0.1 to 0.5 liter/minute) to reduce drawdown. A drawdown of less than 0.3 feet in the water column, once the pumping rate has stabilized, is desirable; however depending on the lithology, this is not always possible. At a minimum, the depth-to-water should be stabilized for three consecutive readings taken between 3 to 5 minutes apart (in conjunction with the stabilization of the other parameters).

For monitoring wells, sampling should proceed as follows:

1. Note the general condition of the well. Check well for security damage or evidence of tampering and record pertinent observations. Note any maintenance tasks that should be completed, such as well cap or padlock replacement.
2. Open the well and wait a minimum of five minutes for water levels to approach an equilibrium state with atmospheric pressure before taking any measurements.
3. Measure the depth to water relative to the marking on the well casing. If there is no mark, use the north side of the casing. Record the water level on the field form. Note if DNAPL or LNAPL is present.
4. If using a portable pump setup, slowly lower the pump or tubing to the midpoint of the screen or sample interval. Secure the pump or tubing to prevent it from moving. Skip this step if using dedicated pumps.
5. Hook up the control box, compressor or nitrogen tank with regulator, or peristaltic pump, and flow cell with field water quality monitoring equipment. Put the water level probe in the well so water levels can be measured as you are pumping. Start the pump and adjust the pumping rate to between 0.1 and 0.5 liters per minute (using a measuring cup to calculate the flow rate). Begin recording readings on the field sheet. Be sure to purge the amount of water in tubing before taking readings or a sample. Monitor water levels as well as groundwater parameters.
6. During purging, take readings every 3 to 5 minutes. Record readings on the field form. Purging is considered complete when the groundwater parameters have stabilized for three consecutive readings.

Field Parameter	**Stabilization Goal**
Temperature	+/- 3%
Specific conductance	+/- 3% mS/cm
pH	+/- 0.1 pH units
DO	+/- 10% *or* +/- 0.3 mg/L
ORP	+/- 10 millivolts
Depth to Water	+/1 0.3 feet

7. Measure turbidity of the sample water using field instruments prior to sample collection and upon any obvious visual changes in turbidity during sample collection.
8. The water sample must be collected before the water passes through the flow cell. Disconnect the tubing from the flow cell and directly fill the sample containers. If you are

collecting samples for volatile organic compound (VOC) analysis, you may need to decrease the pump rate; if this is the case, other samples should be collected first. Fill unpreserved bottles first. Filtered samples should be collected after all other samples have been collected.

9. Groundwater samples for dissolved metals analyses can be field filtered with a 0.45 micron filter directly connected to the tubing. Mark “field filtered” or “FF” on the bottle label, field form, and chain of custody.
10. Prior to filling or just after filling, label each bottle and make sure it is properly sealed. Place in a cooler with ice and pack for transportation.
11. As necessary, pull pump and discard tubing. Decontaminate the pump based on the SOP for the site.
12. Close and lock the well.
13. Make sure all information is completed on the groundwater field form and sign and date it.
14. Dispose of all purge and decontamination water in the appropriate containers.

For temporary borings, the goal of minimizing the drawdown may not be obtainable for the following reasons:

- The narrow temporary casing (often 1-inch PVC) can prevent monitoring groundwater level measurements (insufficient room in the temporary casing to install a water level meter)
- Excessive fines (silt and clay) may be present in the temporary screened interval because the boring has not been developed in the manner of a constructed monitoring well.
- Excessive suspended sediment in the water column may prevent a peristaltic pump from operating at a low flow rate (the peristaltic pump often quits working at very low flow rates).

For these reasons, temporary borings should be sampled by utilizing the lowest flow rate possible and monitoring field parameters as indicated above to indicate when sampling is appropriate. All other procedural steps should be completed as appropriate to a temporary boring scenario.

References:

Puls, R.W. and M.J. Barcelona, 1996, GROUNDWATER ISSUE PAPER: Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures; U.S. Environmental Protection Agency, EPA/540/S-95/504.

Yeskis, D. and Bernard Zavala, GROUNDWATER ISSUE PAPER: Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers, U.S. Environmental Protection Agency, EPA 542-S-02-001, May 2002

ATTACHMENT III

August 2014 Groundwater Sampling Forms MW1-MW4

PBS

PBS Engineering & Environmental

GROUNDWATER SAMPLING FIELD FORM

Revised: 12/2011

Project: Roy Farms

Project No.: 62357

Date: 8/5/14

Field Personnel: DBS

Monitoring Well ID: MW-1

Weather Conditions: Hot, clear, 85°F

Initial DTW: 13.13

INITIAL WELL DATA & WELL PURGING INFORMATION

1/4 inch tubing = approx 0.0025 gallons/linear foot

Time (0.00 - 24:00)	Water Temperature (+/-0.50C)	Specific Conductivity (mS/cm)	Dissolved Oxygen mg/L	Water pH	ORP (mV)	Turbidity (visual)	Water Level (feet TOC)	Volume Purged (gallons)
1122						~~Clear~~ murky	13.13	
1130	15.14	1276	7.12	7.47	-36.6	"	"	
1133	14.36	1249	6.79	7.44	-11.0	"	13.13	
1137	14.43	1221	7.04	7.49	5.0	"	"	
1142	14.37	1163	7.88	7.58	15.5	"	"	
1148	14.27	1117	8.21	7.65	19.7	"	13.13	
1154	14.14	1090	8.47	7.70	22.2	"	"	
1156	14.12	1085	8.60	7.71	24.4	"	"	
1158	14.14	1081	8.55	7.71	25.4	"		
							Total Purged =	

Type of pump used (circle one): Peristaltic Bladder Other _____

Depth of tubing inlet (approx. feet bgs): 27.5

Purge Pumping Rate (approx. ml/m): 300 3CPm

QA/QC Sample collected (circle one): Duplicate Lab QA/QC Equipment Blank None

Final Turbidity Reading (NTUs): 8.25

Time Sampled: 1200

Sample ID: ~~1200~~ MW-1

MW-DUP

WELL CONDITION

Recommended Well Repairs/Additional Notes:

Well in good condition, one well cover bolt is broken.

TD = 33.65'

FIELD OBSERVATIONS / NOTES

Signature of Field Personnel:

PBS

PBS Engineering & Environmental

GROUNDWATER SAMPLING FIELD FORM

Revised: 12/2011

Project: Roy Farms

Project No.: 62357

Date: 8/5/14

Field Personnel: DBE

Monitoring Well ID: MW-2

Weather Conditions: Hot, clear, 95°F

Initial DTW: 16.72

INITIAL WELL DATA & WELL PURGING INFORMATION

1/4 inch tubing = approx 0.0025 gallons/linear foot

Time (0.00 - 24:00)	Water Temperature (+/-0.50C)	Specific Conductivity (mS/cm)	Dissolved Oxygen mg/L	Water pH	ORP (mV)	Turbidity (visual)	Water Level (feet TOC)	Volume Purged (gallons)	GPM
1334						sl murky	16.72		3
1340	16.80	1050	3.11	7.29	-49.7	"	"		3
1343	15.30	1032	1.96	7.17	-46.8	"	"		3
1345	14.95	1027	1.73	7.28	-34.0	"	16.85		2
1350	15.46	1023	2.05	7.24	-33.7	"	16.80		
1357	15.33	1018	2.44	7.22	-27.4	"	"		
1400	15.19	1008	2.60	7.22	-22.8	"	16.80		
1405	15.03	993	2.97	7.25	-16.3	"	"		
1408	15.10	986	3.07	7.24	-15.0	"	"		
1410	15.07	976	3.15	7.25	-11.6	"	"		
1412	15.10	976	3.17	7.24	-11.0	"	"		
							Total Purged =		

Type of pump used (circle one): Peristaltic Bladder Other ____________

Depth of tubing inlet (approx. feet bgs): 19'

Purge Pumping Rate (approx. ml/m): 200@2 3 GPM/@2 GPM

QA/QC Sample collected (circle one):

Duplicate Lab QA/QC Equipment Blank None

Final Turbidity Reading (NTUs): 3.85

Time Sampled: 1415

Sample ID: MW-2

WELL CONDITION

Recommended Well Repairs/Additional Notes: TD=31.40' Well in good Condition. Several inches of water were in the bottom of the well cover, PBS bailed out the water. PBS observed a sheen on the water.

FIELD OBSERVATIONS / NOTES

Signature of Field Personnel:

PBS

PBS Engineering & Environmental

GROUNDWATER SAMPLING FIELD FORM

Revised: 12/2011

Project: Ray Farms

Project No.: 62357

Date: 8/6/14

Field Personnel: DBE

Monitoring Well ID: MW-3

Weather Conditions: Hot, clear, 90°F

Initial DTW: 13.95

INITIAL WELL DATA & WELL PURGING INFORMATION

1/4 inch tubing = approx 0.0025 gallons/linear foot

Time (0.00 - 24:00)	Water Temperature (+/-0.50C)	Specific Conductivity (mS/cm)	Dissolved Oxygen mg/L	Water pH	ORP (mV)	Turbidity (visual)	Water Level (feet TOC)	Volume Purged (gallons)
1210								
1213						sl murky	13.95	
1215						"	14.03	3
1217	15.22	1256	3.47	7.07	-298.1	"	14.10	3
1224	15.56	1255	2.59	7.08	-331.1	"	14.03	1
1228	15.50	1256	2.44	7.14	-338.2	"	14.03	
1231	15.53	1255	2.10	7.14	-335.0	"	"	
1235	15.37	1256	1.95	7.14	-337.7	"	"	
1238	15.35	1256	1.79	7.14	-338.0	"	"	
1240	15.36	1256	1.77	7.14	-337.7	"	"	

Total Purged =

Type of pump used (circle one): Peristaltic Bladder Other ____

Depth of tubing inlet (approx. feet bgs): 20'

Purge Pumping Rate (approx. ml/m): 110/1 cpm 2 cpm

QA/QC Sample collected (circle one):

Duplicate Lab QA/QC Equipment Blank None

Final Turbidity Reading (NTUs): 21.28

Time Sampled: 1245

Sample ID: MW-3

WELL CONDITION

Recommended Well Repairs/Additional Notes:

TD=30.55' Well in good Condition

FIELD OBSERVATIONS / NOTES

Fuel odor.

Signature of Field Personnel:

PBS

PBS Engineering & Environmental

GROUNDWATER SAMPLING FIELD FORM

Revised: 12/2011

Project: Roy Farms

Project No.: 62357

Date: 8/6/14

Field Personnel: DBE

Monitoring Well ID: MW-4

Weather Conditions: Hot, clear 80°F

Initial DTW: 7.72

INITIAL WELL DATA & WELL PURGING INFORMATION

1/4 inch tubing = approx 0.0025 gallons/linear foot

Time (0.00 - 24:00)	Water Temperature (+/-0.50C)	Specific Conductivity (mS/cm)	Dissolved Oxygen mg/L	Water pH	ORP (mV)	Turbidity (visual)	Water Level (feet TOC)	Volume Purged (gallons)	
0946							7.72		
0953	17.67	165	3.16	8.24	-54.0	sl murky	9.25		3 cpm
1000	–							Hold	
1005	–						8.36		1 cpm
1012	18.69	166	2.80	8.27	-48.5	"	8.55		"
1016	18.46	166	3.22	8.26	-48.1	"	8.61		
1020	18.41	165	3.15	8.27	-40.1	"	8.72		
1027	18.38	166	3.64	8.27	-39.9	"	8.78		
1032	18.32	165	3.20	8.26	-30.6	"	8.70		
1038	18.26	164	3.47	8.27	-31.9	"	8.70		
1044	18.16	165	3.36	8.27	-29.9	"	8.70		
1046	18.13	165	3.20	8.27	-30.1	"	"		
1048	18.16	165	3.22	8.27	-30.0	"	"		
1050	18.12	165	3.22	8.27	-26.2	"	"		

Total Purged =

Type of pump used (circle one): Peristaltic Bladder Other ______

Depth of tubing inlet (approx. feet bgs): 21'

Purge Pumping Rate (approx. ml/m): 125/1cpm 3 CPM to start 1 cpm

QA/QC Sample collected (circle one):

Duplicate Lab QA/QC Equipment Blank None

Final Turbidity Reading (NTUs): 11.28

Time Sampled: 1100

Sample ID: MW-4

WELL CONDITION

Recommended Well Repairs/Additional Notes:

TD=24.80' Well in good condition

FIELD OBSERVATIONS / NOTES

Water in the road just NW of well, flowing west

Signature of Field Personnel:

ATTACHMENT IV

Table 1: Roy Farms Groundwater Parameters and Petroleum Constituents for 2009-2014

Table 1. Roy Farms Groundwater Parameters and Petroleum Constituents for 2009-2014
Roy Farms
Moxee, Washington

Sample #	Sample Date	Depth to Groundwater (feet)	pH	Conductivity (micromhos/cm)	Temp (°C)	ORP (millivolts)	Gasoline (µg/L)	BTEX (µg/L)	Diesel/Oil (µg/L)	MTBE (µg/L)	EDC (µg/L)	EDB (µg/L)	Lead (µg/L)	Naphthalene (µg/L)
MW-1	06/08/2009	19.18	NA	NA	NA	NA	**7,700**	**330/**270/320/810	NA	NA	NA	NA	NA	NA
	09/28/2009	16.99	7.34	1032	16.2	NA	ND	3.4/1/ND/5	ND	NA	NA	NA	NA	NA
	12/16/2009	18.64	7.41	1040	15.5	NA	130	**39**/2/<1/130	50^/<250	NA	NA	NA	NA	NA
	03/30/2010	19.21	7.27	1161	16.0	NA	150	**16**/ND/ND/16	ND	NA	NA	NA	NA	NA
	07/01/2010	16.24	7.24	1220	13.0	NA	<100	**7.8**/<1/<1/<3	<50/<250	NA	NA	NA	NA	NA
	10/28/2010	17.12	7.25	1090	12.6	+222	<100	1.6/<1/<1/<3	<50/<250	NA	NA	NA	NA	NA
	07/05/2011	16.86	7.08	1391	13.2	+101	110	**23**/<1/<1/2.7	<50/<250	<1	NA	NA	<0.1	4
	01/23/2012	17.92	7.17	1267	11.7	+199	<100	**5.5**/<1/<1/1.1	100/<250	<1	<1	NA	<1.5	<1
	05/29/2012	17.95	7.75	1056	20.7	+80	<100	<0.35/<1/<1<3	<50/<250	<1	<1	<1	NA	<1
	5/6/2013	17.96	7.46	1157	16.16	+27.3	<100	<0.35/<1/<1<3	110x/<250	<1	<1	<1	NA	<1
	9/27/2013	14.20	7.58	828	12.88	237.5	<100	<1/<1/<1<3	<50/<250	<1	<1	<1	NA	<1
	8/5/2014	13.13	7.71	1081	14.14	25.4	<100	<1/<1/<1<3	<50/<250	NA	NA	NA	NA	NA
MW-DUP	8/5/2014						<100	<1/<1/<1<3	<50/<250	NA	NA	NA	NA	NA

Sample #	Sample Date	Depth to Groundwater (feet)	pH	Conductivity (micromhos/cm)	Temp (°C)	ORP (millivolts)	Gasoline (µg/L)	BTEX (µg/L)	Diesel/Oil (µg/L)	MTBE (µg/L)	EDC (µg/L)	EDB (µg/L)	Lead (µg/L)	Naphthalene (µg/L)
MW-2	06/08/2009	22.78	NA	NA	NA	NA	**1,900**	**1,200/**98/13/280	NA	NA	NA	NA	NA	NA
	09/28/2009	20.37	7.11	1138	16.7	NA	**1,300**	**1,000**/25/ND/130	ND	NA	NA	NA	NA	NA
	12/16/2009	22.50	7.07	1440	16.2	NA	**9,500**	**3,100**/93/<1/**9,500**	**840^/**<250	NA	NA	NA	NA	NA
	03/30/2010	22.75	7.09	1229	16.5	NA	**2600**	**2000/160/33/390**	ND	NA	NA	NA	NA	NA
	07/01/2010	20.06	7.01	1235	13.6	NA	**1,000**	**900**/20/ND/76	160^/<250	NA	NA	NA	NA	NA
	10/28/2010	20.43	6.90	1414	13.1	+14	**4,700**	**18,000**/38/<10/160	250^/<250	NA	NA	NA	NA	NA
	07/05/2011	20.65	6.90	1384	14.2	+92	**2,400**	**1,500**/12/<10/100	210^/<250	<1	NA	NA	NA	1.2
	01/23/2012	21.29	6.76	1931	12.9	+247	**4,000**	**2,600**/41/<1/250	**510/**<250	1.7	<1	<1	NA	10
	05/29/2012	21.52	7.09	1377	13.8	+67	**3,000**	**1,700**/<50/<50/140	160^/<250	<50**	<50	<50	NA	<50
	5/7/2013	21.59	6.74	1451	15.77	12	**2,600**	**1,700**/<50/<50/120	190^/<250	<50	<50	<50	NA	<50
	9/27/2013	17.54	7.40	790	13.60	268.3	**1,000**	**410**/<10/<10/<30	<50/<250	<10	<10	<10	NA	<10
	8/5/2014	16.72	7.24	976	15.10	-11	160	**53**/<1/<1<3	<50/<250	NA	NA	NA	NA	NA
MW-3	06/08/2009	20.20	NA	NA	NA	NA	**17,000**	**13,000/7,600/790/3,400**	NA	NA	NA	NA	NA	NA
	09/28/2009	16.96	6.94	1526	16.7	NA	**24,000**	**14,000/7,900/860/5,900**	ND	NA	NA	NA	NA	NA
	12/16/2009	19.86	6.98	1724	15.8	NA	**90,000**	**20,000/12,000/1,300/90,000**	**3,800^/**<250	NA	NA	NA	NA	NA

Sample #	Sample Date	Depth to Groundwater (feet)	pH	Conductivity (micromhos/cm)	Temp (°C)	ORP (millivolts)	Gasoline (µg/L)	BTEX (µg/L)	Diesel/Oil (µg/L)	MTBE (µg/L)	EDC (µg/L)	EDB (µg/L)	Lead (µg/L)	Naphthalene (µg/L)
MW-3	03/30/2010	20.51	6.93	1685	16.5	NA	**50,000**	**24,000/8,300/1,200/7,300**	ND	NA	NA	NA	NA	NA
	07/01/2010	17.09	6.89	1543	13.1	NA	**100,000**	**18,000/4,500/990/5,800**	**3,800^/**<250	NA	NA	NA	NA	NA
	10/28/2010	18.53	6.77	1540	12.9	-85	**72,000**	**18,000/6,500/1,100/7,200**	**4,300^**/<250	NA	NA	NA	NA	NA
	07/05/2011	17.80	6.88	1586	13.6	-30	**71,000**	**19,000/5,100/1,200/ 6,100**	**3,500^**/<250	**110**	NA	NA	<1	**230**
	01/23/2012	19.22	6.81	1850	12.1	-116	**110,000**	**23,000/11,000/1,500/9,500**	**5,200**/<250	**92**	<1	<1	1.86	**350**
	05/29/2012	18.99	7.03/NA	1448/NA	14.5	-217	**47,000**	**22,000/7,900/1,400/6,800**	**3,400^**/<250	<1,000**	<1,000**	<1,000**	NA	<1,000**
	5/6/2013	18.92	6.61	1357	15.78	-81.2	**75,000**	**21,000/6,200/1,900/1,900**	**4,200^**/<250	<100	<100	<100	NA	**380**
	9/27/2013	15.08	7.21	943	14.15	-120	**78,000**	**20,000/3,700/1,600/7,600**	**3,200^**/<250	<200	<200	<200	NA	**250**
MW-DUP	9/27/2013						**76,000**	**20,000/3,600/1,600/7,400**	**2,800^**/<250	<200	<200	<200	NA	**250**
	8/6/2014	13.95	7.14	1256	15.36	-338	**78,000**	**19,000/3,200/1,700/7,800**	**2,300^/**<330	**76**	<1	<1	<1	**260**
MW-4	11/18/2010	19.65	7.75	260	14.0	+120	ND	ND/ND/ND/ND	ND/ND	NA	NA	NA	NA	NA
	07/05/2011	12.88	7.77	221	12.9	+92	<100	<0.35/<1/<1/<3	<50/<250	<1	NA	NA	NA	<1
	01/23/2012	20.90	7.92	317	12.2	-15	<100	<0.35/<1/<1/<3	<50/<250	<1	<1	<1	NA	<1.5
	05/29/2012	12.73	8.24	164	13.6	+38	<100	<0.35/<1/<1/<3	<50/<250	<1	<1	<1	NA	<1
	5/6/2013	11.96	7.33	177	11.88	4.0	<100	<0.35/<1/<1/<3	<50/<250	<1	<1	<1	NA	<1

Sample #	Sample Date	Depth to Groundwater (feet)	pH	Conductivity (micromhos/cm)	Temp (°C)	ORP (millivolts)	Gasoline (µg/L)	BTEX (µg/L)	Diesel/Oil (µg/L)	MTBE (µg/L)	EDC (µg/L)	EDB (µg/L)	Lead (µg/L)	Naphthalene (µg/L)
MW-4	9/27/2013	13.13	8.36	153	16.88	246.3	<100	<0.35/<1/<1/<3	<50/<250	<1	<1	<1	NA	<1
	8/6/2014	7.72	8.27	165	18.12	-26	<100	<0.35/<1/<1/<3	<50/<250	<1	<1	<1	NA	<1
MTCA Method A Cleanup Levels							800/1000	5/1,000/700/1000	500/500	20	5	0.01	15	160

Note: µg/L =micrograms/Liter

MW-DUP =duplicate sample

BTEX = Benzene, Toluene, Ethylbenzene, Total Xylenes

Bold results exceed WDOE – Method A Cleanup Levels

< = Constituent not detected above laboratory method detection limit

ND = Not detected above laboratory method detection limit

^=lab qualifier, diesel range is likely influenced by another constituent

NA = Not analyzed

**= Not further quantified by laboratory

Model Toxics Control Action (MTCA) Method A Cleanup levels are indicated on the last line (The1,000 µg/L cleanup level for gasoline is applicable when no benzene is detected)

ATTACHMENT V

Laboratory Report and COC Form

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

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August 19, 2014

Dana Ertel, Project Manager
PBS Engineering and Environmental, Inc.
400 Bradley Blvd, Suite 300
Richland, WA 99352

Dear Mr. Ertel:

Included are the results from the testing of material submitted on August 8, 2014 from the 62357, F&BI 408132 project. There are 16 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
PBR0819R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on August 8, 2014 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental 62357, F&BI 408132 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	PBS Engineering and Environmental
408132 -01	MW-1
408132 -02	MW-2
408132 -03	MW-Dup
408132 -04	MW-3
408132 -05	MW-4

Several 8260C compounds failed below the acceptance criteria in the matrix spike samples. The laboratory control samples met the acceptance criteria, therefore the data were likely due to sample matrix effect.

Bromomethane in the 8260C laboratory control sample and laboratory control sample duplicate exceeded the acceptance criteria. The analyte was not detected in the sample, therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 08/19/14
Date Received: 08/08/14
Project: 62357, F&BI 408132
Date Extracted: 08/11/14
Date Analyzed: 08/11/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW-3 408132-04 1/100	78,000	92
MW-4 408132-05	<100	90
Method Blank 04-1639 MB	<100	95

Date of Report: 08/19/14
Date Received: 08/08/14
Project: 62357, F&BI 408132
Date Extracted: 08/11/14 and 08/13/14
Date Analyzed: 08/11/14 and 08/13/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW-1 408132-01	<1	<1	<1	<3	<100	94
MW-2 408132-02	53	<1	<1	<3	160	92
MW-Dup 408132-03	<1	<1	<1	<3	<100	91
Method Blank 04-1639 MB	<1	<1	<1	<3	<100	92

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/19/14
Date Received: 08/08/14
Project: 62357, F&BI 408132
Date Extracted: 08/12/14
Date Analyzed: 08/12/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-134)
MW-1 408132-01	<50	<250	97
MW-2 408132-02	<50	<250	94
MW-Dup 408132-03	<50	<250	87
MW-3 408132-04 1/1.3	2,300 x	<330	89
MW-4 408132-05	<50	<250	89
Method Blank 04-1646 MB	<50	<250	86

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-3	Client:	PBS Engineering and Environmental
Date Received:	08/08/14	Project:	62357, F&BI 408132
Date Extracted:	08/13/14	Lab ID:	408132-04
Date Analyzed:	08/13/14	Data File:	408132-04.025
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	NA	Project:	62357, F&BI 408132
Date Extracted:	08/13/14	Lab ID:	I4-507 mb
Date Analyzed:	08/13/14	Data File:	I4-507 mb.017
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-3	Client:	PBS Engineering and Environmental
Date Received:	08/08/14	Project:	62357, F&BI 408132
Date Extracted:	08/11/14	Lab ID:	408132-04
Date Analyzed:	08/11/14	Data File:	081108.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	89	85	117
Toluene-d8	105	93	107
4-Bromofluorobenzene	104	76	126

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	960 ve
Acetone	61	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	3,100 ve
Methylene chloride	<5	o-Xylene	1,300 ve
Methyl t-butyl ether (MTBE)	76	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	51
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	140
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	300 ve
2-Butanone (MEK)	15	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	2,200 ve	1,2,4-Trimethylbenzene	980 ve
Trichloroethene	<1	sec-Butylbenzene	4.6
1,2-Dichloropropane	<1	p-Isopropyltoluene	2.4
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	1,800 ve	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	340 ve
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-3	Client:	PBS Engineering and Environmental
Date Received:	08/08/14	Project:	62357, F&BI 408132
Date Extracted:	08/11/14	Lab ID:	408132-04 1/200
Date Analyzed:	08/11/14	Data File:	081118.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<200	1,3-Dichloropropane	<200
Chloromethane	<2,000	Tetrachloroethene	<200
Vinyl chloride	<40	Dibromochloromethane	<200
Bromomethane	<200	1,2-Dibromoethane (EDB)	<200
Chloroethane	<200	Chlorobenzene	<200
Trichlorofluoromethane	<200	Ethylbenzene	1,700
Acetone	<2,000	1,1,1,2-Tetrachloroethane	<200
1,1-Dichloroethene	<200	m,p-Xylene	6,400
Methylene chloride	<1,000	o-Xylene	1,400
Methyl t-butyl ether (MTBE)	<200	Styrene	<200
trans-1,2-Dichloroethene	<200	Isopropylbenzene	<200
1,1-Dichloroethane	<200	Bromoform	<200
2,2-Dichloropropane	<200	n-Propylbenzene	<200
cis-1,2-Dichloroethene	<200	Bromobenzene	<200
Chloroform	<200	1,3,5-Trimethylbenzene	290
2-Butanone (MEK)	<2,000	1,1,2,2-Tetrachloroethane	<200
1,2-Dichloroethane (EDC)	<200	1,2,3-Trichloropropane	<200
1,1,1-Trichloroethane	<200	2-Chlorotoluene	<200
1,1-Dichloropropene	<200	4-Chlorotoluene	<200
Carbon tetrachloride	<200	tert-Butylbenzene	<200
Benzene	19,000	1,2,4-Trimethylbenzene	1,000
Trichloroethene	<200	sec-Butylbenzene	<200
1,2-Dichloropropane	<200	p-Isopropyltoluene	<200
Bromodichloromethane	<200	1,3-Dichlorobenzene	<200
Dibromomethane	<200	1,4-Dichlorobenzene	<200
4-Methyl-2-pentanone	<2,000	1,2-Dichlorobenzene	<200
cis-1,3-Dichloropropene	<200	1,2-Dibromo-3-chloropropane	<2,000
Toluene	3,200	1,2,4-Trichlorobenzene	<200
trans-1,3-Dichloropropene	<200	Hexachlorobutadiene	<200
1,1,2-Trichloroethane	<200	Naphthalene	260
2-Hexanone	<2,000	1,2,3-Trichlorobenzene	<200

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-4	Client:	PBS Engineering and Environmental
Date Received:	08/08/14	Project:	62357, F&BI 408132
Date Extracted:	08/11/14	Lab ID:	408132-05
Date Analyzed:	08/11/14	Data File:	081117.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	102	93	107
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	62357, F&BI 408132
Date Extracted:	08/11/14	Lab ID:	04-1634 mb
Date Analyzed:	08/11/14	Data File:	081107.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	101	93	107
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Date of Report: 08/19/14
Date Received: 08/08/14
Project: 62357, F&BI 408132

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING METHOD 8021B AND NWTPH-Gx

Laboratory Code: 408132-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	88	65-118
Toluene	ug/L (ppb)	50	90	72-122
Ethylbenzene	ug/L (ppb)	50	89	73-126
Xylenes	ug/L (ppb)	150	90	74-118
Gasoline	ug/L (ppb)	1,000	86	69-134

Date of Report: 08/19/14
Date Received: 08/08/14
Project: 62357, F&BI 408132

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	104	105	58-134	1

Date of Report: 08/19/14
Date Received: 08/08/14
Project: 62357, F&BI 408132

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 408128-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	7.28	95 b	97 b	79-121	2 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	101	83-115

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/19/14
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Project: 62357, F&BI 408132

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 408110-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	109	55-144
Chloromethane	ug/L (ppb)	50	<10	95	67-131
Vinyl chloride	ug/L (ppb)	50	<0.2	101	61-139
Bromomethane	ug/L (ppb)	50	<1	129	66-129
Chloroethane	ug/L (ppb)	50	<1	106	68-126
Trichlorofluoromethane	ug/L (ppb)	50	<1	100	71-128
Acetone	ug/L (ppb)	250	<10	92	48-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	99	71-123
Methylene chloride	ug/L (ppb)	50	<5	94	61-126
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	103	68-125
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	100	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	104	79-113
2,2-Dichloropropane	ug/L (ppb)	50	<1	93	58-132
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	105	73-119
Chloroform	ug/L (ppb)	50	48	96 b	80-112
2-Butanone (MEK)	ug/L (ppb)	250	<10	107	69-123
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	98	78-113
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	105	79-116
1,1-Dichloropropene	ug/L (ppb)	50	<1	103	67-121
Carbon tetrachloride	ug/L (ppb)	50	<1	107	72-123
Benzene	ug/L (ppb)	50	<0.35	97	79-109
Trichloroethene	ug/L (ppb)	50	<1	99	75-109
1,2-Dichloropropane	ug/L (ppb)	50	<1	107	80-111
Bromodichloromethane	ug/L (ppb)	50	1.7	109	78-117
Dibromomethane	ug/L (ppb)	50	<1	110	80-112
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	122	79-123
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	113	76-120
Toluene	ug/L (ppb)	50	<1	101	73-117
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	111	75-122
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	106	81-111
2-Hexanone	ug/L (ppb)	250	<10	116	75-126
1,3-Dichloropropane	ug/L (ppb)	50	<1	107	81-111
Tetrachloroethene	ug/L (ppb)	50	<1	101	72-113
Dibromochloromethane	ug/L (ppb)	50	<1	114	69-129
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	112	83-114
Chlorobenzene	ug/L (ppb)	50	<1	100	75-115
Ethylbenzene	ug/L (ppb)	50	<1	102	71-120
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	109	78-122
m,p-Xylene	ug/L (ppb)	100	<2	106	63-128
o-Xylene	ug/L (ppb)	50	<1	106	64-129
Styrene	ug/L (ppb)	50	<1	3 vo	70-122
Isopropylbenzene	ug/L (ppb)	50	<1	107	76-118
Bromoform	ug/L (ppb)	50	<1	119	49-138
n-Propylbenzene	ug/L (ppb)	50	<1	107	74-117
Bromobenzene	ug/L (ppb)	50	<1	103	70-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	17 vo	81-112
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	112	79-120
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	105	72-119
2-Chlorotoluene	ug/L (ppb)	50	<1	103	77-114
4-Chlorotoluene	ug/L (ppb)	50	<1	96	81-109
tert-Butylbenzene	ug/L (ppb)	50	<1	107	81-116
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	103	74-118
sec-Butylbenzene	ug/L (ppb)	50	<1	109	77-118
p-Isopropyltoluene	ug/L (ppb)	50	<1	109	64-132
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	103	81-111
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	97	78-110
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	97	81-111
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	116	69-129
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	101	74-115
Hexachlorobutadiene	ug/L (ppb)	50	<1	93	67-120
Naphthalene	ug/L (ppb)	50	<1	111	63-136
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	103	79-115

Date of Report: 08/19/14
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Project: 62357, F&BI 408132

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	50	105	105	54-149	0
Chloromethane	ug/L (ppb)	50	93	93	67-133	0
Vinyl chloride	ug/L (ppb)	50	101	101	73-132	0
Bromomethane	ug/L (ppb)	50	125 vo	129 vo	69-123	3
Chloroethane	ug/L (ppb)	50	104	104	68-126	0
Trichlorofluoromethane	ug/L (ppb)	50	102	100	70-132	2
Acetone	ug/L (ppb)	250	106	107	44-145	1
1,1-Dichloroethene	ug/L (ppb)	50	97	97	75-119	0
Methylene chloride	ug/L (ppb)	50	91	91	63-132	0
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	101	101	70-122	0
trans-1,2-Dichloroethene	ug/L (ppb)	50	97	98	76-118	1
1,1-Dichloroethane	ug/L (ppb)	50	102	101	80-116	1
2,2-Dichloropropane	ug/L (ppb)	50	100	99	62-141	1
cis-1,2-Dichloroethene	ug/L (ppb)	50	103	101	81-111	2
Chloroform	ug/L (ppb)	50	98	97	81-109	1
2-Butanone (MEK)	ug/L (ppb)	250	105	110	53-140	5
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	95	95	79-109	0
1,1,1-Trichloroethane	ug/L (ppb)	50	103	102	80-116	1
1,1-Dichloropropene	ug/L (ppb)	50	102	102	78-112	0
Carbon tetrachloride	ug/L (ppb)	50	104	104	72-128	0
Benzene	ug/L (ppb)	50	94	94	81-108	0
Trichloroethene	ug/L (ppb)	50	95	96	77-108	1
1,2-Dichloropropane	ug/L (ppb)	50	100	103	82-109	3
Bromodichloromethane	ug/L (ppb)	50	105	107	76-120	2
Dibromomethane	ug/L (ppb)	50	104	106	80-110	2
4-Methyl-2-pentanone	ug/L (ppb)	250	116	119	59-142	3
cis-1,3-Dichloropropene	ug/L (ppb)	50	111	112	76-128	1
Toluene	ug/L (ppb)	50	97	99	83-108	2
trans-1,3-Dichloropropene	ug/L (ppb)	50	108	110	76-128	2
1,1,2-Trichloroethane	ug/L (ppb)	50	101	101	82-110	0
2-Hexanone	ug/L (ppb)	250	106	111	53-145	5
1,3-Dichloropropane	ug/L (ppb)	50	99	104	83-110	5
Tetrachloroethene	ug/L (ppb)	50	98	100	78-109	2
Dibromochloromethane	ug/L (ppb)	50	111	112	63-140	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	106	108	85-113	2
Chlorobenzene	ug/L (ppb)	50	95	97	84-108	2
Ethylbenzene	ug/L (ppb)	50	98	100	84-110	2
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	106	106	76-125	0
m,p-Xylene	ug/L (ppb)	100	103	105	84-112	2
o-Xylene	ug/L (ppb)	50	104	106	82-113	2
Styrene	ug/L (ppb)	50	108	110	84-116	2
Isopropylbenzene	ug/L (ppb)	50	106	106	81-122	0
Bromoform	ug/L (ppb)	50	116	117	40-161	1
n-Propylbenzene	ug/L (ppb)	50	103	105	81-115	2
Bromobenzene	ug/L (ppb)	50	98	101	80-113	3
1,3,5-Trimethylbenzene	ug/L (ppb)	50	105	109	83-117	4
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	107	109	79-118	2
1,2,3-Trichloropropane	ug/L (ppb)	50	98	101	74-116	3
2-Chlorotoluene	ug/L (ppb)	50	98	101	79-112	3
4-Chlorotoluene	ug/L (ppb)	50	101	103	81-113	2
tert-Butylbenzene	ug/L (ppb)	50	105	107	81-119	2
1,2,4-Trimethylbenzene	ug/L (ppb)	50	106	108	83-116	2
sec-Butylbenzene	ug/L (ppb)	50	108	110	83-116	2
p-Isopropyltoluene	ug/L (ppb)	50	106	108	82-119	2
1,3-Dichlorobenzene	ug/L (ppb)	50	101	103	83-111	2
1,4-Dichlorobenzene	ug/L (ppb)	50	94	96	82-109	2
1,2-Dichlorobenzene	ug/L (ppb)	50	94	96	83-111	2
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	118	121	62-133	3
1,2,4-Trichlorobenzene	ug/L (ppb)	50	98	99	77-117	1
Hexachlorobutadiene	ug/L (ppb)	50	92	95	74-118	3
Naphthalene	ug/L (ppb)	50	108	111	75-131	3
1,2,3-Trichlorobenzene	ug/L (ppb)	50	99	102	82-115	3

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

408132

SAMPLE CHAIN OF CUSTODY

ME 08/08/14

V3/AE3/BO

Page # 1 of 1

Send Report To Dana Ertel

Company PBS

Address 400 Bradley Blvd

City, State, ZIP Richland, WA

Phone # (509) 727-0873 Fax # ______

SAMPLERS (*signature*) Dana R. Ertel

PROJECT NAME/NO. 62357

PO#

REMARKS Pls Return Cooler

TURNAROUND TIME
- ☑ Standard (2 Weeks)
- ☐ RUSH ______
- Rush charges authorized by ______

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Pb						Notes
mw-1	01 A-D	8/5/14		Ground-water	4	✓	✓	✓										
mw-2	02 A-D	↓		↓	4	✓	✓	✓										
mw-DUP	03 A-D	↓		↓	4	✓	✓	✓										
mw-3	04 A-H	8/6/14		↓	8	✓	✓	✓	✓			✓						Contaminated Well
mw-4	05 A-F	↓		↓	6	✓	✓	✓	✓									

Samples received at 4 **°C**

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana R. Ertel	Dana Ertel	PBS	8/7/14	
Received by: [illegible]	Nhan Phan	F&BI	8/8/14	1000
Relinquished by:				
Received by:				

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