Site Characterization and Interim Action Report

AST System Fuel Release

Washington State Fire Training Academy 50810 SE Grouse Ridge Road North Bend, Washington

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1 INTRODUCTION

PBS Engineering and Environmental Inc. (PBS) provided environmental consulting services to Washington State Patrol (WSP) and Washington State Department of Enterprise Services (DES) regarding site characterization work conducted at the Fire Training Academy (FTA) facility, located at 50810 SE Grouse Ridge Road in North Bend, WA (Property or Site). Site characterization was conducted to investigate potential petroleum fuel impact to soil and groundwater resulting from failure of a fuel aboveground storage tank (AST).

1.1 General Site Information

The FTA facility is located on Grouse Ridge Road, near the southwest side of Mailbox Peak; Township 23, Range 9, Section 28. The facility was first developed in the 1980s and comprises approximately 50 acres of developed area. Access to the subject property is via Grouse Ridge Road, which begins at the terminus of SE Homestead Valley Road, near the trailhead for Dirty Harry's Balcony trail.

1.2 Site Use

The FTA facility includes numerous training props for various firefighting scenarios, such as a container ship, apartment buildings, and aircraft. Many firefighting props are located on a flat, paved area called the "burn pad", located to the south of the AST System.

The facility also includes offices, classrooms, mechanical/maintenance garages, and vehicle storage.

1.3 AST System

The props are supplied with fuel from an AST system comprising three 20,000-gallon ASTs, a containment basin and associated piping. The containment basin comprises a vertical concrete stem wall supporting the filling area (where trucks can load/unload fuel), and three sloped earthen walls sealed with asphalt and a hydrocarbon resistant surface coating/liner. The AST containment basin drains to an oil/water separation and treatment system that processes the oily runoff resulting from training exercises. The system comprises a 250,000-gallon capacity oil/water separator pool and three sequential treatment ponds.

1.4 Regional Geology and Hydrogeology

The site lies on Grouse Ridge, a glacial moraine near the base of Mailbox Peak in the Snoqualmie Pass. The site is reportedly underlain by recessional glacial outwash, consisting of loose, stratified fluvial silt, sand, and gravel; well-rounded and moderately to well sorted¹.

2 ADOPTED REGULATORY CRITERIA

Contaminated site assessment and cleanup is conducted in accordance with the substantive requirements of the Model Toxics Control Act (MTCA), Chapter 70.105D of the Revised Code of Washington (RCW) and its implementation regulations, Chapter 173-340 of the Washington Administrative Code (WAC).

Site assessment and cleanup activities have been performed under MTCA. This section summarizes the cleanup standards established for this site.

In accordance with MTCA, development of preliminary cleanup levels includes identifying potential exposure pathways for human and ecological impacts based on the planned land use. MTCA provides for three methods (Method A, B, or C) for establishing cleanup standards. Method A (unrestricted land use) is typically used as the default criterion. Methods B and C are used when developing site-specific cleanup levels.

¹ Geologic Map of the Snoqualmie Pass 30x60 Minute Quadrangle Washington, R. W. Tabor et al, 2000

Considering the current land use as a training/educational facility, the MTCA Method A Cleanup Levels (CULs) for soil (Table 740-1), and groundwater (Table 720-1) are the adopted cleanup criteria for site characterization.

The contaminants of potential concern (COPC) are gasoline-, diesel-, and heavy oil-range total petroleum hydrocarbons (TPH), along with benzene, toluene, ethylbenzene, and xylenes (BTEX).

Cleanup levels for COPC at this site are as follows:

Contaminant of Potential Concern	MTCA Method A Soil Cleanup Level (mg/kg)	MTCA Method A Groundwater Cleanup Level (μg/L)
TPH – Gasoline	100	1,000
IPH – Gasoline	(30 if benzene is present)	(800 if benzene is present)
TPH – Diesel	2,000	500
TPH – Heavy Oil	2,000	500
Benzene	0.03	5
Toluene	7	1,000
Ethylbenzene	6	700
Xylenes	9	1,000

3 SITE CHARACTERIZATION AND INTERIM ACTION

3.1 Release and Initial Response

On August 6, 2021, the site maintenance supervisor discovered a leak in one AST (Fuel Tank #1) of the AST system. The AST reportedly contained aviation gas, which released from the bottom of the AST and flowed from the containment area through a drain line and connected to the "burn pad" training facility drainage system, which in turn flowed into the site's oil/water separation and treatment pond system.

Vacuum trucks were utilized to drain the leaking tank of as much fuel as possible and pump floating fuel from the oil/water separator to a temporary storage tank on site.

PBS visited the site on August 11, 2021 to conduct a visual inspection of the release area and the water treatment ponds. Evidence of fuel impacts was not observed in the three sequential treatment ponds, indicating the release did not significantly impact the system "downstream" of the oil/water separator pool.

PBS observed that the containment basin liner was perforated in several locations, exposing underlying asphalt and soil. Vegetation had grown through the liner in several locations.

3.2 AST System Inspection

On October 6, 2021, PBS oversaw a closed-circuit television video (CCTV) study of the containment basin drainage system. The CCTV study of the drainage system leading out of the AST containment basin revealed no evidence of damage in the drain line running down the hill to the east-southeast and connecting to the "burn pad" training area drainage system that then leads to the oil/water separator.



3.3 Sampling and Analysis Plan

A Sampling and Analysis Plan (SAP) *Sampling and Analysis Plan - AST System Fuel Release* (PBS, November 11, 2021) was developed and describes the scope of work, anticipated sample collection methods, and analytical procedures to be implemented. The SAP detailed the drilling scope, which includes three temporary soil borings and installation of three groundwater monitoring wells, as well as subsequent surveying and groundwater sampling of those wells.

3.4 Subsurface Investigation – January 2022

PBS completed a subsurface investigation at the site January 19 through January 21, 2022, with drilling services provided by Holt Services of Edgewood, Washington. The purpose of the subsurface investigation was to assess the potential for contamination in soil and groundwater in the vicinity of the AST system. The work was conducted in accordance with the SAP.

Prior to drilling, PBS supervised a private utility line location company, Applied Professional Services (APS) of North Bend, WA, while they conducted borehole clearance for subsurface obstructions at all planned drilling locations.

The drilling and sampling program included the advancement of three soil borings (SB-1 to SB-3) for the collection of soil samples, and three borings (MW-1 to MW-3) for the collection of soil samples and the installation of groundwater monitoring wells. A sonic drilling rig was utilized for drilling at the six locations.

Soils were logged continuously during drilling, noting grain size, density, color, odor, and moisture. During the advancement of boreholes, soil was screened for volatiles using a photoionization detector (PID). Cursory PID readings were taken along the runs of soil as they were brought to the surface and bagged. PID readings were also taken from select soil intervals by partially filling a sealable plastic bag and taking headspace readings within the bag.

Groundwater was encountered at depths of approximately 8 to 12 feet below ground surface (bgs) at the boring locations at the base of the hill below the AST containment area, and at a depth of approximately 22 feet bgs in borings at the top of the hill, adjacent to the AST containment area.

Two to three soil samples were collected from each of the borings. In the absence of field indications of contamination, the samples were collected from representative intervals and/or at changes in lithology.

The samples were collected in laboratory-supplied containers, placed on ice in a cooler, and transported to Friedman and Bruya Laboratory, within specified holding times and under chain-of-custody documentation. Analyses were conducted under standard turnaround time and included the following:

- Diesel and Heavy Oil range Total Petroleum Hydrocarbons (TPH) by Method NWTPH-Dx
- Gasoline range TPH by Method NWTPH-Gx
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260B

Soil boring and monitoring well locations are presented on Figure 2: Site Plan. Graphic soil boring logs and well construction details are presented in Appendix A.



3.5 Groundwater Sampling – February 2022

A groundwater monitoring event (GME) was conducted on February 2, 2022, and included the gauging and sampling of three monitoring wells (MW-1 – MW-3). Prior to sampling, the wells were gauged using an interface probe. Static water levels (SWLs) ranged from 4.59 feet below top of casing (fbTOC) in MW-3 to 20.39 fbTOC in MW-1.

Groundwater purging and sampling was conducted using a peristaltic pump, employing low flow sampling methodology with pumping rates not exceeding 0.6 liters/minute and creating minimal drawdown in the well. The sample intake was placed approximately 2.5-feet below the water table and within the screened interval, except for at MW-3, where the top of the screened interval was 0.4 feet below the static water table.

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.

All samples were collected in laboratory-supplied containers, placed on ice in a cooler and transported to Friedman and Bruya 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 Total Petroleum Hydrocarbons (TPH) by Method NWTPH-Dx
- Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8021

3.6 Supplemental Subsurface Investigation

On March 28, 2022, PBS oversaw the advancement of seven soil borings using a direct-push drilling rig, for the collection of soil and "grab" groundwater samples. The purpose of the investigation was to better define the degree and extent of the release.

Soil boring locations are presented on Figure 2: Site Plan. Graphic soil boring logs are presented in Appendix A.

3.7 Groundwater Sampling – July 2022

A second GME was conducted on July 28, 2022, and included the gauging and sampling of three monitoring wells (MW-1 – MW-3). Prior to sampling, the wells were gauged using an interface probe. SWLs ranged from 7.15 fbTOC in MW-3 to 23.76 fbTOC in MW-1.

Groundwater monitoring well locations are presented on Figure 2: Site Plan.

Groundwater sampling information is presented in Appendix C: Groundwater Sampling Datasheets.

3.8 Well Installation – August 2022

On August 16, 2022, PBS oversaw the advancement of four borings to be completed as monitoring wells (MW-4 to MW-7). Select well locations were collocated with soil borings described in Section 3.6. Drilling services were provided by Holocene Drilling of Puyallup, Washington. A hollow-stem auger drilling rig was utilized for drilling at the four locations.



Soil boring and monitoring well locations are presented on Figure 2: Site Plan. Graphic soil boring logs and well construction details are presented in Appendix A.

3.9 Groundwater Sampling – September 2022 and January 2023

A round of groundwater sampling was conducted on September 14, 2022, and included the gauging and sampling of seven monitoring wells (MW-1 – MW-7). Prior to sampling, the wells were gauged using an interface probe. SWLs ranged from 7.15 fbTOC in MW-3 to 23.76 fbTOC in MW-1. There was insufficient groundwater for sampling in MW-5 and MW-7.

A limited sampling round was conducted on January 13, 2023, and included the gauging and sampling of five monitoring wells (MW-1 and MW-4 – MW-7). Prior to sampling, the wells were gauged using an interface probe. SWLs ranged from 7.55 fbTOC in MW-4 to 21.59 fbTOC in MW-1. There was insufficient groundwater for sampling in MW-5. Groundwater collected from MW-7 was only analyzed for gasoline range TPH and BTEX due to insufficient water for diesel and heavy oil range TPH analysis.

3.10 Survey

Accurately measuring the top of casing (TOC) elevation of monitoring wells allows for the determination of groundwater elevation, by measuring the depth to water from the TOC. On February 2, 2022, surveying of TOC, latitude, and longitude of monitoring wells MW-1 through MW-3 was completed by a Registered Professional Land Surveyor licensed in the State of Washington. On January 17, 2023, surveying of TOC, latitude, and longitude of monitoring wells MW-4 through MW-7 was completed by a Registered Professional Land Surveyor licensed in the State of Washington.

The survey reports are included as Appendix C.

4 FINDINGS

4.1 Field Observations

Native material was generally encountered throughout the borings. The subsurface soil profile encountered is presented in the table below:

Classification	Description	Approximate Depth Range (feet bgs)
Native Soil	Loose well-graded gravel with sand (GW-GM) and mixed organic material.	0.0 to 1.0
Native Soil	Loose well-sorted gravel with sand (GW)	1.0 to 24.0
Native Soil	Medium-dense tan lean clay (CL)	24.0 to 26.0
Native Soil	Loose well-sorted coarse to medium sand (SW)	26.0 to 30.0

Subsurface Profile

Hydrocarbon odors and PID readings were observed at depths of approximately 15 feet bgs in MW-2, 10 feet bgs in MW-3, and 5 feet bgs in SB-3.

4.2 Soil Analytical Results

Soil sampling results are presented as follows:

• 26 samples were analyzed for TPH as gasoline, diesel, and heavy oil; and BTEX.



- Concentrations of benzene exceeded the CUL in three samples (SB3-16, MW2-13 and MW3-10), each location is in close proximity to the release.
- Concentrations of analyzed contaminants did not exceed the CULs in the remaining sample locations.

Soil analytical results are presented in Table 1.

Copies of laboratory reports and chain-of-custody documentation are presented in Appendix D.

4.3 Groundwater Analytical Results

Groundwater sampling results are presented as follows:

- Concentrations of TPH and BTEX exceeded the CULs in samples collected from BH2-W and BH4-W.
- Concentrations of TPH and BTEX exceeded the CULs in samples collected from monitoring wells MW-2, MW-3, MW-4, and MW-6.
- Analyzed contaminants of concern were not detected in samples from MW-1, MW-4, and MW-7. Water was insufficient for sampling at MW-5.

The results of the investigation included "clean" groundwater (analyzed contaminants of concern were not detected above CULs) in the upgradient well (MW-1), both cross-gradient locations (northeast: BH1 and MW-4, southwest: BH6), and one downgradient location (MW-7). The "clean" downgradient location MW-7 is relatively far from the release (640-feet), but is an important data point, as it is directly hydraulically downgradient and is between the release and surface water features.

Groundwater analytical results are presented in Table 2.

Copies of laboratory reports and chain-of-custody documentation are presented in Appendix D.

5 INTERIM REMEDIAL ACTION

PBS completed a groundwater removal remedial action at the site August 17 through August 18, 2022. This interim remedial action reduces source zone contamination though contaminated groundwater removal. Groundwater removal included pumping groundwater from monitoring wells MW-2 and MW-3 and discharging to the existing on-site water treatment system.

5.1 Groundwater Withdrawal

- 1. PBS conducted a 26-hour pumping event.
- 2. Water withdrawal was completed using a downhole electric pump with controller for variable pumping speed.
- 3. Discharge water was pumped to the existing water treatment system using rigid tubing. The existing water treatment system was designed and permitted to remove petroleum compounds from the fire-fighting runoff water entering the system.
- 4. A valve on the discharge line was used to collect water quality measurements and samples.
- 5. Pump rate was approximately 2-gallons per minute and was measured periodically using a graduated 5-gallon container.
- 6. Discharge rates and total volume were recorded.





Figure 1. Site Vicinity Map Figure 2. Site Plan





50810 GROUSE RIDGE ROAD

NORTH BEND, WASHINGTON

FIGURE 2

Tables

Table 1. Soil Analytical Results Table 2. Groundwater Analytical Results Table 3. Groundwater Elevation Table 4: Groundwater Pumping

TABLE 1 SOIL ANALYTICAL RESULTS

FIRE TRAINING ACADEMY

50810 GROUSE RIDGE ROAD NORTH BEND, WASHINGTON 98045

PBS PROJECT NO. 40535.498

						Results mg/Kg					
		TPHs					VOCs				
Location-Depth	Gx	Dx	Oil	Benzene	Toluene	Ethylbenzene	Xylene	МТВЕ	EDB	EDC	PAHs
Adopted Criteria: MTCA Method A Cleanup Levels For Soil ^a	100	2000	2000	0.03	7	6	9	0.1	0.005	NE	0.1
Subsurface Investigation Conducted o	n January 21.	2022				1					
SB1-15	<5	<50	<250	< 0.02	<0.02	< 0.02	< 0.06				
SB1-25	<5	<50	<250	< 0.02	< 0.02	< 0.02	< 0.06				
SB2-10	<5	<50	<250	< 0.02	< 0.02	< 0.02	< 0.06				
SB2-16	<5	<50	<250	< 0.02	< 0.02	< 0.02	< 0.06				
SB3-5	<5	180	800	< 0.02	<0.02	< 0.02	< 0.06				
SB3-16	<5	<50	<250	0.092	0.36	<0.02	0.18	< 0.05	< 0.005	< 0.05	<0.1
MW1-12	<5	<50	<250	< 0.02	<0.02	< 0.02	< 0.06				
MW1-15	<5	<50	<250	< 0.02	< 0.02	< 0.02	< 0.06				
MW2-9	<5	<50	<250	< 0.02	< 0.02	< 0.02	< 0.06				
MW2-13	<5	<50	<250	0.031	0.24	< 0.02	0.57				
MW2-25	<5	< 50	<250	< 0.02	< 0.02	< 0.02	< 0.06				
MW3-10	<5	< 50	<250	0.080	0.55	< 0.02	< 0.06				
MW3-18	<5	<50	<250	<0.02	<0.02	< 0.02	< 0.06				
Subsurface Investigation Conducted o	on March 28, 20	022									
BH1-4	<5	<50	<250	<0.02	<0.02	< 0.02	< 0.06				
BH2-3	<5	< 50	<250	<0.02	<0.02	< 0.02	< 0.06				
BH3-4	<5	< 50	<250	<0.02	<0.02	< 0.02	< 0.06				
BH4-4	<5	<50	<250	<0.02	<0.02	< 0.02	< 0.06				
BH5-4	<5	<50	<250	<0.02	<0.02	< 0.02	< 0.06				
BH5-12	<5	<50	<250	< 0.02	0.056	< 0.02	< 0.06				
BH6-4	<5	< 50	<250	< 0.02	< 0.02	< 0.02	< 0.06				
BH7-4	<5	< 50	<250	< 0.02	<0.02	< 0.02	< 0.06				
Subsurface Investigation Conducted o	on August 16, 2	022									
MW5-5	<5	<50	<250	<0.02	<0.02	<0.02	< 0.06				
MW5-15	<5	< 50	<250	< 0.02	<0.02	<0.02	<0.06				
MW6-15	<5	<50	<250	< 0.02	< 0.02	<0.02	<0.06				
MW7-5	<5	<50	<250	< 0.02	< 0.02	< 0.02	< 0.06				
MW7-15	12	<100	<500	< 0.02	< 0.04	0.048	< 0.12				

^a Washington State Department of Ecology Model Toxics Control Act Method A Cleanup Level for Unrestricted Land Use as established in WAC 173-340-900

BOLD indicates above MTCA Method A Cleanup Levels for Soil

mg/kg - milligrams per kilogram

TPH - total petroleum hydrocarbons

Gx - gasoline range hydrocarbons analyzed by Method NWTPH-Gx

Dx - diesel range hydrocarbons analyzed by Method NWTPH-Dx, method also included reporting of TPH in the heavy oil range

MTBE - methyl tertiary-butyl ether

EDB - 1,2-dibromoethane

EDC - 1,2-dichloroethane

PAHs - polycyclic aromatic hydrocarbons analyzed by US EPA Method 8270 SIM

VOCS - volatile organic compounds analyzed by US EPA Method 8260B

NE - Not established

< 50 - less than the laboratory reporting limit

- not analyzed

TABLE 2 GROUNDWATER ANALYTICAL RESULTS

FIRE TRAINING ACADEMY

50810 GROUSE RIDGE ROAD NORTH BEND, WASHINGTON 98045

PBS PROJECT NO. 40535.498

	1	1				Poru		ROJECT NO.	+0555.+50		
			Results µg/L TPHs VOCs								
Sample Identification	Date	Gx	Dx	Heavy Oil	Benzene	Toluene	Ethylbenze ne	Xylenes	МТВЕ	EDB	EDC
Adopted Criteria: MTCA Method A Clean Groundwater ^a	up Levels For	800	500	500	5	1,000	700	1,000	0.1	0.005	NE
Grab groundwater samples collected Ma	rch 28, 2022										
BH1-W	3/28/2022	<100	100	<250	<1	<1	<1	<3			
BH2-W	3/28/2022	11,000	250	600	640	1,900	100	720			
BH3-W	3/28/2022	210	690	<250	<1	3	<1	<3			
BH4-W	3/28/2022	48,000	6,400	660	86	1,500	1,700	3,300			
BH6-W	3/28/2022	<100	210	<300	<1	<1	<1	<3			
BH7-W	3/28/2022	<100	59	<250	<1	<1	<1	<3			
nterim Action groundwater samples (M	W2) collected August	t 17, 2022									
DS1	8/18/2022	29,000			39	5,200	380	2,000			
DS2	8/18/2022	30,000			40	5,700	400	2,200			
DS3	8/18/2022	33,000			43	6,500	460	2,500			
DS4	8/18/2022	33,000			36	5,900	490	2,900			
Monitoring Well Sampling											
	2/2/2022	<100	<50	<250	<1	<1	<1	<3			
MW1	7/28/2022	<100	<50	<250	<1	1	<1	<3			
101001	9/14/2022	<100	<50	<250	<1	2.7	<1	<3			
	1/13/2023	<100	<50	<250	<1	<1	<1	<3			
	2/2/2022	30,000	1,300	<250	680	4,800	410	2,600			
MW2	7/28/2022	76,000	1,600	<250	97	11,000	840	5,200			
	9/14/2022	49,000	870	<250	64	9,200	670	49,000			
	2/2/2022	56,000	1,400	<250	990	10,000	610	4,000	<100	<100	<20
MW3	7/28/2022	29,000	1,100	<250	210	3,600	570	2,300			
	9/14/2022	11,000	550	<250	300	620	410	11,000			
50.04	9/14/2022	<100	<50	<250	<1	<1	<1	<3			
MW4	1/13/2023	<100	59	<250	<1	<1	<1	<3			
MW5	9/14/2022		•	•	I	nsufficient wa	ter for samplin	g	•		
CWINI	1/13/2023				1	nsufficient wa	ter for samplin	9			
MW6	9/14/2022	620	53	<250	75	9.9	1.2	<3			
IVIVO	1/13/2023	600	310	<250	40	9.6	1.1	<3			
MW7	9/14/2022				I	nsufficient wa	ter for samplin	g			
14144 /	1/13/2023	<100			<1	<1	<1	<3			

^a Washington State Department of Ecology Model Toxics Control Act Method A Cleanup Level for Unrestricted Land Use as established in WAC 173-340-900

µg/L - micrograms per litre

BOLD indicates above MTCA Method A Cleanup Levels for Groundwater

<50 - less than the laboratory reporting limit

MTCA - Washington State Department of Ecology Model Toxic Control Act

TPH - total petroleum hydrocarbons

Gx - gasoline range hydrocarbons analyzed by Method NWTPH-Gx

Dx - diesel range hydrocarbons analyzed by Method NWTPH-Dx, method includes reporting TPH in the heavy oil range

MTBE - methyl tertiary-butyl ether

EDB - 1,2-dibromoethane

EDC - 1,2-dichloroethane

VOCs - volatile organic compounds analyzed by US EPA Method 8260B

ND - not detected above laboratory method detection limit

ug/L - micrograms per liter

BGS - below ground surface

TABLE 3

GROUNDWATER ELEVATION DATA

FIRE TRAINING ACADEMY 50810 GROUSE RIDGE ROAD NORTH BEND, WASHINGTON 98045 PBS PROJECT NO. 40535.498

Well ID	Date	Well Screen Interval (ft bgs)	Depth to Water (ft btoc)	TOC Elevation (ft amsl)	Groundwater Elevation (ft amsl)
	2/2/2022	12 - 32	20.39		1554.33
MW1	7/28/2022	12 - 32	23.76	1574.72	1550.97
	9/14/2022	12 - 31.3	25.49	1574.72	1549.23
	1/13/2023	12 - 31.3	21.59	1	1553.13
	2/2/2022	5 - 25	5.75		1552.31
MW2	7/28/2022	12 - 32	8.67	1558.06	1549.39
	9/14/2022	12 - 24.9	10.28] [1547.78
	2/2/2022	5 - 15	4.59		1551.46
MW3	7/28/2022	12 - 32	7.15	1556.05	1548.90
	9/14/2022	12 - 32	8.63] [1547.42
MW4	9/14/2022	5 - 20	11.00	1558.41	1547.41
101004	1/13/2023	5 - 20	7.55	1550.41	1550.86
MW5	9/14/2022	7 - 22	21.99	1556.69	1534.70
101005	1/13/2023	7 - 22	21.59	1550.09	1535.11
MW6	9/14/2022	5 - 15	13.53	1556.04	1542.51
111100	1/13/2023	5 - 15	8.85	1550.04	1547.19
MW7	9/14/2022	7 - 22	21.82	1554.43	1532.61
	1/13/2023	7 - 22	20.83	1554.45	1533.60

Abbreviations & Acronyms:

ft = feet

bgs = below ground surface

toc = top of casing

btoc = below top of casing

amsl = above mean sea level - NAVD 88 via Washington State Reference Network (WSRN)



TABLE 4 GROUNDWATER PUMPING

FIRE TRAINING ACADEMY 50810 GROUSE RIDGE ROAD NORTH BEND, WASHINGTON 98045

PBS PROJECT NO. 40535.498

Activity	Date	Time	Pumping Rate (gallons/minute)	Volume purged (gallons)	Sample ID	Temp (°C)	Specific conductivity (µS/cm)	Dissolved oxygen (mg/L)	рН	ORP (mV)
Begin pumping	8/17/2022	10:04	2	0						
Sample discharge	8/17/2022	10:55	2	102	DS1					
Sample discharge	8/17/2022	13:00	2	352	DS2	10.83	20	12.86	5.45	179
Sample discharge	8/17/2022	15:30	2	652	DS3	10.79	20	12.71	5.80	140
Sample discharge	8/18/2022	12:00	2	3112	DS4	9.9	21	14.30	5.67	163
Cease pumping	8/18/2022	12:15	2	3142						

Abbreviations & Acronyms:

 μ S/cm = microsiemens per centimeter

mg/L = milligrams per liter

ORP = oxidation-reduction potential

mV =millivolts



Appendix A

Soil Boring and Well Construction Logs

		DDC	WSP F NORTI	TA AS H BENI	r fuel D, was	RELE Shing	ASE TON		BORING SB-1
		PBS	PBS	S PROJ 405	ECT NI 535.498		R:		BORING SB-1 LOCATION: (See Site Plan)
DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	DID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0 —		TOPSOIL GRAVEL FILL with sand	ſ	-					
- - - 5.0 — -		Loose, dark gray, well-graded G (GW) with sand and cobbles; me coarse sand; fine to coarse, sub gravel; moist	RAVEL edium to rounded	- - - -	0.0				
- 10.0 - -				- - - -	0.0				
- 15.0 — - -				-	0.0	SB1-15			
20.0					0.0	SB1-25			
- - - 30.0 —		Loose, gray, poorly graded SAN with gravel and cobbles; coarse to coarse, subrounded gravel; m Final depth 30.0 feet bgs; boring backfilled with bentonite. Ground encountered at time of exploration	sand; fine loist	-					
DRILLED	BY: Ho	DD: Sonic Drilling Services AMETER: 4-inch		LOGG	ED BY: N ETED: 1	/. Bagle <u>:</u> /19/22	y		

		DDC	WSP F NORTI	TA AST H BEND	r fuel D, was	RELE SHING	ASE TON		BORING SB-2
		PBS	PBS	6 PROJI 405	ECT NU 535.498		R:		BORING SB-2 LOCATION: (See Site Plan)
)EPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	DID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		TOPSOIL Loose, dark gray, well-graded G (GW) with sand and cobbles; me coarse sand; fine to coarse, sub gravel; moist	edium to	-	0.0				
- 10.0 				- - -	0.0	SB2-10			
15.0 — - - -		Loose, gray, poorly graded SAN with gravel; medium to coarse sa subrounded gravel; moist	D (SP) and; fine,	-		SB2-16			
20.0		becomes wet becomes dark gray; fine sand		- - -	0.0				
25.0 — - -		Final depth 25.0 feet bgs; boring backfilled with bentonite.		-					
30.0				-					
RILLED	BY: Ho	DD: Sonic Drilling DI: Services AMETER: 4-inch		LOGGI COMPL	ED BY: N ETED: 1	/. Bagle <u>y</u> /19/22	/		

		DDC	WSP F NORTI	TA AS ⁻ H BENI	t fuel D, was	RELE	ASE TON		BORING SB-3
		PBS	PBS	S PROJ 405	ECT NI 535.498		R:		BORING SB-3 LOCATION: (See Site Plan)
DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	DID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		Loose, brown to tan; well-graded (GW) with sand; medium to coar fine to coarse, subrounded grave	se sand;	_					
- 5.0 — -				-	0.5	SB3-5			
- - 10.0 -		Loose, gray, silty SAND (SM) wi medium plasticity; fine sand; fine subrounded gravel; wet	th gravel;	-					
- - - 15.0 — - -		Dark gray, poorly graded SAND gravel; coarse sand; fine, subrou gravel; wet	(SP) with	-		SB3-16			
- 20.0 —		Final depth 20.0 feet bgs; boring backfilled with bentonite.		_	10				
- - 25.0 — -	-			-					
- - 30.0 — -				- - - -					
DRILLED	BY: Ho	DD: Sonic Drilling off Services AMETER: 4-inch		LOGG COMPL	ED BY: N ETED: 1	//. Bagle; //20/22	y		

		DDC	WSP F NORT	TA AS H BENI	t fuel D, was	RELE	ASE FON		BORING BH1
-		PBS	PB	S PROJ 405	ECT NU 535.498		:		BORING BH1 LOCATION: (See Site Plan)
DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	(MPR) (MPR)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		TOPSOIL Medium dense, brown, silty SANI with gravel; non-plastic; medium s subrounded gravel; damp	D (SM) sand; fine,	-				100	
5.0				-	0.0	V BH1-4		-	
- - 10.0 —		Medium dense, brown, poorly gra SAND (SP); medium sand; moist becomes wet Final depth 10.0 feet bgs.	aded	-		BH1-W			
-		,		-					
- 15.0 — -	-			-					
20.0	-			- - -					
	-			-					
	-			-					
	BY: H	OD: Direct Push olt Services AMETER: 4-inch		LOGG	ED BY: I	K. Nogei 3/22/22	re		

		DDC	WSP F NORTI	TA AS H BENI	t fuel D, was	. RELE SHING	ASE TON		BORING BH2
_		PBS	PB	S PROJ 405	ECT NU 535.498		:		BORING BH2 LOCATION: (See Site Plan)
DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	DID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT Medium dense, brown, silty SANI with gravel; non-plastic; medium s subrounded gravel; damp	O (SM) sand; fine,	-		2-3			
		Medium dense, brown, silty SANI low plasticity; fine to medium sand	D (SM); I; damp	-		BH2-3		-	
		becomes wet		-		BH2-W		-	
		Final depth 15.0 feet bgs.		_					
- 20.0	-			- - -					
	-			-					
	-			- - - -					
DRILLED	BY: H	OD: Direct Push olt Services AMETER: 4-inch		LOGG COMPL	ED BY: I	K. Noge 3/22/22	ire		



		DDC	WSP F NORT	TA AS H BENI	t fuel D, was	RELE	ASE TON		BORING BH3
		PBS	PB	S PROJ 405	ECT NU 535.498		:		BORING BH3 LOCATION: (See Site Plan)
DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	DIA (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT Medium dense, brown, silty SANI with gravel; non-plastic; medium s subrounded gravel; damp	D (SM) sand; fine,	- -					
5.0				-	0.0	BH3-4		_	
- - 10.0—		Very dense, gray, poorly graded ((GP) with sand; medium sand; fin coarse, subangular gravel; damp Medium dense, brown, poorly gra SAND (SP); medium sand; moist	' ided	- - 		BH3-W		_	
- - - 15.0 —		becomes wet Final depth 15.0 feet bgs.		-				5	
20.0	-			- - -					
25.0	-			-					
				-					
BORING DRILLED	BY: H	OD: Direct Push olt Services AMETER: 4-inch		LOGG	ED BY: I LETED: 3	K. Noge 3/22/22	ire		

		DDC	WSP F NORTI	TA AS H BENI	t fuel D, was	RELE	ASE TON		BORING BH4
		PBS	PB	S PROJ 405	ECT NU 535.498		:		BORING BH4 LOCATION: (See Site Plan)
DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	(MPR) DIP	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT Medium dense, brown, silty SANI with gravel; non-plastic; medium s subrounded gravel; damp	D (SM) sand; fine,	- -					
 5.0				-		BH4-4		-	
- - 10.0 —		Medium dense, greenish gray, po graded SAND (SP); medium san	orly d; moist	- - 		BH4-W		-	
- - 15.0—		becomes wet		-					
-		Final depth 15.0 feet bgs		-					
20.0	-			-					
- 25.0 — - -	-			-					
 30.0 - -	-			- - -					
DRILLED	BY: H	OD: Direct Push olt Services AMETER: 4-inch		LOGG COMPL	ED BY: H ETED: (K. Noge 3/22/22	ire		



		DDC	WSP F NORTI	TA AS H BENI	t fuel D, was	. Rele Shing	ASE TON		BORING BH5
		PBS	PB	S PROJ 405	ECT NU 535.498		:		BORING BH5 LOCATION: (See Site Plan)
DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	DID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT Medium dense, brown, silty SANI with gravel; non-plastic; medium s subrounded gravel; damp	D (SM) sand; fine,	-					
- 5.0		Medium dense, brown, poorly gra SAND (SP); medium sand; moist	ded	-	2.0	BH5-4		-	
- - 10.0 —		Medium dense, gray, silty SAND plasticity; medium sand; moist	SM); Iow	-				_	
- - 15.0 —		becomes wet Medium dense, brown, poorly gra SAND (SP); medium sand; moist Final depth 15.0 feet bgs	ded	- - -	10.0	BH5-12			Insufficient groundwater to sample
-	-	Final depth 13.0 leet bys		-					
- 20.0 — -	-			-					
- 25.0 — -	-			-					
- 30.0 — -	-			-					
RILLED	BY: H	OD: Direct Push olt Services AMETER: 4-inch		LOGG	ED BY: I	K. Nogei 3/22/22	re		

		DDC	WSP F NORTI	TA AS H BENI	t fuel D, was	. RELE Shing	ASE TON		BORING BH6
		PBS	PB	S PROJ 405	ECT NL 535.498		:		BORING BH6 LOCATION: (See Site Plan)
DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	DID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0 — - - - 5.0 —		ASPHALT Medium dense, brown, silty SANI with gravel; non-plastic; medium s subrounded gravel; damp Medium dense, brown, poorly gra SAND (SP); medium sand; damp	sand; fine, / aded	-	0.0	BH6-4		_	
- - 10.0 - - -		Medium dense, brown, silty SAN low plasticity; fine to medium sand Medium dense, brown, poorly gra SAND (SP); medium sand; wet	d; moist aded	-		BH5-W		_	
- 15.0 — -		low plasticity; fine to medium sand Final depth 15.0 feet bgs	d; wet	-					
- 20.0 -	-			- - -					
- 25.0 — -	-			-					
	-			- - -					
RILLED	BY: H	OD: Direct Push olt Services AMETER: 4-inch		LOGG COMPI	ED BY: I LETED: 3	K. Nogei 3/22/22	re		

		DDC	WSP F NORT	TA AS H BENI	t fuel D, was	. RELE SHING	ASE TON		BORING BH7
		PBS	PB	IS PROJ 405	ECT NU 535.498		:		BORING BH7 LOCATION: (See Site Plan)
DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	DID (MPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		TOPSOIL Medium dense, brown, silty SANI with gravel; non-plastic; medium s subrounded gravel; damp	D (SM) sand; fine,	-					
- 5.0 -				-		BH7-4			
- 10.0 — -		Medium dense, greenish gray, po graded SAND (SP); medium san becomes brown; medium to co	l; moist	-		BH7-W			
- - 15.0 —		Final depth 15.0 feet bgs		_					
- - - 20.0	-			-					
- - - 25.0 —	-			-					
- - 30.0— -	-								
DRILLED	BY: H	OD: Direct Push olt Services AMETER: 4-inch			ED BY: I	K. Nogei 3/22/22	re		

		DDC	WSP F NORTI	TA ASI H BEND					BORING MW-1
		PBS	PBS	6 PROJI 405	ECT NU 35.498		R:		BORING MW-1 LOCATION: (See Site Plan)
DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	DID (MPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION Tag ID# BNN183
0.0 - - 5.0 - - -		Loose, dark gray-brown, well-gra GRAVEL (GW) with cobbles; fin coarse, subrounded gravel; mois	e to	-	0.0				Flush-Mount Monument Bentonite Chips PVC Pipe
10.0 — - - - 15.0 — - - - -		Loose, dark gray-brown, well-gra GRAVEL (GW-GM) with silt, sar occasional cobbles; non-plastic; medium sand; fine to coarse, su gravel; moist	nd, and fine to	-	0.0	MW1-15			Sand
- 20.0 — - - -				- - ATD - Y -	0.0	MW1-22			Slotted Screen
25.0 — - - - 30.0 —		Loose, dark tan, poorly graded S (SP) with gravel and occasional medium to coarse sand; fine, su gravel; wet	cobbles;		0.0	MW1-020222 GW			Temporary screen set to collect groundwater
- - -		Final depth 32.0 feet bgs. Monite installed to 32.0 feet bgs.	oring well	-					
DRILLED	BY: Ho	DD: Sonic Drilling DI: Services AMETER: 4-inch		LOGGI COMPL	ED BY: N ETED: 1	1. Bagley /19/22	/		

		DDC		TA AST H BEND					BORING MW-2
		PBS	PB	S PROJ 405	ECT NI 35.498		R:		BORING MW-2 LOCATION: (See Site Plan)
DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	DID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION Tag ID# BNL610
0.0		Loose, gray and tan, poorly grad (SP) with gravel; medium to coa fine to coarse, subrounded grave	rse sand;	-	0.0				Flush-Mount Monument Bentonite Chips PVC Pipe
- - - 10.0 -				- ATD - Y	0.0	MW2-9			Sand
- - 15.0 — - -		becomes wet		-	15	MW2-13			Slight petroleum odor
- 20.0 — -				-	0.0	MW2-020222 GW			Temporary screen set to collect groundwater
- 25.0 — - -		Stiff, tan, lean CLAY (CL) with so medium plasticity; fine to medium wet Gray, poorly graded SAND (SP) gravel; medium to coarse sand; subrounded gravel; wet	n sand; with	-	0.0				- Bentonite Chips
- 30.0 — - -		Gray, silty SAND (SM); medium fine to medium sand; wet Final depth 30.0 feet bgs. Monito installed to 25.0 feet bgs.	/	-	0.0				
DRILLED	BY: Ho	DD: Sonic Drilling blt Services AMETER: 4-inch		LOGGI	ED BY: N ETED: 1	/. Bagle /20/22	y		

		DDC	NORT	H BEND	, WAS	RELE HING	TON		BORING MW-3
		PBS	PBS PROJECT NUMBER: 40535.498					BORING MW-3 LOCATION: (See Site Plan)	
EPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION	GROUND- WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION Tag ID# BNL611
0.0		Loose, tan, well-graded GRAVE with sand; medium to coarse san coarse, subrounded gravel; mois	nd; fine to	-	0.0				Flush-Mount Monument Bentonite Chips
- 5.0 - -		Loose, tan, poorly graded SAND gravel; fine to coarse sand; fine, subrounded gravel; moist	(SP) with	- - - - -					PVC Pipe
- 10.0 — -	• • • •	becomes tan and gray Soft, light tan, lean CLAY (CL) w medium plasticity; fine sand; we	ith sand;	- <u>¥</u> 	11.2	MW3-10			Slight petroleum odor
- - 15.0 — -		Loose, gray and tan, well-graded (SW); wet	ISAND	-	0.0	MW3-020222 GW			Temporary screen set to collect groundwater
- - 20.0 —		Final depth 20.0 feet bgs. Monito		-		MW3-18			- Bentonite Chips
-	-	installed to 15.0 feet bgs.	ning wei	-					
25.0	-			-					
- 30.0 — -	-			-					
- - 35.0 —	-			-					

		DDC	WSP FTA NORTH BI	AST FL END, W	JEL /ASI	RELE HING	ASE FON		BORING MW-4
		PBS	PBS PF	ROJECT 40535.4		MBER	:	BORING MW-4 LOCATION: (See Site Plan: co-located with BH1)	
EPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPT	ION OUND-	PID	(MPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION Tag ID# BPK 146
0.0									Flush-Mount Monument Bentonite Chips PVC Pipe
- - 10.0 - - -									Sand
- 15.0 — - - -	-								
20.0	-	Monitoring well installed to 20.0 fe	eet bgs. - - -						
- 25.0 — - -									
- 30.0 — - - -	-								
35.0		DD: Hollow-Stem Auger blocene Drilling)GGED E MPLETE	BY: S	. Newp	ort		

BORING LOG-ENV CORE 40535.468_MW1-3_SB1-3_2022025.GPJ DATATMPL.GDT PRINT DATE: 10/6/22:RPG

		DDC	WSP FTA NORTH E	A AST BEND	FUEL , WAS	RELE	ASE FON		BORING MW-5
		PBS	PBS F		ECT NU 35.498	IMBER	:		BORING MW-5 LOCATION: (See Site Plan: co-located with BH6)
	GRAPHIC LOG	MATERIAL DESCRIPT		WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION Tag ID# BPK 148
0.0		Medium dense, brown, silty SANI non-plastic; medium sand; damp	D (SM); - - -					30	Flush-Mount Monument
5.0			-		0.0	MW5-5		_	PVC Pipe Bentonite Chips
10.0			-					30	Sand
- 15.0 — -			-		0.0	MW5-15		_	0.10 Slotted PVC Screen
20.0		Final depth 22.0 feet bgs. Monitor installed to 22.0 feet bgs.	- - - ing well						
- 25.0 — - -		installed to 22.0 feet bgs.	-						
			-						
	METH(OD: Hollow-Stem Auger olocene Drilling		.OGGE	ED BY: S	6. Newp	ort		

BORING LOG-ENV CORE 40535.468 MW1-3 SB1-3 2022025.GPJ DATATMPL.GDT PRINT DATE: 10/6/22:RPG



PRINT DATE: 10/6/22:RPG ORING LOG-ENV CORE 40535.468 MW1-3 SB1-3 20220225.GPJ DATATMPL.GDT



ORING LOG-ENV CORE 40535.468 MW1-3 SB1-3 2022025.GPJ DATATMPL.GDT PRINT DATE: 10/6/22:RPG

Appendix B

Groundwater Sampling Datasheets
	PBS Engineering and Environmental Inc.	Project No: 40535 Project Name/	.498
	GROUNDWATER SAMPLING	Location: FTA AS	ST Release
	FORM (YSI Pro)	Date: 2/2/20	022
		Monitoring Well ID	MW-1 (BNN-183)
Initial DTW (feet bgs)	20.39	Sample ID (if not well ID)	
Screen Interval (feet bgs)	12-31.3	Sample Time	10:30
Well depth (feet bgs)	31.3	QC Sample	□ Not collected
Depth of pump/tubing inlet (feet bgs)		type:	ID Time
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	МВ
Purge Rate (L/min)		Weather Conditions	Overcast, snow

			W	ELL PURGING II	NFORMA [®]	TION			
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (F)	Dissolved oxygen (mg/L)	Specific conductivity ⊠mS/cm □µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □gal
10:19	20.39	42.2	11.56	0.026	7.36	63.4	-120		0
10:22	20.41	42.4	11.44	0.021	6.57	90.1	-63		1
10:26	20.41	4202	12.11	0.021	6.43	99	80		3
10:29	20.41	41.5	12.14	0.022	6.41	101.6	86		3.6
							Total V	olume Purged	3.6
FIELD OBSER		IOTES (such a	as well head cor	idition, groundwat	er color, sec	diment load, i	recovery, sheer	ı, odor, equipment)	

	PBS Engineering and Environmental Inc. GROUNDWATER	Project No: 40535 Project Name/ Location: FTA AS	498 ST Release			
	SAMPLING FORM (YSI Pro)	Date: 2/2/2022				
		Monitoring Well ID	MW-2 (BNL-610)			
Initial DTW (feet bgs)	5.75	Sample ID (if not well ID)				
Screen Interval (feet bgs)	12-24.9	Sample Time	11:30			
Well depth (feet bgs)	24.9	QC Sample	□ Not collected			
Depth of pump/tubing inlet (feet bgs)		type:	ID Time			
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	MB			
Purge Rate (L/min)		Weather Conditions	Overcast, snow			

Time elapsed actual DTW (feet) Temp. (F) Dissolved oxygen (mg/L) Specific conductivity µS/cm pH ORP (mV) Turbidity (NTU) Obse 11:22 5.80 42.4 3.58 0.034 5.54 121.6 124 11:26 5.51 42.2 3.38 0.033 5.49 120.9 106 11:30 5.53 42.1 3.52 0.033 5.45 122.4 74 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.54 123.4 62 123.4 62 11:34 5.81 42.1 3.54 123.4 62 123.4 62 11:34 5.9 129.1 129.1 129.1 129.1 129.1 <td< th=""><th></th><th></th><th></th><th>W</th><th>ELL PURGING I</th><th>NFORMA</th><th>TION</th><th></th><th></th><th></th></td<>				W	ELL PURGING I	NFORMA	TION			
11:26 5.51 42.2 3.38 0.033 5.49 120.9 106 11:30 5.53 42.1 3.52 0.033 5.45 122.4 74 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 1.51 1.51 1.51 1.51 1.51 11:34 11:34 11:34 1.51 1.51 1.51 1.51 1.51 11:34 11:34	elapsed			oxygen	conductivity M mS/cm	рН			Observations	Volume purged ⊠ltr □ gal
11:30 5.53 42.1 3.52 0.033 5.45 122.4 74 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 11:34 1 1 1 1 1 1 1 1 11:34 1	11:22	5.80	42.4	3.58	0.034	5.54	121.6	124		0
11:34 5.81 42.1 3.53 0.033 5.43 123.4 62 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11:26	5.51	42.2	3.38	0.033	5.49	120.9	106		1.5
Image: Sector of the sector	11:30	5.53	42.1	3.52	0.033	5.45	122.4	74		3
	11:34	5.81	42.1	3.53	0.033	5.43	123.4	62		4
FIELD OBSERVATIONS / NOTES (such as well head condition, groundwater color, sediment load, recovery, sheen, odor,										4
	FIELD OBSEK							recovery, sheet	, odor, equipment)	

	PBS Engineering and Environmental Inc.	Project No: 40535	.498			
	GROUNDWATER	Project Name/ Location: FTA A	ST Release			
	SAMPLING FORM (YSI Pro)	Date: 2/2/2022				
		Monitoring Well ID	MW-3 (BNL-611)			
Initial DTW (feet bgs)	4.59	Sample ID (if not well ID)				
Screen Interval (feet bgs)	12-32	Sample Time	12:30			
Well depth (feet bgs)	32	QC Sample	□ Not collected			
Depth of pump/tubing inlet (feet bgs)		type:	ID Time			
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	МВ			
Purge Rate (L/min)		Weather Conditions	Overcast, snow			

			WE	ELL PURGING I	NFORMA [®]	ΓΙΟΝ			
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (F)	Dissolved oxygen (mg/L)	Specific conductivity ⊠mS/cm □µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ ltr □ gal
12:06	4.60	43.6	2.10	0.050	5.70	144.4	5.38		0
12:10	4.60	44.1	1.37	0.050	5.65	133.1	7.01		1
12:14	4.61	43.8	1.24	0.050	5.65	125.4	3.5		1.8
12:18	4.62	43.8	1.15	0.051	5.62	122.1	0.40		2.8
							Total V	olume Purged	
FIELD OBSER	VATIONS / N	IOTES (such a	as well head cor	dition, groundwat	er color, sec	liment load, ı	ecovery, sheer	ı, odor, equipment)	

	PBS Engineering and Environmental Inc.	Project No: 40535	.498		
	GROUNDWATER	Project Name/ Location: FTA A	ST Release		
	SAMPLING FORM (YSI Pro)	Date: 7/28/22			
		Monitoring Well ID	MW-1 (BNN-183)		
Initial DTW (feet bgs)	23.755	Sample ID (if not well ID)			
Screen Interval (feet bgs)	12-32	Sample Time	11:20		
Well depth (feet bgs)	31.3	QC Sample	□ Not collected		
Depth of pump/tubing inlet (feet bgs)	23	type:	ID Time		
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	S. Newport and K. Nogeire		
Purge Rate (L/min)	0.23	Weather Conditions	Sunny 85°F		

			WE	ELL PURGING II	NFORMA	TION			
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ⊠ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □ gal
10:55	23.97	27.7	13.1	12	4.7	130			2.3
11:02	24.00	9.62	16.82	37	6.13	99.7			3.5
11:12	24.01	8.44	7.52	33	6.06	106			4.6
11:17	24.01	8.33	7.18	32	6.25	100.0			6.9
	1	1	1	1		1	Total V	olume Purged	~7
FIELD OBSER	VATIONS / N	OTES (such a	as well head con	dition, groundwat	er color, sec	diment load, r	ecovery, sheer	, odor, equipment)	
No odor, n	o sheen, cle	ear. Well h	ead in good	condition, full	of water.				

	PBS Engineering and Environmental Inc.	Project No: 40535	.498		
	GROUNDWATER	Project Name/ Location: FTA A	ST Release		
	SAMPLING FORM (YSI Pro)	Date: 7/28/22			
Initial DTW (feet bgs) Screen Interval (feet bgs) Well depth (feet bgs)		Monitoring Well ID	MW-2 (BNL-610)		
Initial DTW (feet bgs)	8.670	Sample ID (if not well ID)			
Screen Interval (feet bgs)	12-32	Sample Time	12:40		
Well depth (feet bgs)	24.9	QC Sample	□ Not collected		
Depth of pump/tubing inlet (feet bgs)	23	type:	ID Time		
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	S. Newport		
Purge Rate (L/min)	0.612	Weather Conditions	Hot 90°F		

			WE	ELL PURGING II	NFORMA [®]	TION			
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ☑ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □gal
12:15	8.71								
12:20	8.72	9.68	5.17	23	5.69	131			1.5
12:25	8.72	9.60	13.1	23	5.73	119			3
12:30		9.13	10.5	23	5.62	116.8			4.5
12;35		9.28	9.2	22	5.68	114.6			6
	1	1	1	1		1	Total V	olume Purged	6
FIELD OBSER	VATIONS / N	IOTES (such a	as well head con	dition, groundwat	er color, sec	diment load, i	ecovery, sheer	, odor, equipment)	
Clear water	, no odor,	no sheen. V	Well head in	good condition	n.		-		

	PBS Engineering and Environmental Inc.	Project No: 40535	.498		
	GROUNDWATER	Project Name/ Location: FTA A	ST Release		
	SAMPLING FORM (YSI Pro)	Date: 7/28/22			
		Monitoring Well ID	MW-3 (BNL-611)		
Initial DTW (feet bgs)	7.152	Sample ID (if not well ID)			
Screen Interval (feet bgs)	12-32	Sample Time	13:50		
Well depth (feet bgs)		QC Sample	□ Not collected		
Depth of pump/tubing inlet (feet bgs)	23	type:	ID Time		
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	S. Newport		
Purge Rate (L/min)	0.25	Weather Conditions	Hot 90°F		

			W	ELL PURGING II	NFORMA	TION			
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ⊠ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □gal
13:25		11.93	23.9	46	6.02	137.2			4
13:30	7.28	12.20	9.1	47	6.03	111.5			1.5
13:35	7.28	15.46	129.2	23	6.23	117.2			2.5
13:40		12.32	9.9	61	6.13	117.4			4
13:45		12.10	5.9	60	6.11	112.2			5.5
13:50		12.09	5.1	61	6.10	111.7			7
							Total M	olume Purged	7
								5	1
FIELD OBSER	VATIONS / N	IOTES (such a	as well head cor	dition, groundwat	er color, sec	diment load, i	ecovery, sheer	, odor, equipment)	
No odor, no	o sheen, no	o color. We	ll head in go	od condition, f	illed with	n water.			

	PBS Engineering and Environmental Inc.	Project No: 40535	498	
	GROUNDWATER	Project Name/ Location: FTA AS	ST Release	
	SAMPLING FORM (YSI Pro)	Date: 9/14/2	2	
		Monitoring Well ID	MW-1 (BNN-183)	
Initial DTW (feet bgs)	9/13-25.46 9/14-25.49	Sample ID (if not well ID)		
Screen Interval (feet bgs)	12-31.3	Sample Time	11:40	
Well depth (feet bgs)	31.3	QC Sample	□ Not collected	
Depth of pump/tubing inlet (feet bgs)	~27 ft	type:	ID Time	
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	S. Newport	
Purge Rate (L/min)	0.125	Weather Conditions	Overcast 65°F	

			WE	ELL PURGING II	NFORMA	TION			
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ⊠ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □ gal
11:37	25.60	12.9	8.98	38.8	8.19	153.1			0.125
11:40	25.65	11.7	7.48	32.3	7.05	214.6			1.2
11:43	25.70	11.5	7.09	32.3	6.56	230.9			1.6
11:48	25.72	11.3	7.52	31.0	6.13	233.5			2.25
11:51	25.73	11.2	7.30	29.9	6.07	231.1			2.6
	<u> </u>	I	l	<u> </u>		l	Total V	olume Purged	
FIELD OBSER	VATIONS / N	IOTES (such a	as well head con	dition, groundwat	er color, sec	diment load, i	recovery, sheer	n, odor, equipment)	
Well head i	n aood cor	ndition. GV	V clear, low s	ediment load.	No sheen	no odor.	Good recov	erv.	
						,			
1									

	PBS Engineering and Environmental Inc.	Project No: 40535.498				
	GROUNDWATER SAMPLING	Project Name/ Location: FTA AS	ST Release			
	FORM (YSI Pro)	Date: 9/14/2	2			
		Monitoring Well ID	MW-2 (BNL-610)			
Initial DTW (feet bgs)	9/13-10.25 9/14-10.28	Sample ID (if not well ID)				
Screen Interval (feet bgs)	12-24.9	Sample Time	13:30			
Well depth (feet bgs)	24.9	QC Sample	□ Not collected			
Depth of pump/tubing inlet (feet bgs)	~13 ft	type:	ID Time			
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	S. Newport			
Purge Rate (L/min)	0.15	Weather Conditions	Overcast 65°F			

			WE	LL PURGING I	NFORMA [®]	TION			
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ⊠ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □gal
13:22	10.28	11.7	4.41	25.1	6.36	176.1			0.15
13:25	10.29	10.9	1.83	24.8	5.90	186.3			0.6
13:28	10.29	10.7	1.40	25.1	5.53	192.2			1.05
13:31	10.29	10.6	1.28	24.9	5.40	191.0			1.5
13:34	10.29	10.6	1.23	24.8	5.35	187.6			1.95
		<u> </u>				<u> </u>	Total V	olume Purged	~2
FIELD OBSER	VATIONS / N	OTES (such a	as well head con	dition, groundwate	er color, sec	diment load,		n, odor, equipment)	1
				-				line odor, no sh	een

Well head in good condition. GW clear, low sediment load. Good recovery. Moderate gasoline odor, no sheen.

	PBS Engineering and Environmental Inc.	Project No: 40535	498		
	GROUNDWATER SAMPLING	Project Name/ Location: FTA AST Release Date: 9/14/22			
	FORM (YSI Pro)	Dute.	- MW-3 (BNL-611)		
		Monitoring Well ID			
Initial DTW (feet bgs)	9/13-8.61 9/14-8.63	Sample ID (if not well ID)			
Screen Interval (feet bgs)	12-32	Sample Time	12:40		
Well depth (feet bgs)	32	QC Sample	□ Not collected		
Depth of pump/tubing inlet (feet bgs)	~12 ft	type:	ID Time		
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	S. Newport		
Purge Rate (L/min)	0.12	Weather Conditions	Overcast 65°F		

			WE	LL PURGING I	VFORMA	TION			
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ☑ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □gal
12:36	8.80	14.5	8.35	47.9	6.74	177.6			0.12
12:39	8.82	13.5	5.97	48.7	6.16	194.2			0.48
12:42	8.82	13.6	5.55	48.5	5.87	198.3			0.84
12:45	8.83	13.5	5.25	46.9	5.72	196.3			1.2
12:48	8.84	13.3	5.33	46.7	5.67	194.1			1.6
		l	<u> </u>				Total V	olume Purged	~1.75
FIELD OBSER	VATIONS / N	IOTES (such a	as well head con	dition, groundwate	er color, sec	diment load, i	ecovery, sheer	, odor, equipment)	
Well head i	n good cor	ndition. GV	V clear, low s	ediment load.	Moderate	e gasoline	odor, no she	een. Good recov	very.

	PBS Engineering and Environmental Inc.	Project No: 40535.498			
	GROUNDWATER SAMPLING	Project Name/ Location: FTA AST Release			
	FORM (YSI Pro)	Date: 9/14/2	2		
		Monitoring Well ID	MW-4 (BPK-146)		
Initial DTW (feet bgs)	11.00	Sample ID (if not well ID)	MW4-0922		
Screen Interval (feet bgs)	5-20	Sample Time	11:20 - PFAS		
Well depth (feet bgs)	20	QC Sample	□ Not collected		
Depth of pump/tubing inlet (feet bgs)	~15 ft	type:	ID Time		
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	M. Bagley and S. Newport		
Purge Rate (L/min)	0.2	Weather Conditions	Overcast		

			WE	LL PURGING II	NFORMA [®]	TION			
Time elapsed actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ⊠ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □ gal
11:09	11.00	10.6	12.23	43.6	8.21	160.8			0.2
11:12	11.00	10.4	10.07	35.7	7.89	170.7			0.8
11:16	11.04	10.4	9.23	33.4	7.56	177.4			1.6
11:19	11.04	10.5	9.26	32.7	7.46	176.0			2.1
		1	1			1	Total V	olume Purged	~2.5
		OTFS (such a	as well head con	dition aroundwate	er color sec	liment load r		, odor, equipment)	
				ediment load.			ceavery, sheen		
	n good cor	iuition. Gv	v clear, IOW S	eunnent iodu.		overy.			

	PBS Engineering and Environmental Inc.	Project No: 40535	498			
	GROUNDWATER SAMPLING	Project Name/ Location: FTA AST Release				
	FORM (YSI Pro)	Date: 9/13/2	2022			
		Monitoring Well ID	MW-5 (BPK-148)			
Initial DTW (feet bgs)	21.99	Sample ID (if not well ID)				
Screen Interval (feet bgs)	7-22	Sample Time				
Well depth (feet bgs)	22	QC Sample	□ Not collected			
Depth of pump/tubing inlet (feet bgs)		type:	ID Time			
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	S. Newport and M. Bagley			
Purge Rate (L/min)		Weather Conditions	Overcast 67°F			

			WF	ELL PURGING I	NFORMA	TION			
Time elapsed actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ☐ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged Itr gal
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		「 <u> </u>		[]					
		<u> </u>					Γ		
							Total V	/olume Purged	
FIELD OBSER	VATIONS / N	JOTES (such a	as well head cor	dition, groundwat	er color, sec	diment load,	recovery, sheer	n, odor, equipment)	
			in good con						
,,,,,,,,									
Signature of	f Field Persc	onnel:							

	PBS Engineering and Environmental Inc.	Project No: 40535.498		
	GROUNDWATER	Project Name/ Location: FTA AS	ST Release	
	SAMPLING FORM (YSI Pro)	Date: 9/13/2	2	
		Monitoring Well ID	MW-6 (BPK-147)	
Initial DTW (feet bgs)	13.53	Sample ID (if not well ID)	MW6-0922	
Screen Interval (feet bgs)	5-15	Sample Time	12:15 - PFAS	
Well depth (feet bgs)	20	QC Sample	□ Not collected	
Depth of pump/tubing inlet (feet bgs)	~15	type:	ID Time	
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	S. Newport	
Purge Rate (L/min)	0.125	Weather Conditions	Overcast 68°F	

			W	LL PURGING I	NFORMA [®]	TION			
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ⊠ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □gal
12:02	13.65	16.0	2.20	76.8	7.47	165.1			0.13
12:06	13.65	15.0	1.51	67.7	6.99	166.6			0.65
12:09	13.65	14.8	1.89	65.6	6.71	168.0			1.04
12:13	13.65	14.9	1.94	66.4	6.51	169.2			1.56
							Total V	olume Purged	~1.75
FIELD OBSER	VATIONS / N	OTES (such a	as well head cor	dition, groundwate	er color, sec	diment load, i	ecovery, sheen	, odor, equipment)	
				ediment load.			-		

	PBS Engineering and Environmental Inc.	Project No: 40535	498			
	GROUNDWATER SAMPLING	Project Name/ Location: FTA AST Release				
	FORM (YSI Pro)	Date: 9/13/2	2022			
		Monitoring Well ID	MW-7 (BPK-149)			
Initial DTW (feet bgs)	21.82	Sample ID (if not well ID)				
Screen Interval (feet bgs)	7-22	Sample Time				
Well depth (feet bgs)	22	QC Sample	□ Not collected			
Depth of pump/tubing inlet (feet bgs)		type:	ID Time			
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	S. Newport and M. Bagley			
Purge Rate (L/min)		Weather Conditions	Overcast 68°F			

	WELL PURGING INFORMATION								
Time elapsed actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ☐ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged Itr gal
					<u> </u>				
							Τ		
				[]	 		Τ		
							Τ		
							Total V	/olume Purged	
FIELD OBSER	VATIONS / N	IOTES (such a	as well head cor	dition, groundwat	er color, sec	diment load,	recovery, sheer	n, odor, equipment)	
			in good con						
,,,									
Signature of	f Field Persc	onnel:							

	PBS Engineering and Environmental Inc. GROUNDWATER SAMPLING FORM (YSI Pro)	Project No: 40535.498 Project Name/ Location: FTA AST Release Date: 1/13/2022				
		Monitoring Well ID	MW-1 (BNN-183)			
Initial DTW (feet bgs)	21.590	Sample ID (if not well ID)				
Screen Interval (feet bgs)	12-31.3	Sample Time	14:45			
Well depth (feet bgs)	31.3	QC Sample	⊠ Not collected			
Depth of pump/tubing inlet (feet bgs)	~23	type:	ID Time			
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	SN			
Purge Rate (L/min)	0.15	Weather Conditions	45°F light rain			

	WELL PURGING INFORMATION									
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ⊠ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □ gal	
14:51	21.64	6.6	11.28	14.8	6.91	169.9			0	
14:56	21.65	7.0	11.07	14.3	6.60	182.8			0.75	
15:00	21.65	6.8	10.68	14.6	6.47	185.9			1.35	
	1					1	Total V	olume Purged	1.4	
	nulated in r			dition, groundwate v sediment low,			-	ı, odor, equipment) or.		

	PBS Engineering and Environmental Inc. GROUNDWATER SAMPLING FORM (YSI Pro)	Project No: 40535 Project Name/ Location: FTA AS Date: 1/13/2	ST Release
		Monitoring Well ID	MW-2 (BNL-610)
Initial DTW (feet bgs)		Sample ID (if not well ID)	
Screen Interval (feet bgs)	12-24.9	Sample Time	
Well depth (feet bgs)	24.9	QC Sample	□ Not collected
Depth of pump/tubing inlet (feet bgs)		type:	ID Time
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	
Purge Rate (L/min)		Weather Conditions	

	WELL PURGING INFORMATION								
Time elapsed actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ☐ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged Itr gal
	[<u> </u>			「 <u> </u>		Γ		
	[<u> </u>			「 <u> </u>		Γ		
							Total V	/olume Purged	
FIELD OBSER	VATIONS / N	IOTES (such a	as well head cor	ndition, groundwat	er color, sec	diment load,	recovery, sheer	n, odor, equipment)	
Not sample	d								
Signature of	f Field Persc	onnel:							

	PBS Engineering and Environmental Inc. GROUNDWATER SAMPLING FORM (YSI Pro)	Project No: 40535 Project Name/ Location: FTA AS Date: 1/13/2	ST Release
		Monitoring Well ID	MW-3 (BNL-611)
Initial DTW (feet bgs)		Sample ID (if not well ID)	
Screen Interval (feet bgs)	12-32	Sample Time	
Well depth (feet bgs)	32	QC Sample	□ Not collected
Depth of pump/tubing inlet (feet bgs)		type:	ID Time
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	
Purge Rate (L/min)		Weather Conditions	

	WELL PURGING INFORMATION								
Time elapsed actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ☐ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged Itr gal
	[<u> </u>			「 <u> </u>		Γ		
	[<u> </u>			「 <u> </u>		Γ		
							Total V	/olume Purged	
FIELD OBSER	VATIONS / N	IOTES (such a	as well head cor	ndition, groundwat	er color, sec	diment load,	recovery, sheer	n, odor, equipment)	
Not sample	d								
Signature of	f Field Persc	onnel:							

	PBS Engineering and Environmental Inc. GROUNDWATER	Project No: 40535.498 Project Name/ Location: FTA AST Release					
	SAMPLING FORM (YSI Pro)	Date: 1/13/2	022				
		Monitoring Well ID	MW-4 (BPK-146)				
Initial DTW (feet bgs)	7.55	Sample ID (if not well ID)					
Screen Interval (feet bgs)	5-20	Sample Time	16:00				
Well depth (feet bgs)	20	QC Sample	⊠ Not collected				
Depth of pump/tubing inlet (feet bgs)	~10	type:	ID Time				
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	SN				
Purge Rate (L/min)	0.15	Weather Conditions	45°F light rain				

	WELL PURGING INFORMATION									
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ⊠ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □ gal	
15:48	7.56	5.5	11.17	38.4	6.09	200.0			0	
15:52	7.58	5.5	8.97	38.2	5.96	202.3			0.6	
15:59	7.60	5.5	8.59	38.1	5.97	199.3			1.65	
							Total V	olume Purged	1.7	
FIELD OBSER	VATIONS / N	IOTES (such a	as well head con	dition, groundwat	er color, sec	liment load, r	ecovery, sheer	, odor, equipment)	J	
	n good cond			iment load, goo			-	, ouor, equipment,		

	PBS Engineering and Environmental Inc. GROUNDWATER SAMPLING	Project No: 40535 Project Name/ Location: FTA AS Date: 1/13/2	ST Release	
	FORM (YSI Pro)	Monitoring Well ID	MW-5 (BPK-148)	
	21 505			
Initial DTW (feet bgs)	21.585	Sample ID (if not well ID)		
Screen Interval (feet bgs)	7-22	Sample Time	Not collected	
Well depth (feet bgs)	22	QC Sample	□ Not collected	
Depth of pump/tubing inlet (feet bgs)	23	type:	ID Time	
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	SN	
Purge Rate (L/min)		Weather Conditions	45°F light rain	

WELL PURGING INFORMATION									
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ☑ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □ gal
11:43	21.6	6.5	5.29	71.0	5.36	188.3			<0.25
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				ļ!	ļ'				
		<u> </u>		!		_	<u> </u>	¹	
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				<u> </u>	<u> </u>		+	⁻	
		<u> </u>		<u> </u>		<u> </u>	+		
				<u> </u>					
				++					
	<u></u>	<u>I</u>	<u> </u>	L1		<u> </u>	Total V	/olume Purged	<.025
FIELD OBSER	VATIONS / N	، IOTES (such	as well head cor	ndition, groundwat	er color, sec	diment load,		n, odor, equipment)	4
				up. Left and car					
,				·				•	

	PBS Engineering and Environmental Inc. GROUNDWATER SAMPLING FORM (YSI Pro)	Project No: 40535.498 Project Name/ Location: FTA AST Release Date: 1/13/2023		
		Monitoring Well ID	MW-6 (BPK-147)	
Initial DTW (feet bgs)	8.850	Sample ID (if not well ID)		
Screen Interval (feet bgs)	5-15	Sample Time	12:45	
Well depth (feet bgs)	20	QC Sample	⊠ Not collected	
Depth of pump/tubing inlet (feet bgs)	12	type:	ID Time	
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	SN	
Purge Rate (L/min)	0.19	Weather Conditions	45°F light rain	

			W	ELL PURGING I	NFORMA [.]	TION			
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ⊠ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □gal
12:38	8.95	8.5	0.78	54.1	6.00	167.9			0
12:42	8.94	9.0	0.29	54.7	5.91	164.8			.8
12:47	8.94	9.1	0.22	54.9	5.81	166.4			1.75
							Total V	olume Purged	1.75
	n good cond			idition, groundwat				n, odor, equipment)	

	PBS Engineering and Environmental Inc. GROUNDWATER SAMPLING FORM (YSI Pro)	Project No: 40535.498 Project Name/ Location: FTA AST Release Date: 1/13/2022		
		Monitoring Well ID	MW-7 (BPK-149)	
Initial DTW (feet bgs)	20.83	Sample ID (if not well ID)		
Screen Interval (feet bgs)	7-22	Sample Time	13:45	
Well depth (feet bgs)	22	QC Sample	⊠ Not collected	
Depth of pump/tubing inlet (feet bgs)	~24	type:	ID Time	
Sampling method (describe pump or sampler)	Peristaltic Pump / Low Flow	Field Personnel	SN	
Purge Rate (L/min)		Weather Conditions	45°F light rain	

			WE	ELL PURGING II	NFORMA	τιον			
Time □ elapsed ⊠ actual	DTW (feet)	Temp. (C)	Dissolved oxygen (mg/L)	Specific conductivity ☐ mS/cm ⊠ µS/cm	рН	ORP (mV)	Turbidity (NTU)	Observations	Volume purged ⊠ltr □gal
10:12	20.83	7.0	7.01	36.8	9.02	69.3			<.25
			•				Total V	olume Purged	<.25
FIELD OBSER	VATIONS / N	OTES (such a	as well head con	dition, groundwat	er color, sec	liment load, r	ecovery, sheer	, odor, equipment)	
large amour fill amber bo		ange bacte	ria bloom in (GW. Well mostly	dry. Colle	ected 3 vials	s using bailer	, not enough col	lected to

Appendix C Survey Reports



Site Visit: February 2, 2022 Well Monitoring at WSP Fire Training Academy 50810 SE Grouse Ridge Road North Bend, Washington 98045 PBS project #40535.498

WELL ID	LATITUDE	LONGITUDE	TOP PIPE ELEV.	GROUND ELEV.
MW-1	47-27-22.1900	121-39-43.2446	1574.72'	1574.91′
MW-2	47-27-21.2966	121-39-42.1180	1558.06'	1558.44′
MW-3	47-27-20.3664	121-39-42.4861	1556.05′	1556.29′

Benchmark:47-26-16.4986121-38-59.97451328.363''Description:WSDOT Benchmark ID #5798 ("GP17090-291") is a brass disc set in the top of a round concrete
monument and under a WSDOT case and cover, set level with the ground.

TBM #1 PBS CP #1- 60	47-27-21.5903 D Spike/Nail	121-39-42.5796	1575.46′
TBM #2 PBS CP #2- 60	47-27-22.6779 D Spike/Nail	121-39-41.6599	1574.21′

Horizontal Datum: Latitude/Longitude derived from NAD 83/2011 (2010.00 Epoch) Washington North Zone via Washington State Reference Network (WSRN).

Vertical Datum: NAVD 88 via Washington State Reference Network (WSRN).

A Trimble SX-10 one second robotic total station/scanner and Topcon DL-502 digital level was used for on-site horizontal and vertical values.

A Trimble R12i was used for WSRN observations on site control and benchmark verifications.

Accuracy for TBM and monitoring well elevations is +/- 0.01'.

Regan Schaller, WA PLS #54471 PBS Engineering + Environmental 415 W 6th Street, Suite 601 Vancouver, WA 98660 P: 360.567.2111 Regan.schaller@pbsusa.com





Site Visit: January 17, 2022 Well Monitoring at WSP Fire Training Academy Update 50810 SE Grouse Ridge Road North Bend, Washington 98045 PBS project #40535.498

WELL ID	LATITUDE	LONGITUDE	TOP PIPE ELEV.	GROUND ELEV.
MW-4	47-27-21.4119	121-39-40.9046	1558.41′	1558.50′
MW-5	47-27-18.9787	121-39-44.8728	1556.69'	1557.07′
MW-6	47-27-20.0460	121-39-40.7738	1556.04′	1556.14′
MW-7	47-27-15.0796	121-39-42.0615	1554.43′	1554.81′

Benchmark:47-26-16.4986121-38-59.97451328.363''Description:WSDOT Benchmark ID #5798 ("GP17090-291") is a brass disc set in the top of a round concrete
monument and under a WSDOT case and cover, set level with the ground.

TBM #1	47-27-21.5903	121-39-42.5796	1575.46′
PBS CP #1-	1/2" iron rod with red p	lastic cap inscribed "PBS CO	NTROL"

TBM #2	47-27-22.6779	121-39-41.6599	1574.21′
PBS CP #2-	60D Spike/Nail		

Horizontal Datum: Latitude/Longitude derived from NAD 83/2011 (2010.00 Epoch) Washington North Zone via Washington State Reference Network (WSRN).

Vertical Datum: NAVD 88 via Washington State Reference Network (WSRN).

A Trimble S-5 one second robotic total station/scanner and Topcon DL-502 digital level was used for on-site horizontal and vertical values.

A Trimble R12i was used for WSRN observations on site control and benchmark verifications.

Accuracy for TBM and monitoring well elevations is +/- 0.01'.

Regan Schaller, WA PLS #54471 PBS Engineering + Environmental 1325 SE Tech Center Drive, Suite 140 Vancouver, WA 98683 P: 360.567.2111 Regan.schaller@pbsusa.com



Appendix D

Laboratory Reports and Chain-of-Custody Documentation

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

January 27, 2022

Mike Bagley, Project Manager PBS Engineering and Environmental, Inc. 214 E. Galer St, Suite 300 Seattle, WA 98102

Dear Mr Bagley:

Included are the results from the testing of material submitted on January 21, 2022 from the FTA-ASTs 40535.498, F&BI 201304 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. 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.

Colo

Michael Erdahl Project Manager

Enclosures PBS0127R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on January 21, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental FTA-ASTs 40535.498, F&BI 201304 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	PBS Engineering and Environmental
201304 -01	MW1-15
201304 -02	MW1-12
201304 -03	SB1-15
201304 -04	SB1-25
201304 -05	SB2-10
201304 -06	SB2-16
201304 -07	MW2-9
201304 -08	MW2-13
201304 -09	SB3-5
201304 -10	SB3-16
201304 -11	SB2-25
201304 -12	SB3-10
201304 -13	SB3-18

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/27/22 Date Received: 01/21/22 Project: FTA-ASTs 40535.498, F&BI 201304 Date Extracted: 01/24/22 Date Analyzed: 01/24/22 and 01/25/22

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

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	Ethyl <u>Benzene</u>	Total <u>Xylenes</u>	Gasoline <u>Range</u>	Surrogate (<u>% Recovery)</u> (Limit 50-150)
MW1-15 201304-01	< 0.02	< 0.02	< 0.02	< 0.06	<5	81
MW1-12 201304-02	< 0.02	< 0.02	< 0.02	< 0.06	<5	86
SB1-15 201304-03	< 0.02	< 0.02	< 0.02	< 0.06	<5	89
SB1-25 201304-04	< 0.02	< 0.02	< 0.02	< 0.06	<5	89
SB2-10 201304-05	< 0.02	< 0.02	< 0.02	< 0.06	<5	87
SB2-16 201304-06	< 0.02	< 0.02	< 0.02	< 0.06	<5	76
MW2-9 201304-07	< 0.02	< 0.02	< 0.02	< 0.06	<5	90
MW2-13 201304-08	0.031	0.24	< 0.02	0.57	<5	84
SB3-5 201304-09	< 0.02	< 0.02	< 0.02	< 0.06	<5	89
SB3-16 201304-10	0.092	0.36	< 0.02	0.18	<5	88

ENVIRONMENTAL CHEMISTS

Date of Report: 01/27/22 Date Received: 01/21/22 Project: FTA-ASTs 40535.498, F&BI 201304 Date Extracted: 01/24/22 Date Analyzed: 01/24/22 and 01/25/22

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

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	Ethyl <u>Benzene</u>	Total <u>Xylenes</u>	Gasoline <u>Range</u>	Surrogate (<u>% Recovery)</u> (Limit 50-150)
SB2-25 201304-11	< 0.02	< 0.02	< 0.02	< 0.06	<5	73
SB3-10 201304-12	0.080	0.55	< 0.02	0.24	<5	86
SB3-18 201304-13	< 0.02	< 0.02	< 0.02	<0.06	<5	88
Method Blank 02-155 MB	< 0.02	< 0.02	< 0.02	<0.06	<5	90

ENVIRONMENTAL CHEMISTS

Date of Report: 01/27/22 Date Received: 01/21/22 Project: FTA-ASTs 40535.498, F&BI 201304 Date Extracted: 01/24/22 Date Analyzed: 01/24/22

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

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	Surrogate <u>(% Recovery)</u> (Limit 53-144)
MW1-15 201304-01	<50	<250	91
MW1-12 201304-02	<50	<250	91
SB1-15 201304-03	<50	<250	92
SB1-25 201304-04	<50	<250	94
SB2-10 201304-05	<50	<250	92
SB2-16 201304-06	<50	<250	91
MW2-9 201304-07	<50	<250	91
MW2-13 201304-08	<50	<250	92
SB3-5 201304-09	180 x	800	90
SB3-16 201304-10	<50	<250	91

ENVIRONMENTAL CHEMISTS

Date of Report: 01/27/22 Date Received: 01/21/22 Project: FTA-ASTs 40535.498, F&BI 201304 Date Extracted: 01/24/22 Date Analyzed: 01/24/22

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

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	Surrogate <u>(% Recovery)</u> (Limit 53-144)
SB2-25 201304-11	<50	<250	92
SB3-10 201304-12	<50	<250	91
SB3-18 201304-13	<50	<250	91
Method Blank 02-237 MB	<50	<250	94

ENVIRONMENTAL CHEMISTS

Date of Report: 01/27/22 Date Received: 01/21/22 Project: FTA-ASTs 40535.498, F&BI 201304

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

Laboratory Code: 201304-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	< 0.02	< 0.02	nm
Toluene	mg/kg (ppm)	< 0.02	< 0.02	nm
Ethylbenzene	mg/kg (ppm)	< 0.02	< 0.02	nm
Xylenes	mg/kg (ppm)	< 0.06	< 0.06	nm
Gasoline	mg/kg (ppm)	<5	<5	nm

Laboratory Code: Laboratory Control Sample

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	mg/kg (ppm)	0.5	104	69-120
Toluene	mg/kg (ppm)	0.5	95	70-117
Ethylbenzene	mg/kg (ppm)	0.5	94	65 - 123
Xylenes	mg/kg (ppm)	1.5	94	66-120
Gasoline	mg/kg (ppm)	20	120	71-131

ENVIRONMENTAL CHEMISTS

Date of Report: 01/27/22 Date Received: 01/21/22 Project: FTA-ASTs 40535.498, F&BI 201304

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

Laboratory Code:	201307-01 (Matri	x Spike)					
			Sample	Percent	Percent		
	Reporting	Spike	Result	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	(Wet Wt)	MS	MSD	Criteria	(Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	96	94	64-133	2
Laboratory Code:	Laboratory Contr	ol Samp	le				
			Percent	t			
	Reporting	Spike	Recover	y Accep	tance		
Analyte	Units	Units Level LCS Criter		eria			
Diesel Extended	mg/kg (ppm)	5,000	94	58-1	147		

 $\mathbf{7}$

ENVIRONMENTAL CHEMISTS

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 analyte 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 due to sample matrix effects.

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

 ${\rm J}$ - 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.

SAMPLERS (signature) $f(N)$ OT $A - AST is$ POPROJECT NAME POP $TA - AST is$	SAMPLERS (signature), $f(t)$ OTHERS (signature), $f(t)$ PROJECT NAME PO# FTA - AST's PO# FTA - AST's PO# FTA - AST's PO# Froject specific FLs? - Yes / No ANALYSEE NWTPH-Gx ANALYSE	SAMPLERS (signature) PROJECT NAME PROJECT NAME FTA - AST's Project specific RLs? Time Sampled Type Jars Type Jars Solution Sampled Type Jars NWTPH-Dx Sampled Type Jars NWTPH-Dx Solution Sampled Type Jars NWTPH-BCX Solution Sampled Type Jars NWTPH-BCX NWTPH-BCX VOCs EPA 8260 PCBs EPA 8021 PCBs EPA 8022 PAHs EPA 8270 PAHs EP	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	PROJECT NAME PO# FTA - AST's HOS35.448 REMARKS INVOICE TO Project specific RLs? Yes / No Project specific RLs? Yes / No Sampled # of Type Jars V1S Sp:1 Sp:1 Sp:1 Sp:1 Spin Sp:1 Spin Spin Sp:1 Spin Spin Sp:1 Spin Spin Spin Spin Spin	Received by:	Relinquished by:	Received by:		Friedman & Bruva Inco Relinquished by	1 01 91-244		MW 2-13 08	MW2.4 07	562.16 26	50 05-10	401-25 04	561-15 03	NW1-22 02	MW1-15 OFA-R	Sample ID Lab ID		Address 214 E. Uniller St. S.: He ZOD City, State, ZIP Scuttle, WA 98102 Phone 3603303359 Email Wicker, bug ley Deptsu succe	Report To Mike Bagley Company PBS Eng. + Env.
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SAMPLERS (signature) PROJECT NAME PO# $FTA = A5T^{5}$ $Hof 35, 49$ Project specific RLs? - Yes / No No Time Sample Sampled Type J?, σ_7 γ_{57} J2, γ_{77} γ_{77} NWTPH-Dx ANALYSES REQUESTED J3, γ_{77} γ_{75} J2, γ_{77} γ_{75} NWTPH-Dx $NWTPH-Bax$ NWTPH-HCID $NWTPH-HCID$ NWTPH-HCID γ_{77} NWTPH-MCID γ_{77} PCBs EPA 80622 γ_{77} PCBs EPA 80622 γ_{77} PCBs γ_{77} PCBs γ_{77} PCBs γ_{77} NWTP γ_{77} Sample γ_{77} PCBs γ_{77} PCBs <t< th=""><th>Received by:</th><th>Relinquished by:</th><th>Ph. (206) 285-8282</th><th>SIGNATURE</th><th></th><th></th><th></th><th>MW3-18 13 1/20</th><th>Mw3-10 12 1/20</th><th>MW2-25 11.A. & 1/20</th><th>Sample ID Lab ID Date Sampled</th><th></th><th>PhoneEmail</th><th>City, State, ZIP Scatte, WA 98102</th><th>14 E, Galer St, Suite</th><th>Company 155 End. + Env.</th><th>Report To Mike Bagicy</th></t<>	Received by:	Relinquished by:	Ph. (206) 285-8282	SIGNATURE				MW3-18 13 1/20	Mw3-10 12 1/20	MW2-25 11.A. & 1/20	Sample ID Lab ID Date Sampled		PhoneEmail	City, State, ZIP Scatte, WA 98102	14 E, Galer St, Suite	Company 155 End. + Env.	Report To Mike Bagicy
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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

February 9, 2022

Mike Bagley, Project Manager PBS Engineering and Environmental, Inc. 214 E. Galer St, Suite 300 Seattle, WA 98102

Dear Mr Bagley:

Included are the additional results from the testing of material submitted on January 21, 2022 from the FTA-ASTs 40535.498, F&BI 201304 project. There are 8 pages included in this report.

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.

Colo

Michael Erdahl Project Manager

Enclosures PBS0209R.DOC
ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on January 21, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental FTA-ASTs 40535.498, F&BI 201304 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	PBS Engineering and Environmental
201304 -01	MW1-15
201304 -02	MW1-12
201304 -03	SB1-15
201304 -04	SB1-25
201304 -05	SB2-10
201304 -06	SB2-16
201304 -07	MW2-9
201304 -08	MW2-13
201304 -09	SB3-5
201304 -10	SB3-16
201304 -11	SB2-25
201304 -12	SB3-10
201304 -13	SB3-18

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	SB3-16 01/21/22 02/03/22 02/03/22 Soil mg/kg (ppr	n) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	PBS Engineering and Environmental 40535.498, F&BI 201304 201304-10 1/0.25 020320.D GCMS11 RF
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 104 97 98	Lower Limit: 79 84 84	Upper Limit: 128 121 116
Compounds:		Concentration mg/kg (ppm)		
Methyl t-butyl ethe 1,2-Dibromoethane 1,2-Dichloroethane	(EDB)	<0.05 <0.005 <0.05		

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Bl Not Applic 02/03/22 02/03/22 Soil mg/kg (ppr		Client: Project: Lab ID: Data File: Instrument: Operator:	PBS Engineering and Environmental 40535.498, F&BI 201304 02-286 mb2 1/0.25 020308.D GCMS11 RF
			Lower	Upper
Surrogates:		% Recovery:	Limit:	Limit:
1,2-Dichloroethane	-d4	105	79	128
Toluene-d8		95	84	121
4-Bromofluorobenz	ene	95	84	116
Compounds:		Concentration mg/kg (ppm)		
Methyl t-butyl ethe	er (MTBE)	< 0.05		
1,2-Dibromoethane	. ,	< 0.005		
1,2-Dichloroethane	(EDC)	< 0.05		

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	SB3-16 01/21/22 02/02/22 02/02/22 Soil mg/kg (ppm)	Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	PBS Engineering and Environmental 40535.498, F&BI 201304 201304-10 1/5 020215.D GCMS9 VM
Surrogates: 2-Fluorophenol Phenol-d6 Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromopher Terphenyl-d14	ıol	% Recovery: 52 73 74 77 79 106	Lower Limit: 24 37 38 45 11 50	Upper Limit: 111 116 117 117 158 124
Compounds:		Concentration mg/kg (ppm)		
Naphthalene 2-Methylnaphthale 1-Methylnaphthale Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Chrysene Benzo(a)pyrene Benzo(b)fluoranthe Benzo(k)fluoranthe Indeno(1,2,3-cd)pyr Dibenz(a,h)anthrac Benzo(g,h,i)peryler	ne ne ne ene sene	$< 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ < 0.01 \\ <$		

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blank Not Applicable 02/02/22 02/02/22 Soil mg/kg (ppm) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	PBS Engineering and Environmental 40535.498, F&BI 201304 02-276 mb2 1/5 020209.D GCMS9 VM
Surrogates: 2-Fluorophenol Phenol-d6 Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromophen Terphenyl-d14	113	Lower Limit: 24 37 38 45 11 50	Upper Limit: 111 116 117 117 158 124
Compounds:	Concentration mg/kg (ppm)		
Naphthalene 2-Methylnaphthale 1-Methylnaphthale Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Chrysene Benzo(a)pyrene Benzo(b)fluoranthe Benzo(k)fluoranthe Indeno(1,2,3-cd)pyr Dibenz(a,h)anthrac	$\begin{array}{rcrc} & < 0.01 \\ & < 0.01 \\ & < 0.01 \\ & < 0.01 \\ & < 0.01 \\ & < 0.01 \\ & < 0.01 \\ & < 0.01 \\ & < 0.01 \\ & < 0.01 \\ & < 0.01 \\ & < 0.01 \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ $		

ENVIRONMENTAL CHEMISTS

Date of Report: 02/09/22 Date Received: 01/21/22 Project: FTA-ASTs 40535.498, F&BI 201304

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 201425-01 (Matrix Spike)

Laboratory Code: 201425-01	(main opike)		Sample	Percent	Percent		
	Reporting	Spike	Result	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	(Wet wt)	MS	MSD	Criteria	(Limit 20)
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	1	< 0.05	91	97	21 - 145	6
1,2-Dichloroethane (EDC)	mg/kg (ppm)	1	< 0.05	91	96	12 - 160	5
1,2-Dibromoethane (EDB)	mg/kg (ppm)	1	< 0.05	83	94	28 - 142	12

	I I I I I I I I I		Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	1	108	60-123
1,2-Dichloroethane (EDC)	mg/kg (ppm)	1	110	56 - 135
1,2-Dibromoethane (EDB)	mg/kg (ppm)	1	104	74 - 132

ENVIRONMENTAL CHEMISTS

Date of Report: 02/09/22 Date Received: 01/21/22 Project: FTA-ASTs 40535.498, F&BI 201304

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: 201434-01 1/5 (Matrix Spike)

			Sample	Percent	Percent		
	Reporting	Spike	Result	Recovery	Recovery	Acceptance	RPD
Analyte	Ūnits 🖱	Level	(Wet wt)	MS	MSD	Criteria	(Limit 20)
Naphthalene	mg/kg (ppm)	0.83	< 0.01	86	85	50-150	1
2-Methylnaphthalene	mg/kg (ppm)	0.83	< 0.01	81	83	50 - 150	2
1-Methylnaphthalene	mg/kg (ppm)	0.83	< 0.01	84	85	50-150	1
Acenaphthylene	mg/kg (ppm)	0.83	< 0.01	88	91	50-150	3
Acenaphthene	mg/kg (ppm)	0.83	< 0.01	91	93	50 - 150	2
Fluorene	mg/kg (ppm)	0.83	< 0.01	87	91	50 - 150	4
Phenanthrene	mg/kg (ppm)	0.83	< 0.01	95	94	50-150	1
Anthracene	mg/kg (ppm)	0.83	< 0.01	91	90	50 - 150	1
Fluoranthene	mg/kg (ppm)	0.83	< 0.01	91	90	50 - 150	1
Pyrene	mg/kg (ppm)	0.83	< 0.01	92	96	50 - 150	4
Benz(a)anthracene	mg/kg (ppm)	0.83	< 0.01	96	96	50-150	0
Chrysene	mg/kg (ppm)	0.83	< 0.01	97	95	50-150	2
Benzo(a)pyrene	mg/kg (ppm)	0.83	< 0.01	91	92	50-150	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	< 0.01	99	101	50-150	2
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	< 0.01	97	98	50-150	1
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	< 0.01	116	111	50-150	4
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	< 0.01	124	117	50-150	6
Benzo(g,h,i)perylene	mg/kg (ppm)	0.83	< 0.01	124	116	50-150	7

Laboratory Code: Laboratory	y Control San	nple 1/5		
	-	~	Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Ūnits 🛛	Level	LCS	Criteria
Naphthalene	mg/kg (ppm)	0.83	94	61-102
2-Methylnaphthalene	mg/kg (ppm)	0.83	89	62-108
1-Methylnaphthalene	mg/kg (ppm)	0.83	92	62-108
Acenaphthylene	mg/kg (ppm)	0.83	95	61-111
Acenaphthene	mg/kg (ppm)	0.83	98	61-110
Fluorene	mg/kg (ppm)	0.83	93	62-114
Phenanthrene	mg/kg (ppm)	0.83	101	64-112
Anthracene	mg/kg (ppm)	0.83	99	63-111
Fluoranthene	mg/kg (ppm)	0.83	97	66-115
Pyrene	mg/kg (ppm)	0.83	97	65-112
Benz(a)anthracene	mg/kg (ppm)	0.83	101	64-116
Chrysene	mg/kg (ppm)	0.83	101	66-119
Benzo(a)pyrene	mg/kg (ppm)	0.83	91	62-116
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	98	61-118
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	99	65-119
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	117	64-130
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	124	67-131
Benzo(g,h,i)perylene	mg/kg (ppm)	0.83	126	67-126

ENVIRONMENTAL CHEMISTS

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 analyte 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 due to sample matrix effects.

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

 ${\rm J}$ - 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.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

February 9, 2022

Mike Bagley, Project Manager PBS Engineering and Environmental, Inc. 214 E. Galer St, Suite 300 Seattle, WA 98102

Dear Mr Bagley:

Included are the results from the testing of material submitted on February 2, 2022 from the FTA AST's 40535.498, F&BI 202039 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. 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.

Cale

Michael Erdahl Project Manager

Enclosures PBS0209R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 2, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental FTA AST's 40535.498, F&BI 202039 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	
202039 -01	
202039 -02	
202039 -03	
202039 -04	

PBS Engineering and Environmental MW1-020222 MW2-020222 MW3-020222 DUP-020222

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/09/22 Date Received: 02/02/22 Project: FTA AST's 40535.498, F&BI 202039 Date Extracted: 02/04/22 Date Analyzed: 02/06/22

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

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	Ethyl <u>Benzene</u>	Total <u>Xylenes</u>	Gasoline <u>Range</u>	Surrogate (<u>% Recovery</u>) (Limit 52-124)
MW1-020222 202039-01	<1	<1	<1	<3	<100	82
MW2-020222 202039-02 1/80	680	4,800	410	2,600	30,000	83
MW3-020222 202039-03 1/200	910	10,000	620	4,000	56,000	83
DUP-020222 202039-04 1/200	990	10,000	610	4,000	55,000	82
Method Blank 02-310 MB	<1	<1	<1	<3	<100	80

Results Reported as ug/L (ppb)

ENVIRONMENTAL CHEMISTS

Date of Report: 02/09/22 Date Received: 02/02/22 Project: FTA AST's 40535.498, F&BI 202039 Date Extracted: 02/03/22 Date Analyzed: 02/03/22

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)

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	Surrogate <u>(% Recovery)</u> (Limit 41-152)
MW1-020222 202039-01	<50	<250	118
MW2-020222 202039-02	1,300 x	<250	130
MW3-020222 202039-03	1,400 x	<250	133
Method Blank 02-371 MB	<50	<250	133

ENVIRONMENTAL CHEMISTS

Date of Report: 02/09/22 Date Received: 02/02/22 Project: FTA AST's 40535.498, F&BI 202039

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

Laboratory Code: 202015-01 (Duplicate)

·	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(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

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	ug/L (ppb)	50	108	65-118
Toluene	ug/L (ppb)	50	104	72 - 122
Ethylbenzene	ug/L (ppb)	50	109	73-126
Xylenes	ug/L (ppb)	150	104	74-118
Gasoline	ug/L (ppb)	1,000	104	69-134

ENVIRONMENTAL CHEMISTS

Date of Report: 02/09/22 Date Received: 02/02/22 Project: FTA AST's 40535.498, F&BI 202039

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

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Diesel Extended	ug/L (ppb)	2,500	124	124	63-142	0

ENVIRONMENTAL CHEMISTS

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 analyte 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 due to sample matrix effects.

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

 ${\rm J}$ - 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.

Ph. (206) 285-8282	2029	Friedman & Bruya, Inc.						DUP-020222	MW3-020222	MW2-020222	MW1-020222	Sample ID		Phone 360.830.8359 Em	City, State, ZIP Seattle, WA 98102	Address 214 E. Gaier St., Suite 300	Company PBS Eng. + Env.	Report To Mike Bagley	202039
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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

February 21, 2022

Mike Bagley, Project Manager PBS Engineering and Environmental, Inc. 214 E. Galer St, Suite 300 Seattle, WA 98102

Dear Mr Bagley:

Included are the additional results from the testing of material submitted on February 2, 2022 from the FTA AST's 40535.498, F&BI 202039 project. There are 6 pages included in this report.

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.

Colo

Michael Erdahl Project Manager

Enclosures c: Ken Nogeire

PBS0221R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 2, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental FTA AST's 40535.498, F&BI 202039 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	
202039 -01	
202039 -02	
202039 -03	
202039 -04	

PBS Engineering and Environmental MW1-020222 MW2-020222 MW3-020222 DUP-020222

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW3-02022 02/02/22 02/15/22 02/16/22 Water ug/L (ppb)	2	Client: Project: Lab ID: Data File: Instrument: Operator:	PBS Engineering and Environmental FTA AST's 40535.498, F&BI 202039 202039-03 1/100 021616.D GCMS11 RF
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 105 97 94	Lower Limit: 78 87 92	Upper Limit: 126 115 112
Compounds: Methyl t-butyl ethe 1,2-Dibromoethane 1,2-Dichloroethane	(EDB)	Concentration ug/L (ppb) <100 <100 <20		

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Bla Not Applica 02/15/22 02/15/22 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	PBS Engineering and Environmental FTA AST's 40535.498, F&BI 202039 02-404 mb 021507.D GCMS11 RF
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenze		% Recovery: 102 96 96	Lower Limit: 78 87 92	Upper Limit: 126 115 112
Compounds: Methyl t-butyl ethe 1,2-Dibromoethane 1,2-Dichloroethane	(EDB)	Concentration ug/L (ppb) <1 <1 <1 <0.2		

ENVIRONMENTAL CHEMISTS

Date of Report: 02/21/22 Date Received: 02/02/22 Project: FTA AST's 40535.498, F&BI 202039

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

Laboratory Code: 202272-01 (Matrix Spike)

				Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	<1	101	50-150
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	< 0.2	102	50 - 150
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	<1	96	50 - 150

ENVIRONMENTAL CHEMISTS

Date of Report: 02/21/22 Date Received: 02/02/22 Project: FTA AST's 40535.498, F&BI 202039

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

Laboratory coue. Laboratory co	Reporting	Spike	Percent Recovery	Percent Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	92	96	70-130	4
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	100	104	70-130	4
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	96	100	70-130	4

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

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Ph. (206) 285-8282	3012 16 th Avenue West R Seattle, WA 98119-2029 R	ŝ							DUP-020222	MW3-020222	MW2-020222	MW1-020222	Sample ID		Phone 360.830.8359 Ema	City, State, ZIP Seatte, WA 98102	Address 214 E. Galer St., Suite 300	Company Pas Eng + Env.	Keport To Mike Bagley
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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

April 6, 2022

Ken Nogeire, Project Manager PBS Engineering and Environmental, Inc. 214 E. Galer St, Suite 300 Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on March 28, 2022 from the FTA 40535.498, F&BI 203500 project. There are 10 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. 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.

Cale

Michael Erdahl Project Manager

Enclosures PBS0406R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 28, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental FTA 40535.498, F&BI 203500 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	PBS Engineering and Environmental
203500 -01	BH1-4
203500 -02	BH2-3
203500 -03	BH3-4
203500 -04	BH4-4
203500 -05	BH5-4
203500 -06	BH5-12
203500 -07	BH6-4
203500 -08	BH7-4
203500 -09	BH1-W
203500 -10	BH2-W
203500 -11	BH3-W
203500 -12	BH4-W
203500 -13	BH6-W
203500 -14	BH7-W

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/06/22 Date Received: 03/28/22 Project: FTA 40535.498, F&BI 203500 Date Extracted: 03/30/22 Date Analyzed: 03/30/22

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

Results Reported on a Dry Weight Basis Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	Ethyl <u>Benzene</u>	Total <u>Xylenes</u>	Gasoline <u>Range</u>	Surrogate (<u>% Recovery)</u> (Limit 50-132)
BH1-4 203500-01	< 0.02	< 0.02	< 0.02	< 0.06	<5	84
BH2-3 203500-02	< 0.02	< 0.02	< 0.02	< 0.06	<5	87
BH3-4 203500-03	< 0.02	< 0.02	< 0.02	< 0.06	<5	85
BH4-4 203500-04	< 0.02	< 0.02	< 0.02	< 0.06	<5	85
BH5-4 203500-05	< 0.02	< 0.02	< 0.02	< 0.06	<5	81
BH5-12 ²⁰³⁵⁰⁰⁻⁰⁶	< 0.02	0.056	< 0.02	< 0.06	<5	85
BH6-4 203500-07	< 0.02	< 0.02	< 0.02	< 0.06	<5	89
BH7-4 203500-08	< 0.02	< 0.02	< 0.02	< 0.06	<5	91
Method Blank 02-623 MB2	< 0.02	< 0.02	< 0.02	<0.06	<5	87

ENVIRONMENTAL CHEMISTS

Date of Report: 04/06/22 Date Received: 03/28/22 Project: FTA 40535.498, F&BI 203500 Date Extracted: 03/31/22 Date Analyzed: 04/01/22 and 04/05/22

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

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	Ethyl <u>Benzene</u>	Total <u>Xylenes</u>	Gasoline <u>Range</u>	Surrogate (<u>% Recovery</u>) (Limit 52-124)
BH1-W 203500-09	<1	<1	<1	<3	<100	84
BH2-W 203500-10 1/20	640	1,900	100	720	11,000	93
BH3-W 203500-11	<1	3.1	<1	<3	210	96
BH4-W 203500-12 1/10	86	1,500	1,700	3,300	48,000	131
BH6-W 203500-13	<1	<1	<1	<3	<100	97
BH7-W 203500-14	<1	<1	<1	<3	<100	89
Method Blank 02-626 MB	<1	<1	<1	<3	<100	79

Results Reported as ug/L (ppb)

ENVIRONMENTAL CHEMISTS

Date of Report: 04/06/22 Date Received: 03/28/22 Project: FTA 40535.498, F&BI 203500 Date Extracted: 03/30/22 Date Analyzed: 03/30/22

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

Results Reported on a Dry Weight Basis Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	Surrogate <u>(% Recovery)</u> (Limit 48-168)
BH1-4 203500-01	<50	<250	97
BH2-3 203500-02	<50	<250	99
BH3-4 203500-03	<50	<250	98
BH4-4 203500-04	<50	<250	98
BH5-4 203500-05	<50	<250	98
BH5-12 203500-06	<50	<250	98
BH6-4 203500-07	<50	<250	99
BH7-4 203500-08	<50	<250	100
Method Blank	<50	<250	105

ENVIRONMENTAL CHEMISTS

Date of Report: 04/06/22 Date Received: 03/28/22 Project: FTA 40535.498, F&BI 203500 Date Extracted: 03/30/22 Date Analyzed: 03/30/22

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)

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	Surrogate <u>(% Recovery)</u> (Limit 41-152)
BH1-W 203500-09	100 x	<250	136
BH2-W 203500-10	250 x	600 x	134
BH3-W 203500-11	690 x	<250	134
BH4-W 203500-12	6,400 x	660 x	140
BH6-W 203500-13 1/1.2	210 x	<300	150
BH7-W 203500-14	59 x	<250	85
Method Blank 02-761 MB2	<50	<250	148

ENVIRONMENTAL CHEMISTS

Date of Report: 04/06/22 Date Received: 03/28/22 Project: FTA 40535.498, F&BI 203500

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

Laboratory Code: 203482-03 (Duplicate)

	Reporting	Sample Result	Duplicate Result	RPD
Analyte	Units	(Wet Wt)	(Wet Wt)	(Limit 20)
Benzene	mg/kg (ppm)	< 0.02	< 0.02	nm
Toluene	mg/kg (ppm)	< 0.02	< 0.02	nm
Ethylbenzene	mg/kg (ppm)	< 0.02	< 0.02	nm
Xylenes	mg/kg (ppm)	< 0.06	< 0.06	nm
Gasoline	mg/kg (ppm)	<5	<5	nm

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	mg/kg (ppm)	0.5	84	66-121
Toluene	mg/kg (ppm)	0.5	84	72 - 128
Ethylbenzene	mg/kg (ppm)	0.5	94	69 - 132
Xylenes	mg/kg (ppm)	1.5	93	69-131
Gasoline	mg/kg (ppm)	20	94	61 - 153

ENVIRONMENTAL CHEMISTS

Date of Report: 04/06/22 Date Received: 03/28/22 Project: FTA 40535.498, F&BI 203500

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: 203477-01 (Duplicate)								
	Reporting	Sample	Duplicate	RPD				
Analyte	Units	Result	Result	(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				

		Percent					
	Reporting	Spike	Recovery	Acceptance			
Analyte	Units	Level	LCS	Criteria			
Benzene	ug/L (ppb)	50	93	65-118			
Toluene	ug/L (ppb)	50	92	72 - 122			
Ethylbenzene	ug/L (ppb)	50	101	73-126			
Xylenes	ug/L (ppb)	150	101	74-118			
Gasoline	ug/L (ppb)	1,000	94	69-134			

ENVIRONMENTAL CHEMISTS

Date of Report: 04/06/22 Date Received: 03/28/22 Project: FTA 40535.498, F&BI 203500

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

Laboratory Code: 203517-01 (Matrix Spike)							
			Sample	Percent	Percent		
	Reporting	Spike	Result	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	(Wet Wt)	MS	MSD	Criteria	(Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	1,200	97	108	73-135	8
Laboratory Code: Laboratory	Laboratory Code: Laboratory Control Sample						
			Percent				
	Reporting	Spike	Recovery	Acceptar	nce		
Analyte	Units	Level	LCS	Criteria	a		
Diesel Extended	mg/kg (ppm)	5,000	98	74-139)		

ENVIRONMENTAL CHEMISTS

Date of Report: 04/06/22 Date Received: 03/28/22 Project: FTA 40535.498, F&BI 203500

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

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Diesel Extended	ug/L (ppb)	2,500	104	104	63-142	0
ENVIRONMENTAL CHEMISTS

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 analyte 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 due to sample matrix effects.

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

 ${\rm J}$ - 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.

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Friedman & Bruya, Inc. R Ph. (206) 285-8282 R		RH-4-W	BH 3 - W	BHI-W	Sample ID		PhoneEmail	te, ZIP	Address 214 Eust		Report To Ken Voyene	
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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

August 8, 2022

Ken Nogeire, Project Manager PBS Engineering and Environmental, Inc. 214 E. Galer St, Suite 300 Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on July 29, 2022 from the FTA ASTS 40535.498, F&BI 207494 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. 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.

Calu

Michael Erdahl Project Manager

Enclosures c: Sarah Newport PBS0808R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 29, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental FTA ASTS 40535.498, F&BI 207494 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	PBS Engineering and Environmental
207494 -01	MW-1
207494 -02	MW-2
207494 -03	MW-3

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/08/22 Date Received: 07/29/22 Project: FTA ASTS 40535.498, F&BI 207494 Date Extracted: 08/04/22 Date Analyzed: 08/05/22

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

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	Ethyl <u>Benzene</u>	Total <u>Xylenes</u>	Gasoline <u>Range</u>	Surrogate (<u>% Recovery</u>) (Limit 52-124)
MW-1 207494-01	<1	1.0	<1	<3	<100	102
MW-2 207494-02 1/200	97	11,000	840	5,200	76,000	103
MW-3 207494-03 1/100	210	3,600	570	2,300	29,000	103
Method Blank 02-1721 MB	<1	<1	<1	<3	<100	98

Results Reported as ug/L (ppb)

ENVIRONMENTAL CHEMISTS

Date of Report: 08/08/22 Date Received: 07/29/22 Project: FTA ASTS 40535.498, F&BI 207494 Date Extracted: 08/01/22 Date Analyzed: 08/01/22

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)

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	Surrogate <u>(% Recovery)</u> (Limit 41-152)
MW-1 207494-01	<50	<250	98
MW-2 207494-02	1,600 x	<250	106
MW-3 207494-03	1,100 x	<250	100
Method Blank 02-1867 MB	<50	<250	97

ENVIRONMENTAL CHEMISTS

Date of Report: 08/08/22 Date Received: 07/29/22 Project: FTA ASTS 40535.498, F&BI 207494

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

Laboratory Code: 208011-01 (Duplicate)

-	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(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

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	ug/L (ppb)	50	99	65-118
Toluene	ug/L (ppb)	50	101	72 - 122
Ethylbenzene	ug/L (ppb)	50	102	73-126
Xylenes	ug/L (ppb)	150	100	74-118
Gasoline	ug/L (ppb)	1,000	114	69-134

ENVIRONMENTAL CHEMISTS

Date of Report: 08/08/22 Date Received: 07/29/22 Project: FTA ASTS 40535.498, F&BI 207494

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

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Diesel Extended	ug/L (ppb)	2,500	116	112	63-142	4

ENVIRONMENTAL CHEMISTS

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 analyte 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 due to sample matrix effects.

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

 ${\rm J}$ - 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.

Ph. (206) 285-8282	3012 16 th Avenue West Seattle, WA 98119-2029	Friedman & Bruya, Inc.	`						MW-3	MW - 2	MW-1	Sample ID		Phone 206 23 66 Email Survey or persons of Project specific RLs? -	City, State, ZIP Sutty WA	Address 214 E Chalder St	PBS	2074194 Key Noglive Report To Sarah Numport
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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

August 25, 2022

Ken Nogeire, Project Manager PBS Engineering and Environmental, Inc. 214 E. Galer St, Suite 300 Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on August 18, 2022 from the FTA AST 40535.498, F&BI 208287 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. 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.

Cale

Michael Erdahl Project Manager

Enclosures c: Sarah Newport PBS0825R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on August 18, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental FTA AST 40535.498, F&BI 208287 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	PBS Engineering and Environmental
208287 -01	MW5-5
208287 -02	MW5-15
208287 -03	MW6-15
208287 -04	MW7-5
208287 -05	MW7-15

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/25/22 Date Received: 08/18/22 Project: FTA AST 40535.498, F&BI 208287 Date Extracted: 08/22/22 Date Analyzed: 08/23/22

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

Results Reported on a Dry Weight Basis Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	Ethyl <u>Benzene</u>	Total <u>Xylenes</u>	Gasoline <u>Range</u>	Surrogate (<u>% Recovery</u>) (Limit 50-150)
MW5-5 208287-01	< 0.02	< 0.02	< 0.02	< 0.06	<5	97
MW5-15 208287-02	< 0.02	< 0.02	< 0.02	< 0.06	<5	96
MW6-15 208287-03	< 0.02	< 0.02	< 0.02	< 0.06	<5	99
MW7-5 208287-04	< 0.02	< 0.02	< 0.02	< 0.06	<5	99
MW7-15 pc 208287-05 1/2	<0.02 j	<0.04	0.048	<0.12	12	99
Method Blank 02-1740 MB	< 0.02	< 0.02	< 0.02	< 0.06	<5	98

ENVIRONMENTAL CHEMISTS

Date of Report: 08/25/22 Date Received: 08/18/22 Project: FTA AST 40535.498, F&BI 208287 Date Extracted: 08/19/22 Date Analyzed: 08/19/22

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

Results Reported on a Dry Weight Basis Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	Surrogate <u>(% Recovery)</u> (Limit 48-168)
MW5-5 208287-01	<50	<250	99
MW5-15 208287-02	<50	<250	100
MW6-15 208287-03	<50	<250	98
MW7-5 208287-04	<50	<250	102
MW7-15 208287-05 1/2	<100	<500	106
Method Blank 02-2008 MB2	<50	<250	98

ENVIRONMENTAL CHEMISTS

Date of Report: 08/25/22 Date Received: 08/18/22 Project: FTA AST 40535.498, F&BI 208287

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

Laboratory Code: 208258-36 (Duplicate)

	Reporting	Sample Result	Duplicate Result	RPD
Analyte	Units	(Wet Wt)	(Wet Wt)	(Limit 20)
Benzene	mg/kg (ppm)	< 0.02	< 0.02	nm
Toluene	mg/kg (ppm)	< 0.02	< 0.02	nm
Ethylbenzene	mg/kg (ppm)	< 0.02	< 0.02	nm
Xylenes	mg/kg (ppm)	< 0.06	< 0.06	nm
Gasoline	mg/kg (ppm)	<5	<5	nm

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	mg/kg (ppm)	0.5	90	69-120
Toluene	mg/kg (ppm)	0.5	90	70-117
Ethylbenzene	mg/kg (ppm)	0.5	90	65 - 123
Xylenes	mg/kg (ppm)	1.5	93	66 - 120
Gasoline	mg/kg (ppm)	20	85	71 - 131

ENVIRONMENTAL CHEMISTS

Date of Report: 08/25/22 Date Received: 08/18/22 Project: FTA AST 40535.498, F&BI 208287

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

Laboratory Code:	208181-01 (Matri	x Spike)					
			Sample	Percent	Percent		
	Reporting	Spike	Result	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	(Wet Wt)	MS	MSD	Criteria	(Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	118	104	63-146	13
Laboratory Code:	Laboratory Contr	rol Samp	le				
			Percent	5			
	Reporting	Spike	Recover	y Accep	tance		
Analyte	Units	Level	LCS	Crit	eria		
Diesel Extended	mg/kg (ppm)	5,000	106	79-1	144		

ENVIRONMENTAL CHEMISTS

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 analyte 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 due to sample matrix effects.

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

 ${\rm J}$ - 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.

* (200) 200-0202	.2029	,	ċ.		27			MW7-15	MW7-S	MW6-15	MM2 - 12	MW2-2	Sample ID		Phone 206 233 9639 En	6		Company PRS	Report To Ken No acive	200207
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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

August 25, 2022

Ken Nogeire, Project Manager PBS Engineering and Environmental, Inc. 214 E. Galer St, Suite 300 Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on August 18, 2022 from the FTA AST 40535.498, F&BI 208288 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. 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.

Cale

Michael Erdahl Project Manager

Enclosures c: Sarah Newport PBS0825R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on August 18, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental FTA AST 40535.498, F&BI 208288 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	PBS Engineering and Environmental
208288 -01	DS1
208288 -02	DS2
208288 -03	DS3
208288 -04	DS4

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/25/22 Date Received: 08/18/22 Project: FTA AST 40535.498, F&BI 208288 Date Extracted: 08/23/22 Date Analyzed: 08/23/22

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

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	Ethyl <u>Benzene</u>	Total <u>Xylenes</u>	Gasoline <u>Range</u>	Surrogate (<u>% Recovery</u>) (Limit 52-124)
DS1 208288-01	39	5,200	380	2,000	29,000	ip
DS2 208288-02	40	5,700	400	2,200	30,000	ip
DS3 208288-03	43	6,500	460	2,500	33,000	ip
DS4 208288-04	36	5,900	490	2,900	33,000	ip
Method Blank 02-1743 MB	<1	<1	<1	<3	<100	96

Results Reported as ug/L (ppb)

ENVIRONMENTAL CHEMISTS

Date of Report: 08/25/22 Date Received: 08/18/22 Project: FTA AST 40535.498, F&BI 208288

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

Laboratory Code: 208261-01 (Duplicate)

-	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(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	110	nm

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	ug/L (ppb)	50	110	65-118
Toluene	ug/L (ppb)	50	112	72 - 122
Ethylbenzene	ug/L (ppb)	50	113	73-126
Xylenes	ug/L (ppb)	150	110	74-118
Gasoline	ug/L (ppb)	1,000	104	69-134

ENVIRONMENTAL CHEMISTS

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 analyte 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 due to sample matrix effects.

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

 ${\rm J}$ - 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.

Ph. (206) 285-8282	Seattle, WA 98119-2029	3012 16th Avenue West	Friedman & Bruya, Inc.			1			1-50	DS3	DSA	DS1	Sample ID		Phone 50 9. 572. 816 JEmail Sach.	te, ZIP	Address 214 East 6	PBS	Report To Ken Nousire	208288
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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 3012 16th Avenue West Seattle, WA 98119-2029 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

September 23, 2022

Ken Nogeire, Project Manager PBS Engineering and Environmental, Inc. 214 E. Galer St, Suite 300 Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on September 14, 2022 from the FTA AST Release 40535.498, F&BI 209199 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. 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.

Cale

Michael Erdahl Project Manager

Enclosures c: Mike Bagley PBS0923R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 14, 2022 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental FTA AST Release 40535.498, F&BI 209199 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	PBS Engineering and Environmental
209199 -01	MW4
209199 -02	MW6
209199 -03	MW1
209199 -04	MW3
209199 -05	MW2
209199 -06	PH-1

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/23/22 Date Received: 09/14/22 Project: FTA AST Release 40535.498, F&BI 209199 Date Extracted: 09/21/22 Date Analyzed: 09/21/22

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

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	Ethyl <u>Benzene</u>	Total <u>Xylenes</u>	Gasoline <u>Range</u>	Surrogate (<u>% Recovery</u>) (Limit 52-124)
MW4 209199-01	<1	<1	<1	<3	<100	85
MW6 209199-02	75	9.9	1.2	<3	620	88
MW1 209199-03	<1	2.7	<1	<3	<100	89
MW3 209199-04 1/20	300	620	410	1,300	11,000	88
MW2 209199-05 1/100	64	9,200	670	3,800	49,000	86
Method Blank 02-2092 MB	<1	<1	<1	<3	<100	88

Results Reported as ug/L (ppb)

ENVIRONMENTAL CHEMISTS

Date of Report: 09/23/22 Date Received: 09/14/22 Project: FTA AST Release 40535.498, F&BI 209199 Date Extracted: 09/19/22 Date Analyzed: 09/19/22

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)

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	Surrogate <u>(% Recovery)</u> (Limit 41-152)
MW4 209199-01	<50	<250	112
MW6 209199-02	53 x	<250	112
MW1 209199-03	<50	<250	115
MW3 209199-04	550 x	<250	98
MW2 209199-05	870 x	<250	98
Method Blank 02-2230 MB	<50	<250	113

ENVIRONMENTAL CHEMISTS

Date of Report: 09/23/22 Date Received: 09/14/22 Project: FTA AST Release 40535.498, F&BI 209199

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

Laboratory Code: 209279-01 (Duplicate)

	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(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

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	ug/L (ppb)	50	109	65-118
Toluene	ug/L (ppb)	50	108	72 - 122
Ethylbenzene	ug/L (ppb)	50	110	73-126
Xylenes	ug/L (ppb)	150	107	74-118
Gasoline	ug/L (ppb)	1,000	107	69-134

ENVIRONMENTAL CHEMISTS

Date of Report: 09/23/22 Date Received: 09/14/22 Project: FTA AST Release 40535.498, F&BI 209199

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

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Diesel Extended	ug/L (ppb)	2,500	76	68	63-142	11

ENVIRONMENTAL CHEMISTS

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 analyte 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 due to sample matrix effects.

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

 ${\rm J}$ - 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.

		Ph. (206) 285-8282	ı, Inc.		set.		ful j-fid		MW2	E MW	MW 1	Mwb	Mwt	Sample ID		PhoneEmai	City, State, ZIP <u>Ventix VVn</u>		Address 24 E Galur	Meport rover the	Print The Mile Braham	YOW NOALIVE
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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D. Yelena Aravkina, M.S. Michael Erdahl, B.S. Vineta Mills, M.S. Eric Young, B.S. 5500 4th Avenue South Seattle, WA 98108 (206) 285-8282 fbi@isomedia.com www.friedmanandbruya.com

January 20, 2023

Ken Nogeire, Project Manager PBS Engineering and Environmental, Inc. 214 E. Galer St, Suite 300 Seattle, WA 98102

Dear Mr Nogeire:

Included are the results from the testing of material submitted on January 16, 2023 from the FTA AST Release 40535 498, F&BI 301216 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. 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.

Cale

Michael Erdahl Project Manager

Enclosures c: Sarah Newport PBS0120R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on January 16, 2023 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental FTA AST Release 40535 498, F&BI 301216 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	PBS Engineering and Environmental
301216 -01	MW1
301216 -02	MW4
301216 -03	MW6
301216 -04	MW7

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/20/23 Date Received: 01/16/23 Project: FTA AST Release 40535 498, F&BI 301216 Date Extracted: 01/16/23 Date Analyzed: 01/18/23

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

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	Ethyl <u>Benzene</u>	Total <u>Xylenes</u>	Gasoline <u>Range</u>	Surrogate (<u>% Recovery</u>) (Limit 52-124)
MW1 301216-01	<1	<1	<1	<3	<100	86
MW4 301216-02	<1	<1	<1	<3	<100	86
MW6 301216-03	40	9.6	1.1	<3	600	88
MW7 301216-04	<1	<1	<1	<3	<100	85
Method Blank ^{03-024 MB}	<1	<1	<1	<3	<100	123

Results Reported as ug/L (ppb)

ENVIRONMENTAL CHEMISTS

Date of Report: 01/20/23 Date Received: 01/16/23 Project: FTA AST Release 40535 498, F&BI 301216 Date Extracted: 01/17/23 Date Analyzed: 01/17/23

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL10 AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	Diesel Range (C10-C25)	Motor Oil Range (C25-C36)	Surrogate <u>(% Recovery)</u> (Limit 50-150)
MW1 301216-01	<50	<250	126
MW4 301216-02	59 x	<250	127
MW6 301216-03	310 x	<250	130
Method Blank ^{03-165 MB}	<50	<250	125

ENVIRONMENTAL CHEMISTS

Date of Report: 01/20/23 Date Received: 01/16/23 Project: FTA AST Release 40535 498, F&BI 301216

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

Laboratory Code:	301174-02 (Duplie	cate)		
	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(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

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Benzene	ug/L (ppb)	50	110	70-130
Toluene	ug/L (ppb)	50	106	70-130
Ethylbenzene	ug/L (ppb)	50	102	70-130
Xylenes	ug/L (ppb)	150	107	70-130
Gasoline	ug/L (ppb)	1,000	99	70-130

ENVIRONMENTAL CHEMISTS

Date of Report: 01/20/23 Date Received: 01/16/23 Project: FTA AST Release 40535 498, F&BI 301216

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

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Diesel Extended	ug/L (ppb)	2,500	124	136	70-130	9

ENVIRONMENTAL CHEMISTS

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 analyte 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 due to sample matrix effects.

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

 ${\rm J}$ - 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.

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ſ			Ph. (206) 285-8282							L MW	MW 6	MWH	MW 1	Sample ID			Phone R.	City, State, ZIP Stattle WA	Address 214 E Contar St Shift 300	Company PBS	REPORT TO KEN NIVENCE	301216
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11

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Over the course of 26 hours, approximately 3,100 gallons of contaminated water (30,000 μ g/L gasoline) was removed from the source area (MW-2) and disposed of to the on-site water treatment system.

Remedial groundwater pumping information is presented in Table 4.

5.2 Interim Remedial Action Groundwater Monitoring

Monitoring was undertaken at the discharge point for the purpose of evaluating the effectiveness of the interim action using the following procedures:

- Depth to water measurements at MW-2 and MW-3 were collected every 2-hours during groundwater removal using a down-hole water level meter.
- Groundwater field parameters (conductivity, pH, temperature, dissolved oxygen, and oxidationreduction potential) were measured at the discharge point every four hours during groundwater removal events using a YSI Model 556MSP water-quality analyzer.
- Groundwater samples were collected from the discharge point at the start of pumping, at select times during pumping, and prior to ceasing the pumping event.

Samples were collected directly into HCl preserved 40-milliliter vials and sent to the project laboratory for the following analyses:

- Gasoline range TPH by Method NWTPH-Gx
- Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8021

Groundwater analytical results are presented in Table 2.

Copies of the laboratory report and chain-of-custody documentation are presented in Appendix D.

6 SUMMARY AND CONCLUSIONS

Regarding environmental site characterization and interim action conducted at the Fire Training Academy AST System release, the following summary and conclusions are presented:

- On August 6, 2021, a release from one AST (Fuel Tank #1) of the AST system was discovered. The AST contained aviation gas, which released from the bottom of the AST and flowed from the containment area through a drain line and connected to the "burn pad" training facility drainage system, which in turn flowed into the site's oil/water separation and treatment pond system.
- Site characterization was undertaken in accordance with a Sampling and Analysis Plan (SAP): *Sampling and Analysis Plan AST System Fuel Release* (PBS, November 11, 2021), which was developed for the site.
- Site Characterization activities include drilling soil borings to allow for soil and groundwater sampling. Groundwater monitoring wells were installed in seven of those locations.
- 26 soil samples were collected from the borings. Concentrations of benzene exceeded the State Cleanup Level (CUL) in three samples located in close proximity to the release. Concentrations of analyzed contaminants did not exceed the CULs in the remaining sample locations.



- Several groundwater sampling events have been conducted. TPH and BTEX concentrations exceeded the CULs in samples collected from sample points BH2-W and BH4-W, and from monitoring wells MW-2, MW-3, MW-4, and MW-6. Analyzed contaminants of concern were not detected above cleanup levels in the remaining wells. Contaminated groundwater is predominantly located in the area south of the ASTs and extending south under the "burn pad".
- Groundwater investigation results include "clean" groundwater (analyzed contaminants of concern were not detected above CULs) in the upgradient well, both cross-gradient locations, and the downgradient location. The "clean" downgradient location MW-7 is relatively far from the release (640-feet), but is an important data point, as it is directly hydraulically downgradient and is between the release and surface water features.
- The magnitude and extent of soil and groundwater contamination is considered to be substantially defined at this time.
- Interim remedial action groundwater removal was undertaken at the most heavily contaminated groundwater source area. Over the course of 26 hours, approximately 3,100 gallons of contaminated water (30,000 µg/L gasoline) was removed from the source area and disposed of to the on-site water treatment system.

7 LIMITATIONS

PBS has prepared this report for use by the Washington State Patrol and Dept. of Enterprise Services and is not intended for use by others without the written consent of PBS. The findings and conclusions of this report are based on professional judgment concerning the significance of the data gathered during this investigation.

Sincerely, PBS Engineering and Environmental Inc.



Ken Nogeire, LHG Senior Hydrogeologist

Reviewed by: Sarah Newport

