

Groundwater Monitoring and Investigation Report December 2016 to November 2017

Snohomish Square Cleaners Avenue D and 13th Street SE Snohomish, WA

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ABBREVIATIONS AND ACRONYMS

Abbreviation/	
Acronym	Definition
bgs	Below ground surface
COC	Contaminant of concern
CUL	Cleanup level
cVOCs	Chlorinated volatile organic compounds
DO	Dissolved oxygen
EPA	U.S. Environmental Protection Agency
EPI	Environmental Partners, Inc.
ERD	Enhanced reductive dechlorination
HSA	Hollow-stem auger
µg/L	Micrograms per liter
mg/L	Milligrams per liter
MTCA	Model Toxics Control Act
ORP	Oxidation-reduction potential
PCE	Tetrachloroethene
PDB	Passive diffusion bag
PID	Photoionization detector
psi	Pounds per square inch
PVC	Polyvinyl chloride
Skotdal	Skotdal Enterprises, Inc.
TOC	Total organic carbon

1.0 INTRODUCTION

Environmental Partners, Inc. (EPI) is pleased to submit this *Groundwater Monitoring and Investigation Report – December 2016 to November 2017* to address groundwater impacted by tetrachloroethene (PCE) at the former Snohomish Square Cleaners property located at Avenue D and 13th Street SE in Snohomish, Washington (subject property). Skotdal Enterprises, Inc. (Skotdal) currently owns the subject property. The location of the subject property is indicated on Figure 1.

PCE was released as a result of historical operations of a former dry cleaning business at the subject property, which has resulted in impacts to soil and groundwater. The daughter products of PCE, including trichloroethene (TCE), cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride, have been detected in samples from the subject property. However, based on site-specific data, the sole remaining contaminant of concern (COC) is PCE in groundwater. As the sequential reductive dechlorination of PCE occurs, the less chlorinated daughter products might become future COCs. Impacted groundwater has migrated downgradient (to the southwest) to a property owned by Snohomish County. The "Site," as defined by the Model Toxics Control Act (MTCA), includes portions of the subject property as well as the "upper terrace" of the downgradient property to the southwest owned by Snohomish County (Snohomish County property). The locations of the subject property and Snohomish County property are depicted on Figure 2.

Enhanced reductive dechlorination (ERD), which is an *in situ* bioaugmentation remediation technology, was selected as the remediation technology to bring groundwater at the Site into regulatory compliance. A pilot study performed at the Site showed ERD to be an effective remediation technology in consideration of the Site-specific goals and current and future Site uses.

EPI completed an *Interim Remedial Action Report* (IRA) dated January 30, 2017 that established baseline groundwater conditions, documented the first round of ERD treatment, and discussed results of two groundwater monitoring events. The purpose of this implementation of ERD is to reduce PCE mass and concentrations in shallow groundwater at the subject property in order to obtain a "No Further Action" (NFA) determination for the Site.

This report describes quarterly groundwater monitoring events and additional remediation activities that occurred from December 2016 through November 2017.

2.0 GROUNDWATER SAMPLING PROCEDURES

Unless otherwise noted, the groundwater sampling procedures presented in the following paragraphs were followed during each monitoring event.

Prior to sampling, static water levels were measured and recorded to the nearest 0.01-foot using a Solinst electronic water level meter (or equivalent). To ensure consistency, all static water level measurements were taken to consistent measuring points, which are marked on the north side of the top edge of the polyvinyl chloride (PVC) casing. EPI surveyed measuring point elevations for all monitoring wells and used those data, along with measured static water level data, to calculate groundwater elevations, elevation contours, and inferred groundwater flow directions at the Site.

Wells selected for groundwater sampling were purged using a peristaltic pump and low-flow purging techniques. Pump tubing was new, single-use tubing that was changed between each well. During low-flow purging, the groundwater field parameters listed below were measured and recorded approximately every 3 minutes until they met the stabilization criteria noted for each field parameter for three successive readings. Turbidity will be measured and recorded as part of the low-flow purging procedures in subsequent monitoring events.

- pH
- Temperature
- Oxidation-reduction potential (ORP)
- Specific conductivity
- Dissolved oxygen (DO)

After stabilization, groundwater sample containers were labeled and samples were collected into appropriate laboratory-supplied sample containers using low-flow sampling techniques to limit potential contaminant volatilization. Immediately upon collection, filled sample containers were placed in a cooler containing sufficient ice to maintain an internal temperature of 4° Celsius or less for submittal to the analytical laboratory. All samples were transported under standard chain-of-custody protocols to Friedman and Bruya, Inc. (FBI) an analytical laboratory located in Seattle, Washington.

Selected wells were sampled for chlorinated volatile organic compounds (cVOCs) using passive diffusion bags (PDBs). PDBs were tested side-by-side with low-flow sampling methods in 2016 and it was determined that PDB sampling was a feasible option. PDB sampling requires less time and generates less waste when compared to low-flow purging and sampling methods. During the December 2016 baseline monitoring event described below, PDBs were installed in selected wells immediately following the completion of low-flow sampling at each well. The PDBs remained in the wells for a minimum of 2 weeks to achieve equilibrium conditions with groundwater before being retrieved and sampled.

All groundwater samples were submitted for cVOC analysis by U.S. Environmental Protection Agency (EPA) Method 8260B. Selected groundwater samples were also analyzed for total organic carbon (TOC) by EPA Method 415.1; chemical oxygen demand (COD) by EPA Method 410.4; biological oxygen demand (BOD; 5-Day) by EPA Method 5210B; total and dissolved iron and manganese by EPA Method 6010B; chloride by EPA Method 325.1; sulfate/sulfide and nitrate/nitrite by EPA Method 300.0; and the dissolved gases methane, ethane, and carbon dioxide by Method RSK-175.

Copies of the original laboratory results are included in Attachment A.

3.0 GROUNDWATER MONITORING – DECEMBER 2016

3.1 Groundwater Sampling

From December 1 through December 2, 2016, EPI sampled groundwater at 24 well locations. Procedures in Section 2.0 were followed for sampling. Fifteen of the 24 wells were sampled using PDBs on December 2, 2016. The remaining nine wells were sampled using low-flow purging and sampling procedures.

3.2 Piezometric Conditions

Measured depth-to-water data ranged from 2.08 to 20.94 feet below the top of casing. Depth-to-water measurements are presented in Tables 1 and 2. The resulting groundwater elevation data indicate that groundwater flow direction at the subject property is generally in a south-southwest direction with a horizontal hydraulic gradient of 0.012 feet/foot. Figure 3 depicts groundwater flow directions and elevations from the December 2016 monitoring event.

3.3 Geochemical Conditions

Geochemical analytical data for this monitoring event are presented in Tables 1 and 2. Geochemical parameters were analyzed in samples from wells MW-1, MW-2, MW-3, MW-4, MW-7, MW-8, MW-9, MW-15, GW-4, and GW-11.

TOC was detected in groundwater samples from three wells, MW-1, MW-3, and MW-7, at concentrations of 5,200 micrograms per liter (μ g/L), 34,000 μ g/L, and 1,300 μ g/L, respectively (Table 1). These numbers indicate a sharp decrease in TOC concentrations across the Site. This decrease in TOC indicates that bacteria are consuming carbon from the remediation substrate that was injected into the subsurface to promote ERD.

Redox conditions in groundwater can be evaluated by measuring concentrations of iron and manganese in groundwater and using those data as a qualitative guide to the redox status of the aquifer. Metals analysis for iron and manganese are also used to indicate if enhanced reducing geochemical conditions have produced unacceptable metals concentrations. Field-filtered (dissolved) and unfiltered (total) groundwater samples were analyzed for iron and manganese. Total iron was detected in eight groundwater samples at concentrations ranging from 50.2 μ g/L to 11,700 μ g/L. Total iron concentrations in MW-6 and MW-7 decreased significantly during this monitoring event. Total manganese was detected in all eight unfiltered groundwater samples at concentrations ranging from 1.2 μ g/L to 2,440 μ g/L (Table 2).

The comparison of sulfate/sulfide and nitrate/nitrite concentrations provide a measure of reducing conditions produced by remediation substrate injection. These analyses indicate the effects of increased biological activity and provide evidence that reducing conditions are present. Sulfate was detected at concentrations ranging from 640 μ g/L to 19,100 μ g/L. Nitrate was detected at concentrations ranging from less than 25 μ g/L to 16,300 μ g/L (Table 1). These baseline concentrations were low and support prior conclusions that geochemical conditions that support significant biological degradation of PCE were

not naturally present at the Site. As reducing conditions are created by the substrate injections, sulfate should reduce to sulfide and nitrate should reduce to nitrite, nitrogen gas, or ammonia.

Field parameter data for the December 2016 monitoring event are presented in Table 3. DO ranged from 1.02 mg/L to 7.46 mg/L. ORP values ranged from -3.9 millivolts (mV) to 114.7 mV. Geochemical conditions generally are considered aerobic when DO concentrations are approximately 1 mg/L or greater and ORP values are positive, or anaerobic, which is necessary to promote ERD, when DO concentrations are less than 1 mg/L and ORP values are negative. Temperature, pH, and other field-measured parameters were within acceptable ranges for bioremediation to occur. EPI will consider adding a pH buffer in the future to maintain acceptable ranges for pH.

3.4 Analytical Results

PCE concentrations were detected at concentrations ranging from 1.2 μ g/L to 190 μ g/L. Nine of the 24 sample results were greater than the MTCA Method A Groundwater Cleanup Level (MTCA Method A GW CUL) of 5 μ g/L, with the greatest concentration in the sample from MW-15. PCE was detected at concentrations less than the MTCA Method A GW CUL for PCE in seven other monitoring wells (Table 2). PCE was not detected in the other eight samples at a concentration greater than the analytical detection limit. Figure 4 shows the PCE concentrations in groundwater and the horizontal extent of the PCE plume based on data obtained during the December 2016 baseline monitoring event.

The breakdown products of PCE include TCE, cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride. The analytical results for the breakdown products are as follows:

- TCE was detected in three samples at concentrations ranging from 1.1 μ g/L to 85 μ g/L. One of the sample results was greater than the MTCA Method A GW CUL of 5 μ g/L.
- cis-1,2-Dichloroethene was detected in three samples at concentrations ranging from 1.3 μ g/L to 62 μ g/L. Two of the sample results were greater than the MTCA Method B GW CUL of 16 μ g/L.
- trans-1,2-Dichloroethene was not detected in any samples at a concentration exceeding the detection limit of the analytical method.
- Vinyl chloride was detected in two samples at concentrations of 6.4 μg/L in MW-10 and 5.7 μg/L in MW-11, both of which are greater than the MTCA Method A GW CUL of 0.2 μg/L.

4.0 GROUNDWATER MONITORING – FEBRUARY 2017

4.1 Groundwater Sampling

From February 20 through February 21, 2017, EPI sampled groundwater at 25 well locations. Procedures in Section 2.0 were followed for during this monitoring event. Sixteen of the 25 wells were sampled using PDBs on February 21, 2017. The remaining nine wells were sampled using low-flow purging and sampling procedures.

4.2 Piezometric Conditions

Depth-to-water measurements in wells ranged from approximately 1.31 to 20.89 feet below top of casing. Depth-to-water measurements are provided in Tables 1 and 2. Figure 5 depicts groundwater elevations and the groundwater flow direction at the Site as measured during the February 2017 monitoring event.

Groundwater elevations based on water level data collected in February 2017 indicated that the groundwater flow direction at the Site is generally to the south-southwest with a horizontal hydraulic gradient of 0.011 feet/foot. Both the groundwater direction and horizontal gradient are consistent with the baseline monitoring event.

4.3 Geochemical Conditions

Geochemical analytical data for this monitoring event are presented in Tables 1 and 2. Geochemical parameters were analyzed in samples from wells MW-1, MW-2, MW-3, MW-4, MW-7, MW-8, MW-9, MW-15, GW-4, and GW-11.

TOC was detected in all groundwater samples, except in the sample from MW-9, at concentrations ranging from 510 μ g/L to 76,000 μ g/L (Table 1). These data indicate an increase in TOC concentrations across the Site. In general, the wells farther away from the injection wells did not show as much increase in TOC as the source area wells, which are closer to the injection wells. This increase in TOC was the basis for performing the additional injection event described in Section 5.0.

Total iron was detected in eight groundwater samples at concentrations ranging from 56 μ g/L to 37,500 μ g/L. Total manganese was detected in eight groundwater samples at concentrations ranging from 3 μ g/L to 5,170 μ g/L (Table 2). Iron and manganese concentrations in source area well MW-3 significantly increased during this monitoring event and will be monitored over the upcoming monitoring events.

Anions (i.e., chloride, sulfate, and nitrate) were analyzed to provide a measure of geochemical conditions produced by substrate injections. Chloride was detected in eight wells at concentrations ranging from 1,240 μ g/L to 134,000 μ g/L. Chloride concentrations significantly increased in all wells except in the sample from MW-15. Sulfate was detected at concentrations ranging from 780 μ g/L to 21,400 μ g/L. Sulfate concentrations significantly increased in wells MW-8 and GW-11 but remained at relatively consistent concentrations in the remaining wells. Nitrate was detected at concentrations ranging from 399 μ g/L to 11,200 μ g/L (Table 1). Generally, nitrate concentrations decreased during this monitoring event.

Field parameter data for the February 2017 monitoring event are presented in Table 3. DO ranged from 0.36 mg/L to 9.97 mg/L. ORP ranged from -34.1mV to 231.4 mV.

4.4 Analytical Results

PCE was detected at concentrations ranging from 1.1 μ g/L to 140 μ g/L. Seven of the 25 sample results were greater than the MTCA Method A GW CUL of 5 μ g/L, with the greatest concentration in the sample from MW-15. PCE was detected at concentrations less than the MTCA Method A GW CUL for PCE in eight other monitoring wells (Table 2). The remaining 10 samples were not detected at concentrations greater than the analytical detection limits for PCE. Figure 6 shows the PCE groundwater concentrations and the horizontal extent of the plume based on data obtained during the February 2017 monitoring event.

The analytical results for the breakdown products are as follows:

- TCE was detected in three wells at concentrations ranging from 1.2 μg/L to 8.0 μg/L with one of the sample results, from well MW-11, was greater than the MTCA Method A GW CUL of 5 μg/L.
- cis-1,2-Dichloroethene was detected in samples from five wells at concentrations ranging from 3.3 μg/L to 25 μg/L. Two of the sample results were greater than the MTCA Method B GW CUL of 16 μg/L.
- trans-1,2-Dichloroethene was not detected in any samples at a concentration exceeding the detection limit of the analytical method used.
- Vinyl chloride was detected in samples from three wells at concentrations ranging from 1.1 µg/L to 7.4 µg/L. All three detected vinyl chloride concentrations were greater than the MTCA Method A GW CUL of 0.2 µg/L.

5.0 ADDITIONAL TREATMENT – FEBRUARY 2017

As discussed in the IRAR, EPI conducted another round of injections to continue promoting ERD at the Site. EPI continued the use of the proprietary product called 3-D Microemulsion[®] by Regenesis.

The additional injection event began on February 22, 2017 and were completed on February 24, 2017. The injections were performed using a pressurized injection method into the three treatment areas described in the IAWP, shown on Figure 2. Potable water was mixed in a 275-gallon water tote with the two-ingredient 3-D Microemulsion[®] solution (three parts 3-D Microemulsion[®] and one part chemical reducer) at a ratio of 10 parts water to 1 part 3-D Microemulsion[®] mixture. The tote was then mixed until homogeneous using the circulating valve on the injection pump.

Valves and gauges located on the injection pump allowed for the operator to manage flow and document pressures and volumes within the injection wells. Flow rate was controlled by a gate valve located on the discharge side of the injection pump.

Details of well injections are noted in Table 4, displaying dates and total volumes injected into each well. In some of the wells, leakage at the surface around the well annulus was noted and was caused by

location-specific geologic conditions that limited infiltration rates. If leakage occurred at the surface, pressurized injections were stopped and gravity-flow methods were used to reduce the potential for leakage at the surface. Wells that were partially gravity fed are noted in Table 4. In general, each well took approximately 42 pounds per square inch (psi) to overcome the piezometric head of the water column within the well. When the static piezometric head pressure was overcome, injection pressures dropped to approximately 15 to 20 psi for the duration of injection. A total volume of 10,830 gallons of the nutrient substrate mixture has been injected into the subsurface.

6.0 GROUNDWATER MONITORING – MAY 2017

6.1 Groundwater Sampling

From May 24 through May 30, 2017, EPI sampled groundwater at 25 well locations. Procedures in Section 2.0 were followed for sampling. Sixteen of the 25 wells were sampled using PDBs on May 25 and 26, 2017. The remaining nine wells were sampled using low-flow purging and sampling procedures.

6.2 **Piezometric Conditions**

Depth-to-water measurements in wells ranged from approximately 1.30 to 22.07 feet below top of casing. Depth-to-water measurements are provided in Tables 1 and 2. Figure 7 depicts groundwater elevations and the groundwater flow direction at the Site as measured during the May 2017 monitoring event.

Water level data collected in May 2017 indicate that groundwater flow direction at the property is generally in the south-southwest direction with a horizontal hydraulic gradient of 0.012 feet/foot. Both the groundwater direction and horizontal gradient are consistent with previous monitoring events.

6.3 Geochemical Conditions

Geochemical analytical data for this monitoring event are presented in Tables 1 and 2. Geochemical parameters were analyzed in samples from wells MW-1, MW-2, MW-3, MW-4, MW-7, MW-8, MW-9, MW-15, GW-4, and GW-11.

TOC was detected in all groundwater samples, except in the sample from MW-9, at concentrations ranging from 600 μ g/L to 72,000 μ g/L (Table 1). These data indicate continuation of a general increase in TOC concentrations across the Site. The increase in TOC concentrations indicates that the substrate injections distributed 3-D Microemulsion[®] throughout the subsurface as intended. In general, the wells farther away from the injection wells did not show as much increase in TOC as the source area wells.

Total iron was detected in eight groundwater samples at concentrations ranging from 60 μ g/L to 30,200 μ g/L. Total manganese was detected in nine groundwater samples at concentrations ranging from 1 μ g/L to 4,530 μ g/L (Table 2). Iron and manganese concentrations in source area wells MW-1 and MW-3 significantly increased during this monitoring event. Concentrations of iron and manganese in samples from these monitoring wells will be monitored in future monitoring events to evaluate if metals concentrations continue to exceed MTCA Method A GW CULs.

Anions (i.e., chloride, sulfate, and nitrate) were analyzed to provide a measure of geochemical conditions produced by substrate injections. Chloride was detected in samples from eight wells at concentrations ranging from 2,600 μ g/L to 617,000 μ g/L. Chloride concentrations significantly increased in well MW-7. Sulfate was detected in samples from nine wells at concentrations ranging from 780 μ g/L to 25,400 μ g/L. Sulfate concentrations significantly increased in well MW-3, MW-7, and GW-11, and increased slightly or remained relatively the same in the remaining wells. Nitrate was detected in samples from nine wells at concentrations ranging from 753 μ g/L to 7,700 μ g/L (Table 1). Generally, nitrate concentrations remained consistent with previous monitoring events.

Field parameter data for the May 2017 monitoring event are presented in Table 3. DO ranged from 0.22 mg/L to 8.18 mg/L. ORP ranged from 3.1 mV to 187.4 mV.

6.4 Analytical Results

PCE was detected at concentrations ranging from 1.0 μ g/L to 120 μ g/L (Table 1). Seven of the 25 sample results were greater than the MTCA Method A GW CUL of 5 μ g/L, with the greatest concentration in the sample from MW-15. PCE was detected at concentrations less than the MTCA Method A GW CUL for PCE in five other monitoring wells. PCE was not detected at concentrations greater than the analytical detection limit in samples from the remaining 13 wells. Figure 8 shows the PCE groundwater concentrations and plume as identified during the May 2017 monitoring event.

The analytical results for the breakdown products are as follows:

- TCE was detected in three wells at concentrations ranging from 1.5 μg/L to 2.7 μg/L. None of the sample results were greater than the MTCA Method A GW CUL of 5 μg/L.
- Cis-1,2-dichloroethene was detected in samples from seven wells at concentrations ranging from 1.1 μg/L to 26 μg/L. Two of the sample results were greater than the MTCA Method B GW CUL of 16 μg/L.
- Trans-1,2-dichloroethene was not detected in any samples at a concentration exceeding the detection limit of the analytical method used.
- Vinyl chloride was detected in samples from three wells at concentrations ranging from 2.1 µg/L to 4.1 µg/L (Table 1). All three samples were at concentrations greater than the MTCA Method A GW CUL of 0.2 µg/L.

7.0 MW-5 INVESTIGATION – JUNE 2017

PCE was detected in groundwater samples from MW-5 during EPI's 2015 baseline monitoring event, which was performed prior to implementing remedial actions. Since quarterly groundwater monitoring began in February 2016, PCE concentrations in samples from MW-5 have been consistently greater than the MTCA Method A GW CULs despite its upgradient location from the assumed source area plume at the former Snohomish Square Cleaners.

On June 26 and 27, 2017, EPI installed three monitoring wells, identified as MW-16 through MW-18, in the gravel area north of the shopping center, as shown on Figure 9. The purpose of these wells was to provide repeatable and defensible data from monitoring points installed between MW-5 and the former Snohomish Square Cleaner source area to determine if the impacts observed in MW-5 are separate and distinct from the PCE plume associated with the Site.

The borehole for each well was advanced to the bottom depth of 25 feet below ground surface (bgs) using a using a standard truck mounted hollow-stem-auger (HSA) drilling rig equipped with 10-inch outside diameter auger flights. Flush-threaded 2-inch diameter PVC casing with 10 feet of machine-cut 10-slot (0.010-inch) well screen was then installed and backfilled with 10-20 silica sand filter pack from the bottom of the boring to 1 foot above the top of the screened interval. The remainder of the well annulus was sealed with hydrated bentonite chips and a flush completion steel monument set in concrete.

On June 27 and 28, 2017, EPI installed three temporary soil borings in the gravel area north of the shopping center within 10 feet of MW-5. The purpose of these borings was to investigate soil impacts in the vicinity of MW-5. These borings were completed using standard HSA techniques with 10-inch outside diameter auger flights. Boring DPT-1 was completed to 20 feet bgs and borings DPT-2 and DPT-3 were completed to 15 feet bgs. Depth to groundwater varied among the borings from approximately 15 to 17 feet bgs.

Soil collected from the three new monitoring wells and three temporary borings was field screened for the presence of VOCs with a PID. Lithologic characteristics, PID readings, and other field observations were recorded on a field log for each location. The boring logs for MW-16 through MW-18 and DPT-1 through DPT-3 are included in Attachment B.

A total of nine soil samples were submitted for laboratory analysis from the three temporary borings. All samples collected from the borings were submitted for cVOC analysis using the EPA Method 8260C.

A total of three water samples were submitted for laboratory analysis from the three monitoring wells. Wells were purged and sampled following low-flow procedures described in Section 2.0. All samples collected from the monitoring wells and borings were submitted for cVOC analysis using EPA Method 8260C.

7.1 Piezometric Conditions

Depth-to-water measurements in wells ranged from approximately 2.48 to 22.82 feet below top of casing. A new survey was performed to provide a consistent set of measuring point elevations for wells at the Site, including the newly installed groundwater monitoring wells downgradient of MW-5. A summary of the surveyed measuring point elevations, depth-to-water measurements, and groundwater elevations is provided in Table 5. Figure 10 depicts groundwater elevations and the groundwater flow direction at the Site as measured during the June 2017 monitoring event.

According to the bore logs from the newly installed MW-17 and MW-18, these wells are in an area of increased silt, which differs from the soil types observed at other areas at the Site. Groundwater elevations measured at these two wells are significantly lower than other wells at the Site. This increased

silt with the addition of historically low precipitation may have created a localized anomalous area where groundwater elevations are lower than normal and may not be indicative of regional static groundwater conditions.

Data collected in June 2017 indicate that groundwater flow direction at the property is generally in the south-southwest direction with a horizontal hydraulic gradient of 0.01 feet/foot. This gradient confirms that MW-5 is the most upgradient well at the Site and is upgradient from the Snohomish Square Cleaners source area.

7.2 Analytical Results

No cVOCs were detected in soil or groundwater at concentrations exceeding an applicable analytical detection limit from any of the samples collected. These data indicate that PCE-impacted groundwater at MW-5 is distinct and separate from the PCE impacts associated with the former Snohomish Square Cleaners and; therefore, groundwater impacts at MW-5 are not part of the Site.

8.0 GROUNDWATER MONITOIRNG – AUGUST 2017

8.1 Groundwater Sampling

From August 8 through August 10, 2017, EPI sampled groundwater at 28 well locations. Procedures in Section 2.0 were followed for sampling. Fourteen of the 28 wells were sampled using PDBs on August 8, 2017. The remaining 14 wells were sampled using low-flow purging and sampling procedures.

8.2 Piezometric Conditions

Measured depth-to-water data ranged from 2.83 to 23.95 feet below the top of casing. Depth-to-water measurements are presented in Tables 1 and 2. The resulting groundwater elevation data indicate that groundwater flow direction at the subject property is generally in a south-southwest direction with a horizontal hydraulic gradient of 0.011 feet/foot. Both the groundwater flow direction and the magnitude of the horizontal hydraulic gradient are influenced to some degree by seasonal conditions. Figure 10 depicts groundwater flow directions and elevations from the August 2017 monitoring event.

8.3 Geochemical Conditions

Geochemical analytical data for this monitoring event are presented in Tables 1 and 2. Geochemical parameters were analyzed from wells MW-1, MW-2, MW-3, MW-7, MW-8, MW-9, MW-15, GW-4, and GW-11.

TOC was detected in all nine groundwater samples, at concentrations ranging from 580 μ g/L to 36,000 μ g/L (Table 1). These numbers indicate an increase in TOC concentrations in some wells, and a decrease in TOC concentrations in other wells across the Site. A decrease in TOC indicates that bacteria are consuming carbon in the subsurface.

Field-filtered (dissolved) groundwater samples were analyzed for iron and manganese. Iron was detected in seven groundwater samples at concentrations ranging from 59.2 μ g/L to 25,100 μ g/L. Manganese was detected in all nine groundwater samples at concentrations ranging from 2.41 μ g/L to 3,630 μ g/L (Table 2).

The comparison of sulfate/sulfide and nitrate/nitrite concentrations provide a measure of reducing conditions produced by substrate injection. These analyses indicate the effects of increased biological activity and provide evidence that reducing conditions are present. Sulfate was detected at concentrations ranging from 8,900 μ g/L to 24,000 μ g/L. Nitrate was detected at concentrations ranging from 90 μ g/L to 5,400 μ g/L (Table 1). As reducing conditions are created by the substrate injections, sulfate should reduce to sulfide and nitrate should reduce to nitrogen gas or ammonia.

Field parameter data for the August 2017 monitoring event are presented in Table 3. DO ranged from 0.32 mg/L to 4.63 mg/L. ORP values ranged from -114.9 mV to 305.4 mV. Geochemical conditions generally are considered aerobic when DO concentrations are approximately 1 mg/L or greater and ORP values are positive, or anaerobic, and when DO concentrations are less than 1 mg/L and ORP values are negative. Temperature, pH, and other field-measured parameters were within acceptable ranges for bioremediation to occur. EPI will consider adding a pH buffer in the future to maintain acceptable ranges for pH.

8.4 Analytical Results

PCE was detected in samples from 14 wells at concentrations ranging from 2.0 μ g/L to 120 μ g/L. Nine of the 14 sample results were greater than the MTCA Method A GW CUL of 5 μ g/L, with the greatest concentration in the sample from MW-15. PCE was detected at concentrations less than the MTCA Method A GW CUL in five other monitoring wells (Table 2). PCE concentrations were not detected at concentrations greater than the analytical detection limit in the remaining 14 wells. Figure 11 shows the PCE concentrations in groundwater and the horizontal extent of the PCE plume based on data obtained during the August 2017 monitoring event.

The analytical results for the breakdown products are as follows:

- TCE was detected in three samples at concentrations ranging from 1.2 μg/L to 60 μg/L. One of the sample results (MW-10) was greater than the MTCA Method A GW CUL of 5 μg/L.
- cis-1,2-Dichloroethene was detected in seven samples at concentrations ranging from 1.4 μ g/L to 22 μ g/L. Two of the sample results (MW-10 and GW-10) were greater than the MTCA Method B GW CUL of 16 μ g/L.
- trans-1,2-Dichloroethene was not detected in any samples at a concentration exceeding the detection limit of the analytical method used.
- Vinyl chloride was detected in four samples at concentrations of ranging from 0.23 μ g/L to 1.7 μ g/L. All four sample results are greater than the MTCA Method A GW CUL of 0.2 μ g/L.

9.0 ADDITIONAL WELL INSTALLATION AND TREATMENT FOR MW-15 – NOVEMBER 2017

Although the data support that ERD remediation technology is reducing PCE concentrations across the Site, one area represented by well MW-15 is not showing equivalent decreases in PCE concentrations. MW-15 was installed prior to the substrate injection treatments at the Site to address a data gap of PCE concentrations in groundwater in this area downgradient of the former dry cleaner.

Injection wells were not installed in this area for the initial round of substrate injections because PCE concentrations in the area were unknown at the time. Since its installation, groundwater monitoring data consistently demonstrate that the highest concentrations of PCE at the Site are found in samples collected from MW-15. The consistent high PCE concentrations may be due to a preferential flow pathway that is preventing the treatment compound from contacting impacted groundwater in the vicinity of MW-15. Therefore, to address the PCE impacts at MW-15, two additional injection wells were installed immediately upgradient of MW-15 on November 13, 2017.

The borehole for each injection well was advanced to a bottom depth of 30 feet below ground surface (bgs) using a standard truck-mounted HSA drilling rig equipped with 12-inch diameter auger flights. Flush threaded 4-inch diameter PVC casing with 15 feet of machine-cut 20-slot (0.020 inch) well screen was installed and backfilled with a Colorado silica sand filter pack from the bottom of the boring to 2 feet above the top of the screened interval.

Soil was sampled from the injection wells and screened for the presence of VOCs with a PID. Lithologic characteristics, PID readings, and other field observations were recorded on a field log for each location. The boring logs for IJ-13 and IJ-14 are included in Attachment B.

A total of five soil samples were submitted for laboratory analysis from the two injection wells. All samples were submitted for cVOC analysis using the EPA Method 8260C.

PCE was detected in one sample, IJ-13:30, at a concentration of 0.028 milligrams per kilogram (mg/kg), less than the MTCA Method A CUL for PCE in soil of 0.050 mg/kg. No other cVOCs were detected in soil at concentrations exceeding an applicable analytical detection limit from any of the other samples. Copies of analytical laboratory reports are included in Attachment A.

After the injection wells were installed, EPI performed two injection events, one in December 2017 and one in January 2018. During the first event on December 4 and 5, 2017, EPI injected a total volume of 1,675 gallons of substrate. During the second event on January 15 and 16, 2017 EPI injected a total volume of 2,475 gallons of substrate. Details of injection events are noted in Table 4, displaying the dates and total volumes injected into each well.

In some of the wells, leakage at the surface around the well annulus was noted and was caused by location-specific geologic conditions that limited infiltration rates. If leakage occurred at the surface, pressurized injections were stopped and gravity-flow methods were used to reduce the potential for leakage at the surface. Wells that were partially gravity fed are noted in Table 4. In general, each well took approximately 40 psi to overcome the piezometric head of the water column within the well. When

the static piezometric head pressure was overcome, injection pressures dropped to approximately 2 to 0 psi for the duration of injection.

Progress of these recent injections will be evaluated with data from the February 2018 Quarterly Monitoring Event.

10.0 GROUNDWATER MONITORING – NOVEMBER 2017

10.1 Groundwater Sampling

From November 20 through November 21, 2017, EPI sampled groundwater at 25 well locations. Procedures in Section 2.0 were followed for sampling. Fourteen of the 25 wells were sampled using PDBs on November 21, 2017. The remaining 11 wells were sampled using low-flow purging and sampling procedures.

10.2 Piezometric Conditions

Depth-to-water measurements in wells ranged from approximately 1.64 to 22.79 feet below top of casing. Depth-to-water measurements are provided in Tables 1 and 2. Figure 12 depicts groundwater elevations and the groundwater flow direction at the Site as measured during the November 2017 monitoring event.

Water level data collected in November 2017 indicated that groundwater flow direction at the Site is generally in the south-southwest direction with a horizontal hydraulic gradient of 0.012 feet/foot. Both the groundwater direction and horizontal gradient are consistent with the baseline monitoring event.

10.3 Geochemical Results

Geochemical analytical data for this monitoring event are presented in Tables 1 and 2. Geochemical parameters were analyzed from wells MW-3, MW-7, and MW-15.

TOC was detected in MW-3, MW-7, and MW-15 at concentrations of $35,000 \mu g/L$, $2,400 \mu g/L$, and $3,100 \mu g/L$, respectively (Table 1). These data indicate relatively stable TOC concentrations across the Site. These stable TOC concentrations indicate that additional injections may be warranted.

Field-filtered (dissolved) groundwater samples were analyzed for iron and manganese. Iron was detected in MW-3 and MW-7, at concentrations of 19,500 μ g/L and 236 μ g/L. Manganese was detected in all three samples at concentrations ranging from 11.1 μ g/L to 3,480 μ g/L (Table 2). Iron and manganese concentrations in these three wells remained relatively consistent compared to previous concentrations.

Anions (i.e., chloride, sulfate, and nitrate) were analyzed to provide a measure of geochemical conditions produced by substrate injection. Chloride was detected in the three analyzed wells at concentrations ranging from 9,100 μ g/L to 12,600 μ g/L. Sulfate was detected at concentrations ranging from 5,700 μ g/L to 425,000 μ g/L. The sulfate concentration significantly increased in MW-7, and remained relatively the same in the remaining wells. Nitrate was detected at concentrations ranging from 86 μ g/L to 2,900 μ g/L (Table 1). Generally, nitrate concentrations remained relatively stable during this monitoring event.

Field parameter data collected from nine wells during the November 2017 monitoring event are presented in Table 3. DO ranged from 0.83 mg/L to 8.79 mg/L. ORP ranged from 7.3 mv to 281.0 mv.

10.4 Analytical Results

PCE concentrations were detected at concentrations ranging from 1.3 μ g/L to 270 μ g/L. Eight of the 25 sample results were greater than the MTCA Method A GW CUL of 5 μ g/L, with the greatest concentration in the sample from MW-10. PCE was detected at concentrations less than the MTCA Method A GW CUL for PCE in five other monitoring wells (Table 2). PCE was not detected at concentrations greater than the analytical detection limit in the samples from the remaining 12 wells. Figure 13 shows the PCE groundwater concentrations and plume as identified during the November 2017 monitoring event.

The analytical results for the breakdown products are as follows:

- TCE was detected in three samples at concentrations ranging from 1.5 μ g/L to 110 μ g/L. One of the sample results (MW-10) was greater than the MTCA Method A GW CUL of 5 μ g/L.
- cis-1,2-Dichloroethene was detected in samples from five wells at concentrations ranging from 2.2 μ g/L to 54 μ g/L. Two of the sample results (MW-10 and GW-10) were greater than the MTCA Method B GW CUL of 16 μ g/L.
- trans-1,2-Dichloroethene was not detected in any sample at a concentration exceeding the detection limit of the analytical method used.
- Vinyl chloride was detected in samples from MW-4 and MW-10 at concentrations of 0.24 μg/L and 6.4 μg/L, respectively. Both detected vinyl chloride concentrations were greater than the MTCA Method A GW CUL of 0.2 μg/L (Table 2).

11.0 DATA EVALUATION

The geochemical data indicate that nutrient substrate injections have created or enhanced reducing geochemical conditions in some parts of the uppermost aquifer. The TOC data collected in December 2016 indicate sharp decreases in TOC concentrations across the Site indicating that bacteria are consuming the available carbon in the subsurface. The February 2017 geochemical data indicated that TOC concentrations remained relatively low; therefore, nutrient substrate was injected into the aquifer to provide the additional carbon necessary to maintain bacteria populations and promote ERD.

Tables 1 and 2 summarize the groundwater analytical data. Due to the large number of wells and volume of data, the data are most clearly presented graphically. PCE concentrations are shown in a graphical representation of the analytical data on Figures 14A through 14E. Figures 4, 6, 8, 11, and 13 illustrate, on a quarter-by-quarter basis, the estimated extent of PCE in groundwater at concentrations exceeding the MTCA Method A GW CUL.

In November 2017, the PCE concentration at MW-10 was 270 µg/L, which represents an all-time high concentration at the Site. It is EPI's current opinion that this result is suspect as the PCE concentration observed is far outside the typical range observed at the Site and the subsequent sample result at MW-10 collected in February 2018 was within the typical range previously observed. The February 2018 results will be presented in a future report. Due to the uncertainty regarding this result, the concentration observed at MW-10 from the November 2017 monitoring event is included in all tables, graphs, and figures, but the validity of this result will be evaluated during future monitoring events.

Figures 14A through 14E present time series graphs of PCE concentrations in samples from five individual monitoring wells at the Site. These time series graphs provide a visual depiction of PCE concentration trends at specific locations on the Site, which can be evaluated to determine if specific areas require additional remediation substrate injections. Observations from these graphs are as follows:

- Figure 14A presents trend data for MW-15. This well was installed by EPI prior to any injection event to investigate a data gap in the area. The PCE concentrations at MW-15 have been greater than the applicable cleanup level and relatively stable during the seven monitored events. EPI installed injection wells near MW-15 and began performing injections in December 2017 to attempt to reduce these concentrations.
- Figure 14B presents trend data for MW-10. This well is in the source area and is discussed above. Prior to the November 2017 concentration, the PCE concentrations decreased sharply after injections began and then have rebounded back to greater than applicable cleanup levels. This well will be monitored to further investigate the November 2017 concentration.
- Figure 14C presents trend data for MW-11. MW-11 is located slightly downgradient of the source area. PCE concentrations in this well have decreased to less than cleanup levels since the injections began.
- Figure 14D presents trend data for GW-10. GW-10 is located just north of Avenue D to the south of the subject property. PCE concentrations in this well have decreased to less than cleanup levels since the injections began.
- Figure 14E presents trend data for GW-8. GW-8 is located on the Snohomish property. PCE concentrations are still greater than applicable cleanup level but have shown a steady decline since the injections began.

While concentrations remain elevated relative to MTCA Method A CULs, a decreasing trend represents a clear improvement in groundwater quality at the Site and demonstrates the effectiveness of ERD as a remediation technology for the Site. With the successful distribution of the 3-D Microemulsion[®] this improving trend in PCE concentrations is expected to continue.

The declining trend in PCE concentrations in samples from wells on the subject property is evidence of effective treatment at the source. Continued application of the ERD remediation technology is expected to result in a reduction of PCE concentrations in groundwater on the Snohomish County property to less

than MTCA Method A CULs as remediated groundwater from the subject property flows to the downgradient Snohomish property; resulting in a quicker restoration time frame than without the ERD treatment. PCE breakdown products (i.e., trichloroethylene cis-1,2-dichloroethene, and vinyl chloride) have exceeded their respective MTCA Method A CULs in samples from four wells (MW-10, MW-11, MW-4, and GW-10). This is further evidence that injection of 3-D Microemulsion® has initiated reductive dechlorination of PCE. Continued application of the ERD remediation technology is anticipated to continue the reductive dechlorination process and degrade PCE, and its breakdown products, to ethane and ethene. EPI will continue to monitor the occurrence and concentrations of PCE breakdown products as the quarterly monitoring progresses.

Figures 4, 6, 8, 11, and 13 represent the interpolated lateral extent of PCE-impacted groundwater, which extends off-property to the southwest beneath Avenue D and onto the Snohomish County property. The lateral extent of impacts to the aquifer, as indicated by PCE concentrations, is well-characterized and is adequately delineated by the existing monitoring well network.

12.0 SUMMARY OF FINDINGS AND CONCLUSIONS

The declining trend in PCE concentrations in samples from the wells at the Site is evidence of effective treatment at the source. Continued application of the ERD remediation technology is expected to result in a reduction of PCE concentrations in the groundwater at the Snohomish County property to less than MTCA Method A CULs as remediated groundwater from the subject property flows to the downgradient Snohomish County property, resulting in a quicker restoration time frame than without the ERD treatment. This decreasing trend demonstrates the effectiveness of ERD as a remediation technology for the Site.

The following summary of findings and conclusions are supported by the findings of the December 2016 monitoring event, the substrate injection events, and four follow-up quarterly groundwater monitoring events.

- Groundwater elevation data from five monitoring events indicate that the predominant groundwater flow direction at the Site is generally in a south-southwest direction with a horizontal hydraulic gradient of approximately 0.01 feet/foot.
- The current monitoring network and monitoring frequency are appropriate for the observed Site-specific conditions.
- Additional 3-D Microemulsion[®] injections began on February 22, 2017 using a combination of pressurized injection and gravity-flow methods. Over the duration of the injection period, 3,900 gallons of the nutrient substrate mixture were injected into the subsurface at eight injection well locations. Two additional injection wells were installed upgradient of MW-15 and two injection events in were performed in December 2017 and January 2018, injecting a total of 1,675 and 2,475 gallons, respectively. The results of the February 2018 monitoring event will be used to measure the effect of these injections.
- There is a demonstrable trend of decreased total concentration of PCE in groundwater since the first injection events, which were performed in March and April of 2016. The total

concentration of PCE in groundwater has decreased since the baseline monitoring event conducted in February 2016.

- Based on data from the November 2017 monitoring event, 79.7 percent of the remaining concentrations of PCE in groundwater is represented by groundwater at MW-5, MW-10, and MW-15. This declining PCE concentration trend on the subject property is the result of effective treatment at the source and can be expected to result in a lowering of concentrations on the Snohomish property to less than MTCA Method A CULs.
- In November 2017, the PCE concentration at MW-10 was 270 µg/L, which represents an alltime high concentration at the Site. It is EPI's current opinion that this result is suspect as the PCE concentration observed is far outside the typical range observed at the Site. The subsequent PCE concentration measured in a sample collected from MW-10 February 2018 was within the typical range previously observed. The February 2018 results will be presented in a future report. Future monitoring events will evaluate the validity of this result.
- EPI will continue to monitor groundwater at MW-5 and the three new monitoring wells (MW-16, MW-17, and MW-18), which were installed downgradient of MW-5 to evaluate potential connectivity to the PCE plume. No cVOCs were detected in groundwater samples collected from these newly installed wells. Additionally, three soil borings were advanced near MW-5. No cVOCs were detected in soil at concentrations exceeding an analytical detection limit from any of the samples collected.

The presence of PCE in groundwater at MW-5 does not appear to be related to the source area at the Site due to its upgradient location and the documented lack of PCE in groundwater at the three well locations between the source area and MW-5. The impacted groundwater at MW-5 appears to be related to a separate and distinct upgradient source not associated with the former Snohomish Square Cleaners release associated with the Site.

- As the sequential reductive dechlorination of PCE occurs, some of the lesser chlorinated daughter products have been detected at concentrations greater than their respective MTCA CULs and therefore, might become COCs for the Site. The presence of these compounds will continue to be monitored and evaluated throughout the remediation process.
- EPI completed a February 2018 monitoring event and will determine the time frame for a potential additional substrate injection event based on the results from that event.

Tables

Table 1

Groundwater Geochemical Analytical Data (µg/L)

Groundwater Monitoring and Investigation Report – December 2016 to November 2017

Snohomish Square Cleaners

1419 Avenue D and 13th Street SE, Snohomish, Washington

		Depth to	Conventionals		Demand		Mir	nerals	Nutr	ients		Dissolved	Gasses ^f	
Sample ID	Sample Date	Water (feet)	Total Sulfide ^a	BOD⁵	TOC°	CODd	Chloride ^e	Sulfate ^e	Nitrite ^e	Nitrate ^e	Carbon Dioxide	Methane	Ethane	Ethene
	2/9/2016	6.68		<2,000	3,900	16,000	24,300	7,450	<5	10,500	120,000	31	<10	<10
	5/17/2016	8.96	<50	<2,000	7,500	13,000	43,300	7,820		2,300 ^g	110,000	26	<10	<10
	8/30/2016	11.17	<50	<2,000	86,000	<10,000	29,400	11,500	<5	3,380	120,000	<5	<10	<10
MW-1	12/1/2016	6.32	<50	<2,000	5,200	11,000	18,500	4,490	<5	4,900	70,000	29	<10	<10
	2/21/2017	6.18	<50	<2,000	8,400	18,000	26,200	4,300	<5	995	130,000	<5	<10	<10
	5/25/2017	7.73	<50	<2,000	9,600	<10,000	36,200	5,500	<5	901	370,000	9.0	<10	<10
	8/8/2017	10.54	<50	<2,000	4,000	11,000	18,000	9,700	<5	2,600		<5	<10	<10
	2/9/2016	7.67		<2,000	4,200	<10,000	1,560	2,260	<5	17,200	13,000	<5	<10	<10
	5/17/2016	11.02	80	<2,000	700	<10,000	4,500	9,410	<5	10,200	61,000	<5	<10	<10
	8/29/2016	13.31	<50	<2,000	15,000	<10,000	4,640	13,800	<5	6,380	72,000	<5	<10	<10
MW-2	12/2/2016	7.12	<50	<2,000	<500	<10,000	1,240	640	<5	16,300	14,000	<5	<10	<10
	2/20/2017	6.89	<50	<2,000	2,700	<10,000	1,240	1,130	<5	11,200		<5	<10	<10
	5/30/2017	9.39	<50	98,000	72,000	270,000	27,300	770	<5	<25	35,100	<5	<10	<10
	8/8/2017	12.65	<50	<2,000	610	<10,000	6,300	10,700	<5	5,400		<5	<10	<10
	2/9/2016	4.49		<2,000	520	<10,000	22,300	11,900	<5	2,180	79,000	<5	<10	<10
	5/17/2016	8.35	<50	14,000	120,000	1,300,000	10,400	6,540		<10 ^g	100,000	<5	<10	<10
	8/29/2016	10.82	<50	55,000	300,000	1,100,000	9,880	510	<5	<25	200,000	620 ve (640)	<10 (<100)	<10 (<100)
N414/ 0	12/2/2016	4.72	<50	19,000	34,000	110,000	7,590	700	<5	<25	79,000	1,500 ve (1,800)	· · · ·	<10
MW-3	2/20/2017	4.09	<50	83,000	76,000	430,000	34,500	780	<5	<25	130,000	6,100 ve (8,000)		<10
	5/30/2017	6.37	<50	<2,000	9,300	<10,000	4,100	22,400	<5	7,700	445,000	3,300 ve (3,300)		<10
	8/8/2017	10.13	<50	56,000	36,000	160,000	13,600	3,800	<5	90		4,500 ve	<10	<10
	11/21/2017	9.68	<50	12,000	35,000	38,000	9,100	5,700	<5	86	120,000	3400 ve (3,800)	<10	<10
MW-4	5/20/2016	8.93	<50	<2,000	790	18,000	11,300	13,800	<5	1,230				
	2/9/2016	9.82		<2,000	2,600	13,000	191,000	15,700	<5	4,400	86,000	<5	<10	<10
	5/17/2016	11.07	<50	<2,000	1,300	<10,000	172,000	10,800		2,600 ^g	75,000	<5	<10	<10
	8/30/2016	13.46	<50	15,000	2,200	34,000	267,000	26,100	<5	3,020	96,000	<5	<10	<10
	12/1/2016	9.67	<50	<2,000	1,300	<10,000	275,000	7,770	<5	4,090	78,000	<5	<10	<10
MW-7	2/21/2017	9.77	<50	<2,000	5,700	<10,000	134,000	12,300	<5	5,300	82,000	<5	<10	<10
	5/25/2017	10.36	<50	<2,000	1,200	<10,000	617,000	17,600	<5	4,400	137,000	<5	<10	<10
	8/8/2017	12.17	<50	<2,000	920	<10,000	482,000	8,900	<5	3,000		<5	<10	<10
	11/21/2017	12.07	<50	<2,000	2,400	<10,000	10,600	425,000	<5	2,900	23,000	<5	<10	<10
	2/9/2016	9.45		<2,000	570	<10,000	2,620	24,400	<5	1,150	91,000	<5	<10	<10
	5/17/2016	11.03	<50	<2,000	3,200	<10,000	4,530	26,600		380 ^g	130,000	17	<10	<10
	8/29/2016	12.89	60	<2,000	11,000	<10,000	3,760	9,570	<5	2,000	110,000	<5	<10	<10
MW-8	12/2/2016	9.54	<50	<2,000	<500	<10,000	2,380	19,100	<5	1,180	52,000	<5	<10	<10
	2/21/2017	9.50	<50	<2,000	510	<10,000	2,100	21,400	<5	1,300	59,000	<5	<10	<10
	5/24/2017	10.21	<50	<2,000	650	<10,000	2,600	21,600	<5	1,000	145,000	<5	<10	<10
	8/8/2017	12.29	<50	<2,000	1,000	200,000	3,400	24,000	<5	777		<5	<10	<10
	2/9/2016	6.00		<2,000	<500	<10,000	4,360	8,230	<5	1,050	76,000	<5	<10	<10
	5/17/2016	9.27	<50	<2,000	<500	<10,000	17,000	43,100	<5	<25	67,000	<5	<10	<10
	8/29/2016	11.78	<50	<2,000	12,000	<10,000	3,770	9,570	<5	2,000	110,000	<5	<10	<10
MW-9	12/2/2016	6.43	<50	<2,000	<500	<10,000	4,110	6,790	<5	943	60,000	<5	<10	<10
	2/21/2017	6.06	<50	<2,000	<500	<10,000	4,000	6,800	<5	713	69,000	<5	<10	<10
	5/25/2017	7.71	<50	<2,000	<500	<10,000	5,080	8,100	<5	753	92,800	<5	<10	<10
	8/8/2017	NM	<50	<2,000	580	<10,000	2,900	12,900	<5	2,000		<5	<10	<10

Table 1

Groundwater Geochemical Analytical Data (µg/L)

Groundwater Monitoring and Investigation Report – December 2016 to November 2017

Snohomish Square Cleaners

1419 Avenue D and 13th Street SE, Snohomish, Washington

		Depth to	Conventionals		Demand		Mir	nerals	Nutr	ients		Dissolved	Gasses ^f	
Sample ID	Sample Date	Water (feet)	Total Sulfide ^a	BOD ^b	TOC ^c	CODd	Chloride ^e	Sulfate ^e	Nitrite ^e	Nitrate ^e	Carbon Dioxide	Methane	Ethane	Ethene
	5/17/2016	8.42	<50	<2,000	700	<10,000	12,600	11,800		2,200 ^g	67,000	<5	<10	<10
	8/30/2016	10.42	<50	<2,000	20,000	<10,000	12,400	11,800	<5	1,280	87,000	<5	<10	<10
	12/1/2016	6.48	<50	<2,000	<500	<10,000	6,940	8,420	<5	7,290	54,000	<5	<10	<10
MW-15	2/21/2017	6.36	<50	<2,000	690	<10,000	<50	10,400	<5	4,700	67,000	<5	<10	<10
	5/25/2017	7.51	<50	<2,000	1,000	<10,000	10,400	12,400	<5	1,900	116,000	<5	<10	<10
	8/8/2017	12.50	<50	<2,000	810	<10,000	11,800	17,200	<5	612		<5	<10	<10
	11/21/2017	9.47	<50	<2,000	3,100	<10,000	12,600	15,300	<5	758	41,000	<5	<10	<10
MW-16	8/8/2017	15.72												
MW-17	8/8/2017	18.54												
MW-18	8/8/2017	19.20												
	2/10/2016	2.78		<2,000	<500	<10,000	2,500	6,960	<5	323	29,000	<5	<10	<10
	5/17/2016	3.40	<50	<2,000	790	18,000	11,300	13,800	<5	1,230	76,000	<5	<10	<10
	8/29/2016	3.39	<50	<2,000	67,000	<10,000	11,400	19,600	<5	1,720	96,000	<5	<10	<10
GW-4	12/2/2016	3.28	<50	<2,000	<500	<10,000	1,940	7,120	<5	192	33,000	<5	<10	<10
	2/20/2017	2.86	<50	<2,000	580	<10,000	3,680	7,760	<5	399	46,000	<5	<10	<10
	5/26/2017	3.08	<50	<2,000	600	<10,000	8,100	6,000	<5	599	135,000	<5	<10	<10
	8/8/2017	3.40	<50	<2,000	1,100	<10,000	13,900	23,400	<5	2,500		<5	<10	<10
	2/9/2016	18.52		<2,000	740	<10,000	20,500	15,700	<5	971	130,000	<5	<10	<10
	5/17/2016	19.92	<50	<2,000	790	<10,000	30,800	19,500	<5	2,670	90,000	<5	<10	<10
	8/30/2016	20.68	<50	<2,000	28,000	<10,000	24,600	17,900	<5	3,800	110,000	<5	<10	<10
GW-11	12/2/2016	18.54	<50	<2,000	<500	<10,000	13,400	9,340	<5	1,710	150,000	<5	<10	<10
	2/20/2017	18.02	<50	<2,000	1,100	<10,000	53,800	14,200	<5	2,600	130,000	<5	<10	<10
	5/24/2017	19.18	<50	<2,000	1,200	<10,000	41,300	25,400	<5	3,100	148,000	<5	<10	<10
	8/8/2017	20.58	<50	<2,000	920	<10,000	45,100	14,300	<5	3,300		<5	<10	<10
	ITCA Method		NVE	NVE	NVE	NVE	NVE	NVE	1,600	25,600	NVE	NA	NA	NA

Groundwater Cleanup Levelh

All results presented in milligrams/kilogram (µg/L).

Bold Bold results indicate that the compound was detected.

- a Analyzed by Method SM 4500-S2-D.
- b Analyzed by Method SM 5210B.
- c Analyzed by Method SM 5310B.
- d Anayzed by EPA Method 410.4.
- e Anayzed by EPA Method 300.0 unless otherwise indicated.
- f Anayzed by Method RSK 175.
- g Analyzed as Nitrate + Nitrite by EPA 353.2
- h Model Toxics Control Act (MTCA) Method B Groundwater Cleanup Level used, Cleanup Levels and Risk Calculations (CLARC) guidance.
- -- Not analyzed.
- () Value from re-analyzed sample after ve qualifyers were indicated during initial analysis.
- NVE No value established.
- NM Not measured.
- NA Not applicable.

Qualifier:

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

Compounds:

- BOD Biochemical oxygen demand
- TOC Total organic carbon
- COD Chemical oxygen demand

Sample ID	Depth to				Met	tals ^a					Detected VO	Cs ^b				Detected VOCs	c	
Sample ID		Sample Date	lron (filtered)	lron (unfiltered)	Lead (filtered)	Lead (unfiltered)	Manganese (filtered)	Manganese (unfiltered)	PCE	TCE	cis-1,2- Dichloro- ethene	trans-1,2- Dichloro- ethene	Vinyl Chloride	PCE	TCE	cis-1,2-Dichloro- ethene	trans-1,2- Dichloro- ethene	Vinyl Chloride
	6.68	2/9/2016	202	808			1,990	2,080	8.9	<1	<1	<1	<0.2					
	8.96	5/17/2016	1,070	960	<1	<1			4.7	<1	<1	<1	<0.2					
	11.17	8/30/2016	72.2	263			1,870	1,960	18	<1	<1	<1	<0.2					
MW-1	6.32	12/1/2016	385	1,340			2,190	2,440	11	<1	<1	<1	<0.2					
10100-1	6.18	2/21/2017	494	991			2,650	2,660	1.4	<1	<1	<1	<0.2					
	7.73	5/25/2017	1,880	2,740			3,820	3,490	2.4	<1	<1	<1	<0.2					
	10.54	8/8/2017	153	672			1,870	1,720	14	<1	<1	<1	<0.2					
	10.25	11/21/2017							19	<1	<1	<1	<0.2					
	7.67	2/9/2016	52.8	213			3.41	8.09	<1	<1	<1	<1	<0.2					
	11.02	5/17/2016	365	12,600 ve J (16,700)	<1	6.07			<1	<1	<1	<1	<0.2					
	13.31	8/29/2016	<50	3,910			6.41	115	<1	<1	<1	<1	<0.2					
MW-2	7.12	12/2/2016	<50	67.9			3.98	5.12	<1	<1	<1	<1	<0.2					
	6.89	2/20/2017	<50	170			2.54	6.35	<1	<1	<1	<1	<0.2					
	9.39	5/30/2017	<50	59.6			3.76	4.30	<1	<1	<1	<1	<0.2					
	12.65	8/8/2017	59.2	144			3.39	5.54	<1	<1	<1	<1	<0.2					
	11.44	11/21/2017							<1	<1	<1	<1	<0.2					
l	4.49	2/9/2016	<50	270			2.76	8.74	12	<1	<1	<1	<0.2					
	8.35	5/17/2016	12,400 ve J	16,600 ve J	<1	2.51			<1	<1	<1	<1	<0.2					
	10.82	8/29/2016	(15,700) 79,300	(26,400) 75,600			9,620	10,000	<5	<5	<5	<5	<0.2 j					
	4.72	12/2/2016					2,150		2.0	<1	<1	<1	<0.2]					
MW-3	4.72		10,700	11,700				1,410										
		2/21/2017	33,900	37,500			5,000	5,170	4.2	<1	3.3	<1	< 0.2					
	6.37	5/30/2017	28,100	30,200			4,530	4,490	2.1	<1	9.4	<1 <1	< 0.2					
	10.13	8/8/2017	25,100	32,500			3,630	3,770	<1	<1	16		<0.2					
├ ───┤	9.68 4.54	11/21/2017 2/12/2016	19,500	25,100			3,480	3,920	<1 26	<1 1.1	5.6 <1	<1 <1	<0.2 <0.2					
	4.54 NA	2/29/2016									-			28	<1	<1	<1	<0.2
	8.93	5/20/2016							5.6	 <1	 1.3	 <1	<0.2	1.6	<1	<1	<1	<0.2
MW-4	10.29	8/30/2016												<1	<1	4.7	<1	0.45
	4.58	2/21/2017												1.1	<1	22 9.8	<1	2.3
	5.98	5/25/2017												<1	<1 <1		<1 <1	2.1
	8.24	8/8/2017														6.2	-	0.51
┣───┤	8.17	11/21/2017												<1	<1	2.2	<1	0.24
	9.18	2/11/2016							70	1.4	<1	<1	<0.2					
	NA	2/29/2016												50	<1	<1	<1	<0.2
	10.89	5/19/2016							26	1.2	<1	<1	< 0.2	8.6	1.0	<1	<1	< 0.2
	12.06	8/30/2016							16	<1	<1	<1	<0.2	9.5	<1	<1	<1	<0.2
MW-5	8.48	12/2/2016												23	<1	<1	<1	< 0.2
	7.74	2/21/2017												44	<1	<1	<1	<0.2
	9.36	5/25/2017												51	1.5	<1	<1	<0.2
	11.39	8/8/2017												21	1.2	<1	<1	<0.2
├ ───┤	11.13	11/21/2017												25	1.5	<1	<1	<0.2
	13.39	2/11/2016							<1	<1	<1	<1	<0.2					
	NA	2/29/2016												<1	<1	<1	<1	<0.2
	14.63	5/19/2016							<1	<1	<1	<1	<0.2	<1	<1	<1	<1	<0.2
MW-6	16.21	8/30/2016												<1	<1	<1	<1	<0.2
1 [13.71	12/2/2016												<1	<1	<1	<1	<0.2
	13.18	2/21/2017												<1	<1	<1	<1	<0.2
1	13.32	5/25/2017												<1	<1	<1	<1	<0.2

	Depth to				Met	tals ^a					Detected VO	Cs ^b				Detected VOCs	c	
Sample ID		Sample Date	lron (filtered)	lron (unfiltered)	Lead (filtered)	Lead (unfiltered)	Manganese (filtered)	Manganese (unfiltered)	PCE	TCE	cis-1,2- Dichloro- ethene	trans-1,2- Dichloro- ethene	Vinyl Chloride	PCE	TCE	cis-1,2-Dichloro ethene	trans-1,2- Dichloro- ethene	Vinyl Chloride
MW-6	NM	8/8/2017												<1	<1	<1	<1	<0.2
10100-0	16.42	11/21/2017												<1	<1	<1	<1	<0.2
	9.82	2/9/2016	194	296			6.49	10.3	4.8	<1	<1	<1	<0.2					
	11.07	5/17/2016	196	9,690	<1	2.45			25	<1	<1	<1	<0.2					
	13.46	8/30/2016	187	42,000			15.4	1,330	16	<1	<1	<1	<0.2					
MW-7	9.67	12/1/2016	172	212			3.05	2.84	4.5	<1	<1	<1	<0.2					
10100-7	9.77	2/21/2017	101	295			3.11	10.6	8.0	<1	<1	<1	<0.2					
	10.36	5/25/2017	303	323			10.4	10.9	11	<1	<1	<1	<0.2					
	12.17	8/8/2017	323	482			25.5	29.0	15	<1	<1	<1	<0.2					
	12.07	11/21/2017	236	322			30.6	31.4	20	<1	<1	<1	<0.2					
	9.45	2/9/2016	73.9	231			70.5	99.7	<1	<1	<1	<1	<0.2					
	11.03	5/17/2016	171	117	<1	<1			<1	<1	<1	<1	<0.2					
	12.89	8/29/2016	72.1	69,200			203	3,640	<1	<1	<1	<1	<0.2					
MW-8	9.54	12/2/2016	<50	101			57.7	120	<1	<1	<1	<1	<0.2					
10100-0	9.50	2/21/2017	55.7	364			10.1	52.4	<1	<1	<1	<1	<0.2					
	10.21	5/24/2017	<50	324			13.6	186	<1	<1	<1	<1	<0.2					
	12.29	8/8/2017	66.6	181			476	454	<1	<1	<1	<1	<0.2					
	11.71	11/21/2017							<1	<1	<1	<1	<0.2					
	6.00	2/9/2016	<50	2,570			1.27	55.1	7.9	<1	<1	<1	<0.2					
	9.27	5/17/2016	78.1	7,120 ve J (7,990)	<1	2.25			6.5	<1	<1	<1	<0.2					
	11.78	8/29/2016	<50	<500			4.57	13.5	<1	<1	<1	<1	<0.2					
MW-9	6.43	12/2/2016	<50	<50			1.99	1.2	9.0	<1	<1	<1	<0.2					
	6.06	2/21/2017	<50	<50			<1	<1	8.0	<1	<1	<1	<0.2					
	7.71	5/25/2017	<50	<50			<1	1.02	5.4	<1	<1	<1	<0.2					
	NM	8/8/2017	<50	<50			2.41	2.49	<1	<1	<1	<1	<0.2					
	10.67	11/21/2017							1.3	<1	<1	<1	<0.2					
	4.02	2/12/2016							38	2.7	2.4	<1	<0.2					
	NA	2/29/2016												38	1.8	1.5	<1	<0.2
	7.56	5/19/2016							7.0	73	5.5	<1	<0.2	10	12	<1	<1	<0.2
	10.08	8/30/2016												99 (97)	170 ve (170)	95 (97)	1.1 (<10)	<0.2 (<2)
MW-10	4.19	12/2/2016												75	85	62	<1	6.4
	3.74	2/21/2017												5.2	1.2	15	<1	1.1
	5.80	5/25/2017												2.0	1.3	16	<1	3.2
	9.41	8/8/2017												22	60	19	<1	1.3
	9.03	11/21/2017												270	110	54	<1	6.4
	5.23	2/12/2016							48	2.5	1.2	<1	<0.2					
	NA	2/29/2016												57	2.2	1.1	<1	<0.2
	7.55	5/19/2016							62	2.8	1.0	<1	<0.2	36	2.4	<1	<1	<0.2
	10.28	8/30/2016							<1	<1	30	<1	0.7	<1	<1	32	<1	1.1
MW-11	5.56	12/2/2016												<1	1.1	59	<1	5.7
	5.03	2/21/2017												2.7	8.0	25	<1	7.4
	6.36	5/25/2017												<1	<1	26	<1	4.1
	9.13	8/8/2017												<1	<1	3.6	<1	1.7
	NA	11/21/2017																
	9.67	2/12/2016							<1	<1	<1	<1	<0.2					
	NA	2/29/2016												<1	<1	<1	<1	<0.2
MW-12	11.09	5/19/2016							1.7	<1	<1	<1	<0.2	1.7	<1	<1	<1	<0.2
	13.34	8/30/2016												3.5	<1	<1	<1	<0.2
	9.51	12/2/2016												2.8	<1	<1	<1	<0.2

	Depth to				Met	tals ^a					Detected VO	Cs⁵				Detected VOCs	2	
Sample ID	Water (feet)	Sample Date	lron (filtered)	Iron (unfiltered)	Lead (filtered)	Lead (unfiltered)	Manganese (filtered)	Manganese (unfiltered)	PCE	TCE	cis-1,2- Dichloro- ethene	trans-1,2- Dichloro- ethene	Vinyl Chloride	PCE	TCE	cis-1,2-Dichloro ethene	trans-1,2- Dichloro- ethene	Vinyl Chloride
	9.46	2/21/2017												1.2	<1	<1	<1	<0.2
MW-12	10.05	5/25/2017												<1	<1	<1	<1	<0.2
10100-12	15.55	8/8/2017												2.5	<1	<1	<1	<0.2
	12.36	11/21/2017												3.8	<1	<1	<1	<0.2
	18.09	2/11/2016							3.2	<1	<1	<1	<0.2					
	NA	2/29/2016												3.3	<1	<1	<1	<0.2
	18.92	5/20/2016							2.6	<1	<1	<1	<0.2	1.5	<1	<1	<1	<0.2
	19.85	8/30/2016												<1	<1	<1	<1	<0.2
MW-13	18.10	12/2/2016												2.3	<1	<1	<1	<0.2
	18.02	2/21/2017												3.0	<1	<1	<1	<0.2
	18.38	5/25/2017												3.0	<1	<1	<1	<0.2
	19.66	8/8/2017							2.5	<1	<1	<1	<0.2					
	19.78	11/21/2017							2.4	<1	<1	<1	<0.2					
	11.29	2/11/2016							<1	<1	<1	<1	<0.2	<1	<1	<1	<1	<0.2
	NA	2/29/2016												<1	<1	<1	<1	<0.2
	11.95	5/19/2016							<1	<1	<1	<1	<0.2	<1	<1	<1	<1	<0.2
	13.34	8/30/2016												<1	<1	<1	<1	<0.2
MW-14	11.14	12/2/2016												<1	<1	<1	<1	<0.2
	11.24	2/21/2017												<1	<1	<1	<1	<0.2
	11.64	5/25/2017												<1	<1	<1	<1	<0.2
	12.78	8/8/2017												<1	<1	<1	<1	<0.2
	12.21	11/21/2017												<1	<1	<1	<1	<0.2
	8.42	5/17/2016	78.7	214	<1	<1			140	2.8	1.1	<1	<0.2					
	10.42	8/30/2016	<50	289			22.7	28.0	94	2.3	1.5	<1	<0.2					
	6.48	12/1/2016	57.5	338			13.5	19	190 ve (180)	3.4	1.2	<1	<0.2					
MW-15	6.36	2/21/2017	58.6	241			4.17	8.16	140	2.6	<1	<1	<0.2					
	7.51	5/25/2017	<50	62.5			3.37	3.31	120	2.7	1.1	<1	<0.2					
	12.50	8/8/2017	<50	50.0			3.97	3.91	120	3.0	1.8	<1	<0.2					
	9.47	11/21/2017	<50	66.1			11.1	11.3	96	2.6	2.4	<1	<0.2					
	14.45	6/27/2017							<1	<1	<1	<1	<0.2					
MW-16	15.72	8/8/2017							<1	<1	<1	<1	<0.2					
	15.36	11/21/2017																
	22.15	6/27/2017							<1	<1	<1	<1	<0.2					
MW-17	18.54	8/8/2017							<1	<1	<1	<1	<0.2					
	22.02	11/21/2017																
	20.25	6/27/2017							<1	<1	<1	<1	<0.2					
MW-18	19.20	8/8/2017							<1	<1	<1	<1	<0.2					
	22.03	11/21/2017																
	1.64	2/10/2016							<1	<1	<1	<1	<0.2					
	NA	2/29/2016												<1	<1	<1	<1	<0.2
	2.46	5/18/2016							<1	<1	<1	<1	<0.2	<1	<1	<1	<1	<0.2
	2.71	8/30/2016												<1	<1	<1	<1	< 0.2
GW-1	2.08	12/2/2016												<1	<1	<1	<1	<0.2
	1.31	2/21/2017												<1	<1	<1	<1	<0.2
	1.30	5/26/2017												<1	<1	<1	<1	< 0.2
	2.83	8/8/2017												<1	<1	<1	<1	< 0.2
┣────┤	1.64	11/21/2017												<1	<1	<1	<1	<0.2
0.44.0	3.13	2/10/2016							1.6	<1	<1	<1	<0.2					
GW-3	NA	2/29/2016												<1	<1	<1	<1	< 0.2
	3.15	5/18/2016							2.0	<1	<1	<1	<0.2	1.6	<1	<1	<1	<0.2

	Depth to				Met	als ^a					Detected VO	Cs⁵				Detected VOCs	:	
Sample ID	Water (feet)	Sample Date	lron (filtered)	lron (unfiltered)	Lead (filtered)	Lead (unfiltered)	Manganese (filtered)	Manganese (unfiltered)	PCE	TCE	cis-1,2- Dichloro- ethene	trans-1,2- Dichloro- ethene	Vinyl Chloride	PCE	TCE	cis-1,2-Dichloro ethene	trans-1,2- Dichloro- ethene	Vinyl Chloride
	3.34	8/30/2016												2.4	<1	<1	<1	<0.2
	2.93	12/2/2016												1.2	<1	<1	<1	<0.2
GW-3	3.02	2/21/2017												<1	<1	<1	<1	<0.2
011-0	3.17	5/26/2017												<1	<1	<1	<1	<0.2
	3.41	8/8/2017												2.9	<1	<1	<1	<0.2
	2.91	11/21/2017												1.3	<1	<1	<1	<0.2
	2.78	2/10/2016	<50	188			1.42	133	4.8	<1	<1	<1	<0.2					
	3.40	5/17/2016	91.7	3,250	<1	<1			9.6	<1	<1	<1	<0.2					
	3.39	8/29/2016	62.8	<500			44.1	332	11	<1	<1	<1	<0.2					
GW-4	3.28	12/2/2016	<50	50.2			8.51	279	5.7	<1	<1	<1	<0.2					
011-4	2.86	2/20/2017	<50	123			8.2	149	4.5	<1	<1	<1	<0.2					
	3.08	5/26/2017	<50	73.3			1.81	118	4.1	<1	<1	<1	<0.2					
	3.40	8/8/2017	81.6	99.9			48.6	91.7	10	<1	<1	<1	<0.2					
	2.85	11/21/2017			-				6.8	<1	<1	<1	<0.2					
	4.60	2/10/2016							2.5	<1	<1	<1	<0.2					
	NA	2/29/2016												2.5	<1	<1	<1	<0.2
	5.04	5/18/2016							3.1	<1	<1	<1	<0.2	1.8	<1	<1	<1	<0.2
	5.42	8/30/2016												2.9	<1	<1	<1	<0.2
GW-5	4.07	12/2/2016												3.9	<1	<1	<1	<0.2
	4.19	2/21/2017												2.5	<1	<1	<1	<0.2
	4.76	5/26/2017												2.3	<1	<1	<1	<0.2
	5.44	8/8/2017												3.2	<1	<1	<1	<0.2
	NA	11/21/2017																
	3.92										 <1	 <1						
		2/10/2016							6.4	<1			<0.2			<1	 <1	
	NA	2/29/2016											<0.2	6.1	<1			<0.2
	4.08	5/18/2016							6.6	<1	<1	<1		5.1	<1	<1	<1	< 0.2
GW-6	4.21	8/30/2016							7.3	<1	<1	<1	<0.2	7.0	<1	<1	<1	< 0.2
Gw-0	3.66 3.67	12/2/2016												8.6	<1	<1	<1	< 0.2
		2/21/2017 5/26/2017												6.0 5.6	<1	<1	<1 <1	<0.2 <0.2
	3.95 4.25													5.6	<1			
		8/8/2017												9.2	<1	<1	<1	<0.2
	NA	11/21/2017																
	2.67 NA	2/11/2016 2/29/2016							1.2	<1	<1	<1	<0.2		 <1		 <1	
														<1		<1		< 0.2
	3.99	5/20/2016							2.0	<1	<1	<1	<0.2	1.1	<1	<1	<1	< 0.2
GW-7	4.56	8/30/2016												1.1	<1	<1	<1	<0.2
Gvv-/	2.19	12/2/2016												1.1	<1	<1	<1	< 0.2
	2.11	2/21/2017												<1	<1	<1	<1	<0.2
	3.26	5/26/2017												1.0	<1	<1	<1	< 0.2
	4.53	8/8/2017												2.0	<1	<1	<1	< 0.2
	3.15	11/21/2017												1.3	<1	<1	<1	<0.2
	2.39	2/11/2016							22	<1	<1	<1	<0.2					
	NA 2.04	2/29/2016												21	<1	<1	<1	< 0.2
	3.04	5/20/2016							25	<1	<1	<1	<0.2	21	<1	<1	<1	<0.2
GW-8	3.57	8/30/2016												20	<1	<1	<1	< 0.2
	2.50	12/2/2016												18	<1	<1	<1	<0.2
	2.07	2/21/2017												16	<1	<1	<1	<0.2
	2.71	5/26/2017												14	<1	<1	<1	<0.2
	3.55	8/8/2017												26	<1	<1	<1	<0.2

	Depth to				Met	als ^a					Detected VO	Cs ^b				Detected VOCs	c	
Sample ID	Water (feet)	Sample Date	lron (filtered)	lron (unfiltered)	Lead (filtered)	Lead (unfiltered)	Manganese (filtered)	Manganese (unfiltered)	PCE	TCE	cis-1,2- Dichloro- ethene	trans-1,2- Dichloro- ethene	Vinyl Chloride	PCE	TCE	cis-1,2-Dichloro- ethene	trans-1,2- Dichloro- ethene	Vinyl Chloride
GW-8	2.51	11/21/2017												13	<1	<1	<1	<0.2
	2.66	2/11/2016							<1	<1	1.7	<1	<0.2					
	NA	2/29/2016												<1	<1	1.3	<1	<0.2
	2.84	5/20/2016							<1	<1	1.7	<1	<0.2	<1	<1	1.4	<1	<0.2
	4.30	8/30/2016												<1	<1	1.1	<1	<0.2
GW-9	2.34	12/2/2016												<1	<1	<1	<1	<0.2
	4.53	2/21/2017												<1	<1	<1	<1	<0.2
	2.70	5/26/2017												<1	<1	1.1	<1	<0.2
	4.22	8/8/2017												<1	<1	1.4	<1	<0.2
	2.30	11/21/2017			-									<1	<1	<1	<1	<0.2
	21.39	2/11/2016							19	1.2	<1	<1	<0.2					
	NA	2/29/2016												27	1.2	<1	<1	<0.2
	23.21	5/20/2016							8.5	1.3	<1	<1	<0.2	5.8	1.1	<1	<1	<0.2
	23.86	8/30/2016							19	1.3	2.7	<1	<0.2	18	1.1	<1	<1	<0.2
GW-10	20.94	12/2/2016												16	1.3	1.3	<1	<0.2
	20.89	2/21/2017												<1	<1	14	<1	<0.2
	22.07	5/25/2017												1.9	<1	18	<1	<0.2
	23.95	8/8/2017							<1	<1	22	<1	0.23					
	22.79	11/21/2017												<1	<1	32	<1	<0.2
	18.52	2/9/2016	91.2	85.8			2.09	2.7	8.4	<1	<1	<1	<0.2					
	19.92	5/17/2016	127	95	<1	<1			25	<1	<1	<1	<0.2					
	20.68	8/30/2016	90.4	1,210			5.27	29.4	19	<1	<1	<1	<0.2					
GW-11	18.54	12/2/2016	<50	77.8			2.31	2.81	<1	<1	<1	<1	<0.2					
Gvv-11	18.02	2/20/2017	108	147			3.0	3.99	4.7	<1	<1	<1	<0.2					
	19.18	5/24/2017	83.0	106			3.19	3.73	15	<1	<1	<1	<0.2					
	20.58	8/8/2017	154	4,310			3.74	125	19	<1	<1	<1	<0.2					
	19.34	11/21/2017							21	<1	<1	<1	<0.2					
MTCA Metho	d A Groundw Level ^d	vater Cleanup	11,	200 [°]	1	5	2,2	40 ^e	5	5	16°	160°	0.2	5	5	16 ^e	160 [°]	0.2

Notes:

All results presented in milligrams/kilogram (µg/L).

Bold Bold results indicate that the compound was detected.

Shaded cells indicate that the compound was detected at a concentration greater than the cleanup level.

a Analyzed by EPA Method 200.8.

b Analyzed by EPA Method 8260; sampled 2/09/16-2/11/16, 5/18/16, 12/1/16-12/2/16, 8/29/16, 2/21/17, 5/30/17, and 6/27/17.

c Analyzed by EPA Method 8260; sampled with passive diffusion bag (PDB)

d MTCA Method A Groundwater Cleanup Level from Table 720-1 in Washington Administration Code (WAC) Chapter 173-340-900.

e MTCA Method B Groundwater Cleanup Level used, Cleanup Levels and Risk Calculations (CLARC) guidance.

-- Not analyzed.

() Value from re-analyzed sample after ve J qualifyers were indicated during initial analysis.

NA Well not accessible.

NM Not measured.

Qualifiers:

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

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

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

Compounds:

VOCs Volatile organic compounds

PCE Tetrachloroethene

TCE Trichloroethene

Table 3Field ParametersGroundwater Monitoring and Investigation Report – December 2016 to November 2017Snohomish Square Cleaners1419 Avenue D and 13th Street SE, Snohomish, Washington

Sample ID	Sample Date	Depth to Water (feet)	рН	Conductivity (ms/cm ²)	DO (mg/L)	Temperature (°C)	ORP (mv)
	2/9/2016	6.68	6.20	0.420	2.24	12.90	190.1
	5/17/2016	8.96	6.04	0.347	1.20	14.87	114.6
	8/30/2016	11.17	5.82			18.14	257.6
MW-1	12/1/2016	6.32	6.16			16.06	84.6
	2/21/2017	6.18				11.4	110.0
	5/25/2017 8/8/2017	7.73 10.54				14.1 17.60	57.4 159.2
	0/0/2017 11/21/2017	10.54				17.80	219.1
	2/9/2016	7.67				12.66	326.7
	5/17/2016	11.02	5.20			13.37	263.1
	8/30/2016	13.31	5.07		2.89	15.67	258.6
MW-2	12/2/2016	7.12	5.43	0.178	7.46	12.68	77.4
IVIVV-2	2/21/2017	6.89	5.55	0.128	9.97	8.9	231.4
	5/30/2017	9.39	5.48	0.151	8.18	12.1	157.4
	8/9/2017	12.65	5.77			17.96	-114.9
	11/21/2017	11.44				11.9	281.0
	2/9/2016	4.49				10.50	305.4
	5/17/2016 8/30/2016	8.35				14.14	6.5
	8/30/2016	10.82 4.72				17.89 11.68	<u>46.8</u> -3.9
MW-3	2/20/2017	4.09				10.3	-34.1
	5/30/2017	6.37				13.9	3.1
	8/8/17*	10.13	5.86	0.529		18.41	-87.3
	11/21/2017	9.68	5.97	0.296	0.88	14.4	7.3
	2/12/2016	4.54	5.85	0.129	7.15	12.80	183.3
	5/20/2016	8.93	5.66	0.397	0.49	13.79	28.8
	8/30/2016	10.29					
MW-4	12/2/2016	NM ^a				[
10100 -	2/21/2017	4.58					
	5/25/2017	5.98					
	8/10/2017	8.24					
	11/21/2017	8.17					
	2/11/2016 5/19/2016	9.18 10.89				12.56 12.86	<u> </u>
	3/19/2016 8/30/2016	12.06		pH (ms/cm ²) (mg/L) 5.20 0.420 2.24 5.04 0.347 1.20 5.82 0.381 1.01 5.16 0.345 0.95 5.26 0.382 0.36 5.26 0.382 0.38 5.26 0.382 0.36 5.26 0.382 2.48 5.89 0.238 1.57 5.54 0.139 9.51 5.20 0.124 7.82 5.07 0.151 2.89 5.43 0.178 7.46 5.55 0.128 9.97 5.48 0.151 8.18 5.77 0.144 1.79 5.62 0.187 6.88 5.92 0.461 0.48 5.37 0.684 1.50 5.44 0.516 3.28 5.29 1.93 5.85 0.129 7.15 5.66 0.397 0.49 <td>12.00</td> <td>196.9</td>	12.00	196.9	
	12/2/2016	8.48					
MW-5	2/21/2017	7.74					
	5/25/2017	9.36					
	8/8/2017	11.39		•••			
	11/21/2017	11.13			——		
	2/11/2016	13.39	5.81	0.424	0.40	14.58	237.1
	5/19/2016	14.63	5.57	0.366	0.51	14.25	167.4
	8/30/2016	16.21					
MW-6	12/2/2016	13.71					
	2/20/2017	13.18					
	5/25/2017 8/10/2017	13.32 NM					
	0/10/2017 11/21/2017	16.42				 	
	2/9/2016	9.82				12.49	325.6
	5/17/2016	11.07	5.57			14.96	206.3
	8/30/2016	13.46	5.54			18.41	272.8
	12/1/2016	9.67	6.13			15.8	114.7
MW-7	2/21/2017	9.77	6.37			11.0	174.9
	5/25/2017	10.36	5.81		4.53	14.5	135.8
	8/9/2017	12.17	5.50			18.47	253.5
	11/21/2017	12.07	5.60			16.3	158.7
	2/9/2016	9.45	6.02			13.55	284.7
	5/17/2016 8/30/2016	11.03				14.30	213.2
	8/30/2016 12/2/2016	12.89 9.54				18.00 15.08	158.8 102.8
MW-8	2/21/2017	9.54 9.50				12.7	204.9
	5/24/2017	9.50	5.92			14.1	163.7
	8/9/2017	12.29	6.27			16.15	236.8
	11/21/2017	11.71	5.80			15.6	239.6
	2/9/2016	6.00	5.87			12.88	326.5
	5/17/2016	9.27	5.46			15.22	243.0
	8/30/2016	11.78	5.34			19.05	136.0
MW-9	12/2/2016	6.43	5.77			14.94	46.0
	2/21/2017	6.06	5.88			12.0	226.3
	5/25/2017	7.71				13.9	180.9
	8/9/2017	NM				17.56	305.4
	11/21/2017 2/12/2016	10.67 4.02				14.5 11.56	270.0 340.2
	5/19/2016	4.02 7.56				13.31	23.8
	8/30/2016	10.08					
	12/2/2016	4.19				 	
MW-10	2/21/2017	3.74					
	5/25/2017	5.80					
	8/10/2017	9.41					
	11/21/2017	9.03	T				

Table 3Field ParametersGroundwater Monitoring and Investigation Report – December 2016 to November 2017Snohomish Square Cleaners1419 Avenue D and 13th Street SE, Snohomish, Washington

Sample ID	Sample Date	Depth to Water (feet)	рН	Conductivity (ms/cm ²)	DO (mg/L)	Temperature (°C)	ORP (mv)
	2/12/2016	5.23	5.89	0.133	6.40	13.62	337.7
	5/19/2016	7.55	5.71	0.248	0.34	14.02	27.7
	8/30/2016	10.28	6.09	0.663	0.45	17.63	-1.9
MW-11	12/2/2016	5.56					
	2/20/2017	5.03					
	5/25/2017	6.36					
	8/10/2017	9.13					
	11/21/2017 2/12/2016	NA 9.67	5.47	0.329	4.90	12.53	265.9
	5/19/2016	9.07 11.09	5.30	0.329	4.90 4.35	12.55	265.9 157.2
	8/30/2016	13.34	J.JU 				
	12/2/2016	9.51					
MW-12	2/20/2017	9.46	 			 	
	5/25/2017	10.05					
	8/10/2017	15.55					
	11/21/2017	12.36					
	2/11/2016	18.09	5.69	0.290	1.25	13.48	364.4
	5/20/2016	18.92	5.44	0.270	2.92	15.24	150.6
	8/30/2016	19.85					
NNN 40	12/2/2016	18.10					
MW-13	2/20/2017	18.02					
	5/25/2017	18.38					
	8/10/2017	19.66	5.01	0.255	3.04	16.18	226.0
	11/21/2017	19.78	5.67	0.160	3.08	14.9	278.0
	2/11/2016	11.29	6.00	0.117	4.40	12.82	303.4
	5/19/2016	11.95	5.62	0.088	5.97	13.31	194.9
	8/30/2016	13.34					
MW-14	12/2/2016	11.14					
	2/20/2017	11.24					
	.						
	.					14.71	188.2
						17.13	274.4
						15.06	91.2
5/25/2017 11.64 8/10/2017 12.78 11/21/2017 12.21 11/21/2017 12.21 5/17/2016 8.42 5.74 0.143 8/30/2016 10.42 5.56 0.185 12/1/2016 6.48 5.79 0.182 12/1/2016 6.48 5.79 0.182 2/21/2017 6.36 5.93 0.168 5/25/2017 7.51 5.78 0.154 8/9/2017 12.50 4.42 0.143 11/21/2017 9.47 5.81 0.155 MW-16 8/8/2017 15.72 6.76 0.168 11/21/2017 15.36 MW-17 8/8/2017 18.54 6.78 0.365		12.6	195.2				
	8/10/2017 12.78 11/21/2017 12.21 5/17/2016 8.42 5.74 0.143 3.56 8/30/2016 10.42 5.56 0.185 0.95 12/1/2016 6.48 5.79 0.182 2.98 MW-15 2/21/2017 6.36 5.93 0.168 3.69 5/25/2017 7.51 5.78 0.154 3.32 8/9/2017 12.50 4.42 0.143 0.32 11/21/2017 9.47 5.81 0.155 0.83 MW-16 8/8/2017 15.72 6.76 0.168 0.81 11/21/2017 15.36 MW-17 8/8/2017 18.54 6.78 0.365 1.60	14.8	144.5				
						<u>18.43</u> 14.9	294.9 65.9
						16.06	-83.9
MW-16	.						-03.9
						15.20	74.7
MW-17	11/21/2017	22.02	7.03	0.480	1.10	11.8	249.7
	8/10/2017	19.20	7.51	0.487	0.30	16.46	-442.5
MW-18	11/21/2017	22.03					
	2/10/2016	1.64	6.10	0.144	6.79	10.26	295.3
	5/18/2016	2.46	5.83	0.155	5.41	15.41	156.8
	8/30/2016	2.71					
	12/2/2016	2.08					
GW-1	2/20/2017	1.31					
	5/26/2017	1.30					
	8/10/2017	2.83					
	11/21/2017	1.64					
	2/10/2016	3.13	6.68	0.169	7.62	9.22	298.5
	5/18/2016	3.15	6.30	0.178	5.75	16.65	169.5
	8/30/2016	3.34					
GW-3	12/2/2016	2.93					
-	2/20/2017	3.02					
	5/26/2017	3.17					
	8/10/2017	3.41					
	11/21/2017	2.91					
	2/10/2016 5/17/2016	2.78 3.40	6.39 5.74	0.110 0.169	1.03 1.46	9.26 14.08	283.7 237.9
	8/30/2016	3.40 3.39	5.74 5.76	0.169	0.76	14.08	237.9
	12/2/2016	3.39 3.28	5.76 6.14	0.243	0.76 1.02	11.70	47.0
GW-4	2/20/2017	3.20 2.86	6.25	0.105	1.68	8.1	47.0
	5/25/2017	2.00 3.08	6.10	0.131	0.47	12.5	107.2
	8/8/2017	3.40	5.71	0.130	0.47	18.95	199.5
	11/21/2017	2.85	6.05	0.158	1.16	11.5	268.2
	2/10/2016	4.60	6.36	0.363	1.62	10.89	281.0
	5/18/2016	5.04	6.06	0.283	1.41	13.49	151.3
	8/30/2016	5.42					
0.47 -	12/2/2016	4.07	 	••••••••••••••••••••••••••••••••••••••			
GW-5	2/20/2017	4.19	 	••••••••••••••••••••••••••••••••••••••			
	5/26/2017	4.76					
	8/10/2017	5.44					
	0/10/2011						

Table 3Field ParametersGroundwater Monitoring and Investigation Report – December 2016 to November 2017Snohomish Square Cleaners1419 Avenue D and 13th Street SE, Snohomish, Washington

Sample ID	Sample Date	Depth to Water (feet)	рН	Conductivity (ms/cm ²)	DO (mg/L)	Temperature (°C)	ORP (mv)
	2/10/2016	3.92	6.36	0.168	2.63	10.17	298.0
	5/18/2016	4.08	6.09	0.151	1.30	15.91	164.6
	8/30/2016	4.21	6.06	0.219	0.61	20.23	166.9
GW-6	12/2/2016	3.66					
GVV-0	2/20/2017	3.67					
	5/26/2017	3.95					
	8/10/2017	4.25					
	11/21/2017	NA					
	2/11/2016	2.67	6.20	0.185	8.92	9.41	283.9
	5/20/2016	3.99	5.62	0.171	7.95	15.42	196.3
	8/30/2016	4.56					
	12/2/2016	2.19					
GW-7	2/20/2017	2.11					
	5/26/2017	3.26					
	8/10/2017	4.53					
	11/21/2017	3.15					
	2/11/2016	2.39	6.01	0.213	3.05	9.71	318.3
	5/20/2016	3.04	5.65	0.200	1.13	15.51	198.7
	8/30/2016						
0.44	12/2/2016						
GW-8	2/20/2017						
	5/26/2017	2016 3.99 5.62 0.171 7.95 2016 4.56 2017 2.19 2017 2.11 2017 3.26 2017 3.26 2017 3.15 2016 2.39 6.01 0.213 3.05 2016 3.04 5.65 0.200 1.13 2016 3.57 2017 2.71 2017 2.50 2017 2.51 2016 2.66 6.38 0.247 0.29 2016 2.84 6.11 0.230 0.33 2016 2.34 2017 2.70 2017 2.70 2017 2.30 2017 2.30 2016 23.21 6.19 0.341 0.53 2016 23.86 6.15 0.440 0.69					
	8/10/2017						
	11/21/2017						
	2/11/2016		6.38	0.247	0.29	9.38	216.0
	5/20/2016					16.89	33.0
	8/30/2016						
	12/2/2016						
GW-9	2/20/2017						
	5/26/2017						
	8/10/2017						
	11/21/2017						
	2/11/2016		5 89	0 248	3 11	12.71	347.7
	5/20/2016					13.69	-20.2
	8/30/2016					15.97	-13.4
	12/2/2016	20.94					
GW-10	2/20/2017	20.89					
	5/25/2017	22.07					
	8/10/2017	23.95	5.71	0.383	1.05	17.55	-42.3
	11/21/2017	22.79					
	2/9/2016	18.52	5.83	0.214	2.79	14.87	319.4
	5/17/2016	19.92	5.56	0.227	2.13	14.01	255.3
	8/30/2016	20.68	5.34	0.260	2.10	15.76	282.5
	12/2/2016	18.54	5.58	0.200	1.55	13.55	105.6
GW-11	2/20/2017	18.02	5.75	0.355	2.89	13.3	186.2
	5/24/2017	19.18	5.76	0.321	2.03	14.6	187.4
	8/9/2017	20.58	5.81	0.374	1.57	17.25	100.9
	11/21/2017	19.34	5.89	0.303	2.36	13.9	200.2

Notes:

a Could not open well.

* Well went dry while purging

NA Well not accessible.

NM Not measured.

Compounds:

DO Dissolved oxygen ORP Oxidation-reduction potential

ENVIRONMENTAL PARTNERS INC

Table 4 Substrate Injection Amounts Groundwater Monitoring and Investigation Report – December 2016 to November 2017 Snohomish Square Cleaners

1419 Avenue D and 13th Street SE, Snohomish, Washing	ton
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Well	3/29/2016	3/30/2016	3/31/2016	4/5/2016	4/6/2016	4/7/2016	4/8/2016	4/12/2016	4/13/2016	2/22/2017	2/23/2017	2/24/2017	12/4/2017	12/5/2017	1/15/2018	1/16/2018	Total
IJ-1			245		155						550						950 *
IJ-2				400							180						580 *
IJ-3				175	225						625						1,025 *
IJ-4				400						105	295			300			1,100 *
IJ-5			400							400				300			1,100
IJ-6			400							400							800
IJ-7			400							195							595
IJ-8					400							550					950
IJ-9		35	30				120	90	100								375
IJ-10							25	85	90								200 *
IJ-11		375															375 *
IJ-12	40	335															375
IJ-13													140		275		415
IJ-14													935	600	1,100	1,100	3,735
MW-3						140	100										240 *
MW-4							230	150									380
GW-10				165	235												400
MW-11							375										375
EIW-E						1,080											1,080
EIW-W					650	430											1,080
											Total Injec	ted Amount:					16,130

Notes:

Injection amounts in gallons.

Method: Pressurized injection using injection pump.

* Part of injection was gravity fed.

-- No injection at this well.

Table 5Survey and Depth to Groundwater DataGroundwater Monitoring and Investigation Report – December 2016 to November 2017Snohomish Square Cleaners1419 Avenue D and 13th Street SE, Snohomish, Washington

Monitoring Well ID	Top of Casing Elevation ^a (feet)	Depth to Groundwater ^b (feet below TOC)	Groundwater Elevation (feet)
GW-1	144.8	2.48	142.32
GW-2	144.99	NM	NM
GW-3	144.34	3.28	141.06
GW-4	144.24	3.25	140.99
GW-5	144.78	5.20	139.58
GW-6	144.78	4.11	140.67
GW-7	147.53	4.18	143.35
GW-8	146.30	3.30	143.00
GW-9	146.37	3.44	142.93
GW-10	168.38	22.82	145.56
GW-11	164.24	20.22	144.02
MW-1	162.20	9.62	152.58
MW-2	164.41	11.68	152.73
MW-3	161.57	9.05	152.52
MW-4	161.09	8.15	152.94
MW-5	169.51	10.98	158.53
MW-6	165.61	14.76	150.85
MW-7	163.64	11.41	152.23
MW-8	163.75	11.43	152.32
MW-9	163	9.90	153.10
MW-10*	161.18	8.29	152.89
MW-11*	160.85	8.19	152.66
MW-12*	163.34	11.61	151.73
MW-13*	167.24	19.19	148.05
MW-14*	163.83	12.20	151.63
MW-15*	161.30	8.96	152.34
MW-16*	167.67	14.96	152.71
MW-17*	166.24	17.89	148.35
MW-18*	166.14	18.54	147.60

Notes:

All results presented in feet using North American Vertical Datum 1988 (NAVD88).

Survey data provided from *Remedial Investigation and Focused Feasibility Study, Snohomish County Shop Upper Terrace, 1200 Block of Avenue D, Snohomish, Washington.*

* Pace Survey 7/11/17.

a Surveyed by Snohomish County surveyors using State Plane Coordinate System. Benchmark for survey: brass plug in concrete on west side of Bickford Rd at SE corner of building. Snohomish County Point ID#248 Designation #5501. NAVD88, Elevation = 136.31'.

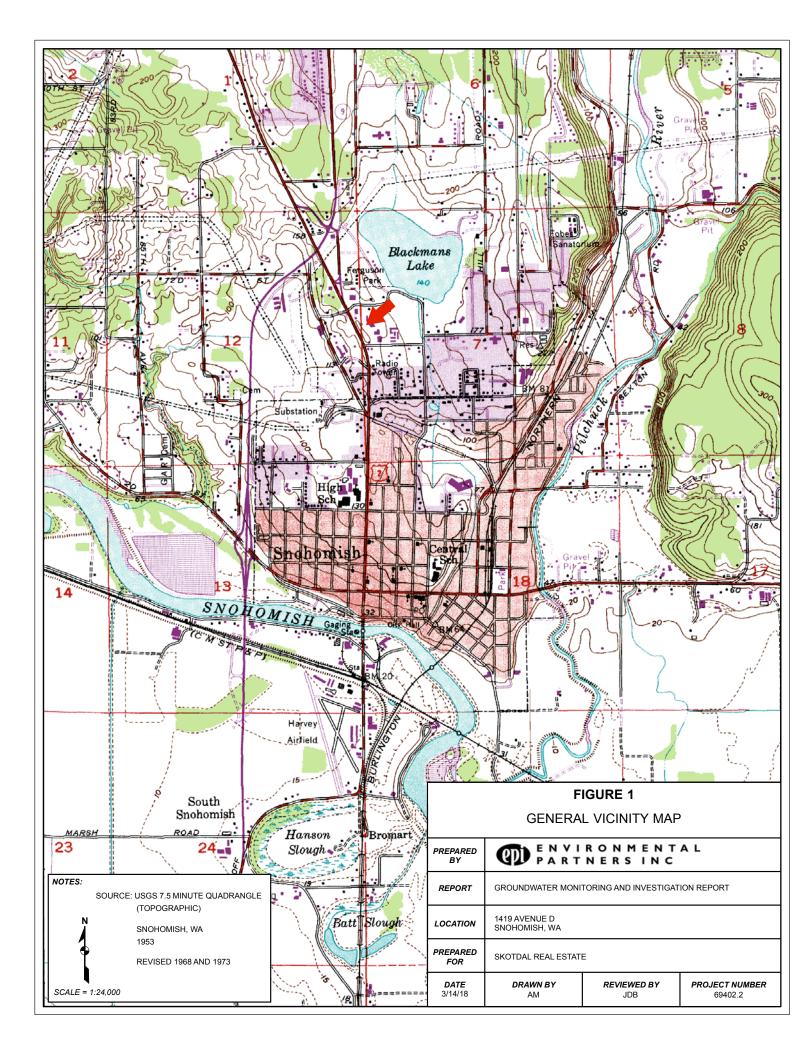
b Depth to water measured by EPI on July 11, 2017.

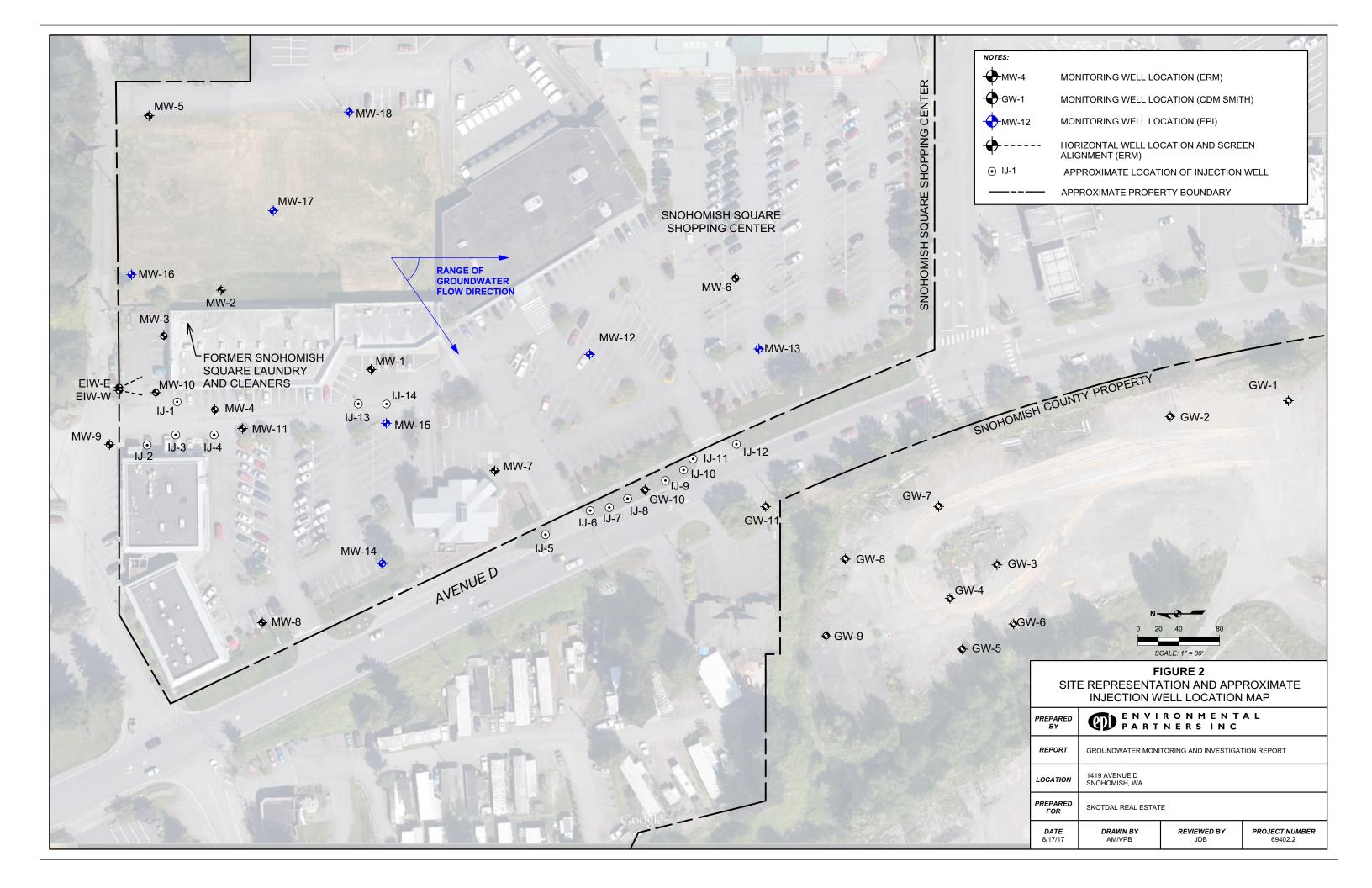
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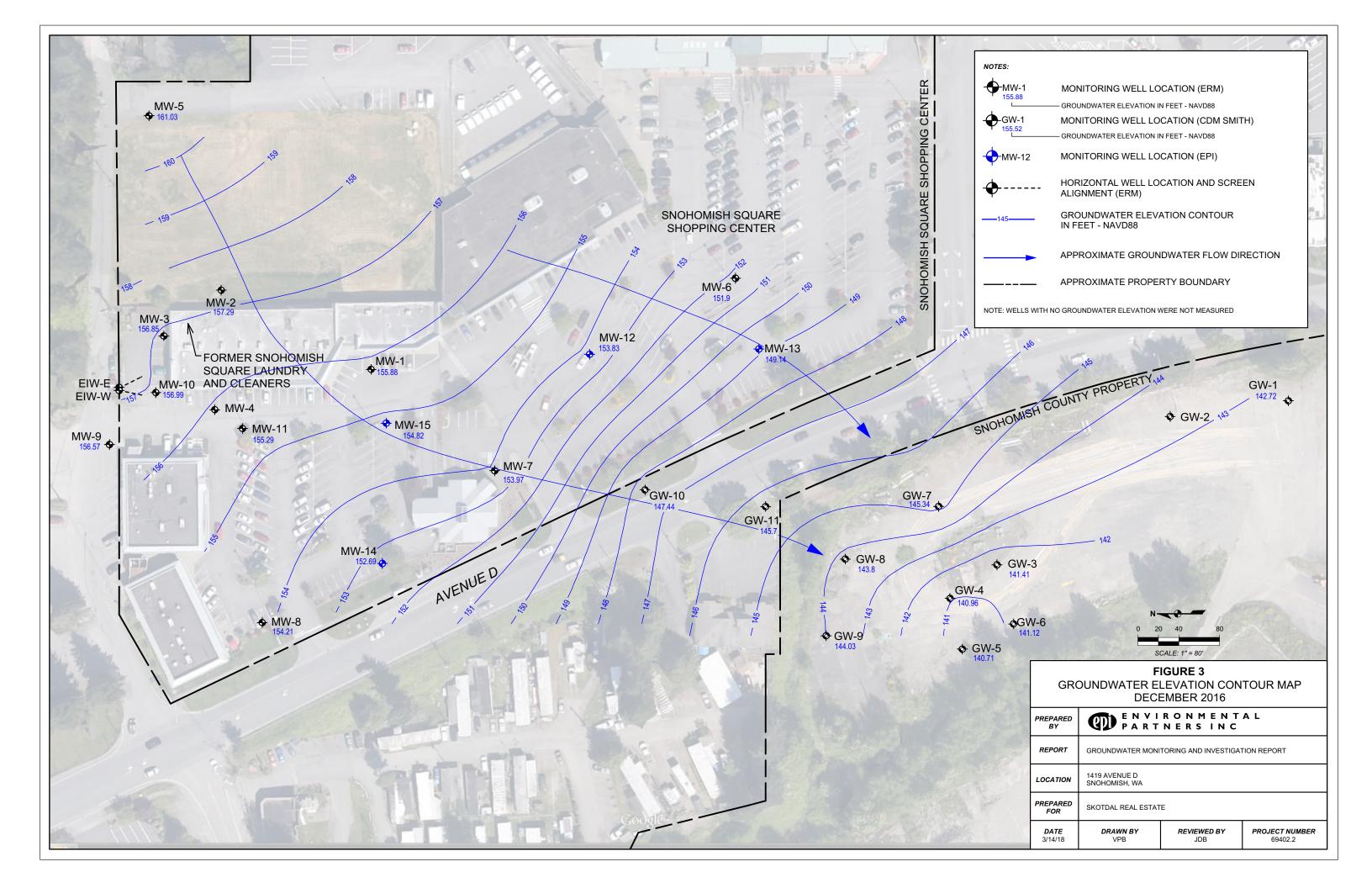
NM Not measured.

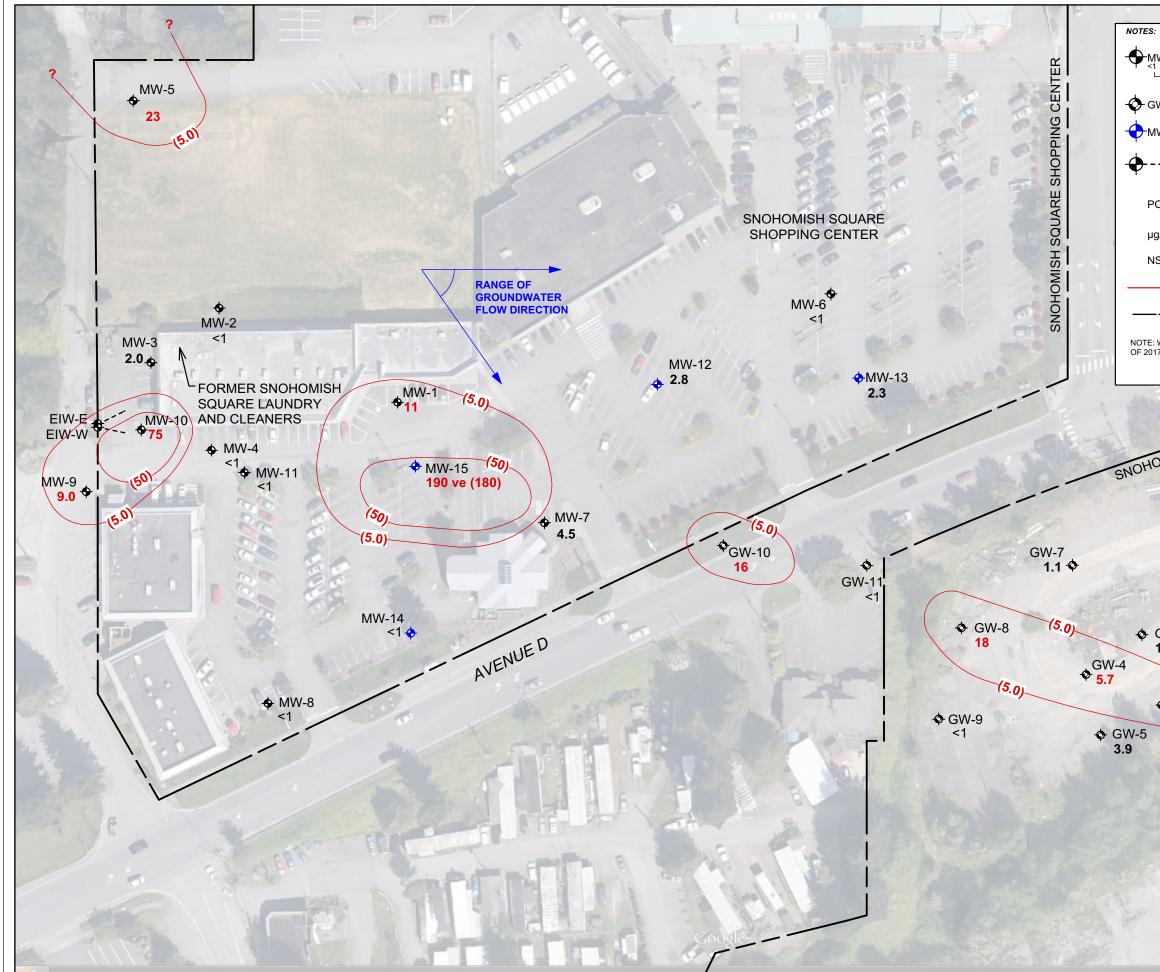
ENVIRONMENTAL PARTNERS INC

Figures

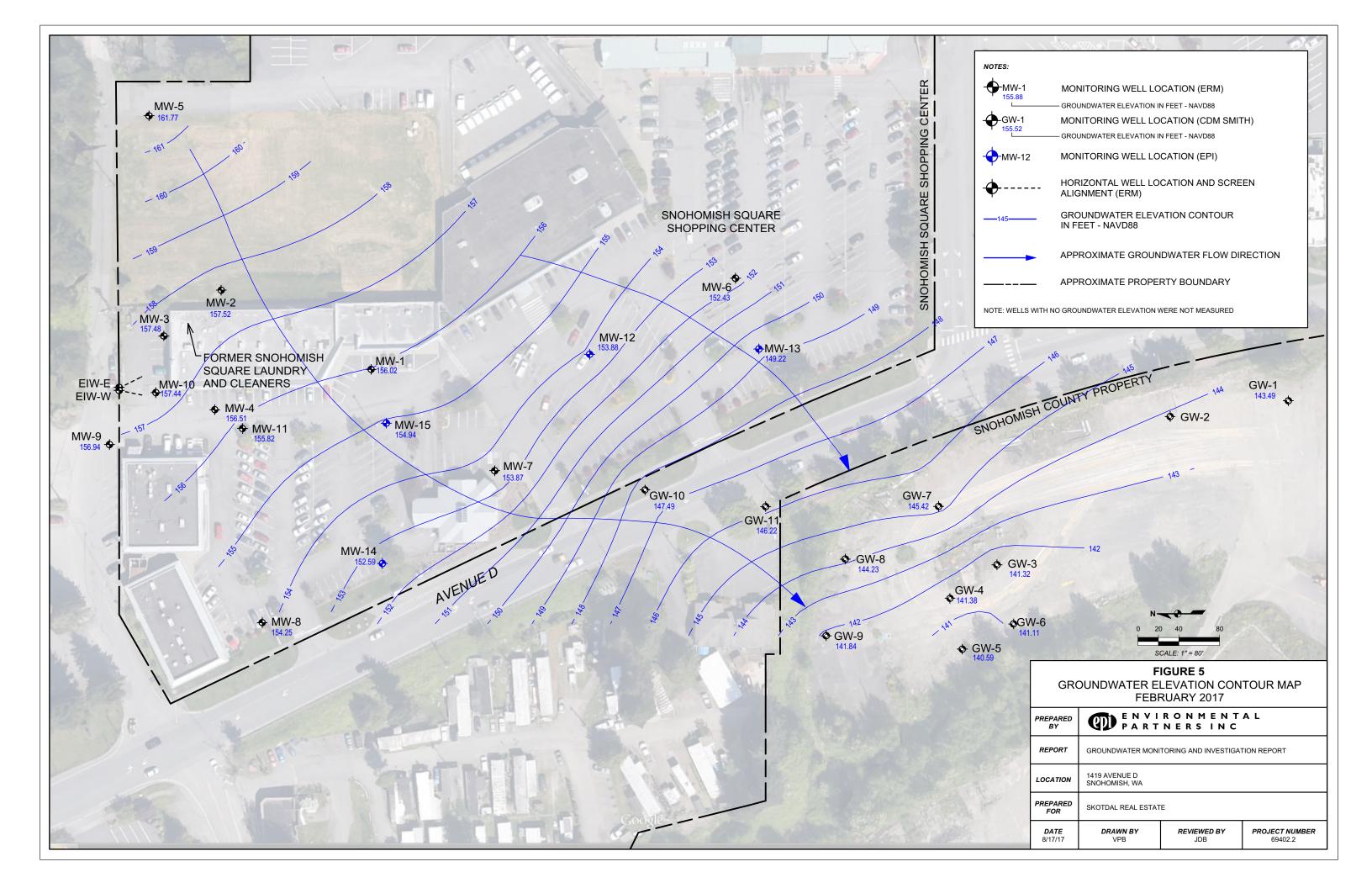


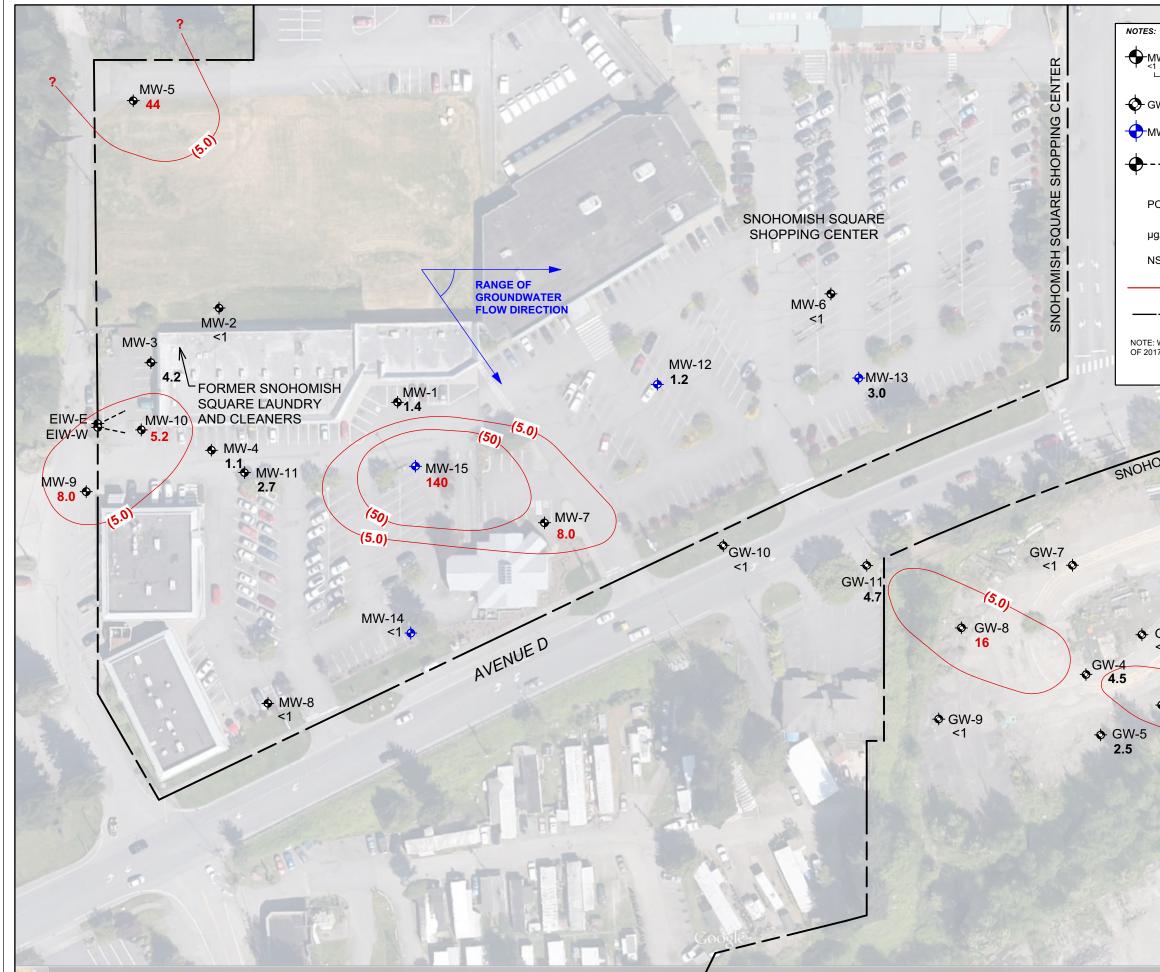




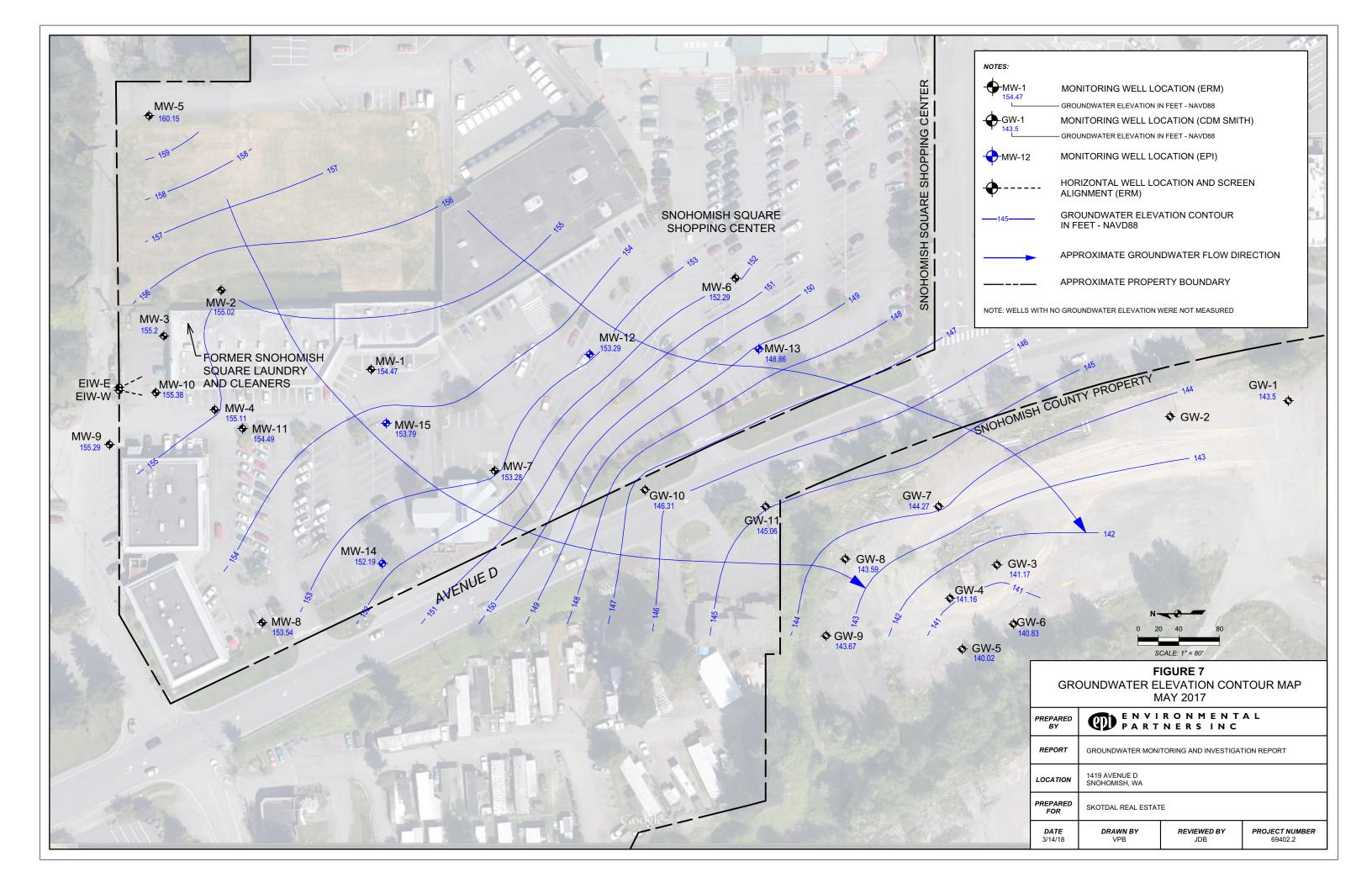


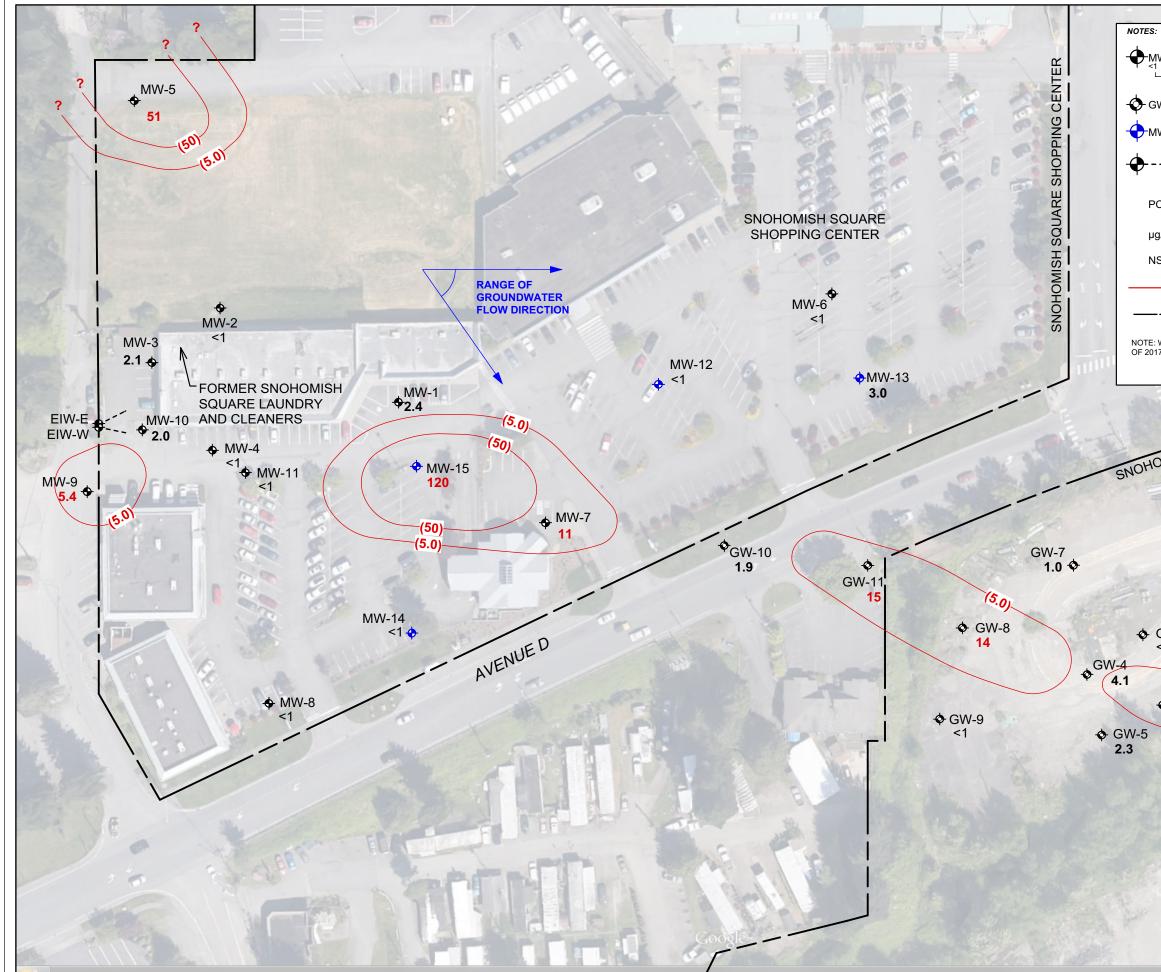
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1.2	W-6 .6	0 20 S F EPRESENTATION W WELLS AND PCE	0 40 80 <i>CALE: 1" = 80'</i> IGURE 4 <i>V</i> ITH GROUNDWATE	ER 2016
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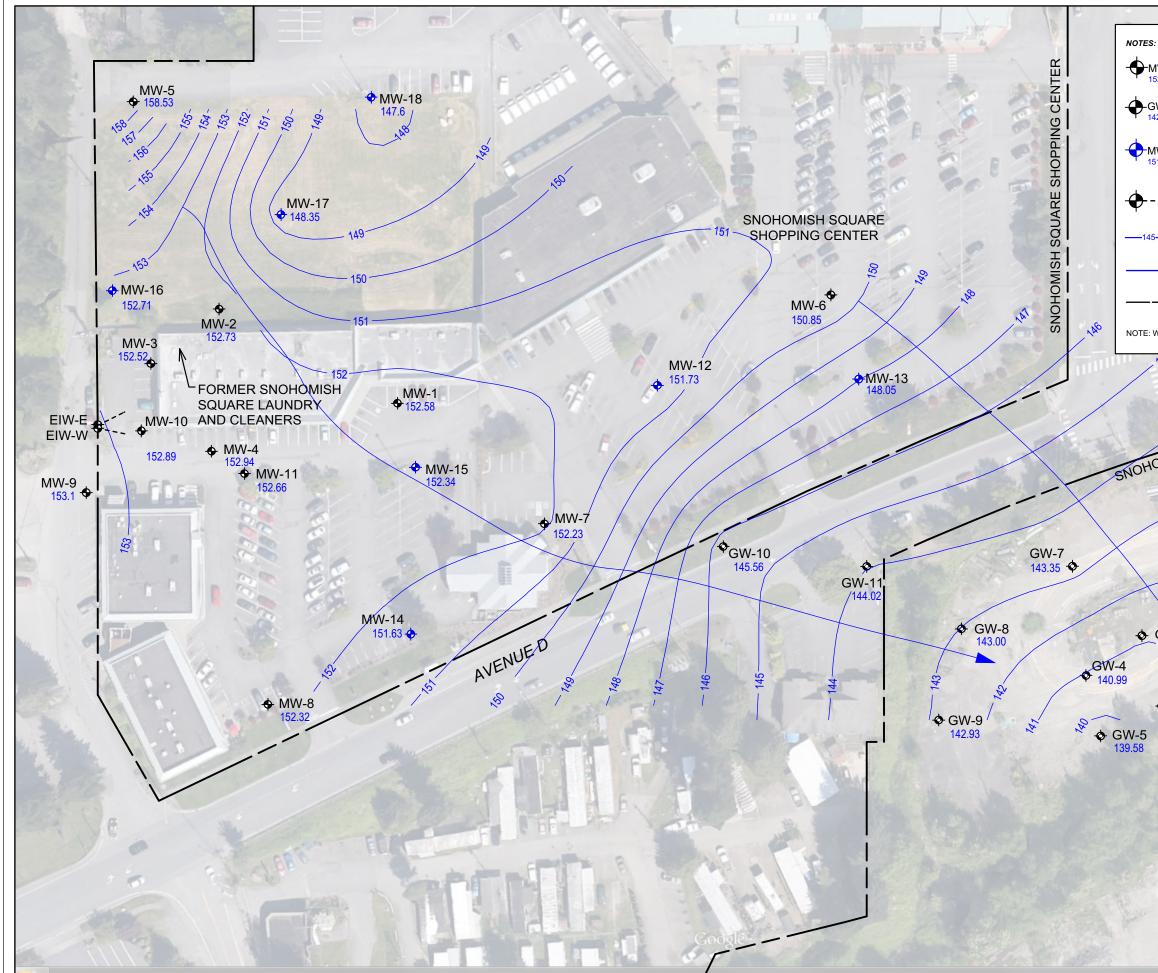


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		RIZONTAL WELL LO GNMENT (ERM)	CATION AND SCRE	EN
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	REPORT	GROUNDWATER MONI	TORING AND INVESTIGAT	TION REPORT
	LOCATION	1419 AVENUE D SNOHOMISH, WA		
	PREPARED FOR	SKOTDAL REAL ESTAT	Έ	
	DATE 3/14/18	DRAWN BY VPB	REVIEWED BY JDB	PROJECT NUMBER 69402.2

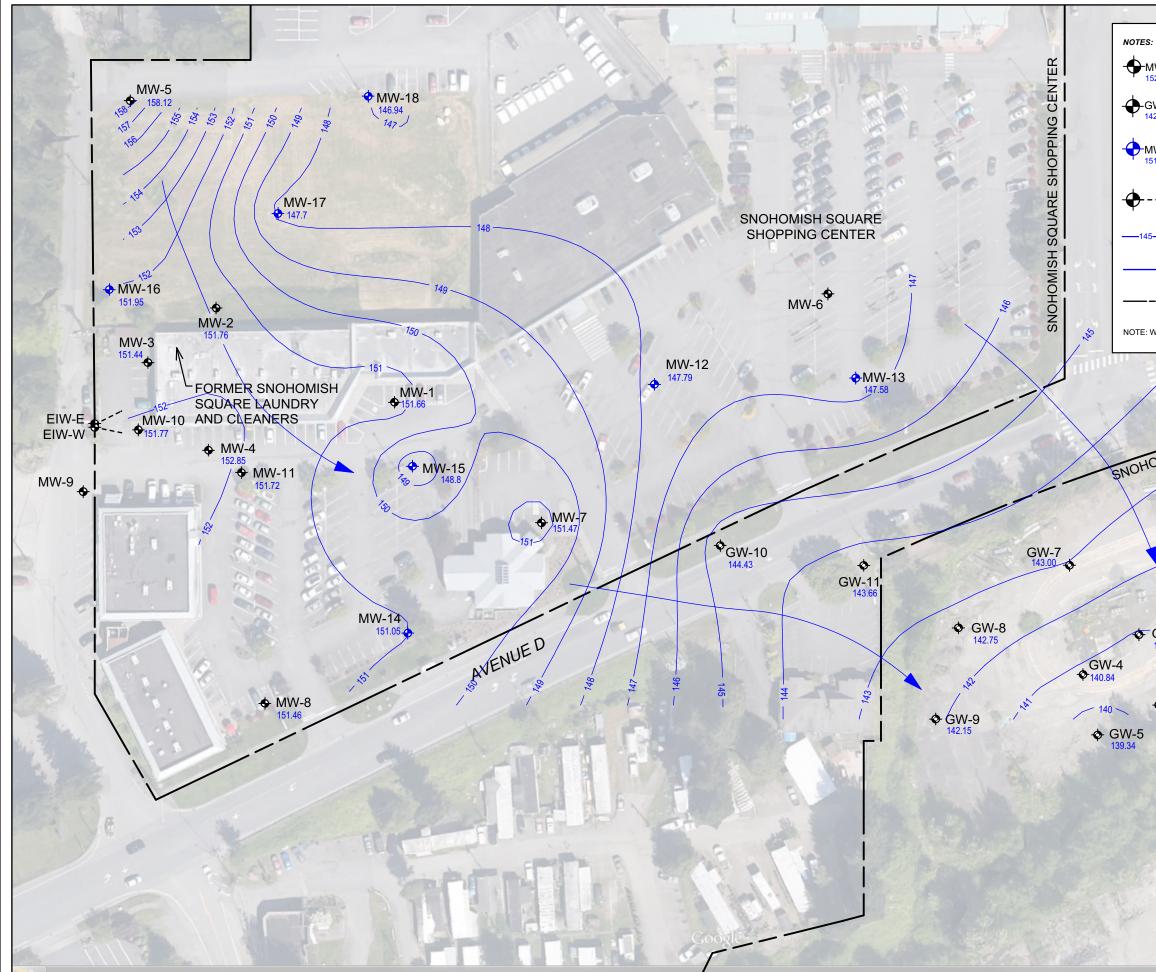




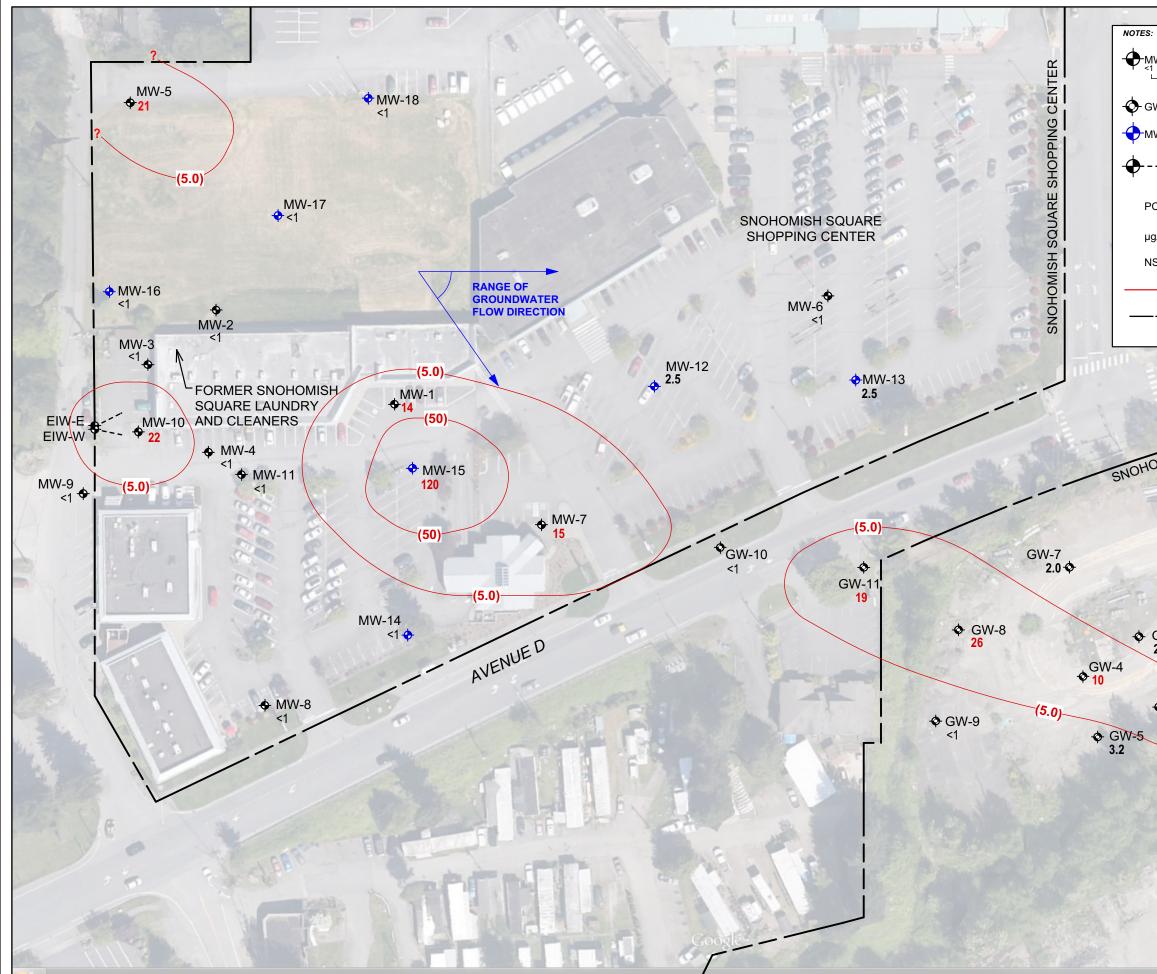
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		RIZONTAL WE GNMENT (ERM		CATION AND SCRE	EN	6.2
		- X	,			27
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IS	NOT	SAMPLED				*
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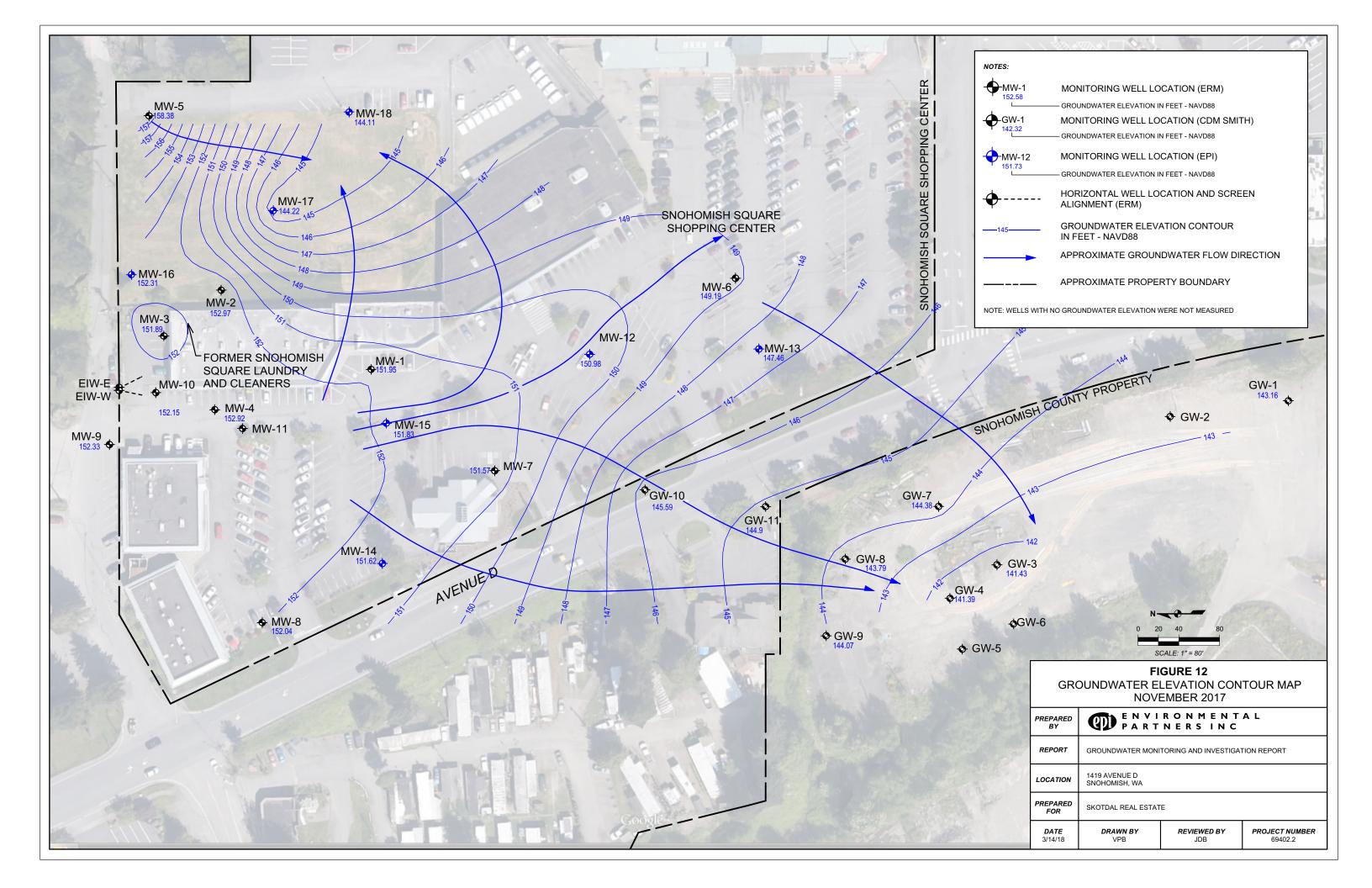
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	_ APP	ROXIMATE PROPE	RTY BOUNDARY	
	WITH NO GRO	UNDWATER ELEVATION	WERE NOT MEASURED	
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	PREPARED BY	P A R T	RONMENT NERSINC	A L
3	REPORT	GROUNDWATER MON	ITORING AND INVESTIGA	
31	LOCATION	1419 AVENUE D SNOHOMISH, WA		
	PREPARED FOR	SKOTDAL REAL ESTA	TE	
	DATE 3/14/18	DRAWN BY AM/VPB	REVIEWED BY JDB	PROJECT NUMBER 69402.2

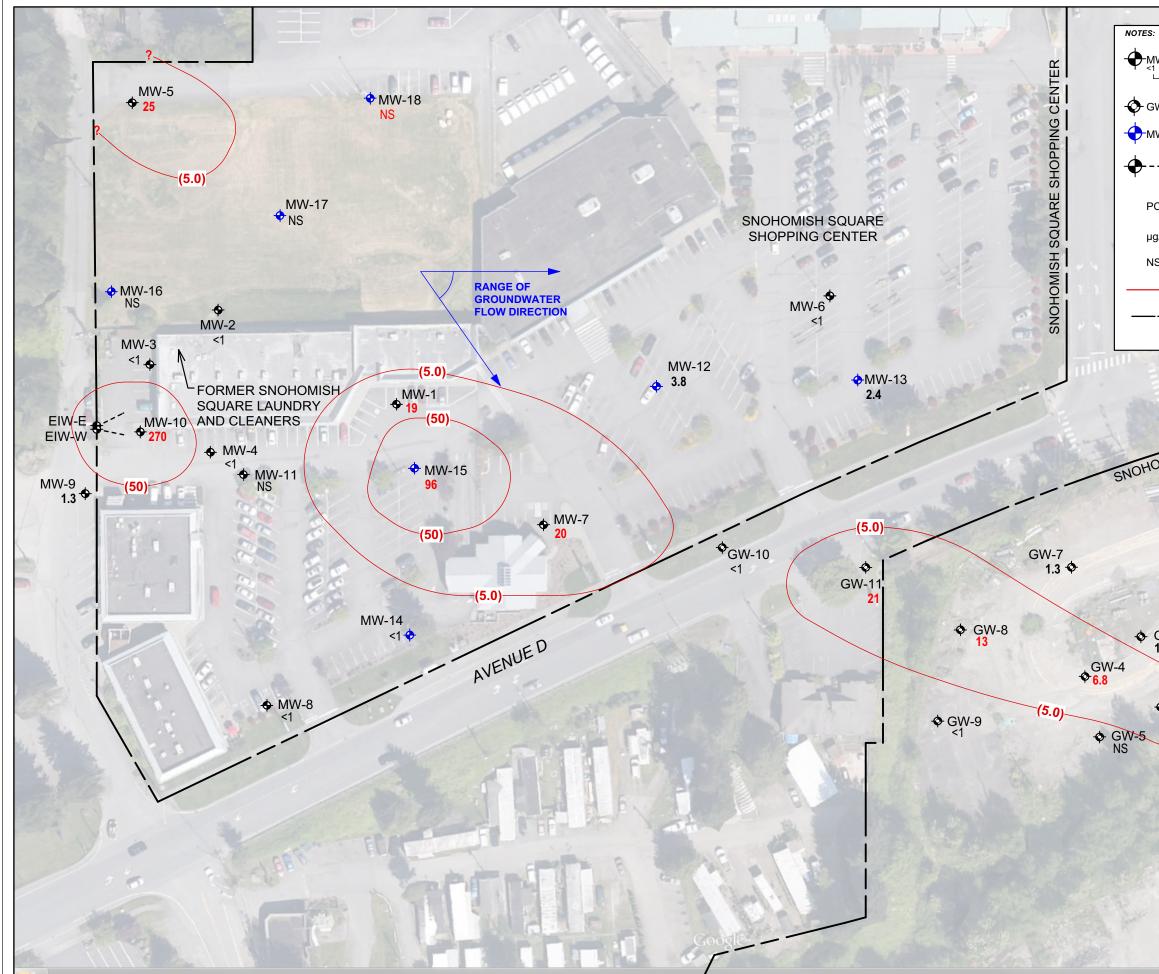


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4W-12 51.73		NITORING WELL LO		
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	ALIO	GNMENT (ERM)		
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	_ APP	ROXIMATE PROPEI	RTY BOUNDARY	
		UNDWATER ELEVATION V	VERE NOT MEASURED	600
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	PREPARED BY	ENVI PART	R O N M E N T N E R S I N C	A L
	REPORT	GROUNDWATER MONI	TORING AND INVESTIGAT	TION REPORT
31	LOCATION	1419 AVENUE D SNOHOMISH, WA		
	PREPARED FOR	SKOTDAL REAL ESTAT	Ē	
	DATE 3/14/18	DRAWN BY AM/VPB	REVIEWED BY JDB	PROJECT NUMBER 69402.2
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1 W-4	PCE (NITORING WELL LO CONCENTRATION IN µg/L RED REPRESENTS A DE NUP LEVELS	CATION (ERM) (TYP). BOLD REPRESEN [®] TECTION ABOVE MTCA N	TS A DETECTION, IETHOD A
SW-1			CATION (CDM SMIT	гн)
1W-12	2 MON	NITORING WELL LO	CATION (EPI)	
		RIZONTAL WELL LO GNMENT (ERM)	CATION AND SCRE	EN
PCE	TET	RACHLOROETHEN	E	
g/L	MIC	ROGRAMS PER LIT	ER	
IS	NOT	SAMPLED		
	PCE	CONCENTRATION	ISOCONTOUR IN µ	g/L
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	PREPARED BY	PART	R O N M E N T N E R S I N C	A L
	REPORT	GROUNDWATER MONI	TORING AND INVESTIGAT	TION REPORT
	LOCATION	1419 AVENUE D SNOHOMISH, WA		
	PREPARED FOR	SKOTDAL REAL ESTAT	Ē	
	DATE	DRAWN BY	REVIEWED BY	PROJECT NUMBER
	3/14/18	VPB	JDB	69402.2





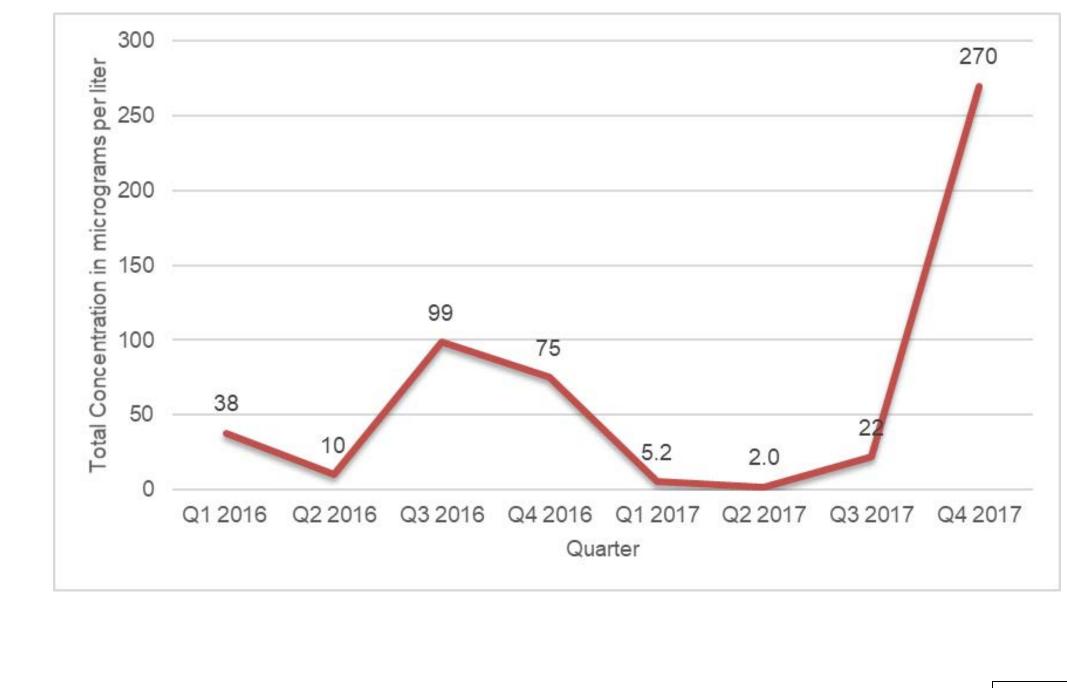
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		RIZONTAL WELL LO GNMENT (ERM)	CATION AND SCRE	EN	
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	PCE	CONCENTRATION	ISOCONTOUR IN µ	g/L	
	— APP	ROXIMATE PROPE	RTY BOUNDARY	2	
GW-		TY PROPERTY	GW-2 NS	<1 🚸	
¢GW-6 NS SCALE: 1" = 80'					
FIGURE 13 SITE REPRESENTATION WITH GROUNDWATER MONITORING WELLS AND PCE PLUME - NOVEMBER 2017					
	PREPARED BY ENVIRONMENTAL PARTNERSINC				
	REPORT	GROUNDWATER MONI	TORING AND INVESTIGAT	FION REPORT	
	LOCATION	1419 AVENUE D SNOHOMISH, WA			
	PREPARED FOR	SKOTDAL REAL ESTAT	Ē		
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PCE TETRACHLOROETHENE

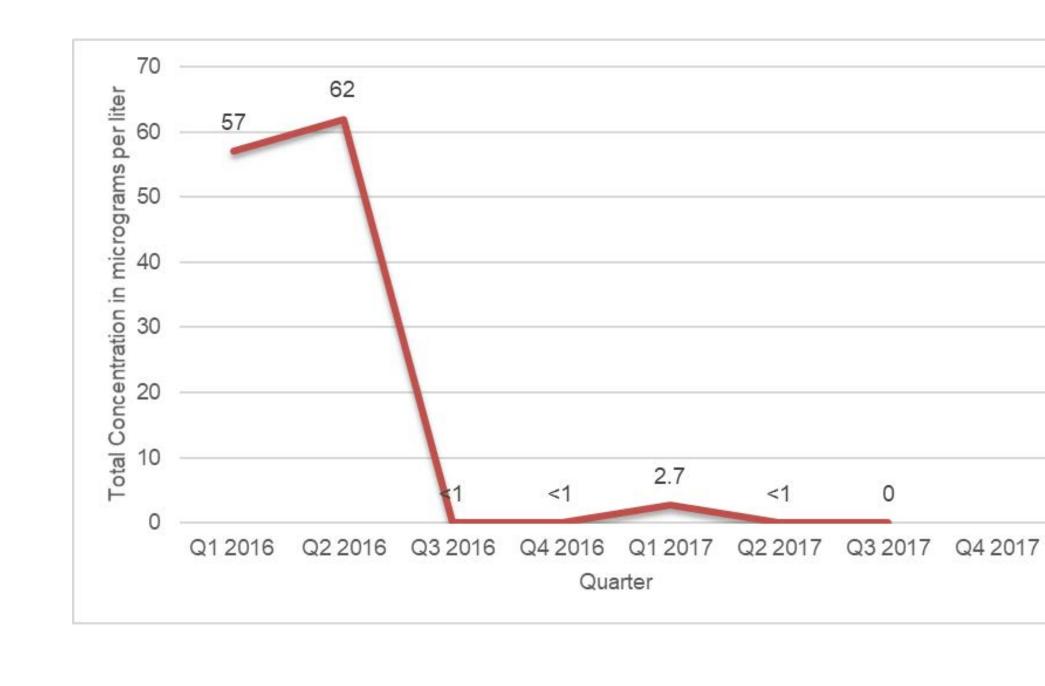
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FIGURE 14A				
_		MW-15		
F	PCE CONCENT	RATION VERSU	STIME	
PREPARED BY ENVIRONMENTAL PARTNERSINC				
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT			
LOCATION	1419 AVENUE D SNOHOMISH, WA			
PREPARED FOR	SKOTDAL REAL ESTATE			
DATE 3/2/18	CREATED BY CSW	REVIEWED BY JB	PROJECT NUMBER 69402.2	



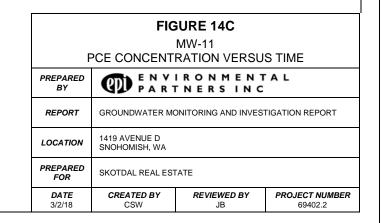
PCE TETRACHLOROETHENE

FIGURE 14B				
		MW-10		
	PCE CONCENT	RATION VERSU	S TIME	
PREPARED BY PARTNERS IN C				
REPORT	GROUNDWATER MO	GROUNDWATER MONITORING AND INVESTIGATION REPORT		
LOCATION	1419 AVENUE D SNOHOMISH, WA			
PREPARED FOR	SKOTDAL REAL ESTATE			
DATE 3/2/18	CREATED BY CSW	REVIEWED BY JB	PROJECT NUMBER 69402.2	



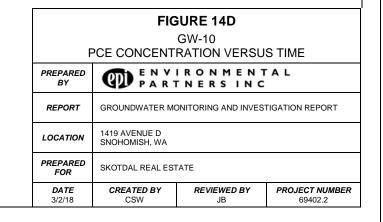
TETRACHLOROETHENE

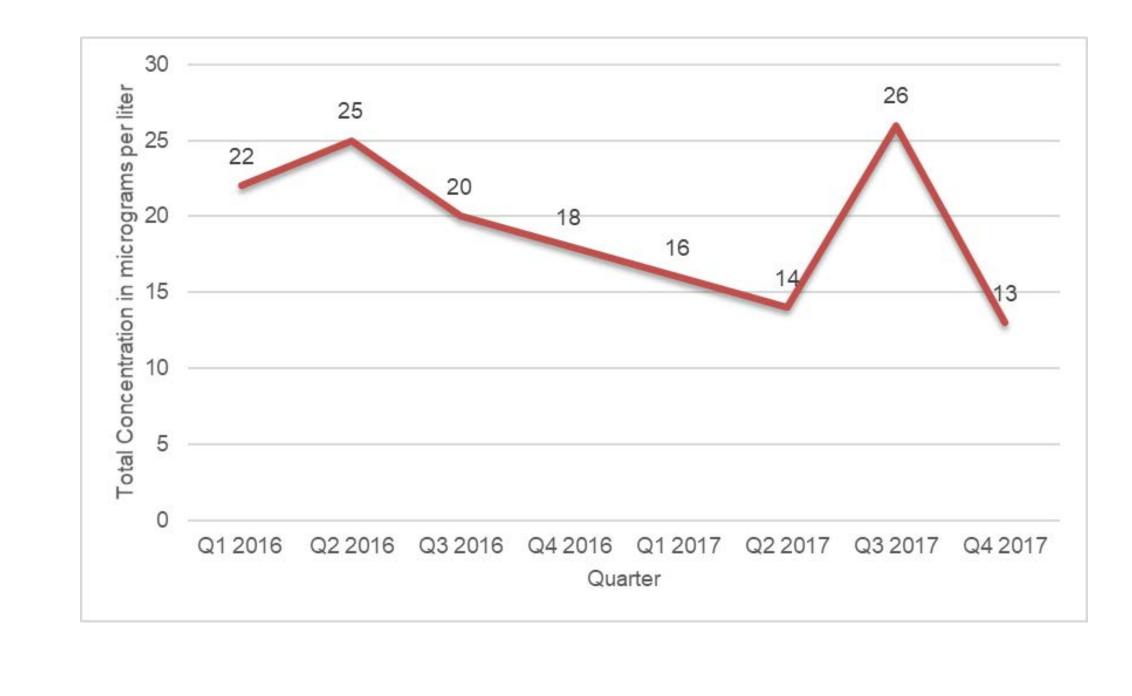
PCE





PCE TETRACHLOROETHENE





PCE TETRACHLOROETHENE

FIGURE 14E				
		GW-8		
l i	PCE CONCENT	RATION VERSU	S TIME	
PREPARED BY ENVIRONMENTAL PARTNERSINC				
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT			
LOCATION	1419 AVENUE D SNOHOMISH, WA			
PREPARED FOR	SKOTDAL REAL ESTATE			
DATE 3/2/18	CREATED BY CSW	REVIEWED BY JB	PROJECT NUMBER 69402.2	

Attachment A Laboratory Analytical Results

ENVIRONMENTAL CHEMISTS

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

March 14, 2017

Josh Bernthal, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 702293

Dear Mr Bernthal:

Included are the results from the testing of material submitted on February 21, 2017 from the 69402, F&BI 702293 project. There are 27 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon EPI0314R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 21, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 702293 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	Environmental Partners
702293 -01	GW-4
702293 -02	GW-11
702293 -03	MW-2
702293 -04	MW-3

The samples were sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the samples were sent to ALS-Simi for carbon dioxide analysis. ALS-Simi received HCl preserved VOAs for GW-11, MW-2, and MW-3 which will bias CO2 concentrations high. Therefore unpreserved VOAs were sent to ALS for GW-11 and MW-3. There were no unpreserved VOAs available for MW-2. The results of GW-11 and MW-3 carbon dioxide testing will be forwarded to your office upon completion. The available results from Amtest and ALS are included.

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	GW-4 02/21/17 02/23/17 02/23/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 702293 702293-01 702293-01.073 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		<50 8.20		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	GW-11 02/21/17 02/23/17 02/23/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 702293 702293-02 702293-02.074 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		108 3.00		

ENVIRONMENTAL CHEMISTS

Client ID:	MW-2		Client:	Environmental Partners
Date Received:	02/21/17		Project:	69402, F&BI 702293
Date Extracted:	02/23/17		Lab ID:	702293-03
Date Analyzed:	02/23/17		Data File:	702293-03.075
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:	ч8, <u>т</u> (ррз)	Concentration ug/L (ppb)	operatori	
Iron Manganese		<50 2.54		

ENVIRONMENTAL CHEMISTS

MW-3 02/21/17 02/23/17 02/23/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 702293 702293-04 x10 702293-04 x10.076
Water		Instrument:	ICPMS2
ug/L (ppb)		Operator:	SP
	Concentration ug/L (ppb)		
	33,900 5 000		
	02/21/17 02/23/17 02/23/17 Water	02/21/17 02/23/17 02/23/17 Water ug/L (ppb) Concentration ug/L (ppb)	02/21/17 Project: 02/23/17 Lab ID: 02/23/17 Data File: Water Instrument: ug/L (ppb) Operator: Concentration ug/L (ppb) 33,900

ENVIRONMENTAL CHEMISTS

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702293
Date Extracted:	02/23/17	Lab ID:	I7-091 mb
Date Analyzed:	02/23/17	Data File:	I7-091 mb.062
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	GW-4 02/21/17 02/21/17 02/21/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 702293 702293-01 702293-01.034 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		123		
Manganese		149		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed:	GW-11 02/21/17 02/21/17 02/21/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 702293 702293-02 702293-02.037
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		147 3.99		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Anglumed:	MW-2 02/21/17 02/21/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 702293 702293-03 702202 02 040
Date Analyzed:	02/21/17		Data File:	702293-03.040
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		170		
Manganese		6.35		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-3 02/21/17 02/21/17 02/21/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 702293 702293-04 x10 702293-04 x10.045 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		37,500 5,170		

ENVIRONMENTAL CHEMISTS

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	I7-088 mb
Date Analyzed:	02/21/17	Data File:	I7-088 mb.026
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-4 02/21/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702293 702293-01 022329.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	97	57	121
Toluene-d8	uı	103	63	127
4-Bromofluorobenzene		103	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride		<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroethene		<1		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		4.5		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-11 02/21/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702293 702293-02 022330.D GCMS4 JS
Surrogates: 1,2-Dichloroethane	-d4	% Recovery: 101	Lower Limit: 57	Upper Limit: 121
Toluene-d8	uı	101	63	127
4-Bromofluorobenzene		101	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	•	<1		
Methylene chloride	<u>)</u>	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroethene		<1		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		4.7		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-2 02/21/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702293 702293-03 022331.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4		99	57	121
Toluene-d8		103	63	127
4-Bromofluorobenzene		102	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride		<5		
trans-1,2-Dichloroethene		<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroethene		<1		
1,2-Dichloroethane (EDC)		<1		
1,1,1-Trichloroethane		<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-3 02/21/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702293 702293-04 022332.D GCMS4 JS
Surrogates: 1,2-Dichloroethane-d4 Toluene-d8 4-Bromofluorobenzene		% Recovery: 98 101 103	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroethene 1,1-Dichloroethane cis-1,2-Dichloroethene 1,2-Dichloroethane (EDC) 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene		<0.2 <1 <1 <5 <1 <1 <1 3.3 <1 <1 <1 <1 <1 4.2		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicab 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702293 07-0349 mb 022308.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 101 100	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene e ene e (EDC) ane	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix:	GW-4 02/21/17 02/21/17 02/21/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 702293 702293-01 006F0601.D GC8
Units:	ug/L (ppb)		Operator:	JS
Compounds:		Concentration ug/L (ppb)		
Methane Ethane		<5 <10		

<10

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix:	GW-11 02/21/17 02/21/17 02/21/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 702293 702293-02 007F0701.D GC8
Units:	ug/L (ppb)		Operator:	JS
Compounds:		Concentration ug/L (ppb)		
Methane Ethane		<5 <10		

<10

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-2 02/21/17 02/21/17 02/21/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 702293 702293-03 008F0801.D GC8
Units:	ug/L (ppb)		Operator:	JS
Compounds:		Concentration ug/L (ppb)		
Methane Ethane		<5 <10		

<10

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-3 02/21/17 02/21/17 02/21/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702293 702293-04 009F0901.D GC8 JS
Compounds:		Concentration ug/L (ppb)		
Methane		6,100 ve		
Ethane		<10		
Ethene		<10		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-3 02/21/17 02/21/17 03/06/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702293 702293-04 1/100 006F0601.D GC8 JS
Compounds: Methane Ethane		Concentration ug/L (ppb) 8,000 <1,000		
Ethene		<1,000		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	07-0345 mb
Date Analyzed:	02/21/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS
	Concentration		
Compounds:	ug/L (ppb)		
Methane	<5		
Ethane	<10		

<10

ENVIRONMENTAL CHEMISTS

Date of Report: 03/14/17 Date Received: 02/21/17 Project: 69402, F&BI 702293

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

Laboratory Coc	de: 702356-01	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	97.4	99	86	70-130	14
Manganese	ug/L (ppb)	20	134	141 b	120 b	70-130	16 b
-							

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	90	85-115
Manganese	ug/L (ppb)	20	90	85-115

ENVIRONMENTAL CHEMISTS

Date of Report: 03/14/17 Date Received: 02/21/17 Project: 69402, F&BI 702293

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

Laboratory Cod	le: 702292-02	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	141	103	97	70-130	6
Manganese	ug/L (ppb)	20	97.0	126	107	70-130	16

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	105	85-115
Manganese	ug/L (ppb)	20	100	85-115

ENVIRONMENTAL CHEMISTS

Date of Report: 03/14/17 Date Received: 02/21/17 Project: 69402, F&BI 702293

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

Laboratory Code: 702321-12 (Matrix Spike)

5	1 /			Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	101	36-166
Chloroethane	ug/L (ppb)	50	<1	114	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	104	60-136
Methylene chloride	ug/L (ppb)	50	<5	94	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	100	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	100	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	99	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	97	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	101	60-146
Trichloroethene	ug/L (ppb)	50	<1	94	66-135
Tetrachloroethene	ug/L (ppb)	50	<1	95	10-226

	r		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	106	102	50-154	4
Chloroethane	ug/L (ppb)	50	116	102	58-146	13
1,1-Dichloroethene	ug/L (ppb)	50	107	103	67-136	4
Methylene chloride	ug/L (ppb)	50	104	97	39-148	7
trans-1,2-Dichloroethene	ug/L (ppb)	50	103	99	68-128	4
1,1-Dichloroethane	ug/L (ppb)	50	103	99	79-121	4
cis-1,2-Dichloroethene	ug/L (ppb)	50	105	99	80-123	6
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	100	95	73-132	5
1,1,1-Trichloroethane	ug/L (ppb)	50	106	100	83-130	6
Trichloroethene	ug/L (ppb)	50	98	93	80-120	5
Tetrachloroethene	ug/L (ppb)	50	102	96	76-121	6

ENVIRONMENTAL CHEMISTS

Date of Report: 03/14/17 Date Received: 02/21/17 Project: 69402, F&BI 702293

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

J	Reporting	Sample	Duplicate	Relative Percent Difference
Analyte	Units	Result	Result	(Limit 20)
Methane	ug/L (ppb)	6,100 ve	6,400 ve	nm
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: 702293-04 (Duplicate)

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Methane	ug/L (ppb)	59	81	76	50-150	7
Ethane	ug/L (ppb)	110	72	68	50-150	6
Ethene	ug/L (ppb)	102	99	93	50-150	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.

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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LABORATORY REPORT

March 8, 2017

Mike Erdahl Friedman & Bruya, Inc. 3012 16th Ave. W. Seattle, WA 98119

RE: 702293

Dear Mike:

Enclosed are the results of the sample submitted to our laboratory on February 23, 2017. For your reference, this analysis has been assigned our service request number P1700898.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at <u>www.alsglobal.com</u>. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

nl By Sue Anderson at 12:15 pm, Mar 08, 2017

By Sue Anderson at 12:16 pm, Mar 08, 20 Sue Anderson Project Manager



2655 Park Center Dr., Suite A Simi Valley, CA 93065 T: +1 805 526 7161 F: +1 805 526 7270 www.alsglobal.com Client: Friedman & Bruya, Inc. Project: 702293

Service Request No: P1700898

CASE NARRATIVE

The sample was received intact under chain of custody on February 23, 2017 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

The analysis for samples GW-11 (P1700898-002), MW-2 (P1700898-003) and MW-3 (P1700898-004) were cancelled because the submitted voa vials were acidified.

Carbon Dioxide Analysis

The sample was analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. The sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gas (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



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ALS Environmental - Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure- certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Louisiana DEQ (NELAP)	http://www.deg.louisiana.gov/portal/DIVISIONS/PublicParticipationandPer mitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp- services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1177034
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	. 11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaborat oryAccreditation/Pages/index.aspx	4068-004
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413- 16-7
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA01627201 6-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946
Analyses ware nor	formed according to aver laboration de NELAD - LD D R. 40	

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at <u>www.alsglobal.com</u>, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT Client: Friedman & Bruya, Inc. Service Request: P1700898 Project ID: 702293 Date Received: 2/23/2017 Time Received: 09:30 RSK 175 - CO2 Date Time Client Sample ID Lab Code Matrix Collected Collected GW-4 P1700898-001 Water 2/20/2017 10:32 х

P1700898_Detail Summary_1703081120_RB.xls - DETAIL SUMMARY

AI YOOK IS	TURNAROUND TIME	Setandard (2 Weeks) CRUSH Rush charges authorized hv		SAMPLE DISPOSAL Dispose after 30 days	Deturn samples Null call with instructions	EQUESTED	vtimileallA M000e-DOT 500	×	*	×	×				COMPANY DATE TIME	Friedman and Bruya $\frac{2}{r} \frac{1}{2} \frac{1}{r} \frac{1}{3} \frac$			1934 34el
SUBCONTRACT SAMPLE CHAIN OF CUSTODY	SUBCONTRACTER ALS- Sim, Valles	PROJECT NAME/NO. PO # 7.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2	(1.77/	RKS	Please Email Results	ANALYSES REQUESTED	Titrate Sulfate Sulfate Sulfate							•	PRINT NAME	Michael Erdahl			6 t/12/2 A
SUBCONTRACTS	ţ.	ruva. Inc.		A 98119 REMARKS	Fax # (206) 283-5044		Lab ID Date Time Matrix	U 2/rolit 1032 weter		0421 2	4) 2 ISIS 4		· · · · · · · · · · · · · · · · · · ·		SIGNATURE 7	Reliarquished by: 0	Received by:	Relinquished by:	Received by:
	Send Report To Michael Erdahl	·	Address 3012 16th Ave W	City, State, ZIP <u>Seattle, WA 98119</u>	285-8282		Sample ID	6w-4 0							Priedman & Bruya, Inc.	L	Seattle, WA 98119-2029 Re-	Ph. (206) 285-8282	Fax (206) 283-5044 Re

ALS Environmental

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	t: Friedman & :: 702293	Bruya, Inc.			-	Work order:	P1700898			www
	e(s) received or	n: <u>2/23/17</u>		- -	Date opened:	2/23/17	by:	ADA	/ID	u
<u>Note:</u> Thi	s form is used for	all samples received by AL	.S. The use of this	form for custody	seals is strictly me	ant to indicate pro	esence/absence and	not as an	indicatio	m of
		y. Thermal preservation a								
							e.	Yes	<u>No</u>	<u>N/A</u>
1		e containers properly		•)?			X		
2	Did sample	containers arrive in g	ood condition?					X		
3	Were chain-	of-custody papers use	ed and filled ou	t?				\mathbf{X}		
4	Did sample (container labels and/	or tags agree w	ith custody pap	pers?			\mathbf{X}		
5	Was sample volume received adequate for analysis?									
6	Are samples	within specified hold	ing times?					\mathbf{X}		
7	Was proper t	emperature (thermal	preservation)	of cooler at rec	eipt adhered to	o?		\mathbf{X}		
		mperature: 3° C B			· ·		Packs			
8		y seals on outside of	-						\mathbf{X}	
		Location of seal(s)					Sealing Lid?			$\overline{\mathbf{X}}$
	Were signatu	re and date included?	W							X
	Were seals in									\mathbf{X}
9		ers have appropriate	preservation a	ecording to m	ethod/SOP or (ⁿ lient specifie	d information?		N	
		ent indication that the				enem speeme	a miormation?			し 区
		vials checked for pres			esei veu :					
						.c	k0			
10	Tubes:	nt/method/SOP requi			ample pH and_	it necessaryait	er it?		X	
10		Are the tubes ca								X
11	Badges:	Are the badges								\boxtimes
		Are dual bed ba	dges separated	and individual	ly capped and	intact?	······			$\overline{\mathbf{N}}$
Lat	Sample ID	Container	Required	Received	Adjusted	V@A Headspa	re Recei	nt / Pres	ervatio	n
		Description	pH *	pHi	pHt	Presence/Adsence	the second s	Comme	6 X 20 X 64 90 1	
P170080	8-001.01	40mL VOA NP		7		A	MC 3/02/201	entre de seure		
	8-001.02	40mL VOA NP		· · · · · · · · · · · · · · · · · · ·		A	1410 5/02/201	1		
	8-002.01	40ml VOA HCL				A				
	8-002.02	40ml VOA HCL		1		А	MC 3/02/201	7		
	8-003.01	40ml VOA HCL				A				
	8-003.02	40ml VOA HCL	-	1		<u>A</u>	MC 3/02/201	7		
	8-004.01	40ml VOA HCL				<u> </u>	110 2/00/001	~		
P170085	8-004.02	40ml VOA HCL		1		A	MC 3/02/201	/		
				·						
						•				

Explain any discrepancies: (include lab sample ID numbers):

Samples -002 thru -004 could not be analyzed because they were acidified.

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS Page 1 of 1

Client: Friedman & Bruya, Inc. Client Project ID: 702293 **Carbon** Dioxide **RSK 175** Instrument ID: HP5890A/GC10/TCD Analyst: Mike Conejo Matrix: Water Test Notes: Injection **Client Sample ID** ALS Sample ID Volume Result ml(s) μg/L GW-4 P1700898-001 0.10 46,000

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

P170302-MB

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ND

0.10

ALS Project ID: P1700898

Test Code:

Method Control Sample

Date(s) Collected: 2/20/17 Date Received: 2/23/17 Date Analyzed: 3/2/17

Data

Qualifier

MRL

μg/L

1,000

1,000

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client:	Friedman & Bruya, Inc.
Client Sample ID: Client Project ID:	Duplicate Lab Control Sample

ALS Project ID: P1700898 ALS Sample ID: P170302-DLCS

Test Code: Instrument ID: Analyst: Matrix: Test Notes:	RSK 175 HP5890A/GC10/TCD Mike Conejo Water	Date Collected: NA Date Received: NA Date Analyzed: 3/02/17 Volume(s) Analyzed: NA ml(s)
lest Notes:		

		Spike Amount	Result		ALS					
CAS #	Compound	LCS / DLCS	LCS	DLCS	% Re	covery	Acceptance	RPD	RPD	Data
7700 44 5		ug/L	ug/L	ug/L	LCS	DLCS	Limits		Limit	Oualifier
7782-44-7	Oxygen/Argon*	22,900	22,700	21,600	99	94	50-150	5	30	

 t_{1} = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL. Oxygen free water cannot be achieved due to the nature of the matrix.

* = Coeluting compounds.



Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664

Professional Analytical Services

Mar 13 2017 Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your 702293 project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
GW-4	Water	17-A002329	DEM, MIN, NUT, CONV
GW-11	Water	17-A002330	DEM, MIN, NUT, CONV
MW-2	Water	17-A002331	DEM, MIN, NUT, CONV
MW-3	Water	17-A002332	DEM, MIN, NUT, CONV

Your samples were received on Tuesday, February 21, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young

Laboratory Manager

Project #: 702293 PO Number: E-504

BACT = Bacteriological CONV = Conventionals

MET = Metals ORG = Organics NUT=Nutrients **DEM=Demand**

MIN=Minerals

Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 www.amtestlab.com



Professional Analytical Services

ANALYSIS REPORT

Date Received: 02/21/17 Date Reported: 3/13/17

Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL Project Name: 702293 Project #: 702293 PO Number: E-504 All results reported on an as received basis.

AMTEST Identification Number	17-A002329
Client Identification	GW-4
Sampling Date	02/20/17, 10:32

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	0.58	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	3.68	mg/l		0.05	EPA 300.0	JC	02/21/17
Sulfate	7.76	mg/l		0.1	EPA 300.0	JC	02/21/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/21/17
Nitrate	0.399	mg/l		0.025	EPA 300.0	JC	02/21/17
Nitrate+Nitrite	0.399	mg/l		0.025	EPA 300.0	Calculated	

AMTEST Identification Number	17-A002330
Client Identification	GW-11
Sampling Date	02/20/17, 11:25

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	1.1	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	53.8	mg/l		0.05	EPA 300.0	JC	02/27/17
Sulfate	14.2	mg/l		0.1	EPA 300.0	JC	02/21/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/21/17
Nitrate	2.60	mg/l		0.025	EPA 300.0	JC	02/21/17
Nitrate+Nitrite	2.60	mg/l		0.025	EPA 300.0	Calculated	

AMTEST Identification Number	17-A002331
Client Identification	MW-2
Sampling Date	02/20/17, 12:40

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	2.7	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	1.24	mg/l		0.05	EPA 300.0	JC	02/21/17
Sulfate	1.13	mg/l		0.1	EPA 300.0	JC	02/21/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/21/17
Nitrate	11.2	mg/l		0.025	EPA 300.0	JC	02/24/17
Nitrate+Nitrite	11.2	mg/l		0.025	EPA 300.0	Calculated	

AMTEST Identification Number	17-A002332
Client Identification	MW-3
Sampling Date	02/20/17, 15:18

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE	
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17	

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	83.	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	76.	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	430	mg/l		10	EPA 410.4	SW	03/07/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	34.5	mg/l		0.05	EPA 300.0	JC	02/27/17
Sulfate	0.78	mg/l		0.1	EPA 300.0	JC	02/21/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/21/17
Nitrate	< 0.025	mg/l		0.025	EPA 300.0	JC	02/21/17
Nitrate+Nitrite	< 0.025	mg/l		0.025	EPA 300.0	Calculated	

aron w V Aaron W. Young Laboratory Manager

Am Test Inc. 13600 NE 126th PL Suite C Kirkland, WA, 98034 (425) 885-1664 www.amtestlab.com



QC Summary for sample numbers: 17-A002329 to 17-A002332

DUPLICATES

17-A002329

17-A002329

17-A002506

17-A002329

Nitrate

Total Sulfide

Nitrite

Sulfate

SAMPLE #	ANALYTE	UNITS	SAMPLE VAL	UE DUP VAL	UE R	PD
17-A002401	BOD	mg/l	< 2	< 2		
17-A002124	Chemical Oxygen Demand	mg/l	< 10	< 10		
17-A002331	Chemical Oxygen Demand	mg/l	< 10	< 10		
17-A002401	Chemical Oxygen Demand	mg/l	< 10	< 10		
17-A002540	Chemical Oxygen Demand	mg/l	15.	13.		4.
17-A002550	Chemical Oxygen Demand	mg/l	25.	23.		.3
17-A002329	Chloride	mg/l	3.68	3.71		.81
17-A002247	Chloride	mg/l	88.8	87.6		.4
17-A002469	Chloride	mg/l	46.0	44.5		.3
17-A002329	Nitrate	mg/l	0.399	0.386	3	.3
17-A002367	Nitrate	mg/l	< 0.025	< 0.025		
17-A002329	Nitrite	mg/l	< 0.005	< 0.005		
17-A002367	Nitrite	mg/l	< 0.005	< 0.005		
17-A002400	Total Sulfide	mg/l	< 0.05	< 0.05		
17-A002506	Total Sulfide	mg/l	< 0.05	< 0.05		
17-A002329	Sulfate	mg/l	7.76	7.06	9	.4
MATRIX SP	IKES					
SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
17-A002044	Total Organic Carbon	mg/l	1.7	27.	25.	101.20 %
17-A002165	Total Organic Carbon	mg/l 2	2.3	25.	25.	90.80 %
17-A002175	Total Organic Carbon	mg/l :	3.5	27.	25.	94.00 %
17-A002399	Total Organic Carbon	mg/l !	5.7	49.	50.	86.60 %
17-A002329	Chloride	mg/l :	3.68	8.65	5.00	99.40 %
17-A002247	Chloride	U U U	88.8	133.	50.0	88.40 %
17-A002469	Chloride	mg/l	46.0	93.0	50.0	94.00 %
				1	1	

0.399

< 0.005

< 0.05

7.76

5.22

4.89

0.34

13.1

5.00

5.00

0.39

5.00

96.42 %

97.80 %

87.18 %

106.80 %

mg/l

mg/l

mg/l

mg/l

QC Summary for sample numbers: 17-A002329 to 17-A002332...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	170	85.0 %
Total Organic Carbon	mg/l	50.	48.	96.0 %
Total Organic Carbon	mg/l	50.	48.	96.0 %
Chemical Oxygen Demand	mg/l	100	98.	98.0 %
Chemical Oxygen Demand	mg/l	100	96.	96.0 %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chloride	mg/l	5.00	4.97	99.4 %
Chloride	mg/l	5.00	4.88	97.6 %
Chloride	mg/l	5.00	4.89	97.8 %
Nitrate	mg/l	5.00	4.83	96.6 %
Nitrate	mg/l	5.00	4.61	92.2 %
Nitrite	mg/l	5.00	4.96	99.2 %
Total Sulfide	mg/l	0.39	0.34	87.2 %
Sulfate	mg/l	5.00	5.71	114. %

BLANKS

DLANKS		
ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1

Fax (206) 283-5044 Received by:	Ph. (206) 285-8282 Relinquished by:	Seattle, WA 98119-2029 Received by:	3012 16th Avenue West Relinquished by:	Friedman & Bruya, Inc.					MW-3 32	MW-Z 31	05 N-W-D	Gw-4 7329	Sample ID Lab ID		City, State, ZIP <u>Seattle, WA 98119</u> Phone <u># (206) 285-8282</u> Fax <u># 1</u>		Address 3012 16th Ave W		Send Report To Michael Erdahl	
oy:	hed by:	vy:	ned by:	SIGNATURE					<u> </u>	Mangal Albert	411111419 ⁻⁴ 1	2/2017	Date Sampled		<u>9</u> (206) 283-5044		AY 64, 1110-			SU
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Ph. (206) 285-8282	Soliz 16" Avenue West Seattle, WA 98119-2029	Fileanun & Druya, Inc.	Fridman & Dame Too							MW-3	MW-2	aw-u	61w-4	Sample ID		City, State, ZIP <u>LSSaquan, WA 48027</u> Phone <u>425-345 colu</u> Email joshb@epi-wu.com		Address 1180 NW	Company EPT	Report To Josh L	702293	
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	4	-21-12	DATE		at U	þ				×	×	×	×	Chloride per 35 2/21/17 Notes		 Dispose after 30 days Archive Samples Other 	SAMPLE DISPOSAT	Rush charges authorized by:	B Standard Turnaround	Page # 1 of /	, Va	
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ENVIRONMENTAL CHEMISTS

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

March 10, 2017

Josh Bernthal, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 702316

Dear Mr Bernthal:

Included are the results from the testing of material submitted on February 21, 2017 from the 69402, F&BI 702316 project. There are 30 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon EPI0310R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 21, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 702316 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
702316-01	MW-15
702316-02	MW-1
702316-03	MW-7
702316-04	MW-8
702316-05	MW-9

The samples were sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the samples were sent to ALS-Simi for carbon dioxide analysis. The results from Amtest and ALS are included.

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Client ID:	MW-15		Client:	Environmental Partners
Date Received:	02/21/17		Project:	69402, F&BI 702316
Date Extracted:	02/27/17		Lab ID:	702316-01
Date Analyzed:	02/28/17		Data File:	702316-01.126
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
		Concentration		
Analyte:		ug/L (ppb)		
Iron		241		
Manganese		8.16		

ENVIRONMENTAL CHEMISTS

Client ID:	MW-1		Client:	Environmental Partners
Date Received:	02/21/17		Project:	69402, F&BI 702316
Date Extracted:	02/27/17		Lab ID:	702316-02
Date Analyzed:	02/28/17		Data File:	702316-02.130
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
		Concentration		
Analyte:		ug/L (ppb)		
Iron		991		
Manganese		2,660		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed:	MW-7 02/21/17 02/27/17 02/28/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 702316 702316-03 702316-03.134
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		295		
Manganese		10.6		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted:	MW-8 02/21/17 02/27/17		Client: Project: Lab ID:	Environmental Partners 69402, F&BI 702316 702316-04
Date Analyzed:	02/28/17		Data File:	702316-04.138
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		364 52.4		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed:	MW-9 02/21/17 02/27/17 02/28/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 702316 702316-05 702316-05.139
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		<50		
Manganese		<1		

ENVIRONMENTAL CHEMISTS

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702316
Date Extracted:	02/27/17	Lab ID:	I7-096 mb
Date Analyzed:	02/27/17	Data File:	I7-096 mb.060
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Iron Manganese	<50 <1		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-15 02/21/17 02/23/17 02/23/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 702316 702316-01 702316-01.067 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		58.6 4.17		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-1 02/21/17 02/23/17 02/23/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 702316 702316-02 702316-02.068 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		494 2,650		

ENVIRONMENTAL CHEMISTS

Client ID:	MW-7		Client:	Environmental Partners
Date Received:	02/21/17		Project:	69402, F&BI 702316
Date Extracted:	02/23/17		Lab ID:	702316-03
Date Analyzed:	02/23/17		Data File:	702316-03.069
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
		Concentration		
Analyte:		ug/L (ppb)		
Iron		101		
Manganese		3.11		
manganese		5.11		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed:	MW-8 02/21/17 02/23/17 02/23/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 702316 702316-04 702316-04.070
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		55.7		
Manganese		10.1		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed:	MW-9 02/21/17 02/23/17 02/23/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 702316 702316-05 702316-05.072
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		<50		
Manganese		<1		

ENVIRONMENTAL CHEMISTS

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702316
Date Extracted:	02/23/17	Lab ID:	I7-091 mb
Date Analyzed:	02/23/17	Data File:	I7-091 mb.062
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-15 02/21/17 02/24/17 02/24/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702316 702316-01 022428.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	57	121
Toluene-d8		103	63	127
4-Bromofluorobenzene		104	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	!	<1		
Methylene chloride	2	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	(EDC)	<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		2.6		
Tetrachloroethene		140		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-1 02/21/17 02/24/17 02/24/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702316 702316-02 022429.D GCMS4 JS
Surrogates:	14	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane Toluene-d8	-04	101 103	57 63	121 127
4-Bromofluorobenzene		103	60	133
4-D1011011001000112	lene	102	00	155
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	•	<1		
Methylene chloride	e	<5		
trans-1,2-Dichloro	ethene	<1		
1,1-Dichloroethane	:	<1		
cis-1,2-Dichloroethene		<1		
1,2-Dichloroethane	e (EDC)	<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		1.4		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-7 02/21/17 02/24/17 02/24/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702316 702316-03 022430.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	103	57	121
Toluene-d8		102	63	127
4-Bromofluorobenzene		102	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride		<5		
trans-1,2-Dichloro	ethene	<1		
1,1-Dichloroethane	!	<1		
cis-1,2-Dichloroethene		<1		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		8.0		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-8 02/21/17 02/24/17 02/24/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702316 702316-04 022431.D GCMS4 JS
Surrogates: 1,2-Dichloroethane	-d4	% Recovery: 100	Lower Limit: 57	Upper Limit: 121
Toluene-d8	u i	103	63	127
4-Bromofluorobenzene		101	60	133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	•	<1		
Methylene chloride	<u>)</u>	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-9 02/21/17 02/24/17 02/24/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702316 702316-05 022432.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	98	57	121
Toluene-d8		102	63	127
4-Bromofluorobenzene		104	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride		<5		
trans-1,2-Dichloroe		<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth		<1		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		8.0		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicab 02/24/17 02/24/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702316 07-0351 mb 022412.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 104 101 102	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene e ene e (EDC) ane	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	MW-15		Client:	Environmental Partners
Date Received:	02/21/17		Project:	69402, F&BI 702316
Date Extracted:	03/06/17		Lab ID:	702316-01
Date Analyzed:	03/06/17		Data File:	007F0701.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-1 02/21/17 03/06/17 03/06/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 702316 702316-02 008F0801.D GC8
Units:	ug/L (ppb)		Operator:	JS
Compounds:		Concentration ug/L (ppb)		
Methane Ethane		<5 <10		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID: Date Received:	MW-7 02/21/17		Client: Project:	Environmental Partners 69402, F&BI 702316
Date Extracted:	03/06/17		Lab ID:	702316-03
Date Analyzed:	03/06/17		Data File:	009F0901.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-8 02/21/17 03/06/17 03/06/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 702316 702316-04 010F1001.D GC8
Units:	ug/L (ppb)		Operator:	JS
Compounds:		Concentration ug/L (ppb)		
Methane Ethane		<5 <10		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	MW-9		Client:	Environmental Partners
Date Received:	02/21/17		Project:	69402, F&BI 702316
Date Extracted:	03/06/17		Lab ID:	702316-05
Date Analyzed:	03/06/17		Data File:	011F1101.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702316
Date Extracted:	03/06/17	Lab ID:	07-356 mb
Date Analyzed:	03/06/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS
	Concentration		
Compounds:	ug/L (ppb)		
Methane	<5		
Ethane	<10		

ENVIRONMENTAL CHEMISTS

Date of Report: 03/10/17 Date Received: 02/21/17 Project: 69402, F&BI 702316

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

Laboratory Cod	e: 702402-01	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	2,970	195 b	0 b	70-130	200 b
Manganese	ug/L (ppb)	20	670	176 b	0 b	70-130	200 b
-							

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	106	85-115
Manganese	ug/L (ppb)	20	107	85-115

ENVIRONMENTAL CHEMISTS

Date of Report: 03/10/17 Date Received: 02/21/17 Project: 69402, F&BI 702316

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

Laboratory Co	de: 702356-01	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	97.4	99	86	70-130	14
Manganese	ug/L (ppb)	20	134	141 b	120 b	70-130	16 b

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	90	85-115
Manganese	ug/L (ppb)	20	90	85-115

ENVIRONMENTAL CHEMISTS

Date of Report: 03/10/17 Date Received: 02/21/17 Project: 69402, F&BI 702316

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

Laboratory Code: 702387-03 (Matrix Spike)

	1 /			Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	106	36-166
Chloroethane	ug/L (ppb)	50	<1	109	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	106	60-136
Methylene chloride	ug/L (ppb)	50	<5	98	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	101	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	101	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	102	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	98	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	103	60-146
Trichloroethene	ug/L (ppb)	50	<1	95	66-135
Tetrachloroethene	ug/L (ppb)	50	<1	98	10-226

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	107	118	50-154	10
Chloroethane	ug/L (ppb)	50	115	122	58-146	6
1,1-Dichloroethene	ug/L (ppb)	50	110	114	67-136	4
Methylene chloride	ug/L (ppb)	50	102	108	39-148	6
trans-1,2-Dichloroethene	ug/L (ppb)	50	105	108	68-128	3
1,1-Dichloroethane	ug/L (ppb)	50	105	107	79-121	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	104	109	80-123	5
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	100	105	73-132	5
1,1,1-Trichloroethane	ug/L (ppb)	50	107	110	83-130	3
Trichloroethene	ug/L (ppb)	50	98	102	80-120	4
Tetrachloroethene	ug/L (ppb)	50	99	105	76-121	6

ENVIRONMENTAL CHEMISTS

Date of Report: 03/10/17 Date Received: 02/21/17 Project: 69402, F&BI 702316

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Angleta	Reporting	Sample	Duplicate	Relative Percent Difference
Analyte	Units	Result	Result	(Limit 20)
Methane	ug/L (ppb)	100	100	0
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: 703011-06 (Duplicate)

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Methane	ug/L (ppb)	59	66	66	50-150	0
Ethane	ug/L (ppb)	110	57	58	50-150	2
Ethene	ug/L (ppb)	102	81	81	50-150	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.

 ${\bf b}$ - 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.

 ${\rm d}$ - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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LABORATORY REPORT

March 8, 2017

Mike Erdahl Friedman & Bruya, Inc. 3012 16th Ave. W. Seattle, WA 98119

RE: 702316 / 702316

Dear Mike:

Enclosed are the results of the samples submitted to our laboratory on February 23, 2017. For your reference, these analyses have been assigned our service request number P1700896.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at <u>www.alsglobal.com</u>. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Sue Anderson at 12:12 pm, Mar 08, 2017

Sue Anderson Project Manager



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Client: Friedman & Bruya, Inc. Project: 702316 / 702316

Service Request No: P1700896

CASE NARRATIVE

The samples were received intact under chain of custody on February 23, 2017 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gas (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



2655 Park Center Dr., Suite A Simi Valley, CA 93065 T: +1 805 526 7161 F: +1 805 526 7270 www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure- certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPer mitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp- services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1177034
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oga/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaborat oryAccreditation/Pages/index.aspx	4068-004
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413- 16-7
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA01627201 6-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at <u>www.alsglobal.com</u>, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Project ID:	Friedman & Bru 702316	ıya, Inc.			Service Request: P1700896
Date Received: Time Received:	2/23/2017 09:30				
					- C02
Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175
MW-15 MW-1	P1700896-001 P1700896-002	Water Water	2/21/2017 2/21/2017	06:16 07:00	× X
MW-7 MW-8	P1700896-003 P1700896-004	Water Water	2/21/2017 2/21/2017	08:03 09:04	x X
MW-9	P1700896-005	Water	2/21/2017	09:59	Х

21 2121	Page # of f	2 Weeks)	Rush charges authorized by:	SAMPLE DISPOSAL ose after 30 days	🛙 Return samples 🛛 Will call with instructions		Notes			r							DATE TIME	2/aft7 1130			-
A	, y	# XStandard (2 Weeks)		SAMF	0 Return san 0 Will call wi	ANALYSES REQUESTED	Alkalinity TOC-9060M CO2	*	*	*	*	×					COMPANY	Friedman and Bruya			3°ged
SUBCONTRACT SAMPLE CHAIN OF CUSTODY	R Amtert als-Simi Villeg	NO. PO#	16 E-506		Please Email Results	ANALYSES	Dioxina/Furana HPH HPH Mitrate Nitrate										PRINT NAME	lahl			2/23/17 0734
TRACT SAMPLE (SUBCONTRACTER	PROJECT NAME/NO.	702316	REMARKS			ed Matrix # of jars	weter							* *			Michael Erdahl			A
SUBCON	dah]		<u>Friedman and Bruya. Inc.</u> 3013 16th Ave W	08119	Fax # (206) 283-5044		Lab ID Date Time Sampled	1 2/21/17 0/2 16		3 0603	4 0406	1 1 0423					SIGNATURE	Relidentspectfor	Received by:	Relinquished by:	Received by:
	history the Manual Level		Company <u>Kriedman and Br</u> Adduces 3013 16th Ave W	and the	Uity, State, LIF <u>Seaue, Wo</u> Phone # (206) 285-8282		Sample ID	Mu-15			MW-6	WV-9		 *			Printman & Rrivia Inc	<u></u>	Seattle, WA 98119-2029 R	Ph. (206) 285-8282	Fax (206) 283-5044
						ţ			5 of	8						•					

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ALS Environmental

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	t: <u>Friedman &</u> t: 702316	z Bruya, Inc.	**	•	heck Form Worl	c order:	P1700896			
-	e(s) received a	on: <u>2/23/17</u>		Da	ate opened: 2/23/	17	by:	ADA	VID	
Note: Thi	s form is used for	r <u>all</u> samples received by AI	S The use of this f	mu fan matadu aan						
		ity. Thermal preservation a								n of
	• •• •• ••••••••••••••••••••	wy. Therman properties and	na pri win only be e	vanatou citiiçi at u	ie request or the cher	a and/or as i	equired by the met	nod/SOP	<u>No</u>	N/A
1	Were samp	le containers properly	marked with cli	ent sample ID?				X		
2		containers arrive in g		*				\mathbf{X}		
3	Were chain	-of-custody papers us	ed and filled out	?		·		X		
4		container labels and/			s?			N		D
5		e volume received ade						N		
6	_	s within specified hold						X		
7	-	temperature (therma	0	f cooler at receir	ot adhered to?			$\overline{\mathbf{X}}$		D
		emperature: 3° C B				Gell	Packs	ha	Konnuf	-
8		dy seals on outside of							\mathbf{X}	
		Location of seal(s)					Sealing Lid?			$\overline{\mathbf{X}}$
	Were signat	ure and date included		hudin - hudin - hudina - hudin						\mathbf{X}
	Were seals i									X
9	Do contai	ners have appropriate	preservation, ac	cording to meth	od/SOP or Clien	snecified	information?	X		
		lient indication that the				. spooniec	information:			N
		vials checked for pre-	•	~ +				\boxtimes		
		ent/method/SOP requi			nla nH and if nar	acconuplt			L N	
10	Tubes:	Are the tubes ca		t oncon the sum	pic pit and <u>it nee</u>	<u>vssai</u> yan	AL 16:			
11	Badges:		properly capped	and intect?						
* *					capped and intac	2				X X
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Lab	Sample ID	Container	Required			Headspac		1 T (1 T)	ervation	n .
		Description	рН *	pH	pill	nce Americ	AN CONTRACTOR OF THE SAME	Comme	nts	
	06-001.01	40mL VOA NP	_	7		A	MC 3/2/2017			
	06-001.02 06-002.01	40mL VOA NP 40mL VOA NP		7		<u>A</u>	NO 202017			
	6-002.02	40mL VOA NP		/		A A	MC 3/2/2017			
	6-003.01	40mL VOA NP		7		<u>A</u>	MC 3/2/2017			
P170089	6-003.02	40mL VOA NP			· · · · ·	A				
	6-004.01	40mL VOA NP		7	· · ·	A	MC 3/2/2017			
	6-004.02	40mL VOA NP				A				
	6-005.01	40mL VOA NP		7		<u>A</u>	MC 3/2/2017			
r1/0089	6-005.02	40mL VOA NP				A				
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ALS ENVIRONMENTAL

RESULTS OF ANALYSIS Page 1 of 1

Client: Friedman & Bruya, Inc. Client Project ID: 702316 ALS Project ID: P1700896 **Carbon Dioxide** Test Code: **RSK 175** Instrument ID: HP5890A/GC10/TCD Date(s) Collected: 2/21/17 Analyst: Mike Conejo Date Received: 2/23/17 Matrix: Water Date Analyzed: 3/2/17 Test Notes: Injection Client Sample ID ALS Sample ID Volume Result MRL ml(s) μg/L μg/L **MW-15** P1700896-001 0.10 67,000 1,000 MW-1 P1700896-002 0.10 130,000 1,000 **MW-7** P1700896-003 0.10 82,000 1,000

0.10

0.10

0.10

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

P1700896-004

P1700896-005

P170302-MB

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

59,000

69,000

ND

1,000

1,000

1,000

MW-8

MW-9

Method Control Sample

Data

Qualifier

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client:Friedman & Bruya, Inc.Client Sample ID:Duplicate Lab Control SampleClient Project ID:702316

ALS Project ID: P1700896 ALS Sample ID: P170302-DLCS

Test Code: Instrument ID:	RSK 175 HP5890A/GC10/TCD	Date Collected: NA Date Received: NA
Analyst:	Mike Conejo	Date Analyzed: 3/02/17
Matrix: Test Notes:	Water	Volume(s) Analyzed: NA ml(s)

		Spike Amount	Result _i		ALS					
CAS #	Compound	LCS / DLCS	LCS	DLCS	% Re	covery	Acceptance	RPD	RPD	Data
	······································	ug/L	ug/L	ug/L	LCS	DLCS	Limits		Limit	Qualifier
124-38-9	Carbon Dioxide	22,900	22,700	21,600	99	94	62-123	5	20	

t = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.



Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 Professional Analytical Services

Mar 8 2017 Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-15	Water	17-A002397	DEM, MIN, NUT, CONV
MW-1	Water	17-A002398	DEM, MIN, NUT, CONV
MW-7	Water	17-A002399	DEM, MIN, NUT, CONV
MW-8	Water	17-A002400	DEM, MIN, NUT, CONV
MW-9	Water	17-A002401	DEM, MIN, NUT, CONV

Your samples were received on Wednesday, February 22, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young

Laboratory Manager

Project #: 702316 PO Number: E-503

BACT = Bacteriological CONV = Conventionals MET = Metals ORG = Organics NUT=Nutrients DEM=Demand **MIN=Minerals**

Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 www.amtestlab.com



Professional Analytical Services

ANALYSIS REPORT

Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL Project #: 702316 PO Number: E-503 All results reported on an as received basis. Date Received: 02/22/17 Date Reported: 3/ 8/17

AMTEST Identification Number	17-A002397
Client Identification	MW-15
Sampling Date	02/21/17, 06:16

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	0.69	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	< 0.05	mg/l		0.05	EPA 300.0	JC	02/22/17
Sulfate	10.4	mg/l		0.1	EPA 300.0	JC	02/22/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/22/17
Nitrate	4.70	mg/l		0.025	EPA 300.0	JC	02/22/17

AMTEST Identification Number	17-A002398
Client Identification	MW-1
Sampling Date	02/21/17, 07:00

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	8.4	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	18.	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	26.2	mg/l		0.05	EPA 300.0	JC	02/22/17
Sulfate	4.30	mg/l		0.1	EPA 300.0	JC	02/22/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/22/17
Nitrate	0.995	mg/l		0.025	EPA 300.0	JC	02/22/17

AMTEST Identification Number	17-A002399
Client Identification	MW-7
Sampling Date	02/21/17, 08:03

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	5.7	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	134.	mg/l		0.05	EPA 300.0	JC	02/24/17
Sulfate	12.3	mg/l		0.1	EPA 300.0	JC	02/22/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/22/17
Nitrate	5.30	mg/l		0.025	EPA 300.0	JC	02/22/17

AMTEST Identification Number	17-A002400
Client Identification	MW-8
Sampling Date	02/21/17, 09:04

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	0.51	mg/l		0.5	SM 5310B	SW	03/01/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	2.10	mg/l		0.05	EPA 300.0	JC	02/22/17
Sulfate	21.4	mg/l		0.1	EPA 300.0	JC	02/22/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/22/17
Nitrate	1.30	mg/l		0.025	EPA 300.0	JC	02/22/17

AMTEST Identification Number	17-A002401
Client Identification	MW-9
Sampling Date	02/21/17, 09:59

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	< 0.5	mg/l		0.5	SM 5310B	SW	03/01/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	4.00	mg/l		0.05	EPA 300.0	JC	02/22/17
Sulfate	6.80	mg/l		0.1	EPA 300.0	JC	02/22/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/22/17
Nitrate	0.713	mg/l		0.025	EPA 300.0	JC	02/22/17

WV aron Aaron W. Young Laboratory Manager

Am Test Inc. 13600 NE 126th PL Suite C Kirkland, WA, 98034 (425) 885-1664 www.amtestlab.com



QC Summary for sample numbers: 17-A002397 to 17-A002401

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A002401	BOD	mg/l	< 2	< 2	
17-A002124	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A002331	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A002401	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A002234	Chloride	mg/l	7.30	7.30	0.00
17-A002400	Total Sulfide	mg/l	< 0.05	< 0.05	
17-A002506	Total Sulfide	mg/l	< 0.05	< 0.05	

MATRIX SPIKES

MAIRIX SP	IKES					
SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
17-A002044	Total Organic Carbon	mg/l	1.7	27.	25.	101.20 %
17-A002165	Total Organic Carbon	mg/l	2.3	25.	25.	90.80 %
17-A002175	Total Organic Carbon	mg/l	3.5	27.	25.	94.00 %
17-A002399	Total Organic Carbon	mg/l	5.7	49.	50.	86.60 %
17-A002539	Total Organic Carbon	mg/l	9.9	57.	50.	94.20 %
17-A002549	Total Organic Carbon	mg/l	8.5	56.	50.	95.00 %
17-A002234	Chloride	mg/l	7.30	12.1	5.00	96.00 %
17-A002506	Total Sulfide	mg/l	< 0.05	0.34	0.39	87.18 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	170	85.0 %
Total Organic Carbon	mg/l	50.	48.	96.0 %
Total Organic Carbon	mg/l	50.	48.	96.0 %
Total Organic Carbon	mg/l	50.	48.	96.0 %
Total Organic Carbon	mg/l	50.	48.	96.0 %
Chemical Oxygen Demand	mg/l	100	98.	98.0 %
Chemical Oxygen Demand	mg/l	100	96.	96.0 %
Chloride	mg/l	5.00	4.92	98.4 %
Chloride	mg/l	5.00	4.88	97.6 %
Chloride	mg/l	5.00	4.87	97.4 %
Nitrate	mg/l	5.00	4.78	95.6 %
Nitrite	mg/l	5.00	4.92	98.4 %
Total Sulfide	mg/l	0.39	0.34	87.2 %
Sulfate	mg/l	5.00	5.22	104. %

QC Summary for sample numbers: 17-A002397 to 17-A002401...

BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1

Fax (206) 283-5044	Ph. (206) 285-8282	Seattle, WA 98119-2029	3012 16th Avenue West	Friedman & Bruna Inc.		v			MW-9	MW-B	MW-7-	MW-1	MW-15	Sample ID		City, State, ZIP <u>Seattle.</u> ¹ Phone # (206) 285-8282	Address3012 16th Ave W	CompanyFriedma:	Send Report <u>To Michael Erdahl</u>		
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ENVIRONMENTAL CHEMISTS

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

March 2, 2017

Josh Bernthal, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 702321

Dear Mr Bernthal:

Included are the results from the testing of material submitted on February 22, 2017 from the 69402, F&BI 702321 project. There are 20 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon EPI0302R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 22, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 702321 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	Environmental Partners
702321 -01	MW-5:Bag
702321 -02	MW-10:Bag
702321 -03	MW-4:Bag
702321 -04	MW-11:Bag
702321 -05	MW-14:Bag
702321 -06	MW-12:Bag
702321 -07	GW-10:Bag
702321 -08	MW-13:Bag
702321 -09	GW-1:Bag
702321 -10	GW-7:Bag
702321 -11	GW-8:Bag
702321 -12	GW-9:Bag
702321 -13	GW-5:Bag
702321 -14	GW-6:Bag
702321 -15	GW-3:Bag
702321 -16	MW-6:Bag

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Surrogates:% Recovery:LowerUpper1,2-Dichloroethane-d410057121Toluene-d8101631274-Bromofluorobenzene10160133ConcentrationConcentrationCompounds:ug/L (ppb)Vinyl chloride<0.2	Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-5:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-01 022309.D GCMS4 JS
1,2-Dichloroethane-d410057121Toluene-d8101631274-Bromofluorobenzene10160133Concentration Compounds:Compounds:ug/L (ppb)Vinyl chloride<0.2	Sumagatagi		% Decement		
Toluene-d8101631274-Bromofluorobenzene10160133ConcentrationCompounds:ug/L (ppb)Vinyl chloride<0.2	-	-14	v		
4-Bromofluorobenzene10160133Concentration Compounds:ug/L (ppb)Vinyl chloride<0.2		e-04			
ConcentrationCompounds:ug/L (ppb)Vinyl chloride<0.2					
Compounds:ug/L (ppb)Vinyl chloride<0.2	4-Droinonuorobenz	zene	101	00	155
Vinyl chloride<0.2Chloroethane<1			Concentration		
Chloroethane<11,1-Dichloroethene<1	Compounds:		ug/L (ppb)		
1,1-Dichloroethene<1	Vinyl chloride		<0.2		
Methylene chloride<5trans-1,2-Dichloroethene<1	Chloroethane		<1		
trans-1,2-Dichloroethene<11,1-Dichloroethane<1	1,1-Dichloroethene)	<1		
1,1-Dichloroethane<1	Methylene chloride	e	<5		
cis-1,2-Dichloroethene<11,2-Dichloroethane (EDC)<1	trans-1,2-Dichloro	ethene	<1		
1,2-Dichloroethane (EDC)<1	1,1-Dichloroethane	•	<1		
1,1,1-Trichloroethane<1	cis-1,2-Dichloroeth	ene	<1		
Trichloroethene <1	1,2-Dichloroethane	e (EDC)	<1		
	1,1,1-Trichloroetha	ane	<1		
Tetrachloroethene 44	Trichloroethene		<1		
	Tetrachloroethene		44		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-10:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-02 022327.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	57	121
Toluene-d8		102	63	127
4-Bromofluorobenz	zene	103	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		1.1		
Chloroethane		<1		
1,1-Dichloroethene	;	<1		
Methylene chloride	<u>è</u>	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane	:	<1		
cis-1,2-Dichloroeth	ene	15		
1,2-Dichloroethane	(EDC)	<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		1.2		
Tetrachloroethene		5.2		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-4:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-03 022333.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 97 101 103	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	2.3 < 1 < 1 < 5 < 1 < 1 < 22 < 1 < 1 < 1 < 1 < 1 < 1 <		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-11:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-04 022326.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 101 102 103	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	7.4 <1 <5 <1 <1 25 <1 <1 <1 8.0 2.7		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-14:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-05 022310.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4 Promofluorobane		% Recovery: 97 100	Lower Limit: 57 63 60	Upper Limit: 121 127 122
4-Bromofluorobenz Compounds:	zene	102 Concentration ug/L (ppb)	60	133
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-12:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-06 022311.D GCMS4 JS
			Lower	Upper
Surrogates:		% Recovery:	Limit:	Limit:
1,2-Dichloroethane	-d4	100	57	121
Toluene-d8		101	63	127
4-Bromofluorobenz	zene	99	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride	9	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroethene		<1		
1,2-Dichloroethane	e (EDC)	<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		1.2		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-10:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-07 022324.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	57	121
Toluene-d8		103	63	127
4-Bromofluorobenzene		102	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride		<5		
trans-1,2-Dichloroethene		<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroethene		14		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

ENVIRONMENTAL CHEMISTS

Client Sample ID:MW-13:BDate Received:02/22/17Date Extracted:02/23/17Date Analyzed:02/23/17Matrix:WaterUnits:ug/L (ppb)	0	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-08 022312.D GCMS4 JS
Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	101	60 60	133
		00	100
_	Concentration		
Compounds:	ug/L (ppb)		
Vinyl chloride	< 0.2		
Chloroethane	<1		
1,1-Dichloroethene	<1		
Methylene chloride	<5		
trans-1,2-Dichloroethene	<1		
1,1-Dichloroethane	<1		
cis-1,2-Dichloroethene	<1		
1,2-Dichloroethane (EDC)	<1		
1,1,1-Trichloroethane	<1		
Trichloroethene	<1		
Tetrachloroethene	3.0		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-1:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-09 022313.D GCMS4 JS
Surrogates: 1,2-Dichloroethane	-d4	% Recovery: 100	Lower Limit: 57	Upper Limit: 121
Toluene-d8 4-Bromofluorobenzene		100 103	63 60	127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe		<0.2 <1 <1 <5 <1		
1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	ene (EDC)	<1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-7:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-10 022314.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	101	57	121
Toluene-d8		100	63	127
4-Bromofluorobenzene		102	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	•	<1		
Methylene chloride	<u>è</u>	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroethene		<1		
1,2-Dichloroethane	e (EDC)	<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-8:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-11 022325.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8		% Recovery: 99 101	Lower Limit: 57 63	Upper Limit: 121 127
4-Bromofluorobenz Compounds:	zene	103 Concentration ug/L (ppb)	60	133
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 16		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-9:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-12 022315.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 100 101	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-5:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-13 022316.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 101 103	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1 2.5		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-6:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-14 022317.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 99 100	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	< 0.2 < 1 < 1 < 5 < 1 < 0.0		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-3:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-15 022318.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 100 101	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-6:Bag 02/22/17 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 702321-16 022319.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 99 100	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicab 02/23/17 02/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 702321 07-0349 mb 022308.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 101 100	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:	(Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene a (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Date of Report: 03/02/17 Date Received: 02/22/17 Project: 69402, F&BI 702321

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

Laboratory Code: 702321-12 (Matrix Spike)

J X	Reporting	Spike	Sample	Percent Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	101	36-166
Chloroethane	ug/L (ppb)	50	<1	114	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	104	60-136
Methylene chloride	ug/L (ppb)	50	<5	94	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	100	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	100	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	99	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	97	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	101	60-146
Trichloroethene	ug/L (ppb)	50	<1	94	66-135
Tetrachloroethene	ug/L (ppb)	50	<1	95	10-226

Laboratory Code: Laboratory Control Sample

	P		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	106	102	50-154	4
Chloroethane	ug/L (ppb)	50	116	102	58-146	13
1,1-Dichloroethene	ug/L (ppb)	50	107	103	67-136	4
Methylene chloride	ug/L (ppb)	50	104	97	39-148	7
trans-1,2-Dichloroethene	ug/L (ppb)	50	103	99	68-128	4
1,1-Dichloroethane	ug/L (ppb)	50	103	99	79-121	4
cis-1,2-Dichloroethene	ug/L (ppb)	50	105	99	80-123	6
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	100	95	73-132	5
1,1,1-Trichloroethane	ug/L (ppb)	50	106	100	83-130	6
Trichloroethene	ug/L (ppb)	50	98	93	80-120	5
Tetrachloroethene	ug/L (ppb)	50	102	96	76-121	6

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.

 ${\bf b}$ - 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.

 ${\rm d}$ - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Ph. (206) 285-8282	Seattle, WA 98119-2029	3012 16 th Avenue West	Friedman & Bruya, Inc.	, ,	aw-7: Bay	Gw-1: Bay	MW-13: Bag	Gw-10: Brg	MW-12 : Bas	Mw-14: 64	MW-11 Bry	MW-4: Bry	MW-10: Bry	Mu-5: Bug	Sample ID		City, State, ZIP <u>Tssayuh, WA</u> Phone <u>425-365-cols</u> Email	Nw	Company EPT	Report To Josh Ber	7023	
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Page #	02/22/		(]) `			SD(OF C	SAMPLERS (signature)	SAMPLE CHAIN OF CUSTODY			702321

ENVIRONMENTAL CHEMISTS

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

June 13, 2017

Eric Koltes, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 705438

Dear Mr Koltes:

Included are the results from the testing of material submitted on May 24, 2017 from the 69402, F&BI 705438 project. There are 18 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon, Josh Bernthal EPI0613R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 24, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 705438 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
705438-01	MW-8
705438-02	GW-11

The samples were sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the samples were sent to Fremont for carbon dioxide analysis. The reports are included.

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Manganese

Client ID:	MW-8		Client:	Environmental Partners
Date Received:	05/24/17		Project:	69402, F&BI 705438
Date Extracted:	05/30/17		Lab ID:	705438-01
Date Analyzed:	05/30/17		Data File:	705438-01.135
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte: Iron		Concentration ug/L (ppb) <50	-	

13.6

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	GW-11 05/24/17 05/30/17 05/30/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 705438 705438-02 705438-02.136 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		83.0 3.19		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705438
Date Extracted:	05/30/17	Lab ID:	I7-295 mb
Date Analyzed:	05/30/17	Data File:	I7-295 mb.062
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed:	MW-8 05/24/17 05/30/17 05/30/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 705438 705438-01 705438-01.137
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		324		
Manganese		186		

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	GW-11 05/24/17 05/30/17 05/30/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 705438 705438-02 705438-02.138 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		106 3.73		

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705438
Date Extracted:	05/30/17	Lab ID:	I7-294 mb
Date Analyzed:	05/30/17	Data File:	I7-294 mb.079
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-8 05/24/17 05/25/17 05/25/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705438 705438-01 052511.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	102	57	121
Toluene-d8		103	63	127
4-Bromofluorobenz	zene	99	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene)	<1		
Methylene chloride	<u>)</u>	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane	!	<1		
cis-1,2-Dichloroeth		<1		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-11 05/24/17 05/25/17 05/25/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705438 705438-02 052512.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	d4	101	57	121
Toluene-d8	-44	101	63	121
4-Bromofluorobenz	ano	98	60	133
4-Di ollioli do obcilz	ene	50	00	155
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		< 0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride	•	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	(EDC)	<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		<1		
Tetrachloroethene		15		

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicab 05/25/17 05/25/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705438 07-1041 mb 052505.D GCMS4 JS
Surrogatos		% Decovery	Lower Limit:	Upper Limit:
Surrogates:	44	% Recovery:		
1,2-Dichloroethane	-04	98 105	57	121
Toluene-d8		105	63	127
4-Bromofluorobenz	zene	98	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	•	<1		
Methylene chloride	<u>e</u>	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane	1	<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	e (EDC)	<1		
1,1,1-Trichloroetha		<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	MW-8		Client:	Environmental Partners
Date Received:	05/24/17		Project:	69402, F&BI 705438
Date Extracted:	05/30/17		Lab ID:	705438-01
Date Analyzed:	05/30/17		Data File:	006F0601.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

<10

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	GW-11		Client:	Environmental Partners
Date Received:	05/24/17		Project:	69402, F&BI 705438
Date Extracted:	05/30/17		Lab ID:	705438-02
Date Analyzed:	05/30/17		Data File:	007F0701.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

<10

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705438
Date Extracted:	05/30/17	Lab ID:	07-1154 mb
Date Analyzed:	05/30/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS
	Concentration		
Compounds:	ug/L (ppb)		
Methane	<5		
Ethane	<10		

<10

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/24/17 Project: 69402, F&BI 705438

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

Laboratory Cod	le: 705461-01	(Matrix Sp	oike)	Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	1,880	101 b	183 b	70-130	58 b
Manganese	ug/L (ppb)	20	3,820	0 b	1200 b	70-130	200 b

Laboratory Code: Laboratory Control Sample

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	100	85-115
Manganese	ug/L (ppb)	20	112	85-115

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/24/17 Project: 69402, F&BI 705438

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

Laboratory Co	de: 705475-01	(Matrix Sp	oike)				
-		_		Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	73.3	97 b	121 b	70-130	22 b
Manganese	ug/L (ppb)	20	118	70 b	139 b	70-130	66 b

Laboratory Code: Laboratory Control Sample

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	105	85-115
Manganese	ug/L (ppb)	20	113	85-115

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/24/17 Project: 69402, F&BI 705438

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

Laboratory Code: 705442-01 (Matrix Spike)

		G 11	c l	Percent	A .
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	97	36-166
Chloroethane	ug/L (ppb)	50	<1	112	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	104	60-136
Methylene chloride	ug/L (ppb)	50	<5	100	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	102	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	95	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	100	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	104	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	104	60-146
Trichloroethene	ug/L (ppb)	50	<1	99	66-135
Tetrachloroethene	ug/L (ppb)	50	<1	92	10-226

Laboratory Code: Laboratory Control Sample

Euboratory Couc. Euboratory	Jointi of Sumpro	0	D (D (
			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	89	87	50-154	2
Chloroethane	ug/L (ppb)	50	104	102	58-146	2
1,1-Dichloroethene	ug/L (ppb)	50	97	94	67-136	3
Methylene chloride	ug/L (ppb)	50	98	99	39-148	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	97	93	68-128	4
1,1-Dichloroethane	ug/L (ppb)	50	90	88	79-121	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	93	91	80-123	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	96	94	73-132	2
1,1,1-Trichlor oethane	ug/L (ppb)	50	100	96	83-130	4
Trichloroethene	ug/L (ppb)	50	94	91	80-120	3
Tetrachloroethene	ug/L (ppb)	50	91	89	76-121	2

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/24/17 Project: 69402, F&BI 705438

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methane	ug/L (ppb)	<5	<5	nm
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: 705461-04 (Duplicate)

Laboratory Code: Laboratory Control Sample

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Methane	ug/L (ppb)	59	79	79	50-150	0
Ethane	ug/L (ppb)	110	70	70	50-150	0
Ethene	ug/L (ppb)	102	94	94	50-150	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.

 ${\bf b}$ - 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.

 ${\rm d}$ - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

Friedman & Bruya Michael Erdahl 3012 16th Ave. W. Seattle, WA 98119

RE: 705438 Work Order Number: 1705335

June 02, 2017

Attention Michael Erdahl:

Fremont Analytical, Inc. received 2 sample(s) on 5/30/2017 for the analyses presented in the following report.

Total Alkalinity by SM 2320B

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Mohal C. Rady

Mike Ridgeway Laboratory Director

DoD/ELAP Certification #L2371, ISO/IEC 17025:2005 ORELAP Certification: WA 100009-007 (NELAP Recognized)



CLIENT: Project: Work Order:	Friedman & Bruya 705438 1705335	Work Order Sample Summar						
Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received					
1705335-001	MW-8	05/24/2017 1:29 PM	05/30/2017 1:04 PM					
1705335-002	GW-11	05/24/2017 2:57 PM	05/30/2017 1:04 PM					



Case Narrative

WO#: **1705335** Date: **6/2/2017**

CLIENT:Friedman & BruyaProject:705438

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

II. GENERAL REPORTING COMMENTS:

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

The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers & Acronyms



WO#: **1705335** Date Reported: **6/2/2017**

Qualifiers:

- * Flagged value is not within established control limits
- B Analyte detected in the associated Method Blank
- D Dilution was required
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- I Analyte with an internal standard that does not meet established acceptance criteria
- J Analyte detected below Reporting Limit
- N Tentatively Identified Compound (TIC)
- Q Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- (<20%RSD, <20% Drift or minimum RRF)
- S Spike recovery outside accepted recovery limits
- ND Not detected at the Reporting Limit
- R High relative percent difference observed

Acronyms:

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



CLIENT: Friedman & Bruya

Analytical Report

 Work Order:
 1705335

 Date Reported:
 6/2/2017

Project: 705438					
Lab ID: 1705335-001 Client Sample ID: MW-8			Collectior Matrix: W		5/24/2017 1:29:00 PM
Analyses	Result	RL Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B			Batch	n ID: R3	6524 Analyst: MW
Carbon dioxide	145	5.00	mg/L	1	6/1/2017 12:10:00 PM
Lab ID: 1705335-002 Client Sample ID: GW-11			Collectior Matrix: W		5/24/2017 2:57:00 PM
Analyses	Result	RL Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B			Batch	ID: R3	6524 Analyst: MW
Carbon dioxide	148	5.00	mg/L	1	6/1/2017 12:15:00 PM



Work Order:17053CLIENT:FriedmProject:70543	nan & Bruya					-	SUMMAR tal Alkalinit		
Sample ID MB-R36524 Client ID: MBLKW	SampType: MBLK Batch ID: R36524			Units: mg/L	Prep Date: 6/1/201 Analysis Date: 6/1/201		RunNo: 3652 SeqNo: 7006		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50							
Sample ID LCS-R36524	SampType: LCS			Units: mg/L	Prep Date: 6/1/201	7	RunNo: 3652	24	
Client ID: LCSW	Batch ID: R36524				Analysis Date: 6/1/201	7	SeqNo: 7006	52	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	113	2.50	100.0	0	113 80 120				
Sample ID 1705343-001FD	UP SampType: DUP			Units: mg/L	Prep Date: 6/1/201	7	RunNo: 3652	24	
Client ID: BATCH	Batch ID: R36524				Analysis Date: 6/1/201	7	SeqNo: 7006	54	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	2,520	2.50				2,572	2.06	20	



Sample Log-In Check List

	Erica Silva Ddy ustody complete? sample delivered?	Date Received: Yes ✔ FedEx	5/30/201	7 1:04:00 PM
Chain of Co ow was the 2	ustody complete?		No 🗌	Not Present
Chain of Co ow was the 2	ustody complete?		No 🗌	Not Present
1	sample delivered?	<u>FedEx</u>		
	resent?	Yes 🗌	No 🗸	
		ceived at appropria		
nipping cont	ainer/cooler in good condition?	Yes 🖌	No 🗌	
		Yes	No 🗹	Not Required
as an atten	npt made to cool the samples?	Yes 🗹	No 🗌	
ere all item	s received at a temperature of >0°C to 10.0°C*	Yes 🔽	No 🗌	
ample(s) in	proper container(s)?	Yes	No 🗹	
ufficient san	nple volume for indicated test(s)?	Yes 🖌	No 🗌	
e samples	properly preserved?	Yes 🖌	No 🗌	
as preserva	ative added to bottles?	Yes	No 🗹	NA 🗌
there head	space in the VOA vials?	Yes	No 🖌	
d all sample	es containers arrive in good condition(unbroken)?	Yes 🖌	No 🗌	
oes paperw	ork match bottle labels?	Yes 🗹	No 🗌	
e matrices	correctly identified on Chain of Custody?	Yes 🖌	No 🗌	
it clear wha	at analyses were requested?	Yes 🖌	No 🗌	
ere all hold	ing times able to be met?	Yes 🗹	No 🗌	
al Handli	ng (if applicable)			
	••••	Yes	No 🗌	NA 🔽
Person I	Notified: Date			
By Who	m: Via:	eMail Pho	one 🗌 Fax	In Person
Regardi	ng:			
Client In	structions:			
	efer to com as an atten ere all item mple(s) in fficient san e samples as preserva there head: d all sample es paperw e matrices it clear what ere all hold al Handli as client no Person I By Who Regardin Client In	By Whom: Via: Regarding: Client Instructions: ditional remarks:	efer to comments for Custody Seals not intact) as an attempt made to cool the samples? Yes ♥ ere all items received at a temperature of >0°C to 10.0°C* Yes ♥ mple(s) in proper container(s)? Yes ♥ fficient sample volume for indicated test(s)? Yes ♥ e samples properly preserved? Yes ♥ as preservative added to bottles? Yes ■ there headspace in the VOA vials? Yes ♥ d all samples containers arrive in good condition(unbroken)? Yes ♥ e matrices correctly identified on Chain of Custody? Yes ♥ e matrices correctly identified on Chain of Custody? Yes ♥ e matrices correctly identified on Chain of Custody? Yes ♥ e matrices correctly identified on be met? Yes ♥ ere all holding times able to be met? Yes ♥ Person Notified: Date By Whom: Via: eMail Phi Regarding: Client Instructions: ditional remarks:	effer to comments for Custody Seals not intact) as an attempt made to cool the samples? Yes No as an attempt made to cool the samples? Yes No ere all items received at a temperature of >0°C to 10.0°C* Yes No mple(s) in proper container(s)? Yes No mple(s) in proper container(s)? Yes No esamples properly preserved? Yes No esamples properly preserved? Yes No as preservative added to bottles? Yes No there headspace in the VOA vials? Yes No d all samples containers arrive in good condition(unbroken)? Yes No e matrices correctly identified on Chain of Custody? Yes No e matrices correctly identified on Chain of Custody? Yes No ere all holding times able to be met? Yes No ere all holding times able to be met? Yes No ere all holding times able to be met? Yes No Person Notified:

Item #	Temp °C
Sample	6.1

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

Fax (206) 283-5044	Ph. (206) 285-8282	Seattle, WA 98119-2029	3012 16th Avenue West	Friedman & Bruya, Inc.								(J-W-)	MH-8	Sample ID		Phone # <u>(206)</u> 285-8282	City, State, ZIP <u>Seattle</u>	Address	CompanyFriedm	Send Report <u>To Michae</u>	
Keceived by:	Relinquished by:	Received by:	Relingusterbed by:											Lab ID		Fax #	Seattle, WA 98119	3012 16th Ave W	Friedman and Bruya, Inc	Michael Erdahl	
y:	ied by:	y: Ch	Jedday:	SIGNATURE				E.				*	5/24/17	Date Sampled		(206) 283-5044	19		ruya, Inc.		
			E	TURE ,								せいちょう	1329	Time Sampled		5044	2				
			Mi									-	writer	Matrix			REMARKS		PROJECT NAME/NO.	SUBCONTRACTER	
			Michael Erdahl									2	2	# of jars		Please	KS	4	T NAI	NTRA	
x			Irdahl	PRINT										Dioxins/Furans		Please Email Results	- 1 Marine 1	32450Z	ME/NC		
				T NAME										EPH		Resul		Q.,).	tim	
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							 		 					Nitrate	ANALYSES		9	ņ			
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			Friedman and Bruya	C					 		 	 		Alkalinity	REQUESTED				++		
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		1304	MADO://	TIME										Notes		lons	SAL	l by:		of 1	

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

1705335

Page 8 of 8



Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 Professional Analytical Services

Jun 9 2017 Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-8	Water	17-A007750	DEM, MIN, NUT, CONV
GW-11	Water	17-A007751	DEM, MIN, NUT, CONV

Your samples were received on Thursday, May 25, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young

Laboratory Manager

Project #: 705438 PO Number: E-646

BACT = Bacteriological CONV = Conventionals MET = Metals ORG = Organics NUT=Nutrients DEM=Demand **MIN=Minerals**

Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 www.amtestlab.com



Professional Analytical Services

ANALYSIS REPORT

Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL Project #: 705438 PO Number: E-646 All results reported on an as received basis.

AMTEST Identification Number	17-A007750
Client Identification	MW-8
Sampling Date	05/24/17, 13:29

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/25/17
Total Organic Carbon	0.65	mg/l		0.5	SM 5310B	SW	05/30/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	2.60	mg/l		0.05	EPA 300.0	JC	05/26/17
Sulfate	21.6	mg/l		0.1	EPA 300.0	JC	05/31/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	1.00	mg/l		0.025	EPA 300.0	JC	05/26/17

Date Received: 05/25/17 Date Reported: 6/ 9/17

AMTEST Identification Number	17-A007751
Client Identification	GW-11
Sampling Date	05/24/17, 14:57

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/25/17
Total Organic Carbon	1.2	mg/l		0.5	SM 5310B	SW	05/30/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	41.3	mg/l		0.05	EPA 300.0	JC	06/01/17
Sulfate	25.4	mg/l		0.1	EPA 300.0	JC	06/01/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	3.10	mg/l		0.025	EPA 300.0	JC	05/26/17

σh Aaron W. Young Laboratory Manager

Am Test Inc. 13600 NE 126th PL Suite C Kirkland, WA, 98034 (425) 885-1664 www.amtestlab.com



QC Summary for sample numbers: 17-A007750 to 17-A007751

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A007743	BOD	mg/l	5.0	5.3	5.8
17-A007701	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007813	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007927	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007824	Nitrate	mg/l	0.102	0.093	9.2
17-A007824	Nitrite	mg/l	< 0.005	< 0.005	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPKAMT	RECOVERY
17-A007701	Total Organic Carbon	mg/l	1.5	3.1	2.0	80.00 %
17-A007751	Total Organic Carbon	mg/l	1.2	3.0	2.0	90.00 %
17-A007701	Chemical Oxygen Demand	mg/l	< 10	45.	50.	90.00 %
17-A007813	Chemical Oxygen Demand	mg/l	< 10	89.	100	89.00 %
17-A007927	Chemical Oxygen Demand	mg/l	< 10	86.	100	86.00 %
17-A007824	Nitrate	mg/l	0.102	4.93	5.00	96.56 %
17-A007824	Nitrite	mg/l	< 0.005	4.81	5.00	96.20 %
17-A007817	Total Sulfide	mg/l	< 0.05	0.54	0.50	108.00 %
17-A007817	Total Sulfide	mg/l	< 0.05	0.54	0.50	108.00 %

MATRIX SPIKE DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE + SPK	MSD VALUE	RPD
Spike	Total Sulfide	mg/l	0.54	0.54	0.00

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	190	95.0 %
Total Organic Carbon	mg/l	5.0	5.3	106. %
Total Organic Carbon	mg/l	5.0	4.9	98.0 %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chemical Oxygen Demand	mg/l	100	110	110. %
Chloride	mg/l	5.00	5.11	102. %
Chloride	mg/l	5.00	4.88	97.6 %
Nitrate	mg/l	5.00	4.92	98.4 %
Nitrate	mg/l	5.00	4.96	99.2 %
Nitrite	mg/l	5.00	5.00	100. %
Nitrite	mg/l	5.00	5.00	100. %
Total Sulfide	mg/l	1.0	1.0	100. %
Sulfate	mg/l	5.00	5.45	109. %
Sulfate	mg/l	5.00	5.17	103. %

QC Summary for sample numbers: 17-A007750 to 17-A007751...

BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1
Sulfate	mg/l	< 0.1

Fax (206) 283-5044 Received by:	Ph. (206) 285-8282 Relinquished by:	Seattle, WA 98119-2029 Received by:	Relinquished by	Fridmon & Bruya Inc SIGNATURE PRINT							45h1 7 15 11	Mire 1750 S/24/17 1329 wite 5	Sample ID Lab ID Date Time Matrix # of Jars Dioxins/Furans		City, State, ZIP <u>Seattle, WA 98119</u> Please Email Results Phone # (206) 285-8282 Fax # (206) 283-5044 Please Email Results	Address 3012 16th Ave W REMARKS	y Friedman and Bruya, Inc.	Send Report 10 MICHAEL DI VAME/NO.	
	C	M		' NAME	_						X X	× ×	Sulfide VPH Nitrate	ANAI		_	0		
											¥	×	Sulfate	NALYSES REQUESTED			6-646	PO#	
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5012-16" Avenue West Seattle, WA 98119-2029 Ph. (206) 285-8282	Priedman & Bruya, Inc.	- - - -								(mw-1)	Buw	Sample ID		PhoneE	City, State, ZIPssaq	Address 180 NW	Company E?	Report To Eric Ila	8Eh50t
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Sol Shi	Ser .	SIGNATURE								- 	5/24/17	Date Sampled			72086			he	
										457	1329	Time Sampled			REMARKS		PROJEC	SAMPL	SAMPLE CHAIN OF CUSTODY
HONZ	Elizabeth Webber Brys									4/20	H3 0	Sample Type			KS	20409	PROJECT NAME	SAMPLERS (sighature	CHAIN
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ENVIRONMENTAL CHEMISTS

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

June 13, 2017

Eric Koltes, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 705461

Dear Mr Koltes:

Included are the results from the testing of material submitted on May 25, 2017 from the 69402, F&BI 705461 project. There are 26 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon, Josh Bernthal EPI0613R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 25, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 705461 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
705461 -01	MW-1
705461 -02	MW-7
705461 -03	MW-15
705461 -04	MW-9

The samples were sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the samples were sent to Fremont for carbon dioxide analysis. The reports are included.

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-1 05/25/17 05/30/17 05/30/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 705461 705461-01 705461-01.099 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		1,880 3,820		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted:	MW-7 05/25/17 05/30/17		Client: Project: Lab ID:	Environmental Partners 69402, F&BI 705461 705461-02
Date Analyzed:	05/30/17		Data File:	705461-02.103
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		303 10.4		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Manganese

Client ID:	MW-15		Client:	Environmental Partners
Date Received:	05/25/17		Project:	69402, F&BI 705461
Date Extracted:	05/30/17		Lab ID:	705461-03
Date Analyzed:	05/30/17		Data File:	705461-03.104
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte: Iron		Concentration ug/L (ppb) <50		

3.37

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed:	MW-9 05/25/17 05/30/17 05/30/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 705461 705461-04 705461-04.105
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		<50		
Manganese		<1		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	I7-295 mb
Date Analyzed:	05/30/17	Data File:	I7-295 mb.062
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

ENVIRONMENTAL CHEMISTS

Client ID:	MW-1		Client:	Environmental Partners
Date Received:	05/25/17		Project:	69402, F&BI 705461
Date Extracted:	05/30/17		Lab ID:	705461-01
Date Analyzed:	05/30/17		Data File:	705461-01.121
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		2,740 3,490		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed:	MW-7 05/25/17 05/30/17 05/30/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 705461 705461-02 705461-02.122
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		323		
Manganese		10.9		

ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted:	MW-15 05/25/17 05/30/17		Client: Project: Lab ID: Data Film	Environmental Partners 69402, F&BI 705461 705461-03 705461 02 120
Date Analyzed:	05/30/17		Data File:	705461-03.130
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration		
Analyte.		ug/L (ppb)		
Iron		62.5		
Manganese		3.31		

ENVIRONMENTAL CHEMISTS

Client ID:	MW-9		Client:	Environmental Partners
Date Received:	05/25/17		Project:	69402, F&BI 705461
Date Extracted:	05/30/17		Lab ID:	705461-04
Date Analyzed:	05/30/17		Data File:	705461-04.131
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		<50 1.02		

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	I7-294 mb
Date Analyzed:	05/30/17	Data File:	I7-294 mb.079
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-1 05/25/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705461 705461-01 052618.D GCMS4 VM
C		04 D	Lower	Upper
Surrogates:		% Recovery:	Limit:	Limit:
1,2-Dichloroethane	e-d4	102	57	121
Toluene-d8		104	63	127
4-Bromofluorobenz	zene	99	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene)	<1		
Methylene chloride	ę	<5		
trans-1,2-Dichloro	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	e (EDC)	<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		2.4		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-7 05/25/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705461 705461-02 052619.D GCMS4 VM
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	101	57	121
Toluene-d8	, ui	101	63	127
4-Bromofluorobenz	zene	98	60 60	133
1 Di oniona oi obeni	lene			100
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		< 0.2		
Chloroethane		<1		
1,1-Dichloroethene	<u>j</u>	<1		
Methylene chlorid	е	<5		
trans-1,2-Dichloro	ethene	<1		
1,1-Dichloroethane	è.	<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	e (EDC)	<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		11		

ENVIRONMENTAL CHEMISTS

Date Received:0Date Extracted:0Date Analyzed:0Matrix:W	4W-15 5/25/17 5/26/17 5/26/17 Vater g/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705461 705461-03 052620.D GCMS4 VM
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	Į	101	57	121
Toluene-d8		105	63	127
4-Bromofluorobenzen	e	99	60	133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride		<5		
trans-1,2-Dichloroeth	ene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroethene	<u>j</u>	1.1		
1,2-Dichloroethane (E	CDC)	<1		
1,1,1-Trichloroethane		<1		
Trichloroethene		2.7		
Tetrachloroethene		120		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-9 05/25/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705461 705461-04 052621.D GCMS4 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 105 99	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1, 1-Dichloroethane Methylene chloride trans-1,2-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 5.4		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicab 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705461 07-1044 mb 052609.D GCMS4 VM
Surrogatos		% Recovery:	Lower Limit:	Upper Limit:
Surrogates:	44	102	57	121
1,2-Dichloroethane Toluene-d8	e-u4	102	63	121
4-Bromofluorobenz		99	60	133
4-DI 01110111001 0De112	Lene	99	00	155
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	<u>è</u>	<1		
Methylene chloride	<u>ġ</u>	<5		
trans-1,2-Dichloro	ethene	<1		
1,1-Dichloroethane	•	<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	e (EDC)	<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-1 05/25/17 05/30/17 05/30/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 705461 705461-01 008F0801.D GC8
Units:	ug/L (ppb)		Operator:	JS
Compounds:		Concentration ug/L (ppb)		
Methane Ethane		9.0 <10		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	MW-7		Client:	Environmental Partners
Date Received:	05/25/17		Project:	69402, F&BI 705461
Date Extracted:	05/30/17		Lab ID:	705461-02
Date Analyzed:	05/30/17		Data File:	009F0901.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID: Date Received:	MW-15 05/25/17		Client: Project:	Environmental Partners 69402, F&BI 705461
Date Extracted:	05/30/17		Lab ID:	705461-03
Date Analyzed:	05/30/17		Data File:	010F1001.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	MW-9		Client:	Environmental Partners
Date Received:	05/25/17		Project:	69402, F&BI 705461
Date Extracted:	05/30/17		Lab ID:	705461-04
Date Analyzed:	05/30/17		Data File:	011F1101.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	07-1154 mb
Date Analyzed:	05/30/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS
	Concentration		
Compounds:	ug/L (ppb)		
Methane	<5		
Ethane	<10		

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/25/17 Project: 69402, F&BI 705461

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

Laboratory Co	de: 705461-01	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	1,880	101 b	183 b	70-130	58 b
Manganese	ug/L (ppb)	20	3,820	0 b	1200 b	70-130	200 b

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	100	85-115
Manganese	ug/L (ppb)	20	112	85-115

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/25/17 Project: 69402, F&BI 705461

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

Laboratory Cod	de: 705475-01	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	73.3	97 b	121 b	70-130	22 b
Manganese	ug/L (ppb)	20	118	70 b	139 b	70-130	66 b
-							

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	105	85-115
Manganese	ug/L (ppb)	20	113	85-115

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/25/17 Project: 69402, F&BI 705461

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

Laboratory Code: 705475-01 (Matrix Spike)

	Reporting	Spike	Sample	Percent Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	84	36-166
Chloroethane	ug/L (ppb)	50	<1	98	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	97	60-136
Methylene chloride	ug/L (ppb)	50	<5	96	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	95	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	89	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	92	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	95	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	96	60-146
Trichloroethene	ug/L (ppb)	50	<1	92	66-135
Tetrachloroethene	ug/L (ppb)	50	4.1	90	10-226

	1		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	87	83	50-154	5
Chloroethane	ug/L (ppb)	50	99	97	58-146	2
1,1-Dichloroethene	ug/L (ppb)	50	95	96	67-136	1
Methylene chloride	ug/L (ppb)	50	91	88	39-148	3
trans-1,2-Dichloroethene	ug/L (ppb)	50	94	94	68-128	0
1,1-Dichloroethane	ug/L (ppb)	50	89	87	79-121	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	91	91	80-123	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	96	93	73-132	3
1,1,1-Trichloroethane	ug/L (ppb)	50	99	95	83-130	4
Trichloroethene	ug/L (ppb)	50	92	90	80-120	2
Tetrachloroethene	ug/L (ppb)	50	93	89	76-121	4

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/25/17 Project: 69402, F&BI 705461

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methane	ug/L (ppb)	<5	<5	nm
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: 705461-04 (Duplicate)

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Methane	ug/L (ppb)	59	79	79	50-150	0
Ethane	ug/L (ppb)	110	70	70	50-150	0
Ethene	ug/L (ppb)	102	94	94	50-150	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.

 ${\bf b}$ - 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.

 ${\rm d}$ - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

Friedman & Bruya Michael Erdahl 3012 16th Ave. W. Seattle, WA 98119

RE: 705461 Work Order Number: 1705336

June 02, 2017

Attention Michael Erdahl:

Fremont Analytical, Inc. received 4 sample(s) on 5/30/2017 for the analyses presented in the following report.

Total Alkalinity by SM 2320B

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Mohl C. Rady

Mike Ridgeway Laboratory Director

DoD/ELAP Certification #L2371, ISO/IEC 17025:2005 ORELAP Certification: WA 100009-007 (NELAP Recognized)



CLIENT: Project: Work Order:	Friedman & Bruya 705461 1705336	Work Order S	Sample Summary
Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1705336-001	MW-1	05/25/2017 8:13 AM	05/30/2017 1:04 PM
1705336-002	MW-7	05/25/2017 9:06 AM	05/30/2017 1:04 PM
1705336-003	MW-15	05/25/2017 10:00 AM	05/30/2017 1:04 PM
1705336-004	MW-9	05/25/2017 11:21 AM	05/30/2017 1:04 PM



Case Narrative

WO#: **1705336** Date: **6/2/2017**

CLIENT:Friedman & BruyaProject:705461

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

II. GENERAL REPORTING COMMENTS:

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

The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers & Acronyms



WO#: **1705336** Date Reported: **6/2/2017**

Qualifiers:

- * Flagged value is not within established control limits
- B Analyte detected in the associated Method Blank
- D Dilution was required
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- I Analyte with an internal standard that does not meet established acceptance criteria
- J Analyte detected below Reporting Limit
- N Tentatively Identified Compound (TIC)
- Q Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- (<20%RSD, <20% Drift or minimum RRF)
- S Spike recovery outside accepted recovery limits
- ND Not detected at the Reporting Limit
- R High relative percent difference observed

Acronyms:

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



Friedman & Bruya

CLIENT:

Analytical Report

 Work Order:
 1705336

 Date Reported:
 6/2/2017

Lab ID: 1705336-001 Client Sample ID: MW-1				Collection Matrix: V		5/25/2017 8:13:00 AM
Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B				Batc	h ID: R3	6524 Analyst: MW
Carbon dioxide	370	5.00		mg/L	1	6/1/2017 11:50:00 AM
Lab ID: 1705336-002 Client Sample ID: MW-7				Collection Matrix: V		5/25/2017 9:06:00 AM
Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B				Batc	h ID: R3	6524 Analyst: MW
Carbon dioxide	137	5.00		mg/L	1	6/1/2017 11:55:00 AM
Lab ID: 1705336-003 Client Sample ID: MW-15				Collection Matrix: V		5/25/2017 10:00:00 AM
Analyses	Result	RL	Qual	Units	DF	Date Analyzed

Total Alkalinity by SM 2320B			Batch	ID: F	R36524 Analyst: MW
Carbon dioxide	116	5.00	mg/L	1	6/1/2017 12:00:00 PM



CLIENT: Friedman & Bruya

Analytical Report

 Work Order:
 1705336

 Date Reported:
 6/2/2017

Project: 705461					
Lab ID: 1705336-004 Client Sample ID: MW-9			Collection Matrix: W		5/25/2017 11:21:00 AM
Analyses	Result	RL Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B			Batch	ID: R3	6524 Analyst: MW
Carbon dioxide	92.8	5.00	mg/L	1	6/1/2017 12:05:00 PM



Work Order:17053CLIENT:FriedmentProject:70546	an & Bruya							-	SUMMA tal Alkalini		
Sample ID MB-R36524 Client ID: MBLKW	SampType: MBLK Batch ID: R36524			Units: mg/L		Prep Date: Analysis Date:			RunNo: 365 SeqNo: 700		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	lighLimit RPD	Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									
Sample ID LCS-R36524	SampType: LCS			Units: mg/L		Prep Date:	6/1/2017		RunNo: 365	524	
Client ID: LCSW	Batch ID: R36524					Analysis Date:	6/1/2017		SeqNo: 700	652	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	lighLimit RPD	Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	113	2.50	100.0	0	113	80	120				
Sample ID 1705343-001FD	UP SampType: DUP			Units: mg/L		Prep Date:	6/1/2017		RunNo: 365	524	
Client ID: BATCH	Batch ID: R36524					Analysis Date:	6/1/2017		SeqNo: 700	0654	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	lighLimit RPD	Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	2,520	2.50						2,572	2.06	20	



Sample Log-In Check List

С	lient Name:	FB	Work Order Numb	ber: 1705336	
Lo	ogged by:	Erica Silva	Date Received:	5/30/2017	7 1:04:00 PM
Cha	in of Cust	ody			
		sustody complete?	Yes 🖌	No	Not Present
2.	How was the	sample delivered?	<u>FedEx</u>		
Log	In				
-	Coolers are p	present?	Yes	No 🖌	
0.			eceived at appropria		
4.	Shipping con	tainer/cooler in good condition?	Yes 🗹	No 🗌	
5.		Is present on shipping container/cooler? nments for Custody Seals not intact)	Yes	No 🗹	Not Required
6.	Was an atter	npt made to cool the samples?	Yes 🖌	No 🗌	NA 🗌
7.	Were all item	ns received at a temperature of >0°C to 10.0°C*	Yes ✔	No 🗌	
8.	Sample(s) in	proper container(s)?	Yes	No 🔽	
9.	Sufficient sar	mple volume for indicated test(s)?	Yes 🖌	No 🗌	
10.	Are samples	properly preserved?	Yes 🗹	No 🗌	
11.	Was preserv	ative added to bottles?	Yes	No 🔽	NA 🗌
12.	Is there head	Ispace in the VOA vials?	Yes	No 🔽	
13.	Did all sampl	es containers arrive in good condition(unbroken)?	Yes 🖌	No 🗌	
14.	Does paperw	ork match bottle labels?	Yes 🗹	No 🗌	
15	Are matrices	correctly identified on Chain of Custody?	Yes 🖌	No 🗌	
-		at analyses were requested?	Yes 🖌	No 🗌	
17.	Were all hold	ling times able to be met?	Yes 🗹	No 🗌	
<u>Spe</u>	cial Handl	ing (if applicable)			
18.	Was client no	otified of all discrepancies with this order?	Yes	No 🗌	NA 🔽
	Person	Notified: Date	e		
	By Who	-	P	one 🗌 Fax	In Person
	Regardi	ing:			
	Client Ir	nstructions:			
19.	Additional rei	marks:			
ltem	Information				

Item #	Temp °C
Sample	6.1

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

Fax (206) 283-5044	Ph. (206) 285-8282	Seattle, WA 98119-2029	3012 16th Avenue West	Friedman & Bruya, Inc.						MW-9	MW-15	H-WM	MW-1	Sample ID		Phone # <u>(206) 285-8282</u>	City, State, ZIP <u>Seattle</u> ,	Address <u>3012 16</u>	CompanyFriedm	Send Report <u>To Michae</u>	
Received by:	Relinquished by:	Received by:	Relingudented by											Lab ID		Fax #	Seattle, WA 98119	3012 16th Ave W	<u>Friedman and Bruya, Inc.</u>	Michael Erdahl	
by:	hed by:	V No	N. C.	SIGNATURE								-	5/25/17	Date Sampled		(206) 283-5044	19		cuya, Inc.		IS
		/	Ĺ	FURE						1121	1000	0906	5190	Time Sampled		5044					SUBCONTRACT SAMPLE CHAIN OF
			Mi							-		_	water	Matrix			REMARKS		PROJECT NAME/NO.	SUBCONTRACTER	ACT SA
			Michael Erdahl						-	~.	s	~	2	# of jars		Please Email Results	KS	307	T NAN	NTRAC	MPL
			Irdahl	PRIN										Dioxins/Furans		Email		194507	AE/NO		E CH
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			Fr			 		 						Sulfate	ISES			6-653	PO#		OD
		8	Friedman and Bruya	Q		 		 						Alkalinity	REQU						R
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			ya			 		 								ll call	SAN spose a	charg	JSH	Page #	
		5	15/30	DA												Return samples Will call with instructions	SAMPLE DISPOSAL Dispose after 30 days	Rush charges authorized by:	Standard (2 Weeks)	Page # of TURNAROUND TIME	
		SOLT	<i>t1/</i> c	DATE										E.		Istruct) days	horized	eks)	UND	
		17	11:00AM	TIME										Notes		ions	SAL	ł by:		IME	
		404	MM	ME															Page	9 of 9)

Page	9	of
	-	-

1705336



Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664

Professional Analytical Services

Jun 9 2017 Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-1	Water	17-A007810	DEM, MIN, NUT, CONV
MW-7	Water	17-A007811	DEM, MIN, NUT, CONV
MW-15	Water	17-A007812	DEM, MIN, NUT, CONV
MW-9	Water	17-A007813	DEM, MIN, NUT, CONV

Your samples were received on Friday, May 26, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young

Laboratory Manager

Project #: 705461 PO Number: E-647

BACT = Bacteriological CONV = Conventionals MET = Metals ORG = Organics NUT=Nutrients **DEM=Demand**

MIN=Minerals

Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 www.amtestlab.com



Professional Analytical Services

ANALYSIS REPORT

Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL Project #: 705461 PO Number: E-647 All results reported on an as received basis.

AMTEST Identification Number	17-A007810
Client Identification	MW-1
Sampling Date	05/25/17, 08:13

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/26/17
Total Organic Carbon	9.6	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	36.2	mg/l		0.05	EPA 300.0	JC	06/05/17
Sulfate	5.50	mg/l		0.1	EPA 300.0	JC	05/26/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	0.901	mg/l		0.025	EPA 300.0	JC	05/26/17

AMTEST Identification Number	17-A007811
Client Identification	MW-7
Sampling Date	05/25/17, 09:06

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/26/17
Total Organic Carbon	1.2	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	617.	mg/l		0.05	EPA 300.0	JC	06/01/17
Sulfate	17.6	mg/l		0.1	EPA 300.0	JC	06/01/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	4.40	mg/l		0.025	EPA 300.0	JC	05/26/17

AMTEST Identification Number	17-A007812
Client Identification	MW-15
Sampling Date	05/25/17, 10:00

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/26/17
Total Organic Carbon	1.0	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	10.4	mg/l		0.05	EPA 300.0	JC	06/01/17
Sulfate	12.4	mg/l		0.1	EPA 300.0	JC	06/01/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	1.90	mg/l		0.025	EPA 300.0	JC	05/26/17

AMTEST Identification Number	17-A007813
Client Identification	MW-9
Sampling Date	05/25/17, 11:21

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/26/17
Total Organic Carbon	< 0.5	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	5.08	mg/l		0.05	EPA 300.0	JC	05/26/17
Sulfate	8.10	mg/l		0.1	EPA 300.0	JC	05/26/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	0.753	mg/l		0.025	EPA 300.0	JC	05/26/17

σh Aaron W. Young Laboratory Manager

Am Test Inc. 13600 NE 126th PL Suite C Kirkland, WA, 98034 (425) 885-1664 www.amtestlab.com



QC Summary for sample numbers: 17-A007810 to 17-A007813

DUPLICATES

DUPLICAT	23				
SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A007796	BOD	mg/l	4.6	5.1	10.
17-A007701	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007813	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007927	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007824	Nitrate	mg/l	0.102	0.093	9.2
17-A007824	Nitrite	mg/l	< 0.005	< 0.005	
17-A007824	Nitrate	mg/l	0.102	0.093	9.2

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
17-A007844	Total Organic Carbon	mg/l	0.89	5.9	5.0	100.20 %
17-A007848	Total Organic Carbon	mg/l	0.78	6.4	5.0	112.40 %
17-A007701	Chemical Oxygen Demand	mg/l	< 10	45.	50.	90.00 %
17-A007813	Chemical Oxygen Demand	mg/l	< 10	89.	100	89.00 %
17-A007927	Chemical Oxygen Demand	mg/l	< 10	86.	100	86.00 %
17-A007824	Nitrate	mg/l	0.102	4.93	5.00	96.56 %
17-A007824	Nitrite	mg/l	< 0.005	4.81	5.00	96.20 %
17-A007817	Total Sulfide	mg/l	< 0.05	0.54	0.50	108.00 %
17-A007817	Total Sulfide	mg/l	< 0.05	0.54	0.50	108.00 %

MATRIX SPIKE DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE + SPK	MSD VALUE	RPD
Spike	Total Sulfide	mg/l	0.54	0.54	0.00

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	200	100. %
Total Organic Carbon	mg/l	5.0	5.1	102. %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chemical Oxygen Demand	mg/l	100	110	110. %
Chloride	mg/l	5.00	5.11	102. %
Chloride	mg/l	5.00	4.88	97.6 %
Chloride	mg/l	5.00	4.87	97.4 %
Nitrate	mg/l	5.00	4.92	98.4 %
Nitrate	mg/l	5.00	4.96	99.2 %
Nitrite	mg/l	5.00	5.00	100. %
Nitrite	mg/l	5.00	5.00	100. %
Total Sulfide	mg/l	1.0	1.0	100. %
Sulfate	mg/l	5.00	5.26	105. %
Sulfate	mg/l	5.00	5.17	103. %

QC Summary for sample numbers: 17-A007810 to 17-A007813...

BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1
Sulfate	mg/l	< 0.1
Chloride Chloride Chloride Nitrate Nitrate Nitrite Nitrite Total Sulfide Sulfate	mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l	< 0.05 < 0.05 < 0.05 < 0.025 < 0.025 < 0.005 < 0.005 < 0.05 < 0.1

Send Report <u>To</u> <u>Michael Erdahl</u> Company <u>Friedman and E</u> Address <u>3012 16th Ave V</u>	Michael Erdahl Friedman and Bruya, Inc 3012 16th Ave W	•	SUBCONTRACT SAMPLE CHAIN OF C SUBCONTRACTER Antst PROJECT NAME/NO. 70546	ACT SAMPLE CH SUBCONTRACTER PROJECT NAME/NO 70546	T SAMPLE BCONTRACT OJECT NAME	E CH TER IE/NO	Amtst	OF OF	ET CUS	USTODY PO#	+ # Y		Rus	Page #	Page # TURNAR Idard (2 W)H harges au	Page # of TURNAROUND TIME © Standard (2 Weeks) □ RUSH Rush charges authorized by:	ME (
City, State, ZIP <u>Seattle</u> , Phone <u># (206) 285-8282</u>	Seattle, WA 98119 35-8282 Fax #	<u>.9</u> (206) 283-5044	044	REMARKS Ple	KS Please Email Results	Email	Resul	ts						SAMPLE I Dispose after 30 Return samples Will call with in	MPLH after sampl l with	SAMPLE DISPOSAL Dispose after 30 days Return samples Will call with instructions	AL ns
									ANAL	YSES	REQ	VALYSES REQUESTED	CED				
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	Sulfide VPH	Nitrate	Sulfate	Chlonde Alkalinity	TOC-9 060M	CUD	Nitrite	BOD	Nc	Notes
mw-1	0181	5/20/2	513	water	Ч			\times	\times	\prec	\times	\mathbf{x}	\times	\times	×		
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MH4)-15	12		00		Л			×	X	X	Х	X	Χ	X	X		
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Friedman & Bruya, Inc.		∧ SIGNATURE	TURE			PRINT	T NAME	ME				COM	COMPANY		_	DATE	TIME
3012 16th Avenue West	Relinquished by:	hed by:	and a second	Mi	Michael Erdahl	brdaht	Cen	4	DUNT	1	Friedr	Friedman and Bruya	nd Br	uya	4	SLOFT	830
Seattle, WA 98119-2029 Ph. (206) 285-8282	Received by:" Relinquished by:	by:" hed by:	A		4.57	STAAB		the second	1.0		A-LT	ANTEST			5/	26/17	10:30
Fax (206) 283-5044	Received by:	by:															

P.8

Friedman & Bruya, Inc. 3012 16 th Avenue West Seattle, WA 98119-2029 Ph. (206) 285-8282	м <i>м</i> - 9	MW-7	Sample ID Mw-1	705461 Report To $Fric 61$ Company $EP1$ Address 180 NM M City, State, ZIP $155aqvah$ Phone Email
Relinquished by Received by Received by:	OYA-P	02A-P 03A-P	Lab ID	aple w
D.M. BU			Date Sampled	Bernthal St. St.
	1121	906 1000	Time Sampled	SAMPLE CHAIN OF CUST SAMPLERS (signature) PROJECT NAME PROJECT NAME 6940 2 REMARKS
			Sample Type Water	AMPLE CHAIN OI SAMPLERS (signatur PROJECT NAME 6940 2 REMARKS
PRINT NAME Effsherr	16	16	# of Jars	OF
PRINT NAN			TPH-HCID	
		<u> </u>	TPH-Diesel	TODY
P. Nebber			TPH-Gasoline BTEX by 8021B	Y
38	X	××	× <u>evoc</u> s by 8260C	ANA
			SVOCs by 8270D	ME O PO # INVOICE TO
			PAHs 8270D SIM	PO # OICE T
COMPANY BEPI	×	XX	PAHs 8270D SIM Total for +Pb Dissolved for B Methane, ethat q	E S
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<u> </u>	<u> </u>	XX	TOC+COD	$\frac{25}{17} + \frac{1}{1} = 0$ $\frac{1}{10} = 0$
		\times \times	X Nitrate/Nitrite	ROU ROU autho autho r 30 c
	Ma-perley		× Bod es	25/17 VWS Page # 1 of TURNAROUND TIME & Standard Turnaround I RUSH Rush charges authorized by: SAMPLE DISPOSAL I Dispose after 30 days I Archive Samples
TIME		<u> </u>		
		÷	* Sulfide	
(×	XX	* Carbon Dioxide	

ENVIRONMENTAL CHEMISTS

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

June 1, 2017

Eric Koltes, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 705462

Dear Mr Koltes:

Included are the results from the testing of material submitted on May 25, 2017 from the 69402, F&BI 705462 project. There are 14 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon, Josh Bernthal EPI0601R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 25, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 705462 project. Samples were logged in under the laboratory ID's listed below.

Environmental Partners
MW-4:Bag
MW-10:Bag
MW-11:Bag
MW-5:Bag
MW-14:Bag
MW-12:Bag
MW-6:Bag
MW-13:Bag
GW-10:Bag

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-4:Bag 05/25/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705462 705462-01 052613.D GCMS9 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 97 99 99	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	2.1 <1 <1 <5 <1 <1 9.8 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-10:Bag 05/25/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705462 705462-02 052618.D GCMS9 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 100 102	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	3.2 < 1 < 1 < 5 < 1 < 1 < 1 < 1 < 1 < 1 < 1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-11:Bag 05/25/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705462 705462-03 052620.D GCMS9 VM
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	102	85	117
Toluene-d8	u i	98	91	108
4-Bromofluorobenzene		99	76	126
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		4.1		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride	e e e e e e e e e e e e e e e e e e e	<5		
trans-1,2-Dichloroe		<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth		26		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-5:Bag 05/25/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705462 705462-04 052630.D GCMS9 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 100 101	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichlorœthae Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 51		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-14:Bag 05/25/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705462 705462-05 052631.D GCMS9 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 100 101	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-12:Bag 05/25/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705462 705462-06 052621.D GCMS9 VM
-			Lower	Upper
Surrogates:		% Recovery:	Limit:	Limit:
1,2-Dichloroethane	-d4	100	85	117
Toluene-d8		98	91	108
4-Bromofluorobenzene		98	76	126
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	•	<1		
Methylene chloride	<u>e</u>	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane	1	<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	(EDC)	<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-6:Bag 05/25/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705462 705462-07 052622.D GCMS9 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 100 100	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-13:Bag 05/25/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705462 705462-08 052623.D GCMS9 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 100 101	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 3.0		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-10:Bag 05/25/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705462 705462-09 052624.D GCMS9 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 99 100	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 18 <1 <1 <1 <1 <1 1.9		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blar Not Applical 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705462 07-1043 mb 052609.D GCMS9 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 100 103	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Date of Report: 06/01/17 Date Received: 05/25/17 Project: 69402, F&BI 705462

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

Laboratory Code: 705453-02 1/100 (Duplicate)

	Reporting	Sample	Duplicate	RPD
Analyte	Units	Result	Result	(Limit 20)
Vinyl chloride	ug/L (ppb)	<20	<20	nm
Chloroethane	ug/L (ppb)	<100	<100	nm
1,1-Dichloroethene	ug/L (ppb)	<100	<100	nm
Methylene chloride	ug/L (ppb)	<500	<500	nm
trans-1,2-Dichloroethene	ug/L (ppb)	<100	<100	nm
1,1-Dichloroethane	ug/L (ppb)	<100	<100	nm
cis-1,2-Dichloroethene	ug/L (ppb)	<100	<100	nm
1,2-Dichloroethane (EDC)	ug/L (ppb)	<100	<100	nm
1,1,1-Trichloroethane	ug/L (ppb)	<100	<100	nm
Trichloroethene	ug/L (ppb)	<100	<100	nm
Tetrachloroethene	ug/L (ppb)	<100	<100	nm

Laboratory Code: 705462-01 (Matrix Spike)

				Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	2.1	93	61-139
Chloroethane	ug/L (ppb)	50	<1	91	55-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	94	71-123
Methylene chloride	ug/L (ppb)	50	<5	98	61-126
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	96	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	94	79-113
cis-1,2-Dichloroethene	ug/L (ppb)	50	9.8	92	63-126
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	90	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	94	75-121
Trichloroethene	ug/L (ppb)	50	<1	85	73-122
Tetrachloroethene	ug/L (ppb)	50	<1	89	72-113

ENVIRONMENTAL CHEMISTS

Date of Report: 06/01/17 Date Received: 05/25/17 Project: 69402, F&BI 705462

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

Laboratory code. Laboratory con	lei or Sumpre		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	99	94	70-128	5
Chloroethane	ug/L (ppb)	50	96	91	66-149	5
1,1-Dichloroethen e	ug/L (ppb)	50	98	97	75-119	1
Methylene chloride	ug/L (ppb)	50	106	103	63-132	3
trans-1,2-Dichloroethene	ug/L (ppb)	50	99	96	76-118	3
1,1-Dichloroethane	ug/L (ppb)	50	95	93	77-119	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	95	92	76-119	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	92	90	78-114	2
1,1,1-Trichloroethane	ug/L (ppb)	50	97	95	80-116	2
Trichloroethene	ug/L (ppb)	50	88	86	72-119	2
Tetrachloroethene	ug/L (ppb)	50	91	90	78-109	1

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.

 ${\bf b}$ - 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.

 ${\rm d}$ - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

 $\ensuremath{\text{ip}}$ - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

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

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

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

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

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

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

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

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

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

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

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

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ENVIRONMENTAL CHEMISTS

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

June 13, 2017

Eric Koltes, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 705475

Dear Mr Koltes:

Included are the results from the testing of material submitted on May 26, 2017 from the 69402, F&BI 705475 project. There are 14 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon, Josh Bernthal EPI0613R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 26, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 705475 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	
705475 -01	

Environmental Partners GW-4

Sample GW-4 was sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the sample was sent to Fremont for carbon dioxide analysis. The reports are included.

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed:	GW-4 05/26/17 05/30/17 05/30/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 705475 705475-01 705475-01.082
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		73.3		
Manganese		118		

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705475
Date Extracted:	05/30/17	Lab ID:	I7-294 mb
Date Analyzed:	05/30/17	Data File:	I7-294 mb.079
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted:	GW-4 05/26/17 05/30/17		Client: Project: Lab ID:	Environmental Partners 69402, F&BI 705475 705475-01
Date Analyzed:	05/30/17		Data File:	705475-01.086
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		<50		
Manganese		1.81		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705475
Date Extracted:	05/30/17	Lab ID:	I7-295 mb
Date Analyzed:	05/30/17	Data File:	I7-295 mb.062
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-4 05/26/17 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705475 705475-01 052617.D GCMS4 VM
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	101	57	121
Toluene-d8	uı	101	63	127
4-Bromofluorobenz	zene	98	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride		<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth		<1		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		<1		
Tetrachloroethene		4.1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicab 05/26/17 05/26/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705475 07-1044 mb 052609.D GCMS4 VM
Surrogatos		% Decovoru:	Lower Limit:	Upper Limit:
Surrogates:	14	% Recovery:		
1,2-Dichloroethane	e-04	102	57	121
Toluene-d8		103	63	127
4-Bromofluorobenz	zene	99	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene)	<1		
Methylene chloride	ę	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane	•	<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	e (EDC)	<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-4 05/26/17 05/30/17 05/30/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705475 705475-01 013F1301.D GC8 JS
Compounds:		Concentration ug/L (ppb)		
Methane Ethane		<5 <10		

<10

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705475
Date Extracted:	05/30/17	Lab ID:	07-1154 mb
Date Analyzed:	05/30/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS
	Concentration		
Compounds:	ug/L (ppb)		
Methane	<5		
Ethane	<10		

<10

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/26/17 Project: 69402, F&BI 705475

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

Laboratory Cod	le: 705475-01	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	73.3	97 b	121 b	70-130	22 b
Manganese	ug/L (ppb)	20	118	70 b	139 b	70-130	66 b

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	105	85-115
Manganese	ug/L (ppb)	20	113	85-115

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/26/17 Project: 69402, F&BI 705475

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

Laboratory Coc	de: 705461-01	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	1,880	101 b	183 b	70-130	58 b
Manganese	ug/L (ppb)	20	3,820	0 b	1200 b	70-130	200 b

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	100	85-115
Manganese	ug/L (ppb)	20	112	85-115

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/26/17 Project: 69402, F&BI 705475

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

Laboratory Code: 705475-01 (Matrix Spike)

5	1 /			Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	84	36-166
Chloroethane	ug/L (ppb)	50	<1	98	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	97	60-136
Methylene chloride	ug/L (ppb)	50	<5	96	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	95	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	89	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	92	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	95	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	96	60-146
Trichloroethene	ug/L (ppb)	50	<1	92	66-135
Tetrachloroethene	ug/L (ppb)	50	4.1	90	10-226

	r		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	87	83	50-154	5
Chloroethane	ug/L (ppb)	50	99	97	58-146	2
1,1-Dichloroethene	ug/L (ppb)	50	95	96	67-136	1
Methylene chloride	ug/L (ppb)	50	91	88	39-148	3
trans-1,2-Dichloroethene	ug/L (ppb)	50	94	94	68-128	0
1,1-Dichloroethane	ug/L (ppb)	50	89	87	79-121	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	91	91	80-123	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	96	93	73-132	3
1,1,1-Trichloroethane	ug/L (ppb)	50	99	95	83-130	4
Trichloroethene	ug/L (ppb)	50	92	90	80-120	2
Tetrachloroethene	ug/L (ppb)	50	93	89	76-121	4

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/26/17 Project: 69402, F&BI 705475

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methane Ethane	ug/L (ppb) ug/L (ppb)	<5 <10	<5 <10	nm nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: 705461-04 (Duplicate)

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Methane	ug/L (ppb)	59	79	79	50-150	0
Ethane	ug/L (ppb)	110	70	70	50-150	0
Ethene	ug/L (ppb)	102	94	94	50-150	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.

 ${\rm d}$ - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

Friedman & Bruya Michael Erdahl 3012 16th Ave. W. Seattle, WA 98119

RE: 705475 Work Order Number: 1705337

June 02, 2017

Attention Michael Erdahl:

Fremont Analytical, Inc. received 1 sample(s) on 5/30/2017 for the analyses presented in the following report.

Total Alkalinity by SM 2320B

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Mohal C. Rady

Mike Ridgeway Laboratory Director

DoD/ELAP Certification #L2371, ISO/IEC 17025:2005 ORELAP Certification: WA 100009-007 (NELAP Recognized)



CLIENT:Friedman & BruyaProject:705475Work Order:1705337		Work Order S	Sample Summary
Lab Sample ID	Client Sample ID	Date/Time Collected 05/28/2017 7:12 AM	Date/Time Received
1705337-001	GW-4		05/30/2017 1:04 PM



Case Narrative

WO#: **1705337** Date: **6/2/2017**

CLIENT:Friedman & BruyaProject:705475

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

II. GENERAL REPORTING COMMENTS:

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

The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers & Acronyms



WO#: **1705337** Date Reported: **6/2/2017**

Qualifiers:

- * Flagged value is not within established control limits
- B Analyte detected in the associated Method Blank
- D Dilution was required
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- I Analyte with an internal standard that does not meet established acceptance criteria
- J Analyte detected below Reporting Limit
- N Tentatively Identified Compound (TIC)
- Q Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- (<20%RSD, <20% Drift or minimum RRF)
- S Spike recovery outside accepted recovery limits
- ND Not detected at the Reporting Limit
- R High relative percent difference observed

Acronyms:

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



Analytical Report

 Work Order:
 1705337

 Date Reported:
 6/2/2017

Client: Friedman & Bruya	ent: Friedman & Bruya Collection Date: 5/28/2017 7:12:0								
Project: 705475 Lab ID: 1705337-001	Matrix: Water								
Client Sample ID: GW-4									
Analyses	Result	RL	Qual	Units	DF	Date Analyzed			
Total Alkalinity by SM 2320B				Batc	h ID: R	36524 Analyst: MW			
Carbon dioxide	135	5.00		mg/L	1	6/1/2017 12:20:00 PM			



Work Order:17053CLIENT:FriedmProject:70547	nan & Bruya								SUMMAF al Alkalini		
Sample ID MB-R36524 Client ID: MBLKW	SampType: MBLK Batch ID: R36524			Units: mg/L		Prep Date: Analysis Date:			RunNo: 365 SeqNo: 700		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	ighLimit RPD R	lef Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									
Sample ID LCS-R36524	SampType: LCS			Units: mg/L		Prep Date:	6/1/2017		RunNo: 365	524	
Client ID: LCSW	Batch ID: R36524					Analysis Date:	6/1/2017		SeqNo: 700	652	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	ighLimit RPD R	lef Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	113	2.50	100.0	0	113	80	120				
Sample ID 1705343-001FD	UP SampType: DUP			Units: mg/L		Prep Date:	6/1/2017		RunNo: 365	524	
Client ID: BATCH	Batch ID: R36524					Analysis Date:	6/1/2017		SeqNo: 700	0654	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	ighLimit RPD R	lef Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	2,520	2.50						2,572	2.06	20	



Sample Log-In Check List

Client Name: FB		Work Order Numb	per: 1705337		
Lo	gged by:	Erica Silva	Date Received:	5/30/2017	7 1:04:00 PM
Cha	in of Cust	ody			
		ustody complete?	Yes 🔽	No 🗌	Not Present
2.	How was the	sample delivered?	<u>FedEx</u>		
<u>Log</u>	In				
-	Coolers are p	present?	Yes 🗌	No 🖌	
		Sample rec	ceived at appropria	te temperatu	re
4.	Shipping con	tainer/cooler in good condition?	Yes 🗹	No 🗌	
5.		Is present on shipping container/cooler? nments for Custody Seals not intact)	Yes	No 🗹	Not Required
6.	Was an atter	npt made to cool the samples?	Yes 🖌	No 🗌	
7.	Were all item	as received at a temperature of >0°C to 10.0°C*	Yes ✔	No 🗌	
8.	Sample(s) in	proper container(s)?	Yes	No 🔽	
9.	Sufficient sar	mple volume for indicated test(s)?	Yes 🗹	No 🗌	
10.	Are samples	properly preserved?	Yes 🖌	No 🗌	
11.	Was preserv	ative added to bottles?	Yes	No 🗹	NA 🗌
12.	Is there head	Ispace in the VOA vials?	Yes	No 🗹	
13.	Did all sampl	es containers arrive in good condition(unbroken)?	Yes 🖌	No 🗌	
14.	Does paperw	vork match bottle labels?	Yes 🖌	No 🗌	
15.	Are matrices	correctly identified on Chain of Custody?	Yes 🗹	No 🗌	
16.	Is it clear what	at analyses were requested?	Yes 🖌	No 🗌	
17.	Were all hold	ling times able to be met?	Yes 🖌	No 🗌	
<u>Spe</u>	cial Handl	ing (if applicable)			
18.	Was client no	otified of all discrepancies with this order?	Yes	No 🗌	NA 🔽
	Person	Notified: Date			
	By Who	om: Via:	eMail 🗌 Pho	one 🗌 Fax	In Person
	Regardi	ing:			
	Client Ir	nstructions:			
19.	Additional re	marks:			<u>I</u>
ltem	nformation				

Item #	Temp °C
Sample	6.1

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

Fax (206) 283-5044	Ph. (206) 285-8282	Seattle, WA 98119-2029	3012 16th Avenue West	Friedman & Bruya, Inc.								Gw-4	Sample ID		Phone # <u>(206) 285-8282</u>	City, State, ZIP <u>Seattle</u> ,		CompanyFriedm	Send Report <u>To Michae</u>	
Received by:	Relinquished	Received by:	Relingudshed									5	Lab ID		Fax #_	Seattle, WA 98119	3012 16th Ave W	Friedman and Bruya, Inc	Michael Erdahl	
by:	hed by:	by:	The state	SIGNATURE			1					5/28/17	Date Sampled		(206) 283-5044	19	1	ruya, Inc.		IS
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			Michael Erdahl									2	# of jars		Please	KS	204	CT NAI	NTRA(AMPL
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Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 Professional Analytical Services

Jun 9 2017 Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
GW-4	Water	17-A007817	DEM, MIN, NUT, CONV

Your sample was received on Friday, May 26, 2017. At the time of receipt, the sample was logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young Laboratory Manager

Project #: 705475 PO Number: E-650

BACT = Bacteriological CONV = Conventionals MET = Metals ORG = Organics NUT=Nutrients DEM=Demand **MIN=Minerals**

Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 www.amtestlab.com



Professional Analytical Services

ANALYSIS REPORT

Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL Project #: 705475 PO Number: E-650 All results reported on an as received basis.

AMTEST Identification Number	17-A007817
Client Identification	GW-4

0 GW-4 05/26/17, 07:12

Conventionals

Sampling Date

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/26/17
Total Organic Carbon	0.60	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	8.10	mg/l		0.05	EPA 300.0	JC	05/26/17
Sulfate	6.00	mg/l		0.1	EPA 300.0	JC	05/26/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	0.599	mg/l		0.025	EPA 300.0	JC	05/26/17

Friedman & Bruya, Inc. Project Name: AmTest ID: 17-A007817

. / Aaron W. Young Laboratory Manager

Am Test Inc. 13600 NE 126th PL Suite C Kirkland, WA, 98034 (425) 885-1664 www.amtestlab.com



QC Summary for sample number: 17-A007817

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A007796	BOD	mg/l	4.6	5.1	10.
17-A007701	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007813	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007927	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007824	Nitrate	mg/l	0.102	0.093	9.2
17-A007824	Nitrite	mg/l	< 0.005	< 0.005	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPKAMT	RECOVERY
17-A007844	Total Organic Carbon	mg/l	0.89	5.9	5.0	100.20 %
17-A007848	Total Organic Carbon	mg/l	0.78	6.4	5.0	112.40 %
17-A007701	Chemical Oxygen Demand	mg/l	< 10	45.	50.	90.00 %
17-A007813	Chemical Oxygen Demand	mg/l	< 10	89.	100	89.00 %
17-A007927	Chemical Oxygen Demand	mg/l	< 10	86.	100	86.00 %
17-A007824	Nitrate	mg/l	0.102	4.93	5.00	96.56 %
17-A007824	Nitrite	mg/l	< 0.005	4.81	5.00	96.20 %
17-A007817	Total Sulfide	mg/l	< 0.05	0.54	0.50	108.00 %
17-A007817	Total Sulfide	mg/l	< 0.05	0.54	0.50	108.00 %

MATRIX SPIKE DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE + SPK	MSD VALUE	RPD
Spike	Total Sulfide	mg/l	0.54	0.54	0.00

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	200	100. %
Total Organic Carbon	mg/l	5.0	5.1	102. %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chemical Oxygen Demand	mg/l	100	110	110. %
Chloride	mg/l	5.00	5.11	102. %
Nitrate	mg/l	5.00	4.92	98.4 %
Nitrate	mg/l	5.00	4.96	99.2 %
Nitrite	mg/l	5.00	5.00	100. %
Nitrite	mg/l	5.00	5.00	100. %
Total Sulfide	mg/l	1.0	1.0	100. %
Sulfate	mg/l	5.00	5.26	105. %

QC Summary for sample number: 17-A007817...

BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1

Ph. (206) 285-8282 Fax (206) 283-5044	Seattle, WA 98119-2029	rrieaman & Druya, 111c. 3012 16th Avenue West	Friday & Draw Inc							GW-4	Sample ID		City, State, ZIP <u>Seattle, V</u> Phone # (206) 285-8282	Address <u>3012 16t</u>	Company <u>Friedma</u>	Send Report <u>To Michael Erdahl</u>	
Relinquished by: Received by:	Received by:	Relinquis								181	Lab ID		Seattle, WA 98119 85-8282 Fax #	3012 16th Ave W	Friedman and Bruya, Inc.	Erdahl	
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Ph. (206) 285-8282	Seattle, WA 98119-2029	3012 16 th Avenue West	Friedman & Bruya, Inc.											GW-4	Sample ID		PhoneEr	City, State, ZIP Issaquat	Address 1180 NW	Company Environmentel	Report To Josh &	544504
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ENVIRONMENTAL CHEMISTS

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

June 1, 2017

Eric Koltes, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 705476

Dear Mr Koltes:

Included are the results from the testing of material submitted on May 26, 2017 from the 69402, F&BI 705476 project. There are 11 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon, Josh Bernthal EPI0601R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 26, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 705476 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	Environmental Partners
705476 -01	GW-1:Bag
705476 -02	GW-7:Bag
705476 -03	GW-8:Bag
705476 -04	GW-9:Bag
705476 -05	GW-5:Bag
705476 -06	GW-6:Bag
705476 -07	GW-3:Bag

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-1:Bag 05/26/17 05/30/17 05/30/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705476 705476-01 053009.D GCMS9 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 98 99 100	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-7:Bag 05/26/17 05/30/17 05/30/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705476 705476-02 053010.D GCMS9 VM
Commente de la		0/ D	Lower	Upper
Surrogates:	14	% Recovery:	Limit:	Limit:
1,2-Dichloroethane	-d4	100	85	117
Toluene-d8		99	91	108
4-Bromofluorobenz	zene	99	76	126
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	•	<1		
Methylene chloride	9	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	(EDC)	<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		<1		
Tetrachloroethene		1.0		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-8:Bag 05/26/17 05/30/17 05/30/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705476 705476-03 053011.D GCMS9 VM
Surrogates: 1,2-Dichloroethane	-d4	% Recovery: 99	Lower Limit: 85	Upper Limit: 117
Toluene-d8		102	91	108
4-Bromofluorobenz	zene	98	76	126
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	<u>!</u>	<1		
Methylene chloride	è.	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		<1		
Tetrachloroethene		14		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-9:Bag 05/26/17 05/30/17 05/30/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705476 705476-04 053012.D GCMS9 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 101 101 99	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 1.1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-5:Bag 05/26/17 05/30/17 05/30/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705476 705476-05 053013.D GCMS9 VM
Surrogates: 1,2-Dichloroethane	d4	% Recovery: 100	Lower Limit: 85	Upper Limit: 117
Toluene-d8	-44	100	85 91	108
4-Bromofluorobenz	zene	99	76	126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride		< 0.2		
Chloroethane		<1		
1,1-Dichloroethene	•	<1		
Methylene chloride	2	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth		<1		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		<1		
Tetrachloroethene		2.3		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-6:Bag 05/26/17 05/30/17 05/30/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705476 705476-06 053014.D GCMS9 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 98 101 100	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1 5.6		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-3:Bag 05/26/17 05/30/17 05/30/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705476 705476-07 053015.D GCMS9 VM
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 98 100 100	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicab 05/30/17 05/30/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705476 07-1049 mb 053008.D GCMS9 VM
Sumagatagi		0/ Decovery	Lower Limit:	Upper Limit:
Surrogates:	14	% Recovery:		
1,2-Dichloroethane	e-d4	101	85	117
Toluene-d8		99	91	108
4-Bromofluorobenz	zene	97	76	126
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene)	<1		
Methylene chloride	ę	<5		
trans-1,2-Dichloro	ethene	<1		
1,1-Dichloroethane	•	<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	e (EDC)	<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

ENVIRONMENTAL CHEMISTS

Date of Report: 06/01/17 Date Received: 05/26/17 Project: 69402, F&BI 705476

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

Laboratory Code: 705476-01 (Matrix Spike)

5	1 /				
				Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	99	61-139
Chloroethane	ug/L (ppb)	50	<1	97	55-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	101	71-123
Methylene chloride	ug/L (ppb)	50	<5	102	61-126
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	100	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	97	79-113
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	96	63-126
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	96	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	99	75-121
Trichloroethene	ug/L (ppb)	50	<1	91	73-122
Tetrachloroethene	ug/L (ppb)	50	<1	91	72-113

Laboratory Code: Laboratory Control Sample

Laboratory coue. Laboratory con			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	96	96	70-128	0
Chloroethane	ug/L (ppb)	50	93	96	66-149	3
1,1-Dichloroethene	ug/L (ppb)	50	99	100	75-119	1
Methylene chloride	ug/L (ppb)	50	93	94	63-132	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	97	98	76-118	1
1,1-Dichloroethane	ug/L (ppb)	50	93	95	77-119	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	94	94	76-119	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	94	94	78-114	0
1,1,1-Trichloroethane	ug/L (ppb)	50	95	97	80-116	2
Trichloroethene	ug/L (ppb)	50	90	90	72-119	0
Tetrachloroethene	ug/L (ppb)	50	91	91	78-109	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.

 ${\bf b}$ - 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.

 ${\rm d}$ - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Pn. (206) 285-8282	Seattle, WA 98119-2029	3012 16 th Avenue West	Friedman & Round Inc				Gw-3; Pag	Gw-6:B20	Gw-S: Eng	Gw - 9: Bag	aw-8: Rag	Gw-7: Ang	GW-1: Bag	Sample ID	-	1 I I	City State 710 /cc -	Address 1180 N	Company EP/	Report To Eric Ulo Hesp	9th50t
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ENVIRONMENTAL CHEMISTS

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

June 13, 2017

Eric Koltes, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 705507

Dear Mr Koltes:

Included are the results from the testing of material submitted on May 30, 2017 from the 69402, F&BI 705507 project. There are 19 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon, Josh Bernthal EPI0613R.DOC

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 30, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 705507 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
705507 -01	MW-3
705507 -02	MW-2

The samples were sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the samples were sent to Fremont for carbon dioxide analysis. The reports are included.

All quality control requirements were acceptable.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID: Date Received:	MW-3 05/30/17		Client: Project:	Environmental Partners 69402, F&BI 705507
Date Extracted:	05/31/17		Lab ID:	705507-01 x10
Date Analyzed:	05/31/17		Data File:	705507-01 x10.057
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
		Concentration		
Analyte:		ug/L (ppb)		
Iron		30,200		
Manganese		4,490		

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed:	MW-2 05/30/17 05/31/17 05/31/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 705507 705507-02 705507-02.051
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		59.6 4.30		

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705507
Date Extracted:	05/31/17	Lab ID:	I7-294 mb2
Date Analyzed:	05/31/17	Data File:	I7-294 mb2.043
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-3 05/30/17 05/31/17 05/31/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 705507 705507-01 x10 705507-01 x10.056 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		28,100 4,530		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed:	MW-2 05/30/17 05/31/17 05/31/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 705507 705507-02 705507-02.053
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		<50		
Manganese		3.76		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705507
Date Extracted:	05/31/17	Lab ID:	I7-295 mb2
Date Analyzed:	05/31/17	Data File:	I7-295 mb2.042
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-3 05/30/17 06/01/17 06/01/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705507 705507-01 060109.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 101 100 102	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	< 0.2 < 1 < 1 < 5 < 1 < 1 9.4 < 1 < 1 < 1 < 1 < 1 < 2 < 2		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-2 05/30/17 06/01/17 06/01/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705507 705507-02 060110.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 98 101 103	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicab 06/01/17 06/01/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705507 07-1157 mb 060107.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	57	121
Toluene-d8		101	63	127
4-Bromofluorobenz	zene	104	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	<u>,</u>	<1		
Methylene chloride	ġ.	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	e (EDC)	<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-3 05/30/17 06/01/17 06/01/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705507 705507-01 007F0701.D GC8 JS
Compounds:		Concentration ug/L (ppb)		
Methane		3,300 ve		
Ethane		<10		
Ethene		<10		

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-3 05/30/17 06/01/17 06/01/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 705507 705507-01 1/10 006F0601.D GC8 JS
Compounds:		Concentration ug/L (ppb)		
Methane Ethane		3,300 <100		

<100

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID: Date Received:	MW-2 05/30/17		Client: Project:	Environmental Partners 69402, F&BI 705507
Date Extracted:	06/01/17		Lab ID:	705507-02
Date Analyzed:	06/01/17		Data File:	008F0801.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

<10

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705507
Date Extracted:	06/01/17	Lab ID:	07-1158 mb
Date Analyzed:	06/01/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS
	Concentration		
Compounds:	ug/L (ppb)		
Methane	<5		
Ethane	<10		

<10

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/30/17 Project: 69402, F&BI 705507

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

Laboratory Co	de: 705475-01	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	73.3	97 b	121 b	70-130	22 b
Manganese	ug/L (ppb)	20	118	70 b	139 b	70-130	66 b
0	• • • •						

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	105	85-115
Manganese	ug/L (ppb)	20	113	85-115

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/30/17 Project: 69402, F&BI 705507

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

Laboratory Co	de: 705461-01	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	1,880	101 b	183 b	70-130	58 b
Manganese	ug/L (ppb)	20	3,820	0 b	1200 b	70-130	200 b

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	100	85-115
Manganese	ug/L (ppb)	20	112	85-115

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/30/17 Project: 69402, F&BI 705507

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

Laboratory Code: 705507-02 (Matrix Spike)

, , , , , , , , , , , , , , , , , , ,	Reporting	Spike	Sample	Percent Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	100	36-166
Chloroethane	ug/L (ppb)	50	<1	103	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	99	60-136
Methylene chloride	ug/L (ppb)	50	<5	96	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	101	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	97	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	99	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	97	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	99	60-146
Trichloroethene	ug/L (ppb)	50	<1	96	66-135
Tetrachloroethene	ug/L (ppb)	50	<1	95	10-226

Laboratory couct Laboratory c	I I I		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	106	105	50-154	1
Chloroethane	ug/L (ppb)	50	110	107	58-146	3
1,1-Dichloroethene	ug/L (ppb)	50	106	101	67-136	5
Methylene chloride	ug/L (ppb)	50	106	98	39-148	8
trans-1,2-Dichloroethene	ug/L (ppb)	50	108	102	68-128	6
1,1-Dichloroethane	ug/L (ppb)	50	103	98	79-121	5
cis-1,2-Dichloroethene	ug/L (ppb)	50	105	99	80-123	6
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	104	99	73-132	5
1,1,1-Trichloroethane	ug/L (ppb)	50	105	101	83-130	4
Trichloroethene	ug/L (ppb)	50	103	98	80-120	5
Tetrachloroethene	ug/L (ppb)	50	102	97	76-121	5

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17 Date Received: 05/30/17 Project: 69402, F&BI 705507

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methane	ug/L (ppb)	25	22	13
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: 706013-05 (Duplicate)

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Methane	ug/L (ppb)	59	79	77	50-150	3
Ethane	ug/L (ppb)	110	71	71	50-150	0
Ethene	ug/L (ppb)	102	95	93	50-150	2

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.

 ${\bf b}$ - 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.

 ${\rm d}$ - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

Friedman & Bruya Michael Erdahl 3012 16th Ave. W. Seattle, WA 98119

RE: 705507 Work Order Number: 1705351

June 02, 2017

Attention Michael Erdahl:

Fremont Analytical, Inc. received 2 sample(s) on 5/31/2017 for the analyses presented in the following report.

Total Alkalinity by SM 2320B

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Unl c. Kedy

Mike Ridgeway Laboratory Director

DoD/ELAP Certification #L2371, ISO/IEC 17025:2005 ORELAP Certification: WA 100009-007 (NELAP Recognized)



CLIENT: Project: Work Order:	Friedman & Bruya 705507 1705351	Work Order Sample Sum					
Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received				
1705351-001	MW-3	05/30/2017 12:07 PM	05/31/2017 10:19 AM				
1705351-002	MW-2	05/30/2017 1:27 PM	05/31/2017 10:19 AM				



Case Narrative

WO#: **1705351** Date: **6/2/2017**

CLIENT:Friedman & BruyaProject:705507

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

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

The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers & Acronyms



WO#: **1705351** Date Reported: **6/2/2017**

Qualifiers:

- * Flagged value is not within established control limits
- B Analyte detected in the associated Method Blank
- D Dilution was required
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- I Analyte with an internal standard that does not meet established acceptance criteria
- J Analyte detected below Reporting Limit
- N Tentatively Identified Compound (TIC)
- Q Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- (<20%RSD, <20% Drift or minimum RRF)
- S Spike recovery outside accepted recovery limits
- ND Not detected at the Reporting Limit
- R High relative percent difference observed

Acronyms:

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



Friedman & Bruya

CLIENT:

Analytical Report

 Work Order:
 1705351

 Date Reported:
 6/2/2017

Project: 705507					
Lab ID: 1705351-001 Client Sample ID: MW-3			Collection Matrix: W		5/30/2017 12:07:00 PM
Analyses	Result	RL Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B			Batch	ID: R3	6524 Analyst: MW
Carbon dioxide	445	5.00	mg/L	1	6/1/2017 12:25:00 PM
Lab ID: 1705351-002 Client Sample ID: MW-2			Collection Matrix: W		5/30/2017 1:27:00 PM
Analyses	Result	RL Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B			Batch	ID: R3	6524 Analyst: MW
Carbon dioxide	35.1	5.00	mg/L	1	6/1/2017 12:30:00 PM



Work Order: 1705351 CLIENT: Friedman & Project: 705507	Bruya							•	SUMMA al Alkalini		-
Sample ID MB-R36524	SampType: MBLK			Units: mg/L		Prep Date:	6/1/2017		RunNo: 365	524	
Client ID: MBLKW	Batch ID: R36524				A	nalysis Date:	6/1/2017		SeqNo: 700	0651	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	lighLimit F	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									
Sample ID LCS-R36524	SampType: LCS			Units: mg/L		Prep Date:	6/1/2017		RunNo: 36	524	
Client ID: LCSW	Batch ID: R36524				A	nalysis Date:	6/1/2017		SeqNo: 700	652	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	lighLimit F	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	113	2.50	100.0	0	113	80	120				
Sample ID 1705343-001FDUP	SampType: DUP			Units: mg/L		Prep Date:	6/1/2017		RunNo: 36	524	
Client ID: BATCH	Batch ID: R36524				A	nalysis Date:	6/1/2017		SeqNo: 700	0654	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit H	lighLimit F	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	2,520	5.00						2,572	2.06	20	
Alkalinity, Carbonate (As CaCO3)	ND	5.00						0		20	
Alkalinity, Hydroxide (As CaCO3)	ND	5.00						0		20	
Alkalinity, Total (As CaCO3)	2,520	2.50						2,572	2.06	20	



Sample Log-In Check List

С	lient Name:	FB	Work Order Numb	er: 1705351		
L	ogged by:	Erica Silva	Date Received:	5/31/2017	7 10:19:00 AM	
Cha	ain of Cust	ody				
1.	Is Chain of C	ustody complete?	Yes 🖌	No 🗌	Not Present	
2.	How was the	sample delivered?	<u>FedEx</u>			
Loc	ı In					
-	Coolers are p	present?	Yes	No 🖌		
			No cooler preser	<u>nt</u>		
4.	Shipping con	tainer/cooler in good condition?	Yes 🗹	No 🗌		
5.		Is present on shipping container/cooler? nments for Custody Seals not intact)	Yes	No 🗌	Not Required 🗹	
6.	Was an atten	npt made to cool the samples?	Yes 🖌	No 🗌	NA 🗌	
7.	Were all item	as received at a temperature of >0°C to 10.0°C*	Yes 🗹	No 🗌		
8.	Sample(s) in	proper container(s)?	Yes 🔽	No 🗌		
9.	Sufficient sar	nple volume for indicated test(s)?	Yes 🖌	No 🗌		
10.	Are samples	properly preserved?	Yes 🖌	No 🗌		
11.	Was preserva	ative added to bottles?	Yes	No 🗸	NA 🗌	
12.	Is there head	space in the VOA vials?	Yes	No 🗌	NA 🔽	
13.	Did all sampl	es containers arrive in good condition(unbroken)?	Yes 🖌	No 🗌		
14.	Does paperw	ork match bottle labels?	Yes 🖌	No 🗌		
15.	Are matrices	correctly identified on Chain of Custody?	Yes 🖌	No 🗌		
16.	Is it clear what	at analyses were requested?	Yes 🖌	No 🗌		
17.	Were all hold	ling times able to be met?	Yes 🗹	No 🗌		
<u>Spe</u>	cial Handl	ing (if applicable)				
18.	Was client no	otified of all discrepancies with this order?	Yes	No 🗌	NA 🗹	
	Person	Notified: Date				
	By Who	m: Via:	🗌 eMail 🗌 Pho	one 🗌 Fax	In Person	
	Regardi	ng:				
	Client Ir	nstructions:				
19.	Additional rer	marks:				

Item Information

Item #	Temp °C
Sample	2.5

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

Fax (206) 283-5044	Ph. (206) 285-8282	3012 16th Avenue West	Friedman & Bruya, Inc.							MW.2	NW-3	Sample ID		Phone # (206) 285-8282	City, State, ZIP <u>Seattle, WA</u>			Send Report <u>To</u> Michae
Received by:	Relinquished by:	Relinquished by Received hv:										Lab ID		Fax #	WA 98119	3012 16th Ave W	Friedman and Bruya.	Michael Erdahl
by:	hed by:	here of the	SIGNATURE							4.	5/30/17	Date Sampled		(206) 283-5044	[9]		uya, Inc.	
		2	TURE							1327	1207	Time Sampled		5044				
		1 8								4	water	Matrix			REMARKS		PROJECT NAME/NO.	SUBCONTRACTER
	MNK	Michael Erdahl										# of jars		Please Email Results	KS	20H	T NAN	NTRAC
	MM	Erdahl	PRIN									Dioxins/Furans		Email		to 550t	AE/NO	TER .
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SUBCONTRACT SAMPLE CHAIN OF CUSTODY

1705351



Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 Professional Analytical Services

Jun 9 2017 Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-3	Water	17-A007927	DEM, MIN, NUT, CONV
MW-2	Water	17-A007928	DEM, MIN, NUT, CONV

Your samples were received on Wednesday, May 31, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young

Laboratory Manager

Project #: 705507 PO Number: E-657

BACT = Bacteriological CONV = Conventionals MET = Metals ORG = Organics NUT=Nutrients DEM=Demand **MIN=Minerals**

Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 www.amtestlab.com



Professional Analytical Services

ANALYSIS REPORT

Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL Project #: 705507 PO Number: E-657 All results reported on an as received basis.

AMTEST Identification Number	17-A007927
Client Identification	MW-3
Sampling Date	05/30/17, 12:07

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	06/05/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	06/01/17
Total Organic Carbon	9.3	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	4.10	mg/l		0.05	EPA 300.0	JC	05/31/17
Sulfate	22.4	mg/l		0.1	EPA 300.0	JC	06/01/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/31/17
Nitrate	7.70	mg/l		0.025	EPA 300.0	JC	05/31/17

Date Received: 05/31/17 Date Reported: 6/ 9/17

AMTEST Identification Number	17-A007928
Client Identification	MW-2
Sampling Date	05/30/17, 13:27

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	06/05/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	98.	mg/l		2	SM 5210B	NG	06/01/17
Total Organic Carbon	72.	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	270	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	27.3	mg/l		0.05	EPA 300.0	JC	06/01/17
Sulfate	0.77	mg/l		0.1	EPA 300.0	JC	05/31/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/31/17
Nitrate	< 0.025	mg/l		0.025	EPA 300.0	JC	05/31/17

σh Aaron W. Young Laboratory Manager

Am Test Inc. 13600 NE 126th PL Suite C Kirkland, WA, 98034 (425) 885-1664 www.amtestlab.com



QC Summary for sample numbers: 17-A007927 to 17-A007928

DUPLICATES

DUFLICAT	_3				
SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A007923	BOD	mg/l	160	150	6.5
17-A007701	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007813	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007927	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007930	Nitrate	mg/l	0.627	0.610	2.7
17-A007930	Nitrite	mg/l	< 0.005	< 0.005	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPKAMT	RECOVERY
17-A007844	Total Organic Carbon	mg/l	0.89	5.9	5.0	100.20 %
17-A007848	Total Organic Carbon	mg/l	0.78	6.4	5.0	112.40 %
17-A007701	Chemical Oxygen Demand	mg/l	< 10	45.	50.	90.00 %
17-A007813	Chemical Oxygen Demand	mg/l	< 10	89.	100	89.00 %
17-A007927	Chemical Oxygen Demand	mg/l	< 10	86.	100	86.00 %
17-A007930	Nitrate	mg/l	0.627	2.75	2.00	106.15 %
17-A007930	Nitrite	mg/l	< 0.005	1.83	2.00	91.50 %
17-A008102	Total Sulfide	mg/l	< 0.05	0.53	0.50	106.00 %
17-A008102	Total Sulfide	mg/l	< 0.05	0.56	0.50	112.00 %

MATRIX SPIKE DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE + SPK	MSD VALUE	RPD
Spike	Total Sulfide	mg/l	0.53	0.56	5.5

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	180	90.0 %
Total Organic Carbon	mg/l	5.0	5.1	102. %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chemical Oxygen Demand	mg/l	100	110	110. %
Chloride	mg/l	5.00	5.20	104. %
Chloride	mg/l	5.00	4.88	97.6 %
Nitrate	mg/l	5.00	4.97	99.4 %
Nitrite	mg/l	5.00	5.00	100. %
Total Sulfide	mg/l	1.0	0.99	99.0 %
Sulfate	mg/l	5.00	5.45	109. %
Sulfate	mg/l	5.00	5.17	103. %
		•	•	•

QC Summary for sample numbers: 17-A007927 to 17-A007928...

BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	0.07
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1
Sulfate	mg/l	< 0.1

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Ph. (206) 285-8282	3012 16" Avenue West Seattle, WA 98119-2029	Friedman & Bruya, Inc.								· · · · · · · · · · · · · · · · · · ·		Mw - 2	MW-3	Sample ID		PhoneE	City, State, ZIP /SSee	Address 1180 NW	Company EP1	Report To Josh Be	70507
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#### ENVIRONMENTAL CHEMISTS

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

July 3, 2017

Josh Bernthal, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 706447

Dear Mr Bernthal:

Included are the results from the testing of material submitted on June 28, 2017 from the 69402, F&BI 706447 project. There are 18 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon, Charles McFadden EPI0703R.DOC

#### ENVIRONMENTAL CHEMISTS

#### CASE NARRATIVE

This case narrative encompasses samples received on June 28, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 706447 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
706447 -01	MW-16:5
706447 -02	MW-16:10
706447 -03	MW-16:20
706447 -04	MW-16:25
706447 -05	MW-17:5
706447 -06	MW-17:10
706447 -07	MW-17:15
706447 -08	MW-17:20
706447 -09	MW-17:25
706447 -10	MW-16
706447 -11	MW-17
706447 -12	DPT-1
706447 -13	MW-18
706447 -14	MW-18:5
706447 -15	MW-18:10
706447 -16	MW-18:15
706447 -17	MW-18:20
706447 -18	MW-18:25
706447 -19	DPT-1:5
706447 -20	DPT-1:10
706447 -21	DPT-1:12.5
706447 -22	DPT-1:15
706447 -23	DPT-1:20
706447 -24	DPT-2:5
706447 -25	DPT-2:12.5
706447 -26	DPT-2:15
706447 -27	DPT-3:10
706447 -28	DPT-3:12.5
706447 -29	DPT-3:15

All quality control requirements were acceptable.

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	DPT-1:5 06/28/17 06/28/17 06/28/17 Soil mg/kg (ppm	ı) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 706447-19 062829.D GCMS4 JS
		04 D	Lower	Upper
Surrogates:	• •	% Recovery:	Limit:	Limit:
1,2-Dichloroethane	e-d4	100	62	142
Toluene-d8		107	55	145
4-Bromofluorobenz	zene	98	65	139
		Concentration		
Compounds:		mg/kg (ppm)		
Vinyl chloride		< 0.05		
Chloroethane		< 0.5		
1,1-Dichloroethen e		< 0.05		
Methylene chloride	9	< 0.5		
trans-1,2-Dichloroe	ethene	< 0.05		
1,1-Dichloroethane		< 0.05		
cis-1,2-Dichloroeth	ene	< 0.05		
1,2-Dichloroethane	(EDC)	< 0.05		
1,1,1-Trichloroetha		< 0.05		
Trichloroethene		< 0.02		
Tetrachloroethene		< 0.025		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	DPT-1:12.5 06/28/17 06/28/17 06/28/17 Soil mg/kg (ppm)	) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 706447-21 062830.D GCMS4 JS
-			Lower	Upper
Surrogates:		% Recovery:	Limit:	Limit:
1,2-Dichloroethane	-d4	101	62	142
Toluene-d8		105	55	145
4-Bromofluorobenz	zene	99	65	139
		Concentration		
Compounds:		mg/kg (ppm)		
Vinyl chloride		< 0.05		
Chloroethane		< 0.5		
1,1-Dichloroethene	<b>;</b>	< 0.05		
Methylene chloride	)	< 0.5		
trans-1,2-Dichloroe	ethene	< 0.05		
1,1-Dichloroethane		< 0.05		
cis-1,2-Dichloroeth	ene	< 0.05		
1,2-Dichloroethane	(EDC)	< 0.05		
1,1,1-Trichloroetha	ine	< 0.05		
Trichloroethene		< 0.02		
Tetrachloroethene		< 0.025		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	DPT-1:15 06/28/17 06/28/17 06/28/17 Soil mg/kg (ppm	n) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 706447-22 062828.D GCMS4 JS
Commentante en		0/ <b>D</b>	Lower	Upper
Surrogates:	1.4	% Recovery:	Limit:	Limit:
1,2-Dichloroethane	-d4	102	62	142
Toluene-d8		107	55	145
4-Bromofluorobenz	zene	100	65	139
		Concentration		
Compounds:		mg/kg (ppm)		
Vinyl chloride		< 0.05		
Chloroethane		< 0.5		
1,1-Dichloroethene	<u>.</u>	< 0.05		
Methylene chloride	)	< 0.5		
trans-1,2-Dichloroe	ethene	< 0.05		
1,1-Dichloroethane		< 0.05		
cis-1,2-Dichloroeth	ene	< 0.05		
1,2-Dichloroethane	(EDC)	< 0.05		
1,1,1-Trichloroetha		< 0.05		
Trichloroethene		< 0.02		
Tetrachloroethene		< 0.025		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	DPT-2:5 06/28/17 06/28/17 06/28/17 Soil mg/kg (ppm	n) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 706447-24 062813.D GCMS4 JS
Commente de la		0/ <b>D</b>	Lower	Upper
Surrogates:	14	% Recovery:	Limit:	Limit:
1,2-Dichloroethane	-04	99	62	142
Toluene-d8		105	55	145
4-Bromofluorobenz	zene	100	65	139
		Concentration		
Compounds:		mg/kg (ppm)		
Vinyl chloride		< 0.05		
Chloroethane		<0.5		
1,1-Dichloroethene	<u>.</u>	< 0.05		
Methylene chloride	e e e e e e e e e e e e e e e e e e e	< 0.5		
trans-1,2-Dichloroe	ethene	< 0.05		
1,1-Dichloroethane		< 0.05		
cis-1,2-Dichloroeth	ene	< 0.05		
1,2-Dichloroethane	(EDC)	< 0.05		
1,1,1-Trichloroetha	ine	< 0.05		
Trichloroethene		< 0.02		
Tetrachloroethene		< 0.025		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	DPT-2:12.5 06/28/17 06/28/17 06/28/17 Soil mg/kg (ppm	) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 706447-25 062814.D GCMS4 JS
<b>G</b>			Lower	Upper
Surrogates:	• •	% Recovery:	Limit:	Limit:
1,2-Dichloroethane	-d4	100	62	142
Toluene-d8		106	55	145
4-Bromofluorobenz	zene	100	65	139
		Concentration		
Compounds:		mg/kg (ppm)		
Vinyl chloride		< 0.05		
Chloroethane		< 0.5		
1,1-Dichloroethene	<b>;</b>	< 0.05		
Methylene chloride	<u>)</u>	< 0.5		
trans-1,2-Dichloroe	ethene	< 0.05		
1,1-Dichloroethane		< 0.05		
cis-1,2-Dichloroeth	ene	< 0.05		
1,2-Dichloroethane	(EDC)	< 0.05		
1,1,1-Trichloroetha		< 0.05		
Trichloroethene		< 0.02		
Tetrachloroethene		< 0.025		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	DPT-2:15 06/28/17 06/28/17 06/28/17 Soil mg/kg (ppm	n) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 706447-26 062815.D GCMS4 JS
C		04 <b>D</b>	Lower	Upper
Surrogates:		% Recovery:	Limit:	Limit:
1,2-Dichloroethane	-d4	100	62	142
Toluene-d8		107	55	145
4-Bromofluorobenz	ene	98	65	139
		Concentration		
Compounds:		mg/kg (ppm)		
Vinyl chloride		< 0.05		
Chloroethane		< 0.5		
1,1-Dichloroethene	:	< 0.05		
Methylene chloride	<b>)</b>	< 0.5		
trans-1,2-Dichloroe	ethene	< 0.05		
1,1-Dichloroethane		< 0.05		
cis-1,2-Dichloroeth	ene	< 0.05		
1,2-Dichloroethane	(EDC)	< 0.05		
1,1,1-Trichloroetha		< 0.05		
Trichloroethene		< 0.02		
Tetrachloroethene		< 0.025		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	DPT-3:10 06/28/17 06/28/17 06/28/17 Soil mg/kg (ppn	n) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 706447-27 062816.D GCMS4 JS
			Lower	Upper
Surrogates:	_	% Recovery:	Limit:	Limit:
1,2-Dichloroethane	-d4	99	62	142
Toluene-d8		107	55	145
4-Bromofluorobenz	zene	99	65	139
		Concentration		
Compounds:		mg/kg (ppm)		
Vinyl chloride		< 0.05		
Chloroethane		< 0.5		
1,1-Dichloroethene	<b>)</b>	< 0.05		
Methylene chloride	9	< 0.5		
trans-1,2-Dichloroe	ethene	< 0.05		
1,1-Dichloroethane		< 0.05		
cis-1,2-Dichloroeth	ene	< 0.05		
1,2-Dichloroethane	(EDC)	< 0.05		
1,1,1-Trichloroetha		< 0.05		
Trichloroethene		< 0.02		
Tetrachloroethene		< 0.025		

## ENVIRONMENTAL CHEMISTS

LowerUpperSurrogates:% Recovery:Limit:1,2-Dichloroethane-d49962142Toluene-d810655145
1,2-Dichloroethane-d4 99 62 142
101uene-uo 100 55 145
4-Bromofluorobenzene 98 65 139
4-DI 011011001 0Delizelle 36 05 159
Concentration
Compounds: mg/kg (ppm)
Vinyl chloride <0.05
Chloroethane <0.5
1,1-Dichloroethene <0.05
Methylene chloride <0.5
trans-1,2-Dichloroethene <0.05
1,1-Dichloroethane <0.05
cis-1,2-Dichloroethene <0.05
1,2-Dichloroethane (EDC) <0.05
1,1,1-Trichloroethane <0.05
Trichloroethene <0.02
Tetrachloroethene <0.025

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	DPT-3:15 06/28/17 06/28/17 06/28/17 Soil mg/kg (ppm	n) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 706447-29 062818.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	62	142
Toluene-d8	uı	105	55	145
4-Bromofluorobenz	zene	100	65	139
		Concentration		
Compounds:		mg/kg (ppm)		
Vinyl chloride		< 0.05		
Chloroethane		< 0.5		
1,1-Dichloroethene		< 0.05		
Methylene chloride		< 0.5		
trans-1,2-Dichloroe	ethene	< 0.05		
1,1-Dichloroethane		< 0.05		
cis-1,2-Dichloroeth		< 0.05		
1,2-Dichloroethane		< 0.05		
1,1,1-Trichloroetha	ine	< 0.05		
Trichloroethene		< 0.02		
Tetrachloroethene		< 0.025		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicab 06/28/17 06/28/17 Soil mg/kg (ppm)	e	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 07-1338 mb 062806.D GCMS4 JS
			Lower	Upper
Surrogates:		% Recovery:	Limit:	Limit:
1,2-Dichloroethane	-d4	99	62	142
Toluene-d8		105	55	145
4-Bromofluorobenz	zene	100	65	139
	(	Concentration		
Compounds:		mg/kg (ppm)		
Vinyl chloride		< 0.05		
Chloroethane		<0.5		
1,1-Dichloroethene	,	< 0.05		
Methylene chloride	<u>)</u>	<0.5		
trans-1,2-Dichloroe	ethene	< 0.05		
1,1-Dichloroethane		< 0.05		
cis-1,2-Dichloroeth	ene	< 0.05		
1,2-Dichloroethane	e (EDC)	< 0.05		
1,1,1-Trichloroetha	ane	< 0.05		
Trichloroethene		< 0.02		
Tetrachloroethene		< 0.025		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-16 06/28/17 06/28/17 06/29/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 706447-10 062845.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	57	121
Toluene-d8	ui	100	63	127
4-Bromofluorobenzene		100	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		< 0.2		
Chloroethane		<1		
1,1-Dichloroethene	•	<1		
Methylene chloride	)	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroethene		<1		
1,2-Dichloroethane	(EDC)	<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-17 06/28/17 06/28/17 06/29/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 706447-11 062846.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 106 99	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-18 06/28/17 06/28/17 06/29/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 706447-13 062847.D GCMS4 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 106 99	Lower Limit: 57 63 60	Upper Limit: 121 127 133
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blar Not Applical 06/28/17 06/28/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 706447 07-1339 mb 062827.D GCMS4 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	57	121
Toluene-d8		107	63	127
4-Bromofluorobenz	zene	99	60	133
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		< 0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride		<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane	!	<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

### ENVIRONMENTAL CHEMISTS

Date of Report: 07/03/17 Date Received: 06/28/17 Project: 69402, F&BI 706447

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

Laboratory Code: 706467-03 (Matrix Spike)

	,		Sample	Percent	Percent		
	Reporting	Spike	Result	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	(Wet wt)	MS	MSD	Criteria	(Limit 20)
Vinyl chloride	mg/kg (ppm)	2.5	< 0.05	50	47	10-138	6
Chloroethane	mg/kg (ppm)	2.5	< 0.5	67	63	10-176	6
1,1-Dichloroethene	mg/kg (ppm)	2.5	< 0.05	72	67	10-160	7
Methylene chloride	mg/kg (ppm)	2.5	< 0.5	101	92	10-156	9
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	< 0.05	84	77	14-137	9
1,1-Dichloroethane	mg/kg (ppm)	2.5	< 0.05	85	79	19-140	7
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	< 0.05	92	84	25-135	9
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	< 0.05	93	87	12-160	7
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	< 0.05	90	85	10-156	6
Trichloroethene	mg/kg (ppm)	2.5	< 0.02	91	86	21-139	6
Tetrachloroethene	mg/kg (ppm)	2.5	< 0.025	87	81	20-133	7

	r i r		Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Vinyl chloride	mg/kg (ppm)	2.5	79	22-139
Chloroethane	mg/kg (ppm)	2.5	92	10-163
1,1-Dichloroethene	mg/kg (ppm)	2.5	100	47-128
Methylene chloride	mg/kg (ppm)	2.5	107	42-132
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	109	67-127
1,1-Dichloroethane	mg/kg (ppm)	2.5	106	68-115
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	112	72-113
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	112	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	112	62-131
Trichloroethene	mg/kg (ppm)	2.5	111	64-117
Tetrachloroethene	mg/kg (ppm)	2.5	106	72-114

### ENVIRONMENTAL CHEMISTS

Date of Report: 07/03/17 Date Received: 06/28/17 Project: 69402, F&BI 706447

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

Laboratory Code: 706447-10 (Matrix Spike)

	Reporting	Spike	Sample	Percent Recovery	Acceptance
Analyte	<b>U</b> nits	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	102	36-166
Chloroethane	ug/L (ppb)	50	<1	109	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	106	60-136
Methylene chloride	ug/L (ppb)	50	<5	108	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	109	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	104	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	107	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	111	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	110	60-146
Trichloroethene	ug/L (ppb)	50	<1	106	66-135
Tetrachloroethene	ug/L (ppb)	50	<1	98	10-226

	r		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	95	90	50-154	5
Chloroethane	ug/L (ppb)	50	102	96	58-146	6
1,1-Dichloroethene	ug/L (ppb)	50	106	100	67-136	6
Methylene chloride	ug/L (ppb)	50	106	102	39-148	4
trans-1,2-Dichloroethene	ug/L (ppb)	50	109	103	68-128	6
1,1-Dichloroethane	ug/L (ppb)	50	103	98	79-121	5
cis-1,2-Dichloroethene	ug/L (ppb)	50	108	102	80-123	6
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	109	104	73-132	5
1,1,1-Trichloroethane	ug/L (ppb)	50	109	104	83-130	5
Trichloroethene	ug/L (ppb)	50	108	102	80-120	6
Tetrachloroethene	ug/L (ppb)	50	100	94	76-121	6

### 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.

 ${\bf b}$  - 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.

 ${\rm d}$  - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Ph. (206) 285-8282	Seattle, WA 98119-2029	<u>ن</u> ن			MW-17:25	MW-17:20	S1:21-MW	MW-17:10	S: LI-MW	52:91-MW	MW-16:20	MW-16:10	WW-16:5	Sample ID		PhoneEmail	City, State, ZIP I ssay ush, WK	Address 1180 NW maple	Company Fr	Report To Josh Berntha	7064
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#### ENVIRONMENTAL CHEMISTS

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

August 28, 2017

Josh Bernthal, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 708145

Dear Mr Bernthal:

Included are the results from the testing of material submitted on August 8, 2017 from the 69402, F&BI 708145 project. There are 20 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon, Eric Koltes EPI0828R.DOC

### ENVIRONMENTAL CHEMISTS

### CASE NARRATIVE

This case narrative encompasses samples received on August 8, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 708145 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	Environmental Partners
708145 -01	GW-4
708145 -02	MW-3
708145 -03	MW-16
708145 -04	MW-17

The samples were sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the samples were sent to Fremont for carbon dioxide analysis. The results from Amtest and Fremont are included.

The RSK 175 methane concentration in sample MW-3 exceeded the calibration range of the instrument. The data were flagged accordingly.

All other quality control requirements were acceptable.

## ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed:	GW-4 08/08/17 08/09/17 08/10/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 708145 708145-01 708145-01.044
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		81.6		
Manganese		48.6		

## ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-3 08/08/17 08/09/17 08/10/17 Water		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 708145 708145-02 x10 708145-02 x10.056 ICPMS2
Units:	Water ug/L (ppb)		Instrument: Operator:	SP
Analyte:	u8/11 (Pps)	Concentration ug/L (ppb)	oporatori	
Iron Manganese		25,100 3,630		

## ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	<b>Environmental Partners</b>
Date Received:	Not Applicable	Project:	69402, F&BI 708145
Date Extracted:	08/09/17	Lab ID:	I7-420 mb
Date Analyzed:	08/09/17	Data File:	I7-420 mb.089
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

## ENVIRONMENTAL CHEMISTS

# Analysis For Total Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	GW-4 08/08/17 08/09/17 08/10/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 708145 708145-01 708145-01.055 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:	0	Concentration ug/L (ppb)	-	
Iron Manganese		99.9 91.7		

## ENVIRONMENTAL CHEMISTS

# Analysis For Total Metals By EPA Method 200.8

Client ID: Date Received:	MW-3 08/08/17		Client: Project:	Environmental Partners 69402, F&BI 708145
Date Extracted:	08/09/17		Lab ID:	708145-02 x10
Date Analyzed:	08/10/17		Data File:	708145-02 x10.058
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
		Concentration		
Analyte:		ug/L (ppb)		
Iron		32,500		
Manganese		3,770		

## ENVIRONMENTAL CHEMISTS

# Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	<b>Environmental Partners</b>
Date Received:	Not Applicable	Project:	69402, F&BI 708145
Date Extracted:	08/09/17	Lab ID:	I7-419 mb2
Date Analyzed:	08/10/17	Data File:	I7-419 mb2.039
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-4 08/08/17 08/11/17 08/11/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708145 708145-01 081115.D GCMS9 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	101	85	117
Toluene-d8		103	91	108
4-Bromofluorobenz	ene	98	76	126
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride	•	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	(EDC)	<1		
1,1,1-Trichloroetha		<1		
Trichloroethene		<1		
Tetrachloroethene		10		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-3 08/08/17 08/11/17 08/11/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708145 708145-02 081116.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 98 99 98	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 16 <1 <1 <1 <1 <1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-16 08/08/17 08/11/17 08/11/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708145 708145-03 081117.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 103 99	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Com pounds:	lene	Concentration ug/L (ppb)	70	120
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-17 08/08/17 08/11/17 08/11/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708145 708145-04 081118.D GCMS9 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	85	117
Toluene-d8	u	101	91	108
4-Bromofluorobenz	zene	99	76	126
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	•	<1		
Methylene chloride	<u>)</u>	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	e (EDC)	<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blar Not Applicat 08/11/17 08/11/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708145 07-1718 mb 081114.D GCMS9 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	85	117
Toluene-d8		103	91	108
4-Bromofluorobenz	zene	99	76	126
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	<b>)</b>	<1		
Methylene chloride		<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

## ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	GW-4		Client:	<b>Environmental Partners</b>
Date Received:	08/08/17		Project:	69402, F&BI 708145
Date Extracted:	08/11/17		Lab ID:	708145-01
Date Analyzed:	08/11/17		Data File:	010F1001.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

<10

## ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-3		Client:	Environmental Partners
Date Received:	08/08/17		Project:	69402, F&BI 708145
Date Extracted:	08/11/17		Lab ID:	708145-02
Date Analyzed:	08/11/17		Data File:	011F1101.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
Compounds: Methane Ethane Ethene		Concentration ug/L (ppb) 4,500 ve <10 <10	-	

## ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 708145
Date Extracted:	08/11/17	Lab ID:	07-1722 mb
Date Analyzed:	08/11/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS
	Concentration		
Compounds:	ug/L (ppb)		
Methane	<5		
Ethane	<10		

<10

### ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/17 Date Received: 08/08/17 Project: 69402, F&BI 708145

### **QUALITY ASSURANCE RESULTS** FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Cod	e: 708073-01	(Matrix Sp	oike)	Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	1,820	0 b	147 b	70-130	200 b
Manganese	ug/L (ppb)	20	467	10 b	117 b	70-130	169 b

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	105	85-115
Manganese	ug/L (ppb)	20	104	85-115

### ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/17 Date Received: 08/08/17 Project: 69402, F&BI 708145

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

Laboratory Co	de: 708116-01	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	7,960	385 b	139 b	70-130	94 b
Manganese	ug/L (ppb)	20	322	156 b	74 b	70-130	71 b
	• • • •						

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	103	85-115
Manganese	ug/L (ppb)	20	112	85-115

### ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/17 Date Received: 08/08/17 Project: 69402, F&BI 708145

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

Laboratory Code: 708145-01 (Matrix Spike)

5	1 /				
				Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	101	61-139
Chloroethane	ug/L (ppb)	50	<1	97	55-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	91	71-123
Methylene chloride	ug/L (ppb)	50	<5	104	61-126
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	99	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	98	79-113
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	100	63-126
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	104	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	94	75-121
Trichloroethene	ug/L (ppb)	50	<1	100	73-122
Tetrachloroethene	ug/L (ppb)	50	10	101	72-113

Laboratory coue. Laboratory con	I I		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	99	97	70-128	2
Chloroethane	ug/L (ppb)	50	93	93	66-149	0
1,1-Dichloroethene	ug/L (ppb)	50	87	85	75-119	2
Methylene chloride	ug/L (ppb)	50	105	104	63-132	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	97	95	76-118	2
1,1-Dichloroethane	ug/L (ppb)	50	97	95	77-119	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	98	96	76-119	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	102	100	78-114	2
1,1,1-Trichloroethane	ug/L (ppb)	50	91	89	80-116	2
Trichloroethene	ug/L (ppb)	50	101	99	72-119	2
Tetrachloroethene	ug/L (ppb)	50	101	101	78-109	0

### ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/17 Date Received: 08/08/17 Project: 69402, F&BI 708145

### QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Laboratory coue. 7	<b>Relative Percent</b>			
	Reporting	Sample	Duplicate	Difference
Analyte	Units	Result	Result	(Limit 20)
Methane	ug/L (ppb)	<5	5.2	nm
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: 708103-01 (Duplicate)

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Methane	ug/L (ppb)	59	76	74	50-150	3
Ethane	ug/L (ppb)	110	78	74	50-150	5
Ethene	ug/L (ppb)	102	98	99	50-150	1

### 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.

 ${\bf b}$  - 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.

 ${\rm d}$  - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 Professional Analytical Services

Aug 22 2017 Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
GW-4	Water	17-A013063	DEM, MIN, NUT, CONV
MW-3	Water	17-A013064	DEM, MIN, NUT, CONV

Your samples were received on Wednesday, August 9, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young

Laboratory Manager

Project #: 708145 PO Number: F-33

BACT = Bacteriological CONV = Conventionals MET = Metals ORG = Organics NUT=Nutrients DEM=Demand **MIN=Minerals** 

Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 www.amtestlab.com



Professional Analytical Services

### **ANALYSIS REPORT**

Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL Project #: 708145 PO Number: F-33 All results reported on an as received basis.

AMTEST Identification Number	17-A013063
Client Identification	GW-4
Sampling Date	08/08/17, 11:25

#### Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	08/11/17

#### Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	08/10/17
Total Organic Carbon	1.1	mg/l		0.5	SM 5310B	SW	08/10/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	08/16/17

#### Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	13.9	mg/l		0.05	EPA 300.0	JC	08/09/17
Sulfate	23.4	mg/l		0.1	EPA 300.0	JC	08/09/17

#### Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	08/09/17
Nitrate	2.50	mg/l		0.025	EPA 300.0	JC	08/09/17
Nitrate+Nitrite	2.50	mg/l		0.025	EPA 300.0	Calculated	

Date Received: 08/09/17 Date Reported: 8/22/17

AMTEST Identification Number	17-A013064
Client Identification	MW-3
Sampling Date	08/08/17, 12:51

#### Conventionals

PARAMETER	RESULT UNITS		Q	D.L.	METHOD	ANALYST	DATE	
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	08/11/17	

#### Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	56.	mg/l		2	SM 5210B	NG	08/10/17
Total Organic Carbon	36.	mg/l		0.5	SM 5310B	SW	08/10/17
Chemical Oxygen Demand	160	mg/l		10	EPA 410.4	SW	08/16/17

### Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	13.6	mg/l		0.05	EPA 300.0	JC	08/09/17
Sulfate	3.80	mg/l		0.1	EPA 300.0	JC	08/09/17

### Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	08/09/17
Nitrate	0.090	mg/l		0.025	EPA 300.0	JC	08/09/17
Nitrate+Nitrite	0.090	mg/l		0.025	EPA 300.0	Calculated	

Aaron W. Young Laboratory Manager

Am Test Inc. 13600 NE 126th PL Suite C Kirkland, WA, 98034 (425) 885-1664 www.amtestlab.com



#### QC Summary for sample numbers: 17-A013063 to 17-A013064

#### DUPLICATES

DUPLICAT	23				
SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A013071	BOD	mg/l	< 2	< 2	
17-A013031	Total Organic Carbon	mg/l	< 0.5	< 0.5	
17-A013062	Total Organic Carbon	mg/l	2.3	2.1	9.1
17-A013095	Total Organic Carbon	mg/l	0.90	0.88	2.2
17-A013031	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A013323	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A013327	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A012827	Chloride	mg/l	25.1	23.4	7.0

#### **MATRIX SPIKES**

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
17-A013031	Total Organic Carbon	mg/l	< 0.5	26.	25.	104.00 %
17-A013061	Total Organic Carbon	mg/l	2.5	27.	25.	98.00 %
17-A013097	Total Organic Carbon	mg/l	2.9	27.	25.	96.40 %
17-A013031	Chemical Oxygen Demand	mg/l	< 10	64.	50.	128.00 %
17-A013323	Chemical Oxygen Demand	mg/l	< 10	54.	50.	108.00 %
17-A013327	Chemical Oxygen Demand	mg/l	< 10	57.	50.	114.00 %
17-A013327	Total Sulfide	mg/l	< 0.05	0.58	0.50	116.00 %
17-A013327	Total Sulfide	mg/l	< 0.05	0.57	0.50	114.00 %

#### MATRIX SPIKE DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE + SPK	MSD VALUE	RPD
Spike	Total Sulfide	mg/l	0.58	0.57	1.7

#### STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	210	105. %
Total Organic Carbon	mg/l	50.	54.	108. %
Total Organic Carbon	mg/l	25.	27.	108. %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chloride	mg/l	5.00	5.11	102. %
Nitrate	mg/l	5.00	4.85	97.0 %
Nitrite	mg/l	5.00	4.86	97.2 %
Total Sulfide	mg/l	1.0	1.0	100. %
Sulfate	mg/l	5.00	5.26	105. %
Nitrate Nitrite Total Sulfide	mg/l mg/l mg/l	5.00 1.0	4.86 1.0	97.2 % 100. %

#### QC Summary for sample numbers: 17-A013063 to 17-A013064...

### BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05

									20	0							
Fax (206) 283-5044	Ph. (206) 285-8282	Sourd Loth Avenue West Seattle, WA 98119-2029	Friedman & Bruya, Inc.						c/ MW-3	3 Gw-4	Sample ID		Phone # (206) 285-8282	City, State, ZIP <u>Seattle</u> ,		CompanyFriedm	Send Report <u>To</u> <u>Michae</u>
Received by:	Relinquished by:	Received by:	7								Lab ID		Fax #_	Seattle, WA 98119	3012 16th Ave W	Friedman and Bruya, Inc.	Michael Erdahl
)y:	ned by:	NACON.	SIGNATURE						4	£1/8/3	Date Sampled		(206) 283-5044	9		uya, Inc.	
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SUBCONTRACT SAMPLE CHAIN OF CUSTODY

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Ph. (206) 285-8282	Seattle, WA 98119-2029	3012 16"" Avenue West	Friedman & Bruya, Inc.	) - - -						t-mm	MW-16	Mw -3	5w -4	Sample ID	· ·	City, State, ZIP <u>/SSaqua</u> h, Phone <u>Email</u>	Company Englandental Address 1/80 NW Map	Report To Josh B	408147
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#### ENVIRONMENTAL CHEMISTS

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

August 28, 2017

Eric Koltes, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 708174

Dear Mr Koltes:

Included are the results from the testing of material submitted on August 9, 2017 from the 69402, F&BI 708174 project. There are 38 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon, Josh Bernthal EPI0828R.DOC

#### ENVIRONMENTAL CHEMISTS

#### CASE NARRATIVE

This case narrative encompasses samples received on August 9, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 708174 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
708174 -01	MW-1
708174 -02	MW-7
708174 -03	MW-15
708174 -04	MW-8
708174 -05	MW-9
708174 -06	GW-11
708174 -07	MW-2

The samples were sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the samples were sent to Fremont for carbon dioxide analysis. The results from Amtest and Fremont are included.

All quality control requirements were acceptable.

# ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted:	MW-1 08/09/17 08/14/17		Client: Project: Lab ID: Data Film	Environmental Partners 69402, F&BI 708174 708174-01 709174-01 197
Date Analyzed:	08/15/17		Data File:	708174-01.127
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
indiyte.		dg, r (bbp)		
Iron		672		
Manganese		1,720		

# ENVIRONMENTAL CHEMISTS

Client ID:	MW-7		Client:	<b>Environmental Partners</b>
Date Received:	08/09/17		Project:	69402, F&BI 708174
Date Extracted:	08/14/17		Lab ID:	708174-02
Date Analyzed:	08/15/17		Data File:	708174-02.128
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
		Concentration		
Analyte:		ug/L (ppb)		
Iron		482		
Manganese		29.0		

# ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-15 08/09/17 08/14/17 08/15/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 708174 708174-03 708174-03.129 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		50.0 3.91		

# ENVIRONMENTAL CHEMISTS

MW-8 08/09/17 08/14/17 08/15/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 708174 708174-04 708174-04.130
Water		Instrument:	ICPMS2
ug/L (ppb)		Operator:	SP
	Concentration ug/L (ppb)		
	181 454		
	08/09/17 08/14/17 08/15/17 Water	08/09/17 08/14/17 08/15/17 Water ug/L (ppb) Concentration ug/L (ppb)	08/09/17 Project: 08/14/17 Lab ID: 08/15/17 Data File: Water Instrument: ug/L (ppb) Operator: 181

# ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted:	MW-9 08/09/17 08/14/17		Client: Project: Lab ID:	Environmental Partners 69402, F&BI 708174 708174-05
Date Analyzed:	08/15/17		Data File:	708174-05.131
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		<50 2.49		

# ENVIRONMENTAL CHEMISTS

Client ID:	GW-11		Client:	Environmental Partners
Date Received:	08/09/17		Project:	69402, F&BI 708174
Date Extracted:	08/14/17		Lab ID:	708174-06
Date Analyzed:	08/15/17		Data File:	708174-06.132
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
		Concentration		
Analyte:		ug/L (ppb)		
Iron		4,310		
Manganese		125		

# ENVIRONMENTAL CHEMISTS

Client ID:	MW-2		Client:	Environmental Partners
Date Received:	08/09/17		Project:	69402, F&BI 708174
Date Extracted:	08/14/17		Lab ID:	708174-07
Date Analyzed:	08/15/17		Data File:	708174-07.133
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
		Concentration		
Analyte:		ug/L (ppb)		
Iron		144		
Manganese		5.54		

# ENVIRONMENTAL CHEMISTS

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 708174
Date Extracted:	08/14/17	Lab ID:	I7-429 mb
Date Analyzed:	08/15/17	Data File:	I7-429 mb.032
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

#### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-1 08/09/17 08/14/17 08/15/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708174 708174-01 708174-01.087 ICPMS2 SP
Analyte:		Concentration ug/L (ppb)		
Iron		153		

1,870

Manganese

#### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Manganese

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-7 08/09/17 08/14/17 08/15/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708174 708174-02 708174-02.090 ICPMS2 SP
Analyte:		Concentration ug/L (ppb)		
Iron		323		

25.5

# ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-15 08/09/17 08/14/17 08/15/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708174 708174-03 708174-03.091 ICPMS2 SP
Analyte:		Concentration ug/L (ppb)		
Iron		<50		

3.97

Manganese

# ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted:	MW-8 08/09/17 08/14/17		Client: Project: Lab ID:	Environmental Partners 69402, F&BI 708174 708174-04
Date Analyzed:	08/15/17		Data File:	708174-04.092
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		66.6 476		

#### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

MW-9 08/09/17 08/14/17 08/15/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708174 708174-05 708174-05.093 ICPMS2 SP
	Concentration ug/L (ppb)		
	08/09/17 08/14/17 08/15/17 Water	08/09/17 08/14/17 08/15/17 Water ug/L (ppb) Concentration	08/09/17 Project: 08/14/17 Lab ID: 08/15/17 Data File: Water Instrument: ug/L (ppb) Operator: Concentration ug/L (ppb)

2.41

Manganese

# ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	GW-11		Client:	Environmental Partners
Date Received:	08/09/17		Project:	69402, F&BI 708174
Date Extracted:	08/14/17		Lab ID:	708174-06
Date Analyzed:	08/15/17		Data File:	708174-06.094
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte: Iron	ugʻri (ppb)	Concentration ug/L (ppb) 154	operator.	51

3.74

Manganese

#### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-2		Client:	<b>Environmental Partners</b>
Date Received:	08/09/17		Project:	69402, F&BI 708174
Date Extracted:	08/14/17		Lab ID:	708174-07
Date Analyzed:	08/15/17		Data File:	708174-07.095
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
		Concentration		
Analyte:		ug/L (ppb)		
Iron		59.2		
Manganese		3.39		

# ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	<b>Environmental Partners</b>
Date Received:	Not Applicable	Project:	69402, F&BI 708174
Date Extracted:	08/14/17	Lab ID:	I7-430 mb
Date Analyzed:	08/15/17	Data File:	I7-430 mb.080
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

# ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-1 08/09/17 08/11/17 08/11/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708174 708174-01 081119.D GCMS9 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	85	117
Toluene-d8		103	91	108
4-Bromofluorobenzene		98	76	126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride	•	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroethene		<1		
1,2-Dichloroethane	(EDC)	<1		
1,1,1-Trichloroetha	ne	<1		
Trichloroethene		<1		
Tetrachloroethene		14		

# ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-7 08/09/17 08/11/17 08/11/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708174 708174-02 081120.D GCMS9 JS
Surrogates: 1,2-Dichloroethane	-d4	% Recovery: 101	Lower Limit: 85	Upper Limit: 117
Toluene-d8 4-Bromofluorobenz	zene	101 98	91 76	108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 15		

# ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-15 08/09/17 08/11/17 08/11/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708174 708174-03 081130.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 103 98	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)	70	120
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 1.8 <1 <1 <1 3.0 120		

# ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-8 08/09/17 08/11/17 08/11/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708174 708174-04 081121.D GCMS9 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	85	117
Toluene-d8		100	91	108
4-Bromofluorobenzene		98	76	126
Compounds:		Concentration ug/L (ppb)		
Compounds.		ug/r (hhn)		
Vinyl chloride		< 0.2		
Chloroethane		<1		
1,1-Dichloroethene	e e e e e e e e e e e e e e e e e e e	<1		
Methylene chloride	ġ.	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	e (EDC)	<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

# ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-9 08/09/17 08/11/17 08/11/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708174 708174-05 081122.D GCMS9 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100 100 100 100 100 100 100 100 100 100	85	117
Toluene-d8	uı	102	91	108
4-Bromofluorobenz	zene	97	76	126
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	<u>.</u>	<1		
Methylene chloride	e e e e e e e e e e e e e e e e e e e	<5		
trans-1,2-Dichloroethene		<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	(EDC)	<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

# ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-11 08/09/17 08/11/17 08/11/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708174 708174-06 081129.D GCMS9 JS
Surrogates: 1,2-Dichloroethane	-d4	% Recovery: 101	Lower Limit: 85	Upper Limit: 117
Toluene-d8 4-Bromofluorobenz	zene	103 99	91 76	108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	<u>.</u>	<1		
Methylene chloride	2	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth	ene	<1		
1,2-Dichloroethane	(EDC)	<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		<1		
Tetrachloroethene		19		

# ENVIRONMENTAL CHEMISTS

Client Sample ID:MW-2Date Received:08/09/17Date Extracted:08/11/17Date Analyzed:08/11/17Matrix:WaterUnits:ug/L (ppb)	)	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708174 708174-07 081123.D GCMS9 JS
Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	99	76	126
Compounds:	Concentration ug/L (ppb)		
Vinyl chloride	< 0.2		
Chloroethane	<1		
1,1-Dichloroethene	<1		
Methylene chloride	<5		
trans-1,2-Dichloroethene	<1		
1,1-Dichloroethane	<1		
cis-1,2-Dichloroethene	<1		
1,2-Dichloroethane (EDC)	<1		
1,1,1-Trichloroethane	<1		
Trichloroethene	<1		
Tetrachloroethene	<1		

# ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicab 08/11/17 08/11/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708174 07-1718 mb 081114.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 103 99	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:	(	Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene e ene e (EDC) ane	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

#### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-1 08/09/17 08/11/17 08/11/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 708174 708174-01 014F1401.D GC8
Units:	ug/L (ppb)		Operator:	JS
Compounds:		Concentration ug/L (ppb)		
Methane Ethane		<5 <10		

#### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	MW-7		Client:	Environmental Partners
Date Received:	08/09/17		Project:	69402, F&BI 708174
Date Extracted:	08/11/17		Lab ID:	708174-02
Date Analyzed:	08/11/17		Data File:	015F1501.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

#### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	MW-15		Client:	Environmental Partners
Date Received:	08/09/17		Project:	69402, F&BI 708174
Date Extracted:	08/11/17		Lab ID:	708174-03
Date Analyzed:	08/11/17		Data File:	016F1601.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

#### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	MW-8		Client:	Environmental Partners
Date Received:	08/09/17		Project:	69402, F&BI 708174
Date Extracted:	08/11/17		Lab ID:	708174-04
Date Analyzed:	08/11/17		Data File:	017F1701.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

#### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	MW-9		Client:	Environmental Partners
Date Received:	08/09/17		Project:	69402, F&BI 708174
Date Extracted:	08/11/17		Lab ID:	708174-05
Date Analyzed:	08/11/17		Data File:	018F1801.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

#### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	GW-11		Client:	Environmental Partners
Date Received:	08/09/17		Project:	69402, F&BI 708174
Date Extracted:	08/11/17		Lab ID:	708174-06
Date Analyzed:	08/11/17		Data File:	019F1901.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

#### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	MW-2		Client:	<b>Environmental Partners</b>
Date Received:	08/09/17		Project:	69402, F&BI 708174
Date Extracted:	08/11/17		Lab ID:	708174-07
Date Analyzed:	08/11/17		Data File:	020F2001.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

#### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 708174
Date Extracted:	08/11/17	Lab ID:	07-1722 mb
Date Analyzed:	08/11/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS
	Concentration		
Compounds:	ug/L (ppb)		
Methane	<5		
Ethane	<10		

#### ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/17 Date Received: 08/09/17 Project: 69402, F&BI 708174

#### **QUALITY ASSURANCE RESULTS** FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020A

Laboratory Cod	de: 708198-01	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	649	79 b	0 b	75-125	200 b
Manganese	ug/L (ppb)	20	5,230	0 b	0 b	75-125	0 b
	• • • •						

Laboratory Code: Laboratory Control Sample

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	104	80-120
Manganese	ug/L (ppb)	20	106	80-120

#### ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/17 Date Received: 08/09/17 Project: 69402, F&BI 708174

#### **QUALITY ASSURANCE RESULTS** FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Co	de: 708174-01	(Matrix Sp	oike)				
				Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	153	85 b	120 b	70-130	34 b
Manganese	ug/L (ppb)	20	1,870	0 b	507 b	70-130	200 b

Laboratory Code: Laboratory Control Sample

		Percent					
	Reporting	Spike	Recovery	Acceptance			
Analyte	Units	Level	LCS	Criteria			
Iron	ug/L (ppb)	100	105	85-115			
Manganese	ug/L (ppb)	20	96	85-115			

#### ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/17 Date Received: 08/09/17 Project: 69402, F&BI 708174

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

Laboratory Code: 708145-01 (Matrix Spike)

5	1 /				
				Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	101	61-139
Chloroethane	ug/L (ppb)	50	<1	97	55-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	91	71-123
Methylene chloride	ug/L (ppb)	50	<5	104	61-126
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	99	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	98	79-113
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	100	63-126
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	104	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	94	75-121
Trichloroethen e	ug/L (ppb)	50	<1	100	73-122
Tetrachloroethene	ug/L (ppb)	50	10	101	72-113

Laboratory Code: Laboratory Control Sample

Laboratory couct Laboratory con			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	99	97	70-128	2
Chloroethane	ug/L (ppb)	50	93	93	66-149	0
1,1-Dichloroethene	ug/L (ppb)	50	87	85	75-119	2
Methylene chloride	ug/L (ppb)	50	105	104	63-132	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	97	95	76-118	2
1,1-Dichloroethane	ug/L (ppb)	50	97	95	77-119	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	98	96	76-119	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	102	100	78-114	2
1,1,1-Trichloroethane	ug/L (ppb)	50	91	89	80-116	2
Trichloroethene	ug/L (ppb)	50	101	99	72-119	2
Tetrachloroethene	ug/L (ppb)	50	101	101	78-109	0

#### ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/17 Date Received: 08/09/17 Project: 69402, F&BI 708174

#### QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

y the second	boroo or (Dupin	,		<b>Relative Percent</b>
	Reporting	Sample	Duplicate	Difference
Analyte	Units	Result	Result	(Limit 20)
Methane	ug/L (ppb)	<5	5.2	nm
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: 708103-01 (Duplicate)

Laboratory Code: Laboratory Control Sample

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Methane	ug/L (ppb)	59	76	74	50-150	3
Ethane	ug/L (ppb)	110	78	74	50-150	5
Ethene	ug/L (ppb)	102	98	99	50-150	1

#### 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.

 ${\rm d}$  - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 Professional Analytical Services

Aug 22 2017 Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-1	Water	17-A013321	DEM, MIN, NUT, CONV
MW-7	Water	17-A013322	DEM, MIN, NUT, CONV
MW-15	Water	17-A013323	DEM, MIN, NUT, CONV
MW-8	Water	17-A013324	DEM, MIN, NUT, CONV
MW-9	Water	17-A013325	DEM, MIN, NUT, CONV
GW-11	Water	17-A013326	DEM, MIN, NUT, CONV
MW-2	Water	17-A013327	DEM, MIN, NUT, CONV

Your samples were received on Thursday, August 10, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young

Aaron W. Young Laboratory Manager

Project #: 708174 PO Number: F-36

BACT = Bacteriological CONV = Conventionals MET = Metals ORG = Organics NUT=Nutrients DEM=Demand **MIN=Minerals** 

Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 www.amtestlab.com



Professional Analytical Services

#### **ANALYSIS REPORT**

Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL Project #: 708174 PO Number: F-36 All results reported on an as received basis.

AMTEST Identification Number	17-A013321
Client Identification	MW-1
Sampling Date	08/09/17, 07:18

#### Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	08/11/17

#### Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	08/11/17
Total Organic Carbon	4.0	mg/l		0.5	SM 5310B	SW	08/16/17
Chemical Oxygen Demand	11.	mg/l		10	EPA 410.4	SW	08/16/17

#### Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	18.0	mg/l		0.05	EPA 300.0	JC	08/11/17
Sulfate	9.70	mg/l		0.1	EPA 300.0	JC	08/10/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	08/10/17
Nitrate	2.60	mg/l		0.025	EPA 300.0	JC	08/10/17

AMTEST Identification Number	17-A013322
Client Identification	MW-7
Sampling Date	08/09/17, 08:22

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	08/11/17

#### Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	08/11/17
Total Organic Carbon	0.92	mg/l		0.5	SM 5310B	SW	08/16/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	08/16/17

#### Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	482.	mg/l		0.05	EPA 300.0	JC	08/11/17
Sulfate	8.90	mg/l		0.1	EPA 300.0	JC	08/11/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	08/10/17
Nitrate	3.00	mg/l		0.025	EPA 300.0	JC	08/10/17

AMTEST Identification Number	17-A013323
Client Identification	MW-15
Sampling Date	08/09/17, 09:44

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	08/11/17

#### Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	08/11/17
Total Organic Carbon	0.81	mg/l		0.5	SM 5310B	SW	08/16/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	08/16/17

#### Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	11.8	mg/l		0.05	EPA 300.0	JC	08/11/17
Sulfate	17.2	mg/l		0.1	EPA 300.0	JC	08/11/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	08/10/17
Nitrate	0.612	mg/l		0.025	EPA 300.0	JC	08/10/17

AMTEST Identification Number	17-A013324
Client Identification	MW-8
Sampling Date	08/09/17, 11:02

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	08/11/17

#### Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	08/11/17
Total Organic Carbon	1.0	mg/l		0.5	SM 5310B	SW	08/16/17
Chemical Oxygen Demand	200	mg/l		10	EPA 410.4	SW	08/16/17

#### Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	3.40	mg/l		0.05	EPA 300.0	JC	08/10/17
Sulfate	24.0	mg/l		0.1	EPA 300.0	JC	08/11/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	08/10/17
Nitrate	0.777	mg/l		0.025	EPA 300.0	JC	08/10/17

AMTEST Identification Number	17-A013325
Client Identification	MW-9
Sampling Date	08/09/17, 12:27

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	08/11/17

#### Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	08/11/17
Total Organic Carbon	0.58	mg/l		0.5	SM 5310B	SW	08/16/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	08/16/17

#### Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	2.90	mg/l		0.05	EPA 300.0	JC	08/10/17
Sulfate	12.9	mg/l		0.1	EPA 300.0	JC	08/11/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	08/10/17
Nitrate	2.00	mg/l		0.025	EPA 300.0	JC	08/10/17

AMTEST Identification Number	17-A013326
Client Identification	GW-11
Sampling Date	08/09/17, 13:39

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	08/11/17

#### Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	08/11/17
Total Organic Carbon	0.92	mg/l		0.5	SM 5310B	SW	08/16/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	08/16/17

#### Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	45.1	mg/l		0.05	EPA 300.0	JC	08/11/17
Sulfate	14.3	mg/l		0.1	EPA 300.0	JC	08/11/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	08/10/17
Nitrate	3.30	mg/l		0.025	EPA 300.0	JC	08/10/17

AMTEST Identification Number	17-A013327			
Client Identification	MW-2			
Sampling Date	08/09/17, 15:04			

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	08/11/17

#### Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	08/11/17
Total Organic Carbon	0.61	mg/l		0.5	SM 5310B	SW	08/16/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	08/16/17

#### Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	6.30	mg/l		0.05	EPA 300.0	JC	08/10/17
Sulfate	10.7	mg/l		0.1	EPA 300.0	JC	08/10/17

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	08/10/17
Nitrate	5.40	mg/l		0.025	EPA 300.0	JC	08/10/17

σh Aaron W. Young Laboratory Manager

Am Test Inc. 13600 NE 126th PL Suite C Kirkland, WA, 98034 (425) 885-1664 www.amtestlab.com



#### QC Summary for sample numbers: 17-A013321 to 17-A013327

#### DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A013301	BOD	mg/l	88.	82.	7.1
17-A013771	Total Organic Carbon	mg/l	1.9	1.9	0.00
17-A013031	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A013323	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A013327	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A013326	Nitrate	mg/l	3.30	3.20	3.1
17-A013326	Nitrite	mg/l	< 0.005	< 0.005	

#### **MATRIX SPIKES**

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
17-A013772	Total Organic Carbon	mg/l	1.9	27.	25.	100.40 %
17-A013031	Chemical Oxygen Demand	mg/l	< 10	64.	50.	128.00 %
17-A013323	Chemical Oxygen Demand	mg/l	< 10	54.	50.	108.00 %
17-A013327	Chemical Oxygen Demand	mg/l	< 10	57.	50.	114.00 %
17-A013326	Nitrate	mg/l	3.30	5.11	2.00	90.50 %
17-A013326	Nitrite	mg/l	< 0.005	1.60	2.00	80.00 %
17-A013327	Total Sulfide	mg/l	< 0.05	0.58	0.50	116.00 %
17-A013327	Total Sulfide	mg/l	< 0.05	0.57	0.50	114.00 %

#### MATRIX SPIKE DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE + SPK	MSD VALUE	RPD
Spike	Total Sulfide	mg/l	0.58	0.57	1.7

#### STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	190	95.0 %
Total Organic Carbon	mg/l	50.	52.	104. %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chloride	mg/l	5.00	4.92	98.4 %
Chloride	mg/l	5.00	4.83	96.6 %
Chloride	mg/l	5.00	4.90	98.0 %
Nitrate	mg/l	5.00	4.78	95.6 %
Nitrate	mg/l	5.00	4.68	93.6 %
Nitrite	mg/l	5.00	4.84	96.8 %
Nitrite	mg/l	5.00	4.73	94.6 %
Total Sulfide	mg/l	1.0	1.0	100. %
Sulfate	mg/l	5.00	5.14	103. %
Sulfate	mg/l	5.00	5.11	102. %
Sulfate	mg/l	5.00	5.14	103. %

#### QC Summary for sample numbers: 17-A013321 to 17-A013327...

#### BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Chloride	mg/l	0.09
Nitrate	mg/l	< 0.025
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1
Sulfate	mg/l	< 0.1
Sulfate	mg/l	< 0.1

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	Fax (206) 283-5044	Ph. (206) 285-8282	Seattle, WA 98119-2029	3012 16th Avenue West	Friedman & Bruya, Inc.	1 • •				MW-2	Gw-1]	Am-9	MW-8	MW-15		MW-1	Sample ID		Phone # (206) 285-8282	City, State, ZIP <u>Seattle</u>	Address 3012 1	CompanyFriedm	Send Report <u>ToMicha</u>	
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SUBCONTRACT SAMPLE CHAIN OF CUSTODY

*	Ph. (206) 285-8282	Seattle, WA 98119-2029	3012 16 th Avenue West	Friedman & Bruya, Inc.					Mw-2	GW-11	MW - 9	B-MW	MW - 15	Mw -7		Sample ID		PhoneEr	City, State, ZIP <u>/SSa</u>	Address (RO NW	Company Environmental	Report To Eric Kolles	708174
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#### ENVIRONMENTAL CHEMISTS

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

August 18, 2017

Josh Bernthal, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 708197

Dear Mr Bernthal:

Included are the results from the testing of material submitted on August 10, 2017 from the 69402, F&BI 708197 project. There are 21 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon, Eric Koltes EPI0818R.DOC

#### ENVIRONMENTAL CHEMISTS

#### CASE NARRATIVE

This case narrative encompasses samples received on August 10, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 708197 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
708197 -01	MW-13
708197 -02	GW-10
708197 -03	MW-12:Bag
708197 -04	MW-6:Bag
708197 -05	MW-18
708197 -06	MW-5:Bag
708197 -07	MW-10:Bag
708197 -08	MW-14:Bag
708197 -09	MW-11:Bag
708197 -10	MW-4:Bag
708197 -11	GW-1:Bag
708197 -12	GW-7:Bag
708197 -13	GW-3:Bag
708197 -14	GW-6:Bag
708197 -15	GW-5:Bag
708197 -16	GW-9:Bag
708197 -17	GW-8:Bag

All quality control requirements were acceptable.

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-13 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-01 081416.D GCMS9 JS
Surrogates: 1,2-Dichloroethane	-d4	% Recovery: 99	Lower Limit: 85	Upper Limit: 117
Toluene-d8	u i	102	91	108
4-Bromofluorobenz	zene	98	76	126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	•	<1		
Methylene chloride	9	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroeth		<1		
1,2-Dichloroethane		<1		
1,1,1-Trichloroetha	ane	<1		
Trichloroethene		<1		
Tetrachloroethene		2.5		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-10 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-02 081417.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 100 97	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	0.23 <1 <1 <5 <1 <1 22 <1 <1 <1 <1		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-12:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-03 081418.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 99 98	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	< 0.2 < 1 < 1 < 5 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 2 < 1 < 1 < 2 < 1 < 2 < 1 < 1 < 2 < 1 < 1 < 2 < 1 < 2 < 1 < 2 < 1 < 2 < 1 < 2 < 2		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-6:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-04 081419.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 100 100	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-18 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-05 081420.D GCMS9 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	85	117
Toluene-d8		101	91	108
4-Bromofluorobenzene		99	76	126
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		<0.2		
Chloroethane		<1		
1,1-Dichloroethene	<b>!</b>	<1		
Methylene chloride	<u>)</u>	<5		
trans-1,2-Dichloroe	ethene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroethene		<1		
1,2-Dichloroethane	(EDC)	<1		
1,1,1-Trichloroetha	ine	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-5:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-06 081434.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 101 99 97	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 1.2 21		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-10:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-07 081435.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 101 97	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	$ \begin{array}{c} 1.3 \\ <1 \\ <5 \\ <1 \\ <1 \\ 19 \\ <1 \\ <1 \\ 60 \\ 22 \\ \end{array} $		

### ENVIRONMENTAL CHEMISTS

Date Received: Date Extracted: Date Analyzed: Matrix:	MW-14:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-08 081424.D GCMS9 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-c	11	100 1000 100	85	117
Toluene-d8	11	100	91	108
4-Bromofluorobenzene		98	76	126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride		< 0.2		
Chloroethane		<1		
1,1-Dichloroethene		<1		
Methylene chloride		<5		
trans-1,2-Dichloroet	hene	<1		
1,1-Dichloroethane		<1		
cis-1,2-Dichloroether	ne	<1		
1,2-Dichloroethane (	(EDC)	<1		
1,1,1-Trichloroethan	ie	<1		
Trichloroethene		<1		
Tetrachloroethene		<1		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-11:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-09 081425.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 101 102 97	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene	e ethene ene e (EDC)	$ \begin{array}{c} 1.7 \\ <1 \\ <5 \\ <1 \\ <1 \\ 3.6 \\ <1 \\ <1 \\ <1 \\ <1 \\ <1 \end{array} $		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-4:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-10 081426.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 101 100	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	$\begin{array}{c} 0.51 \\ <1 \\ <1 \\ <5 \\ <1 \\ <1 \\ 6.2 \\ <1 \\ <1 \\ <1 \\ <1 \end{array}$		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-1:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-11 081427.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 99 98	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-7:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-12 081428.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 102 98	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 2.0		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-3:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-13 081429.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 101 100 97	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 2.9		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-6:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-14 081430.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 101 103 98	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1 9.2		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-5:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-15 081431.D GCMS9 JS
Surrogates: 1,2-Dichloroethane-d4 Toluene-d8 4-Bromofluorobenzene		% Recovery: 102 102 98	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroeth ane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 3.2		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-9:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-16 081432.D GCMS9 JS
Surrogates: 1,2-Dichloroethane-d4 Toluene-d8 4-Bromofluorobenzene		% Recovery: 100 102 98	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 1.4 <1 <1 <1 <1		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-8:Bag 08/10/17 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 708197-17 081433.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8	-d4	% Recovery: 102 99	Lower Limit: 85 91	Upper Limit: 117 108
4-Bromofluorobenzene		99 97	91 76	126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 26		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicab 08/14/17 08/14/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 708197 07-1725 mb 081408.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 101 101 98	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:	(	Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

#### ENVIRONMENTAL CHEMISTS

Date of Report: 08/18/17 Date Received: 08/10/17 Project: 69402, F&BI 708197

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

Laboratory Code: 708197-01 (Matrix Spike)

5	1 /				
				Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	94	61-139
Chloroethane	ug/L (ppb)	50	<1	91	55-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	87	71-123
Methylene chloride	ug/L (ppb)	50	<5	100	61-126
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	94	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	93	79-113
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	95	63-126
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	98	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	89	75-121
Trichloroethene	ug/L (ppb)	50	<1	97	73-122
Tetrachloroethene	ug/L (ppb)	50	2.5	100	72-113

Laboratory Code: Laboratory Control Sample

Laboratory coue. Laboratory con	I I		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	100	99	70-128	1
Chloroethane	ug/L (ppb)	50	94	96	66-149	2
1,1-Dichloroethene	ug/L (ppb)	50	94	95	75-119	1
Methylene chloride	ug/L (ppb)	50	110	109	63-132	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	99	100	76-118	1
1,1-Dichloroethane	ug/L (ppb)	50	98	99	77-119	1
cis-1,2-Dichloroethene	ug/L (ppb)	50	100	101	76-119	1
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	101	103	78-114	2
1,1,1-Trichloroethane	ug/L (ppb)	50	98	99	80-116	1
Trichloroethene	ug/L (ppb)	50	100	103	72-119	3
Tetrachloroethene	ug/L (ppb)	50	103	102	78-109	1

#### 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.

 ${\bf b}$  - 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.

 ${\rm d}$  - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Ph. (206) 285-8282	Seattle, WA 98119-2029	or 7 or 40enue West	;		Mw-4: Bag	MW -11: Bag	MW-14: Bag	MW-10: Bag	MW-S: Bag	MW -18	Mw-6: Bag	MW -12: Bra	Gw-10	MW~13	Sample ID		PhoneE	City, State, ZIP 15599464	Address 1180 Nu	Company Environmental	Report To Jesh Bern that	LD180L
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#### ENVIRONMENTAL CHEMISTS

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

November 20, 2017

Josh Bernthal, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402

Dear Mr Bernthal:

Included are the results from the testing of material submitted on November 14, 2017 from the 69402, F&BI 711264 project. There are 10 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon EPI1120R.DOC

#### ENVIRONMENTAL CHEMISTS

#### CASE NARRATIVE

This case narrative encompasses samples received on November 14, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	Environmental Partners
711264 -01	IJ-13:20
711264 -02	IJ-13:25
711264 -03	IJ-13:30
711264 -04	IJ-14:15
711264 -05	IJ-14:25

All quality control requirements were acceptable.

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	LJ-13:20 11/14/17 11/15/17 11/15/17 Soil mg/kg (ppn	n) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partn 69402, F&BI 711264 711264-01 111533.D GCMS4 JS	ers
-			Lower	Upper	
Surrogates: 1,2-Dichloroethane	d4	% Recovery:	Limit: 62	Limit: 142	
Toluene-d8	e-04	101 103	62 55	142	
4-Bromofluorobenz	zene	103	65	139	
		Concentration			Concentration
Compounds:		mg/kg (ppm)	Compou	nds:	mg/kg (ppm)
Dichlorodifluorome	ethane	<0.5	1,3-Dich	loropropane	< 0.05
Chloromethane		<0.5		oroethene	< 0.025
Vinyl chloride		< 0.05		chloromethane	< 0.05
Bromomethane		<0.5		omoethane (EDB)	< 0.05
Chloroethane		<0.5	Chlorobe		< 0.05
Trichlorofluoromet	thane	<0.5	Ethylber		< 0.05
Acetone		< 0.5		etrachloroethane	< 0.05
1,1-Dichloroethene	<u>à</u>	<0.05 <0.25	m,p-Xyle		<0.1 <0.05
Hexane Methylene chloride		<0.25 <0.5	o-Xylene Styrene		<0.05 <0.05
Methyl t-butyl ethe		<0.05		lbenzene	< 0.05
trans-1,2-Dichloroe		<0.05	Bromofo		< 0.05
1,1-Dichloroethane		< 0.05	n-Propyl		< 0.05
2,2-Dichloropropar		< 0.05	Bromobe		< 0.05
cis-1,2-Dichloroeth		< 0.05	1,3,5-Tri	methylbenzene	< 0.05
Chloroform		< 0.05	1,1,2,2-T	etrachloroethane	< 0.05
2-Butanone (MEK)		<0.5		chloropropane	< 0.05
1,2-Dichloroethane		< 0.05	2-Chloro		< 0.05
1,1,1-Trichloroetha		< 0.05	4-Chloro		< 0.05
1,1-Dichloropropen		< 0.05		ylbenzene	< 0.05
Carbon tetrachlori	ae	< 0.05		methylbenzene	< 0.05
Benzene Trichloroethene		<0.03 <0.02		vlbenzene pyltoluene	< 0.05 < 0.05
1,2-Dichloropropan	1e	<0.02		lorobenzene	< 0.05
Bromodichlorometl		<0.05		lorobenzene	<0.05
Dibromomethane	liune	< 0.05		lorobenzene	< 0.05
4-Methyl-2-pentan	one	<0.5		omo-3-chloropropane	< 0.5
cis-1,3-Dichloropro		< 0.05		chlorobenzene	< 0.25
Toluene	-	< 0.05	Hexachl	orobutadiene	< 0.25
trans-1,3-Dichlorop		< 0.05	Naphtha	< 0.05	
1,1,2-Trichloroetha	ane	< 0.05	1,2,3-Tri	chlorobenzene	< 0.25
2-Hexanone		<0.5			

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	IJ-13:25 11/14/17 11/15/17 11/15/17 Soil mg/kg (ppn	n) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partn 69402, F&BI 711264 711264-02 111534.D GCMS4 JS	ers
_			Lower	Upper	
Surrogates:	-14	% Recovery:	Limit:	Limit:	
1,2-Dichloroethane Toluene-d8	-04	102 103	62 55	142 145	
4-Bromofluorobenz	zene	103	55 65	145	
		Concentration			Concentration
Compounds:		mg/kg (ppm)	Compou	nds:	mg/kg (ppm)
Dichlorodifluorome	ethane	< 0.5	1,3-Dich	loropropane	< 0.05
Chloromethane		< 0.5		loroethene	< 0.025
Vinyl chloride		< 0.05		ochloromethane	< 0.05
Bromomethane		< 0.5		omoethane (EDB)	< 0.05
Chloroethane		< 0.5	Chlorobe		< 0.05
Trichlorofluoromet	hane	< 0.5	Ethylber		< 0.05
Acetone		< 0.5		etrachloroethane	< 0.05
1,1-Dichloroethene		< 0.05	m,p-Xyle		< 0.1
Hexane Methylene chloride	,	<0.25 <0.5	o-Xylene		<0.05 <0.05
Methyl t-butyl ethe		<0.3 <0.05	Styrene	lbenzene	< 0.05
trans-1,2-Dichloroe		<0.05	Bromofo		<0.05
1,1-Dichloroethane		<0.05	n-Propyl		<0.05
2,2-Dichloropropar		< 0.05	Bromobe		< 0.05
cis-1,2-Dichloroeth		< 0.05	1,3,5-Tri	methylbenzene	< 0.05
Chloroform		< 0.05		etrachloroethane	< 0.05
2-Butanone (MEK)		< 0.5		chloropropane	< 0.05
1,2-Dichloroethane		< 0.05	2-Chloro		< 0.05
1,1,1-Trichloroetha		< 0.05	4-Chloro		< 0.05
1,1-Dichloropropen		< 0.05		ylbenzene	< 0.05
Carbon tetrachlori	de	< 0.05		methylbenzene	< 0.05
Benzene Trichloroethene		<0.03 <0.02	0	vlbenzene	<0.05 <0.05
1,2-Dichloropropan		<0.02 <0.05		pyltoluene lorobenzene	<0.05 <0.05
Bromodichloromet		< 0.05		lorobenzene	< 0.05
Dibromomethane	liane	<0.05		lorobenzene	< 0.05
4-Methyl-2-pentan	one	<0.5		omo-3-chloropropane	<0.5
cis-1,3-Dichloropro		< 0.05		chlorobenzene	< 0.25
Toluene	-	< 0.05		orobutadiene	< 0.25
trans-1,3-Dichloroj	oropene	< 0.05	Naphtha	alene	< 0.05
1,1,2-Trichloroetha	ane	< 0.05	1,2,3-Tri	chlorobenzene	< 0.25
2-Hexanone		< 0.5			

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	IJ-13:30 11/14/17 11/15/17 11/15/17 Soil mg/kg (ppn	n) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partn 69402, F&BI 711264 711264-03 111535.D GCMS4 JS	ers
-			Lower	Upper	
Surrogates:	44	% Recovery:	Limit:	Limit:	
1,2-Dichloroethane Toluene-d8	-04	100 104	62 55	142 145	
4-Bromofluorobenz	zene	104	65	145	
		Concentration			Concentration
Compounds:		mg/kg (ppm)	Compou	nds:	mg/kg (ppm)
Dichlorodifluorome	ethane	<0.5	1,3-Dich	loropropane	< 0.05
Chloromethane		< 0.5		loroethene	0.028
Vinyl chloride		< 0.05		ochloromethane	< 0.05
Bromomethane		< 0.5		omoethane (EDB)	< 0.05
Chloroethane	_	<0.5	Chlorobe		< 0.05
Trichlorofluoromet	hane	<0.5	Ethylber		< 0.05
Acetone		< 0.5		etrachloroethane	< 0.05
1,1-Dichloroethene		<0.05 <0.25	m,p-Xyle		<0.1 <0.05
Hexane Methylene chloride	``````````````````````````````````````	<0.25 <0.5	o-Xylene Styrene	<b>,</b>	<0.05 <0.05
Methyl t-butyl ethe		<0.05		lbenzene	< 0.05
trans-1,2-Dichloroe		< 0.05	Bromofo		< 0.05
1,1-Dichloroethane		< 0.05	n-Propyl		< 0.05
2,2-Dichloropropar		< 0.05	Bromobe		< 0.05
cis-1,2-Dichloroeth		< 0.05	1,3,5-Tri	methylbenzene	< 0.05
Chloroform		< 0.05		etrachloroethane	< 0.05
2-Butanone (MEK)		< 0.5		chloropropane	< 0.05
1,2-Dichloroethane		< 0.05	2-Chloro		< 0.05
1,1,1-Trichloroetha		< 0.05	4-Chloro		< 0.05
1,1-Dichloropropen		< 0.05		ylbenzene	< 0.05
Carbon tetrachlori	de	< 0.05		methylbenzene	< 0.05
Benzene Trichloroethene		<0.03 <0.02		vlbenzene	< 0.05 < 0.05
1,2-Dichloropropan		<0.02 <0.05		pyltoluene lorobenzene	<0.05 <0.05
Bromodichloromet		<0.05		lorobenzene	< 0.05
Dibromomethane	nane	<0.05		lorobenzene	<0.05
4-Methyl-2-pentan	one	<0.5		omo-3-chloropropane	< 0.5
cis-1,3-Dichloropro		< 0.05		chlorobenzene	< 0.25
Toluene	-	< 0.05		or obutadiene	< 0.25
trans-1,3-Dichloroj	propene	< 0.05	Naphtha	alene	< 0.05
1,1,2-Trichloroetha		< 0.05	1,2,3-Tri	chlorobenzene	< 0.25
2-Hexanone		<0.5			

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	IJ-14:15 11/14/17 11/15/17 11/16/17 Soil mg/kg (ppn	n) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partn 69402, F&BI 711264 711264-04 111536.D GCMS4 JS	ers
		04 <b>D</b>	Lower	Upper	
Surrogates: 1,2-Dichloroethane	d1	% Recovery:	Limit: 62	Limit: 142	
Toluene-d8	-04	101 102	62 55	142	
4-Bromofluorobenz	zene	102	65	145	
		Concentration			Concentration
Compounds:		mg/kg (ppm)	Compou	nds:	mg/kg (ppm)
Dichlorodifluorome	ethane	< 0.5	1,3-Dich	loropropane	< 0.05
Chloromethane		< 0.5	Tetrachl	oroethene	< 0.025
Vinyl chloride		< 0.05		ochloromethane	< 0.05
Bromomethane		< 0.5		omoethane (EDB)	< 0.05
Chloroethane		< 0.5	Chlorobe		< 0.05
Trichlorofluoromet	hane	< 0.5	Ethylber		< 0.05
Acetone		< 0.5		etrachloroethane	< 0.05
1,1-Dichloroethene		<0.05 <0.25	m,p-Xyle		<0.1 <0.05
Hexane Methylene chloride	<b>`</b>	<0.25 <0.5	o-Xylene Styrene		<0.05 <0.05
Methyl t-butyl ethe		<0.05		lbenzene	<0.05
trans-1,2-Dichloroe		<0.05	Bromofo		<0.05
1,1-Dichloroethane		< 0.05	n-Propyl		< 0.05
2,2-Dichloropropan		< 0.05	Bromobe		< 0.05
cis-1,2-Dichloroeth		< 0.05	1,3,5-Tri	methylbenzene	< 0.05
Chloroform		< 0.05	1,1,2,2-T	etrachloroethane	< 0.05
2-Butanone (MEK)		< 0.5		chloropropane	< 0.05
1,2-Dichloroethane		< 0.05	2-Chloro		< 0.05
1,1,1-Trichloroetha		< 0.05	4-Chloro		< 0.05
1,1-Dichloropropen		< 0.05		ylbenzene	< 0.05
Carbon tetrachlorie Benzene	ae	<0.05 <0.03		imethylbenzene vlbenzene	<0.05 <0.05
Trichloroethene		< 0.03		pyltoluene	< 0.05
1,2-Dichloropropan	le	< 0.02		lorobenzene	< 0.05
Bromodichlorometl		< 0.05		lorobenzene	< 0.05
Dibromomethane		< 0.05		lorobenzene	< 0.05
4-Methyl-2-pentan	one	< 0.5		omo-3-chloropropane	< 0.5
cis-1,3-Dichloropro		< 0.05		chlorobenzene	< 0.25
Toluene	_	< 0.05		orobutadiene	< 0.25
trans-1,3-Dichlorop		< 0.05	Naphtha		< 0.05
1,1,2-Trichloroetha	ane	< 0.05	1,2,3-Tri	chlorobenzene	< 0.25
2-Hexanone		< 0.5			

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	IJ-14:25 11/14/17 11/15/17 11/16/17 Soil mg/kg (ppn	n) Dry Weight	Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partn 69402, F&BI 711264 711264-05 111537.D GCMS4 JS	ers
		o <b></b>	Lower	Upper	
Surrogates:	44	% Recovery:	Limit:	Limit:	
1,2-Dichloroethane Toluene-d8	-04	100 104	62 55	142 145	
4-Bromofluorobenz	zene	104	65	139	
		Concentration			Concentration
Compounds:		mg/kg (ppm)	Compou	nds:	mg/kg (ppm)
Dichlorodifluorome	ethane	<0.5	1,3-Dich	loropropane	< 0.05
Chloromethane		< 0.5	Tetrachl	oroethene	< 0.025
Vinyl chloride		< 0.05	Dibromo	ochloromethane	< 0.05
Bromomethane		<0.5		omoethane (EDB)	< 0.05
Chloroethane		< 0.5	Chlorobe		< 0.05
Trichlorofluoromet	hane	<0.5	Ethylber		< 0.05
Acetone		<0.5		etrachloroethane	< 0.05
1,1-Dichloroethene		< 0.05	m,p-Xyle		< 0.1
Hexane Methylene chloride		<0.25 <0.5	o-Xylene Styrene		<0.05 <0.05
Methyl t-butyl ethe		<0.3 <0.05		lbenzene	< 0.05
trans-1,2-Dichloroe		<0.05	Bromofo		<0.05
1,1-Dichloroethane		< 0.05	n-Propyl		< 0.05
2,2-Dichloropropan		< 0.05	Bromobe		< 0.05
cis-1,2-Dichloroeth		< 0.05		methylbenzene	< 0.05
Chloroform		< 0.05		etrachloroethane	< 0.05
2-Butanone (MEK)		< 0.5		chloropropane	< 0.05
1,2-Dichloroethane		< 0.05	2-Chloro		< 0.05
1,1,1-Trichloroetha		< 0.05	4-Chloro		< 0.05
1,1-Dichloropropen		< 0.05		ylbenzene	< 0.05
Carbon tetrachlori	de	< 0.05		methylbenzene	< 0.05
Benzene		< 0.03		vlbenzene	< 0.05
Trichloroethene 1,2-Dichloropropan		<0.02 <0.05		pyltoluene lorobenzene	<0.05 <0.05
Bromodichlorometl		<0.05 <0.05		lorobenzene	< 0.05
Dibromomethane	nane	<0.05		lorobenzene	< 0.05
4-Methyl-2-pentan	one	<0.5		omo-3-chloropropane	<0.5
cis-1,3-Dichloropro		<0.05		chlorobenzene	<0.25
Toluene	•	< 0.05		orobutadiene	< 0.25
trans-1,3-Dichlorop	propene	< 0.05	Naphtha		< 0.05
1,1,2-Trichloroetha		< 0.05	1,2,3-Tri	chlorobenzene	< 0.25
2-Hexanone		< 0.5			

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Bla Not Applica 11/15/17 11/15/17 Soil mg/kg (ppn		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partn 69402, F&BI 711264 07-2563 mb2 111520.D GCMS4 JS	ers
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:	
1,2-Dichloroethane	-d4	⁷⁰ Recovery. 100	62	142	
Toluene-d8	ui	102	55	145	
4-Bromofluorobenz	zene	109	65	139	
		Concentration			Concentration
Compounds:		mg/kg (ppm)	Compou	nds:	mg/kg (ppm)
Dichlorodifluorome	ethane	< 0.5	1,3-Dich	loropropane	< 0.05
Chloromethane		< 0.5	Tetrachl	loroethene	< 0.025
Vinyl chloride		< 0.05		ochloromethane	< 0.05
Bromomethane		< 0.5		omoethane (EDB)	< 0.05
Chloroethane		< 0.5	Chlorobe		< 0.05
Trichlorofluoromet	hane	< 0.5	Ethylber		< 0.05
Acetone		< 0.5		etrachloroethane	< 0.05
1,1-Dichloroethene Hexane	2	<0.05 <0.25	m,p-Xyle		< 0.1
Methylene chloride		<0.25 <0.5	o-Xylene Styrene		<0.05 <0.05
Methyl t-butyl ethe		<0.05		lbenzene	<0.05
trans-1,2-Dichloroe		<0.05	Bromofo		<0.05
1,1-Dichloroethane		< 0.05	n-Propyl		< 0.05
2,2-Dichloropropan		< 0.05	Bromobe		< 0.05
cis-1,2-Dichloroeth		< 0.05	1,3,5-Tri	methylbenzene	< 0.05
Chloroform		< 0.05		etrachloroethane	< 0.05
2-Butanone (MEK)		<0.5		chloropropane	< 0.05
1,2-Dichloroethane		< 0.05	2-Chloro		< 0.05
1,1,1-Trichloroetha		< 0.05	4-Chloro		< 0.05
1,1-Dichloropropen		< 0.05		ylbenzene	< 0.05
Carbon tetrachlorie	de	<0.05 <0.03		methylbenzene	<0.05 <0.05
Benzene Trichloroethene		< 0.03		/lbenzene pyltoluene	<0.05 <0.05
1,2-Dichloropropan		< 0.02		lorobenzene	< 0.05
Bromodichlorometl		<0.05		lorobenzene	< 0.05
Dibromomethane	lune	< 0.05		lorobenzene	< 0.05
4-Methyl-2-pentan	one	<0.5		omo-3-chloropropane	< 0.5
cis-1,3-Dichloropro		< 0.05		chlorobenzene	< 0.25
Toluene	_	< 0.05	Hexachl	orobutadiene	< 0.25
trans-1,3-Dichlorop	-	< 0.05	Naphtha		< 0.05
1,1,2-Trichloroetha	ine	< 0.05	1,2,3-Tri	chlorobenzene	< 0.25
2-Hexanone		<0.5			

#### ENVIRONMENTAL CHEMISTS

Date of Report: 11/20/17 Date Received: 11/14/17 Project: 69402, F&BI 711264

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

Laboratory Code: 711266-05 (Matrix Spike)

Laboratory Code. 711200	oo (maanin opino)		Sample	Percent	Percent		
	Reporting	Spike	Result	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	(Wet wt)	MS	MSD	Criteria	(Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	24	25	10-142	4
Chloromethane	mg/kg (ppm)	2.5	< 0.5	48	47	10-126	2
Vinyl chloride	mg/kg (ppm)	2.5	< 0.05	49	50	10-138	2
Bromomethane	mg/kg (ppm)	2.5	<0.5	56	59	10-163	5
Chloroethane	mg/kg (ppm)	2.5	<0.5	54	55	10-176	2
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	53	54 75	10-176	2
Acetone 1,1-Dichloroethene	mg/kg (ppm) mg/kg (ppm)	12.5 2.5	<0.5 <0.05	74 65	75 64	10-163 10-160	1 2
Hexane	mg/kg (ppm)	2.5	<0.05	54	58	10-137	7
Methylene chloride	mg/kg (ppm)	2.5	<0.5	78	79	10-156	1
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	78	77	21-145	1
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	< 0.05	72	73	14-137	1
1,1-Dichloroethane	mg/kg (ppm)	2.5	< 0.05	77	76	19-140	1
2,2-Dichloropropane	mg/kg (ppm)	2.5	< 0.05	101	100	10-158	1
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	< 0.05	80	79	25-135	1
Chloroform	mg/kg (ppm)	2.5	< 0.05	79	78	21-145	1
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	88	89	19-147	1
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	< 0.05	79	79	12-160	0
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	< 0.05	86	84	10-156	2
1,1-Dichloropropene Carbon tetrachloride	mg/kg (ppm)	2.5 2.5	< 0.05	78	78 90	17-140	0
Benzene	mg/kg (ppm)	2.5	<0.05 <0.03	90 78	90 79	9-164 29-129	1
Trichloroethene	mg/kg (ppm) mg/kg (ppm)	2.5	<0.03	78 80	79 79	29-129 21-139	1
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.02	87	87	30-135	0
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	90	88	23-155	2
Dibromomethane	mg/kg (ppm)	2.5	<0.05	84	84	23-145	õ
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	93	93	24-155	0
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	< 0.05	95	95	28-144	0
Toluene	mg/kg (ppm)	2.5	< 0.05	84	83	35-130	1
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	< 0.05	101	102	26-149	1
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	< 0.05	90	89	10-205	1
2-Hexanone	mg/kg (ppm)	12.5	<0.5	97	97	15-166	0
1,3-Dichloropropane	mg/kg (ppm)	2.5	< 0.05	89	89	31-137	0
Tetrachloroethene	mg/kg (ppm)	2.5	< 0.025	85	85 99	20-133	0
Dibromochloromethane 1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5 2.5	<0.05 <0.05	100 98	99 97	28-150 28-142	1
Chlorobenzene	mg/kg (ppm) mg/kg (ppm)	2.5	<0.05	98 86	97 86	32-129	0
Ethylbenzene	mg/kg (ppm)	2.5	< 0.05	86	86	32-129	0
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	95	93	31-143	2
m,p-Xylene	mg/kg (ppm)	5	<0.1	87	87	34-136	õ
o-Xylene	mg/kg (ppm)	2.5	< 0.05	83	83	33-134	ŏ
Styrene	mg/kg (ppm)	2.5	< 0.05	88	87	35-137	1
Isopropylbenzene	mg/kg (ppm)	2.5	< 0.05	86	85	31-142	1
Bromoform	mg/kg (ppm)	2.5	< 0.05	106	105	21-156	1
n-Propylbenzene	mg/kg (ppm)	2.5	< 0.05	90	90	23-146	0
Bromobenzene	mg/kg (ppm)	2.5	< 0.05	92	90	34-130	2
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5 2.5	< 0.05	88	89	18-149	1
1,1,2,2-Tetrachloroethane 1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05 <0.05	91 88	90 88	28-140 25-144	1
2-Chlorotoluene	mg/kg (ppm) mg/kg (ppm)	2.5	<0.05	88	88	25-144 31-134	0
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	89	89	31-134	0
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	88	89	30-137	1
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	88	88	10-182	0
sec-Butylbenzene	mg/kg (ppm)	2.5	< 0.05	90	90	23-145	Ő
p-Isopropyltoluene	mg/kg (ppm)	2.5	< 0.05	89	89	21-149	0
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	< 0.05	88	88	30-131	0
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	< 0.05	88	88	29-129	0
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	< 0.05	88	88	31-132	0
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	98	100	11-161	2
1,2,4 Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	88	88	22-142	0
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	91	91	10-142	0
Naphthalene 1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5 2.5	<0.05 <0.25	87 87	88 87	14-157 20-144	1
1,2,5 IIICHOLODEHZEIIE	mg/kg (ppm)	2.0	<0.20	01	01	20-144	U

#### ENVIRONMENTAL CHEMISTS

Date of Report: 11/20/17 Date Received: 11/14/17 Project: 69402, F&BI 711264

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

Laboratory Code: Laboratory Control Sample

Laboratory Code. Laboratory	Control Sample	C	Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	53	10-146
Chloromethane	mg/kg (ppm)	2.5	65	27-133
Vinyl chloride Bromomethane	mg/kg (ppm)	2.5 2.5	74 71	22-139
Chloroethane	mg/kg (ppm) mg/kg (ppm)	2.5 2.5	71 76	38-114 10-163
Trichlorofluoromethane	mg/kg (ppm)	2.5	79	10-196
Acetone	mg/kg (ppm)	12.5	90	52-141
1,1-Dichloroethene Hexane	mg/kg (ppm) mg/kg (ppm)	2.5 2.5	84 90	47-128 43-142
Methylene chloride	mg/kg (ppm)	2.5	94	42-132
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	90	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	91	67-127
1,1-Dichloroethane 2.2-Dichloropropane	mg/kg (ppm) mg/kg (ppm)	2.5 2.5	91 119	68-115 52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	94	72-113
Chloroform	mg/kg (ppm)	2.5	91	66-120
2-Butanone (MEK)	mg/kg (ppm)	12.5	97	57-123
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5 2.5	92 101	56-135
1,1,1-Trichloroethane 1,1-Dichloropropene	mg/kg (ppm) mg/kg (ppm)	2.5 2.5	95	62-131 69-128
Carbon tetrachloride	mg/kg (ppm)	2.5	109	60-139
Benzene	mg/kg (ppm)	2.5	91	68-114
Trichloroethene 1.2-Dichloropropane	mg/kg (ppm)	2.5 2.5	93 98	64-117 72-127
1,2-Dichloropropane Bromodichloromethane	mg/kg (ppm) mg/kg (ppm)	2.5 2.5	98 101	72-127
Dibromomethane	mg/kg (ppm)	2.5	96	70-120
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	102	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	107	75-136
Toluene trans-1,3-Dichloropropene	mg/kg (ppm) mg/kg (ppm)	2.5 2.5	96 112	66-126 72-132
1.1.2-Trichloroethane	mg/kg (ppm)	2.5	98	75-113
2-Hexanone	mg/kg (ppm)	12.5	101	33-152
1,3-Dichloropropane	mg/kg (ppm)	2.5	98	72-130
Tetrachloroethene Dibromochloromethane	mg/kg (ppm) mg/kg (ppm)	2.5 2.5	100 112	72-114 74-125
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	107	74-123
Chlorobenzene	mg/kg (ppm)	2.5	96	76-111
Ethylbenzene	mg/kg (ppm)	2.5	98	64-123
1,1,1,2-Tetrachloroethane m,p-Xylene	mg/kg (ppm)	2.5 5	110 98	69-135 78-122
o-Xylene	mg/kg (ppm) mg/kg (ppm)	5 2.5	98 96	78-122
Styrene	mg/kg (ppm)	2.5	99	74-126
Isopropylbenzene	mg/kg (ppm)	2.5	98	76-127
Bromoform	mg/kg (ppm)	2.5 2.5	118 99	56-132 74-124
n-Propylbenzene Bromobenzene	mg/kg (ppm) mg/kg (ppm)	2.5	99 101	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	98	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	98	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2.5 2.5	95	61-137
2-Chlorotoluene 4-Chlorotoluene	mg/kg (ppm) mg/kg (ppm)	2.5	98 97	74-121 75-122
tert-Butylbenzene	mg/kg (ppm)	2.5	100	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	98	76-125
sec-Butylbenzene	mg/kg (ppm)	2.5	99	71-130
p-Isopropyltoluene 1.3-Dichlorobenzene	mg/kg (ppm) mg/kg (ppm)	2.5 2.5	100 99	70-132 75-121
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	99	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	99	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	112	58-138
1,2,4 Trichlorobenzene Hexachlorobutadiene	mg/kg (ppm) mg/kg (ppm)	2.5 2.5	100 104	64-135 50-153
Naphthalene	mg/kg (ppm) mg/kg (ppm)	2.5 2.5	98	50-155 63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	102	63-138

#### 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.

 ${\bf b}$  - 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.

 ${\rm d}$  - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

<u> </u>	Seattle, WA 98119-2029 Relinquished by:	ې جنب	Palinauitand			T.J-14:25 051 V 1500	IT-14:15 04 1454	IJ-13:30 03 054	[J-13:25 02 945	IJ-13:20 01 A-D 11/3/17 935	Sample ID Lab ID Date Time Sampled Sampled		Phone Email	City, State, ZIP 155 aq Va 4, WM	Address · 11 80 NW Maple St	armers Inc	
	t	Elizabeth Webber Shug	PRINT NAME	1 1 1 1 1 1		4				Soil 4	Type Sample J # of TPH-HCID TPH-Diesel TPH-Gasoline BTEX by 8021B	A		REMARKS	69402	PRØJECT NAME	VILD. M. Sx
	T8J	P	COMPANY	Samples received at		×	×	× 	×	×	VOCs by 8260C SVOCs by 8270D PAHs 8270D SIM	ANALYSES REQUESTED	Archiv     Other	INVOICE TO	Rush ch	PO # 28tanda	UL II
		· w/14/17 1340	DATE TIME								Notes		<ul> <li>Archive Samples</li> <li>Other</li> </ul>	SAMPLE DISPOSAL	Rush charges authorized by:	Standard Turnaround	TURNAROUND TIME

#### ENVIRONMENTAL CHEMISTS

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

December 1, 2017

Josh Bernthal, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 711416

Dear Mr Bernthal:

Included are the results from the testing of material submitted on November 21, 2017 from the 69402, F&BI 711416 project. There are 26 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon EPI1201R.DOC

#### ENVIRONMENTAL CHEMISTS

#### CASE NARRATIVE

This case narrative encompasses samples received on November 21, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 711416 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
711416-01	GW-11
711416-02	MW-1
711416-03	MW-8
711416-04	MW-9
711416-05	MW-17
711416-06	MW-2
711416-07	MW-16:Bag
711416-08	MW-18:Bag
711416-09	MW-5:Bag
711416-10	GW-3:Bag
711416-11	GW-9:Bag
711416-12	GW-4
711416-13	GW-8:Bag
711416-14	GW-7:Bag
711416-15	GW-1:Bag
711416-16	MW-6:Bag
711416-17	MW-12:Bag
711416-18	MW-13
711416-19	GW-10:Bag
711416-20	MW-10:Bag
711416-21	MW-4:Bag
711416-22	MW-14:Bag
	5

All quality control requirements were acceptable.

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-11 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-01 112233.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 99 99	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 21		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-1 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-02 112234.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 99 102	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 19		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-8 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-03 112235.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 99 101	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene a (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-9 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-04 112236.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 101 100 104	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 3		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-2 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-06 112237.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 99 102	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-5:Bag 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-09 112238.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 100 102	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	< 0.2 < 1 < 1 < 5 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 25 < 25		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-3:Bag 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-10 112239.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 98 99 101	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1 3		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-9:Bag 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-11 112240.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 99 100	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)	10	120
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-4 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-12 112241.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 101 98 99	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-8:Bag 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-13 112242.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 100 103	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1 13		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-7:Bag 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-14 112243.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 98 100	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 1.3		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-1: Bag 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-15 112244.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 99 102	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-6:Bag 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-16 112245.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 100 102	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-12:Bag 11/21/17 11/22/17 11/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-17 112246.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 97 98 101	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 3.8		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-13 11/21/17 11/22/17 11/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-18 112247.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 101 100 101	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	GW-10:Bag 11/21/17 11/22/17 11/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-19 112248.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 98 100	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 32 <1 <1 <1 <1		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-10:Bag 11/21/17 11/22/17 11/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-20 112249.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 99 104	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	5.9 <1 <1 <5 <1 <1 52 <1 <1 110 280 ve		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-10:Bag 11/21/17 11/22/17 11/27/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-20 1/10 112708.D GCMS9 JS
Surrogates:		% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane	-d4	100	85	117
Toluene-d8		100	91	108
4-Bromofluorobenzene		100	76	126
		Concentration		
Compounds:		ug/L (ppb)		
Vinyl chloride		6.4		
Chloroethane		<10		
1,1-Dichloroethene		<10		
Methylene chloride	<u>)</u>	<50		
trans-1,2-Dichloroe	ethene	<10		
1,1-Dichloroethane		<10		
cis-1,2-Dichloroeth	ene	54		
1,2-Dichloroethane	(EDC)	<10		
1,1,1-Trichloroetha	ine	<10		
Trichloroethene		110		
Tetrachloroethene		270		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-4:Bag 11/21/17 11/22/17 11/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-21 112250.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluor obenz		% Recovery: 101 99 103	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroet 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	$\begin{array}{c} 0.24 \\ <1 \\ <1 \\ <5 \\ <1 \\ <1 \\ 2.2 \\ <1 \\ <1 \\ <1 \\ <1 \end{array}$		

## ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-14:Bag 11/21/17 11/22/17 11/23/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 711416-22 112251.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 100 104	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicat 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 07-2611 mb2 112223.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 99 100	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blar Not Applicat 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711416 07-2649 mb 112222.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 99 100 102	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1		

#### ENVIRONMENTAL CHEMISTS

Date of Report: 12/01/17 Date Received: 11/21/17 Project: 69402, F&BI 711416

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

Laboratory Code: 711402-01 (Matrix Spike)

5	1 /				
				Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	92	61-139
Chloroethane	ug/L (ppb)	50	<1	91	55-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	94	71-123
Methylene chloride	ug/L (ppb)	50	<5	99	61-126
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	94	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	97	79-113
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	95	63-126
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	98	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	96	75-121
Trichloroethene	ug/L (ppb)	50	<1	95	73-122
Tetrachloroethene	ug/L (ppb)	50	<1	90	72-113

Laboratory coue. Laboratory con			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	96	94	70-128	2
Chloroethane	ug/L (ppb)	50	96	94	66-149	2
1,1-Dichloroethene	ug/L (ppb)	50	95	94	75-119	1
Methylene chloride	ug/L (ppb)	50	104	103	63-132	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	96	95	76-118	1
1,1-Dichloroethane	ug/L (ppb)	50	99	99	77-119	0
cis-1,2-Dichloroethene	ug/L (ppb)	50	97	95	76-119	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	99	100	78-114	1
1,1,1-Trichloroethane	ug/L (ppb)	50	98	98	80-116	0
Trichloroethene	ug/L (ppb)	50	97	97	72-119	0
Tetrachloroethene	ug/L (ppb)	50	93	92	78-109	1

#### ENVIRONMENTAL CHEMISTS

Date of Report: 12/01/17 Date Received: 11/21/17 Project: 69402, F&BI 711416

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

Laboratory Code: 711416-16 (Matrix Spike)

	1 /				
				Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	93	61-139
Chloroethane	ug/L (ppb)	50	<1	94	55-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	92	71-123
Methylene chloride	ug/L (ppb)	50	<5	100	61-126
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	96	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	99	79-113
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	96	63-126
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	98	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	97	75-121
Trichloroethene	ug/L (ppb)	50	<1	95	73-122
Tetrachloroethene	ug/L (ppb)	50	<1	91	72-113

	1		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	96	94	70-128	2
Chloroethane	ug/L (ppb)	50	96	94	66-149	2
1,1-Dichloroethene	ug/L (ppb)	50	95	94	75-119	1
Methylene chloride	ug/L (ppb)	50	104	103	63-132	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	96	95	76-118	1
1,1-Dichloroethane	ug/L (ppb)	50	99	99	77-119	0
cis-1,2-Dichloroethene	ug/L (ppb)	50	97	95	76-119	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	99	100	78-114	1
1,1,1-Trichloroethane	ug/L (ppb)	50	98	98	80-116	0
Trichloroethene	ug/L (ppb)	50	97	97	72-119	0
Tetrachloroethene	ug/L (ppb)	50	93	92	78-109	1

#### 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 compound is a common laboratory and field contaminant.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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#### ENVIRONMENTAL CHEMISTS

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

December 12, 2017

Josh Bernthal, Project Manager Environmental Partners, Inc. 1180 NW Maple St, Suite 310 Issaquah, WA 98027

RE: 69402, F&BI 711417

Dear Mr Bernthal:

Included are the results from the testing of material submitted on November 21, 2017 from the 69402, F&BI 711417 project. There are 23 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl Project Manager

Enclosures c: Cynthia Moon EPI1212R.DOC

#### ENVIRONMENTAL CHEMISTS

#### CASE NARRATIVE

This case narrative encompasses samples received on November 21, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 711417 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
711417-01	MW-3
711417-02	MW-15
711417-03	MW-7

The samples were sent to Amtest for TOC, COD, BOD, sulfate, sulfide, nitrate, nitrite, chloride, and carbon dioxide analyses. The report is enclosed.

All quality control requirements were acceptable.

### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-3 f 11/21/17 12/05/17 12/05/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 711417 711417-01 x10 711417-01 x10.128 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		19,500 3,480		

### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Client ID: Date Received: Date Extracted: Date Analyzed:	MW-15 f 11/21/17 12/05/17 12/05/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 711417 711417-02 711417-02.034
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron		<50		
Manganese		11.1		

### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Manganese

Client ID:	MW-7 f		Client:	Environmental Partners
Date Received:	11/21/17		Project:	69402, F&BI 711417
Date Extracted:	12/05/17		Lab ID:	711417-03
Date Analyzed:	12/05/17		Data File:	711417-03.037
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte: Iron		Concentration ug/L (ppb) 236	-	

30.6

4

### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank f	Client:	<b>Environmental Partners</b>
Date Received:	Not Applicable	Project:	69402, F&BI 711417
Date Extracted:	12/05/17	Lab ID:	I7-676 mb
Date Analyzed:	12/05/17	Data File:	I7-676 mb.031
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP
	Concentration		
Analyte:	ug/L (ppb)		
Iron	<50		
Manganese	<1		

### ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed:	MW-3 11/21/17 11/28/17 11/29/17		Client: Project: Lab ID: Data File:	Environmental Partners 69402, F&BI 711417 711417-01 x10 711417-01 x10.050
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		25,100 3,920		

### ENVIRONMENTAL CHEMISTS

Client ID: Date Received: Date Extracted: Date Analyzed: Matrix:	MW-15 11/21/17 11/28/17 11/28/17 Water		Client: Project: Lab ID: Data File: Instrument:	Environmental Partners 69402, F&BI 711417 711417-02 711417-02.089 ICPMS2
Units:	ug/L (ppb)		Operator:	SP
Analyte:		Concentration ug/L (ppb)		
Iron Manganese		66.1 11.3		

### ENVIRONMENTAL CHEMISTS

Client ID: Date Received:	MW-7 11/21/17		Client: Project:	Environmental Partners 69402, F&BI 711417
Date Extracted:	11/28/17		Lab ID:	711417-03
Date Analyzed:	11/28/17		Data File:	711417-03.090
Matrix:	Water		Instrument:	ICPMS2
Units:	ug/L (ppb)		Operator:	SP
		Concentration		
Analyte:		ug/L (ppb)		
Iron		322		
Manganese		31.4		

### ENVIRONMENTAL CHEMISTS

Method Blank	Client:	Environmental Partners
Not Applicable	Project:	69402, F&BI 711417
11/28/17	Lab ID:	I7-662 mb
11/28/17	Data File:	I7-662 mb.065
Water	Instrument:	ICPMS2
ug/L (ppb)	Operator:	SP
Concentration		
ug/L (ppb)		
<50		
<1		
	Not Applicable 11/28/17 11/28/17 Water ug/L (ppb) Concentration ug/L (ppb) <50	Not ApplicableProject:11/28/17Lab ID:11/28/17Data File:WaterInstrument:ug/L (ppb)Operator:Concentrationug/L (ppb)<50

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-3 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711417 711417-01 112230.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 98 98 101	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroeth 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene	e ethene ene (EDC)	< 0.2 < 1 < 1 < 5 < 1 < 1		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-15 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711417 711417-02 112231.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 99 99	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene (EDC)	< 0.2 < 1 < 1 < 5 < 1 < 1 2.4 < 1 < 1 2.6 96		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-7 11/21/17 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711417 711417-03 112232.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 100 101 103	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene ene e (EDC)	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 20		

### ENVIRONMENTAL CHEMISTS

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	Method Blan Not Applicat 11/22/17 11/22/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711417 07-2611 mb2 112223.D GCMS9 JS
Surrogates: 1,2-Dichloroethane Toluene-d8 4-Bromofluorobenz		% Recovery: 102 99 100	Lower Limit: 85 91 76	Upper Limit: 117 108 126
Compounds:		Concentration ug/L (ppb)		
Vinyl chloride Chloroethane 1,1-Dichloroethene Methylene chloride trans-1,2-Dichloroe 1,1-Dichloroethane cis-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane Trichloroethene Tetrachloroethene	e ethene e ene e (EDC) ane	<0.2 <1 <1 <5 <1 <1 <1 <1 <1 <1 <1 <1		

### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-3		Client:	Environmental Partners
Date Received:	11/21/17		Project:	69402, F&BI 711417
Date Extracted:	12/01/17		Lab ID:	711417-01
Date Analyzed:	12/01/17		Data File:	006F0601.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
Compounds: Methane Ethane Ethene		Concentration ug/L (ppb) 3,400 ve <10 <10		

### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Client Sample ID: Date Received: Date Extracted: Date Analyzed: Matrix: Units:	MW-3 11/21/17 12/01/17 12/04/17 Water ug/L (ppb)		Client: Project: Lab ID: Data File: Instrument: Operator:	Environmental Partners 69402, F&BI 711417 711417-01 1/20 004F0401.D GC8 JS
Compounds:		Concentration ug/L (ppb)		
Methane		3,800		

15

### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	MW-15		Client:	<b>Environmental Partners</b>
Date Received:	11/21/17		Project:	69402, F&BI 711417
Date Extracted:	12/01/17		Lab ID:	711417-02
Date Analyzed:	12/01/17		Data File:	007F0701.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

<10

### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	MW-7		Client:	<b>Environmental Partners</b>
Date Received:	11/21/17		Project:	69402, F&BI 711417
Date Extracted:	12/01/17		Lab ID:	711417-03
Date Analyzed:	12/01/17		Data File:	008F0801.D
Matrix:	Water		Instrument:	GC8
Units:	ug/L (ppb)		Operator:	JS
		Concentration		
Compounds:		ug/L (ppb)		
Methane		<5		
Ethane		<10		

<10

### ENVIRONMENTAL CHEMISTS

# Analysis For Dissolved Gasses By RSK 175

Ethene

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 711417
Date Extracted:	12/01/17	Lab ID:	07-2680 mb
Date Analyzed:	12/01/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS
	Concentration		
Compounds:	ug/L (ppb)		
Methane	<5		
Ethane	<10		

<10

#### ENVIRONMENTAL CHEMISTS

Date of Report: 12/12/17 Date Received: 11/21/17 Project: 69402, F&BI 711417

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

Laboratory Cod	Reporting	Spike	Sample	Percent Recovery	Percent Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	<50	98	99	70-130	1
Manganese	ug/L (ppb)	20	11.1	96	100	70-130	4

Laboratory Code: 711417-02 (Matrix Spike)

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	98	85-115
Manganese	ug/L (ppb)	20	100	85-115

#### ENVIRONMENTAL CHEMISTS

Date of Report: 12/12/17 Date Received: 11/21/17 Project: 69402, F&BI 711417

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

Laboratory Coc	de: 711413-01	(matrix 5)	Jike)	Percent	Percent		
	Reporting	Spike	Sample	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	Result	MS	MSD	Criteria	(Limit 20)
Iron	ug/L (ppb)	100	3,420	257 b	223 b	70-130	14 b
Manganese	ug/L (ppb)	20	82.9	117	113	70-130	3

			Percent	
	Reporting	Spike	Recovery	Acceptance
Analyte	Units	Level	LCS	Criteria
Iron	ug/L (ppb)	100	102	85-115
Manganese	ug/L (ppb)	20	103	85-115

#### ENVIRONMENTAL CHEMISTS

Date of Report: 12/12/17 Date Received: 11/21/17 Project: 69402, F&BI 711417

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

Laboratory Code: 711402-01 (Matrix Spike)

	1 /				
				Percent	
	Reporting	Spike	Sample	Recovery	Acceptance
Analyte	Units	Level	Result	MS	Criteria
Vinyl chloride	ug/L (ppb)	50	< 0.2	92	61-139
Chloroethane	ug/L (ppb)	50	<1	91	55-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	94	71-123
Methylene chloride	ug/L (ppb)	50	<5	99	61-126
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	94	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	97	79-113
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	95	63-126
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	98	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	96	75-121
Trichloroethene	ug/L (ppb)	50	<1	95	73-122
Tetrachloroethene	ug/L (ppb)	50	<1	90	72-113

Laboratory couct Laboratory con	<b>F</b>		Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Vinyl chloride	ug/L (ppb)	50	96	94	70-128	2
Chloroethane	ug/L (ppb)	50	96	94	66-149	2
1,1-Dichloroethene	ug/L (ppb)	50	95	94	75-119	1
Methylene chloride	ug/L (ppb)	50	104	103	63-132	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	96	95	76-118	1
1,1-Dichloroethane	ug/L (ppb)	50	99	99	77-119	0
cis-1,2-Dichloroethene	ug/L (ppb)	50	97	95	76-119	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	99	100	78-114	1
1,1,1-Trichloroethane	ug/L (ppb)	50	98	98	80-116	0
Trichloroethene	ug/L (ppb)	50	97	97	72-119	0
Tetrachloroethene	ug/L (ppb)	50	93	92	78-109	1

#### ENVIRONMENTAL CHEMISTS

Date of Report: 12/12/17 Date Received: 11/21/17 Project: 69402, F&BI 711417

#### QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Laboratory Code: (Duplicate)

Laboratory coue.	(2 apricace)			<b>Relative Percent</b>
	Reporting	Sample	Duplicate	Difference
Analyte	Units	Result	Result	(Limit 20)
Methane	ug/L (ppb)	<5	<5	nm
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

			Percent	Percent		
	Reporting	Spike	Recovery	Recovery	Acceptance	RPD
Analyte	Units	Level	LCS	LCSD	Criteria	(Limit 20)
Methane	ug/L (ppb)	59	84	83	50-150	2
Ethane	ug/L (ppb)	110	80	77	50-150	5
Ethene	ug/L (ppb)	102	104	100	50-150	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.

 ${\bf b}$  - 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.

 ${\rm d}$  - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 Professional Analytical Services

Dec 8 2017 Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-3	Water	17-A020722	CONV, MIN, DEM, CO2-tot, NUT
MW-15	Water	17-A020723	CONV, MIN, DEM, CO2-tot, NUT
MW-7	Water	17-A020724	CONV, MIN, DEM, CO2-tot, NUT

Your samples were received on Wednesday, November 22, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

aron lu Aaron W. Young

Aaron W. Young Laboratory Manager

Project #: 711417 PO Number: F-176

BACT = Bacteriological CONV = Conventionals MET = Metals ORG = Organics NUT=Nutrients DEM=Demand **MIN=Minerals** 

Am Test Inc. 13600 NE 126TH PL Suite C Kirkland, WA 98034 (425) 885-1664 www.amtestlab.com



Professional Analytical Services

#### **ANALYSIS REPORT**

Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Attention: MICHAEL ERDAHL Project #: 711417 PO Number: F-176 All results reported on an as received basis.

AMTEST Identification Number	17-A020722
Client Identification	MW-3
Sampling Date	11/21/17, 15:05

#### Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
pH	5.44	unit	*	0.1	SM 4500H B	DB	11/22/17
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	MJ	11/27/17
Total Carbon Dioxide	120	mg/l		1	SM 2320B	SRW	11/28/17

#### Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	12.	mg/l		2	SM 5210B	JM	11/22/17
Total Organic Carbon	35.	mg/l		0.5	SM 5310B	NNL	12/07/17
Chemical Oxygen Demand	38.	mg/l		10	EPA 410.4	MJ	11/28/17

#### Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Alkalinity (as CaCO3)	130	mg/l		1	SM 2320B	SRW	11/28/17
Chloride	9.10	mg/l		0.05	EPA 300.0	JC	11/22/17
Sulfate	5.70	mg/l		0.1	EPA 300.0	JC	11/22/17

Date Received: 11/22/17 Date Reported: 12/ 8/17 Friedman & Bruya, Inc. Project Name: AmTest ID: 17-A020722

#### **Nutrients**

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	11/22/17
Nitrate	0.086	mg/l		0.025	EPA 300.0	JC	11/22/17

AMTEST Identification Number	17-A020723
Client Identification	MW-15
Sampling Date	11/21/17, 15:58

#### Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
pH	5.36	unit	*	0.1	SM 4500H B	DB	11/22/17
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	MJ	11/27/17
Total Carbon Dioxide	41.	mg/l		1	SM 2320B	SRW	11/28/17

#### Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	11/22/17
Total Organic Carbon	3.1	mg/l		0.5	SM 5310B	NNL	12/07/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	MJ	11/28/17

#### Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Alkalinity (as CaCO3)	46.	mg/l		1	SM 2320B	SRW	11/28/17
Chloride	12.6	mg/l		0.05	EPA 300.0	JC	11/28/17
Sulfate	15.3	mg/l		0.1	EPA 300.0	JC	11/28/17

#### Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	11/22/17
Nitrate	0.768	mg/l		0.025	EPA 300.0	JC	11/22/17

AMTEST Identification Number	17-A020724
Client Identification	MW-7
Sampling Date	11/21/17, 16:47

#### Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
рН	5.46	unit	*	0.1	SM 4500H B	DB	11/22/17
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	MJ	11/27/17
Total Carbon Dioxide	23.	mg/l		1	SM 2320B	SRW	11/28/17

#### Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	11/22/17
Total Organic Carbon	2.4	mg/l		0.5	SM 5310B	NNL	12/07/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	MJ	11/28/17

#### Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE	
Alkalinity (as CaCO3)	26.	mg/l		1	SM 2320B	SRW	11/28/17	
Chloride	10.6	mg/l		0.05	EPA 300.0	JC	11/28/17	
Sulfate	425.	mg/l		0.1	EPA 300.0	JC	11/28/17	

#### **Nutrients**

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	11/22/17
Nitrate	2.90	mg/l		0.025	EPA 300.0	JC	11/22/17

* = The method specifies the test is to be performed in the field; therefore the result is an estimate.

on W Aaron W. Young Laboratory Manager

Am Test Inc. 13600 NE 126th PL Suite C Kirkland, WA, 98034 (425) 885-1664 www.amtestlab.com



# QC Summary for sample numbers: 17-A020722 to 17-A020724

## DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A020730	pH	unit	6.93	7.01	1.1
17-A020256	Alkalinity (as CaCO3)	mg/l	110	110	0.00
17-A020426	Alkalinity (as CaCO3)	mg/l	18.	18.	0.00
17-A020742	Alkalinity (as CaCO3)	mg/l	16.	16.	0.00
17-A020714	BOD	mg/l	< 2	< 2	
17-A020664	Chloride	mg/l	< 0.05	< 0.05	
17-A020740	Chloride	mg/l	2.70	2.60	3.8

# **MATRIX SPIKES**

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
17-A020980	Total Organic Carbon	mg/l	< 0.5	23.	25.	92.00 %
17-A021329	Total Organic Carbon	mg/l	0.51	24.	25.	93.96 %
17-A021500	Total Organic Carbon	mg/l	8.6	28.	25.	77.60 %
17-A020468	Chemical Oxygen Demand	mg/l	11.	100	100	89.00 %
17-A020468	Chemical Oxygen Demand	mg/l	11.	98.	100	87.00 %
17-A020664	Chloride	mg/l	< 0.05	1.94	2.00	97.00 %
17-A020740	Chloride	mg/l	2.70	4.43	2.00	86.50 %
17-A020724	Total Sulfide	mg/l	< 0.05	0.27	0.25	108.00 %
17-A020724	Total Sulfide	mg/l	< 0.05	0.27	0.25	108.00 %

# MATRIX SPIKE DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE + SPK	MSD VALUE	RPD
Spike	Chemical Oxygen Demand	mg/l	100	98.	2.0
Spike	Total Sulfide	mg/l	0.27	0.27	0.00

# STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
рН	unit	6.86	6.81	99.3 %
pH	unit	6.86	6.81	99.3 %
Alkalinity (as CaCO3)	mg/l	240	250	104. %
Alkalinity (as CaCO3)	mg/l	240	250	104. %
BOD	mg/l	200	170	85.0 %
Total Organic Carbon	mg/l	50.	47.	94.0 %
Total Organic Carbon	mg/l	50.	49.	98.0 %
Total Organic Carbon	mg/l	50.	46.	92.0 %
Total Organic Carbon	mg/l	50.	47.	94.0 %
Chemical Oxygen Demand	mg/l	100	110	110. %
Chloride	mg/l	5.00	4.96	99.2 %
Chloride	mg/l	5.00	4.81	96.2 %
Nitrate	mg/l	5.00	4.78	95.6 %
Nitrite	mg/l	5.00	4.99	99.8 %

# QC Summary for sample numbers: 17-A020722 to 17-A020724...

# STANDARD REFERENCE MATERIALS continued....

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Total Sulfide	mg/l	0.50	0.47	94.0 %
Sulfate	mg/l	5.00	5.40	108. %
Sulfate	mg/l	5.00	5.08	102. %

# BLANKS

ANALYTE	UNITS	RESULT
Alkalinity (as CaCO3)	mg/l	< 1
Alkalinity (as CaCO3)	mg/l	< 1
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1
Sulfate	mg/l	< 0.1

Fax (206) 283-5044	Ph. (206) 285-8282	Seattle, WA 98119-2029	3012 16th Avenue West	Friedman & Bruyc							t-mw	MW-15	MW-3 26	Sample ID		Phone # <u>(206) 285-8282</u>	City, State, ZIP <u>S</u>		CompanyF	Send Report <u>To</u>
4		-2029	West	ı, Inc.							24	2	722	Lab ID		5-8282	<u>beattle,</u>	3012 16	riedma	Michae
Received by:	Relinquished by:	Received by:	Relinquished								4.000 (mag)	8	11/21/17	Date Sampled		Fax #(2	Seattle, WA 98119	3012 16th Ave W	Friedman and Bruya, Inc	Michael Erdahl
	l by:		Relinquished by:	SIGNATURI							1647	1558	5051	Time Sampled		(206) 283-5044			a, Inc.	
	Ó	W		Ð							-		Low	Matrix		/	RJ		PI	IS
			- M								0	6	6	# of jars			REMARKS	アノ	PROJECT NAME/NO.	SUBCONTRACTER
			Michael Erdahl								×	ĸ	×	Total Organic Carbon		Please Email Results	SY	イルリア	TNAN	VTRAC
			Erdah	PRII							×	×	×	410.4 COD		Emai			/IE/NC	ACTER
			1	PRINT NAME							×	×	×	52.1013 BOD	F	l Resu				
				ME		 	 				x	×	×	300.0 Chloride	ANALY	lts				
						 					×	×	ĸ	300.0 Sulfate				T		
			F								×	×	×	5141500-52-1) Sulfide	REQU			-176	PO #	
			Friedman and Bruya	0		 					×	×	×	Nitrafe/Nitrite 300.0 CO2	SES REQUESTED			6	74	
			an and	COMPANY		 					X	x	X	CO2	Ð					]
			d Bruy	ANY		 				 						□ Keti Will	<b>X</b> Disj	Rush	∠XStanda □ RUSH	
			7a											and an early of the second		Keturn samples Will call with in	SAMI pose af	charge	ndard ( SH	Page # TURNA
		1221	11/22/17	DATE										Notes		<ul> <li>Keturn samples</li> <li>Will call with instructions</li> </ul>	SAMPLE DISPOSAL Dispose after 30 days	Rush charges authorized by:	⊠Standard (2 Weeks) □ RUSH	ROUND
		123	10an	TIME		3										ons	SAL	l by:		of /
			2	AE.	L.,														1	

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

P.7

Friedman & Bruya, Inc. 3012 16 th Avenue West Seattle, WA 98119-2029 Ph. (206) 285-8282			ww-7	MW-15-	MW - 3	Sample ID	PhoneE	City, State, ZIP /5 50		Company Energy and tal	711417 Report To Josh Re
SIGNATURE Relinquished by: Received by: Relinquented by: Received by:			02 1	67	01 A-0 11/21/17	Lab ID Date Sampled	Email	Ksaquah, WA	150 NW Maple ST	ntal Parmes Inc.	Bernhad
	· · · · · · · · · · · · · · · · · · ·		4 P 3	1538	1505 W	Time Se Sampled		- REMARKS	69402	PRUJECT	SAMPLE CHAIN OF SAMPLERS (signature)
PRINT NAME Dizobeth Web			······		Water 15	Sample # of Jars			192 <u>-</u>	VAME <	SAMPLE CHAIN OF CUSTODY
NAME Webber-Brig						TPH-HCID TPH-Diesel TPH-Gasoline BTEX by 8021B					JSTODY
	Samples received		×	×	**	VOCs by 8260C SVOCs by 8270D PAHs 8270D SIM To く, ここプ BOD		INVOICE TO		. PO #	ME 11 - 21-
COMPANY COMPANY	eceived at		× × ×	X X X	X	Torel + Disolver	L <u>.</u>	SAMPLE DISPO	Rush charge	The RIJSH	-/
DATE TIME	å		×	×	X	Norak/Nitr + <u>Chioride</u> M-Thave, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, ethane, eth	amples	SAMPLE DISPOSAL ose after 30 days	Rush charges authorized by:	Standard Turnaround	VW4/AT4 Page # // of 4 TURNAROUND TIME



2655 Park Center Dr., Suite A Simi Valley, CA 93065 T: +1 805 526 7161 F: +1 805 526 7270 www.alsglobal.com

# LABORATORY REPORT

March 14, 2017

Mike Erdahl Friedman & Bruya, Inc. 3012 16th Ave. W. Seattle, WA 98119

RE: 702293

Dear Mike:

Enclosed are the results of the samples submitted to our laboratory on March 7, 2017. For your reference, these analyses have been assigned our service request number P1701103.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at <u>www.alsglobal.com</u>. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

For Sue Anderson Project Manager



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Client: Friedman & Bruya, Inc. Project: 702293 Service Request No: P1701103

## CASE NARRATIVE

The samples were received intact under chain of custody on March 7, 2017 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

#### Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gas (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



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# ALS Environmental - Simi Valley

## CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure- certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm_	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPer mitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp- services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1177034
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaborat oryAccreditation/Pages/index.aspx	4068-004
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413- 16-7
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA01627201 6-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at <u>www.alsglobal.com</u>, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

### ALS ENVIRONMENTAL

#### DETAIL SUMMARY REPORT

Client: Project ID:	Friedman & Bru 702293	ıya, Inc.			Service Request: P1701103
Date Received: Time Received:	3/7/2017 10:25				5 - CO2
Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 17
GW-11	P1701103-001	Water	2/20/2017	11:25	Х
MW-3	P1701103-002	Water	2/20/2017	15:18	Х

P1701103

# SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report <u>To Michae</u>	end Report <u>ToMichael Erdahl</u>						SUBCONTRACTER ALS-Sini Valley							Page # of TURNAROUND TIME				
Company Friedm	an and Br	uya, Inc.		PROJ	ECT NA	ME/NO	).		1	PC	)#					Weeks)		
	<u>6th Ave W</u>				7022	-93			E	-52	1		Rı	ish cha	irges :	authorize 4	ed by:	
City, State, ZIP <u>Seattle</u>				REMARKS Please Email Results					SAMPLE DISPOSAL  Dispose after 30 days Return samples									
Phone #(206) 285-8282	Fax #_	(206) 283-	5044		riease		nesu	11.9			·		□ Will call with instructions					
			<u></u>			<b>I</b>			ANA	LYSES	S REQ	UES	TED					
Sample ID	Lab ID	Date Sampled	Time Sampled	Matr	ix # of jars	Dioxins/Furans	EPH	HdV	Nitrate	Sulfate	Alkalinity	TOC-9060M	Discolved				Notes	
Gw-11	R	2/10/17	1125	unter	Z								X		<u> </u>			
MW-3	Ì	Ţ	1518	1	2								X					
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Friedman & Bruya, Inc. 3012 16th Avenue West	Relinquist	SIGNA'	TURE	$\rightarrow$	Michael 1	PRIN Erdahl	T NA	ME				COM nan a				DATE	TIME	
Seattle, WA 98119-2029 Received by			<del>SY</del>			z-	Ø	<del>n</del> el	>	^				. uya		16/17	1170	
Ph. (206) 285-8282						gr-		· · ·			ļ	45			3	7/17	1025	
Fax (206) 283-5044	Received b																	
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#### ALS Environmental Sample Acceptance Check Form

	ient: Friedman & Bruya, Inc. Work order: P1701103											
	702293											
Sample	(s) received on:	3/7/17		. ]	Date opened:	3/7/17	by:	ADAV	'ID			
		samples received by ALS.		•	-				ndication	of		
compliance	or nonconformity.	Thermal preservation and	pH will only be e	valuated either at	the request of the	e client and/or as requ	ired by the meth		No	N/A		
1	Were sample of	c <b>ontainers</b> properly n	narked with cli	ient sample ID	?			$\underline{\text{Yes}}$	<u>No</u>			
2	Did sample co	ntainers arrive in goo	od condition?					X				
3	Were chain-of		X									
4	Did sample co	X										
5	Was sample v	olume received adequ	ate for analysi	is?				X				
6	Are samples w	thin specified holdin	g times?					X				
7	Was proper te	mperature (thermal p	reservation) o	f cooler at rece	eipt adhered t	o?		X				
	Cooler Tem	perature: 4° C Bla	nk Temperatur	re: °C	•	Gel Pa	acks					
8		seals on outside of co	-						X			
	·	Location of seal(s)?					Sealing Lid?			X		
	Were signature	e and date included?								X		
	Were seals inta									X		
9	Do container	rs have appropriate <b>p</b>	eservation, a	ccording to me	thod/SOP or	Client specified i	nformation?	X				
		nt indication that the s		•		Ĩ				X		
		als checked for prese	1					X				
		t/method/SOP require			mple pH and	if necessary alter	it?		X			
10	Tubes:	Are the tubes capp	bed and intact?	2						X		
11										X		
		Are dual bed bad	ges separated a	and individuall	v capped and	intact?				X		
	Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)		pt / Pres Comme	ervatio			
P170110	3-001.01	40mL VOA NP		7		А	MC 3/09/201	17				

	Description	рн *	рн	рн	(Presence/Absence)	Comments
P1701103-001.01	40mL VOA NP		7		А	MC 3/09/2017
P1701103-001.02	40mL VOA NP				А	
P1701103-002.01	40mL VOA NP		7		А	MC 3/09/2017
P1701103-002.02	40mL VOA NP				А	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

#### ALS ENVIRONMENTAL

# RESULTS OF ANALYSIS

## Page 1 of 1

## Client: Friedman & Bruya, Inc. Client Project ID: 702293

ALS Project ID: P1701103

#### **Carbon Dioxide**

Test Code:	RSK 175	
Instrument ID:	HP5890A/GC10/TCD	Date(s) Collected: 2/20/17
Analyst:	Mike Conejo	Date Received: 3/7/17
Matrix:	Water	Date Analyzed: 3/9/17
Test Notes:		

		Injection			
Client Sample ID	ALS Sample ID	Volume ml(s)	Result µg/L	MRL μg/L	Data Qualifier
GW-11	P1701103-001	0.10	130,000	1,000	
MW-3	P1701103-002	0.10	130,000	1,000	
Method Control Sample	P170309-MB	0.10	ND	1,000	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

### ALS ENVIRONMENTAL

#### LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: Client Sample ID: Client Project ID:	Friedman & Bruya, Inc. Duplicate Lab Control Sample 702293	ALS Project ID: P1701103 ALS Sample ID: P170309-DLCS
Test Code:	RSK 175	Date Collected: NA
Instrument ID:	HP5890A/GC10/TCD	Date Received: NA
Analyst:	Mike Conejo	Date Analyzed: 3/09/17
Matrix:	Water	Volume(s) Analyzed: NA ml(s)
Test Notes:		

		Spike Amount	Res	sult ₁			ALS			
CAS #	Compound	LCS / DLCS	LCS	DLCS	% Re	covery	Acceptance	RPD	RPD	Data
		ug/L	ug/L	ug/L	LCS	DLCS	Limits		Limit	Qualifier
124-38-9	Carbon Dioxide	22,900	20,300	19,900	89	87	62-123	2	20	

 $_{1}$  = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Attachment B Bore Logs

<b>edi</b>		VIRONM RTNERS			BORING	ID: DPT-1				
SITE AD	DDRESS				CLIENT:		CASING MATER	IAL AND SIZE:		
1419 A	Avenue	D, Snohomisl	h, Wa		Skotdal Re	eal Estate	Temporary 2-Inch PVC			
		FRACTOR:	,		PROJECT #:			SCREEN SIZE:		
Stead	fast				69402.4			0.010-Inch SI	ot	
DRILLIN	NG EQUI	PMENT:			DATE:			SCREEN INTER	/AL:	
Truck	Mount	ed CME-55			6/27/17			10'-20' bgs		
DRILLIN	NG METH	HOD:			GROUND SU	RFACE ELEV. FT	AMSL:	FILTER PACK:		
Hollov	w-Stem	n Auger						Native		
LOGGE			BOREHOLE SIZE:		TOTAL DEPT	H:		FILTER PACK IN	TERVAL:	
	Fadder	<u>ן</u>	8-Inch		20' bgs		1	N/A		
Depth (feet)	nscs	De USCS name; C Plasticity; Dilater	escription Color; Moisture; Density; hcy; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Well Co	nstruction	
0		Asphalt Surface								
2 -		SANDY SILT WI medium plasticit sand and minor	ITH GRAVEL; gray; moist; y; mostly silt with minor fine gravel; no odor.	_					2-Inch Temporary Well	
6 -				33	9-50/2"	DPT-1:5	0.1			
- 8 - -				2	50/6"		0.1			
10 -	ML			5	50/3"	DPT-1:10	0.1			
12 - - 14 -		Odor at 12.5' bg	s	33	50/4"	DPT-1:12.5	67			
- 16				1	50/3"	DPT-1:15	1.7			
- 18 - -		Wet; no recover	y at 17.5' bgs	0	60/2"					
20		En	d of Borehole	33	50/6"	DPT-1:20	0.4			
22 -										
24 -										
26 NOTI	ES:	1					1	1	1 of 1	

PARTNERS INC			BORING ID: DPT-2							
SITE A	DDRESS			CLIENT:						
419	Avenu	e D, Snohomish, Wa		Skotdal Re	al Estate					
		TRACTOR:		PROJECT #:						
Stead	teadfast			69402.4						
RILLI	NG EQU	IPMENT:		DATE:						
ruck	Moun	ted CME-55		6/27/17						
RILLI	NG MET	HOD:		GROUND SU	RFACE ELEV. FT	AMSL:	DECOMMISSIONING MATERIAL			
		n Auger					Hydrated Bentonite			
	ED BY:			TOTAL DEPT	H:		BOREHOLE SIZE:			
	Fadde	n		15' bgs			8-Inch			
Depth (feet)	nscs	Description USCS name; Color; Moisture; Density; Plasticity; Dilatency; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Comments			
0		Gravel Surface								
-										
2 -										
_		SANDY SILT; brown; damp; dense; low plasticity; mostly fine sand with some silt and	$\neg$							
4 -		trace gravel; no odor.								
-					DPT-2:5	0.1				
6 -			66	15-24-37						
-						0				
8 -		No recovery	0	50/3"						
-	MÜ									
0 -						0				
_		No recovery	0	35-50/6"						
2 -										
2		Odor; auger flights moist with odor; softer			DPT-2:12.5	72				
_		drilling compared to DPT-1	66	50/6"						
4 -										
_					DPT-2:15	3.5				
_		End of Borehole	33	60/6"						
6 -										
-										
8 -										
_										
20 -										
22 -										
_										
24 -										
26										
	TES:			1						
							1 of 1			

PARTNERS INC			BORING ID: DPT-3							
ITE ADDRESS	3		CLIENT:							
419 Avenu	9 Avenue D, Snohomish, Wa Skotda				otdal Real Estate					
RILLING CON	TRACTOR:	PROJECT #:								
Steadfast			69402.4							
RILLING EQU			DATE:							
ruck Moun	ted CME-55		6/27/17							
RILLING MET	HOD:		GROUND SU	RFACE ELEV. FT	AMSL:	DECOMMISSIONING MATERIAL				
lollow-Sten	n Auger					Hydrated Bentonite				
OGGED BY:			TOTAL DEPT	H:		BOREHOLE SIZE:				
<u>. McFadde</u>	n	>	15' bgs			8-Inch				
Depth (feet)	<b>Description</b> USCS name; Color; Moisture; Density; Plasticity; Dilatency; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Comments				
0	Asphalt Surface									
-										
2 -										
ППП	SANDY SILT WITH GRAVEL; gray; moist;	-								
1000	medium plasticity; mostly silt with minor fine sand and minor gravel; no odor.									
4 -										
_					0.3					
		66	09-15-27							
6 -										
8 -										
0 -				DPT-3:10	0.9					
-		66	27-50/6"							
2 -										
-	SANDY SILT; gray; moist; mostly silt with			DPT-3:12.5	1.7					
	minor fine sand; no odor.	33	35-50/6"							
4 -    ML										
	1	_		DPT-3:15	0					
6		33	50/6"							
6 -										
-										
8 -										
_										
20 -										
-										
22 -										
24 -										
-										
26										
NOTES:										
-						1 of 1				

ЧIJ	<b>PAR</b>	IRONM TNERS	INC		BORING	ID: MW-16				
SITE AD	DDRESS				CLIENT:			CASING MA	TERIAL AND SIZE:	
419	Avenue	D, Snohomish	n, Wa		Skotdal Re	eal Estate	2-Inch PVC			
	NG CONTI				PROJECT #:			SCREEN SI	ZE:	
Stead	eadfast				69402.4			0.010-Inch Slot		
RILLIN	NG EQUIP	MENT:			DATE:			SCREEN IN	TERVAL:	
ruck	Mounte	ed CME-55			6/26/17			15'-25' bg	IS	
RILLIN	NG METH	DD:			GROUND SU	RFACE ELEV. FT	AMSL:	FILTER PAG	CK:	
lollov	w-Stem	Auger						Silica Sa	nd	
OGGE	D BY:		BOREHOLE SIZE:		TOTAL DEPT	H:		FILTER PAG	CK INTERVAL:	
	Fadden		8-Inch		25' bgs		1	13'-25' bg	js	
Depth (feet)	nscs	USCS name: C	escription Color; Moisture; Density; Icy; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Wel	I Construction	
0		Gravel Surface							Traffic Rated	
2 - 4 -		SILTY SAND Wi dense; mostly fir minor silt; no odd	TH GRAVEL; bluish gray; dry ne sand; with some gravel and or.	/; d					2-Inch PVC	
6 -	SM			2	60/6"	MW-16:5	0			
8 -	• • • • • • • • • • • •	WELL-GRADED mostly fine-coars trace silt; no odo	GRAVEL; gray; damp; dense se gravel with minor sand and r.	<del>e</del> ; 1					Hydrated Bentonite	
10 -	• <b>G</b> W •			33	42-50/6"	MW-16:10	0			
12 -			ED GRAVEL; increased	_						
-	GP						0			
6 -				2	50/3"					
8 -		SAND; gray; wet	GRAVEL WITH SILT AND t; dense; mostly fine-coarse r sand and minor silt; no odor						0.010"- Slot Screen	
20 -	GW-GM			33	65/6"	MW-16:20	0			
22 -		fine sand with mi	uish gray; moist; dense; most inor silt and trace gravel; no	ly					Silica Sand Filter Pack	
24 -	SM	odor.	d of Borehole	10	65/6"	MW-16:25	0			
26		EN		10	00/0					

C/L		IRONM TNERS			BORING	ID: MW-17				
SITE AL	DDRESS				CLIENT:			CASING MA	TERIAL AND SIZE:	
419	Avenue	D, Snohomish	n, Wa		Skotdal Re	al Estate	2-Inch PVC			
		RACTOR:			PROJECT #:			SCREEN SIZ	ZE:	
Stead	fast				69402.4			0.010-Inch Slot		
ORILLIN	NG EQUIF	MENT:			DATE:			SCREEN IN	TERVAL:	
<b>ruck</b>	Mounte	ed CME-55			6/26/17			15'-25' bg	S	
RILLIN	NG METH	OD:			GROUND SU	RFACE ELEV. FT	F AMSL:	FILTER PAC	K:	
lollov	w-Stem	Auger						Silica Sar	nd	
	D BY:		BOREHOLE SIZE:		TOTAL DEPTI	H:			K INTERVAL:	
	Fadden		8-Inch		25' bgs			13'-25' bg	S	
Depth (feet)	NSCS	De USCS name; C Plasticity; Dilaten	scription olor; Moisture; Density; icy; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Well	Construction	
0 - 2 - 4 - - - - - - - - - - - - -	SM	sand with minor :	own; damp; dense; mostly fin silt and trace gravel; no odor.	e	32-42-47	MW-17:5 MW-17:10	0.1		2-Inch PVC	
- 16 - -			limitied recovery; increased t, soil very close to saturated	1	60/6"	MW-17:15	0		0.010"- Slot	
18 - -		SANDY SILT; brown with some fine sa	own; moist; dense; mostly silt and and trace gravel; no odor	-					Screen	
20 -	ML	Wet auger flights bgs	from approximately 17' - 24'	6	80/3"	MW-17:20	0			
22 - - 24 -		Decreased moist	ture						Silica Sand Filter Pack	
-			d of Borehole	3	60/3"	MW-17:25	0			
26				5	30/0		1			

		VIRONMENTAL RTNERS INC		BORING	ID: MW-18			
ITE AD	DRES			CLIENT:			CASING MATERIAL AND SIZE:	
1419 Avenue D, Snohomish, Wa				Skotdal Re	al Estate	2-Inch PVC		
		TRACTOR:		PROJECT #:			SCREEN SIZE:	
tead	fast			69402.4			0.010-Inch Slot	
		IPMENT:		DATE:			SCREEN INTERVAL:	
		ted CME-55		6/27/17			15'-25' bgs	
	IG MET			GROUND SU	RFACE ELEV. FT	F AMSL:	FILTER PACK:	
DGGE		BOREHOLE SIZE:		TOTAL DEPTI	<u>ц</u> .		Silica Sand FILTER PACK INTERVAL:	
	Fadde			25' bgs			13'-25' bgs	
Depth (feet)	nscs	Description USCS name; Color; Moisture; Density; Plasticity; Dilatency; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Well Construction	
0 - 2 - - 4 -		Gravel Surface SANDY SILT; brown; damp; dense; low plasticity; mostly fine sand with some silt and trace gravel; no odor.					2-Inch PVC	
6 -			66	11-15-27	MW-18:5	0.1		
8 - - 0 - - 2 -			66	31-50/3"	MW-18:10	0	Hydrated Bentonite	
4 - - 6 -	ML	Increased moisture to moist; increased gravel content to few; limited recovery in sampler at 15' bgs; wet auger flights 15'-20' bgs	2	100/5"	MW-18:15	0.1	0.010"- Slot	
8 - - 0 - -			33	50/6"	MW-18:20	0.1	Screen	
2 -		Decreased moisture					Silica Sand Filter Pack	
-•		End of Borehole	10	50/6"	MW-18:25	0		