ANNUAL GROUNDWATER MONITORING REPORT - YEAR 1

Olympic Water & Sewer, Inc.
781 Walker Way
Port Ludlow, Washington 98365
VCP Identification No. SW1311

Prepared for: Olympic Property Group, A Rayonier Company

Project No. 130046 • October 15, 2020 FINAL

Aspect CONSULTING

earth + water

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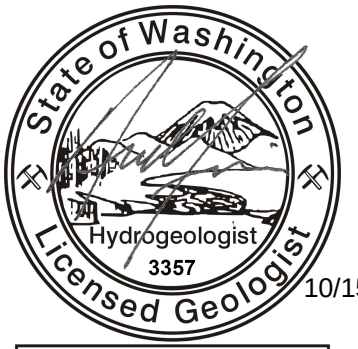

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Contents

List of Tables

List of Figures

List of Appendices

Abbreviations

AGI	Applied Geotechnology, Inc.
Aspect	Aspect Consulting, LLC
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
COCs	contaminants of concern
Ecology	Washington Department of Ecology
FFS	Focused Feasibility Study
GRO	gasoline-range organics
GMP	Groundwater Monitoring Plan
GWMR	Groundwater Monitoring Report
µg/L	micrograms per liter
MTCA	Model Toxics Control Act
MNA	Monitored Natural Attenuation
NFA	No Further Action
OWSI	Olympic Water & Sewer, Inc.
USTs	underground storage tanks
VOC	volatile organic compound
WAC	Washington Administrative Code

1 Introduction

Aspect Consulting, LLC (Aspect) has prepared this Annual Groundwater Monitoring Report (GWMR) on behalf of Olympic Property Group, A Rayonier Company for the Olympic Water & Sewer, Inc. (OWSI) property located at 781 Walker Way in Port Ludlow, Washington (herein referred to as the Site).

1.1 Regulatory Framework

In September 1990, Applied Geotechnology, Inc. (AGI) removed three underground storage tanks (USTs) from the property – one 1,000-gallon UST and two 2,000-gallon USTs. During the UST removals, a release of gasoline from the 1,000-gallon UST was discovered, and gasoline-impacted soil was removed to the extents practicable. During the installation of a water supply well in April 2009, gasoline impacts to shallow, perched groundwater were discovered. The Jefferson County Health Department was notified, who further notified the Washington State Department of Ecology (Ecology). Ecology listed the Site on its Confirmed or Suspected Contaminated Sites list in September 2009; the Site is identified as the Olympic Water & Sewer Inc Site, cleanup Site ID 1196 and facility ID 62223345.

The Model Toxics Control Act (MTCA) defines the Site as anywhere where a hazardous substance has come to be located (Washington Administrative Code [WAC] 173-340-200). Further investigation through 2013 confirmed that Site can be defined as the release(s) of total petroleum hydrocarbons measured as gasoline-range organics (GRO) and benzene, toluene, ethylbenzene, and xylenes (BTEX) to soil and groundwater. As part of Site investigation and cleanup activities, a Focused Feasibility Study (FFS; Aspect, 2013) was performed, which identified a preferred remedial alternative in accordance with MTCA. The preferred remedial alternative for the Site consisted of three primary components:

- **Source Removal**: In 1990, three USTs were removed. During removal, a release of gasoline was discovered, and over-excavation of GRO-contaminated soil was performed. The cleanup action consisted of excavation of the impacted soil to the extents practicable; however, residual impacted soil was left in place at the base of one of the UST excavations to prevent structural damage to a nearby building. At that time, residual impacted soil was expected to occur from approximately 10 feet below ground surface (bgs) to the perched groundwater table between approximately 20 to 41 feet bgs (SLR, 2011).
- **Institutional Controls:** An environmental covenant was filed with Jefferson County on September 24, 2015, with the deed on the property which restricts certain activities that could cause exposure to impacted soils or groundwater or could result in mobilization of contaminants at the Site. Specifically, the environmental covenant included the following deed restrictions:
    - The property zoning and use will remain commercial, as the cleanup levels established for compliance are based on a commercial land use.

  - The contaminated soil which exceeds cleanup levels and remains on the property is under existing structures and an existing layer of clean soil from the ground surface to a depth of 15 feet bgs. The covenant restricts the alteration of the current property configuration, including earthwork activities which may disturb the clean soil cap.
  - Groundwater use in the shallow, perched groundwater at the Site will not be used for water supply.
  - Groundwater monitoring will be maintained until groundwater at the Site meets applicable cleanup levels. The groundwater monitoring program was further defined in the second portion of the selected cleanup action as described below.

- **Monitored Natural Attenuation (MNA):** Cleanup levels at the Site will be achieved by the natural attenuation of GRO and BTEX in soil and groundwater. To monitor the natural attenuation of contaminants at the Site, a Groundwater Monitoring Plan (GMP) was developed which describes the frequency, location, and analyses of groundwater sampling activities to ensure the protectiveness of the selected cleanup action (Aspect, 2015). The GMP prescribed quarterly groundwater sampling during the first year of MNA, and annual groundwater sampling thereafter. The results of these groundwater sampling events will be evaluated during the Washington State Department of Ecology's (Ecology) 5-Year Site review.

The Site was entered in the Ecology Voluntary Cleanup Program (VCP) in 2013 and was assigned identification number SW1311. Ecology provided an opinion that upon completion of the preferred remedial alternative, no further remedial action would be necessary to clean up contamination at the Site (Ecology, 2014). The recorded environmental covenant was sent to Ecology on June 2, 2016. Ecology initiated preparation of the no further action (NFA) letter, but as of the date of publication of this report the letter has not been formally issued.

1.2 Report Organization

This GWMR documents the results of the first year of MNA groundwater monitoring, in accordance with the Ecology-approved GMP. This report is organized to include the following Sections:

- **Section 2 – Site Background** describes the property location and zoning, operational history, topography, land use, and hydrogeology.
- **Section 3 – Groundwater Monitoring Procedures** describes the monitoring well network, contaminants of concern (COCs) and cleanup levels selected for the Site, and the procedures for obtaining groundwater samples.
- **Section 4 – Groundwater Monitoring Results** describes the groundwater elevations, gradient, and flow directions and laboratory analytical results for COCs during Year 1 of groundwater monitoring.

- **Section 5 – Summary** presents a summary of Year 1 groundwater monitoring activities and presents recommendations for continued monitoring under the GMP.

2 Site Background

2.1 Site Location and Description

The Site is located in Section 8, Township 28 North, Range 1 East in Port Ludlow, Washington (Figure 1). Identified as Jefferson County Parcel No. 821084004, the Site consists of an approximately 2.2-acre parcel of land located approximately 0.5-mile northwest of the Port Ludlow bay. The Site is located at the southwest corner of the intersection of Walker Way and Rainer Lane at 781 Walker Way (Figure 2).

The Site is densely forested, with an approximate 0.5-acre area developed with an OWSI operations and maintenance facility, consisting of an office/shop/garage building (garage building), a public water supply well (Well #2), pump house building for Well #2, and a storage trailer (Figure 2). The ground surface within the developed portion of the Site is primarily unpaved, except for a narrow asphalt driveway that runs down the center of the OWSI facility from Walker Way to approximately the storage trailer. A densely vegetated gulley, containing an intermittent seasonal stream, bisects the western half of the parcel, west of the OWSI facility, and flows off-property (Figure 2).

The ground surface elevation proximate to the northern property boundary of the Site is approximately 290 feet above mean sea level. The ground surface of the OWSI facility slopes gently to the southwest toward the intermittent stream (Figure 2).

2.2 Hydrogeology

Shallow groundwater at the Site occurs as a shallow, perched water-bearing zone within the glacial advance outwash and lacustrine deposits at depths above approximately 60 feet bgs. Seasonally, groundwater in the shallow, perched water-bearing zone at the Site ranges between 22 and 44 feet bgs, with individual wells showing seasonal fluctuations of groundwater levels of approximately 4.6 to 8.0 feet (Table 1). A deeper, regional, water-bearing unit used for drinking water occurs at depths of between 215 and 245 feet bgs at Well #2.

The shallow, perched water-bearing zone and the regional aquifer are separated by a thick aquitard comprised of clay and cemented silty sand. This aquitard was encountered in all borings at thicknesses ranging from 15 to more than 23 feet thick (Aspect, 2013). The regional aquifer is greater than 150 feet below the top of the aquitard and the base of the shallow, perched water-bearing zone.

The shallow, perched water-bearing zone occurs within a sand to gravel unit, which is perched on top of the underlying clayey to gravelly, cemented silt to sand unit that comprises the aquitard (SLR, 2011). During periods of seasonal recharge, groundwater appears to collect above the silt and overlying silty sand units. In areas where the silty sands and silts are present at higher elevations, the groundwater elevations are higher. Groundwater within the shallow, perched, water-bearing unit (wells MW-3 through MW-5) is hydraulically continuous with the deeper perched water intercepted by wells MW-1 and MW-2. The horizontal hydraulic conductivity of the sand to gravel unit is expected to be significantly (i.e., orders of magnitude) greater than the vertical hydraulic conductivity of the underlying silt and silty sand (Aspect, 2013). Therefore, groundwater accumulating

in the shallow, perched water-bearing zone is expected to primarily flow laterally, toward the intermittent stream in the gulley to the west.

The points of compliance for the shallow, perched groundwater at the Site were set for the protection of drinking water and the protection of surface water. Therefore, the points of compliance are within the perched aquifer extending vertically to the lowest depth potentially affected (the regional aquifer) and the discharge of groundwater to the intermittent stream.

3 Groundwater Monitoring Procedures

Year 1 of groundwater monitoring occurred quarterly in July and November 2019 and February and May 2020. Detailed sampling and quality assurance/quality control procedures are presented in the GMP (Aspect, 2015). The following presents a summary of procedures performed during Year 1 of groundwater monitoring. Deviations from the GMP are discussed below.

3.1 Groundwater Monitoring Well Network

The long-term groundwater monitoring network at the Site consists of the existing monitoring wells on the Site (MW-1, MW-2, MW-3, MW-4, and MW-5), the water supply well (Well #2), and the intermittent stream. Monitoring wells MW-1, MW-2, and MW-4 represent the source area wells because of their locations relative to the release of gasoline from the 1,000-gallon UST (Figure 2). Monitoring well MW-3 serves generally as a downgradient (or sentinel well) of the shallow groundwater plume. Monitoring well MW-5 represents the upgradient well, as it is outside of the plume boundary. Water supply Well #2 and the intermittent stream at the southern, most-accessible on-property point serve as monitoring points to ensure that human and ecological receptors are protected.

3.2 Contaminants of Concern and Cleanup Levels

As described in the FFS, the groundwater cleanup levels for the Site are MTCA Method A for unrestricted land use. MTCA Method A is appropriate because the Site meets the criteria of WAC 173-340-704(1): there are few hazardous substances at the Site; the implemented remedy qualifies as a routine cleanup action; and numerical standards are established for the hazardous substances at the Site. The groundwater contaminants of concern (COCs)and applicable MTCA Method A cleanup levels are:

- GRO – 800 micrograms per liter (µg/L)
- Benzene – 5 µg/L
- Toluene – 1,000 µg/L
- Ethylbenzene – 700 µg/L
- Total xylenes – 1,000 µg/L

3.3 Groundwater Monitoring Procedures

The following procedures were implemented during the collection of groundwater samples for each quarter:

- Prior to sampling, all monitoring wells were inspected to ensure that the well monuments, well caps, and well casings were in good working order and remained undamaged between sampling events.
- Depth-to-groundwater measurements were recorded for each monitoring well. The water level indicator was decontaminated between wells. Prior to gauging the depth to water at Well #2, the water level indicator was also decontaminated

using diluted chlorine bleach to prevent bacteriological and cross-contamination in the water supply well and deeper aquifer.

- With the exception of Well #2, each monitoring well was sampled using standard low-flow procedures. Wells were sampled using a portable bladder pump, which was decontaminated between wells, and a new bladder and tubing used at each monitoring well.
- During purging, field parameters (temperature, pH, specific electrical conductance, dissolved oxygen, and oxidation-reduction potential) were monitored using a YSI meter and flow-through cell. Turbidity was also monitored using a separate turbidimeter.
- To sample Well #2, the sample port closest to the wellhead was opened, and the pump was allowed to run for a minimum of 10 minutes to purge the well and flush the lines prior to collecting the sample.
- Groundwater samples were collected directly into laboratory-supplied sample containers.
- Quality control groundwater samples (field duplicates and trip blanks) were collected during each monitoring event.
- The intermittent stream was monitored during all four quarters and was documented as dry during three events (July 2019, November 2019, and May 2020). Due to physical limitations, a peristaltic pump could not be used to collect the stream sample. Therefore, a mid-depth, mid-flow grab water sample was collected using a laboratory-provided clean, non-preserved vessel and transferred to the laboratory-supplied sample ware.
- Samples were maintained at the proper temperature for sample preservation and under chain-of-custody until delivered to the laboratory.
- Samples were submitted for analysis of site COCs (Section 2.2) for every quarter. Additionally, groundwater samples were analyzed for geochemical parameters during two of the four quarters, which will be used during the 5-Year Site review to assess MNA.

During Year 1 groundwater monitoring, no deviations from the GMP were noted.

4 Groundwater Monitoring Results

This section presents the results of Year 1 groundwater monitoring at the Site.

4.1 Groundwater Elevations, Gradient, and Flow Direction

Groundwater elevations are summarized in Table 1 and depicted on Figure 3. During the first year of groundwater monitoring, groundwater elevations at the Site showed seasonal variation consistent with historical data. Between quarters, the groundwater elevation in the shallow, perched water-bearing zone at individual wells fluctuated by 3.4 and 4.7 feet. Similarly, groundwater elevations in the deeper, regional aquifer (measured at Well #2) used for water supply showed a seasonal fluctuation of 3.3 feet. Groundwater elevations in the shallow, perched aquifer at the most upgradient (MW-5) and downgradient (MW-2) monitoring wells differed by approximately 17 feet (November 2019) and 21 feet (February 2020).

In the shallow, perched water-bearing zone, the flow direction is primarily to the west, with slight southerly flow in the northern portion of the Site and slight northerly flow in the southern portion of the Site (Figure 3).

While the flow direction was consistent between the four quarters, the horizontal hydraulic gradient varied. In the northern portion of the Site, horizontal gradient varied between approximately 0.14 (July 2019) and 0.21 foot/foot (February 2020). In the southern portion of the Site, horizontal gradient varied between approximately 0.06 (February 2020) and 0.11 (May 2020) foot/foot.

4.2 Groundwater and Surface Water Analytical Results

Groundwater analytical results from Year 1 are summarized in Table 2 and displayed on Figure 4. The laboratory analytical reports for Year 1 are included as Appendix A.

Groundwater analytical results were consistent between all four quarters of Year 1 groundwater monitoring and were consistent with historical results (Table 3). During all four quarters, GRO and benzene were present at concentrations exceeding the MTCA Method A cleanup levels at monitoring wells MW-1 and MW-2. Concentrations of GRO at MW-1 ranged between 3,600 and 4,300 µg/L and at MW-2 ranged between 2,800 and 6,400 µg/L; the MTCA Method A Cleanup Level for GRO is 800 µg/L.

Concentrations of benzene ranged between 180 to 200 µg/L and 150 to 840 µg/L at MW-1 and MW-2, respectively; the MTCA Method A Cleanup Level for benzene is 5 µg/L. Toluene, ethylbenzene, and total xylenes were also detected at MW-1 and MW-2 in most samples, but at concentrations below the respective MTCA Method A cleanup levels.

At the remaining three monitoring wells (MW-3, MW-4, and MW-5) and the water supply (Well #2), GRO and BTEX were not detected during each of the four sampling events above the laboratory reporting limit. Similarly, GRO and BTEX were not detected in the sample collected from the intermittent stream (Table 2).

The intermittent stream was only flowing during the February 2020 monitoring event for Year 1. None of the contaminants of concern were detected in the stream sample above the laboratory reporting limit (Table 2).

MNA parameters were collected from each well during the first and third quarters during Year 1. The MNA parameters included total alkalinity, nitrate and nitrite as nitrogen, sulfate, methane, dissolved iron, dissolved manganese, and ferrous iron. The geochemical data will be evaluated during the 5-Year Site Review to assess the progress of MNA.

4.3 Plume Stability Assessment

A linear regression analysis and non-parametric analysis for plume stability was performed using the Ecology data analysis tools (Ecology, 2007). Although insufficient historical data exists to perform all of the analyses available, a preliminary analysis using the Mann-Kendall test was performed. The preliminary analysis indicates that the groundwater plume is shrinking for MW-2 and stable at MW-1 (Appendix B). Further analyses will be conducted in following years, as the data set grows to support more detailed linear regression and non-parametric analysis.

4.4 Data Validation and Management

The groundwater data was managed in a project database operated by Aspect and has been uploaded to Ecology's Environmental Information Management (EIM) database. The Aspect database manager verified the completeness and correctness of all laboratory deliverables (i.e., laboratory report and EDDs) before loading the data into EIM. Field and laboratory quality control were validated in accordance with the United States Environmental Protection Agency (EPA) National Functional Guidelines for organic and inorganic analyses (EPA, 2008 and 2010, respectively), and laboratory defined QC limits, with regard to the following (as appropriate to the particular analysis): sample documentation/custody, holding times, reporting limits, blank/rinsate samples, and surrogate percent recoveries, laboratory duplicates, field duplicates, comparability, and completeness.

For each quarter, blind field duplicates were submitted to the laboratory. EPA data validation guidance provides no specific evaluation criteria for field duplicate samples. Advisory evaluation criteria are set forth at 35 percent for relative percent difference (if both results are greater than 5 times the RL) and two times the RLs for concentration difference (if either of the result is less than 5 times the RL) between the original and field duplicate results. Results between the field duplicates and samples varied between 2.6 percent and 21.9 percent, indicating the results were valid and reproducible.

Trip blanks were submitted for each quarter to monitor possible cross-contamination occurring during sample transport. No detections of GRO or BTEX were noted in the trip blanks from each quarter.

5 Summary

Groundwater elevations, flow directions, and horizontal hydraulic gradients were consistent with historical results. The flow direction (to the west) and the steep hydraulic gradient are driven by local geology: the clayey and gravelly silt bed, which creates the perched groundwater condition, dips steeply to the west towards the gully and intermittent stream. However, the interconnectedness of the shallow, perched groundwater to surface water is not apparent, as the stream only flows intermittently, and COCs have never been detected in surface water at the Site.

Analytical results from Year 1 groundwater sampling were consistent with historical results. GRO and benzene concentrations exceeded the Site cleanup levels at MW-1 and MW-2 for all quarters, and COCs were not detected at any of the remaining monitoring wells, in surface water, or in water supply Well #2.

Based on the results of groundwater monitoring at the OWSI Site, the groundwater plume is stable and/or shrinking, and there are no complete exposure pathways of contaminated groundwater to either surface water or drinking water. Therefore, continued MNA of the groundwater plume is recommended at the frequency prescribed in the GMP.

Laboratory reports from all four quarters at Well #2 were submitted to the Washington State Office of Drinking Water within 5 days of receipt, as prescribed by the GMP. Analytical results were evaluated for quality control in accordance with the GMP, and all analytical results were validated and loaded into Ecology's EIM database.

The next monitoring event should be performed in the second quarter of 2021, in accordance with the GMP. For Years 2 through 5 of MNA, groundwater sampling will be performed on an annual basis, and a GWMR will be generated following receipt of laboratory analytical data.

6 References

Aspect Consulting, LLC (Aspect), 2013, Focused Feasibility Study, Olympic Water & Sewer, Inc. Site, dated September 24, 2013.

Aspect Consulting, LLC (Aspect), 2015, Groundwater Monitoring Plan, Olympic Water & Sewer, Inc. Site, dated July 20, 2015.

SLR, 2011, Additional Investigation Report, Olympic Water & Sewer, Inc. Property, 781 Walker Way, Port Ludlow, Washington, August 2, 2011.

United States Environmental Protection Agency (EPA), 2008, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, June 2008, USEPA-540-R-08-01.

United States Environmental Protection Agency (EPA), 2010, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, January 2010, USEPA 540/R-10/011.

Washington State Department of Ecology (Ecology), 2007, Natural Attenuation Analysis Tool Package for Petroleum-Contaminated Groundwater, July 2005, updated for Excel version 2007.

Washington State Department of Ecology (Ecology), 2014, Letter Re: Opinion on Proposed Cleanup of the following Site: Olympic Water & Sewer Inc. 781 Walker Way, Port Ludlow, WA 98365, Cleanup Site ID 1196, Facility/Site No. 62223345, VCP Project No. SW1311, Prepared for Tom Ringo OPG/Pope Resources, LP, February 11, 2014.

7 Limitations

Work for this project was performed for the Olympic Property Group and Pope Resources, LP (Clients), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

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Please refer to Appendix C titled "Report Limitations and Guidelines for Use" for additional information governing the use of this report.

TABLES

Table 1. Summary of Groundwater Elevation Data

Project No. 130046-001-02, Olympic Water and Sewer, Inc. Site
781 Walker Way, Port Ludlow, Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Groundwater Elevation (feet)
MW-1	294.02	06/14/10	41.33	252.69
		10/20/10	40.30	253.72
		04/08/11	36.98	257.04
		07/11/19	37.89	256.13
		11/08/19	40.14	253.88
		02/11/20	39.42	254.60
		05/28/20	36.75	257.27
MW-2	293.79	06/14/10	39.63	254.16
		10/20/10	40.71	253.08
		04/08/11	36.90	256.89
		07/11/19	43.58	250.21
		11/08/19	41.95	251.84
		02/11/20	43.20	250.59
		05/28/20	39.78	254.01
MW-3	289.37	06/14/10	25.19	264.18
		10/20/10	28.70	260.67
		04/08/11	23.02	266.35
		07/11/19	27.68	261.69
		11/08/19	31.06	258.31
		02/11/20	29.96	259.41
		05/28/20	26.35	263.02
MW-4	295.33	06/14/10	23.92	271.41
		10/20/10	26.67	268.66
		04/08/11	21.95	273.38
		07/11/19	27.75	267.58
		11/08/19	29.06	266.27
		02/11/20	28.03	267.30
		05/28/20	25.43	269.90
MW-5	299.40	04/08/11	23.55	275.85
		07/11/19	29.04	270.36
		11/08/19	30.36	269.04
		02/11/20	27.59	271.81
		05/28/20	25.73	273.67
Well #2	Not Surveyed	07/11/19	87.10	--
		11/08/19	83.78	--
		02/11/20	86.29	--
		05/28/20	84.82	--

Notes:

[a] Top of casing elevations were surveyed relative to NAVD88 datum.

[b] Depth to groundwater measured in feet below top of PVC casing.

Table 2. Summary of Groundwater Analytical Results

Project No. 130046-001-02, Olympic Water and Sewer, Inc. Site
781 Walker Way, Port Ludlow, Washington

			Location	MW-1				MW-2			
			Date	07/11/2019	11/08/2019	02/11/2020	05/28/2020	07/11/2019	11/08/2019	02/11/2020	05/28/2020
			Sample	MW-1-071119	MW-1-110819	MW-1-021120	MW-1-052820	MW-2-071119	MW-2-110819	MW-2-021120	MW-2-052820
Analyte	**Fraction**	**Unit**	**MTCA Method A Cleanup Level**								
Total Petroleum Hydrocarbons											
Gasoline Range Organics	T	ug/L	800	**4000**	**3600**	**3900**	**4300**	**6400**	**5400**	**5000**	**2800**
Benzene, Toluene, Ethylbenzene, and Total Xylenes											
Benzene	T	ug/L	5	**180**	**180**	**200**	**190**	**780**	**820**	**840**	**150**
Toluene	T	ug/L	1,000	**61**	**58**	**72**	**100**	**120**	**83**	**79**	**58**
Ethylbenzene	T	ug/L	700	**360**	**340**	**420**	**410**	**380**	**260**	**240**	**240**
Total Xylenes	T	ug/L	1,000	**68**	< 30 U	< 30 U	**120**	**91**	**69**	**64**	< 60 U
Monitored Natural Attenuation Parameters											
Alkalinity, Total	T	mg/L	--	**312**	--	**292**	--	**422**	--	**380**	--
Nitrate as Nitrogen	T	mg/L	--	< 0.5 U	--	< 0.100 U	--	< 0.5 U	--	< 0.100 U	--
Nitrite as Nitrogen	T	mg/L	--	< 0.5 U	--	< 0.100 U	--	< 0.5 U	--	< 0.100 U	--
Sulfate	T	mg/L	--	**0.868**	--	**0.963**	--	**13.1**	--	**14.6**	--
Methane	T	mg/L	--	**0.057**	--	**0.0367**	--	**0.0284**	--	**0.0158**	--
Iron	D	ug/L	--	**590**	--	--	--	**453**	--	--	--
Manganese	D	ug/L	--	**805**	--	--	--	**491**	--	--	--
Iron, Ferrous, Fe+2	T	mg/L	--	**0.488**	--	--	--	**0.197**	--	--	--

Notes:

Values shaded and in **bold** exceed the groundwater cleanup levels.

µg/L = micrograms per liter (ppb).
mg/L = miligraphs per liter (ppm).
T = Total fraction
D = Dissolved fraction

Table 2. Summary of Groundwater Analytical Results

Project No. 130046-001-02, Olympic Water and Sewer, Inc. Site
781 Walker Way, Port Ludlow, Washington

			Location	MW-3				MW-4			
			Date	07/11/2019	11/08/2019	02/11/2020	05/28/2020	07/11/2019	11/08/2019	02/11/2020	05/28/2020
			Sample	MW-3-071119	MW-3-110819	MW-3-021120	MW-3-052820	MW-4-071119	MW-4-110819	MW-4-021120	MW-4-052820
Analyte	**Fraction**	**Unit**	**MTCA Method A Cleanup Level**								
Total Petroleum Hydrocarbons											
Gasoline Range Organics	T	ug/L	800	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Benzene, Toluene, Ethylbenzene, and Total Xylenes											
Benzene	T	ug/L	5	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Toluene	T	ug/L	1,000	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Ethylbenzene	T	ug/L	700	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Total Xylenes	T	ug/L	1,000	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U
Monitored Natural Attenuation Parameters											
Alkalinity, Total	T	mg/L	--	**202**	--	**205**	--	**140**	--	**239**	--
Nitrate as Nitrogen	T	mg/L	--	**2.14**	--	**2.22**	--	**0.551**	--	**0.604**	--
Nitrite as Nitrogen	T	mg/L	--	< 0.2 U	--	< 0.200 U	--	< 0.1 U	--	< 0.100 U	--
Sulfate	T	mg/L	--	**17.4**	--	**15.3**	--	**8.76**	--	**8.17**	--
Methane	T	mg/L	--	< 0.00863 U	--	< 0.00863 U	--	< 0.00863 U	--	< 0.00863 U	--
Iron	D	ug/L	--	**128**	--	--	--	**65.5**	--	--	--
Manganese	D	ug/L	--	< 1 U	--	--	--	< 1 U	--	--	--
Iron, Ferrous, Fe+2	T	mg/L	--	**0.0959 J**	--	--	--	**0.199**	--	--	--

Notes:

Values shaded and in **bold** exceed the groundwater cleanup levels.

µg/L = micrograms per liter (ppb).
mg/L = miligraphs per liter (ppm).
T = Total fraction
D = Dissolved fraction

Table 2. Summary of Groundwater Analytical Results

Project No. 130046-001-02, Olympic Water and Sewer, Inc. Site
781 Walker Way, Port Ludlow, Washington

			Location	MW-5				W-2				Stream
			Date	07/11/2019	11/08/2019	02/11/2020	05/28/2020	07/11/2019	11/08/2019	02/11/2020	05/28/2020	2/11/2020
			Sample	MW-5-071119	MW-5-110819	MW-5-021120	MW-5-052820	W-2-071119-P	W-2-110819	W-2-021120	W-2-052820	SW-1-021120
Analyte	**Fraction**	**Unit**	**MTCA Method A Cleanup Level**									
Total Petroleum Hydrocarbons												
Gasoline Range Organics	T	ug/L	800	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Benzene, Toluene, Ethylbenzene, and Total Xylenes												
Benzene	T	ug/L	5	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Toluene	T	ug/L	1,000	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Ethylbenzene	T	ug/L	700	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Total Xylenes	T	ug/L	1,000	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U
Monitored Natural Attenuation Parameters												
Alkalinity, Total	T	mg/L	--	**136**	--	**146**	--	**68.2**	--	**102**	--	--
Nitrate as Nitrogen	T	mg/L	--	**0.561**	--	**0.628**	--	< 0.1 U	--	< 0.100 U	--	--
Nitrite as Nitrogen	T	mg/L	--	< 0.1 U	--	< 0.200 U	--	< 0.1 U	--	< 0.100 U	--	--
Sulfate	T	mg/L	--	**6.66**	--	**4.61**	--	**43.2**	--	**47.4**	--	--
Methane	T	mg/L	--	< 0.00863 U	--	< 0.00863 U	--	**0.0178**	--	**0.0574**	--	--
Iron	D	ug/L	--	**81.3**	--	--	--	**1,150**	--	--	--	--
Manganese	D	ug/L	--	< 1 U	--	--	--	**275**	--	--	--	--
Iron, Ferrous, Fe+2	T	mg/L	--	**0.591 J**	--	--	--	< 0.05 UJ	--	--	--	--

Notes:

Values shaded and in **bold** exceed the groundwater cleanup levels.

µg/L = micrograms per liter (ppb).
mg/L = miligraphs per liter (ppm).
T = Total fraction
D = Dissolved fraction

Table 3. Summary of Historical Groundwater Analytical Data

Project No. 130046-001-02, Olympic Water and Sewer, Inc. Site
781 Walker Way, Port Ludlow, Washington

Well Number	Date Collected		Analytical Results (µg/L)								
		Gasoline-range TPH[a]	Benzene[b]	Toluene[b]	Ethylbenzene[b]	Total Xylenes[b]	Naphthalene[b]	MTBE[b]	EDC[b]	EDB[c]	Total Lead[d]
MTCA Method A Cleanup Levels[e]		**800**	**5**	**1,000**	**700**	**1,000**	**160[f]**	**20**	**5**	**0.01**	**15**
MW-1	06/14/10	**990**	**110**	45	1.10	186	<1	<1	<1	<0.01	<1
	10/20/10	**1,900**	**520**	140	110	221	15	NA	NA	NA	NA
	04/07/11	**3,000**	**530**	82	160	120	NA	NA	NA	NA	NA
MW-2	06/14/10	**8,400**	**2,100**	620	**960**	650	100	<1	<1	<0.01	<1
	10/20/10	**3,900**	**1,300**	290	430	530	35	NA	NA	NA	NA
	04/07/11	**5,600**	**500**	730	160	410	NA	NA	NA	NA	NA
MW-3	06/14/10	<100	0.36	<1	<1	<3	<1	<1	<1	<0.01	<1
	10/20/10	<100	<0.35	<1	<1	<3	<1	NA	NA	NA	NA
	04/07/11	<100	<1	<1	<1	<3	NA	NA	NA	NA	NA
MW-4	06/14/10	<100	<0.35	<1	<1	<3	<1	<1	<1	<0.01	<1
	10/20/10	<100	<0.35	<1	<1	<3	<1	NA	NA	NA	NA
	04/08/11	380	**5.3**	75	13	47	NA	NA	NA	NA	NA
MW-5	04/08/11	220	3.40	43	7.80	25	NA	NA	NA	NA	NA
SVE-1	04/07/11	**34,000**	**550**	**5,700**	**850**	**3,300**	NA	NA	NA	NA	NA
SVE-2	04/07/11	**2,000**	5.0	14	18	35	NA	NA	NA	NA	NA

Notes:

µg/L = micrograms per liter (ppb).

Values shaded and in **bold** exceed the groundwater cleanup levels.

NA = Not analyzed.

[a]Gasoline-range TPH by Northwest Method NWTPH-Gx or 8260c..

[b]Benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, methyl tertiary butyl ether (MTBE), and 1,2-dichloroethane (EDC) by EPA Method 8260C, or BTEX

[c]1,2-dibromoethane (EDB) by EPA Method 8011 Modified.

[d]Total lead by EPA Method 200.8.

[e]Chapter 173-340 WAC, Model Toxics Control Act (MTCA) Cleanup Regulation, Method A Cleanup Levels. Amended 2007.

[f]The cleanup level is the total value for naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene.

Data from this table is from *Site Characterization Report, Olympic Water & Sewer, Inc. Property, 781 Walker Way, Port Ludlow, Washington* dated December 17, 2010 prepared by SLR and *Additional Investigation Report, Olympic Water & Sewer, Inc. Property, 781 Walker Way, Port Ludlow, Washington* dated August 2, 2011, prepared by SLR.

FIGURES

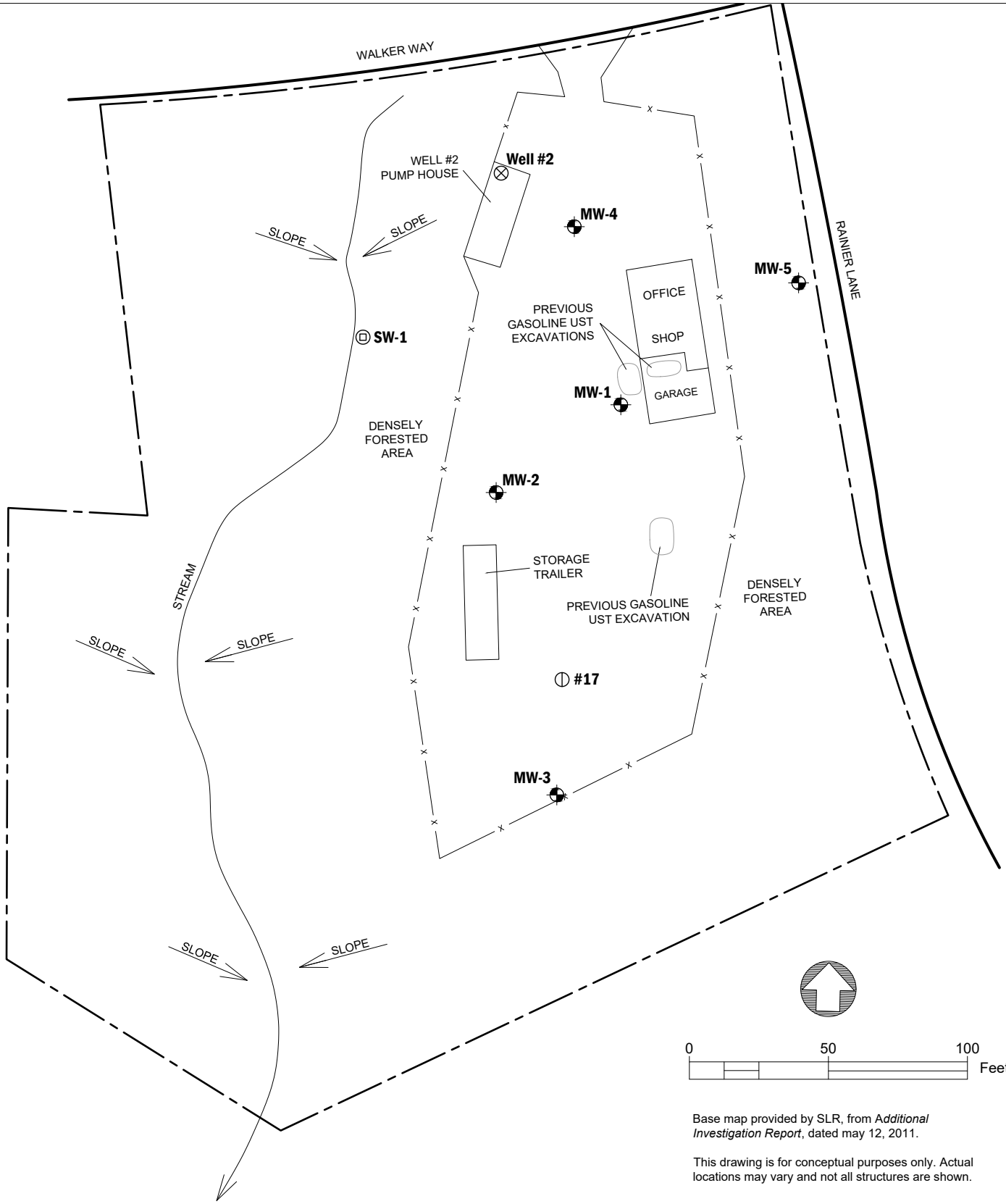
Site Location Map

Olympic Water & Sewer, Inc.
Groundwater Monitoring Report
Port Ludlow, Washington

Aspect CONSULTING	JUL-2020	BY: AJY / SCC	FIGURE NO. 1
	PROJECT NO. 130046	REVISED BY: ---	

Basemap Layer Credits || Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

GIS Path: Q:\Olympic Property Group\130046 Port Ludlow\2020-07 GW Monitoring Report\GIS\Site Location Map.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 7/22/2020 || User: scudd || Print Date: 7/22/2020



Base map provided by SLR, from A*dditional Investigation Report*, dated may 12, 2011.

This drawing is for conceptual purposes only. Actual locations may vary and not all structures are shown.

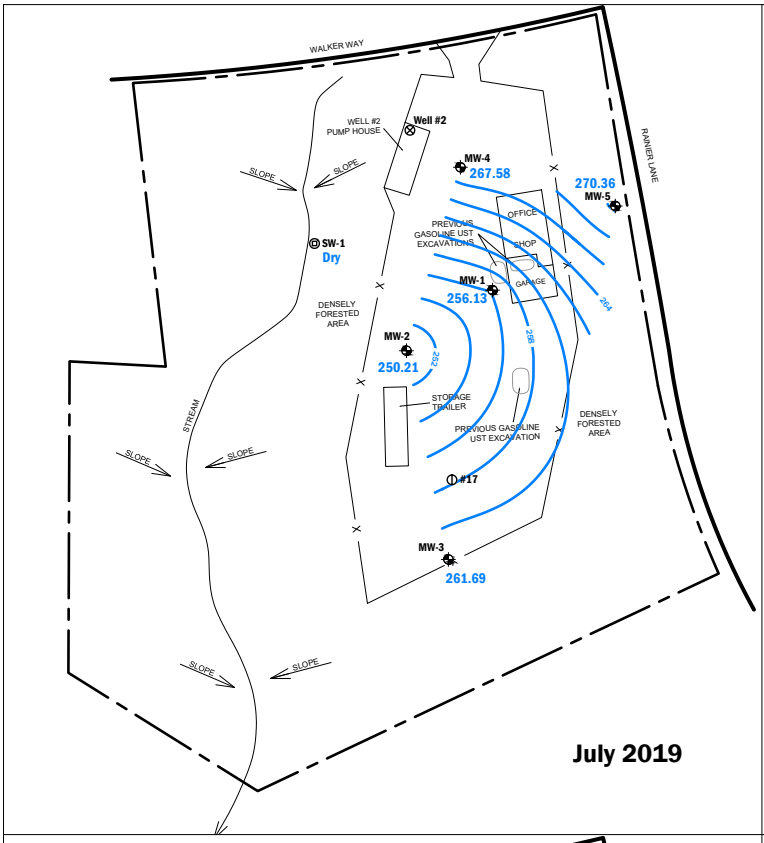
Legend

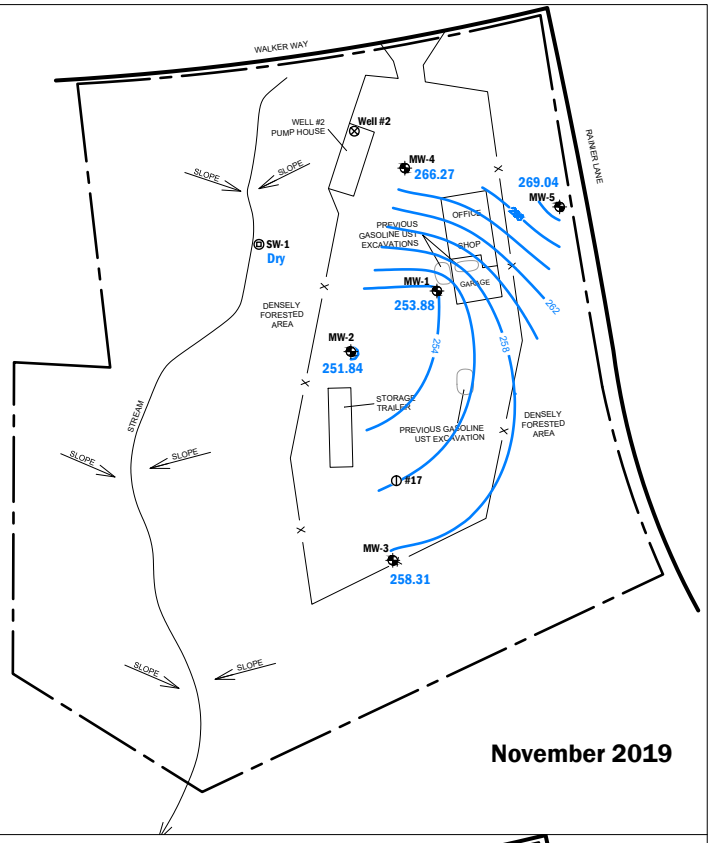
- Monitoring Well Location
- Stream Sample Location
- Existing Water Supply Well Location
- Existing Casing Location

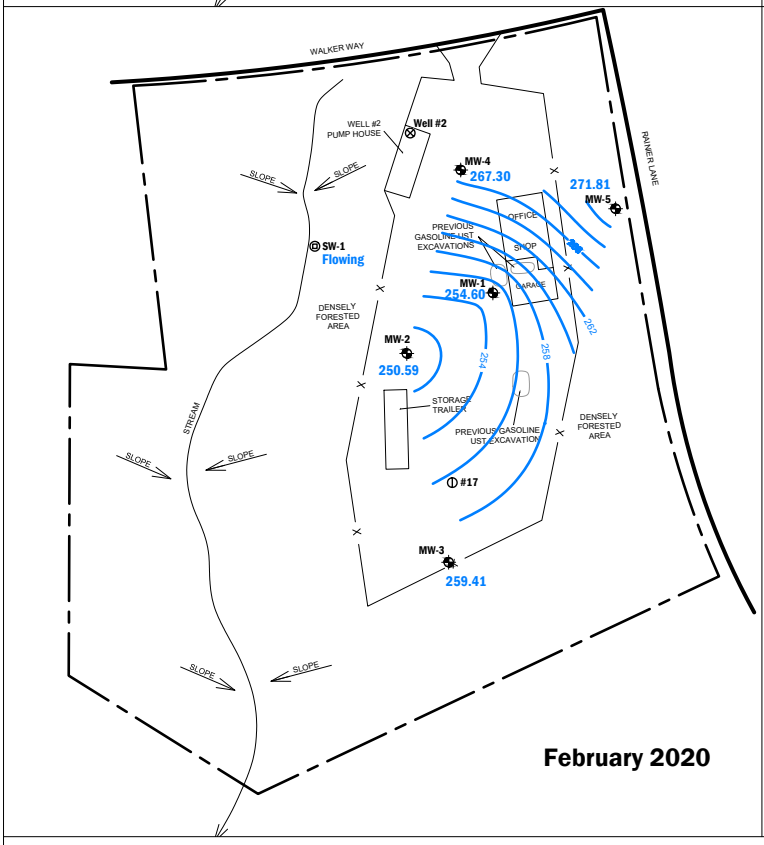
Site Plan

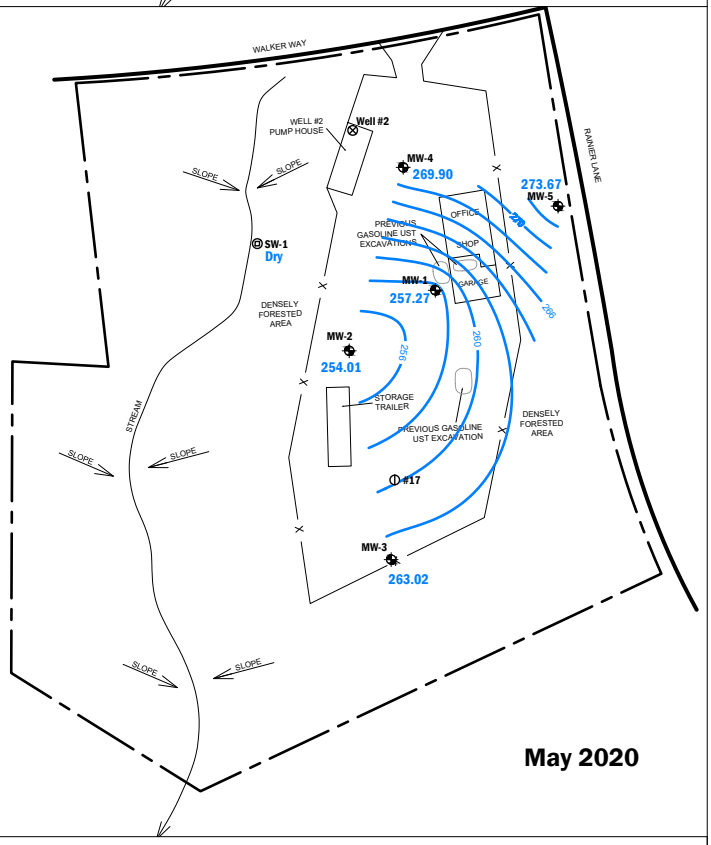
Olympic Water & Sewer, Inc.
Groundwater Monitoring Report
Port Ludlow, Washington

Aspect CONSULTING	Jul-2020	BY: AJY/SCC	FIGURE NO. 2
	PROJECT NO. 130046	REVISED BY: -	









Legend

- Monitoring Well Location
- Stream Sample Location
- Existing Water Supply Well Location
- Existing Casing Location
- Groundwater Elevation Contour Line (Feet)

Base map provided by SLR, from *Additional Investigation Report*, dated may 12, 2011.

This drawing is for conceptual purposes only. Actual locations may vary and not all structures are shown.

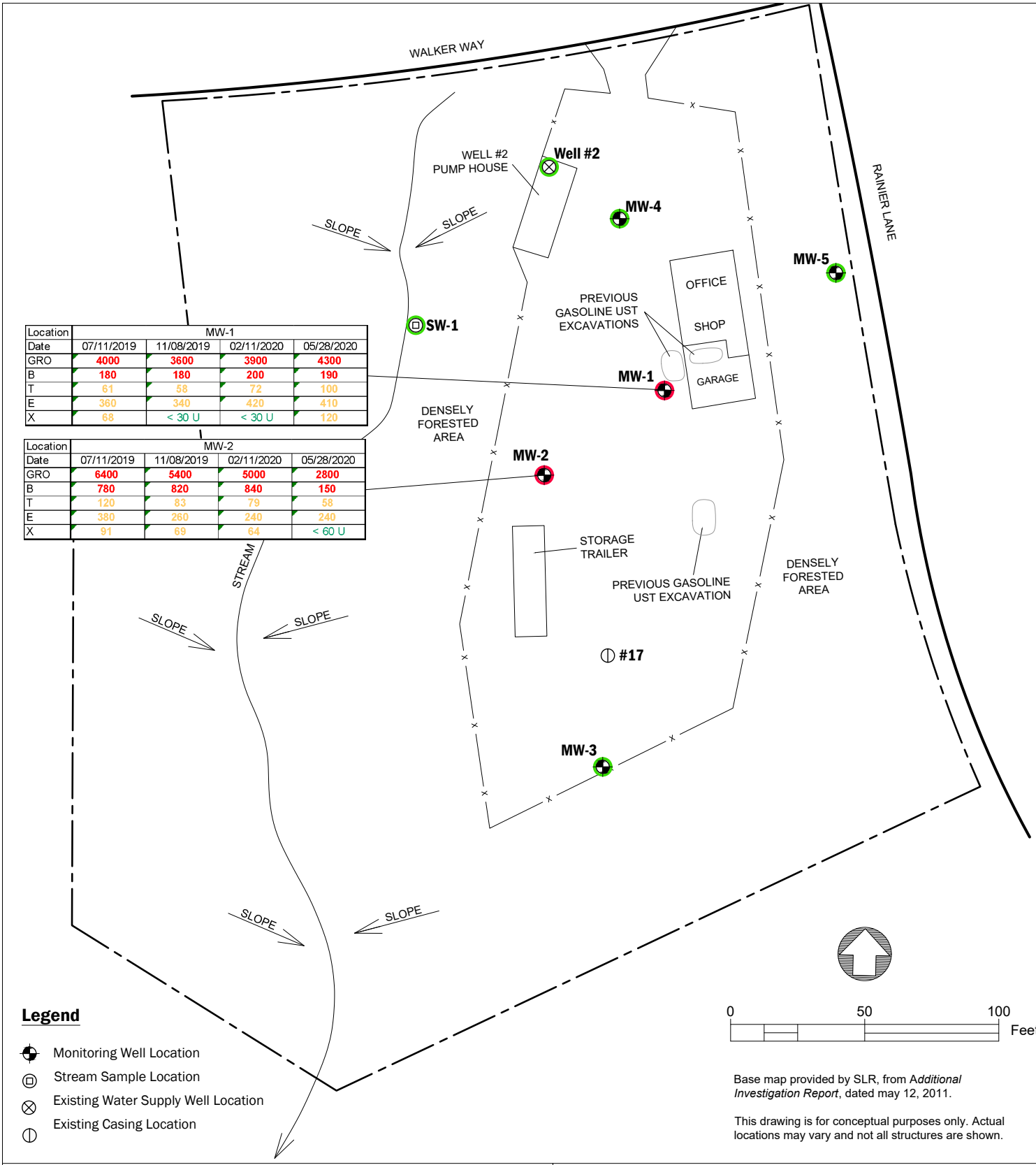
0 50 100 Feet

Groundwater Elevation and Contours

Olympic Water & Sewer, Inc.
Groundwater Monitoring Report
Port Ludlow, Washington

Aspect CONSULTING	Aug-2020	BY: AJY/SCC	FIGURE NO. 3
	PROJECT NO. 130046	REVISED BY: SCC	

CAD Path: Q:\Olympic Property Group\130046 Port Ludlow\2020-07 GW Monitoring Report\130046-02.dwg 04 GW Elev || Date Saved: Aug 17, 2020 2:47pm || User: scudd



Location	MW-1			
Date	07/11/2019	11/08/2019	02/11/2020	05/28/2020
GRO	4000	3600	3900	4300
B	180	180	200	190
T	61	58	72	100
E	360	340	420	410
X	68	< 30 U	< 30 U	120

Location	MW-2			
Date	07/11/2019	11/08/2019	02/11/2020	05/28/2020
GRO	6400	5400	5000	2800
B	780	820	840	150
T	120	83	79	58
E	380	260	240	240
X	91	69	64	< 60 U

Legend

- Monitoring Well Location
- Stream Sample Location
- Existing Water Supply Well Location
- Existing Casing Location

0 50 100 Feet

Base map provided by SLR, from A*dditional Investigation Report*, dated may 12, 2011.

This drawing is for conceptual purposes only. Actual locations may vary and not all structures are shown.

Analytical Results

- One or more petroleum hydrocarbon constituents was detected at a concentration exceeding its respective MTCA Method A Cleanup Level
- One or more petroleum hydrocarbons constituents was detected at a concentration less than its respective MTCA Method A Cleanup Level
- Petroleum hydrocarbon constituents not detected

GRO - Gasoline-range Total Petroleum Hydrocarbons
B - Benzene
T - Toluene
E - Ethylbenzene
X - Total Xylenes

Results are for all four quarters of Year 1 groundwater monitoring, except from the Stream sample (SW-1). The stream was only flowing during the February 2020 sampling event, and results are shown for that single quarter.

Groundwater and Surface Water Analytical Results - Year 1

Olympic Water & Sewer, Inc.
Groundwater Monitoring Report
Port Ludlow, Washington

Aspect Consulting	Aug-2020	BY: AJY/SCC	FIGURE NO. 4
	PROJECT NO. 130046	REVISED BY: SCC	

CAD Path: Q:\Olympic Property Group\130046 Port Ludlow\2020-07 GW Monitoring Report\130046-02.dwg 03 GW and SW Results || Date Saved: Aug 17, 2020 2:28pm || User: scudd

APPENDIX A

Laboratory Analytical Reports

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 21, 2020

Andrew Yonkofski, Project Manager
Aspect Consulting, LLC
710 2nd Ave S, Suite 550
Seattle, WA 98104

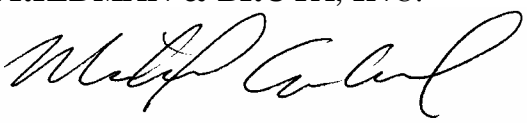
Dear Mr Yonkofski:

Included are the results from the testing of material submitted on February 12, 2020 from the OWSI 130046, F&BI 002161 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Data Aspect, Kirsi Longley
ASP0221R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 12, 2020 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC OWSI 130046, F&BI 002161 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
002161 -01	MW-1-021120
002161 -02	MW-2-021120
002161 -03	MW-3-021120
002161 -04	MW-4-021120
002161 -05	MW-5-021120
002161 -06	MW-X-021120
002161 -07	W-2-021120
002161 -08	SW-1-021120
002161 -09	Trip Blank

The samples were sent to Fremont Analytical for nitrate, nitrite, sulfate, alkalinity, and dissolved methane analyses. The report is enclosed.

All quality control requirements were acceptable.

Date of Report: 02/21/20
Date Received: 02/12/20
Project: OWSI 130046, F&BI 002161
Date Extracted: 02/13/20
Date Analyzed: 02/13/20

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW-1-021120 002161-01 1/10	200	72	420	<30	3,900	88
MW-2-021120 002161-02 1/10	840	79	240	64	5,000	88
MW-3-021120 002161-03	<1	<1	<1	<3	<100	85
MW-4-021120 002161-04	<1	<1	<1	<3	<100	87
MW-5-021120 002161-05	<1	<1	<1	<3	<100	87
MW-X-021120 002161-06 1/20	200	70	420	<60	3,900	87
W-2-021120 002161-07	<1	<1	<1	<3	<100	85
SW-1-021120 002161-08	<1	<1	<1	<3	<100	88
Trip Blank 002161-09	<1	<1	<1	<3	<100	88
Method Blank 00-261 MB	<1	<1	<1	<3	<100	87

Date of Report: 02/21/20
Date Received: 02/12/20
Project: OWSI 130046, F&BI 002161

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

Laboratory Code: 002110-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	1.3	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	98	65-118
Toluene	ug/L (ppb)	50	100	72-122
Ethylbenzene	ug/L (ppb)	50	102	73-126
Xylenes	ug/L (ppb)	150	100	74-118
Gasoline	ug/L (ppb)	1,000	94	69-134

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

ip - Recovery fell outside of control limits due to sample matrix effects.

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

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: 002161
Work Order Number: 2002196

February 19, 2020

Attention Michael Erdahl:

Fremont Analytical, Inc. received 9 sample(s) on 2/12/2020 for the analyses presented in the following report.

Dissolved Gases by RSK-175
Ion Chromatography by EPA Method 300.0
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,

Brianna Barnes
Project Manager

Date: *02/19/2020*

CLIENT: Friedman & Bruya
Project: 002161
Work Order: 2002196

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2002196-001	MW-1-021120	02/11/2020 3:00 PM	02/12/2020 10:45 AM
2002196-002	MW-2-021120	02/11/2020 4:25 PM	02/12/2020 10:45 AM
2002196-003	MW-3-021120	02/11/2020 11:45 AM	02/12/2020 10:45 AM
2002196-004	MW-4-021120	02/11/2020 1:50 PM	02/12/2020 10:45 AM
2002196-005	MW-5-021120	02/11/2020 10:30 AM	02/12/2020 10:45 AM
2002196-006	MW-X-021120	02/11/2020 12:00 AM	02/12/2020 10:45 AM
2002196-007	W-2-021120	02/11/2020 12:50 PM	02/12/2020 10:45 AM
2002196-008	SW-1-021120	02/11/2020 9:20 AM	02/12/2020 10:45 AM
2002196-009	Trip Blank	02/11/2020 12:00 AM	02/12/2020 10:45 AM

Case Narrative

WO#: **2002196**
Date: **2/19/2020**

CLIENT: Friedman & Bruya
Project: 002161

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

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

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

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

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below 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: **2002196**
Date Reported: **2/19/2020**

Client: Friedman & Bruya
Collection Date: 2/11/2020 3:00:00 PM
Project: 002161
Lab ID: 2002196-001
Matrix: Water
Client Sample ID: **MW-1-021120**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R57337		Analyst: AD
Methane	0.0367	0.00863		mg/L	1	2/13/2020 3:16:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 27428		Analyst: SS
Nitrite (as N)	ND	0.100		mg/L	1	2/13/2020 12:01:00 PM
Nitrate (as N)	ND	0.100		mg/L	1	2/13/2020 12:01:00 PM
Sulfate	0.963	0.300		mg/L	1	2/13/2020 12:01:00 PM
Total Alkalinity by SM 2320B				Batch ID: R57480		Analyst: WF
Alkalinity, Total (As CaCO3)	292	2.50		mg/L	1	2/19/2020 5:30:14 PM

Analytical Report

Work Order: **2002196**
Date Reported: **2/19/2020**

Client: Friedman & Bruya
Collection Date: 2/11/2020 4:25:00 PM
Project: 002161
Lab ID: 2002196-002
Matrix: Water
Client Sample ID: **MW-2-021120**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R57337		Analyst: AD
Methane	0.0158	0.00863		mg/L	1	2/13/2020 3:21:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 27428		Analyst: SS
Nitrite (as N)	ND	0.100		mg/L	1	2/13/2020 12:24:00 PM
Nitrate (as N)	ND	0.100		mg/L	1	2/13/2020 12:24:00 PM
Sulfate	14.6	0.300		mg/L	1	2/13/2020 12:24:00 PM
Total Alkalinity by SM 2320B				Batch ID: R57480		Analyst: WF
Alkalinity, Total (As CaCO3)	380	2.50		mg/L	1	2/19/2020 5:30:14 PM

Analytical Report

Work Order: **2002196**
Date Reported: **2/19/2020**

Client: Friedman & Bruya
Collection Date: 2/11/2020 11:45:00 AM
Project: 002161
Lab ID: 2002196-003
Matrix: Water
Client Sample ID: **MW-3-021120**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R57337		Analyst: AD
Methane	ND	0.00863		mg/L	1	2/13/2020 3:24:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 27428		Analyst: SS
Nitrite (as N)	ND	0.100	H	mg/L	1	2/13/2020 12:47:00 PM
Nitrite (as N)	ND	0.200	D	mg/L	2	2/12/2020 8:12:00 PM
Nitrate (as N)	2.22	0.200	D	mg/L	2	2/12/2020 8:12:00 PM
Sulfate	15.3	0.600	D	mg/L	2	2/12/2020 8:12:00 PM
Total Alkalinity by SM 2320B				Batch ID: R57480		Analyst: WF
Alkalinity, Total (As CaCO3)	205	2.50		mg/L	1	2/19/2020 5:30:14 PM

Analytical Report

Work Order: **2002196**
Date Reported: **2/19/2020**

Client: Friedman & Bruya
Collection Date: 2/11/2020 1:50:00 PM
Project: 002161
Lab ID: 2002196-004
Matrix: Water
Client Sample ID: **MW-4-021120**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R57337		Analyst: AD
Methane	ND	0.00863		mg/L	1	2/13/2020 3:27:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 27428		Analyst: SS
Nitrite (as N)	ND	0.100		mg/L	1	2/12/2020 8:35:00 PM
Nitrate (as N)	0.604	0.100		mg/L	1	2/12/2020 8:35:00 PM
Sulfate	8.17	0.300		mg/L	1	2/12/2020 8:35:00 PM
Total Alkalinity by SM 2320B				Batch ID: R57480		Analyst: WF
Alkalinity, Total (As CaCO3)	239	2.50		mg/L	1	2/19/2020 5:30:14 PM

Analytical Report

Work Order: **2002196**
Date Reported: **2/19/2020**

Client: Friedman & Bruya
Collection Date: 2/11/2020 10:30:00 AM
Project: 002161
Lab ID: 2002196-005
Matrix: Water
Client Sample ID: **MW-5-021120**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R57337		Analyst: AD
Methane	ND	0.00863		mg/L	1	2/13/2020 3:30:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 27428		Analyst: SS
Nitrite (as N)	ND	0.200	D	mg/L	2	2/12/2020 8:58:00 PM
Nitrate (as N)	0.628	0.200	D	mg/L	2	2/12/2020 8:58:00 PM
Sulfate	4.61	0.600	D	mg/L	2	2/12/2020 8:58:00 PM
NOTES: Diluted due to high levels of non-target analytes.						
Total Alkalinity by SM 2320B				Batch ID: R57480		Analyst: WF
Alkalinity, Total (As CaCO3)	146	2.50		mg/L	1	2/19/2020 5:30:14 PM

Analytical Report

Work Order: **2002196**
Date Reported: **2/19/2020**

Client: Friedman & Bruya
Collection Date: 2/11/2020
Project: 002161
Lab ID: 2002196-006
Matrix: Water
Client Sample ID: **MW-X-021120**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R57337		Analyst: AD
Methane	0.0294	0.00863		mg/L	1	2/13/2020 3:32:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 27428		Analyst: SS
Nitrite (as N)	ND	0.100	H	mg/L	1	2/13/2020 1:10:00 PM
Nitrite (as N)	ND	0.400	D	mg/L	4	2/12/2020 9:22:00 PM
Nitrate (as N)	ND	0.100	H	mg/L	1	2/13/2020 1:10:00 PM
Nitrate (as N)	ND	0.400	D	mg/L	4	2/12/2020 9:22:00 PM
Sulfate	1.05	0.300		mg/L	1	2/13/2020 1:10:00 PM
Total Alkalinity by SM 2320B				Batch ID: R57480		Analyst: WF
Alkalinity, Total (As CaCO3)	312	2.50		mg/L	1	2/19/2020 5:30:14 PM

Analytical Report

Work Order: **2002196**
Date Reported: **2/19/2020**

Client: Friedman & Bruya
Collection Date: 2/11/2020 12:50:00 PM
Project: 002161
Lab ID: 2002196-007
Matrix: Water
Client Sample ID: **W-2-021120**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R57337		Analyst: AD
Methane	0.0574	0.00863		mg/L	1	2/13/2020 3:38:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 27428		Analyst: SS
Nitrite (as N)	ND	0.100		mg/L	1	2/12/2020 10:31:00 PM
Nitrate (as N)	ND	0.100		mg/L	1	2/12/2020 10:31:00 PM
Sulfate	47.4	1.50	D	mg/L	5	2/13/2020 1:33:00 PM
Total Alkalinity by SM 2320B				Batch ID: R57480		Analyst: WF
Alkalinity, Total (As CaCO3)	102	2.50		mg/L	1	2/19/2020 5:30:14 PM

Analytical Report

Work Order: **2002196**
Date Reported: **2/19/2020**

Client: Friedman & Bruya
Collection Date: 2/11/2020 9:20:00 AM
Project: 002161
Lab ID: 2002196-008
Matrix: Water
Client Sample ID: **SW-1-021120**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R57337		Analyst: AD
Methane	ND	0.00863		mg/L	1	2/13/2020 3:40:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 27428		Analyst: SS
Nitrite (as N)	ND	0.100		mg/L	1	2/12/2020 10:54:00 PM
Nitrate (as N)	1.41	0.100		mg/L	1	2/12/2020 10:54:00 PM
Sulfate	5.06	0.300		mg/L	1	2/12/2020 10:54:00 PM
Total Alkalinity by SM 2320B				Batch ID: R57480		Analyst: WF
Alkalinity, Total (As CaCO3)	26.8	2.50		mg/L	1	2/19/2020 5:30:14 PM

Analytical Report

Work Order: **2002196**
Date Reported: **2/19/2020**

Client: Friedman & Bruya
Project: 002161
Lab ID: 2002196-009
Client Sample ID: **Trip Blank**

Collection Date: 2/11/2020
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R57337		Analyst: AD
Methane	ND	0.00863		mg/L	1	2/13/2020 3:43:00 PM

Work Order: 2002196
CLIENT: Friedman & Bruya
Project: 002161

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **MB-R57480**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **2/19/2020**	RunNo: **57480**
Client ID: **MBLKW**	Batch ID: **R57480**		Analysis Date: **2/19/2020**	SeqNo: **1146902**

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-R57480**	SampType: **LCS**	Units: **mg/L**	Prep Date: **2/19/2020**	RunNo: **57480**
Client ID: **LCSW**	Batch ID: **R57480**		Analysis Date: **2/19/2020**	SeqNo: **1146903**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	103	2.50	100.0	0	103	94.3	116				

Sample ID: **2002196-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **2/19/2020**	RunNo: **57480**
Client ID: **MW-1-021120**	Batch ID: **R57480**		Analysis Date: **2/19/2020**	SeqNo: **1146905**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	296	2.50						292.5	1.10	20	

Work Order: 2002196
CLIENT: Friedman & Bruya
Project: 002161

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **LCS-27428**	SampType: **LCS**	Units: **mg/L**	Prep Date: **2/12/2020**	RunNo: **57332**
Client ID: **LCSW**	Batch ID: **27428**		Analysis Date: **2/12/2020**	SeqNo: **1143222**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	0.731	0.100	0.7500	0	97.5	90	110				
Nitrate (as N)	0.722	0.100	0.7500	0	96.3	90	110				
Sulfate	3.58	0.300	3.750	0	95.5	90	110				

Sample ID: **MB-27428**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **2/12/2020**	RunNo: **57332**
Client ID: **MBLKW**	Batch ID: **27428**		Analysis Date: **2/12/2020**	SeqNo: **1143223**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	ND	0.100									
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.300									

Sample ID: **2002196-008ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **2/12/2020**	RunNo: **57332**
Client ID: **SW-1-021120**	Batch ID: **27428**		Analysis Date: **2/12/2020**	SeqNo: **1143234**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	ND	0.100						0		20	
Nitrate (as N)	1.41	0.100						1.410	0	20	
Sulfate	5.05	0.300						5.055	0.0792	20	

Sample ID: **2002196-008AMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **2/12/2020**	RunNo: **57332**
Client ID: **SW-1-021120**	Batch ID: **27428**		Analysis Date: **2/12/2020**	SeqNo: **1143235**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	0.693	0.100	0.7500	0	92.4	80	120				
Nitrate (as N)	2.22	0.100	0.7500	1.410	107	80	120				
Sulfate	8.87	0.300	3.750	5.055	102	80	120				

Work Order: 2002196
CLIENT: Friedman & Bruya
Project: 002161

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **2002196-008AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **2/12/2020** RunNo: **57332**
Client ID: **SW-1-021120** Batch ID: **27428** Analysis Date: **2/13/2020** SeqNo: **1143236**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	0.710	0.100	0.7500	0	94.7	80	120	0.6930	2.42	20	
Nitrate (as N)	2.22	0.100	0.7500	1.410	108	80	120	2.216	0.315	20	
Sulfate	8.91	0.300	3.750	5.055	103	80	120	8.873	0.450	20	

Sample ID: **2002199-004BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **2/12/2020** RunNo: **57332**
Client ID: **BATCH** Batch ID: **27428** Analysis Date: **2/13/2020** SeqNo: **1143257**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	ND	5.00						0		20	D
Nitrate (as N)	305	5.00						307.4	0.931	20	DE
Sulfate	5,420	15.0						5,467	0.913	20	DE

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: **2002199-004BMS** SampType: **MS** Units: **mg/L** Prep Date: **2/12/2020** RunNo: **57332**
Client ID: **BATCH** Batch ID: **27428** Analysis Date: **2/13/2020** SeqNo: **1143258**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	34.5	5.00	37.50	0	92.0	80	120				D
Nitrate (as N)	344	5.00	37.50	307.4	97.3	80	120				DE
Sulfate	5,570	15.0	187.5	5,467	55.2	80	120				DES

NOTES:
S - Analyte concentration was too high for accurate spike recovery(ies).
E - Estimated value. The amount exceeds the linear working range of the instrument.

Work Order: 2002196
CLIENT: Friedman & Bruya
Project: 002161

QC SUMMARY REPORT

Dissolved Gases by RSK-175

Sample ID: **MB-R57337**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **2/13/2020**	RunNo: **57337**
Client ID: **MBLKW**	Batch ID: **R57337**		Analysis Date: **2/13/2020**	SeqNo: **1143426**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	ND	0.00863									

Sample ID: **LCS-R57337**	SampType: **LCS**	Units: **mg/L**	Prep Date: **2/13/2020**	RunNo: **57337**
Client ID: **LCSW**	Batch ID: **R57337**		Analysis Date: **2/13/2020**	SeqNo: **1143425**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	1,090	0.00863	1,000	0	109	70	130				

Sample ID: **2002095-001AREP**	SampType: **REP**	Units: **mg/L**	Prep Date: **2/13/2020**	RunNo: **57337**
Client ID: **BATCH**	Batch ID: **R57337**		Analysis Date: **2/13/2020**	SeqNo: **1143411**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	ND	0.00863						0		30	

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**2002196**
Logged by:	**Carissa True**	Date Received:	**2/12/2020 10:45:00 AM**

Chain of Custody

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

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☑	Not Required ☐
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☑	NA ☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

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

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler 1	4.1
Sample 1	3.2

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

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2002196

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER Fremont

PROJECT NAME/NO. 002161

PO # B-110

REMARKS Aspect EDD

TURNAROUND TIME
- [x] Standard TAT
- [ ] RUSH
Rush charges authorized by:

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	VPH	Nitrate	Nitrite	Sulfate	Alkalinity	Dissolved CH4			Notes
MW-1-021120		2/11/20	1500	water	4				x	x	x	x	x			
MW-2-021120			1625		4				x	x	x	x	x			
MW-3-021120			1145		4				x	x	x	x	x			
MW-4-021120			1350		4				x	x	x	x	x			
MW-5-021120			1030		4				x	x	x	x	x			
MW-X-021120			—		4				x	x	x	x	x			
W-2-021120			1250		4				x	x	x	x	x			
SW-1-021120			0920		4				x	x	x	x	x			
Trip Blank		2/11/20	—	water	1								x			

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman & Bruya	2/12/20	09:00AM
Received by:	Makenzie Meinardt	FAI	2/12/20	1045
Relinquished by:				
Received by:				

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

002161

SAMPLE CHAIN OF CUSTODY ME 02-12-20

A14 / VW4

Page # 1 of 1

Report To Andrew Yonkofski / Kris Longley

Company Aspect Consulting

Address 710 2nd Ave Ste. 550

City, State, ZIP Seattle, WA, 98104

Phone (206) 413-5411 Email ayonkofski@aspectconsulting.com

SAMPLERS (signature)	[signature]
PROJECT NAME: Owst	PO #: 130046
REMARKS: Project specific RLs? - Yes / No	INVOICE TO: AP

TURNAROUND TIME
☒ Standard turnaround
☐ RUSH
Rush charges authorized by:
SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	NO_2^-/NO_3^-	SO_4^{2-}	Dissolved CH_4	Alkalinity	Notes
MW-1-021120	01 A-G	2/11/20	1500	WG	7		X	X					X	X	X	X	
MW-2-021120	02	↓	1625	↓	↓		↓	↓					↓	↓	↓	↓	
MW-3-021120	03	↓	1145	↓	↓		↓	↓					↓	↓	↓	↓	
MW-4-021120	04	↓	1350	↓	↓		↓	↓					↓	↓	↓	↓	
MW-5-021120	05	↓	1030	↓	↓		↓	↓					↓	↓	↓	↓	
MW-X-021120	06	↓	—	↓	↓		↓	↓					↓	↓	↓	↓	
W-2-021120	07	↓	1250	↓	↓		↓	↓					↓	↓	↓	↓	
SW-1-021120	08	↓	0920	↓	↓		↓	↓					↓	↓	↓	↓	
Trip Blank	09 A B	—	—	AQ	2		↓	↓							↓		
																	Samples received at 3 °C

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	David Unruh	Aspect Consulting	2/12	
Received by: Brown Gitau	[signature]	Fedex	2/12/20	8:04
Relinquished by:				
Received by: [signature]	Nhan Phan	FeBI	2/12/20	0840

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

July 24, 2019

Andrew Yonkofski, Project Manager
Aspect Consulting, LLC
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Mr Yonkofski:

Included are the results from the testing of material submitted on July 12, 2019 from the OWSI 130046-001-02, F&BI 907197 project. There are 12 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Data Aspect, Kirsi Longley
ASP0724R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 12, 2019 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC OWSI 130046-001-02, F&BI 907197 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
907197 -01	MW-5-071119
907197 -02	MW-3-071119
907197 -03	W-2-071119
907197 -04	W-2-071119-P
907197 -05	MW-4-071119
907197 -06	MW-2-071119
907197 -07	MW-1-071119
907197 -08	MW-X-071119-D
907197 -09	VTRP

Samples MW-5-071119, MW-3-071119, W-2-071119-P, MW-4-071119, MW-2-071119, and MW-1-071119 were sent to Fremont Analytical for sulfate, nitrate, nitrite, dissolved gasses, and ferrous iron analyses. The report is enclosed.

All quality control requirements were acceptable.

Date of Report: 07/24/19
Date Received: 07/12/19
Project: OWSI 130046-001-02, F&BI 907197
Date Extracted: 07/12/19
Date Analyzed: 07/12/19, 7/16/19, and 07/19/19

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW-5-071119 907197-01	<1	<1	<1	<3	<100	96
MW-3-071119 907197-02	<1	<1	<1	<3	<100	95
W-2-071119-P 907197-04	<1	<1	<1	<3	<100	95
MW-4-071119 907197-05	<1	<1	<1	<3	<100	96
MW-2-071119 907197-06 1/10	780	120	380	91	6,400	100
MW-1-071119 907197-07 1/10	180	61	360	68	4,000	100
MW-X-071119-D 907197-08 1/10	180	61	360	69	3,900	100
VTRP 907197-09	<1	<1	1.4	<3	<100	97
Method Blank 09-1588 MB	<1	<1	<1	<3	<100	107

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-5-071119	Client:	Aspect Consulting, LLC
Date Received:	07/12/19	Project:	OWSI 130046-001-02
Date Extracted:	07/16/19	Lab ID:	907197-01
Date Analyzed:	07/16/19	Data File:	907197-01.066
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	81.3
Manganese	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-3-071119	Client:	Aspect Consulting, LLC
Date Received:	07/12/19	Project:	OWSI 130046-001-02
Date Extracted:	07/16/19	Lab ID:	907197-02
Date Analyzed:	07/16/19	Data File:	907197-02.067
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	128
Manganese	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	W-2-071119-P	Client:	Aspect Consulting, LLC
Date Received:	07/12/19	Project:	OWSI 130046-001-02
Date Extracted:	07/16/19	Lab ID:	907197-04
Date Analyzed:	07/16/19	Data File:	907197-04.068
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	1,150
Manganese	275

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-4-071119	Client:	Aspect Consulting, LLC
Date Received:	07/12/19	Project:	OWSI 130046-001-02
Date Extracted:	07/16/19	Lab ID:	907197-05
Date Analyzed:	07/16/19	Data File:	907197-05.069
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	65.5
Manganese	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-2-071119	Client:	Aspect Consulting, LLC
Date Received:	07/12/19	Project:	OWSI 130046-001-02
Date Extracted:	07/16/19	Lab ID:	907197-06
Date Analyzed:	07/16/19	Data File:	907197-06.072
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	453
Manganese	491

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-1-071119	Client:	Aspect Consulting, LLC
Date Received:	07/12/19	Project:	OWSI 130046-001-02
Date Extracted:	07/16/19	Lab ID:	907197-07
Date Analyzed:	07/16/19	Data File:	907197-07.073
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	590
Manganese	805

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	OWSI 130046-001-02
Date Extracted:	07/16/19	Lab ID:	I9-423 mb2
Date Analyzed:	07/16/19	Data File:	I9-423 mb2.065
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Date of Report: 07/24/19
Date Received: 07/12/19
Project: OWSI 130046-001-02, F&BI 907197

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

Laboratory Code: 907197-01 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	104	65-118
Toluene	ug/L (ppb)	50	108	72-122
Ethylbenzene	ug/L (ppb)	50	112	73-126
Xylenes	ug/L (ppb)	150	111	74-118
Gasoline	ug/L (ppb)	1,000	100	69-134

Date of Report: 07/24/19
Date Received: 07/12/19
Project: OWSI 130046-001-02, F&BI 907197

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

Laboratory Code: 907219-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	299	85	94	70-130	10
Manganese	ug/L (ppb)	20	30.7	95	104	70-130	9

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	95	85-115
Manganese	ug/L (ppb)	20	92	85-115

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

ip - Recovery fell outside of control limits due to sample matrix effects.

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

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

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

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

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

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

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

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

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

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

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

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

RE: 907197
Work Order Number: 1907169

July 19, 2019

Attention Michael Erdahl:

Fremont Analytical, Inc. received 7 sample(s) on 7/12/2019 for the analyses presented in the following report.

Dissolved Gases by RSK-175
Ferrous Iron by SM3500-Fe B
Ion Chromatography by EPA Method 300.0
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,

Brianna Barnes
Project Manager

Date: *07/19/2019*

CLIENT: Friedman & Bruya
Project: 907197
Work Order: 1907169

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1907169-001	MW-5-071119	07/11/2019 10:00 AM	07/12/2019 10:00 AM
1907169-002	MW-3-071119	07/11/2019 11:45 AM	07/12/2019 10:00 AM
1907169-003	W-2-071119	07/11/2019 1:10 PM	07/12/2019 10:00 AM
1907169-004	W-2-071119-P	07/11/2019 2:10 PM	07/12/2019 10:00 AM
1907169-005	MW-4-071119	07/11/2019 3:05 PM	07/12/2019 10:00 AM
1907169-006	MW-2-071119	07/11/2019 4:30 PM	07/12/2019 10:00 AM
1907169-007	MW-1-071119	07/11/2019 5:50 PM	07/12/2019 10:00 AM

Case Narrative

WO#: **1907169**
Date: **7/19/2019**

CLIENT: Friedman & Bruya
Project: 907197

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

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

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

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

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below 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: **1907169**
Date Reported: **7/19/2019**

Client: Friedman & Bruya
Collection Date: 7/11/2019 10:00:00 AM
Project: 907197
Lab ID: 1907169-001
Matrix: Water
Client Sample ID: **MW-5-071119**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R52740		Analyst: WC
Methane	ND	0.00863		mg/L	1	7/18/2019 3:32:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 25185		Analyst: GM
Nitrite (as N)	ND	0.100		mg/L	1	7/12/2019 4:30:00 PM
Nitrate (as N)	0.561	0.100		mg/L	1	7/12/2019 4:30:00 PM
Sulfate	6.66	0.300		mg/L	1	7/12/2019 4:30:00 PM
Total Alkalinity by SM 2320B				Batch ID: R52759		Analyst: WF
Alkalinity, Total (As CaCO3)	136	2.50		mg/L	1	7/19/2019 1:01:45 PM
Ferrous Iron by SM3500-Fe B				Batch ID: R52645		Analyst: SS
Ferrous Iron	0.591	0.0500	H	mg/L	1	7/12/2019 3:10:00 PM

Analytical Report

Work Order: **1907169**
Date Reported: **7/19/2019**

Client: Friedman & Bruya
Collection Date: 7/11/2019 11:45:00 AM
Project: 907197
Lab ID: 1907169-002
Matrix: Water
Client Sample ID: **MW-3-071119**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R52740		Analyst: WC
Methane	ND	0.00863		mg/L	1	7/18/2019 3:37:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 25185		Analyst: GM
Nitrite (as N)	ND	0.100	H	mg/L	1	7/16/2019 1:40:00 PM
Nitrite (as N)	ND	0.200	D	mg/L	2	7/12/2019 4:53:00 PM
Nitrate (as N)	2.14	0.200	D	mg/L	2	7/12/2019 4:53:00 PM
Sulfate	17.4	0.600	D	mg/L	2	7/12/2019 4:53:00 PM
Total Alkalinity by SM 2320B				Batch ID: R52759		Analyst: WF
Alkalinity, Total (As CaCO3)	202	2.50		mg/L	1	7/19/2019 1:01:45 PM
Ferrous Iron by SM3500-Fe B				Batch ID: R52645		Analyst: SS
Ferrous Iron	0.0959	0.0500	H	mg/L	1	7/12/2019 3:10:00 PM

Analytical Report

Work Order: **1907169**
Date Reported: **7/19/2019**

Client: Friedman & Bruya
Collection Date: 7/11/2019 2:10:00 PM
Project: 907197
Lab ID: 1907169-004
Matrix: Water
Client Sample ID: **W-2-071119-P**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R52740		Analyst: WC
Methane	0.0178	0.00863		mg/L	1	7/18/2019 3:44:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 25185		Analyst: GM
Nitrite (as N)	ND	0.100		mg/L	1	7/12/2019 5:16:00 PM
Nitrate (as N)	ND	0.100		mg/L	1	7/12/2019 5:16:00 PM
Sulfate	43.2	3.00	D	mg/L	10	7/17/2019 1:26:00 PM
Total Alkalinity by SM 2320B				Batch ID: R52759		Analyst: WF
Alkalinity, Total (As CaCO3)	68.2	2.50		mg/L	1	7/19/2019 1:01:45 PM
Ferrous Iron by SM3500-Fe B				Batch ID: R52645		Analyst: SS
Ferrous Iron	ND	0.0500	H	mg/L	1	7/12/2019 3:10:00 PM

Analytical Report

Work Order: **1907169**
Date Reported: **7/19/2019**

Client: Friedman & Bruya
Collection Date: 7/11/2019 3:05:00 PM
Project: 907197
Lab ID: 1907169-005
Matrix: Water
Client Sample ID: **MW-4-071119**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R52740		Analyst: WC
Methane	ND	0.00863		mg/L	1	7/18/2019 3:47:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 25185		Analyst: GM
Nitrite (as N)	ND	0.100		mg/L	1	7/12/2019 6:02:00 PM
Nitrate (as N)	0.551	0.100		mg/L	1	7/12/2019 6:02:00 PM
Sulfate	8.76	0.300		mg/L	1	7/12/2019 6:02:00 PM
Total Alkalinity by SM 2320B				Batch ID: R52759		Analyst: WF
Alkalinity, Total (As CaCO3)	140	2.50		mg/L	1	7/19/2019 1:01:45 PM
Ferrous Iron by SM3500-Fe B				Batch ID: R52645		Analyst: SS
Ferrous Iron	0.199	0.0500		mg/L	1	7/12/2019 3:10:00 PM

Analytical Report

Work Order: **1907169**
Date Reported: **7/19/2019**

Client: Friedman & Bruya
Project: 907197
Lab ID: 1907169-006
Client Sample ID: **MW-2-071119**

Collection Date: 7/11/2019 4:30:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R52740		Analyst: WC
Methane	0.0284	0.00863		mg/L	1	7/18/2019 3:49:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 25185		Analyst: GM
Nitrite (as N)	ND	0.100	H	mg/L	1	7/16/2019 2:26:00 PM
Nitrite (as N)	ND	0.500	D	mg/L	5	7/12/2019 6:25:00 PM
Nitrate (as N)	ND	0.100	H	mg/L	1	7/16/2019 2:26:00 PM
Nitrate (as N)	ND	0.500	D	mg/L	5	7/12/2019 6:25:00 PM
Sulfate	13.1	0.300		mg/L	1	7/16/2019 2:26:00 PM
Total Alkalinity by SM 2320B				Batch ID: R52759		Analyst: WF
Alkalinity, Total (As CaCO3)	422	2.50		mg/L	1	7/19/2019 1:01:45 PM
Ferrous Iron by SM3500-Fe B				Batch ID: R52645		Analyst: SS
Ferrous Iron	0.197	0.0500		mg/L	1	7/12/2019 3:10:00 PM

Analytical Report

Work Order: **1907169**
Date Reported: **7/19/2019**

Client: Friedman & Bruya
Collection Date: 7/11/2019 5:50:00 PM
Project: 907197
Lab ID: 1907169-007
Matrix: Water
Client Sample ID: **MW-1-071119**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R52740		Analyst: WC
Methane	0.0570	0.00863		mg/L	1	7/18/2019 3:53:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 25230		Analyst: SS
Nitrite (as N)	ND	0.100	H	mg/L	1	7/16/2019 7:26:00 PM
Nitrite (as N)	ND	0.500	D	mg/L	5	7/12/2019 6:48:00 PM
Nitrate (as N)	ND	0.100	H	mg/L	1	7/16/2019 7:26:00 PM
Nitrate (as N)	ND	0.500	D	mg/L	5	7/12/2019 6:48:00 PM
Sulfate	0.868	0.300		mg/L	1	7/16/2019 7:26:00 PM
Total Alkalinity by SM 2320B				Batch ID: R52759		Analyst: WF
Alkalinity, Total (As CaCO3)	312	2.50		mg/L	1	7/19/2019 1:01:45 PM
Ferrous Iron by SM3500-Fe B				Batch ID: R52645		Analyst: SS
Ferrous Iron	0.488	0.0500		mg/L	1	7/12/2019 3:10:00 PM

Work Order: 1907169
CLIENT: Friedman & Bruya
Project: 907197

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **MB-R52759**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **7/19/2019**	RunNo: **52759**
Client ID: **MBLKW**	Batch ID: **R52759**		Analysis Date: **7/19/2019**	SeqNo: **1042208**

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-R52759**	SampType: **LCS**	Units: **mg/L**	Prep Date: **7/19/2019**	RunNo: **52759**
Client ID: **LCSW**	Batch ID: **R52759**		Analysis Date: **7/19/2019**	SeqNo: **1042209**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	103	2.50	100.0	0	103	80	120				

Sample ID: **1907169-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **7/19/2019**	RunNo: **52759**
Client ID: **MW-5-071119**	Batch ID: **R52759**		Analysis Date: **7/19/2019**	SeqNo: **1042211**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	134	2.50						136.5	1.80	20	

Work Order: 1907169
CLIENT: Friedman & Bruya
Project: 907197

QC SUMMARY REPORT

Ferrous Iron by SM3500-Fe B

Sample ID: **MB-R52645**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **7/12/2019**	RunNo: **52645**
Client ID: **MBLKW**	Batch ID: **R52645**		Analysis Date: **7/12/2019**	SeqNo: **1039945**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	ND	0.0500									

Sample ID: **LCS-R52645**	SampType: **LCS**	Units: **mg/L**	Prep Date: **7/12/2019**	RunNo: **52645**
Client ID: **LCSW**	Batch ID: **R52645**		Analysis Date: **7/12/2019**	SeqNo: **1039946**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	0.410	0.0500	0.4000	0	103	80	120				

Sample ID: **1907169-001BDUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **7/12/2019**	RunNo: **52645**
Client ID: **MW-5-071119**	Batch ID: **R52645**		Analysis Date: **7/12/2019**	SeqNo: **1039948**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	1.12	0.0500						0.5911	61.8	20	RH

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

Sample ID: **1907169-001BMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **7/12/2019**	RunNo: **52645**
Client ID: **MW-5-071119**	Batch ID: **R52645**		Analysis Date: **7/12/2019**	SeqNo: **1039949**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	0.335	0.0500	0.4000	0.5911	-64.0	80	120				SH

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: **1907169-001BMSD**	SampType: **MSD**	Units: **mg/L**	Prep Date: **7/12/2019**	RunNo: **52645**
Client ID: **MW-5-071119**	Batch ID: **R52645**		Analysis Date: **7/12/2019**	SeqNo: **1039950**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	0.596	0.0500	0.4000	0.5911	1.17	80	120	0.3353	56.0	20	RSH

Date: *7/19/2019*

Work Order: 1907169
CLIENT: Friedman & Bruya
Project: 907197

QC SUMMARY REPORT

Ferrous Iron by SM3500-Fe B

Sample ID: **1907169-001BMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **7/12/2019**			RunNo: **52645**		
Client ID: **MW-5-071119**	Batch ID: **R52645**					Analysis Date: **7/12/2019**			SeqNo: **1039950**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.
R - High RPD observed.

Work Order: 1907169
CLIENT: Friedman & Bruya
Project: 907197

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **MB-25185** SampType: **MBLK** Units: **mg/L** Prep Date: **7/12/2019** RunNo: **52668**
Client ID: **MBLKW** Batch ID: **25185** Analysis Date: **7/12/2019** SeqNo: **1040307**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	ND	0.100									
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.300									

Sample ID: **LCS-25185** SampType: **LCS** Units: **mg/L** Prep Date: **7/12/2019** RunNo: **52668**
Client ID: **LCSW** Batch ID: **25185** Analysis Date: **7/12/2019** SeqNo: **1040308**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	0.693	0.100	0.7500	0	92.4	90	110				
Nitrate (as N)	0.728	0.100	0.7500	0	97.1	90	110				
Sulfate	3.49	0.300	3.750	0	93.0	90	110				

Sample ID: **1907159-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **7/12/2019** RunNo: **52668**
Client ID: **BATCH** Batch ID: **25185** Analysis Date: **7/12/2019** SeqNo: **1040310**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	ND	0.200						0		20	D
Nitrate (as N)	ND	0.200						0		20	D
Sulfate	1.69	0.600						1.722	1.64	20	D

NOTES:
Diluted due to matrix.

Sample ID: **1907159-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **7/12/2019** RunNo: **52668**
Client ID: **BATCH** Batch ID: **25185** Analysis Date: **7/12/2019** SeqNo: **1040311**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	1.13	0.200	1.500	0	75.5	80	120				DS
Nitrate (as N)	1.42	0.200	1.500	0	94.4	80	120				D
Sulfate	8.41	0.600	7.500	1.722	89.2	80	120				D

Work Order: 1907169
CLIENT: Friedman & Bruya
Project: 907197

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **1907159-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **7/12/2019** RunNo: **52668**
Client ID: **BATCH** Batch ID: **25185** Analysis Date: **7/12/2019** SeqNo: **1040311**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect (Nitrite)
Diluted due to matrix.

Sample ID: **1907159-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **7/12/2019** RunNo: **52668**
Client ID: **BATCH** Batch ID: **25185** Analysis Date: **7/12/2019** SeqNo: **1040312**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	1.16	0.200	1.500	0	77.5	80	120	1.132	2.62	20	DS
Nitrate (as N)	1.41	0.200	1.500	0	94.1	80	120	1.416	0.283	20	D
Sulfate	8.56	0.600	7.500	1.722	91.1	80	120	8.410	1.72	20	D

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect (Nitrite).
Diluted due to matrix.

Sample ID: **MB-25230** SampType: **MBLK** Units: **mg/L** Prep Date: **7/16/2019** RunNo: **52717**
Client ID: **MBLKW** Batch ID: **25230** Analysis Date: **7/16/2019** SeqNo: **1041270**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	ND	0.100									
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.300									

Sample ID: **LCS-25230** SampType: **LCS** Units: **mg/L** Prep Date: **7/16/2019** RunNo: **52717**
Client ID: **LCSW** Batch ID: **25230** Analysis Date: **7/16/2019** SeqNo: **1041271**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	0.678	0.100	0.7500	0	90.4	90	110				
Nitrate (as N)	0.714	0.100	0.7500	0	95.2	90	110				
Sulfate	3.54	0.300	3.750	0	94.4	90	110				

Work Order: 1907169
CLIENT: Friedman & Bruya
Project: 907197

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **1907176-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **7/16/2019** RunNo: **52717**
Client ID: **BATCH** Batch ID: **25230** Analysis Date: **7/16/2019** SeqNo: **1041276**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	ND	0.100						0		20	H
Nitrate (as N)	ND	0.100						0		20	H
Sulfate	2.05	0.300						2.043	0.391	20	

Sample ID: **1907176-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **7/16/2019** RunNo: **52717**
Client ID: **BATCH** Batch ID: **25230** Analysis Date: **7/16/2019** SeqNo: **1041277**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	0.684	0.100	0.7500	0	91.2	80	120				H
Nitrate (as N)	0.730	0.100	0.7500	0	97.3	80	120				H
Sulfate	5.64	0.300	3.750	2.043	95.9	80	120				

Sample ID: **1907176-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **7/16/2019** RunNo: **52717**
Client ID: **BATCH** Batch ID: **25230** Analysis Date: **7/16/2019** SeqNo: **1041278**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	0.675	0.100	0.7500	0	90.0	80	120	0.6840	1.32	20	H
Nitrate (as N)	0.728	0.100	0.7500	0	97.1	80	120	0.7300	0.274	20	H
Sulfate	5.63	0.300	3.750	2.043	95.7	80	120	5.638	0.142	20	

Work Order: 1907169
CLIENT: Friedman & Bruya
Project: 907197

QC SUMMARY REPORT

Dissolved Gases by RSK-175

Sample ID: **MB-R52740**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **7/18/2019**	RunNo: **52740**
Client ID: **MBLKW**	Batch ID: **R52740**		Analysis Date: **7/18/2019**	SeqNo: **1041768**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	ND	0.00863									

Sample ID: **LCS-R52740**	SampType: **LCS**	Units: **mg/L**	Prep Date: **7/18/2019**	RunNo: **52740**
Client ID: **LCSW**	Batch ID: **R52740**		Analysis Date: **7/18/2019**	SeqNo: **1041767**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	1,180	0.00863	1,000	0	118	70	130				

Sample ID: **1907169-002CREP**	SampType: **REP**	Units: **mg/L**	Prep Date: **7/18/2019**	RunNo: **52740**
Client ID: **MW-3-071119**	Batch ID: **R52740**		Analysis Date: **7/18/2019**	SeqNo: **1041755**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	ND	0.00863						0		30	

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1907169**
Logged by:	**Carissa True**	Date Received:	**7/12/2019 10:00:00 AM**

Chain of Custody

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

Log In

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

Special Handling (if applicable)

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

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

19. Additional remarks:

7/12/19: Ferrous Iron added on per Michael Erdahl. OK to proceed out of hold.

Item Information

Item #	Temp °C
Cooler 1	5.5
Sample 1	2.2

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

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

1907169

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont

PROJECT NAME/NO. 907197

PO # A-321

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	VPH	Sulfate	Nitrate	Nitrite	Alkalinity	Methane			Notes
MW-5-071119		7/11/19	1000	water					x	x	x	x	x			
MW-3-071119			1145						x	x	x	x	x			
W-2-071119			1310						x	x						Hold all MS 7/12/19
W-2-071119-P			1410						x	x	x	x	x			
MW-4-071119			1505						x	x	x	x	x			
MW-2-071119			1630						x	x	x	x	x			
MW-1-071119			1750						x	x	x	x	x			

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman & Bruya	7/12/19	0845
Received by: Kayla Pete	Kayla Peterson		7/12/19	10:00
Relinquished by:				
Received by:				

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

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

1907169

Page # 1 of 1

Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 3012 16th Ave W
City, State, ZIP Seattle, WA 98119
Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont
PROJECT NAME/NO. 907197
PO # A-321
REMARKS Edits By CRT 7/12 per ME
Please Email Results

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	VPH	Sulfate	Nitrate	Nitrite	Alkalinity	Methane	Ferrous Iron		Notes
MW-5-071119		7/11/19	1000	water					X	X	X	X	X	X		
MW-3-071119			1145						X	X	X	X	X	X		
W-2-071119			1310						X	X						Hold all MS 7/12/19
W-2-071119-P			1410						X	X	X	X	X	X		
MW-4-071119			1505						X	X	X	X	X	X		
MW-2-071119			1630						X	X	X	X	X	X		
MW-1-071119			1750						X	X	X	X	X	X		

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

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	7/12/19	0845
Received by:	Kayla Pete	Kayla Peterson		7/12/19	10:00
Relinquished by:					
Received by:					

907197

SAMPLE CHAIN OF CUSTODY ME 07-12-19

VW4/AI4

Page # ____ of ____

Report To: Andrew Yonkotski / Kirsi Longley
Company: Aspect Consulting
Address: 710 2nd Ave, Ste 550
City, State, ZIP: Seattle, WA, 98104
Phone: (206) 413-5411 Email: ayonkotski@aspectconsulting.com

SAMPLERS (signature): [signature]

PROJECT NAME: OWSI

PO #: 130046-001-02

REMARKS: * Dissolved Fe/Mn field filtered.

INVOICE TO: AP

TURNAROUND TIME
- ☒ Standard Turnaround
- ☐ RUSH ____
- Rush charges authorized by: ____

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other ____

ANALYSES REQUESTED *

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	Hold [illegible] ~~SVOCs by 8270D~~	Diss Fe/Mn 200.8 ~~PAHs 8270D SIM~~	Sulfate EPA 300.0	NO2, NO3 EPA 353.2	Methane RSK-175	Alkalinity SM2320B	Ferrous Iron	Notes
MW-5-071119	01 A-J	7/11/19	1000	W	10			X	X			X	X	X	X	X	⊗	⊗ - per DU
MW-3-071119	02		1145					X	X			X	X	X	X	X	⊗	7/12/19
W-2-071119	03		1310								X							ME
W-2-071119-P	04		1410					X	X			X	X	X	X	X	⊗	
MW-4-071119	05		1505					↓	↓			↓	↓	↓	↓	↓	⊗	
MW-2-071119	06		1630					↓	↓			↓	↓	↓	↓	↓	⊗	
MW-1-071119	07		1750					↓	↓			↓	↓	↓	↓	↓	⊗	
MW-X-071119-D	08 A-C		—		3			X	X									
VTRP	09 A B		—		2			X	X									

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	David Vorosh	Aspect Consulting	7/12/19	0852
Received by: [signature]	Nhan Phan	FeBI	7/12/19	0832
Relinquished by:				
Received by:		Samples received at 2 °C		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 3, 2020

Andrew Yonkofski, Project Manager
Aspect Consulting, LLC
710 2nd Ave S, Suite 550
Seattle, WA 98104

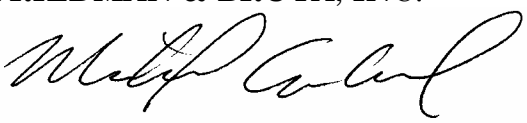
Dear Mr Yonkofski:

Included are the results from the testing of material submitted on May 28, 2020 from the OWSI PO 130046, F&BI 005374 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Data Aspect
ASP0603R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 28, 2020 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC OWSI PO 130046, F&BI 005374 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
005374 -01	MW-1-052820
005374 -02	MW-2-052820
005374 -03	MW-3-052820
005374 -04	MW-4-052820
005374 -05	MW-5-052820
005374 -06	MW-X-052820
005374 -07	W-2-052820
005374 -08	Trip Blank

All quality control requirements were acceptable.

Date of Report: 06/03/20
Date Received: 05/28/20
Project: OWSI PO 130046, F&BI 005374
Date Extracted: 05/29/20
Date Analyzed: 06/01/20

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW-1-052820 005374-01 1/10	190	100	410	120	4,300	96
MW-2-052820 005374-02 1/20	150	58	240	<60	2,800	94
MW-3-052820 005374-03	<1	<1	<1	<3	<100	93
MW-4-052820 005374-04	<1	<1	<1	<3	<100	91
MW-5-052820 005374-05	<1	<1	<1	<3	<100	95
MW-X-052820 005374-06 1/20	180	100	420	120	4,900	92
W-2-052820 005374-07	<1	<1	<1	<3	<100	95
Trip Blank 005374-08	<1	<1	<1	<3	<100	96
Method Blank 00-1108 MB	<1	<1	<1	<3	<100	91

Date of Report: 06/03/20
Date Received: 05/28/20
Project: OWSI PO 130046, F&BI 005374

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

Laboratory Code: 005377-01 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	106	65-118
Toluene	ug/L (ppb)	50	101	72-122
Ethylbenzene	ug/L (ppb)	50	107	73-126
Xylenes	ug/L (ppb)	150	106	74-118
Gasoline	ug/L (ppb)	1,000	101	69-134

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

ip - Recovery fell outside of control limits due to sample matrix effects.

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

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.

005374

SAMPLE CHAIN OF CUSTODY

MG 5-28-20

VW2

Page # 1 of 1

Report To Andrew Yonhefski
Company Aspect Consulting
Address 710 2nd Ave, Ste 550
City, State, ZIP Seattle, WA 98104
Phone (206) 443-5411 Email ~~yonhefski@aspectconsulting.com~~

SAMPLERS (*signature*) David Unruh

PROJECT NAME: OWST
PO #: 130046

REMARKS
Project specific RLs? - Yes / (No)

INVOICE TO: AP

TURNAROUND TIME
(X) Standard turnaround
( ) RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
( ) Archive samples
( ) Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082					Notes
MW-1-052820	01 A-C	5/28/20	1310	WG	3		X	X									
MW-2-052820	02		1410														
MW-3-052820	03		1015														
MW-4-052820	04		1145														
MW-5-052820	05		0900														
MW-X-052820	06		—														
W-2-052820	07		1120														
Trip Blank	08 A B	—	—	AQ	2												

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: David Unruh	David Unruh	Aspect Consulting	5/28/20	1647
Received by:	Khoi Hoang	FBT	5/28/20	1647
Relinquished by:				
Received by:		Samples received at 4 °C		

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

November 14, 2019

Andrew Yonkofski, Project Manager
Aspect Consulting, LLC
710 2nd Ave S, Suite 550
Seattle, WA 98104

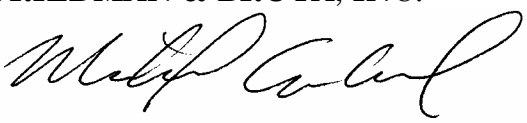
Dear Mr Yonkofski:

Included are the results from the testing of material submitted on November 11, 2019 from the OWSI PO 130046, F&BI 911134 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Data Aspect, Kirsi Longley
ASP1114R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on November 11, 2019 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC OWSI PO 130046, F&BI 911134 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
911134 -01	MW-1-110819
911134 -02	MW-2-110819
911134 -03	MW-3-110819
911134 -04	MW-4-110819
911134 -05	MW-5-110819
911134 -06	W-2-110819
911134 -07	MW-X-110819-D
911134 -08	Trip Blank

All quality control requirements were acceptable.

Date of Report: 11/14/19
Date Received: 11/11/19
Project: OWSI PO 130046, F&BI 911134
Date Extracted: 11/11/19
Date Analyzed: 11/11/19 and 11/12/19

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW-1-110819 911134-01 1/10	180	58	340	<30	3,600	76
MW-2-110819 911134-02 1/10	820	83	260	69	5,400	78
MW-3-110819 911134-03	<1	<1	<1	<3	<100	81
MW-4-110819 911134-04	<1	<1	<1	<3	<100	80
MW-5-110819 911134-05	<1	<1	<1	<3	<100	80
W-2-110819 911134-06	<1	<1	<1	<3	<100	79
MW-X-110819-D 911134-07 1/20	1,000	90	290	75	6,200	77
Trip Blank 911134-08	<1	<1	<1	<3	<100	76
Method Blank 09-2721 MB	<1	<1	<1	<3	<100	81

Date of Report: 11/14/19
Date Received: 11/11/19
Project: OWSI PO 130046, F&BI 911134

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

Laboratory Code: 911134-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	1.8	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	140	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	104	65-118
Toluene	ug/L (ppb)	50	104	72-122
Ethylbenzene	ug/L (ppb)	50	105	73-126
Xylenes	ug/L (ppb)	150	98	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

ip - Recovery fell outside of control limits due to sample matrix effects.

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

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.

911134

SAMPLE CHAIN OF COUSTODY

ME 11-11-19

VW4

Report To Andrew Yonkofski / Kirsi Longley

Company Aspect Consulting

Address 710 2nd Ave Ste 550

City, State, ZIP Seattle, WA, 98104

Phone (206) 413-5411 Email ayonkofski@aspectconsulting.com

SAMPLERS (signature) [signature]	
PROJECT NAME	PO #
OCJSI	~~180~~ DU 130046
REMARKS	INVOICE TO
Project specific RLs? - Yes / No (circled)	AP

Page # 1 of 1

TURNAROUND TIME
- ☒ Standard turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Archive samples
- ☐ Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082					Notes
MW-1-110819	01 A-F	11/8/19	1410	Water	6		X	X									
MW-2-110819	02	↓	1510	↓	↓		↓	↓									
MW-3-110819	03	↓	1300	↓	↓		↓	↓									
MW-4-110819	04	↓	0945	↓	↓		↓	↓									
MW-5-110819	05	↓	1140	↓	↓		↓	↓									
W-2-110819	06	↓	1045	↓	↓		↓	↓									
MW-X-110819-D	07	↓	–	↓	↓		↓	↓									Field Duplicate
Trip Blank	08 A-B	–	–	Water	2		X	X									

Samples received at 2 °C

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

SIGNATURE		PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	[signature]	David Unruh	Aspect Consulting	11/11/19	0740
Received by:	[signature]	Nhan Phan	FEBI	11/11/19	0740
Relinquished by:					
Received by:					

APPENDIX B

Plume Stability Analyses

Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)

Site Name:	*Olympic Water & Sewer, Inc. Site*
Site Address:	*718 Walker Way*
Additional Description:	

Well (Sampling) Location?	**MW-1**
Level of Confidence (Decision Criteria)?	**85%**

1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.

		Hazardous Substances (unit is ug/L)					
Sampling Event	Date Sampled	Benzene	TPHg				
#1	6/14/2010	110	990				
#2	10/20/2010	520	1900				
#3	4/7/2011	530	3000				
#4	7/11/2019	180	4000				
#5	11/8/2019	180	3600				
#6	2/11/2020	200	3900				
#7	5/28/2020	190	4300				
#8							
#9							
#10							
#11							
#12							
#13							
#14							
#15							
#16							

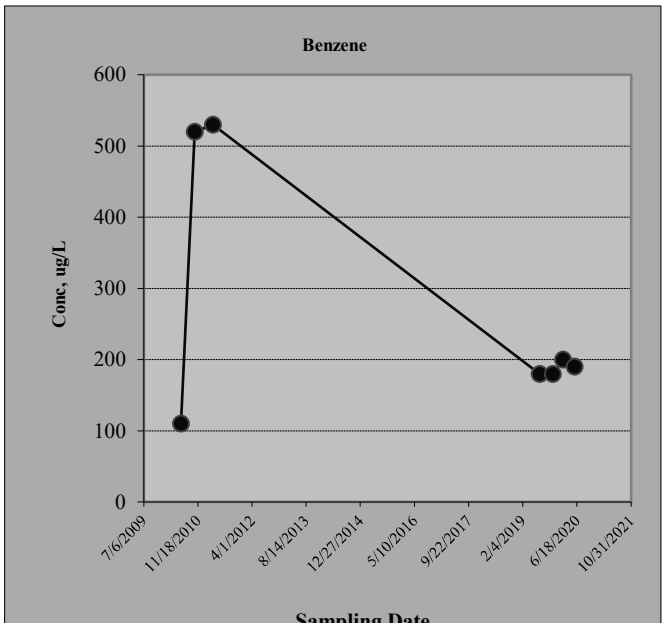
2. Mann-Kendall Non-parametric Statistical Test Results

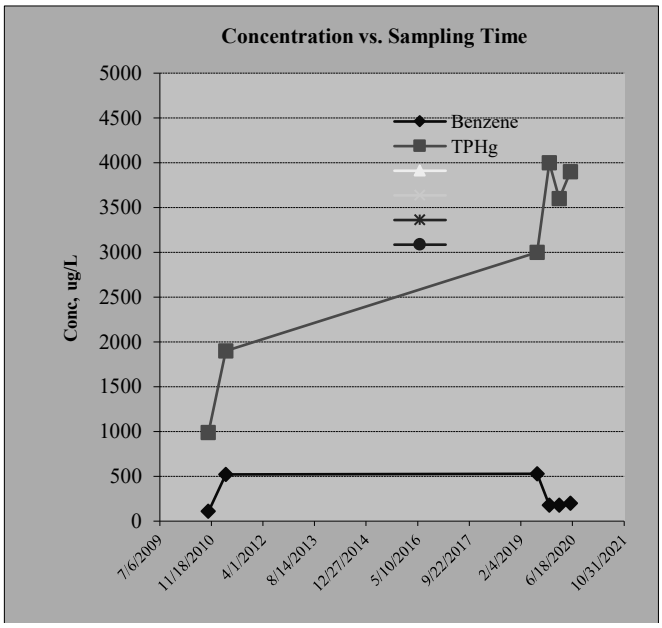
Hazardous Substance?	**Benzene**	**TPHg**				
Confidence Level Calculated?	50.00%	84.50%	NA	NA	NA	NA
Plume Stability?	Stable	Stable	NA	NA	NA	NA
Coefficient of Variation?	CV <= 1	CV <= 1	n<4	n<4	n<4	n<4
Mann-Kendall Statistic "S" value?	2	17	0	0	0	0
Number of Sampling Rounds?	7	7	0	0	0	0
Average Concentration?	272.86	3098.57	NA	NA	NA	NA
Standard Deviation?	174.71	1227.61	NA	NA	NA	NA
Coefficient of Variation?	0.64	0.40	NA	NA	NA	NA
Blank if No Errors found			n<4	n<4	n<4	n<4

3. Temporal Trend: Plot of Concentration vs. Sampling Time

Hazardous substance? **Benzene**

Plume Stability? **Stable**





Sampling Date

Sampling Date

Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)

Site Name:	*Olympic Water & Sewer, Inc. Site*
Site Address:	*718 Walker Way*
Additional Description:	

Well (Sampling) Location?	**MW-2**
Level of Confidence (Decision Criteria)?	**85%**

1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.

		Hazardous Substances (unit is ug/L)					
Sampling Event	Date Sampled	Benzene	TPHg				
#1	6/14/2010	2100	8400				
#2	10/20/2010	1300	3900				
#3	4/7/2011	500	5600				
#4	7/11/2019	780	6400				
#5	11/8/2019	820	5400				
#6	2/11/2020	840	5000				
#7	5/28/2020	150	2800				
#8							
#9							
#10							
#11							
#12							
#13							
#14							
#15							
#16							

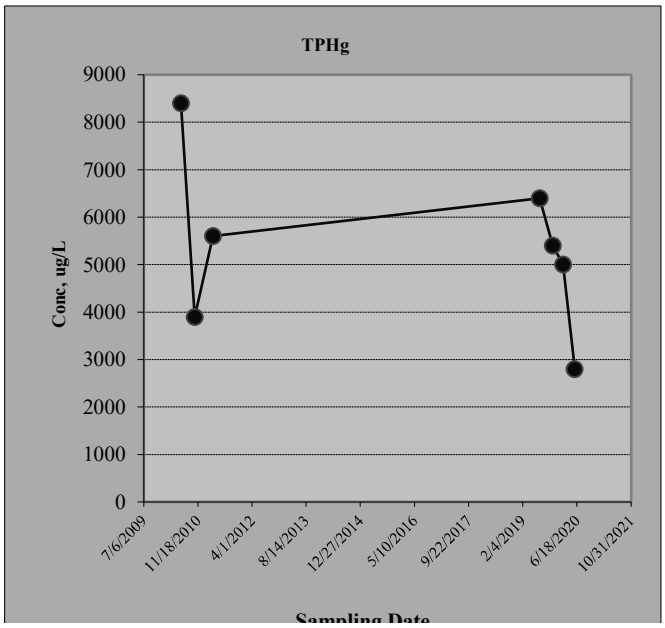
2. Mann-Kendall Non-parametric Statistical Test Results

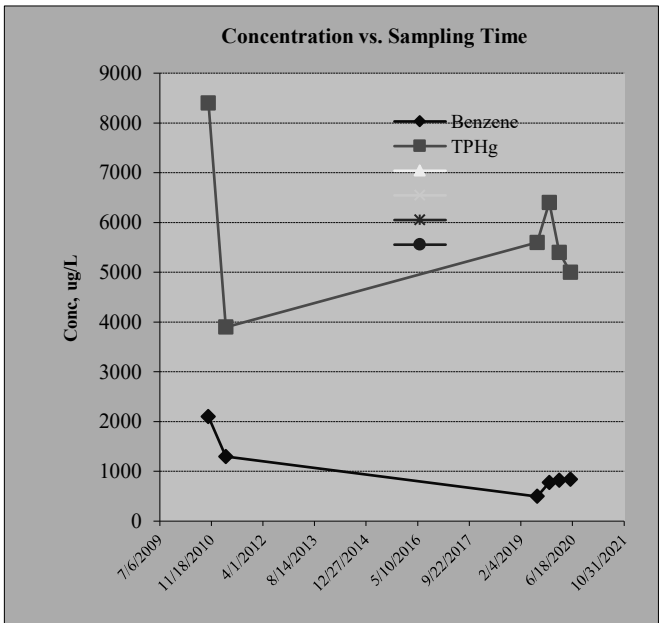
Hazardous Substance?	**Benzene**	**TPHg**				
Confidence Level Calculated?	88.10%	93.20%	NA	NA	NA	NA
Plume Stability?	Shrinking	Shrinking	NA	NA	NA	NA
Coefficient of Variation?			n<4	n<4	n<4	n<4
Mann-Kendall Statistic "S" value?	-9	-11	0	0	0	0
Number of Sampling Rounds?	7	7	0	0	0	0
Average Concentration?	927.14	5357.14	NA	NA	NA	NA
Standard Deviation?	624.73	1788.72	NA	NA	NA	NA
Coefficient of Variation?	0.67	0.33	NA	NA	NA	NA
Blank if No Errors found			n<4	n<4	n<4	n<4

3. Temporal Trend: Plot of Concentration vs. Sampling Time

Hazardous substance? **TPHg**

Plume Stability? **Shrinking**





APPENDIX C

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND USE GUIDELINES

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on this report or the product of our services without the express written consent of Aspect Consulting, LLC (Aspect). This limitation is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual conditions or limitations and guidelines governing their use of the report. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and recognized standards of professionals in the same locality and involving similar conditions.

Services for Specific Purposes, Persons and Projects

Aspect has performed the services in general accordance with the scope and limitations of our Agreement. This report has been prepared for the exclusive use of the Client and their authorized third parties, approved in writing by Aspect. This report is not intended for use by others, and the information contained herein is not applicable to other properties.

This report is not, and should not, be construed as a warranty or guarantee regarding the presence or absence of hazardous substances or petroleum products that may affect the subject property. The report is not intended to make any representation concerning title or ownership to the subject property. If real property records were reviewed, they were reviewed for the sole purpose of determining the subject property's historical uses. All findings, conclusions, and recommendations stated in this report are based on the data and information provided to Aspect, current use of the subject property, and observations and conditions that existed on the date and time of the report.

Aspect structures its services to meet the specific needs of our clients. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and subject property. This report should not be applied for any purpose or project except the purpose described in the Agreement.

This Report Is Project-Specific

Aspect considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

If changes are made to the project or subject property after the date of this report, Aspect should be retained to assess the impact of the changes with respect to the conclusions contained in the report.

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

Environmental Regulations Are Not Static

Some hazardous substances or petroleum products may be present near the subject property in quantities or under conditions that may have led, or may lead, to contamination of the subject property, but are not included in current local, state or federal regulatory definitions of hazardous substances or petroleum products or do not otherwise present potential liability. Changes may occur in the standards for appropriate inquiry or regulatory definitions of hazardous substance and petroleum products; therefore, this report has a limited useful life.

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time (for example, Phase I ESA reports are applicable for 180 days), by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope failure or groundwater fluctuations. If more than six months have passed since issuance of our report, or if any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Historical Information Provided by Others

Aspect has relied upon information provided by others in our description of historical conditions and in our review of regulatory databases and files. The available data does not provide definitive information with regard to all past uses, operations or incidents affecting the subject property or adjacent properties. Aspect makes no warranties or guarantees regarding the accuracy or completeness of information provided or compiled by others.