

**2019 ANNUAL REPORT**  
Remedy Implementation  
Crownhill Elementary School Site  
Prepared for: Bremerton School District

Project No. 100094-007-01 • January 14, 2020 • Final



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# 1 Introduction

## 1.1 General

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Historical landfill activities at the Bremerton School District (BSD) Crownhill Elementary School site (Site) have resulted in soil and groundwater contamination, including the presence of light nonaqueous-phase liquid (LNAPL) floating on the water table. The Washington State Department of Ecology (Ecology) and BSD entered into two Agreed Orders (AOs) to provide for remedial action at the Site. The first AO (No. DE7916) required BSD to conduct a Remedial Investigation (RI) and Feasibility Study (FS) in accordance with the Washington State Model Toxics Control Act (MTCA) Cleanup Regulation (Washington Administrative Code [WAC] 173-340). Upon completion of those activities in 2014, Ecology selected a cleanup remedy and prepared a Cleanup Action Plan (CAP) for the Site (Ecology, 2014). As documented in the CAP, requirements of the selected remedy include the following:

- Periodic monitoring of groundwater quality and LNAPL layer thickness
- Periodic removal and off-Site recycling/disposal of LNAPL from existing wells
- Periodic inspection and maintenance of the existing cover system to prevent direct contact exposures to landfilled materials and impacted soils
- Running the HVAC system in the main school building continuously during the school day (to address the soil vapor intrusion pathway)
- Periodic subslab soil vapor and/or indoor air sampling to reconfirm that vapor intrusion is not a concern<sup>1</sup>
- Defining requirements for performing invasive work in soil<sup>2</sup>

The second AO (No. DE11107) required BSD to develop Site-specific work plans addressing the above requirements, and to implement the cleanup remedy in accordance with those work plans. The following remedy implementation work plans were prepared by BSD and approved by Ecology in 2015:

- Groundwater/LNAPL Monitoring and Contingency Plan (Aspect, 2015a)
- LNAPL Removal Work Plan (Aspect, 2015b)
- Cover System Inspection and Maintenance Plan (Aspect, 2015c)

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<sup>1</sup> Requirements for sampling subslab soil vapor are specified in the “Cover System Inspection and Maintenance Plan” (Aspect, 2015a). Subslab soil vapor sampling was last conducted in November 2015, and is next required in November 2020. If subslab sampling indicates a potential vapor intrusion concern, then follow-up indoor air sampling may be warranted.

<sup>2</sup> Requirements for performing invasive work in soil are specified in Appendix A of the Cover System Inspection and Maintenance Plan (Aspect, 2015a).

In October 2018, Ecology provided a letter to BSD (Ecology, 2018) stating that *no further remedial action is necessary to clean up contamination at the Site, other than further operation and maintenance of the final remedy (including removal of LNAPL, continuous operation of the HVAC system during school hours, and institutional controls and monitoring), and periodically reviewing conditions at the Site.*

Annual reports documenting remedy implementation activities completed by BSD for the calendar year are submitted to Ecology in January of the following year. Annual reports for 2015 through 2018 (Aspect, 2016 through Aspect, 2019) are referenced in Section 7 of this report. This report documents activities completed in 2019.

## 1.2 Project Background

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Located in Bremerton, Washington, the Site includes both the Crownhill Elementary School (School) property at 1500 Rocky Point Road and the northern portion of the Bremerton United Methodist Church (BUMC) property at 1150 Marine Drive. A Site Plan is provided as Figure 1. The Site was used for sand and gravel mining up to the 1930s, and the mined area was backfilled with municipal and industrial wastes in the 1930s and 1940s. The original school building was constructed in 1956, and partially burned down in 1993. A series of environmental investigations were conducted during the period between that fire and construction of the current school building, which was completed in 1996. Additional investigations were conducted beginning in 2009, culminating in preparation of the “Remedial Investigation Report” (Aspect, 2014a; herein referred to as the RI report).

The purpose of the RI was to collect data necessary to adequately characterize the nature and extent of Site contamination. Using multiple lines of evidence (e.g., historical photographs, Site assessment activity, construction observations), the RI identified two generalized areas of landfill accumulation, designated the ‘north’ and ‘south’ landfill areas. Figure 1 shows the interpreted boundaries of these two areas. Landfilled materials were found at up to 40-foot depth in the north landfill area, and at up to 20-foot depth in the south landfill area. Extensive sampling identified the following constituents of potential concern (COPCs) in Site soils:

- Total petroleum hydrocarbon (TPH) in the diesel and motor-oil ranges
- Trichloroethene (TCE)
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs)
- The metals/metalloids antimony, arsenic, chromium III, copper, lead, and zinc

Three monitoring wells (MW-1 through MW-3) were installed at the Site in December 1994/January 1995, and another 13 wells (MW-4 through MW-16) during the RI (between March 2011 and October 2012; refer to Figure 1 for well locations). This network of 2-inch-diameter wells was used to periodically monitor groundwater, which is encountered beneath the Site at roughly 110-foot depth, for a wide range of contaminants. Monitoring identified TPH in the diesel and motor oil ranges, TCE, arsenic, and lead as COPCs dissolved in groundwater in the northern portion of the Site.

In addition to dissolved contaminants, separate-phase oil was observed floating on the groundwater table (as LNAPL) in well MW-8, which is installed in the north landfill area. The primary reason for installing the last five RI monitoring wells (MW-12 through MW-16) was to investigate the areal extent and thickness of the LNAPL accumulation. LNAPL was

observed in three of these wells (MW-13, MW-14, and MW-16), and periodic removal of LNAPL via bailing began in November 2012. At the recommendation of Ecology, a 4-inch-diameter well designed specifically for LNAPL extraction (EW-17) was installed in October 2015.

Site cleanup alternatives were developed and comparatively evaluated with respect to MTCA-specified criteria in the “Feasibility Study” report (Aspect, 2014b). Based on the information provided in the RI report and on the FS evaluation, the CAP (Ecology, 2014) then established Site-specific cleanup levels for constituents of concern (COCs) in Site soil, groundwater, and air, and selected a cleanup remedy for implementation. Figure 1 shows the estimated TPH, TCE, and arsenic plumes<sup>3</sup> (i.e., areas where concentrations in groundwater exceed the respective groundwater cleanup levels) as depicted in the CAP. Refer to the CAP for a full description of the selected cleanup remedy for the Site.

## 2 Routine Activities Completed in 2019

This section documents routine cleanup-related activities completed by BSD during the 2019 calendar year. Periodic monitoring of groundwater and LNAPL thickness is documented in Section 2.1, LNAPL removal in Section 2.2, and Site inspections in Section 2.3.

### 2.1 Periodic Monitoring Activities

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#### 2.1.1 Groundwater Monitoring

Semiannual groundwater monitoring was conducted on April 4 and October 14, 2019, in general accordance with the requirements of the Groundwater/LNAPL Monitoring and Contingency Plan (Aspect, 2015a). Well locations are shown on Figure 1. Table 1 identifies which Site wells are included in the monitoring program, which of those wells contain LNAPL, and the specific COCs analyzed in groundwater samples collected from the wells that do not contain LNAPL. Monitoring results for the non-LNAPL wells are summarized in Table 2. Recent results (going back to December 2013) are included in Table 2; refer to the RI report (Aspect, 2014a) for results prior to December 2013 and for information on Site wells not included in the monitoring program. Laboratory reports for groundwater samples submitted for analysis, dated April 11 and October 23, 2019, are provided in Appendix D.

Groundwater cleanup levels are 500 micrograms per liter ( $\mu\text{g/L}$ ) for diesel- and motor oil-range TPH, and 5  $\mu\text{g/L}$  for TCE and total arsenic. Well MW-10 is the conditional point of compliance for achieving these cleanup levels. This well has been sampled on 21 occasions through October 2019, and arsenic is the only COC detected in any of those sampling rounds.

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<sup>3</sup> Lead is also a COC in groundwater. However, as discussed in the *Groundwater/LNAPL Monitoring and Contingency Plan* (Aspect, 2015a), compliance with the groundwater cleanup level for lead has been demonstrated. Therefore, lead is not included in the groundwater monitoring program.



Well MW-6, the only well with arsenic cleanup level exceedances since early 2012,<sup>4</sup> is located approximately 130 feet upgradient of MW-10 and serves as a sentinel well for dissolved contaminant plume migration. The Groundwater/LNAPL Monitoring and Contingency Plan (Aspect, 2015a) specifies contingency actions that will be taken if arsenic is detected above 40 µg/L at MW-6 or above 4.5 µg/L at MW-10. Neither of these concentration limits was exceeded in 2019.

Figure 2 shows arsenic concentrations measured at MW-6 and MW-10 since those wells were installed. Concentrations at MW-6 exhibited an increasing trend through the April 2016 monitoring round. More recent results have fluctuated widely. The April 2018 result (29.7 µg/L) was the highest concentration measured to date, and significantly lower concentrations were measured in the three rounds conducted since then. The cause(s) of arsenic concentration fluctuation at MW-6 is unknown.

The arsenic concentrations measured at MW-10 in 2019 are slightly higher than the 2018 measurements, but remain well below the contingency action trigger level of 4.5 µg/L.

MW-9 is the only well with TCE cleanup level exceedances. TCE concentrations measured at this well increased marginally from 2018 to 2019, but remain within the range of previous measurements.

MW-15 is located immediately downgradient of the LNAPL area and serves as a sentinel well for TPH plume migration.<sup>5</sup> Diesel-range TPH was detected at this well in the April 2019 monitoring round at a concentration of 61 µg/L, but was not detected (at a detection limit of 50 µg/L) in the October round. This is the third time diesel-range TPH has been detected at MW-15; the previous detections were in November 2012 (at an estimated 70 µg/L) and April 2018 (at 53 µg/L). Consistent with previous years, motor oil-range TPH was not detected at MW-15 in 2019.

Beginning in 2015, TPH in the diesel and motor oil ranges has been measured on just an annual basis at wells MW-5 and MW-12. The motor-oil-range TPH concentration measured at MW-12 in October 2019 (1,200 µg/L) is the highest to date. The other TPH results are within the range of previous detections. Diesel- and motor oil-range TPH concentrations at both wells remain above the corresponding groundwater cleanup levels.

Water samples collected from the McKinney domestic well (sampled in both 2019 monitoring rounds) are analyzed for TCE only. As shown in Table 2, TCE has never been detected in any of the water samples collected from the McKinney well.

### **2.1.2 LNAPL Thickness Monitoring**

LNAPL thickness monitoring was conducted concurrent with groundwater monitoring in April and October 2018. Consistent with previous monitoring rounds, LNAPL was detected in five wells (MW-8, MW-13, MW-14, MW-16, and EW-17). Table 3 summarizes LNAPL thicknesses measured in these wells since they were installed. Thicknesses measured in 2019 ranged from 0.4 feet in MW-08 to 3.0 feet in EW-17 (April measurements).

<sup>4</sup> As shown on Figure 2, the arsenic cleanup level was also exceeded at MW-10 the first two times it was sampled following its installation in December 2011. Arsenic at MW-10 has been consistently below its cleanup level in the last 17 monitoring rounds.

<sup>5</sup> Well MW-15 is also the conditional point of compliance for LNAPL migration.

## 2.2 LNAPL Removal

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Bottom-filling bailers are used to periodically remove LNAPL from Site wells. LNAPL removal is attempted whenever an LNAPL layer thickness of at least 0.3 foot is measured in a well (prior to bailing). In 2019, LNAPL removal was conducted concurrent with the two LNAPL thickness/groundwater monitoring rounds discussed above, in general accordance with the requirements of the *LNAPL Removal Work Plan* (Aspect, 2015b). Bailing was attempted from all five LNAPL-containing wells (MW-8, MW-13, MW-14, MW-16, and EW-17) in both the April and October rounds. Table 3 shows estimated LNAPL volumes bailed from each well during each removal event, and Figure 3 plots cumulative LNAPL removal on an annual basis. An estimated total of 2.44 liters of LNAPL was bailed in 2019. Since bailing began in 2012, an estimated total of nearly 23 liters of LNAPL have been removed.

## 2.3 Site Inspections

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Semiannual Site inspections were conducted on June 25 and December 11, 2019, in accordance with the requirements of the *Cover System Inspection and Maintenance Plan* (Aspect, 2015c). The completed inspection records are provided in Appendices A and B, along with photos taken during the inspections. The photos were taken from four specific vantage points, identified on Figure 1, to provide photo-documentation of the following cover features:

- Photo Location 1 – Pavement in the parking area along Bertha Avenue NW, where an RI soil sample collected from beneath the pavement (composite sample to 3-foot depth) contained lead at a concentration exceeding the cleanup level.
- Photo Locations 2 and 4 – Soil/sod covers next to the portable classroom building and in the southeast corner of the School property, where lead cleanup level exceedances were identified in soil samples collected from the 1- to 3-foot depth range. In summer 2013, these two areas were covered with a geotextile fabric (placed directly on the undisturbed ground surface) and an additional 1-foot thickness of fill soil was imported and hydroseeded to supplement the pre-existing clean soil cover layer.
- Photo Location 3 – A soil/sod cover in the northwest corner of the BUMC property (and extending approximately 10 feet onto the School property), where an interim action was completed in spring 2012 in which contaminated surface soils were removed to a 1-foot depth, a geotextile fabric was placed on remaining contaminated soils, and a 1-foot thickness of fill soil was imported and hydroseeded.

In July 2018, asphalt repairs were completed at three locations in the Bertha Ave NW parking area (Photo Location 1) after potholes were observed (documented in Aspect, 2019). The parking area appeared to be in excellent condition and the soil/sod cover at Photo Locations 2 through 4 appeared to be in good condition during both 2019 inspection events. The 2019 inspections did not identify any cover system deficiencies in other areas of the Site or other action items.

## 3 Nonroutine Activities Completed in 2019

### 3.1 Disposal of Drummed Liquids

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On February 26, 2019, six drums containing water mixed with LNAPL were removed from the BSD bus maintenance facility and disposed of as nonhazardous waste. These waste liquids, generated at the Site between October 2015 and October 2018, included well purge water from groundwater monitoring rounds and LNAPL/water recovered during LNAPL removal rounds. Waste disposal documentation is provided in Appendix C.

## 4 Statement of Compliance

On behalf of BSD, Aspect certifies that the remedy implementation activities completed at the Site in 2019 complied with the requirements of the CAP, Agreed Order No. DE11107, and the remedy implementation work plans approved by Ecology.

## 5 Plans for 2020

The following remedy implementation activities are planned for 2020:

- Periodic review by Ecology (refer to Section 6 below)
- Conduct semiannual rounds of groundwater/LNAPL monitoring and LNAPL removal (scheduled for April and October 2020)<sup>6</sup>
- Conduct semiannual Site inspections (scheduled for June and December 2020)
- Conduct subslab soil vapor sampling (scheduled for November 2020)

Other activities, as specified in the remedy implementation work plans, may also be required based on monitoring and/or inspection results.

## 6 Periodic Review in 2020

At least every 5 years after the initiation of a cleanup action, Ecology conducts a review of postcleanup site conditions and monitoring data to assure that human health and the environment are being protected. Ecology determined that the Crownhill cleanup action was initiated with the filing of the environmental covenants in April 2015, and plans to conduct

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<sup>6</sup> If an LNAPL thickness greater than 4 feet is measured in the April monitoring round, an LNAPL removal round will also be required in July 2020.

the first periodic review in early 2020. Paragraph R in Section VIII of Agreed Order No. DE11107 states:

***At least ninety (90) days prior to each periodic review, BSD shall submit a report to Ecology that documents whether human health and the environment are being protected based on the factors set forth in WAC 173-340-420(4).***

Those factors are listed below in italics along with Aspect's responses on behalf of BSD:

***(a) The effectiveness of ongoing or completed cleanup actions, including the effectiveness of engineered controls and institutional controls limiting exposure to hazardous substances remaining at the site.***

Based on the results of periodic inspections, the existing cover over landfilled materials and near-surface impacted soils has been effective at preventing direct contact exposures. No repair, maintenance, or contingency actions are required at this time.

Periodic bailing has removed small volumes of LNAPL from the water table beneath the north landfill area. Based on the results of periodic LNAPL monitoring, there is no evidence of an increase in LNAPL layer thickness or lateral migration of the LNAPL plume. LNAPL has not been detected at monitoring well MW-6, the conditional point of compliance for LNAPL migration.

Based on the results of periodic groundwater monitoring, there is no evidence of significant expansion or downgradient migration of the dissolved contaminant plumes (Figure 1). Groundwater cleanup levels for arsenic, lead, TCE, and TPH continue to be met at well MW-10, the conditional point of compliance for dissolved contamination. Arsenic concentrations in groundwater remain below the contingency action trigger levels of 40 µg/L at MW-6 and 4.5 µg/L at MW-10. TCE has never been detected in any of the water samples collected from the McKinney domestic well.

The HVAC system in the main school building continues to be run during the school day to minimize the potential for soil vapor intrusion. Compliance with air cleanup standards was demonstrated by subslab vapor sampling conducted in November 2010 and November 2015. The next subslab vapor sampling event is scheduled for November 2020.

Separate environmental covenants were recorded and remain active for the School and BUMC properties. Both environmental covenants prohibit or restrict activities that would interfere with the integrity of the existing cover. The environmental covenant on the School property also prohibits drinking water well installation or invasive activities that may result in exposure to LNAPL or groundwater contamination.

***(b) New scientific information for individual hazardous substances or mixtures present at the site.***

There is no new relevant scientific information for hazardous substances remaining at the Site.

***(c) New applicable state and federal laws for hazardous substances present at the site.***

MTCA cleanup levels for contaminants of concern at the Site have not changed since the No Further Action (NFA) determination was issued (Ecology, 2018).

*(d) Current and projected site and resource uses.*

The Site continues to be occupied by the School and BUMC (unchanged from when the NFA determination was issued). There are no changes projected in the Site use.

*(e) The availability and practicality of more permanent remedies.*

The implemented remedy, as described in the CAP, continues to be protective of human health and the environment. While higher preference cleanup technologies may be available, they are still not practicable at this Site.

*(f) The availability of improved analytical techniques to evaluate compliance with cleanup levels.*

The analytical methods used at the time of the remedial actions were capable of detection below Site cleanup levels. The presence of improved analytical techniques would not affect decisions or recommendations made for the Site.

The above responses, along with the other information and data provided in this report, are intended to satisfy the BSD reporting requirement in Section VIII, Paragraph R of the Agreed Order.

## 7 References

- Aspect Consulting, LLC (Aspect), 2014a, Remedial Investigation, Crownhill Elementary School, prepared for Bremerton School District, November 2014.
- Aspect Consulting, LLC (Aspect), 2014b, Feasibility Study, Crownhill Elementary School, prepared for Bremerton School District, October 21, 2014.
- Aspect Consulting, LLC (Aspect), 2015a, Groundwater/LNAPL Monitoring and Contingency Plan, Crownhill Elementary School Site, prepared for Bremerton School District, November 19, 2015.
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Aspect Consulting, LLC (Aspect), 2019, 2018 Annual Report, Remedy Implementation, Crownhill Elementary School Site, prepared for Bremerton School District, January 22, 2019.

Washington State Department of Ecology (Ecology), 2014, Cleanup Action Plan, Bremerton School District, Crownhill Elementary School Site, December 10, 2014.

Washington State Department of Ecology (Ecology), 2018, Letter to D. Herrington, Bremerton School District, regarding Status of Agreed Order No. DE11107 and No Further Action to complete Cleanup of the Crownhill Elementary School Site, October 15, 2018.

## 8 Limitations

Work for this project was performed for the Bremerton School District (Client), 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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# **TABLES**

## Table 1. 2019 Well Monitoring Program Summary

Project No. 100094-006-01, Crownhill Elementary, Bremerton, Washington

Well Included in Monitoring Program <sup>1</sup>	LNAPL Present in Well <sup>2</sup>	Groundwater Samples Collected for Analysis of COCs <sup>1</sup>			Additional Notes
		TPH <sup>3</sup>	Total Arsenic <sup>4</sup>	TCE <sup>5</sup>	
MW-5		spring			
MW-6			spring/fall		6
MW-8	X				
MW-9				spring/fall	
MW-10		spring/fall	spring/fall	spring/fall	7
MW-12		fall			
MW-13	X				
MW-14	X				
MW-15		spring/fall			8
MW-16	X				
EW-17	X				
McKinney				spring/fall	9

COC constituent of concern  
 LNAPL light non-aqueous-phase liquid  
 TCE trichloroethene  
 TPH total petroleum hydrocarbon

### Notes

- 1) The *Groundwater/LNAPL Monitoring and Contingency Plan* (Aspect, 2015a) provides the rationale for including a well in the monitoring program, and for selecting well-specific COC analytes. Refer to Table 2 for groundwater monitoring results.
- 2) All wells except McKinney are monitored for LNAPL. If LNAPL is detected, its thickness is measured (refer to Table 3) and groundwater samples are not collected for analysis.
- 3) TPH is analyzed for using Method NWTPH-Dx. Both diesel-range TPH and motor-oil-range TPH are COCs.
- 4) Total arsenic is analyzed for using EPA Method 6010.
- 5) TCE is analyzed for using EPA Method 8260.
- 6) Well MW-6 provides early warning of potential arsenic migration.
- 7) Well MW-10 is the conditional point of compliance for achieving groundwater cleanup levels.
- 8) Well MW-15 is the conditional point of compliance for LNAPL migration.
- 9) The McKinney domestic well water sample is collected from the outdoor faucet on the north side of the residence at 1724 Dora Ave NW.



**Table 2. Groundwater Monitoring Data Summary**

Project No. 100094-006-01, Crownhill Elementary, Bremerton, Washington

Well ID and Top-of-Casing Elevation <sup>1,2</sup>	Date	Depth to Water (feet below top-of-casing)	Groundwater Elevation (feet) <sup>2</sup>	Constituent of Concern/Concentration <sup>3</sup>			
				Diesel-Range TPH	Motor-Oil-Range TPH	TCE	Total Arsenic
MW-5 136.95 ft	12/18/13	117.36	19.59	<b>2,100 x</b>	<b>750 x</b>	1.8	1.0
	04/03/14	117.17	19.78	<b>2,400 x</b>	<b>770 x</b>	na	1.2
	07/01/14	116.23	20.72	<b>2,000 x</b>	490 x	na	1.0
	10/13/14	117.56	19.39	<b>1,300</b>	260 x	na	1.0
	04/07/15	116.49	20.46	<b>2,000</b>	430 x	na	na
	04/05/16	113.41	23.54	<b>1,800</b>	<b>600 x</b>	na	na
	04/04/17	112.13	24.82	<b>2,200 x</b>	<b>750 x</b>	na	na
	04/05/18	113.16	23.79	<b>2,600 x</b>	<b>1,100 x</b>	na	na
MW-6 133.87 ft	04/04/19	116.24	20.71	<b>1,600 x</b>	<b>520 x</b>	na	na
	12/18/13	124.36	9.51	50 U	250 U	1.0 U	<b>16.6</b>
	04/03/14	124.70	9.17	50 U	250 U	na	<b>20.5</b>
	07/01/14	124.40	9.47	50 U	250 U	na	<b>19.9</b>
	10/13/14	124.54	9.33	50 U	250 U	na	<b>20.4</b>
	04/07/15	124.61	9.26	na	na	na	<b>26.7</b>
	10/28/15	124.84	9.03	na	na	na	<b>22.8</b>
	04/05/16	124.54	9.33	na	na	na	<b>29.1</b>
	10/28/16	123.70	10.17	na	na	na	<b>23.3</b>
	04/04/17	123.21	10.66	na	na	na	<b>12.5</b>
	10/27/17	122.79	11.08	na	na	na	<b>29.3</b>
	04/05/18	123.31	10.56	na	na	na	<b>29.7</b>
MW-9 134.39 ft	10/26/18	123.71	10.16	na	na	na	<b>23.0</b>
	04/04/19	124.14	9.73	na	na	na	<b>19.4</b>
	10/14/19	124.77	9.10	na	na	na	<b>21.9</b>
	12/17/13	114.49	19.90	110 x	250 U	<b>11</b>	1.0 U
	04/03/14	114.35	20.04	210 x	280 x	<b>11</b>	1.0 U
	07/01/14	113.44	20.95	180 x	250 U	<b>12</b>	1.0 U
	10/13/14	114.71	19.68	180 x	250 U	<b>10</b>	1.0 U
	04/07/15	114.50	19.89	na	na	<b>11</b>	na
	10/28/15	115.30	19.09	na	na	<b>10</b>	na
	04/05/16	110.60	23.79	na	na	<b>11</b>	na
	10/28/16	112.35	22.04	na	na	<b>8.6</b>	na
	04/04/17	109.23	25.16	na	na	<b>9.5</b>	na
	10/27/17	110.58	23.81	na	na	<b>6.8</b>	na
05/02/18	110.35	24.04	na	na	<b>7.1</b>	na	
10/26/18	112.98	21.41	na	na	<b>7.9</b>	na	
04/04/19	113.39	21.00	na	na	<b>9.7</b>	na	
10/14/19	nm <sup>4</sup>	--	na	na	<b>8.0</b>	na	
MW-10 132.33 ft	12/18/13	120.87	11.46	50 U	250 U	1.0 U	3.3
	04/03/14	121.21	11.12	50 U	250 U	1.0 U	3.9
	07/01/14	120.55	11.78	50 U	250 U	1.0 U	3.0
	10/13/14	121.48	10.85	50 U	250 U	1.0 U	3.0
	04/07/15	120.60	11.73	50 U	250 U	1.0 U	2.8
	10/28/15	121.30	11.03	80 U	400 U	1.0 U	2.7
	04/05/16	119.33	13.00	50 U	250 U	1.0 U	2.6
	10/28/16	120.35	11.98	50 U	250 U	1.0 U	2.6
	04/04/17	118.58	13.75	50 U	250 U	1.0 U	2.2
	10/27/17	119.30	13.03	50 U	250 U	1.0 U	2.1
	04/05/18	122.04	10.29	50 U	250 U	1.0 U	1.9
	10/26/18	120.62	11.71	50 U	250 U	1.0 U	1.8
	04/04/19	120.85	11.48	50 U	250 U	1.0 U	2.0
10/14/19	121.79	10.54	50 U	250 U	1.0 U	2.1	
MW-12 133.87 ft	12/17/13	114.24	19.63	<b>2,000 x</b>	<b>800 x</b>	1.0 U	1.5
	04/03/14	114.11	19.76	<b>2,800 x</b>	<b>850 x</b>	na	1.4
	07/01/14	113.17	20.70	<b>1,800 x</b>	420 x	na	1.7
	10/13/14	114.45	19.42	<b>1,600</b>	250 U	na	1.7
	10/28/15	115.02	18.85	<b>2,400 x</b>	<b>620 x</b>	na	na
	10/28/16	112.19	21.68	<b>1,500 x</b>	<b>680 x</b>	na	na
	10/27/17	110.40	23.47	<b>1,700 x</b>	<b>570 x</b>	na	na
	10/26/18	112.76	21.11	<b>2,200 x</b>	<b>510 x</b>	na	na
	10/14/19	115.37	18.50	<b>1,900 x</b>	<b>1,200 x</b>	na	na
MW-15 133.37 ft	12/17/13	nm <sup>4</sup>	--	50 U	250 U	1.0 U	4.6
	04/03/14	nm <sup>4</sup>	--	50 U	250 U	na	1.2
	07/01/14	nm <sup>4</sup>	--	50 U	250 U	na	1.0 U
	10/13/14	nm <sup>4</sup>	--	50 U	250 U	na	1.1
	04/07/15	nm <sup>4</sup>	--	50 U	250 U	na	na
	10/28/15	nm <sup>4</sup>	--	50 U	250 U	na	na
	04/05/16	109.88	23.49	50 U	250 U	na	na
	10/28/16	111.65	21.72	50 U	250 U	na	na
	04/04/17	109.61	23.76	50 U	250 U	na	na
	10/27/17	109.90	23.47	50 U	250 U	na	na
	04/05/18	109.65	23.72	53 x	250 U	na	na
	10/26/18	nm <sup>4</sup>	--	60 U	300 U	na	na
04/04/19	nm <sup>4</sup>	--	61 x	250 U	na	na	
10/14/19	nm <sup>4</sup>	--	50 U	250 U	na	na	
McKinney (domestic well)	10/6/14 <sup>5</sup>	nm	--	100 U	200 U	0.2 U	0.4
	2/19/15 <sup>5</sup>	nm	--	100 U	200 U	0.2 U	0.4
	6/1/2015 <sup>5</sup>	nm	--	100 U	200 U	0.2 U	0.3
	10/28/15	nm	--	na	na	1.0 U	na
	04/05/16	nm	--	na	na	1.0 U	na
	10/28/16	nm	--	na	na	1.0 U	na
	04/04/17	nm	--	na	na	1.0 U	na
	10/27/17	nm	--	na	na	1.0 U	na
	04/04/18	nm	--	na	na	1.0 U	na
	10/26/18	nm	--	na	na	1.0 U	na
04/04/19	nm	--	na	na	1.0 U	na	
10/14/19	nm	--	na	na	1.0 U	na	

na not analyzed      TCE trichloroethene      U analyte not detected at or above the reported result  
 nm not measured      TPH total petroleum hydrocarbon      x sample chromatographic pattern does not resemble the fuel standard used for quantitation

**Notes**

- 1) Only wells included in the current monitoring program that do not contain LNAPL are shown in this table. Refer to Table 3 for wells containing LNAPL. Refer to the Remedial Investigation Report (Aspect, 2014a) for data prior to December 2013 and for information on other wells.
- 2) Elevations are based on NAVD88 vertical datum.
- 3) All concentrations are in micrograms per liter (µg/L). Cleanup levels are 500 µg/L for diesel- and motor-oil-range TPH, and 5 µg/L for TCE and total arsenic. Cleanup level exceedances are bolded.
- 4) Water level was below top of pump and could not be measured.
- 5) Sample was collected for analysis by the Kitsap Public Health District and analyzed by Analytical Resources, Inc.

**Table 3. LNAPL Thickness Measurements and Removal Summary**

Project No. 100094-006-01, Crownhill Elementary, Bremerton, Washington

Well ID	Date	Initial Thickness in ft <sup>(1)</sup>	LNAPL Removal in Liters <sup>(2)</sup>	Notes
MW-8	10/26/12	0.20		Well installed on 12/20/11.  (Note 5) (Note 4)  Not bailed because initial thickness was <0.3 feet. (Note 4) Not bailed because initial thickness was <0.3 feet. Not bailed because initial thickness was <0.3 feet. (Note 4) Not bailed because initial thickness was <0.3 feet. Not bailed because initial thickness was <0.3 feet. (Note 4) (Note 4) (Note 4) (Note 4) (Note 4)
	11/21/12	nm		
	01/31/13	0.10		
	05/03/13	0.03		
	08/07/13	0.23		
	12/17/13	0.86		
	04/02/14	0.39	0.18	
	05/23/14	0.38	0.11	
	07/01/14	0.23		
	10/13/14	0.28		
	04/07/15	0.27		
	10/28/15	0.90	0.36	
	01/18/16	0.10		
	04/05/16	0.01		
	10/28/16	0.40	0.01	
04/04/17	0.13			
10/27/17	0.15			
04/03/18	(Note 6)	0.02		
10/26/18	1.70	0.75		
04/04/19	0.40	0.23		
10/14/19	1.15	0.18		
<b>Cumulative LNAPL Removal</b>			<b>1.84</b>	
MW-13	11/01/12	1.46		Well installed on 10/25/12. (Note 4)  Water detected above LNAPL. (Note 4) Water detected above LNAPL. (Note 4)  (Note 4) (Note 4) (Note 4) (Note 4) Not bailed because initial thickness was <0.3 feet. Not bailed because initial thickness was <0.3 feet. Not bailed because initial thickness was <0.3 feet. (Note 4) (Note 4) (Note 4) (Note 4) (Note 4) (Note 4) (Note 4) (Note 4)
	11/21/12	0.99	0.90	
	01/31/13	0.10		
	05/03/13	0.31		
	08/07/13	0.49		
	12/17/13	4.90		
	04/02/14	1.35	0.02	
	05/23/14	2.08	0.18	
	07/01/14	0.84		
	10/13/14	3.39		
	04/07/15	1.00	0.17	
	10/28/15	4.15	0.02	
	01/18/16	1.39	0.52	
	04/05/16	1.31	0.26	
	10/28/16	0.05		
04/04/17	0.20			
10/27/17	0.04			
04/03/18	1.70	0.35		
10/26/18	2.00	1.05		
04/04/19	1.70	0.22		
10/14/19	1.10	0.10		
<b>Cumulative LNAPL Removal</b>			<b>3.78</b>	
MW-14	11/01/12	nd		Well installed on 10/26/12.  Not bailed because initial thickness was <0.1 feet. Not bailed because initial thickness was <0.1 feet.  Not bailed because initial thickness was <0.3 feet. (Note 4) (Note 4) Not bailed because initial thickness was <0.3 feet. (Note 5) (Note 4) (Note 5) (Note 5) (Note 5) (Note 5) (Note 5) (Note 5) (Note 4) (Note 4)
	01/31/13	nd		
	05/03/13	nd		
	08/07/13	0.12		
	12/17/13	0.10		
	04/02/14	0.08		
	05/23/14	0.09		
	07/01/14	0.46		
	10/13/14	0.71		
	04/07/15	0.23		
	10/28/15	1.48	0.35	
	01/18/16	0.32	0.20	
	04/05/16	0.01		
	10/28/16	0.37	0.03	
	04/04/17	0.77	0.32	
10/27/17	0.60	0.64		
04/03/18	0.70	0.06		
10/26/18	2.40	1.65		
04/04/19	1.20	0.71		
10/14/19	2.90	0.27		
<b>Cumulative LNAPL Removal</b>			<b>4.22</b>	
MW-16	11/01/12	nd		Well installed on 10/26/12.  (Note 5) (Note 5)  (Note 5) (Note 4) Bailing was stopped after measuring <0.01 foot LNAPL thickness. Four bailing attempts recovered only a trace of LNAPL. Third bailing attempt recovered only 20 ml of LNAPL. Not bailed because initial thickness was <0.3 feet. (Note 4) (Note 4) (Note 5) (Note 5) (Note 4) (Note 4)
	01/31/13	0.50		
	05/03/13	0.48		
	08/07/13	2.61		
	12/17/13	2.83		
	04/02/14	3.02	0.85	
	05/23/14	4.25	2.06	
	07/01/14	3.79		
	10/13/14	3.25		
	04/07/15	2.64	1.19	
	10/28/15	2.18	0.35	
	01/18/16	0.45	0.17	
	04/05/16	0.39	0.00	
	10/28/16	0.87	0.10	
	04/04/17	0.24		
10/27/17	2.15	1.35		
04/03/18	(Note 6)	0.30		
10/26/18	3.25	1.55		
04/04/19	2.30	0.27		
10/14/19	1.10	0.15		
<b>Cumulative LNAPL Removal</b>			<b>8.34</b>	
EW-17	10/28/15	0.45	0.03	Well installed on 10/13/15. LNAPL observed to be much more viscous (sludge-like) than in other wells. (Note 4) LNAPL appears to be less viscous than in previous rounds. (Note 4) Fourth bailing attempt recovered only 5 ml of LNAPL. Initial thickness measurements ranged from 0.23 to 3.45 ft. (Note 4) (Note 4) (Note 4) (Note 5) (Note 4) (Note 4)
	01/18/16	0.40	0.21	
	04/05/16	0.44	1.66	
	10/28/16	0.47	0.11	
	04/04/17	1.95	0.52	
	10/27/17	0.85	0.12	
	04/03/18	(Note 6)	0.60	
	10/26/18	1.90	1.11	
	04/04/19	3.00	0.18	
10/14/19	1.30	0.14		
<b>Cumulative LNAPL Removal</b>			<b>4.67</b>	
<b>TOTAL LNAPL REMOVED</b>			<b>22.8</b>	<b>(ALL WELLS)</b>

LNAPL light non-aqueous-phase liquid      nd no detectable LNAPL thickness      nm not measured

- Notes:**
- 1) The viscous, sticky nature of the LNAPL results in inconsistent readings of the interface probe (used to measure depth-to-LNAPL and depth-to-water). Therefore, the reported LNAPL thicknesses can only be regarded as estimates.
  - 2) Water has been observed to separate out from LNAPL samples over a period of months. Therefore, actual volumes of non-aqueous-phase liquid removed from the subsurface are likely less than the LNAPL volumes reported in this table.
  - 3) Well EW-17 (4-inch ID) has a unit volume of approximately 2.5 liters per vertical foot of well casing. All other wells are 2-inch ID and have unit volumes of approximately 0.62 liter per vertical foot of well casing.
  - 4) Bailing was stopped after bailer retrieved a relatively large volume of water with little or no LNAPL.
  - 5) Bailing was stopped because bailer would no longer go down well due to LNAPL buildup on inside well casing.
  - 6) Unable to determine initial thickness of LNAPL. Bailing was attempted.

# FIGURES



1724 Dora Avenue NW (Note 2)

North Landfill Area

Estimated Extent of TPH Cleanup Level Exceedance

Estimated Extent of TCE Cleanup Level Exceedance

Geotextile at 1 Foot Below Ground Surface (Summer 2013 Interim Action)

Estimated Extent of Arsenic Cleanup Level Exceedance

Bertha Ave NW Parking Area

PORTABLE CLASSROOM BUILDING

MAIN SCHOOL BUILDING

South Landfill Area

Geotextile at 1 Foot Below Ground Surface (Summer 2013 Interim Action)

Geotextile at 1 Foot Below Ground Surface (Spring 2012 Interim Action)

MARINE DR

DORA AVE

BERTHA AVE NW

**Well Locations:**

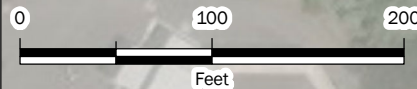
- Extraction Well Included in Monitoring Program
- Monitoring Well Included in Monitoring Program
- Monitoring Well Not Included in Monitoring Program
- McKinney Domestic Well (Note 2)
- Approximate photo location & orientation for semiannual cover system inspections

**Note:**

- (1) LNAPL has been observed in Wells EW-17, MW-8, MW-13, MW-14, and MW-16.
- (2) The McKinney well water sample is collected from the outdoor faucet on the north side of the residence at 1724 Dora Avenue NW.

**Other Site Features and Interpretation:**

- Interpreted Extent of Landfill Activity
- Estimated Extent of Groundwater Cleanup Level Exceedances in 2014 (Ecology, 2014)
- Bremerton School District Property Boundary
- Bremerton United Methodist Church Property Boundary
- Inferred Direction of Groundwater Flow



**Site Plan**

2019 Annual Report  
Crownhill Elementary  
Bremerton, Washington



JAN-2020

PROJECT NO. 100094

BY: DLH / PPW

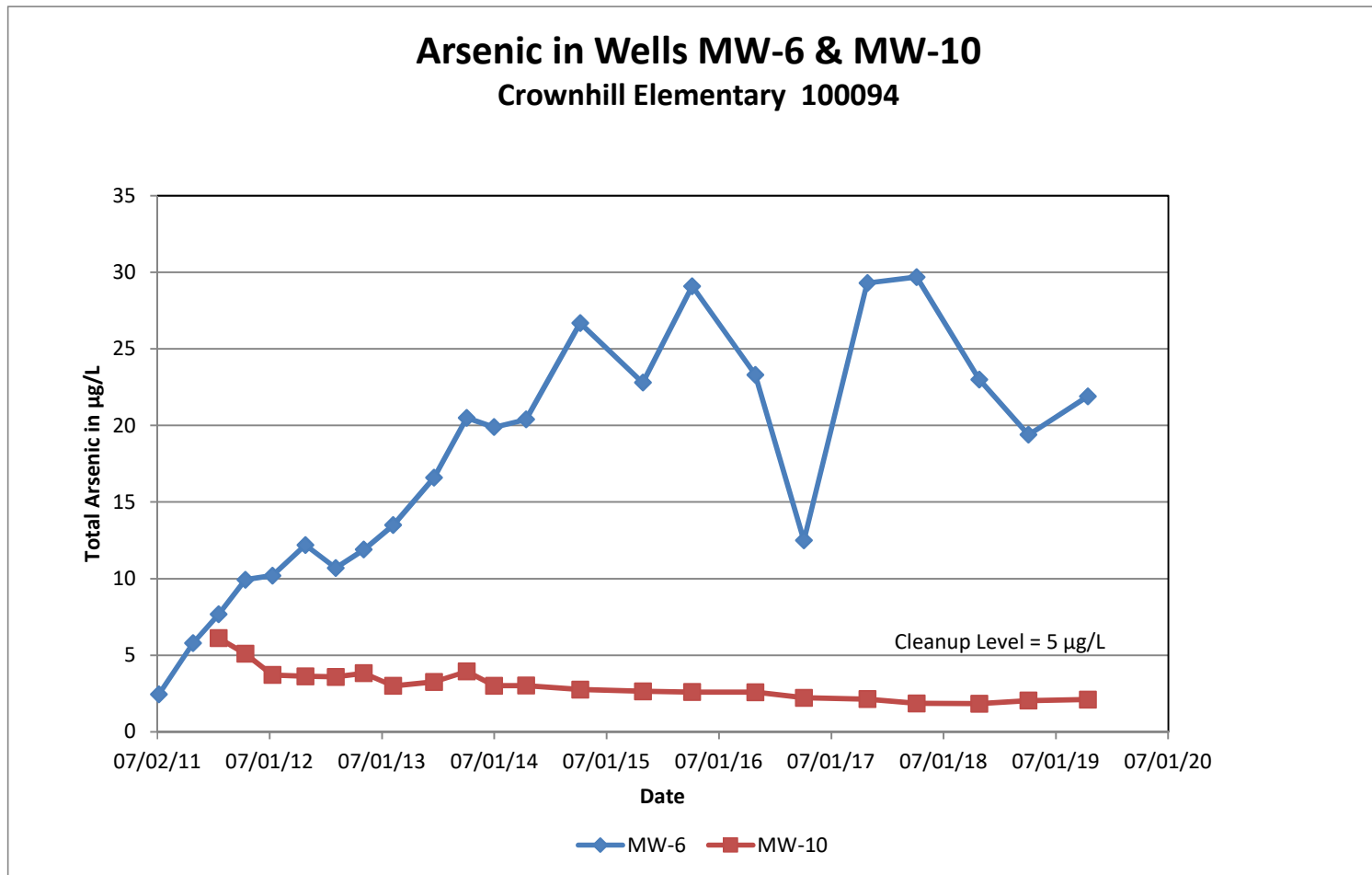
REVISED BY: EAC

FIGURE NO.

**1**

## Figure 2. Arsenic in Wells MW-6 and MW-10

Crownhill Elementary, Bremerton, Washington



### Notes:

- 1) Well MW-6, installed in March 2011, provides early warning of potential arsenic migration.
- 2) Well MW-10, installed in December 2011, is the conditional point of compliance for arsenic in groundwater.

Aspect Consulting

January 2020

V:\100094 BSD Crownhill Elementary RIFS\Deliverables\Remediation Implementation\2019 Annual Report\Client Review Draft\Tables and Figs\TbIs and Fig

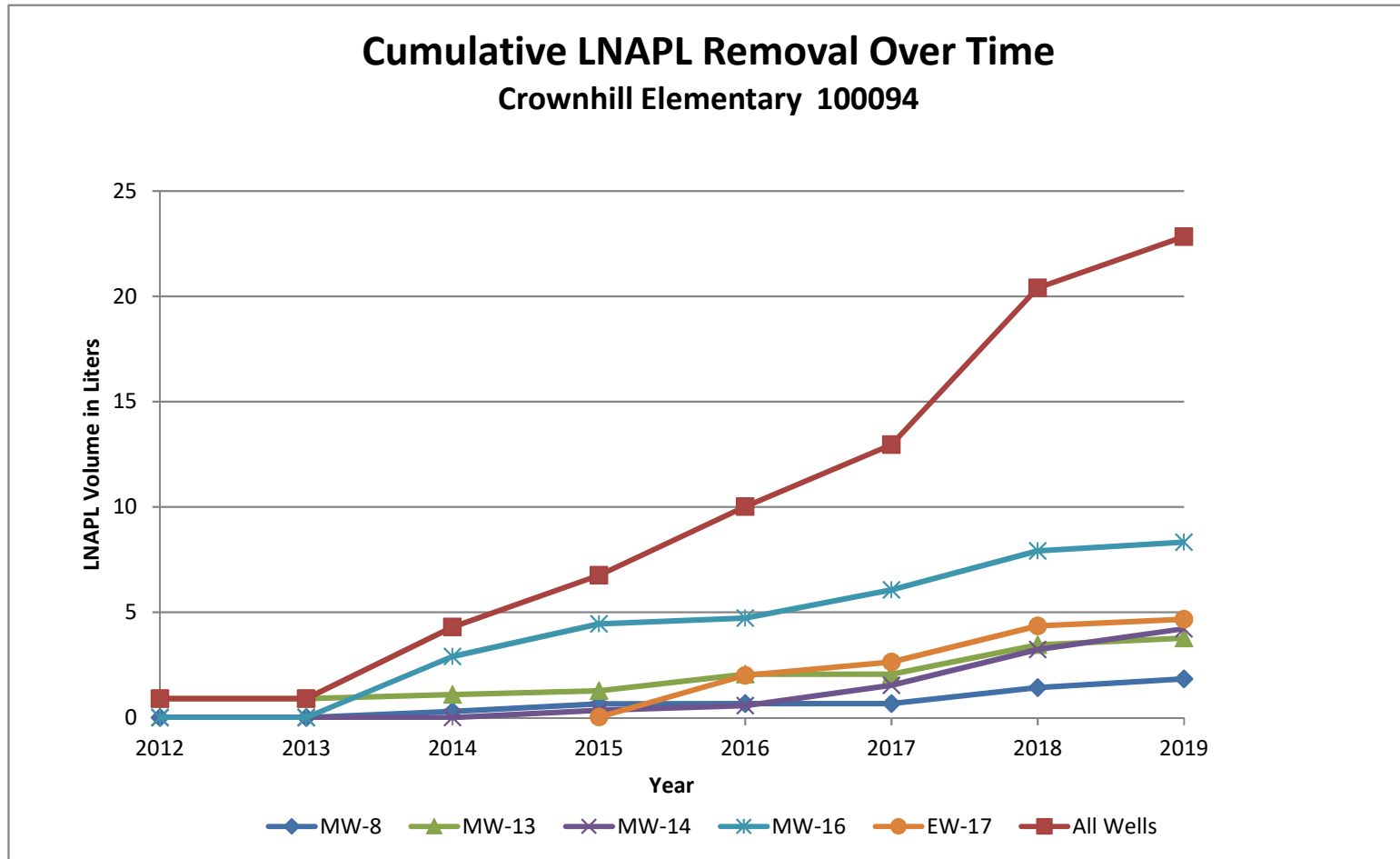
Figure 2

2019 Annual Report

Page 1 of 1

### Figure 3. Cumulative LNAPL Removal Over Time

Crownhill Elementary, Bremerton, Washington



## **APPENDIX A**

### **June 2019 Inspection Record and Photos**



Project Name: **Crownhill Elementary School**

Date: 6/25/19

Project No.: 100094

Inspector's Name: Matthew M. Lewis

Weather Conditions: Sunny, Low 70°Fs

Inspector's Signature: Matthew M. Lewis

Inspector's Title/Affiliation: Staff Geologist / Aspect Consulting

**FORM 1 - INSPECTION RECORD**

INSPECTION ITEM	YES	NO	COMMENTS/NOTES
<b>1. North Environmental Covenant Area</b>			
a. Building or pavement modifications since last inspection?		X	
b. Pavement deterioration/damage along Bertha Ave NW? <sup>1</sup>		X	
c. Evidence of soil disturbance?		X	
d. Geotextile fabric visible in interim action area?		X	
<b>2. South Environmental Covenant Area</b>			
a. Building or pavement modifications since last inspection?		X	
b. Evidence of soil disturbance?		X	
c. Geotextile fabric visible in interim action areas?		X	
<b>3. Other Inspection Items</b>			
a. Are all wells (MW-1 through EW-17) accessible?	X		
b. Evidence of well monument damage/tampering?		X	
c. HVAC system operates continuously during school day? <sup>2</sup>	X		System is always circulating air, with heating & cooling as needed.

**Deficient Action Items & Other Comments:**

HVAC system operation confirmed by conversation with custodian (Mj. Steve) on 6/25/19.

**Notes**

- Item 1b refers to the paved parking area described in Section 1.3.
- The inspector should describe under COMMENTS/NOTES how the determination is made regarding HVAC system operation.





Photo Location 1, 6/25/19 site inspection



Photo Location 2, 6/25/19 site inspection



Photo Location 3, 6/25/19 site inspection



Photo Location 4, 6/25/19 site inspection

## **APPENDIX B**

### **December 2019 Inspection Record and Photos**



Project Name: **Crownhill Elementary School**

Date: 12/11/19

Project No.: 100094

Inspector's Name: Matthew M. Lewis

Inspector's Signature: Matthew M. Lewis

Weather Conditions: Rainy 40°F

Inspector's Title/Affiliation: Staff Geologist / Aspect Consulting

**FORM 1 - INSPECTION RECORD**

INSPECTION ITEM	YES	NO	COMMENTS/NOTES
<b>1. North Environmental Covenant Area</b>			
a. Building or pavement modifications since last inspection?		X	
b. Pavement deterioration/damage along Bertha Ave NW? <sup>1</sup>		X	
c. Evidence of soil disturbance?		X	
d. Geotextile fabric visible in interim action area?		X	
<b>2. South Environmental Covenant Area</b>			
a. Building or pavement modifications since last inspection?		X	
b. Evidence of soil disturbance?		X	
c. Geotextile fabric visible in interim action areas?		X	
<b>3. Other Inspection Items</b>			
a. Are all wells (MW-1 through EW-17) accessible?	X		
b. Evidence of well monument damage/tampering?		X	
c. HVAC system operates continuously during school day? <sup>2</sup>	X		System is always circulating air, w/ heating & cooling as needed.

**Deficient Action Items & Other Comments:**

HVAC system operation confirmed by custodian in conversation.  
 12/11/19

**Notes**

1. Item 1b refers to the paved parking area described in Section 1.3.  
 2. The inspector should describe under COMMENTS/NOTES how the determination is made regarding HVAC system operation.

Revision: December 2015



Photo Location 1, 12/11/19 site inspection



Photo Location 2, 12/11/19 site inspection



Photo Location 3, 12/11/19 site inspection



Photo Location 4, 12/11/19 site inspection

## **APPENDIX C**

### **Nonhazardous Waste Manifest**

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator ID Number N/A	2. Page 1 of 1	3. Emergency Response Phone (800) 337-7455	4. Waste Tracking Number CE - 0226 19-01
5. Generator's Name and Mailing Address Bremerton School District 200 Bremen Ave Bremerton, WA 98312 (206) 780-7729 Attn: Bob Hanford			Generator's Site Address (if different than mailing address) 100 Bremerton Ave Bremerton, WA 98312		
6. Transporter 1 Company Name DH Environmental, Inc.			U.S. EPA ID Number WAH000047217		
7. Transporter 2 Company Name Chemical Waste Management of the Northwest			U.S. EPA ID Number ORD089452353		
8. Designated Facility Name and Site Address Chemical Waste Management of the Northwest 17629 Cedar Springs Lane Arlington, OR 97817 (541) 454-2643			U.S. EPA ID Number ORD089452353		
9. Waste Shipping Name and Description		10. Containers		11. Total Quantity	12. Unit Wt./Vol.
		No.	Type		
1. Material Not Regulated by DOT (non-reg IDW water)		6	DM	1400	P
2.					
3.					
4.					
13. Special Handling Instructions and Additional Information OR328306 - STABLE, non-reg IDW 1. water					
14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.					
Generator's/Offoror's Printed/Typed Name KIM SCHNEEWIND			Signature <i>Kim Schneewind</i>		Month Day Year 2 26 19
15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Date leaving U.S.: _____					
16. Transporter Acknowledgment of Receipt of Materials					
Transporter 1 Printed/Typed Name Leonard J. Warnock			Signature <i>Leonard J. Warnock</i>		Month Day Year 2 26 19
Transporter 2 Printed/Typed Name MICHAEL CASTANEDA			Signature <i>M. Castaneda</i>		Month Day Year 2 26 19
17. Discrepancy					
17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection					
17b. Alternate Facility (or Generator)			Manifest Reference Number:		U.S. EPA ID Number
17c. Signature of Alternate Facility (or Generator)					
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a					
Printed/Typed Name			Signature		Month Day Year



## **APPENDIX D**

### **Laboratory Reports, 2019 Groundwater Sampling**

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

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

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

April 11, 2019

Dave Heffner, Project Manager  
Aspect Consulting, LLC  
710 2<sup>nd</sup> Ave S, Suite 550  
Seattle, WA 98104

Dear Mr Heffner:

Included are the results from the testing of material submitted on April 4, 2019 from the Crownhill Elementary 100094, F&BI 904113 project. There are 13 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  
ASP0411R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 4, 2019 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Crownhill Elementary 100094, F&BI 904113 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Aspect Consulting, LLC</u>
904113 -01	MW-5-040419
904113 -02	MW-6-040419
904113 -03	MW-9-040419
904113 -04	MW-10-040419
904113 -05	MW-15-040419
904113 -06	McKinney-040419

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/11/19

Date Received: 04/04/19

Project: Crownhill Elementary 100094, F&BI 904113

Date Extracted: 04/05/19

Date Analyzed: 04/05/19 and 04/18/19

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 51-134)
MW-5-040419 904113-01	1,600 x	520 x	103
MW-10-040419 904113-04	<50	<250	109
MW-15-040419 904113-05	61 x	<250	114
Method Blank 09-728 MB	<50	<250	122

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	MW-6-040419	Client:	Aspect Consulting, LLC
Date Received:	04/04/19	Project:	Crownhill Elementary 100094
Date Extracted:	04/05/19	Lab ID:	904113-02
Date Analyzed:	04/05/19	Data File:	904113-02.130
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	19.4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	MW-10-040419	Client:	Aspect Consulting, LLC
Date Received:	04/04/19	Project:	Crownhill Elementary 100094
Date Extracted:	04/05/19	Lab ID:	904113-04
Date Analyzed:	04/05/19	Data File:	904113-04.133
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Crownhill Elementary 100094
Date Extracted:	04/05/19	Lab ID:	I9-230 mb
Date Analyzed:	04/08/19	Data File:	I9-230 mb.069
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

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

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-9-040419	Client:	Aspect Consulting, LLC
Date Received:	04/04/19	Project:	Crownhill Elementary 100094
Date Extracted:	04/05/19	Lab ID:	904113-03
Date Analyzed:	04/06/19	Data File:	040570.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	50	150
Toluene-d8	97	50	150
4-Bromofluorobenzene	98	50	150

Compounds:	Concentration ug/L (ppb)
Trichloroethene	9.7



# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-10-040419	Client:	Aspect Consulting, LLC
Date Received:	04/04/19	Project:	Crownhill Elementary 100094
Date Extracted:	04/05/19	Lab ID:	904113-04
Date Analyzed:	04/06/19	Data File:	040571.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	50	150
Toluene-d8	99	50	150
4-Bromofluorobenzene	101	50	150

Compounds:	Concentration ug/L (ppb)
Trichloroethene	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	McKinney-040419	Client:	Aspect Consulting, LLC
Date Received:	04/04/19	Project:	Crownhill Elementary 100094
Date Extracted:	04/05/19	Lab ID:	904113-06
Date Analyzed:	04/06/19	Data File:	040572.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	50	150
Toluene-d8	101	50	150
4-Bromofluorobenzene	102	50	150

Compounds:	Concentration ug/L (ppb)
Trichloroethene	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Crownhill Elementary 100094
Date Extracted:	04/05/19	Lab ID:	09-679 mb
Date Analyzed:	04/06/19	Data File:	040551.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	50	150
Toluene-d8	100	50	150
4-Bromofluorobenzene	103	50	150

Compounds:	Concentration ug/L (ppb)
Trichloroethene	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/11/19

Date Received: 04/04/19

Project: Crownhill Elementary 100094, F&BI 904113

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	100	100	58-134	0

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/11/19

Date Received: 04/04/19

Project: Crownhill Elementary 100094, F&BI 904113

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL METALS USING EPA METHOD 6020B**

Laboratory Code: 904113-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	19.4	109	120	75-125	10

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	97	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/11/19

Date Received: 04/04/19

Project: Crownhill Elementary 100094, F&BI 904113

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

Laboratory Code: 904054-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Trichloroethene	ug/L (ppb)	50	5.4	96	73-122

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Trichloroethene	ug/L (ppb)	50	100	101	72-119	1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The analyte is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits due to sample matrix effects.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- 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.

904113

SAMPLE CHAIN OF CUSTODY

ME 04/04/19

Page # 1 of 1  
VW/AT2

Report To Dave Hefner  
 Company Aspect  
 Address Seattle  
 City, State, ZIP \_\_\_\_\_  
 Phone On File Email \_\_\_\_\_

SAMPLERS (signature) Matthew M. Lewis  
 PROJECT NAME Counhill Elementary PO # 100094  
 REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_

TURNAROUND TIME  
 Standard Turnaround  
 RUSH  
 Rush charges authorized by: \_\_\_\_\_  
 SAMPLE DISPOSAL  
 Dispose after 30 days  
 Archive Samples  
 Other \_\_\_\_\_

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED										Notes	
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Total AS	TCE			
MW-5-040419	01	4/4/19	1145	GW	1		X										
MW-6-040419	02		1305		1								X				
MW-9-040419	03A-C		1010		3									X			
MW-10-040419	04A-E		1345		5		X						X	X			
MW-15-040419	05		1050		1		X										
McKinney-040419	06A-C	-	1215	-	3									X			

Samples received at 3 °C

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>Matthew M. Lewis</u>	<u>Matthew M. Lewis</u>	<u>Aspect</u>	<u>4/4/19</u>	<u>1500</u>
Received by: <u>[Signature]</u>	<u>DO VO</u>	<u>FBI</u>	<u>4-4-19</u>	<u>16:20</u>
Relinquished by: _____	_____	_____	_____	_____
Received by: _____	_____	_____	_____	_____



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

October 23, 2019

Dave Heffner, Project Manager  
Aspect Consulting, LLC  
710 2<sup>nd</sup> Ave S, Suite 550  
Seattle, WA 98104

Dear Mr Heffner:

Included are the results from the testing of material submitted on October 15, 2019 from the Crownhill Elementary 100094, F&BI 910312 project. There are 13 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  
ASP1023R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 15, 2019 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Crownhill Elementary 100094, F&BI 910312 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Aspect Consulting, LLC</u>
910312 -01	MW-6-101419
910312 -02	MW-9-101419
910312 -03	MW-10-101419
910312 -04	MW-12-101419
910312 -05	MW-15-101419
910312 -06	McKinney-101419

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/23/19

Date Received: 10/15/19

Project: Crownhill Elementary 100094, F&BI 910312

Date Extracted: 10/17/19

Date Analyzed: 10/18/19

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> (% Recovery) (Limit 47-140)
MW-10-101419 910312-03	<50	<250	98
MW-12-101419 910312-04	1,900 x	1,200 x	74
MW-15-101419 910312-05	<50	<250	91
Method Blank 09-2584 MB	<50	<250	106

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	MW-6-101419	Client:	Aspect Consulting, LLC
Date Received:	10/15/19	Project:	Crownhill Elementary 100094, F&BI 910312
Date Extracted:	10/17/19	Lab ID:	910312-01
Date Analyzed:	10/17/19	Data File:	910312-01.145
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Arsenic	21.9
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	MW-10-101419	Client:	Aspect Consulting, LLC
Date Received:	10/15/19	Project:	Crownhill Elementary 100094, F&BI 910312
Date Extracted:	10/17/19	Lab ID:	910312-03
Date Analyzed:	10/17/19	Data File:	910312-03.146
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Arsenic	2.11
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Crownhill Elementary 100094, F&BI 910312
Date Extracted:	10/17/19	Lab ID:	I9-663 mb
Date Analyzed:	10/17/19	Data File:	I9-663 mb.078
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Arsenic	<1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-9-101419	Client:	Aspect Consulting, LLC
Date Received:	10/15/19	Project:	Crownhill Elementary 100094, F&BI 910312
Date Extracted:	10/17/19	Lab ID:	910312-02
Date Analyzed:	10/18/19	Data File:	101752.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS/AEN

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	96	63	127
4-Bromofluorobenzene	94	60	133

Compounds:	Concentration ug/L (ppb)
Trichloroethene	8.0

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-10-101419	Client:	Aspect Consulting, LLC
Date Received:	10/15/19	Project:	Crownhill Elementary 100094, F&BI 910312
Date Extracted:	10/17/19	Lab ID:	910312-03
Date Analyzed:	10/18/19	Data File:	101753.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS/AEN

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	95	63	127
4-Bromofluorobenzene	92	60	133

Compounds:	Concentration ug/L (ppb)
Trichloroethene	<1



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	McKinney-101419	Client:	Aspect Consulting, LLC
Date Received:	10/15/19	Project:	Crownhill Elementary 100094, F&BI 910312
Date Extracted:	10/17/19	Lab ID:	910312-06
Date Analyzed:	10/18/19	Data File:	101754.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS/AEN

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	97	63	127
4-Bromofluorobenzene	94	60	133

Compounds:	Concentration ug/L (ppb)
Trichloroethene	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Crownhill Elementary 100094, F&BI 910312
Date Extracted:	10/17/19	Lab ID:	09-2553 mb
Date Analyzed:	10/17/19	Data File:	101728.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS/AEN

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	97	63	127
4-Bromofluorobenzene	97	60	133

Compounds:	Concentration ug/L (ppb)
Trichloroethene	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/23/19

Date Received: 10/15/19

Project: Crownhill Elementary 100094, F&BI 910312

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	92	92	61-133	0

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/23/19

Date Received: 10/15/19

Project: Crownhill Elementary 100094, F&BI 910312

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL METALS USING EPA METHOD 6020B**

Laboratory Code: 910339-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	1.74	102	100	75-125	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	92	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/23/19

Date Received: 10/15/19

Project: Crownhill Elementary 100094, F&BI 910312

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

Laboratory Code: 910283-02 (Matrix Spike)

<u>Analyte</u>	<u>Reporting Units</u>	<u>Spike Level</u>	<u>Sample Result</u>	<u>Percent Recovery MS</u>	<u>Acceptance Criteria</u>
Trichloroethene	ug/L (ppb)	50	<1	88	66-135

Laboratory Code: Laboratory Control Sample

<u>Analyte</u>	<u>Reporting Units</u>	<u>Spike Level</u>	<u>Percent Recovery LCS</u>	<u>Percent Recovery LCSD</u>	<u>Acceptance Criteria</u>	<u>RPD (Limit 20)</u>
Trichloroethene	ug/L (ppb)	50	97	93	79-113	4

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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.

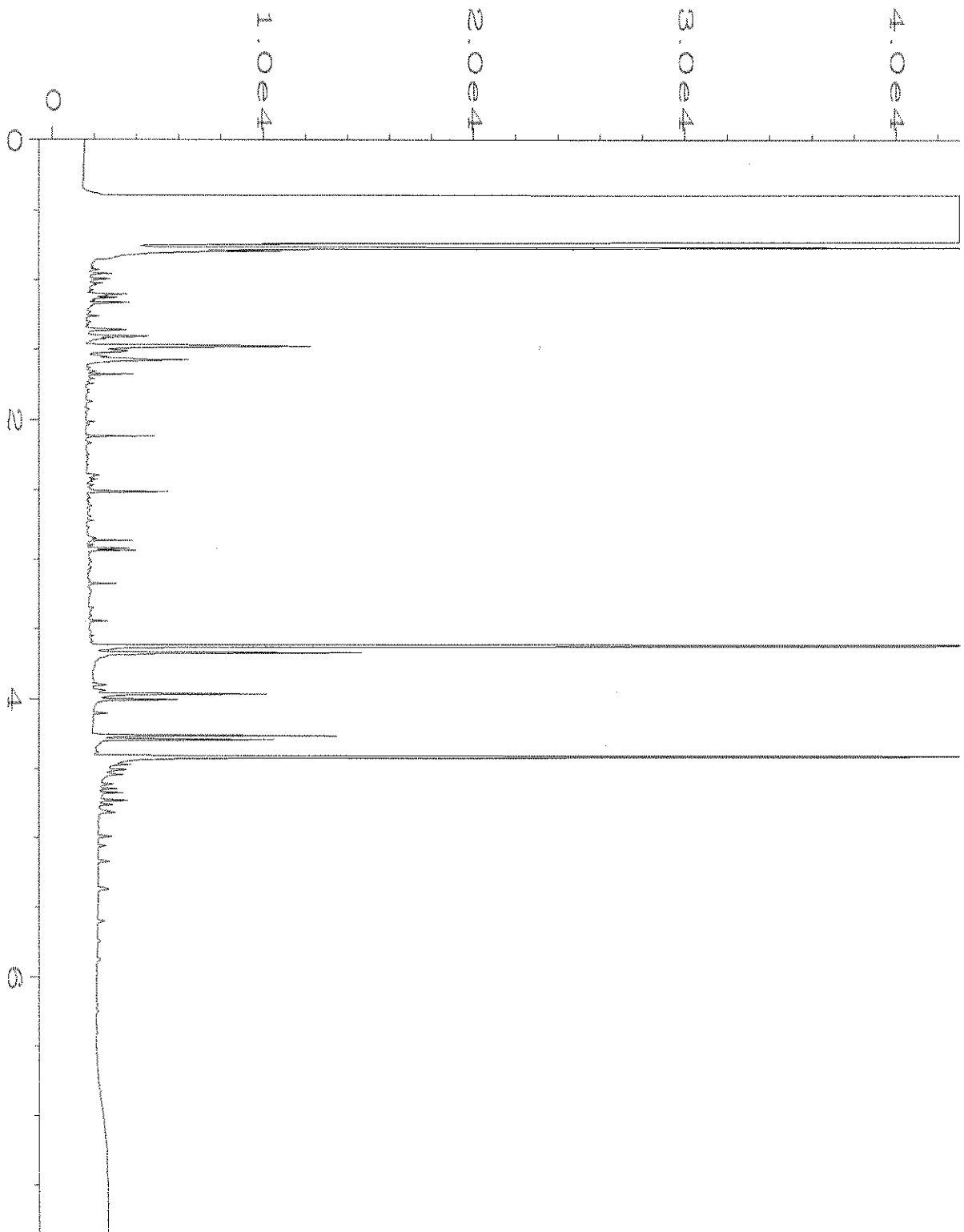
nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

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.

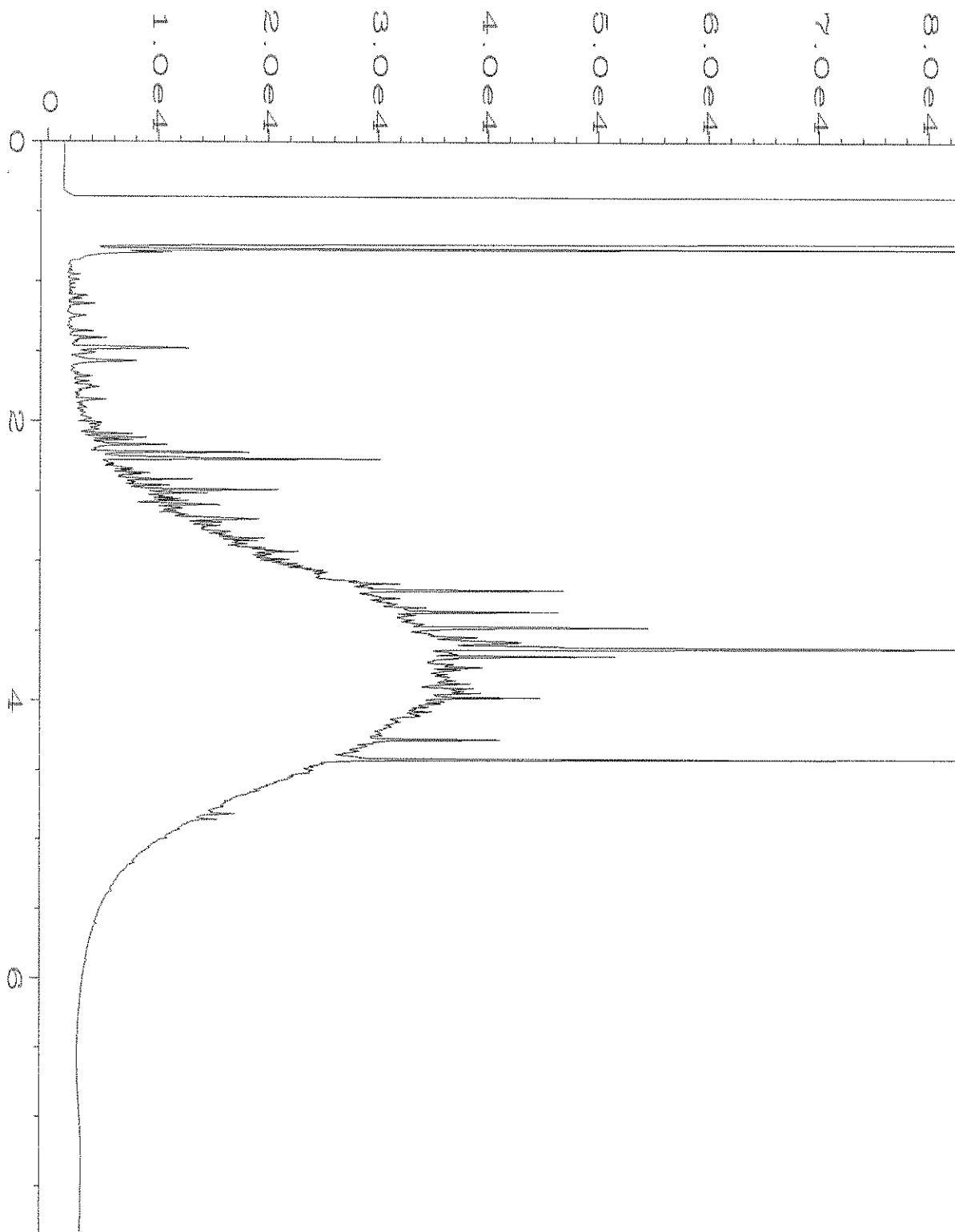
ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

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.

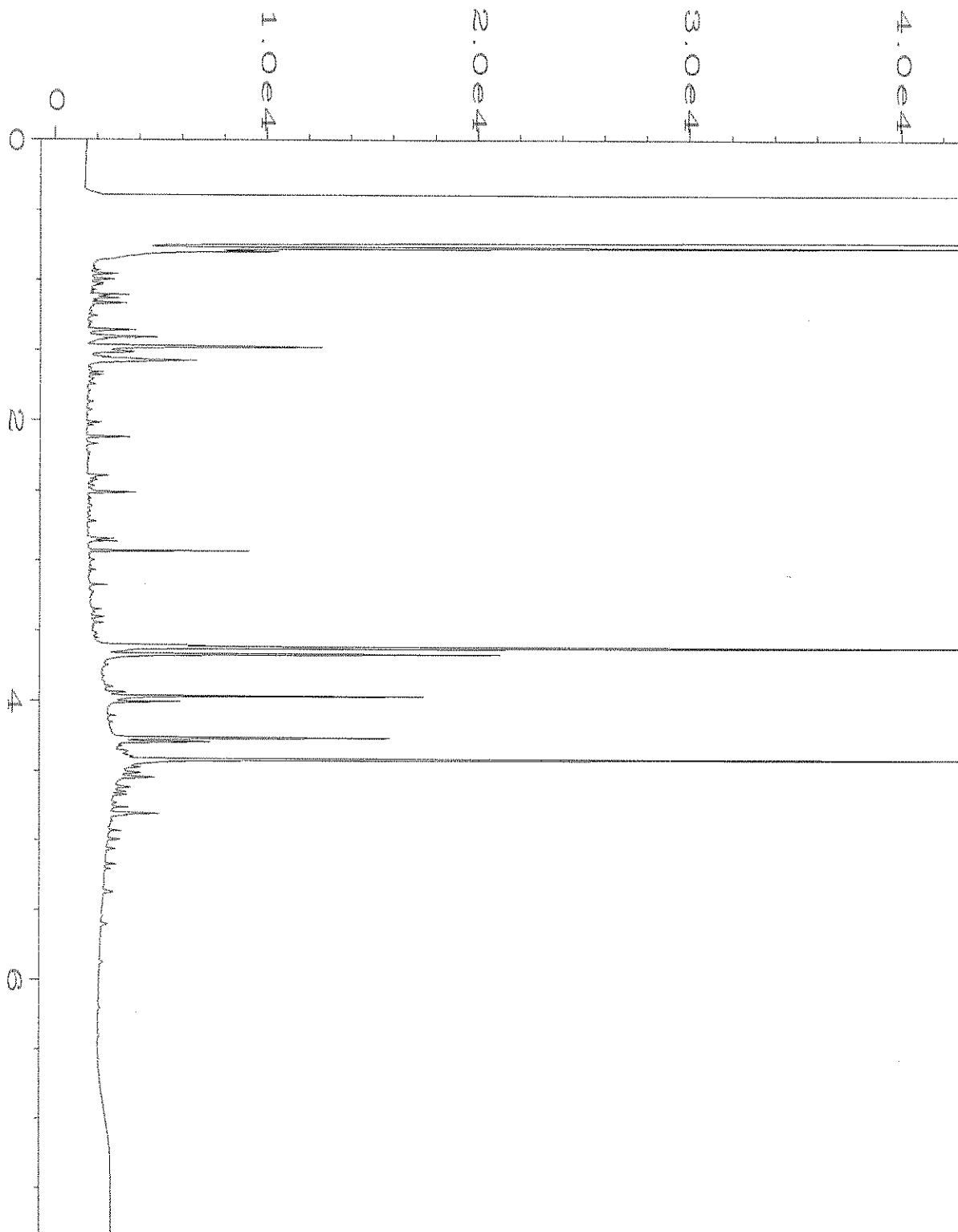


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Operator	: TL	Vial Number	: 43
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 910312-03	Sequence Line	: 13
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 18 Oct 19 08:01 AM	Analysis Method	: BAKEOUT.MTH
Report Created on:	18 Oct 19 11:50 AM		

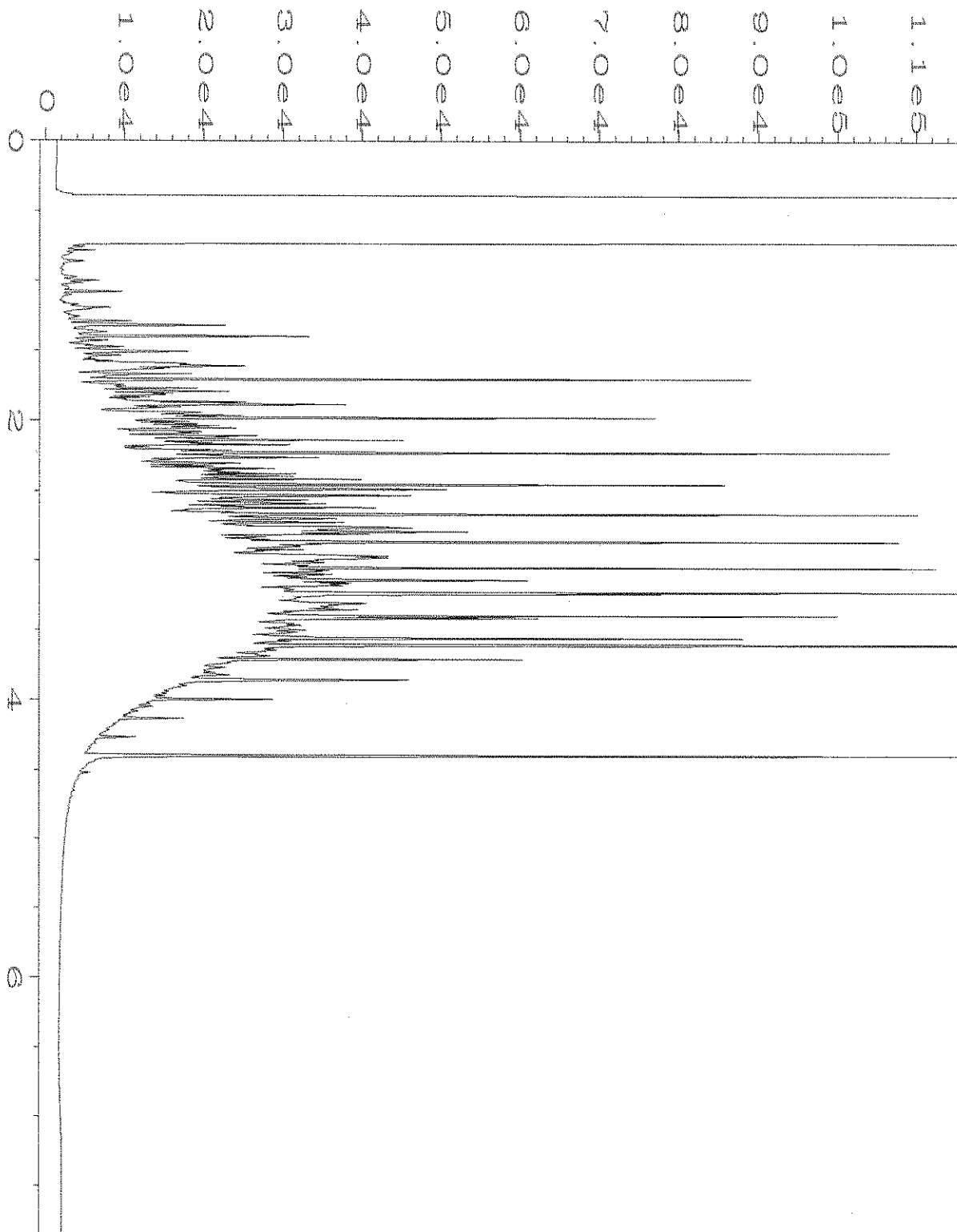


Data File Name	: C:\HPCHEM\4\DATA\10-17-19\044F1301.D	Page Number	: 1
Operator	: TL	Vial Number	: 44
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 910312-04	Sequence Line	: 13
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 18 Oct 19 08:13 AM	Analysis Method	: BAKEOUT.MTH
Report Created on:	18 Oct 19 11:54 AM		

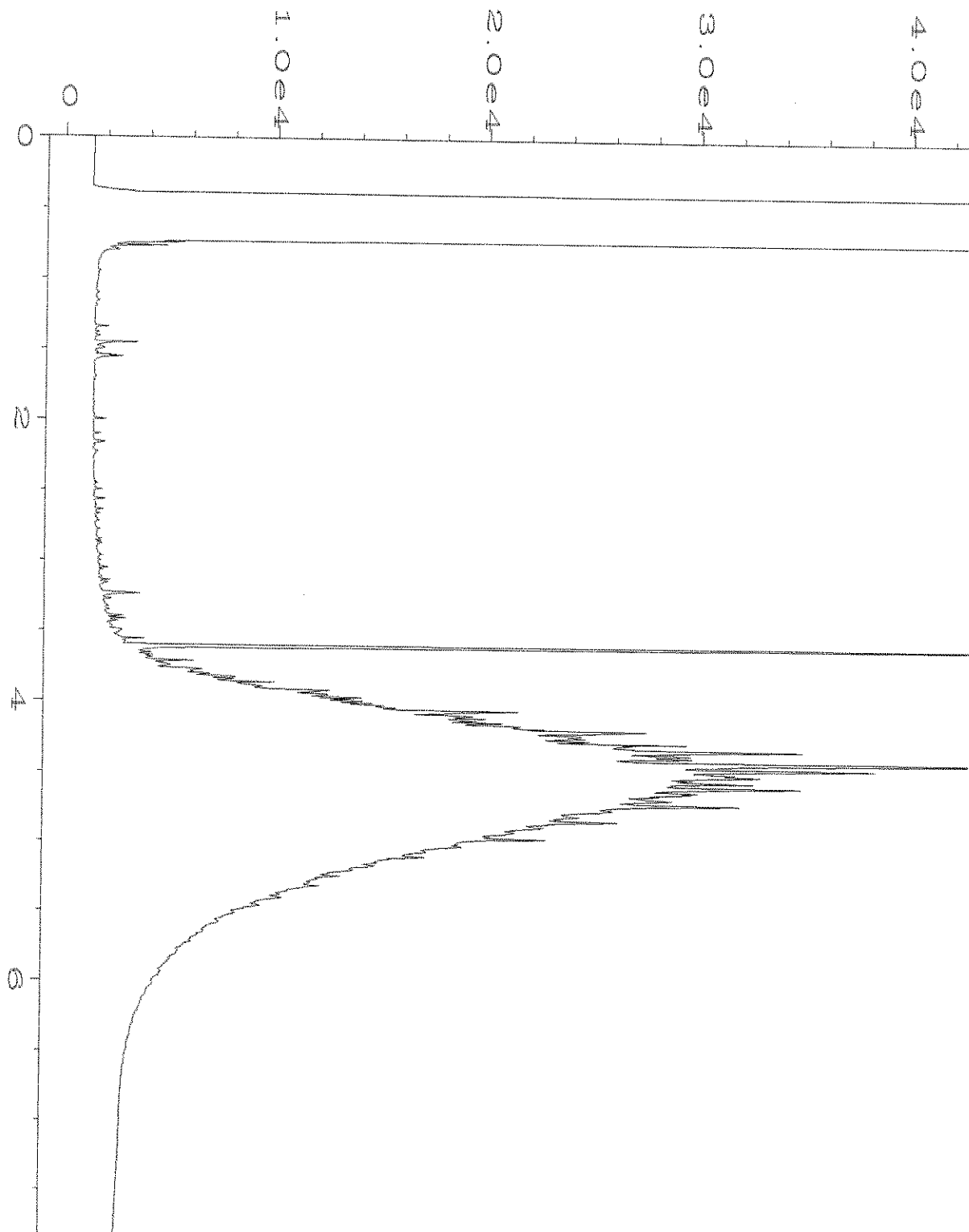




Data File Name	: C:\HPCHEM\4\DATA\10-17-19\045F1301.D	Page Number	: 1
Operator	: TL	Vial Number	: 45
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 910312-05	Sequence Line	: 13
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 18 Oct 19 08:25 AM	Analysis Method	: BAKEOUT.MTH
Report Created on:	18 Oct 19 11:54 AM		



Data File Name	: C:\HPCHEM\4\DATA\10-17-19\003F0201.D	Page Number	: 1
Operator	: TL	Vial Number	: 3
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 500 Dx 58-62F	Sequence Line	: 2
Run Time Bar Code:		Instrument Method	: DX.MTH
Acquired on	: 17 Oct 19 06:04 AM	Analysis Method	: BAKEOUT.MTH
Report Created on:	18 Oct 19 11:45 AM		



Data File Name	: C:\HPCHEM\4\DATA\10-17-19\002F0201.D	Page Number	: 1
Operator	: TL	Vial Number	: 2
Instrument	: GC#4	Injection Number	: 1
Sample Name	: 500 MO 58-164C	Sequence Line	: 2
Run Time Bar Code:		Instrument Method	: DX.MTH
Acquired on	: 17 Oct 19 05:34 AM	Analysis Method	: BAKEOUT.MTH
Report Created on:	18 Oct 19 11:45 AM		

910312

SAMPLE CHAIN OF CUSTODY

ME 10/15/19

AD1  
VW2  
C05

Report To Dave Hefner  
Company Aspect  
Address Seattle  
City, State, ZIP \_\_\_\_\_  
Phone on file Email \_\_\_\_\_

SAMPLERS (signature) [Signature]  
PROJECT NAME Crownhill Elementary PO# 100094  
REMARKS \_\_\_\_\_ INVOICE TO \_\_\_\_\_  
Project specific RLs? - Yes / No

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	ANALYSES REQUESTED										Notes	
						NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Total As	TCE by 8620			
MW-6-101419	01	10/14/19	1305	GW	1									X			
MW-9-101419	02A-C		1010		3										X		
MW-10-101419	03A-E		1430		5	X								X	X		
MW-12-101419	04		1200		1	X											
MW-15-101419	05		1105		1	X											
McKinney-101419	06A-C <del>AD</del>		1445		3 <del>3</del> <sup>4</sup> EVB										X		
															Samples received at <u>4</u> °C		

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	Matthew M. Lewis	Aspect	10/15/19	1453
Received by: <u>[Signature]</u>	Rich Courser	Fed Ex	10/15/19	1454
Relinquished by: <u>[Signature]</u>				
Received by: <u>[Signature]</u>	Nhan Phan	FBI	10/15/19	1535