EHS–International, Inc.

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Seattle, WA 98134
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March 13, 2019

Mr. Nick Chou
ESD Project Manager
Edmonds School District
2927 Alderwood Mall Boulevard
Lynnwood, Washington 98036

Re: Summary of the Cleanup Action at the Edmonds School District Former Maintenance and Transportation Facility
2927 Alderwood Mall Boulevard
Lynnwood, Washington 98036

Dear Mr. Chou:

As you are aware, there has been investigation and remediation of hazardous substances in the soil and ground water associated with the operation of the Edmonds School District (ESD) Former Maintenance and Transportation Facility (FMTF) site, located at 2927 Alderwood Mall Boulevard in Lynnwood, Washington, since 1991. During that time, the District has pursued full characterization and remediation of the site, with the ultimate goal of obtaining a "No Further Action" (NFA) determination from the Washington State Department of Ecology (Ecology), documenting the site's compliance with the Model Toxics Control Act (MTCA) and its implementing regulations. These efforts are summarized below. To date, since March 2015, ESD has expended approximately $6.4-million in the current cleanup effort, including remediation contractors and EHSI's consulting fees. As described therein, it is EHS-International, Inc. (EHSI's) professional opinion the site is likely to receive an NFA determination assuming the successful completion of the final phase of site remedial work and following application for such a determination to Ecology.

Background

The property is divided into three lots (Lots 3, 4, and 7). Lot 3 occupies the northeast corner of the property, Lot 7 occupies more than half of the north portion of the property from the northwest corner to the Lot 3 boundry, and Lot 4 occupies the southern half of the property.

Lots 3, 4, and 7 of the subject property were owned by the Puget Mill Company beginning in 1874 and appear to have been used for logging and timber resource activities. The lots were then sold to private individuals at different times from 1919 to 1928. In 1947, a company called Tregoning Industries acquired Lot 4 and reportedly operated a boat building, life raft fabrication, and repair facility there. ESD bought Lot 4 from Tregoning Industries in 1955, then acquired Lots 3 and 7 at different times from 1962 to 1966. ESD has operated a school bus facility, and in addition, transportation, facilities, and grounds maintenance operations on the subject property from 1955 through summer 2016.

Beginning in 1991, ESD has employed six (6) environmental consultants and associated environmental remediation contractors to address various known or suspected soil and ground water contamination issues on the property, EHSI being the most recent consultant, beginning in 2010 and continuing to the present.

The FMTF site is currently enrolled in the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP), with a site identification number of NW2712. The previous Site investigations were summarized in EHS-International, Inc. (EHSI's) Revised Remedial Investigation (RI) Report, issued July 2017.

The EHSI revised RI report identified various indicator hazardous substances at different locations across the site. The report described the discovery of releases from the fuel dispensers, a historic fueling system, a leaking hydraulic hoist, a leaking former waste oil underground storage tank (UST), improper disposal of chemicals into several sumps, and uncontrolled fill material.

<u>Interim Cleanup Action</u>

The selected remedy for the identified contamination was based on a Cleanup Action Plan, also issued in July 2017. It recommended the excavation and off-site disposal of the contaminated soil, pumping and treating contaminated groundwater, and backfilling the excavations with Oxygen Release Compound Advanced® (ORCA) treated structural fill, to stimulate biogenic degradation of remaining contaminated groundwater. Seven soil excavation areas were completed during the cleanup action. Groundwater was pumped from each excavation into an on-site treatment system before being discharged to the City of Lynnwood sanitary sewer.

During the course of excavating contaminated soil on Lots 3 and 7, significant quantities of buried solid waste were encountered and removed. The debris consisted of discarded drums of oil, roofing tar, building materials, trees and vegetation, and various metal objects. A portion of the debris consisted of asbestos-containing roofing and flooring.

<u>Interim Cleanup Action Conclusions</u>

To document the effectiveness of the cleanup action, confirmation soil samples were collected at the final limits of each excavation and a network of groundwater monitoring wells were installed around the excavated areas.

Based on confirmation sampling and testing at the final limits of the cleanup excavations, the contaminated soil and ACM debris was removed from the site except for a small quantity of inaccessible gasoline and benzene contaminated soil next to the 54-inch storm drain pipe on Lot 4 East (4E).

The excavation of landfill solid waste debris from Lots 3 and 7 removed a source of landfill gases that had been escaping the solid waste area to the surrounding soil. Landfill gas concentrations were expected to naturally decrease since the source materials were removed; however, that has not proved to be the case.

During the cleanup action, the on-site UST system was removed and releases to both soil and groundwater were documented. The releases from the UST system were also cleaned up as part of this interim cleanup action.

54-inch Storm Pipe Sampling

Approximately one year after the cleanup action, EHSI returned to the site and drilled borings to collect soil samples from the wedge of contamination next to the 54-inch storm drain pipe on Lot 4E to assess whether or not the gasoline and benzene contamination next to the pipe had degraded over time.

The results of the soil sampling and testing next to the 54-inch storm drain pipe indicated that the gasoline contamination was eliminated by the ORCA. However, benzene remained in the soil at concentrations lower than those originally measured, but still slightly higher than the cleanup levels.

Groundwater Monitoring

Following the cleanup action, groundwater monitoring was initiated to document post-cleanup conditions. Post-cleanup groundwater monitoring indicated concentrations of total petroleum hydrocarbons (TPH) above the MTCA cleanup levels at various locations across the site. Based on high levels of TPH in areas of the FMTF site without previous petroleum releases and feedback from EHSI's lab, Friedman Bruya, Inc. (FBI), that analytical chromatograms indicated that the TPH being reported did not match the characteristics of petroleum hydrocarbons, EHSI proposed to Ecology that the TPH may be biogenic in origin and not a result of releases at the site. Ecology reviewed the information provided by EHSI and agreed that the elevated TPH was biogenic in origin, and therefore did not fall under the MTCA cleanup regulation (Ecology Letter attached).

Arsenic was detected in groundwater on Lot 7 of the site at concentrations exceeding the MTCA cleanup levels. Ecology issued an opinion letter (attached), that the arsenic was likely derived from reducing conditions caused by both the degradation of naturally-occurring material and petroleum compounds. Discussions with Ecology indicated that they may require placing a deed restriction on the property that would limit the future use of groundwater at the site.

Methane Monitoring

A series of soil gas probes were installed around the perimeter of the landfill excavations on Lots 3 and 7 to monitor for residual methane concentrations. The results of the methane monitoring indicated that there were explosive levels of methane remaining on both Lots 3 and 7 and that these levels were not appreciably decreasing, but rather traveling underground outward from the excavated areas.

EHSI recently completed a soil mixing pilot test study to evaluate if mixing the soil would release the trapped methane. Preliminary results indicate that the mixed soil in the test area had no detectable methane remaining, and therefore soil mixing was an effective means of remediating the methane in the soil.

Recommended Actions for Remaining Environmental Exceedances

1. Groundwater TPH levels in excess of MTCA thresholds: Based on the Ecology Lab letter (attached), identifying these higher TPH levels as biogenically generated, no further action is required.
2. Elevated benzene in soil adjacent to the 54-inch storm water line on Lot 4E: The preferred option for addressing the remaining benzene in a manner that would support an NFA determination by Ecology would be the recording of an Environmental Covenant on the FMTF property that requires the removal and disposal of the affected soil, if/when the storm water line is replaced.
3. Elevated arsenic in ground water on Lot 7: The preferred option for addressing the remaining arsenic in a manner that would support an NFA determination by Ecology would be the recording of an Environmental Covenant on the FMTF property that restricts certain subsurface activities (e.g., the installation of drinking and/or irrigation water wells), in the proximity of the affected ground water, without the prior approval of Ecology.
4. Elevated methane in soil beyond the remedial excavations on Lots 3 and 7: Based on phone conversations with the Ecology VCP Site Manager for the FMTF site, EHSI is proceeding with plans to accomplish soil mixing to release trapped methane from the remainder of the methane impacted soil on Lots 3 and 7. Gas probes will be installed in and around this more extensive soil mixing area, and if results are similar to the soil mixing pilot test study, it is anticipate that no more than four (4) to six (6) weeks of gas probe monitoring will be required to validate to Ecology that the subsurface methane is no longer an issue.

Final Cleanup Report and NFA Determination Letter

Upon achievement of acceptable methane in soil levels (e.g., <0.5% methane in soil gas – estimated to be completed June 15, 2019), EHSI will complete and submit its Final Cleanup Report and Request for NFA Letter (approximately 3 weeks after completion of methane monitoring). Upon receipt of the Final Report and Request for Cleanup Letter, Ecology has 90-days to provide a written response. EHSI will continue to communicate with the Ecology VCP Site Manager, between now and submittal of the final report in an effort to minimize any response questions.

If you have any questions regarding this cleanup action summary, please do not hesitate to contact us.

Sincerely,
EHS-International, Inc.

Herb Brod

Herb Brod, CIH, CHMM
Technical Director

Attachments:

Attachment A - Ecology Letter Dated July 9, 2018, Addressing Elevated TPH in Soil
Attachment B – Ecology Letter Dated February 15, 2019, Addressing Elevated Arsenic in Ground Water

Attachment A

Ecology Letter Dated July 9, 2018, Addressing Elevated TPH in Soil

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

July 09, 2018

Subject: Edmonds School District GC-VCP NW2712

Work No: 1807042

Sample No: 804082-01, -02, -03, -04, -05, 06, -07, -08; 804125-01, -02, -03, -04, -05, -06, -07, -08; 804157-01, -02, -03, -04, -05, -06, -07; 804161-01

Project Officer: Heather Vick

By: Dolores Montgomery

Summary

All TPHD sample data results and chromatograms were reviewed. This included in most cases an analysis prior to silica gel cleanup and a subsequent analysis performed after silica gel treatment.

Samples 804082-02, -03, -08 and 804161-01 were of particular interest since diesel – range TPH concentrations were reported in the pre-silica gel cleanup analysis above MTCA Method A cleanup levels. Upon review of the data, it is my opinion that the chromatograms did not display the typical diesel pattern one would associate with a spill/cleanup site. This is further substantiated by the silica gel treated analysis which resulted in no detects above the labs PQL of 50 µg/L and virtually eliminated any sign of the typical hydrocarbon pattern in the diesel range. It can be concluded that in all likelihood the original diesel values reported are the result of polar compounds naturally occurring in the samples and are not the result of contamination. I would advise using the silica gel treated results in evaluating cleanup levels.

Please call Dolores Montgomery at (360) 871-8818 to further discuss this project.

cc: Project File

Attachment B

Ecology Letter Dated February 15, 2019, Addressing Elevated Arsenic in Ground Water

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Lacey HQ ● 300 Desmond Dr. ● Lacey, Washington 98503 ● (360) 407-6000

February15th, 2019

TO: Heather Vick, TCP-NWRO

FROM: Charles San Juan, LHG, TCP-HQ *Charles San Juan*

SUBJECT: Edmonds SD No 15 Maint & Trans Dept Groundwater Arsenic.

State of Washington
Hydrogeologist
566
Licensed Geologist
Charles F. San Juan

Summary

Per request, this transmittal contains an opinion on the subject site groundwater arsenic levels. High (30 – 70 ppb) arsenic levels (dissolved and total) have been detected in two site wells (B-2 and EB-43). The overall average dissolved arsenic concentration (6.4 ppb; Oct-2018 sampling event) is slightly above the current Ecology standard (5 ppb). This site is located within what appears to be a remnant glacial kettle feature (Vashon till / Qvt). This kettle hole was likely a lake (or wetlands) and was recharged by a relic drainage to the east. As groundwater flows into this bowl-shaped depression (underlain by glacial till), stagnant (low velocity) flow conditions are created. This stagnant groundwater area (west ½ of the site) is also geochemically reduced (< 50 mV ORP). The reduced geochemical conditions are likely the result of microbial oxidation of peat and other soil organic matter (former lake bed or wetland soils). High landfill gas readings (percent methane) occur primarily in the northwest area. These high methane levels are likely the result of decomposition of organic material and other natural detritus. The north-northeast site area has been landfilled with various wastes (e.g. wood, solid waste debris, asbestos floor tiles, etc.). This landfilling has resulted in smaller "pockets" of free-product petroleum (LNAPL). This landfill activity may have also resulted in geochemically reduced groundwater (e.g. decomposition of wood wastes, etc.).

Conclusion

The preponderance of evidence indicates that the high site groundwater arsenic levels (B-2, EB-43) are primarily the result of a combination of sluggish groundwater flow, microbial oxidation and decomposition of naturally occurring organic rich (peat) soils, methane gas (methanogenesis) production and the associated changes in groundwater redox potential. However, the impact of human activity (backfilling with landfill material) on groundwater arsenic levels cannot be completely ruled out. This fill material is likely decomposing, which can result in landfill gas, reduced groundwater and higher arsenic levels.

Recommendations

Additional monitoring, of groundwater arsenic levels, is not recommended. There are two reasons for this. First, given the radial groundwater flow into this bowl-shaped depression, it would be difficult to identify, for monitoring purposes, what is truly upgradient / downgradient. Second, it would likely take a significant sample size to reach the current Ecology Method A cleanup level for arsenic (5 ppb). Specifically, to achieve a 95 UCL (MTCA Section 720(9)), it would likely result in significant monitoring and a large sample size. Consequently, given the natural conditions, additional monitoring, over time, will not likely change the results.

Furthermore, the shallow perched zone groundwater is just a few feet below land surface and is likely of questionable yield and quality. Yes, this groundwater has most likely been impacted by both naturally-occurring conditions and human activity. However, given the topography, it appears unlikely that site arsenic levels would impact off property areas. Specifically, the arsenic levels appear to be localized in the western half of the site.

Therefore, the best (and recommended) option would be to issue a restrictive covenant for this parcel and prohibit future groundwater use. In other words, if the remedy (soil excavation, etc.) is deemed sufficient, then this site should be moved to closure (NFA with an environmental covenant).

Acronym	Definition
ft	Feet
MTCA	Model Toxics Control Act (Chapter 173-340 WAC)
mV	Millivolt
ORP	Oxidation Reduction Potential
ppb	Parts per Billion
ppm	Pats per Million
TPH	Total Petroleum Hydrocarbons
UCL	Upper Confidence Limit

Figures

Tables

Overview

To examine the issue of whether this groundwater arsenic is naturally occurring, multiple lines of evidence were reviewed. The lines of evidence reviewed include: land surface / topography / groundwater flow, soil conditions and landfill gas, groundwater geochemistry, the groundwater petroleum footprint and groundwater arsenic levels. Each line of evidence concludes with a discussion of key points or observations.

Land Surface / Groundwater Flow

Survey elevations (well top of casing) and King County 20-ft land surface elevations (Ecology ArcMap layer) were used to create a 3D land surface map (Surfer contouring software). The site is located within a bowl shaped depression (Figure 1). This depression is likely of glacial origin (e.g. ice kettle hole, etc.). What this suggests is that this site was formerly a small kettle lake (or wetlands). Land surface elevations around the depression rise to about 400 feet. Within the depression, where the maintenance facility is located, the land surface drops to about 380 feet. Land surface elevation contours, slope vectors and a predicted watershed are provided in Figure 2. The 395-foot elevation contour rings the site. A drainage is predicted for the east site area. Again, what this suggests is that this area may have once been a small lake or wetland that was fed by a relic drainage to the east. Groundwater elevation (water table surface) maps are provided in Figures 3 and 4. The shallow perched zone flows from the higher elevations (east) into the lower elevations within the west half of Lot #4. The western area of Lot #4 appears to be a groundwater stagnation zone.

Key point – arsenic is sensitive to groundwater geochemistry (redox potential). High groundwater arsenic may occur in areas with sluggish groundwater flow. Under these conditions, the rate of arsenic mobilization into groundwater can exceed the rate of flushing (USGS, 2007). In this case, groundwater (within the shallow perched zone) is flowing into this bowl shaped (kettle) area underlain by glacial till, which likely creates slow (or sluggish) groundwater flow conditions. This, in turn, can result in reduced geochemical conditions and higher arsenic levels.

Site Soils / Fill Material / Landfill Gas

This site has been back-filled with solid waste debris (1960 and 70s; EHSI, 2018). Some of this material is in the northeast site area (Lot #3). High arsenic levels (B-2 and EB-43) occur primarily in the northwest site area. Petroleum-contaminated soil and solid waste debris has been removed from nine (9) excavation areas (EHSI, 2018). In regard to the northwest site area, contaminated soil was removed from excavation area #5. This area is located along the west half of Lot #7 (as well as Lot #3). The west boundary of excavation area #5 is close to the two high arsenic wells (B-2 and EB-43). Soil (fill material) in this area was attributed to past landfilling, including wood, metal, asbestos floor tile and free-product petroleum (EHSI, 2018).

However, in a recent geotechnical investigation (GeoEngineers, 2018), peat and organic material were observed in several borings (Figure 5). For example, several feet of peat was detected at GEI-2-17. The reason this is significant is because the decomposition of organic material can result in methane gas production and reduced geochemical conditions (higher arsenic).

A summary of landfill gas readings is provided in Table 2 (see also Figure 6). Briefly, the highest percent methane (up to 40%) were observed in the northwest site area (gas probes #6, #8 and #9). The highest groundwater arsenic levels were observed from monitoring well B-2. This well is located in the northwest site corner.

Key point – the decomposition of natural organic material (peat, etc.) as well as wood, petroleum and other landfill material typically results in reduced geochemical conditions in groundwater. Landfill gas can also act as an acidic or reducing agent or Lewis base (Kerfoot et al., 2004; Hounslow, 1980). There is typically a correlation between higher arsenic levels and geochemically reduced groundwater (Ecology, 2018).

Groundwater Geochemistry

Groundwater arsenic is sensitive to changes in geochemical conditions. Thus, groundwater oxidation reduction potential (ORP) levels, from the Oct-2018 sampling event, were tabulated (Table 3). A map of the distribution of ORP levels in groundwater is provided in Figure 7.

Key observation – groundwater ORP levels, for the west half of the site (lowest groundwater elevation area), are < 50 mV. Groundwater ORP levels < 50 mV are indicative of reduced geochemical conditions (Whitlock and Kelly, 2010). For example, in observation well EB-43, the October2018 ORP reading was -23.4 mV. This particular well also had high (> 20 ppb) arsenic levels. Likewise, observation well B-2 (northwest site corner), the Oct-2018 ORP level was about 50 mV. Again, this well (B-2) had high (> 20 ppb) arsenic levels.

Groundwater Petroleum (TPH) Footprint

A map of groundwater gasoline range results is provided in Figure 8. Petroleum degradation can result in reduced geochemical conditions. This, in turn, can result in higher groundwater arsenic levels.

Key observation – the groundwater petroleum releases appear to have occurred primarily in the southeast site are (east ½ of lot #4). What this therefore suggests is that elevated groundwater arsenic levels (northwest) are not connected to groundwater petroleum releases (southeast).

Groundwater Arsenic Levels

A map (graduated symbol and filled contour) of groundwater arsenic levels is provided in Figure 9. Box and probability plots, of groundwater arsenic levels, are provided in Figure's 10 and 11. The wells with the highest arsenic levels (EB's 43 & 45; B-2) are located in the northwest corner of the site (Lot #7). Average arsenic levels (dissolved and total) are roughly 6 to 10 ppb (38 observations from 13 wells, 2018 data). As a check, a 2-sample t Test was performed on the 2018 arsenic dissolved v. total data. The reason this test was performed is because MTCA Section 720(9)(b) mandates use of total data, unless it can be demonstrated that the dissolved is representative. The results of this test (Figure 12) found that there was not enough evidence to indicate a difference between the dissolved / total means at the 0.05 level of significance. Consequently, the dissolved groundwater arsenic data is thought to be representative.

Key observation – the dissolved groundwater arsenic data is representative of site conditions. If you use the dissolved arsenic data as the baseline, then results > 20 ppb are statistical outliers. The highest results were from two locations in the northwest quadrant: B-2 and EB-43.

References

Ecology (2018). Natural Background Groundwater Arsenic Concentrations in Washington State. Toxics Cleanup Program. May 2018 (Review Draft). Publication No. 14-09-044.

EHSI, Inc. (2018). Interim Cleanup Action Report. Edmonds School District Former Maintenance and Transportation Facility. EHSI Project #10719a-15 (March, 2018).

EHSI, Inc. (2018). Post Remedial Action Quarterly Groundwater and Soil Gas Monitoring-Fourth Quarter (November 15th, 2018).

GeoEngineers / Geotechnical Engineering Services (2018). Alderwood South, Lynwood, Washington. For Wolff Enterprises II, LLC. June 12th, 2018.

Kerfoot et al. (2004). Geochemical Changes in Groundwater Due to Landfill Gas Effect. Ground Water Monitoring & Remediation 24, no. 1/ Winter 2004/ pages 60-65

Hounslow, A.W. (1980). Ground-Water Geochemistry: Arsenic in Landfills. GROUND WATER – July-August 1980, Vol. 18, No. 4, pp. 331-333.

USGS. Thomas, Mary Ann (2007). The Association of Arsenic With Redox Conditions, Depth, and Ground-Water Age in the Glacial Aquifer System of the Northern United States. (Scientific Investigations Report 2007-5036). Reston, VA: U.S. Geological Survey, U.S. Department of the Interior.

Whitlock and Kelly (2010). Relationship Between Subsurface Landfill Gas and Arsenic Mobilization into Groundwater. Ground Water Monitoring & Remediation 30, no. 2/ Spring 2010/pages 86–96.

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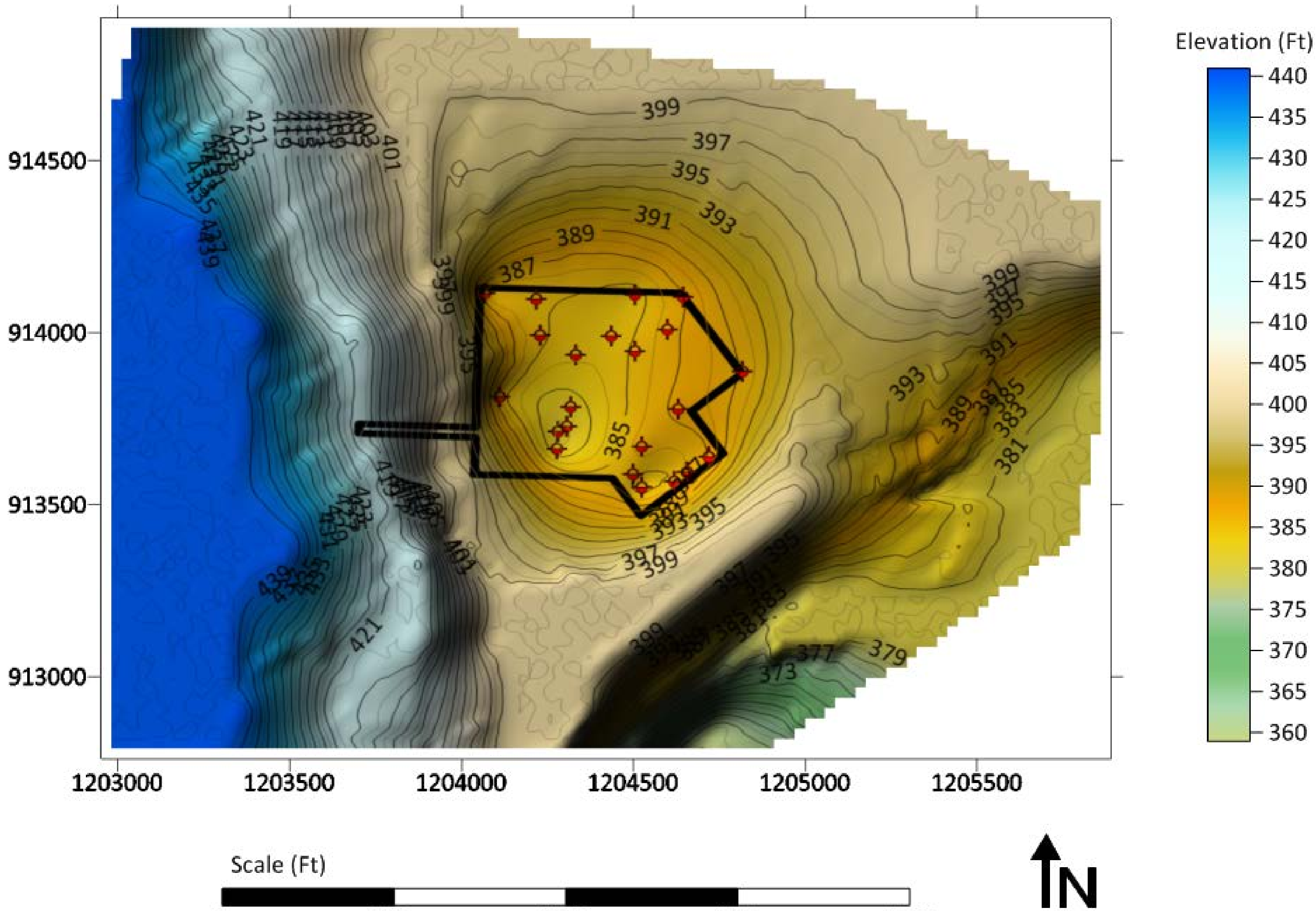


Figure 1 – 3D Land Surface.

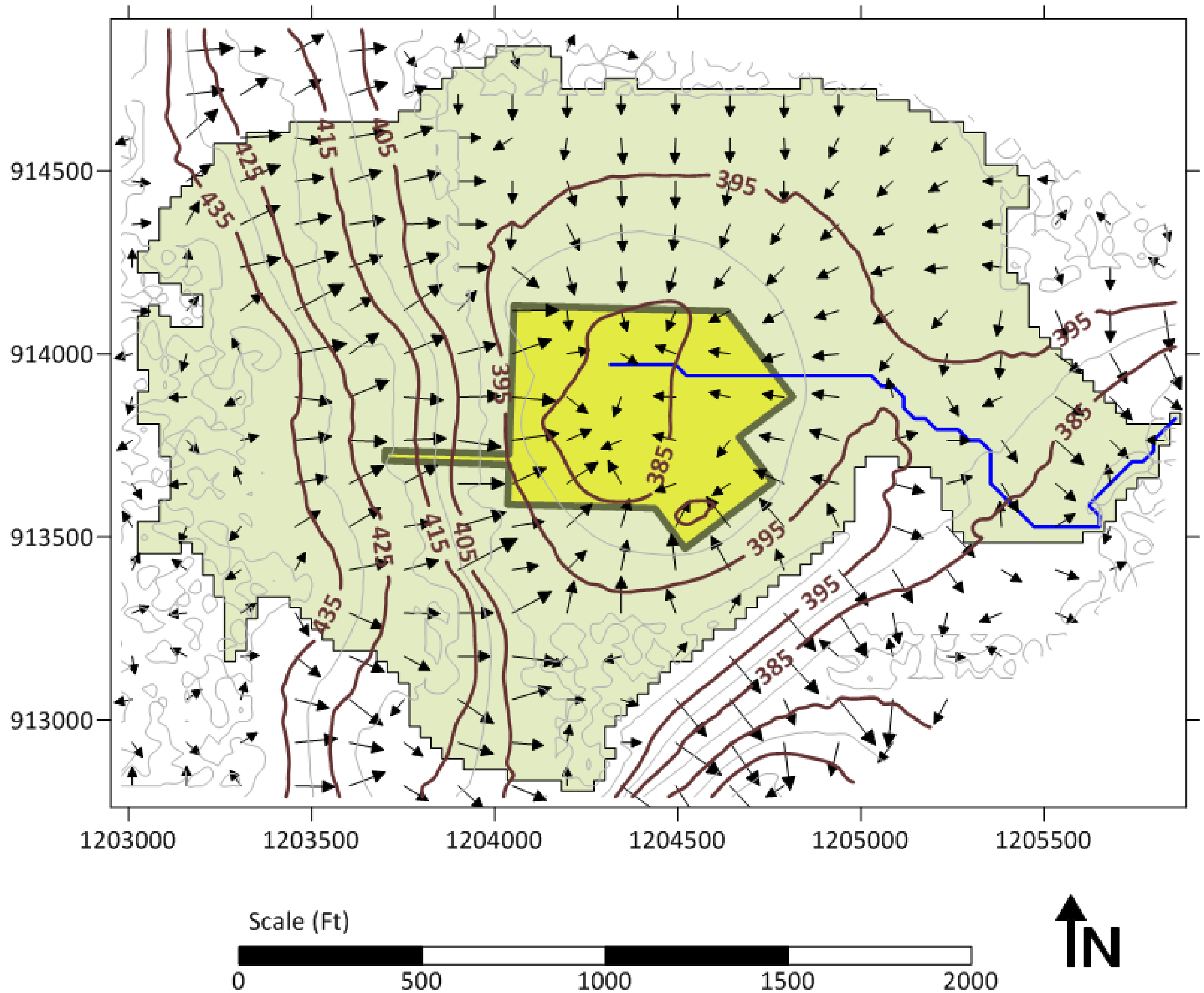
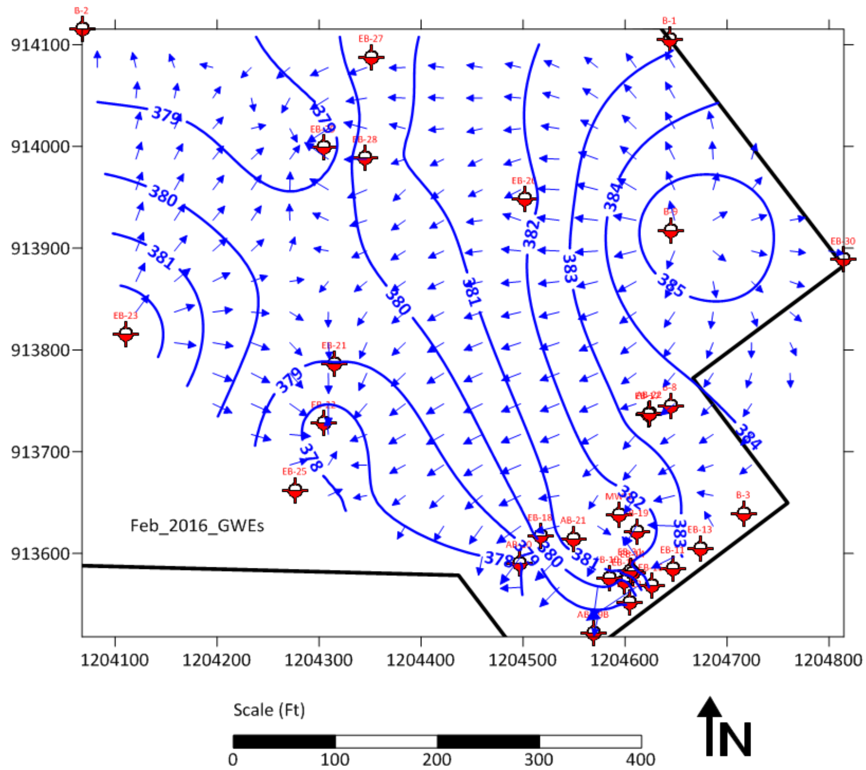


Figure 2 – Land Surface Elevation Contours, Slope Vectors and Predicted Watershed Boundaries.

Feb-2016



Oct_2016

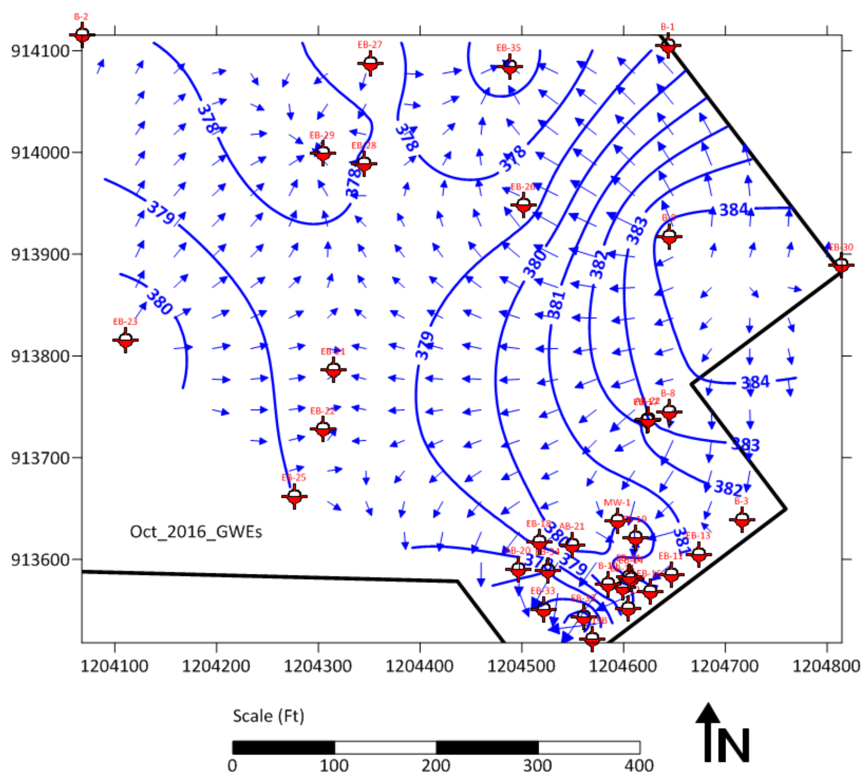


Figure 3 – Groundwater Elevations.

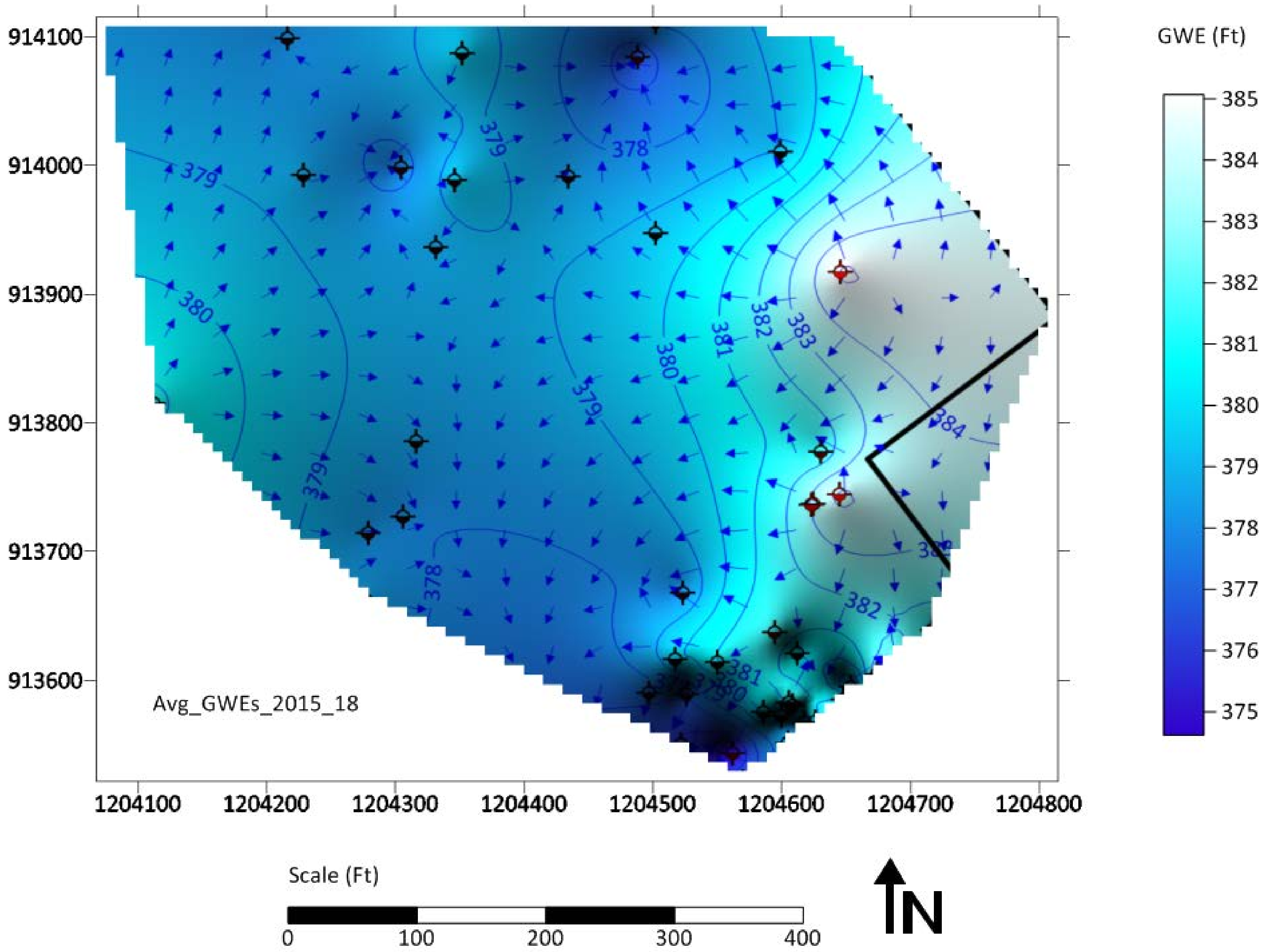


Figure 4 – 3D Groundwater Elevations.

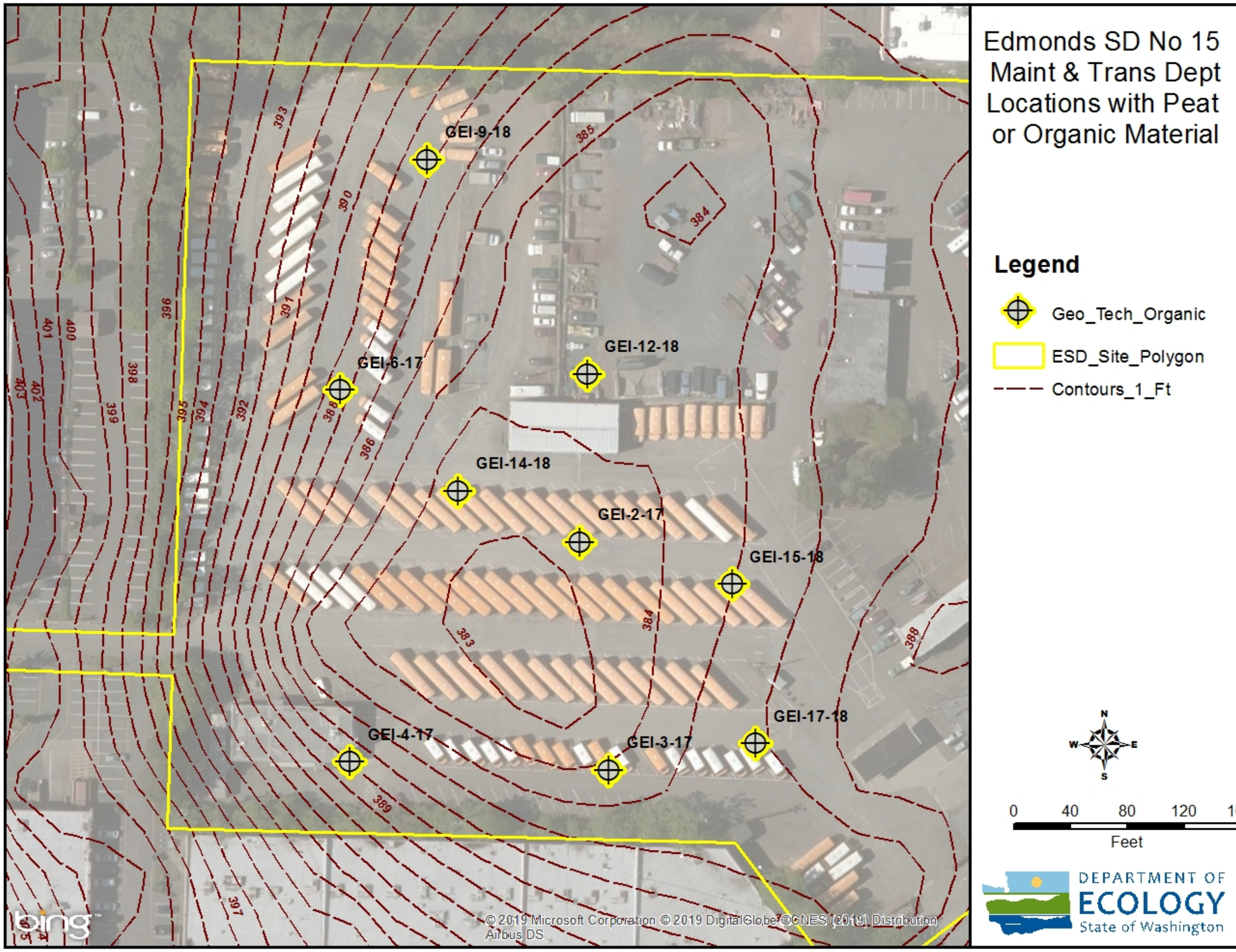


Figure 5 – GeoTech Boring Locations with Organic Material or Peat.

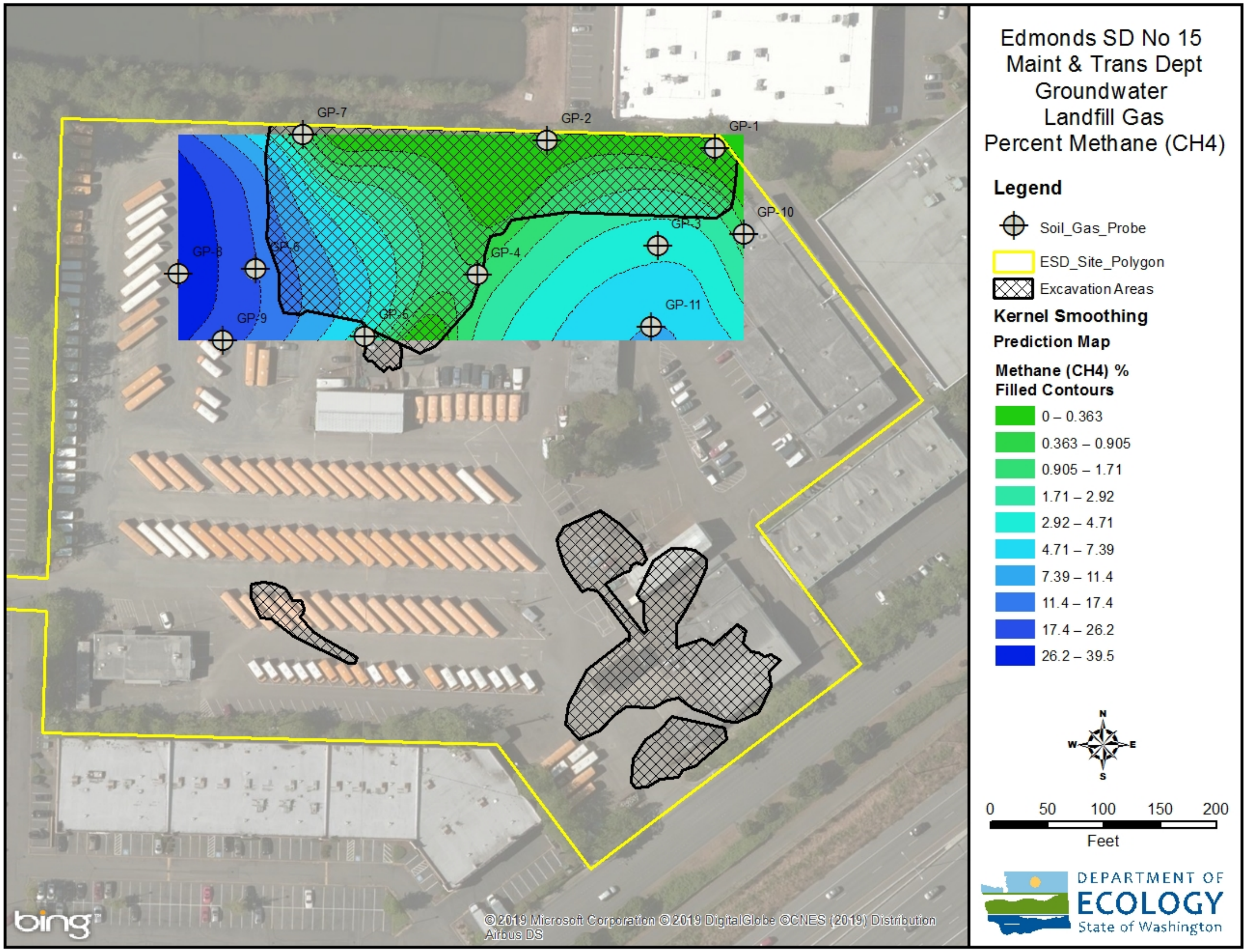


Figure 6 – Landfill Gas Readings (Percent Methane).

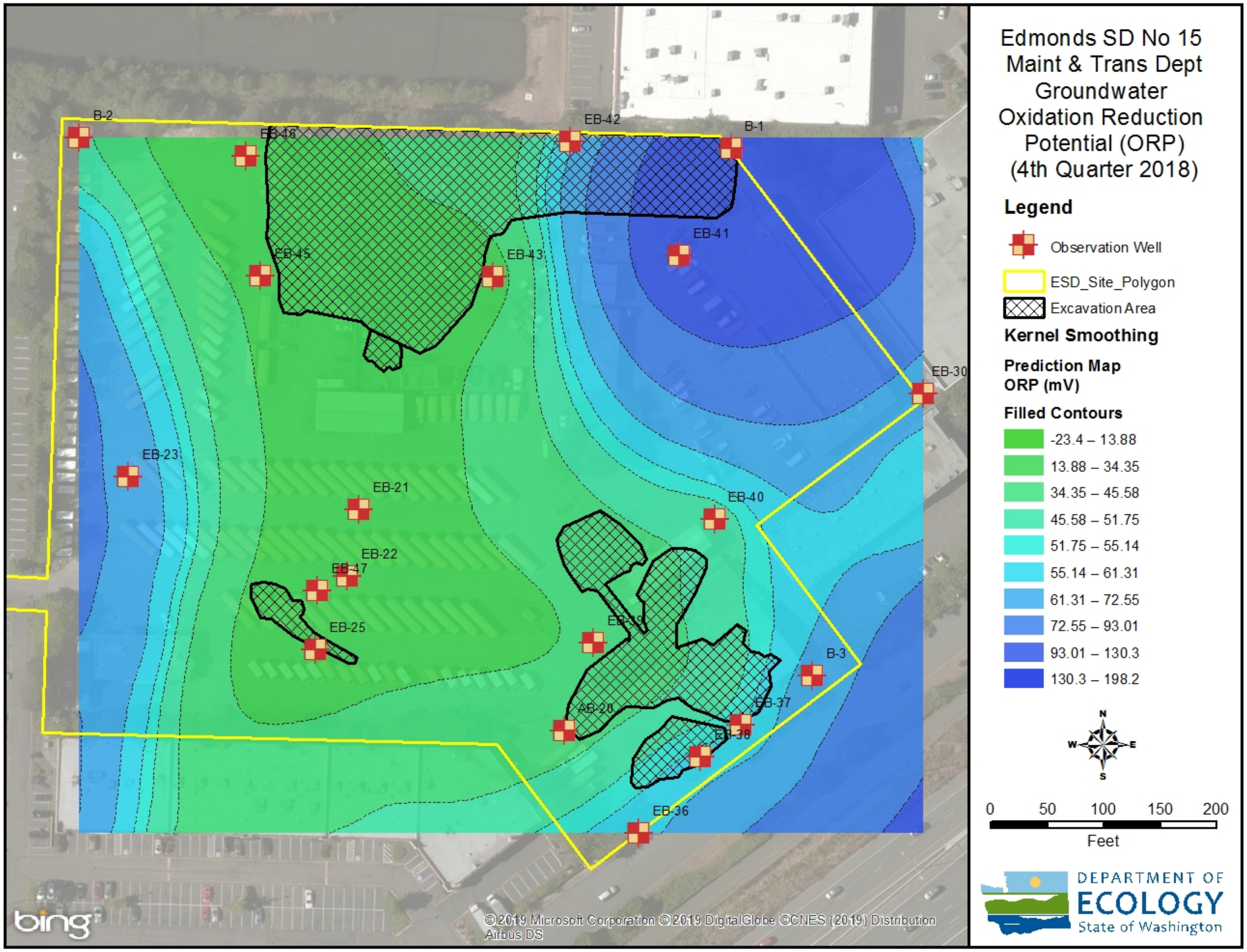


Figure 7 – Groundwater Oxidation Reduction Potential (ORP).

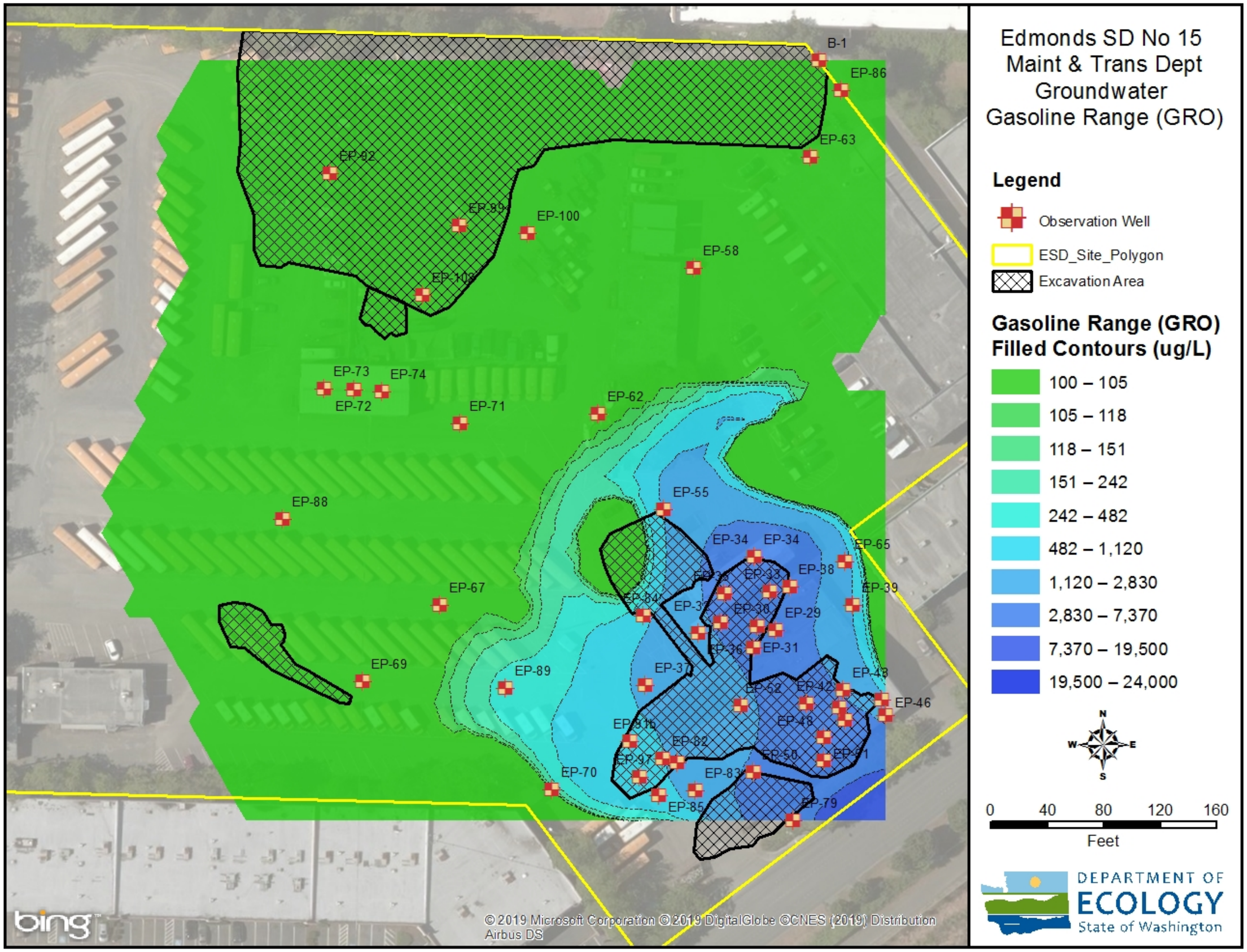
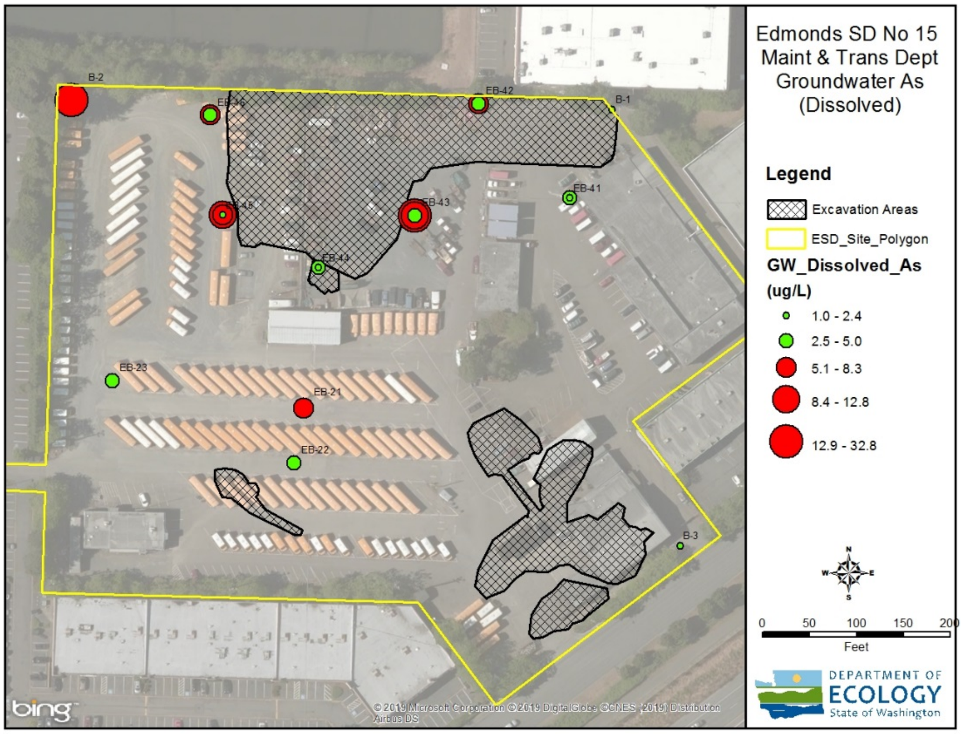


Figure 8 – Groundwater Gasoline Range (GRO) Footprint.

Graduated Symbol



Filled Contours

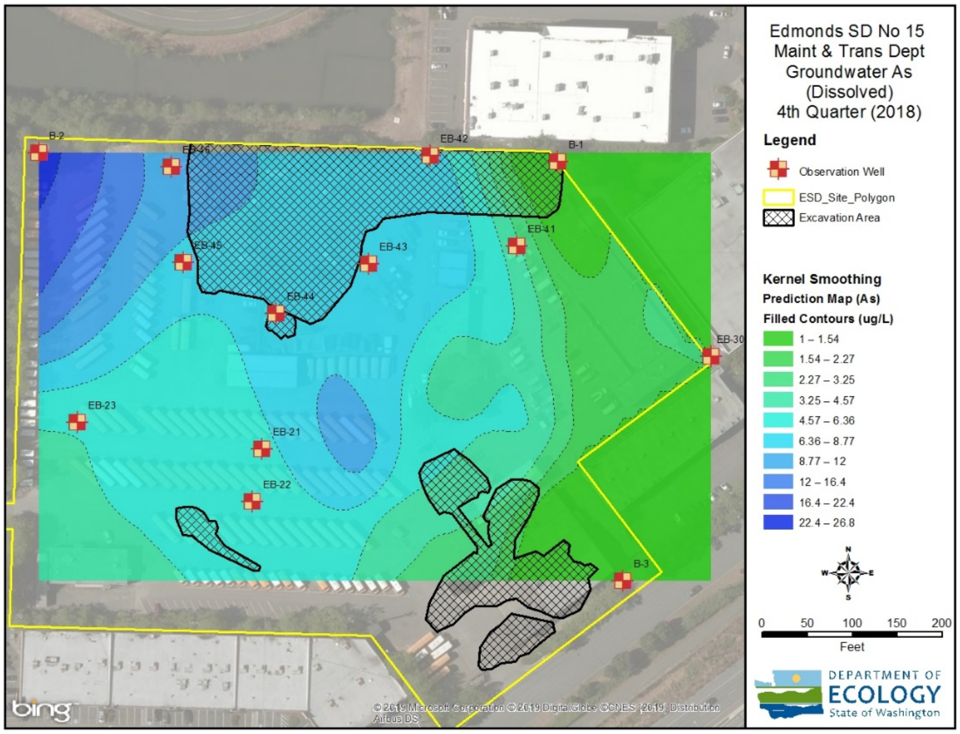


Figure 9 – Dissolved Groundwater Arsenic Levels (Oct-2018).

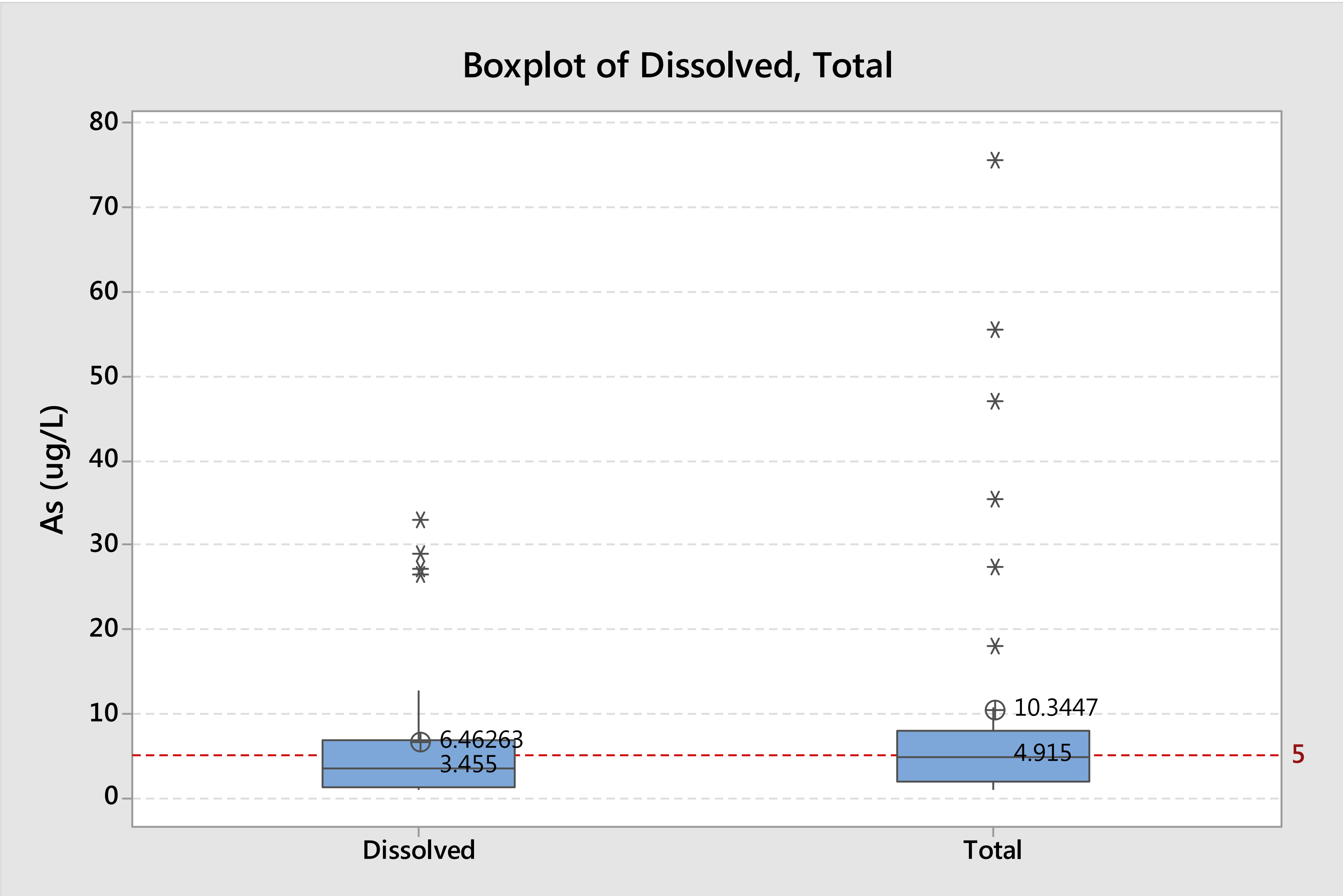


Figure 10 – Groundwater Arsenic Box Plot.

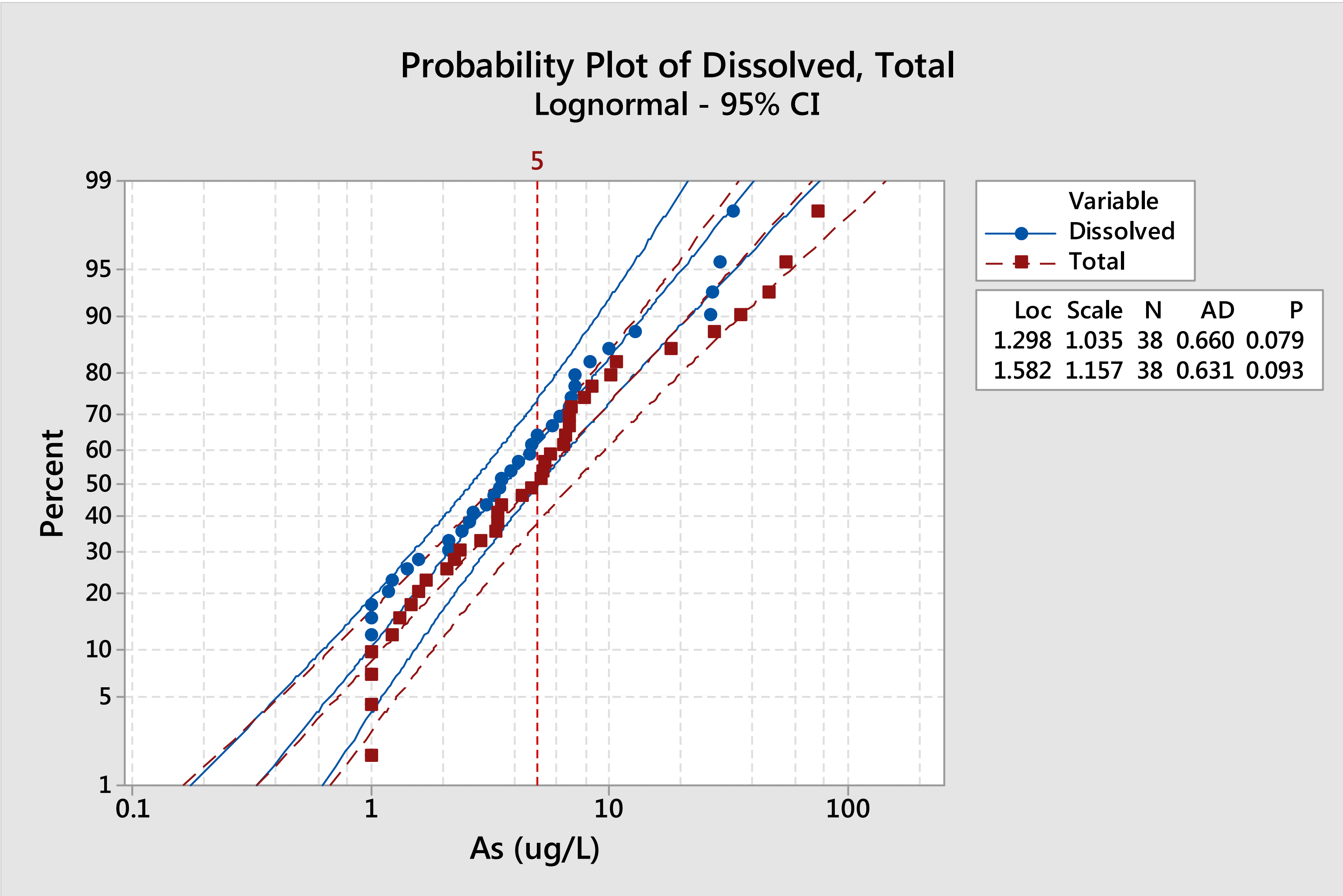
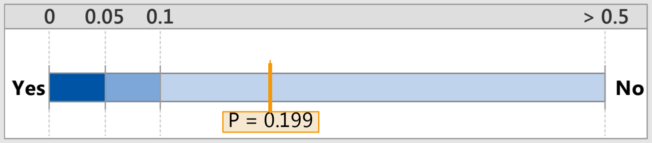


Figure 11 – Groundwater Probability Plot.

2-Sample t Test for the Mean of Dissolved and Total
Summary Report

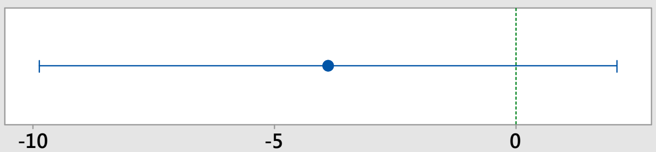
Do the means differ?



The mean of Dissolved is not significantly different from the mean of Total (p > 0.05).

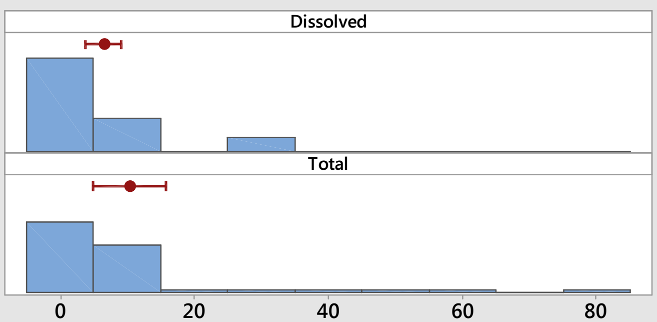
95% CI for the Difference

Is the entire interval above or below zero?



Distribution of Data

Compare the data and means of the samples.



Individual Samples

Statistics	Dissolved	Total
Sample size	38	38
Mean	6.4626	10.345
95% CI	(3.741, 9.185)	(4.9401, 15.749)
Standard deviation	8.2810	16.443

Difference Between Samples

Statistics	*Difference
Difference	-3.8821
95% CI	(-9.8698, 2.1056)

*Difference = Dissolved - Total

Comments

- Test: There is not enough evidence to conclude that the means differ at the 0.05 level of significance.
- CI: Quantifies the uncertainty associated with estimating the difference in means from sample data. You can be 95% confident that the true difference is between -9.8698 and 2.1056.
- Distribution of Data: Compare the location and means of samples. Look for unusual data before interpreting the results of the test.

Figure 12 – 2-Sample t Test Summary Report.

Table 1 – Groundwater Elevations.

Location	*GWE_Ft	Location	GWE_Ft
AB-19B	377.17	**EB-27**	379.58
AB-20	377.41	**EB-28**	379.51
AB-21	381.09	**EB-29**	377.57
AB-22	383.46	**EB-30**	384.55
B-1	380.60	**EB-31**	381.24
B-10	380.28	**EB-32**	374.42
B-2	378.24	**EB-33**	375.89
B-3	381.42	**EB-34**	377.03
B-8	384.20	**EB-35**	376.40
B-9	385.17	**EB-36**	375.61
EB-11	381.33	**EB-37**	377.32
EB-12	378.81	**EB-38**	377.70
EB-13	382.97	**EB-39**	377.99
EB-14	381.71	**EB-40**	381.24
EB-15	378.87	**EB-41**	379.03
EB-16	381.27	**EB-42**	378.14
EB-17	382.92	**EB-43**	378.42
EB-18	379.89	**EB-44**	378.67
EB-19	380.31	**EB-45**	378.70
EB-21	378.46	**EB-46**	378.02
EB-22	378.05	**EB-47**	378.20
EB-23	381.22	**MW-1**	381.74
EB-25	378.56		
EB-26	379.36		

*Average elevation (2015 – 2018). Data Source: EHSI (2018).

Table 2 – Landfill Gas Readings (4th Quarter, 2018).

Location	Date	Quarter	CH4_%	CO2_%	H2S_%	Balance
GP-1	10/2/2018	Q4	0	1.6	0	76.8
GP-1	10/29/2018	Q4	0	0.1	0	78.6
GP-2	10/2/2018	Q4	0	0.1	0	76.3
GP-2	10/29/2018	Q4	0	0.1	0	78.5
GP-3	10/2/2018	Q4	6	14.8	3	74.2
GP-3	10/29/2018	Q4	6.8	15.8	2	76
GP-4	10/2/2018	Q4	0	0.1	0	76.4
GP-4	10/29/2018	Q4	0	0.1	0	77.9
GP-5	10/2/2018	Q4	0	0.5	0	76.6
GP-5	10/29/2018	Q4	N/A	N/A	N/A	N/A
GP-6	10/2/2018	Q4	20.6	39.5	0	39.5
GP-6	10/29/2018	Q4	19.6	34.4	0	45.3
GP-7	10/2/2018	Q4	0	0	0	74.8
GP-7	10/29/2018	Q4	N/A	N/A	N/A	N/A
GP-8	10/29/2018	Q4	39.5	39.8	0	20.3
GP-9	10/29/2018	Q4	17.1	20.8	0	61.6
GP-10	10/29/2018	Q4	0.4	5.2	0	94
GP-11	10/29/2018	Q4	7.9	9	0	82.8

Data Source: EHSI (2018).

Table 3 – Groundwater Geochemistry (4^{th} Quarter, 2018).

Well	Dissolved Oxygen (mg/L)	Specific Conductance Electrical Conductivity (umhos/cm 25°C)	pH (s.u.)	ORP (mV)
AB-20	0.14	383	6.95	34.6
B-1	0.75	294	5.89	104.8
B-2	0.38	514	6.00	52.4
B-3	0.26	354	6.47	73.3
EB-21	0.21	691	6.59	28.1
EB-22	0.21	584	6.65	36.2
EB-23	0.22	393	6.14	73.4
EB-25	0.16	320	6.19	40.5
EB-30	1.61	299	6.15	62.6
EB-36	0.15	266	6.08	58.0
EB-37	0.11	414	6.49	33.1
EB-38	0.27	483	7.64	71.5
EB-39	0.23	359	7.04	32.8
EB-40	0.15	327	6.65	18.2
EB-41	0.11	611	6.21	198.2
EB-42	5.74	609	7.10	47.8
EB-43	0.32	576	6.09	(23.4)
EB-45	0.16	834	6.07	40.3
EB-46	0.13	1,343	6.18	1.7
EB-47	0.12	536	6.31	(20.3)

Data Source: EHSI (2018).