

2024 Groundwater Monitoring Report

Pigeon Property
1705 Route 128
Westford, Vermont

DEC SMS#2019-4863

May 9, 2024

Prepared For:
Co-Operative Insurance Companies
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LEE Project # 19-138



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1.0 INTRODUCTION/BACKGROUND

LE Environmental LLC of Waterbury, Vermont (LEE) was retained by the Co-Operative Insurance Companies of Middlebury, Vermont to perform groundwater monitoring at the Pigeon Property Site, located at 1705 Route 128, Westford, Vermont (Site; DEC Site #2019-4863). A groundwater monitoring work plan dated March 28, 2024 was approved in an electronic mail message from the Vermont Department of Environmental Conservation (DEC) on April 5, 2024. A Site Location Map is included in Appendix A.

The Site includes a vacant residence and a former bus garage on approximately 3.3 acres of land, on the north side of Route 128, in the center of Westford. The buildings are currently unoccupied and are used for storage.

The Site was developed prior to 1858. Historic Site use has included residential, with a gasoline filling station, and automotive and bus repair. A small store was also once present on the southeastern portion of the property. A building was noted on or near the northeastern property line on historic (1869 and 1915) maps. The building was gone by 1948. A tannery was noted on the adjoining property to the west in 1869.

LEE prepared a Phase I ESA report for the property in September 2019¹, and three Recognized Environmental Conditions (RECs) were identified during the Phase I ESA:

1. Historic use of the property for bus/automotive repair and as a gasoline filling station.
2. Possible presence of an abandoned UST.
3. Historic adjoining property use as a tannery.

A Phase II ESA was recommended to determine whether contamination is present on the Site due to the identified RECs. Subsequently, LEE conducted geophysical testing to locate an abandoned UST in 2019 and a Brownfields Phase II ESA in 2020.² The Phase II ESA included assessment of the soils around and below the abandoned gasoline UST, which necessitated its removal, soil boring advancement, groundwater monitoring well installation, soil sampling, groundwater sampling, and drinking water sampling.

In order to access the soils around and beneath it, the abandoned, 1,100-gallon, gasoline UST was removed from the Site on June 2, 2020. The UST was a relic of the

¹ LE Environmental LLC, Phase I Environmental Site Assessment Report, September 23, 2019.

² LE Environmental LLC, Brownfields Phase II Environmental Site Assessment Report, Pigeon Property, July 24, 2020.



former gasoline filling station that operated on the Site from circa 1940 through the mid 1980s. The age of the UST and piping is not known, but it appeared to be at least 80 years old. The UST was a single-walled tank, and piping from other former USTs was also encountered in the excavation. The piping for the removed UST appeared to have been cut near the former pump island, and had paper stuffed in the end. It was buried approximately 1.5' to 2' below grade (bg) and was found to be in failed condition upon removal, with extensive rust, pitting, and several large holes in the bottom of the UST. Groundwater was encountered at 6' bg in the excavation, and a sheen was noted on the groundwater.

The photoionization detector (PID) readings ranged from 17.1 parts per million (ppm) in soil under the former dispenser island to 2,374 ppm at the top of the tank where piping (not attached to this tank) was found. PID readings ranging from 1,286 ppm to 1,644 ppm were observed under the UST, which was also where groundwater was encountered.

A pipe with unknown purpose was noted on the southern wall of the UST excavation. The excavation could not be extended in this direction due to the presence of Route 128 and special permitting; traffic control, and engineering would be required to dig in this area.

Groundwater was found to be impacted with petroleum related Volatile Organic Compounds (VOCs) during the Phase II ESA, at concentrations above the Vermont Groundwater Enforcement Standards (VGES) and above the vapor intrusion (VI) standards for groundwater in the vicinity of the former UST. The limits of the dissolved-phase groundwater contaminant plume were not defined by the Phase II ESA. No VOCs were reported in the drinking water sample obtained during the Phase II ESA.

The Phase II ESA indicated that shallow and deep soils are impacted with petroleum contamination in the southern portion of the property, near the former UST location, and in the parking area to the east. Shallow soils are impacted with Polycyclic Aromatic Hydrocarbons (PAHs) in the area to the north of the garage. The limits of the PAH contamination were not defined during the Phase II ESA. Subsequent investigations did define the limits of PAH contamination in shallow soil.

A Supplemental Site Investigation was completed in 2021. A geophysical investigation was conducted to investigate the area around the suspect pipe noted on the southern edge of the previous UST excavation on November 24, 2020. No evidence of a pipe or additional USTs beneath Route 128 was noted during the geophysical investigation.

A confirmatory round of groundwater sampling was performed on December 3, 2020. The depth to water ranged from 2.86' below grade (bg) at MW-1 to 8.62' bg at



MW-5. Concentrations of benzene, toluene, ethylbenzene, xylenes, trimethylbenzenes, and naphthalene in excess of the VGES were reported in the vicinity of the former UST location (MW-1). Ethylbenzene was reported in MW-2 below the VGES. No contaminant concentrations were reported above laboratory detection limits in MW-3, MW-4, or MW-5. A supply well sample was also obtained on December 3, 2020, and no VOCs were reported in the water supply sample.

Thirteen soil borings were advanced at the Site on December 21, 2020. Three additional groundwater monitoring wells, four soil gas wells, and two vapor pins were installed.

An additional round of groundwater sampling, including the three newly installed monitoring wells, was performed on January 7, 2021. The depth to water ranged from 2.09' bg at MW-7 to 10.27' bg at MW-5. Concentrations of MTBE, benzene, toluene, ethylbenzene, xylenes, trimethylbenzenes, and naphthalene in excess of the VGES were reported in MW-1. A naphthalene concentration in excess of the VGES was reported in MW-8. Concentrations of ethylbenzene and 1,3,5-trimethylbenzene below the VGES were reported in MW-2.

Three soil gas, two sub-slab soil gas, and one outdoor ambient air sample were obtained on January 2, 2021. The soil gas samples were analyzed for the presence of VOCs via EPA Method TO-15. Several VOCs were reported in the soil gas samples including: benzene, carbon tetrachloride, ethylbenzene, methylene chloride, tetrachloroethene (PCE), acetone, ethanol, isopropanol, tetrahydrofuran, toluene, Freon 11, and xylenes. None of the reported concentrations exceeded DEC's residential VI standards.

A Corrective Action Plan (CAP) for petroleum contaminated soil was completed in July 2021. The CAP was approved by the Vermont Department of Environmental Conservation on September 28, 2021.

Excavation of petroleum contaminated soils was performed by US Ecology of Williston, Vermont, under the oversight of LEE. Excavation occurred on November 8-9, 2021. PID readings in soils ranged from 349.5-590.7 ppm in the characterization samples.

Confirmation soil samples were obtained from each sidewall and the bottom of the excavation. The soil samples were submitted to EAI for laboratory analysis of VOCs via EPA Method 8260. A duplicate soil sample was also obtained, for a total of six laboratory analytical soil samples. PID readings obtained from the sidewalls of the excavation ranged from 114.3-1,238 ppm. The soil sample from the bottom of the excavation (and duplicate) contained concentrations of benzene, ethylbenzene, xylenes (in duplicate), trimethylbenzenes, and naphthalene in excess of residential soil standards. The soil sample obtained from the southern sidewall concentrations of benzene, toluene, ethylbenzene, xylenes trimethylbenzenes, and naphthalene in



excess of residential soil standards. The soil sample obtained from the eastern sidewall contained concentrations of ethylbenzene and naphthalene in excess of residential soil standards. No contaminant concentrations exceeded residential standards in the samples obtained from the north and west sidewalls.

A total of 81.06 tons of contaminated soils was transported to Clean Earth in Fort Edward, New York for disposal on December 10, 2021 in three separate trucks. Despite two previous geophysical investigations to locate USTs in the exploration area, a previously unidentified steel UST was found on the southernmost side of the excavation on November 8, 2021. The UST was within the right-of-way for Route 128 and extended to the boundary of the historically archaeologically sensitive area of the property. The UST could not be removed until funding was secured and permitting was completed.

LEE conducted an environmental assessment of the abandoned, 2,000-gallon gasoline UST and oversaw the excavation of 20.61 tons of petroleum contaminated soil on October 17, 2022. ECI Engineers Construction of Williston, Vermont had placed sheet piling and traffic barriers along the edge of Route 128 prior to the start of work. US Ecology of Williston, Vermont performed the excavation, UST cleaning and removal, backfilling, and waste disposal.

The age of the UST and piping was not known, but it appeared to be at least 60 years old. The owner was not aware there were any USTs left in the ground, and he remembered tanks being removed from the Site sometime in the 1980s or 1990s. The UST was a single-walled tank, and the only piping attached to the UST was a vertical pipe encased in cement that was open at the top. It appeared to be part of the former dispenser for the UST. The UST was buried approximately 1.5' below grade and was found to be in fair condition upon removal, with some corrosion and a kink in the bottom where the UST was resting on a large rock. Groundwater was encountered at 3' below grade, and a small amount of free product was noted on the groundwater.

Nine soil samples were collected for field screening with a PID. Soils consisted of gravel, sand, and silt fill overlaying native clay. The PID readings ranged from 4.5 to 1,634 ppm.

Approximately 20.61 tons of petroleum contaminated soil was placed in a roll-off container and shipped to Clean Earth, Inc in Fort Edward, New York on October 19, 2022. A soil sample and a duplicate were collected under the UST, at approximately 6' below grade. The soil samples were submitted to Eastern Analytical Inc. of Concord, NH for analysis of VOCs, polycyclic aromatic hydrocarbons, and RCRA 8 metals.

The laboratory results from the soil samples were tabulated and compared to the Vermont Soil Standards (VSS) for a residential Site. Benzene, Toluene, Ethylbenzene,



Xylenes, 1,3,5-Trimethylbenzene, 1,2,4-Trimethylbenzene, and naphthene were reported above the VSSs for a residential Site. Concentrations of Isopropylbenzene, n-Propylbenzene, sec-Butylbenzene, and p-Isopropyltoluene were reported above laboratory detection limits but below their respective VSSs.

2.0 ENVIRONMENTAL ASSESSMENT - GROUNDWATER

2.1 Groundwater Level Measurement and Sample Collection

On April 16, 2024, LEE measured groundwater levels with an electronic water level indicator at all of the monitoring wells, and collected groundwater samples from monitoring wells MW-1R, MW-2, MW-3, MW-6, and MW-8. Groundwater was measured at depths ranging from 1.50-7.20 feet below top of casing (btoc). A Geotech peristaltic pump was used to purge and sample the wells. New, disposable, polyethylene down hole tubing and silicon pump head tubing was installed prior to pumping each well. Approximately three well volumes of water were removed from each of the monitoring wells prior to sampling.

Following the completion of purging, groundwater samples were collected directly from the pump discharge tubing into laboratory-supplied pre-acidified sample containers. One duplicate sample (duplicate of MW-2) was also collected. The samples were submitted to Eastern Analytical, Inc. of Concord, New Hampshire (EAI) and analyzed for the M8021 VOCs list via EPA Method 8260c.

2.2 Groundwater Hydrology

Measured depth to water was subtracted from the surveyed top of casing elevations to provide groundwater elevations. A reference elevation of 100.00' was assigned to the southeast corner of the garage. The measured water level depths, surveyed top of casing elevations, and calculated groundwater level elevations are presented in Appendix B.

The calculated relative groundwater elevations were plotted to create the Groundwater Contour Map in Appendix A. The overall groundwater flow during this sampling event was determined to be to the northeast. The approximate hydraulic gradient was approximately 4% on the southern portion of the Site and 21% in the central and northern portions of the Site. This groundwater flow and gradient are similar to those observed in the previous sampling events.

2.3 Laboratory Analytical Results-Groundwater Sampling

The groundwater testing results were tabulated in comparison to the current VGES and I-Rule residential VI standards. Concentrations of MTBE, benzene, toluene, ethylbenzene, trimethylbenzenes, and naphthalene in excess of the VGES were



reported in MW-1R. The laboratory detection limits were elevated in MW-1R due to the high contaminant concentrations in the sample. No other concentrations of VOCs were reported above laboratory detection limits in the groundwater samples collected. A tabular summary of the groundwater monitoring data and the laboratory report are included in Appendix B.

The most recent monitoring event revealed contaminant concentrations were confined to the former UST grave area (MW-1R). The dissolved contamination plume previously extended to MW-2 to the north, MW-6 to the northwest, and MW-8 to the northeast. The magnitude of contamination in this area has decreased by 70% since the first sampling event in June 2020, and by 59% since the sampling event prior to soil removal. Contaminant concentrations remain above the VGES for MTBE, benzene, toluene, ethylbenzene, trimethylbenzenes, and naphthalene at MW-1R. The contaminant concentrations increased since the most recent sampling event in April 2023, and may be attributed to a higher groundwater table. The overall decreasing trend is expected continue via natural attenuation in the source area.

Downgradient monitoring wells MW-3, MW-4, MW-5, and MW-6 were previously found to not be impacted from the groundwater contaminant plume. Monitoring well MW-7, which was installed on the Westford Common, is upgradient from the Site and has not had contaminant concentrations detected above laboratory reporting limits. Based on this information, the limits of the plume have been fully defined. Dissolved contaminant concentrations are expected to continue decreasing via natural attenuation now that the sources have been removed from the Site. A Groundwater Contaminant Map indicating the dissolved-phase petroleum VOC contaminant concentrations is included in Appendix A.

2.4 QA/QC Sampling Results

Quality assurance and quality control samples for this investigation included a trip blank, and a duplicate sample. No VOCs were reported in the trip blank, indicating that VOCs were not transmitted to the samples or blanks during sampling, storage, or transit. No VOCs were reported in the MW-2 or the duplicate, so a relative percent difference calculation could not be performed.

No data qualifiers were noted in the laboratory report. The results of surrogate recovery and laboratory control spike (LCS) and LCS duplicate testing were within laboratory acceptance ranges. No VOCs were reported in the laboratory blank.

Based on this information, all of the laboratory data meet normal QAQC requirements and are considered acceptable for the purposes of this investigation.



3.0 CONCEPTUAL SITE MODEL

3.1 Site Conditions and Setting

The area immediately surrounding the Site is the town center of Westford, with closely spaced residential homes, a municipal office building, a public library, and a town common. The topography of the Site is fairly flat on its south side, near Route 128, and then slopes downward to the north, toward the Browns River. There is also a ravine on the eastern side of the Site, which contains an outlet drainage pipe for the town common's stormwater system.

The on-Site residence is heated with fuel oil. The garage is not currently heated but appears to have been heated with wood, propane, and/or fuel oil historically. The buildings are served by a private dug supply well and at least one septic system. The configuration and location of the septic system is not known.

Bedrock was not encountered in the Phase II ESA. According to the most recent geologic map of Vermont, the bedrock in the vicinity of the Site consists of Cambrian and Neoproterozoic aged schist in the Pinnacle formation and the overburden deposits in the area of the Site are mapped as boulders in clay.³

The Site is approximately 470 feet above current sea level on the southern portion of the Site and drops to approximately 435 feet above current sea level at the northern terminus of the parcel boundary. This area has undergone extensive deposition and erosional processes through recent glacial events. The retreat of the Laurentide Ice Sheet led to the formation of glacial Lake Vermont approximately 13,500 years ago. The elevation of the lake surface was approximately 620 feet above sea level, significantly higher than the elevation of the current Lake Champlain. Streams flowing off the melted glacier deposited many sediments, with larger sediments deposited near the front of the glacier and finer grained sediments deposited away from the front of the glacier. Clay and silt varves were deposited in the calmer portions of Lake Vermont.⁴

The data obtained from soil borings indicate the soils at the Site consist of an approximately 3' thick layer of sand with varying amounts of silt overlaying dense, native clay. The clay contained distinct sand layers in each boring, and distinct varves have been noted in several soil borings. This data suggests the Site was likely located in a calmer portion of Lake Vermont. Sand layers noted in the clay point to periods of higher energy deposition in the lake.

The depth to groundwater at the Site varied between the four groundwater sampling events performed to date and fluctuate seasonally. Groundwater flow is

³ ANR Atlas.

⁴ S.F. Wright



generally toward the northeast. The hydraulic gradient in the southern portion of the Site has been calculated between 4 and 10%, while the hydraulic gradient on the central and northern portions of the Site has been calculated between 16 and 22%.

The overall low permeability of the native soils implies the migration of the contaminant plume is limited, and it is not expected to travel off-Site or impact the on-Site drinking water supply well. The low permeability of the soils was evident during sampling, where very low recharge has been noted in the groundwater monitoring wells.

Shallow and deep soils are impacted with petroleum contamination in the southern portion of the property, near the former UST location, and in a portion of the parking area to the east. Shallow soils are impacted with PAHs in the area to the north and northeast of the garage. The limits of the shallow soil PAH contamination have been defined.

Groundwater is impacted with petroleum related VOCs at concentrations above the VGES and the VI standards for groundwater in the vicinity of the former UST. The VGES exceedances are now limited to the former USTs area. The limits of the dissolved-phase contaminant plume have been defined.

Soil gas sampling results indicate several VOCs are present in the soil gas at the Site including: benzene, carbon tetrachloride, ethylbenzene, methylene chloride, tetrachloroethene (PCE), acetone, ethanol, isopropanol, tetrahydrofuran, toluene, Freon 11, and xylenes. None of the reported concentrations exceeded residential VI standards. The results suggest that while VOCs were detected in all of the soil gas samples obtained, since none of these concentrations exceeded residential VI standards, Site users are not likely to be impacted by these contaminants via vapor intrusion into the structures.

3.2 Potential Sources

The most apparent source(s) of contamination at the Site include the leaking gasoline USTs removed 2020 and 2022 (soil and groundwater), historic USTs (soil and groundwater), and historic use and storage of hazardous substances and petroleum products (shallow soil).

3.3 Potential Receptors

Potential receptors of contamination include Site users. Shallow soils are impacted with petroleum and PAHs at the Site. The groundwater plume is not migrating off-Site based on existing data. The Site is currently vacant and not used.



3.3.1 Utility Corridors

Buried underground utilities known to exist on or in the immediate vicinity of the Site include the water line from the well to the residence and garage, and the septic systems for the buildings. The Westford Common to the south of the Site has a series of drainage lines, which connect to a drainage culvert on the eastern portion of the Site.

3.3.2 Wetlands and Surface Water Bodies

The Browns River abuts the property on its northeast side and is approximately 450' from the former UST location. There is also an unnamed tributary that runs through the western portion of the property, and this tributary is approximately 200 feet northwest of the former UST location. The ANR Natural Resources Atlas does not depict Vermont State Wetland Inventory (VSWI) or wetlands advisory areas on the Site. However, apparent wetland vegetation was noted on the northern portions of the Site. Based on the results of the investigation, surface water does not appear to be at risk.

3.3.3 Public and Private Water Supplies

The Site and nearby properties are served by private wells. Approximately 28 water supply wells are depicted on the ANR Natural Resources Atlas within a quarter mile of the Site. The on-Site supply well was sampled and tested for VOCs twice, and no detections of VOCs or exceedances of regulatory standards were noted. The current groundwater monitoring data suggests the on-Site drinking water supply well and the off-Site supply wells are unlikely to be impacted from contamination at this Site.

3.3.4 Site Users

The Site is currently unoccupied and not being used except for storage by the owners of the property. Portions of the area have shallow soil contamination and future Site users could come into contact with this soil.

4.0 CONCLUSIONS AND RECOMMENDATIONS

LEE completed a Groundwater Monitoring event in accordance with the approved Work Plan dated March 28, 2024. The following conclusions are offered:

1. On April 16, 2024, LEE measured groundwater levels with an electronic water level indicator at all of the monitoring wells and collected groundwater samples from groundwater monitoring wells MW-1R, MW-2, MW-3, MW-6, and MW-8 after purging at least three well volumes of water from the well. Depth to groundwater ranged from 1.50 to 7.20 feet below grade.



2. The approximate hydraulic gradient was approximately 4% on the southern portion of the Site and 21% in the central and northern portions of the Site.
3. Concentrations of MTBE, benzene, toluene, ethylbenzene, trimethylbenzenes, and naphthalene in excess of the VGES were reported in MW-1R.
4. The dissolved contaminant plume remains contained near the former UST area on the southern portion of the Site. The magnitude of contamination in this area has decreased by 70% since the first sampling event in June 2020, and by 59% since the sampling event prior to soil removal. Contaminant concentrations remain above the VGES for MTBE, benzene, toluene, ethylbenzene, trimethylbenzenes, and naphthalene at MW-1R. The contaminant concentrations increased since the most recent sampling event in April 2023, and may be attributed to a higher groundwater table.
5. The dissolved contamination plume previously extended to MW-2 to the north, MW-6 to the northwest, and MW-8 to the northeast. The most recent monitoring event revealed contaminant concentrations were confined to the former UST grave area (MW-1R).
6. The limits of the dissolved contaminant plume have been fully defined. Dissolved contaminant concentrations are expected to continue decreasing via natural attenuation now that the sources have been removed from the Site.

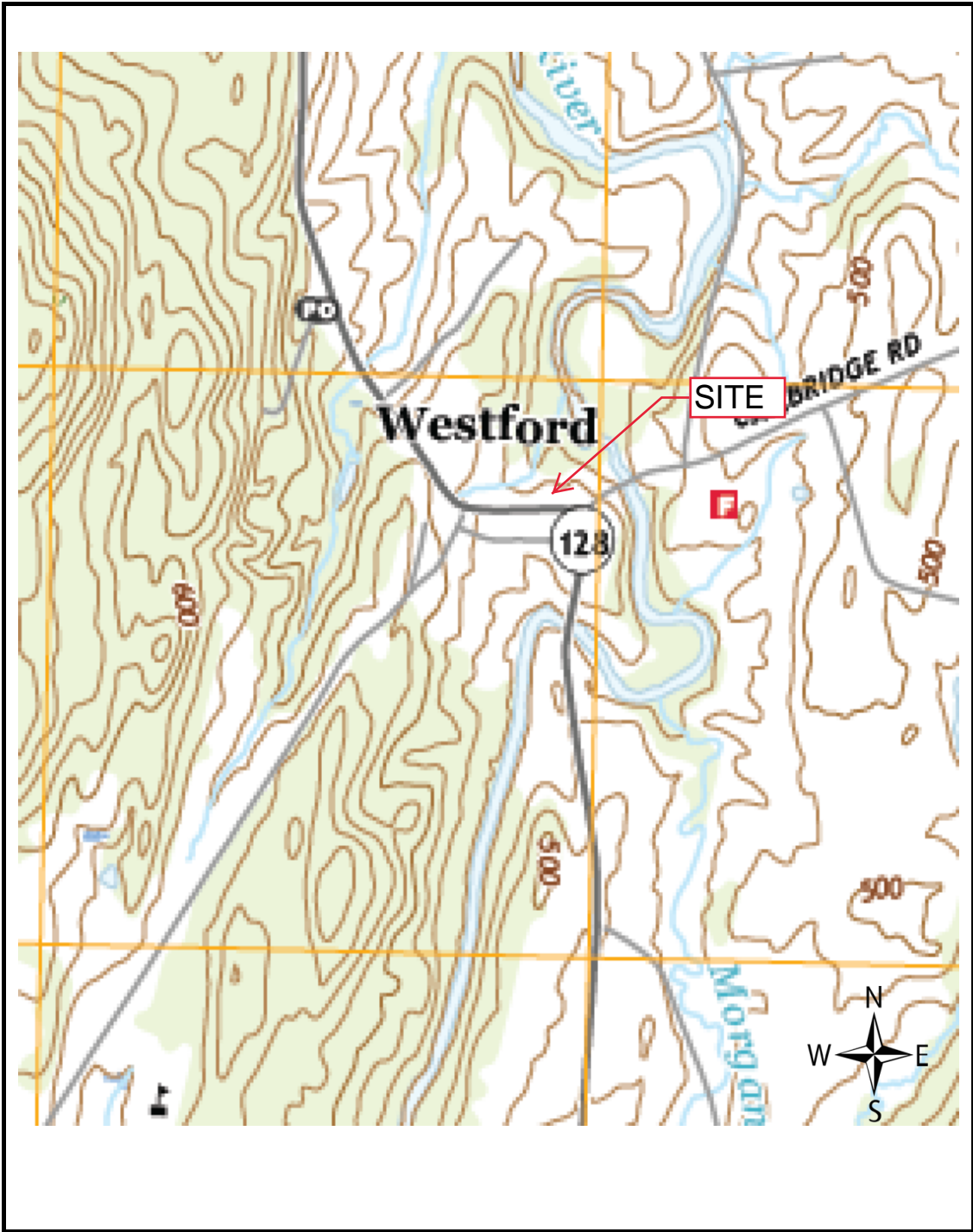
The following recommendations are made:

1. LEE recommends annual groundwater monitoring occurs in the Spring of 2025 to track contaminant concentrations in the vicinity of MW-1R. The sampling schedule should be reduced to include sampling MW-1R, MW-2, and MW-8. Groundwater levels should be collected from all Site monitoring wells.



APPENDIX A

Site Location Map
ANR Atlas Map
Groundwater Contour Map
Groundwater Contaminant Concentration Map

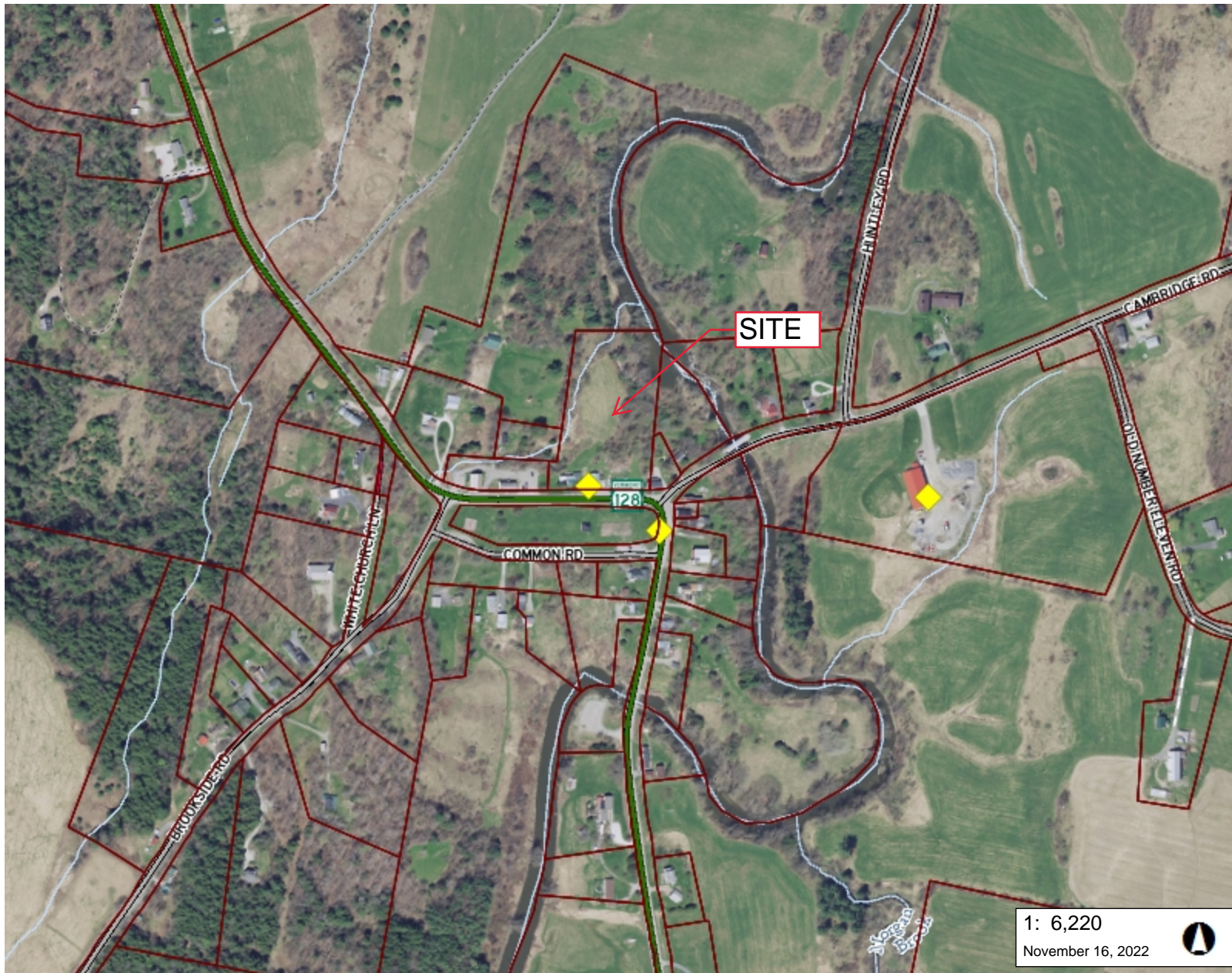


1705 Route 128
Westford, Vermont



Site Location Map

LEE #: 19-138
Date: January 13, 2022
Source: USGS Store



LEGEND

- Hazardous Site
- Brownfields
- Parcels (standardized)
- Roads**
 - Interstate
 - US Highway; 1
 - State Highway
 - Town Highway (Class 1)
 - Town Highway (Class 2,3)
 - Town Highway (Class 4)
 - State Forest Trail
 - National Forest Trail
 - Legal Trail
 - Private Road/Driveway
 - Proposed Roads
- Stream/River**
 - Stream
 - Intermittent Stream
- Town Boundary

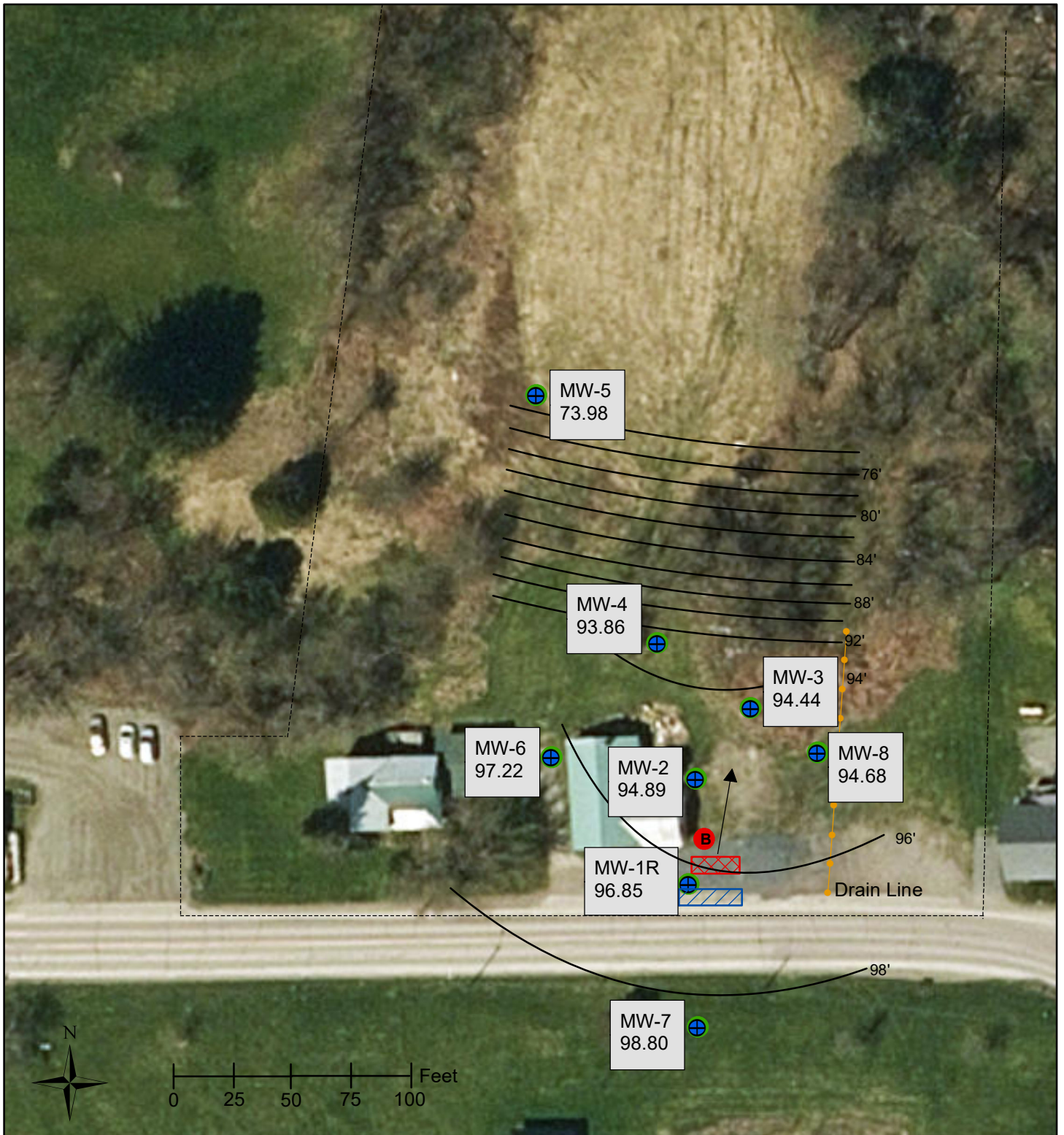
1: 6,220
November 16, 2022


316.0 0 158.00 316.0 Meters
 WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 518 Ft. 1cm = 62 Meters
 © Vermont Agency of Natural Resources THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.






NOTES

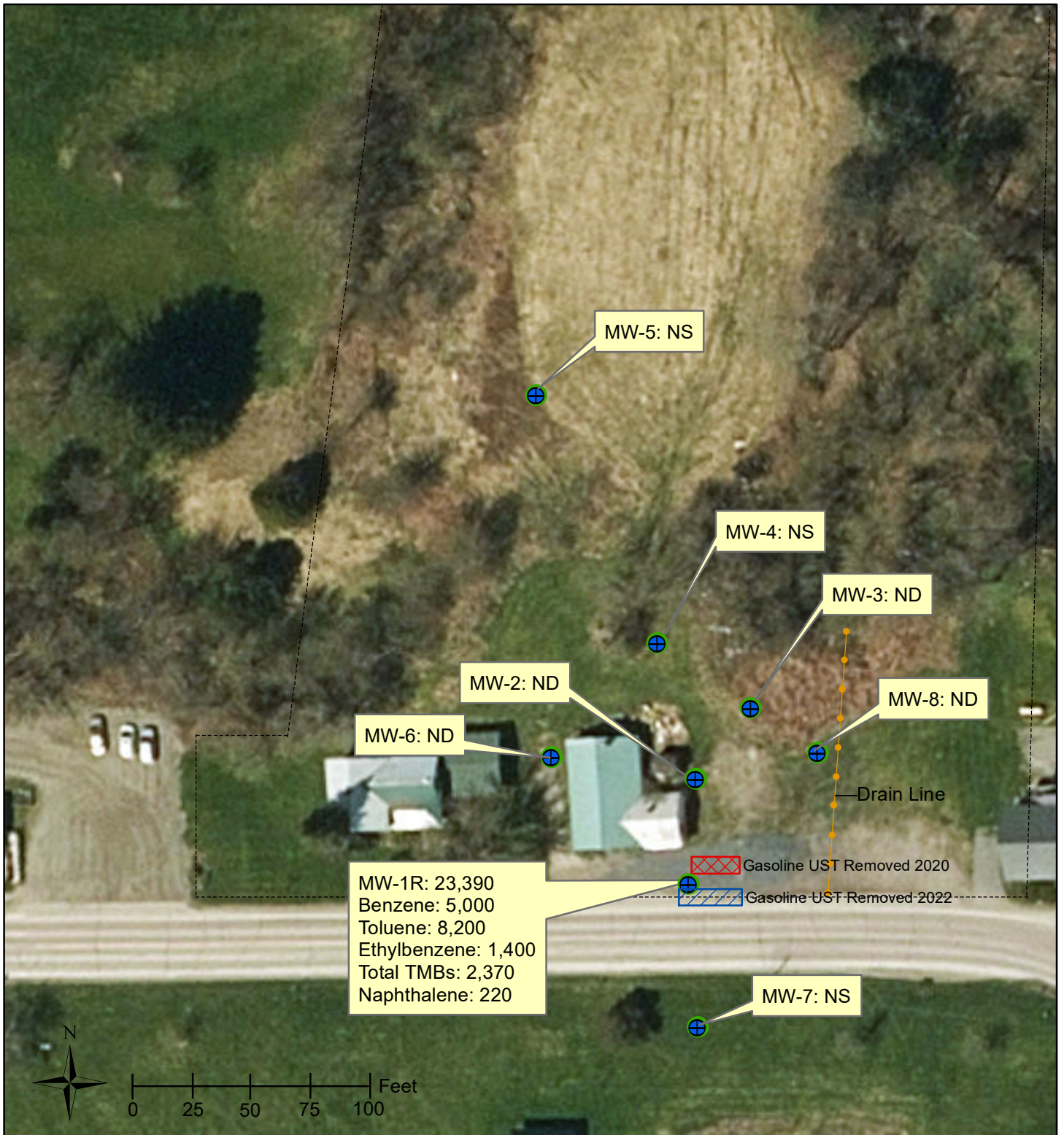
Map created using ANR's Natural Resources Atlas




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Groundwater Contour Map
Pigeon Property
1705 Route 128
Westford, Vermont
LEE Project # 19-138

Legend
 Monitoring well-elevations in feet
 Arrow denotes approximate groundwater flow
 Gasoline UST Pulled 2020
 Gasoline UST Pulled 2022
 Benchmark 100'
 Measure Date: 4/16/24
 Drawing Date: 5/6/24



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Groundwater Contaminant Concentration Map

Pigeon Property

1705 Route 128
Westford, Vermont
LEE Project # 19-138

Legend

- ⊕ GW Monitoring Well with total VOCs concentrations (ug/L)
- Regulatory exceedances in call-out boxes
- ND = Non-Detect
- Sampled via EPA Method 8260
- VT Petroleum List
- Sample Date: 4/16/24
- Drawing Date: 5/6/24



APPENDIX B

Groundwater Elevation Data and Contaminant Concentration Summary Tables

**Brownfields Phase II ESA
Pigeon Property
1705 Route 128
Westford, Vermont**

Measurement Date: April 16, 2024

Well I.D.	Top of Casing Elevation	Depth To Product btoc	Depth To Water btoc	Product Thickness	Specific Gravity Of Product	Water Equivalent	Corrected Depth To Water	Corrected Water Table Elevation
MW-1R	99.51	-	2.66	-	-	-	-	96.85
MW-2	99.74	-	4.85	-	-	-	-	94.89
MW-3	99.03	-	4.59	-	-	-	-	94.44
MW-4	98.68	-	4.82	-	-	-	-	93.86
MW-5	81.18	-	7.20	-	-	-	-	73.98
MW-6	99.99	-	2.77	-	-	-	-	97.22
MW-7	100.30	-	1.50	-	-	-	-	98.80
MW-8	98.37	-	3.69	-	-	-	-	94.68

Notes:

All Values Reported in Feet

btoc - Below Top of Casing

Elevation data relative to 100' at SE corner of garage

**Brownfields Supplemental Site Assessment
Groundwater Sampling Data Summary
Pigeon Property
1705 Route 128, Westford, Vermont
Page 1 of 3**



MW-1/MW-1R

Depth to Groundwater (Ft)	4.45	2.86	3.57	2.62	3.01	2.66	VIS-Resident	VGES
Sample Date	6/17/20	12/3/20	1/7/21	11/7/22	4/11/23	4/16/24		
VOCs, EPA Method 8260c (ug/l)								
Methyl-t-butyl ether (MTBE)	2,100	ND<200	290	450	180	ND<50	-	11
Benzene	14000	4900	5900	5800	2300	5000	0.92	5
1,2-Dichloroethane	ND<100	ND<200	ND<100	ND<100	ND<100	ND<50	-	5
Toluene	34,000	15,000	19,000	13,000	5,300	8,200	-	1000
1,2-Dibromoethane (EDB)	ND<50	ND<100	ND<50	ND<50	ND<50	ND<30	-	0.05
Ethylbenzene	3,900	2,500	2,900	930	920	1,400	2.2	700
mp-Xylene	13,000	12,000	15,000	4,800	4,100	4,500	-	10000**
o-Xylene	6,000	5,700	6,800	2,000	1,700	1,700	-	10000**
1,3,5-trimethylbenzene	770	880	1,000	310	540	450	330	23*
1,2,4-trimethylbenzene	2,900	3,300	4,300	1,100	1,700	1,500	470	23*
1,2,3-trimethylbenzene	NT	950	1,100	250	440	420	790	23*
Naphthalene	640	710	690	150	210	220	4	0.5
Total Reported VOCs	77,310	45,940	56,980	28,790	17,390	23,390		

Notes

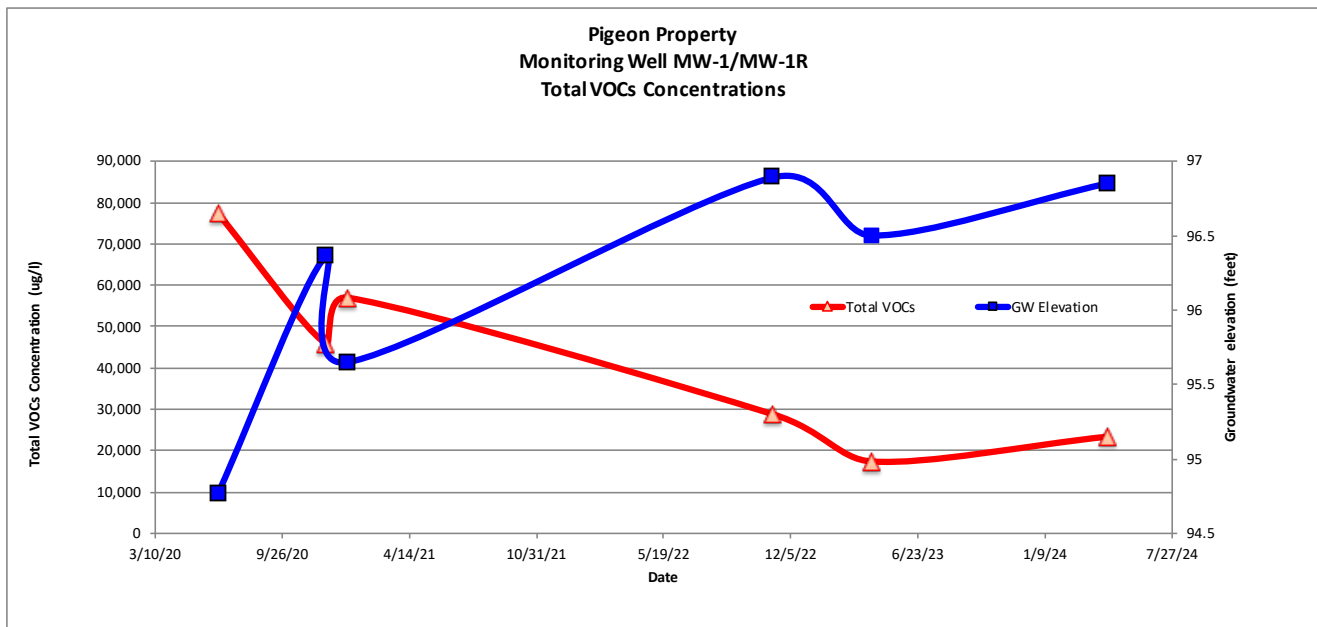
Groundwater Enforcement Standard from Vermont Groundwater Protection Rule 7/19

Groundwater Vapor Intrusion Standards (VIS) from Vermont I-Rule 7/19

Reported results or reporting limits equal to or in excess of regulatory criteria are shaded.

Dashed Cell - no standard

* means total trimethylbenzenes ** means total xylenes



**Brownfields Supplemental Site Assessment
Groundwater Sampling Data Summary
Pigeon Property
1705 Route 128, Westford, Vermont
Page 2 of 3**



MW-2

Depth to Groundwater (Ft)	6.26	5.81	6.19	3.85	5.60	4.85	VIS-Resident	VGES
Sample Date	6/17/20	12/3/20	1/7/21	11/7/22	4/11/23	4/16/24		
VOCs, EPA Method 8260c (ug/l)								
Methyl-t-butyl ether (MTBE)	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	-	11
Benzene	1.3	ND<1	ND<1	ND<1	ND<1	ND<1	0.92	5
1,2-Dichloroethane	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	-	5
Toluene	1.1	ND<1	ND<1	ND<1	ND<1	ND<1	-	1000
1,2-Dibromoethane(EDB)	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	0.05
Ethylbenzene	9.4	1.5	2	ND<1	ND<1	ND<1	2.2	700
mp-Xylene	18	ND<1	ND<1	ND<1	ND<1	ND<1	-	10000**
o-Xylene	2	ND<1	ND<1	ND<1	ND<1	ND<1	-	10000**
1,3,5-trimethylbenzene	7.1	ND<1	1	ND<1	ND<1	ND<1	330	23*
1,2,4-trimethylbenzene	22	ND<1	ND<1	ND<1	ND<1	ND<1	470	23*
1,2,3-trimethylbenzene	NT	ND<1	ND<1	ND<1	ND<1	ND<1	790	23*
Naphthalene	5.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	4	0.5
Total Reported VOCs	66	1.5	3	ND	ND	ND		

MW-3

Depth to Groundwater (Ft)	11.59	4.70	9.37	6.26	4.59	VIS-Resident	VGES
Sample Date	6/17/20	12/3/20	1/7/21	4/11/23	4/16/24		
VOCs, EPA Method 8260c (ug/l)							
Methyl-t-butyl ether (MTBE)	ND<1	ND<1	ND<1	ND<1	ND<1	-	11
Benzene	ND<1	ND<1	ND<1	ND<1	ND<1	0.92	5
1,2-Dichloroethane	ND<1	ND<1	ND<1	ND<1	ND<1	-	5
Toluene	ND<1	ND<1	ND<1	ND<1	ND<1	-	1000
1,2-Dibromoethane(EDB)	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	0.05
Ethylbenzene	ND<1	ND<1	ND<1	ND<1	ND<1	2.2	700
mp-Xylene	ND<1	ND<1	ND<1	ND<1	ND<1	-	10000**
o-Xylene	ND<1	ND<1	ND<1	ND<1	ND<1	-	10000**
1,3,5-trimethylbenzene	ND<1	ND<1	ND<1	ND<1	ND<1	330	23*
1,2,4-trimethylbenzene	ND<1	ND<1	ND<1	ND<1	ND<1	470	23*
1,2,3-trimethylbenzene	NT	ND<1	ND<1	ND<1	ND<1	790	23*
Naphthalene	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	4	0.5
Total Reported VOCs	ND	ND	ND	ND	ND		

Notes

Groundwater Enforcement Standard from Vermont Groundwater Protection Rule 7/19
 Groundwater Vapor Intrusion Standards (VIS) from Vermont I-Rule 7/19
 Reported results or reporting limits equal to or in excess of regulatory criteria are shaded.
 Dashed Cell - no standard
 * means total trimethylbenzenes ** means total xylenes

**Brownfields Supplemental Site Assessment
Groundwater Sampling Data Summary
Pigeon Property
1705 Route 128, Westford, Vermont
Page 3 of 3**



MW-6

Depth to Groundwater (Ft)	3.80	3.02	3.31	2.77	VIS-Resident	VGES
Sample Date	1/7/21	11/7/22	4/11/23	4/16/24		
VOCs, EPA Method 8260c (ug/l)						
Methyl-t-butyl ether (MTBE)	ND<1	ND<1	ND<1	ND<1	-	11
Benzene	ND<1	ND<1	ND<1	ND<1	0.92	5
1,2-Dichloroethane	ND<1	ND<1	ND<1	ND<1	-	5
Toluene	ND<1	ND<1	ND<1	ND<1	-	1000
1,2-Dibromoethane(EDB)	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	0.05
Ethylbenzene	ND<1	ND<1	ND<1	ND<1	2.2	700
mp-Xylene	ND<1	ND<1	ND<1	ND<1	-	10000**
o-Xylene	ND<1	ND<1	ND<1	ND<1	-	10000**
1,3,5-trimethylbenzene	ND<1	ND<1	ND<1	ND<1	330	23*
1,2,4-trimethylbenzene	ND<1	ND<1	ND<1	ND<1	470	23*
1,2,3-trimethylbenzene	ND<1	ND<1	ND<1	ND<1	790	23*
Naphthalene	ND<0.5	ND<0.5	ND<0.5	ND<0.5	4	0.5
Total Reported VOCs	ND	ND	ND	ND		

MW-8

Depth to Groundwater (Ft)	3.80	5.21	4.21	3.69	VIS-Resident	VGES
Sample Date	1/7/21	11/7/22	4/11/23	4/16/24		
VOCs, EPA Method 8260c (ug/l)						
Methyl-t-butyl ether (MTBE)	ND<1	ND<1	ND<1	ND<1	-	11
Benzene	ND<1	ND<1	ND<1	ND<1	0.92	5
1,2-Dichloroethane	ND<1	ND<1	ND<1	ND<1	-	5
Toluene	ND<1	ND<1	ND<1	ND<1	-	1000
1,2-Dibromoethane(EDB)	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-	0.05
Ethylbenzene	ND<1	ND<1	ND<1	ND<1	2.2	700
mp-Xylene	ND<1	ND<1	ND<1	ND<1	-	10000**
o-Xylene	ND<1	ND<1	ND<1	ND<1	-	10000**
1,3,5-trimethylbenzene	ND<1	ND<1	ND<1	ND<1	330	23*
1,2,4-trimethylbenzene	ND<1	ND<1	ND<1	ND<1	470	23*
1,2,3-trimethylbenzene	ND<1	ND<1	ND<1	ND<1	790	23*
Naphthalene	2.9	1.2	ND<0.5	ND<0.5	4	0.5
Total Reported VOCs	2.9	1.2	ND	ND		

Notes

- Groundwater Enforcement Standard from Vermont Groundwater Protection Rule 7/19
- Groundwater Vapor Intrusion Standards (VIS) from Vermont I-Rule 7/19
- Reported results or reporting limits equal to or in excess of regulatory criteria are shaded.
- Dashed Cell - no standard
- * means total trimethylbenzenes ** means total xylenes



APPENDIX C

Analytical Laboratory Results

Angela Emerson
LE Environmental LLC
21 North Main Street #1
Waterbury, VT 05676



Laboratory Report for:

Eastern Analytical, Inc. ID: 277085
Client Identification: Pigeon Property | 19-138
Date Received: 4/19/2024

Enclosed are the analytical results per the Chain of Custody for sample(s) in the referenced project. All analyses were performed in accordance with our QA/QC Program, NELAP and other applicable state requirements. All quality control criteria was within acceptance criteria unless noted on the report pages. Results are for the exclusive use of the client named on this report and will not be released to a third party without consent.

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the written approval of the laboratory.

The following standard abbreviations and conventions apply to all EAI reports:

- < : "less than" followed by the reporting limit
- > : "greater than" followed by the reporting limit
- %R : % Recovery

Certifications:

Eastern Analytical, Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012), New York (12072) and West Virginia (9910C). Please refer to our website at www.easternanalytical.com for a copy of our certificates and accredited parameters.


References:

- EPA 600/4-79-020, 1983
- Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd edition or noted revision year.
- Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- Hach Water Analysis Handbook, 4th edition, 1992
- ASTM International

If you have any questions regarding the results contained within, please feel free to contact customer service. Unless otherwise requested, we will dispose of the sample(s) 6 weeks from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,


Lorraine Olashaw, Lab Director 4.30.24
Date



SAMPLE CONDITIONS PAGE

EAI ID#: 277085

Client: **LE Environmental LLC**

Client Designation: **Pigeon Property | 19-138**

Temperature upon receipt (°C): 1.7

Received on ice or cold packs (Yes/No): Y

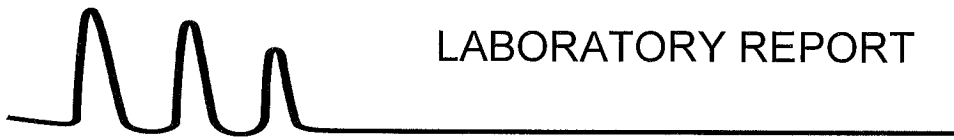
Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date/Time Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
277085.01	MW-1R	4/19/24	4/16/24 11:20	aqueous		Adheres to Sample Acceptance Policy
277085.02	MW-2	4/19/24	4/16/24 10:10	aqueous		Adheres to Sample Acceptance Policy
277085.03	MW-3	4/19/24	4/16/24 09:50	aqueous		Adheres to Sample Acceptance Policy
277085.04	MW-6	4/19/24	4/16/24 10:55	aqueous		Adheres to Sample Acceptance Policy
277085.05	MW-8	4/19/24	4/16/24 10:35	aqueous		Adheres to Sample Acceptance Policy
277085.06	Duplicate	4/19/24	4/16/24 10:10	aqueous		Adheres to Sample Acceptance Policy
277085.07	Trip Blank	4/19/24	2/14/24 09:00	aqueous		Adheres to Sample Acceptance Policy

All results contained in this report relate only to the above listed samples.

Unless otherwise noted:

- Hold times, preservation, container types, and sample conditions adhered to EPA Protocol.
- Solid samples are reported on a dry weight basis, unless otherwise noted. pH/Corrosivity, Flashpoint, Ignitability, Paint Filter, Conductivity and Specific Gravity are always reported on an "as received" basis.
- Analysis of pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite were performed at the laboratory outside of the recommended 15 minute hold time.
- Samples collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures.



LABORATORY REPORT

EAI ID#: **277085**

Client: **LE Environmental LLC**

Client Designation: **Pigeon Property | 19-138**

Sample ID:	MW-1R	MW-2	MW-3	MW-6
Lab Sample ID:	277085.01	277085.02	277085.03	277085.04
Matrix:	aqueous	aqueous	aqueous	aqueous
Date Sampled:	4/16/24	4/16/24	4/16/24	4/16/24
Date Received:	4/19/24	4/19/24	4/19/24	4/19/24
Units:	ug/L	ug/L	ug/L	ug/L
Date of Analysis:	4/22/24	4/19/24	4/19/24	4/19/24
Analyst:	MKB	MKB	MKB	MKB
Method:	8260C	8260C	8260C	8260C
Dilution Factor:	50	1	1	1
Methyl-t-butyl ether(MTBE)	< 50	< 1	< 1	< 1
Benzene	5000	< 1	< 1	< 1
1,2-Dichloroethane	< 50	< 1	< 1	< 1
Toluene	8200	< 1	< 1	< 1
1,2-Dibromoethane(EDB)	< 30	< 0.5	< 0.5	< 0.5
Ethylbenzene	1400	< 1	< 1	< 1
mp-Xylene	4500	< 1	< 1	< 1
o-Xylene	1700	< 1	< 1	< 1
1,3,5-Trimethylbenzene	450	< 1	< 1	< 1
1,2,4-Trimethylbenzene	1500	< 1	< 1	< 1
1,2,3-Trimethylbenzene	420	< 1	< 1	< 1
Naphthalene	220	< 0.5	< 0.5	< 0.5
4-Bromofluorobenzene (surr)	102 %R	99 %R	98 %R	98 %R
1,2-Dichlorobenzene-d4 (surr)	98 %R	100 %R	99 %R	99 %R
Toluene-d8 (surr)	100 %R	99 %R	100 %R	99 %R

GC/MS analysis was employed for the determination of the 8021 compound list.



LABORATORY REPORT

EAI ID#: 277085

Client: **LE Environmental LLC**

Client Designation: **Pigeon Property | 19-138**

Sample ID:	MW-8	Duplicate	Trip Blank
Lab Sample ID:	277085.05	277085.06	277085.07
Matrix:	aqueous	aqueous	aqueous
Date Sampled:	4/16/24	4/16/24	2/14/24
Date Received:	4/19/24	4/19/24	4/19/24
Units:	ug/L	ug/L	ug/L
Date of Analysis:	4/19/24	4/19/24	4/19/24
Analyst:	MKB	MKB	MKB
Method:	8260C	8260C	8260C
Dilution Factor:	1	1	1
Methyl-t-butyl ether(MTBE)	< 1	< 1	< 1
Benzene	< 1	< 1	< 1
1,2-Dichloroethane	< 1	< 1	< 1
Toluene	< 1	< 1	< 1
1,2-Dibromoethane(EDB)	< 0.5	< 0.5	< 0.5
Ethylbenzene	< 1	< 1	< 1
mp-Xylene	< 1	< 1	< 1
o-Xylene	< 1	< 1	< 1
1,3,5-Trimethylbenzene	< 1	< 1	< 1
1,2,4-Trimethylbenzene	< 1	< 1	< 1
1,2,3-Trimethylbenzene	< 1	< 1	< 1
Naphthalene	< 0.5	< 0.5	< 0.5
4-Bromofluorobenzene (surr)	98 %R	99 %R	98 %R
1,2-Dichlorobenzene-d4 (surr)	99 %R	99 %R	100 %R
Toluene-d8 (surr)	98 %R	98 %R	99 %R

GC/MS analysis was employed for the determination of the 8021 compound list.



QC REPORT

EAI ID#: 277085

Client: LE Environmental LLC

Batch ID: 638491-38870/A041924vVT801

Client Designation: Pigeon Property | 19-138

Parameter Name	Blank	LCS	LCSD	Analysis Date	Units	Limits	RPD	Method
Methyl-t-butyl ether(MTBE)	< 1	20 (101 %R)	20 (101 %R) (1 RPD)	4/19/2024	ug/L	70 - 130	20	8260C
Benzene	< 1	21 (107 %R)	22 (108 %R) (1 RPD)	4/19/2024	ug/L	70 - 130	20	8260C
1,2-Dichloroethane	< 1	20 (101 %R)	20 (100 %R) (0 RPD)	4/19/2024	ug/L	70 - 130	20	8260C
Toluene	< 1	21 (103 %R)	21 (106 %R) (2 RPD)	4/19/2024	ug/L	70 - 130	20	8260C
1,2-Dibromoethane(EDB)	< 0.5	20 (99 %R)	20 (100 %R) (1 RPD)	4/19/2024	ug/L	70 - 130	20	8260C
Ethylbenzene	< 1	21 (103 %R)	21 (106 %R) (3 RPD)	4/19/2024	ug/L	70 - 130	20	8260C
mp-Xylene	< 1	41 (103 %R)	42 (106 %R) (3 RPD)	4/19/2024	ug/L	70 - 130	20	8260C
o-Xylene	< 1	20 (100 %R)	21 (104 %R) (3 RPD)	4/19/2024	ug/L	70 - 130	20	8260C
1,3,5-Trimethylbenzene	< 1	20 (98 %R)	21 (103 %R) (5 RPD)	4/19/2024	ug/L	70 - 130	20	8260C
1,2,4-Trimethylbenzene	< 1	20 (100 %R)	21 (104 %R) (4 RPD)	4/19/2024	ug/L	70 - 130	20	8260C
1,2,3-Trimethylbenzene	< 1	21 (103 %R)	21 (107 %R) (4 RPD)	4/19/2024	ug/L	70 - 130	20	8260C
Naphthalene	< 0.5	18 (91 %R)	19 (93 %R) (2 RPD)	4/19/2024	ug/L	70 - 130	20	8260C
4-Bromofluorobenzene (surr)	100 %R	102 %R	101 %R	4/19/2024	% Rec	70 - 130		8260C
1,2-Dichlorobenzene-d4 (surr)	97 %R	101 %R	100 %R	4/19/2024	% Rec	70 - 130		8260C
Toluene-d8 (surr)	97 %R	98 %R	100 %R	4/19/2024	% Rec	70 - 130		8260C

*/! Flagged analyte recoveries deviated from the QA/QC limits. Data that impacts sample results are noted on the sample report.



QC REPORT

EAI ID#: 277085

Client: LE Environmental LLC

Batch ID: 638495-71131/A042224vVT801

Client Designation: Pigeon Property | 19-138

Parameter Name	Blank	LCS	LCSD	Analysis Date	Units	Limits	RPD	Method
Methyl-t-butyl ether(MTBE)	< 1	21 (104 %R)	21 (105 %R) (0 RPD)	4/22/2024	ug/L	70 - 130	20	8260C
Benzene	< 1	22 (111 %R)	22 (110 %R) (1 RPD)	4/22/2024	ug/L	70 - 130	20	8260C
1,2-Dichloroethane	< 1	20 (102 %R)	20 (102 %R) (1 RPD)	4/22/2024	ug/L	70 - 130	20	8260C
Toluene	< 1	22 (110 %R)	22 (109 %R) (1 RPD)	4/22/2024	ug/L	70 - 130	20	8260C
1,2-Dibromoethane(EDB)	< 0.5	21 (104 %R)	21 (103 %R) (1 RPD)	4/22/2024	ug/L	70 - 130	20	8260C
Ethylbenzene	< 1	22 (110 %R)	22 (109 %R) (1 RPD)	4/22/2024	ug/L	70 - 130	20	8260C
mp-Xylene	< 1	44 (110 %R)	44 (110 %R) (1 RPD)	4/22/2024	ug/L	70 - 130	20	8260C
o-Xylene	< 1	22 (108 %R)	21 (107 %R) (0 RPD)	4/22/2024	ug/L	70 - 130	20	8260C
1,3,5-Trimethylbenzene	< 1	21 (107 %R)	21 (104 %R) (3 RPD)	4/22/2024	ug/L	70 - 130	20	8260C
1,2,4-Trimethylbenzene	< 1	22 (108 %R)	21 (106 %R) (2 RPD)	4/22/2024	ug/L	70 - 130	20	8260C
1,2,3-Trimethylbenzene	< 1	22 (111 %R)	22 (109 %R) (1 RPD)	4/22/2024	ug/L	70 - 130	20	8260C
Naphthalene	< 0.5	18 (92 %R)	19 (95 %R) (2 RPD)	4/22/2024	ug/L	70 - 130	20	8260C
4-Bromofluorobenzene (surr)	100 %R	102 %R	102 %R	4/22/2024	% Rec	70 - 130		8260C
1,2-Dichlorobenzene-d4 (surr)	99 %R	100 %R	100 %R	4/22/2024	% Rec	70 - 130		8260C
Toluene-d8 (surr)	98 %R	101 %R	100 %R	4/22/2024	% Rec	70 - 130		8260C

