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Subject February 2018 to January 2019 SWMU 1 Landfill Gas Monitoring Technical Memorandum, Former Hampshire Chemical Corp. Facility, Waterloo, New York

Attention Former Hampshire Chemical Corp.

From Jacobs Engineering Group Inc.

Date August 2019

Project Number DWWAT002

1. Introduction

This technical memorandum reports the results of landfill gas monitoring conducted at the Former Hampshire Chemical Corp. (HCC) Facility Solid Waste Management Unit 1 (SWMU 1) in Waterloo, New York (site). The landfill gas monitoring activities were performed from February 2018 to January 2019 using four shallow landfill gas monitoring wells and six groundwater monitoring wells. The site is regulated under Title 6 of the New York Code of Rules and Regulations (NYCRR) Part 373 and the Resource Conservation and Recovery Act (RCRA), with the New York State Department of Environmental Conservation as the lead agency. RCRA facility investigations (RFIs) have been performed at the facility since 1993 to evaluate the nature and extent of releases to the environment.

This investigation was conducted as a supplement to SWMU 1 corrective measures completed in November 2016. This investigation was conducted to evaluate whether methane and other common landfill gases are present at the boundary of and within the subsurface of the former landfill. The findings of this investigation will be used to evaluate the need for further methane monitoring, mitigation, and/or corrective measures at SWMU 1.

2. Background

The site is located at 228 East Main Street in Waterloo, New York, on property currently occupied by Evans Chemetics, which operates a chemical manufacturing facility. Figure 1 shows the site location relative to New York State and the Village of Waterloo. SWMU 1 is in the southwestern corner of the facility property; bounded to the east by the facility, to the south by the Seneca-Cayuga Canal (canal), to the west by East Water Street, and to the north by the Seneca-Cayuga Canal Raceway (raceway). An asphalt road accesses the facility on the western side near East Water Street and crosses over SWMU 1. Figure 2 shows the location features within and surrounding SWMU 1, including roads, the canal, the raceway, monitoring wells, and the area of concern boundary.

Sanborn fire insurance maps of the site indicate the area along the western side of SWMU 1 and near some of the historical raceways was identified as the Village of Waterloo Dump as early as October 1918. The RCRA Facility Assessment Report (A.T. Kearney 1993) indicates the former Village of Waterloo Dump was probably in operation at the western edge of the site until 1951 (O'Brien and Gere Engineers, Inc. 2003). This suggests an operation period for the dump of at least 33 years, during which the Village of Waterloo placed debris, soil, and refuse in this area.

The 1964 Sanborn map for the facility shows that the canal and raceways were filled to the western edge of the old lock, and the area is identified as the Village of Waterloo Dump (O'Brien and Gere Engineers, Inc. 2003). As indicated by facility personnel, additional material was placed over the filled former raceways in the early 1980s that was derived from soil excavated during facility construction projects, mainly the wastewater treatment plant at the site.

3. Previous Investigations and Corrective Measures

Test pitting conducted during previous environmental investigations at SWMU 1 have identified various municipal waste fill, including glass and plastic fragments, scrap metal, ash, ceramics, shoes, brake pads, copper wire, and vehicle tires. Construction debris, including cobbles, bricks, wood, and metal scrap, also was identified in the test pitting. Intact bottles, both empty and containing liquids, also have been identified in test pits located near the access roadway as well as down along the right-of-way near the canal (CH2M HILL Engineers, Inc. [CH2M] 2006, 2009). The results of the test pit excavations show that fill materials extend onto the canal right-of-way in the area. From that investigation, it has been estimated that approximately 2,500 cubic yards of fill material are present within the canal right-of-way (CH2M 2009).

A soil vapor investigation was conducted within the vicinity of SWMU 1 in December 2007 as part of the RFI Addendum (CH2M 2008). Soil vapor data collected at two locations, SGP-9 and SGP-10, and within the boundary of SWMU 1 were compared to historical SWMU 1 soil and groundwater data to evaluate if the reported soil vapor volatile organic compounds (VOCs) were related to site activities and a subsurface release. The constituents detected in the soil vapor samples historically were not detected in nearby monitoring wells. Based on data evaluation and a review of multiple lines of evidence, it was concluded that none of the reported VOCs in SWMU 1 soil vapor are likely to present a vapor intrusion concern; however, methane was not analyzed during the 2007 soil vapor investigation.

A survey of methane concentrations in six SWMU 1 groundwater monitoring wells was conducted in October and November 2012 (CH2M 2013). Methane was not detected at levels above 0.1 percent by volume (Vol%) during the 2012 survey.

Between September and November 2016, corrective measures were undertaken by HCC at the SWMU 1 landfill. These activities are detailed in the *SWMU 1 Corrective Measures Construction Completion Report* (CH2M 2017) and included the construction of an engineered landfill cap, decommissioning of some groundwater monitoring wells, paving, and site restoration activities.

Beginning in December 2016, elevated concentrations of methane were detected in SWMU 1 monitoring wells MW-17 and TW-01 during wellhead screening conducted as part of a long-term groundwater monitoring event depth-to-water survey. Further details regarding previous environmental and geotechnical investigations conducted at SWMU 1 are in the RFI and RFI Addendum and technical memorandums (CH2M 2006, 2008, 2009, 2012).

4. Landfill Gases

Landfill gas, if present, will be mostly comprised of methane and carbon dioxide by volume, but also can consist of smaller amounts of other gases. Three principal subsurface processes can create landfill gases, including bacterial decomposition, volatilization, and chemical reactions. Waste characteristics and composition and other environmental factors will influence the rate and volume of landfill gas produced at a landfill (Agency for Toxic Substances and Disease Registry [ATSDR] 2001). In general, the more organic material that is buried in the landfill, the more landfill gas will be produced by bacterial decomposition. Organic landfill waste will decompose by bacteria through phases as the subsurface transitions from aerobic to anaerobic conditions. Methane is only produced in the subsurface when oxygen is no longer present since methanogenic bacteria (methane producing) are generally only active under anaerobic conditions (ATSDR 2001).

In addition, the age of the buried waste material also will affect landfill gas production. Waste that has been buried more recently (less than 10 years) generally will produce more landfill gases than waste that is older (buried more than 10 years) (ATSDR 2001). Maximum gas production for organic waste materials through bacterial decomposition, volatilization, or chemical reactions is generally 5 to 7 years after the waste has been buried. Based upon documentation of when waste materials were last disposed in SWMU 1 (early 1950s according to the RCRA Facility Assessment Report [A.T. Kearney 1993]), the waste has been buried for more than 60 years. Additionally, during the 2012 survey methane sampling found concentrations of 0.1 Vol%.

5. Screening Criteria

The lower explosive limit (LEL) for methane is 5% (methane by volume in air at standard temperature and pressure). Following the requirements discussed in Title 6, NYCRR Section 360-2.17(f), the concentration of methane at the property boundary of a sanitary landfill is not to exceed the LEL. Therefore, the LEL of 5% (methane by volume) was used for the screening criteria for the survey.

6. Field Activities

Between February 2018 and January 2019, a field investigation to monitor the concentrations of landfill gases at SWMU 1 was performed. Work associated with this investigation included installing four shallow landfill gas monitoring probes, outfitting five existing groundwater monitoring wells with vapor sampling expansion plugs, and collecting measurements of headspace gases at nine locations. Figure 2 shows the locations of the four landfill gas monitoring probes and five groundwater monitoring wells associated with SWMU 1 that were included in this study. This section discusses the investigative methods used during this effort.

6.1 Landfill Gas Probe Installation

During February 2018, four landfill gas monitoring probes were installed near the perimeter of SWMU 1 to determine if landfill gases, particularly methane, may be migrating offsite. Three of these probes were located along the western boundary of SWMU 1, east of East Water Street and adjacent structures (Figure 2). One probe was located at the southeastern corner of SWMU 1.

6.1.1 Underground Utility Clearance

Dig Safely New York was notified of the forthcoming intrusive activities associated with the landfill gas probe installation at least 2 business days before commencing work. A third-party utility locating service verified the absence of underground utilities at each proposed boring location. Technicians from New York Leak Detection of Jamesville, New York, inspected proposed work areas for surficial evidence of buried facilities, followed by a survey with electromagnetic locating equipment and ground-penetrating radar on February 6, 2018. Permanent or semi-permanent means were used to mark an area free of underground obstructions before advancing each point. The utility location activities were overseen by Jacobs Engineering Group Inc. (Jacobs) field staff.

6.1.2 Soil Borings and Sampling

Drilling activities were conducted on February 7, 2018, by Parratt-Wolff, Inc. of Syracuse, New York, with oversight by a Jacobs geologist. Soil borings were advanced to 7 feet below ground surface (bgs) at four locations (GP-01, GP-02, GP-03, and GP-04) using a Geoprobe direct-push drill rig. Discrete soil samples were collected for visual-manual characterization and VOC screening with a 2.25-inch-diameter by 48-inch-long Macro-Core MC5 Soil Sampler lined with an acetate sleeve. The supervising geologist completed soil boring logs describing the soil type, apparent grain size, color, odor, plasticity, consistency, density, moisture, and any other notable characteristics. In addition to visual-manual characterization, a photoionization detector was used to measure soil VOC concentrations at approximately 1-foot intervals from each boring location. After soil sampling to 7 feet bgs by direct-push drilling, the boring was over-drilled with hollow-stem augers to 7 feet bgs, resulting in a final borehole measuring 5 inches in diameter. Boring logs are included in Attachment 1.

6.1.3 Well Construction and Surveying

Landfill gas monitoring probes were installed in each 5-inch-diameter borehole using 5 to 7 feet of 1-inch-diameter Schedule 40 polyvinyl chloride riser casing and 2 feet of 0.010-inch factory mill-slotted well screen. A #0 clean quartz sand was placed to a depth of 1 foot above the top of the screen followed by a bentonite seal, consisting of 3/8-inch coarse-grained bentonite chips, and a Portland cement grout. The surface completion of GP-01 and GP-04 included an approximately 1.5-foot-tall aboveground steel monument with a locking cover and a concrete pad. GP-02 and GP-03 were completed in 8-inch-diameter flush-mounted road boxes. Attachment 2 contains the construction reports for the landfill gas monitoring probes.

Because the boreholes were advanced without the use of drilling fluids and the wells were completed above the water table, well development was not conducted.

The landfill gas monitoring probe locations were referenced horizontally using latitude and longitude measurements collected with a Trimble GeoXH global positioning handheld computer capable of sub-foot accuracy. Coordinates for each location are included in the construction reports presented in Attachment 2.

6.1.4 Investigative-Derived Waste

Soil cuttings and other investigative-derived waste generated during the February 2018 SWMU 1 drilling activities were containerized in steel 55-gallon drums and transported to a secure onsite secondary containment area for subsequent disposal. One sample was collected from the soil cuttings for waste disposal purposes on February 8, 2018 and shipped under chain-of-custody to Eurofins Lancaster Laboratories in Lancaster, Pennsylvania, for analysis. On February 25, 2019, Veolia removed the soil cuttings for offsite disposal as nonhazardous waste.

6.1.5 Headspace Gas Sampling Expansion Plug Installation

Expansion plugs designed for extracting gas samples from the riser pipe (headspaces) were installed in the four landfill gas monitoring probes (GP-01 to GP-04) and five groundwater monitoring wells (MW-16I, MW-17, MW-18, MW-26, and TW-01) associated with SWMU 1. The EnviroDesign Products extractor plugs incorporate a normally closed male poppet valve (headspace sampling valve), which is opened when a mating female quick-connect fitting (instrument quick-connect fitting) is attached.

6.2 February 2018 to January 2019 SWMU 1 Monitoring

Eight landfill gas monitoring events were conducted at SWMU 1 between February 2018 and January 2019, including six monthly monitoring events from February to July 2018 and quarterly events in October 2018 and January 2019. Headspace field screening logs are included in Attachment 3. The following subsections describe the SWMU 1 monitoring field procedures.

6.2.1 Well Headspace Differential Pressure Measurements

The first measurement collected from the landfill gas monitoring points was the pressure differential between the atmosphere and well headspace (differential pressure). Differential pressure measurements were made using an Alnor EBT730 micromanometer attached to the instrument quick-connect fitting by a short length of low-density polyethylene (LDPE) tubing. Table 1 lists the differential pressure ranges.

6.2.2 Well Headspace Volume Determination

The headspace volume of each landfill gas monitoring point was calculated to determine the volume of gas to purge before recording screening measurements. For the shallow landfill gas monitoring probes (GP-01 to GP-04), the headspace volume was fixed and did not vary between monitoring events; however, the headspace volume of the groundwater monitoring wells fluctuated with changes in groundwater elevations. Table 2 lists the headspace volume calculations and depth-to-water

measurements for SWMU 1 groundwater monitoring wells. Figure 2 is the hydrographs of groundwater elevations at the five groundwater monitoring wells, and Table 3 summarizes the well construction information for the SWMU 1 groundwater monitoring wells.

6.2.3 Landfill Gas Measurements

Measurements of carbon monoxide (parts per million), carbon dioxide (Vol%), hydrogen sulfide (parts per million), the LEL (Vol% calibrated to methane), and methane (Vol%) were made using a Landtec GEM 2000 Plus or GEM 5000 landfill gas meter. The landfill gas meter's sample inlet port was attached to the instrument quick-connect fitting by a short length of vinyl tubing. Gas samples began flowing to the landfill gas meter when the instrument quick-connect fitting was attached to the headspace sampling valve.

During the February and March 2018 monitoring events, all monitoring locations were purged at a nominal rate of 0.25 liter per minute using the internal pump of the GEM 2000 Plus landfill gas meter. Measurements from the landfill gas meter were recorded when concentrations stabilized for approximately 1 minute. Next, the landfill gas meter was disconnected, and a MiniRAE 3000 photoionization detector was attached to the well sampling valve by a short length of LDPE tubing to measure total VOC concentrations. Finally, a VRAE or RKI 6000 was attached to the well sampling valve to measure sulfur dioxide concentrations. Table 1 and Figure 4 present the landfill gas screening results, and Tables 2 and 4 contain the headspace purge data.

To decrease the purge times at groundwater monitoring wells, a trial was conducted in April 2018 to establish the viability of purging at least one headspace volume at a higher rate using an SKC Universal Air Sampling Pump. Table 4 lists the data collected during the April 2018 trial. It was found that the groundwater monitoring wells could be purged at a rate of 0.5 to 1.0 liter per minute using a standalone air sampling pump without drawing excessive vacuum or affecting final/stable gas concentrations. During subsequent monitoring events, the landfill gas probes (GP-01 to GP-04) were purged using the landfill gas meter's internal pump, and the groundwater monitoring wells (MW-16I, MW-17, MW-18, MW-26, and TW-01) were purged using air sampling pumps (Table 2).

Deviations from the landfill gas measurements procedures include:

- MW-26 was not monitored during February 2018 because it was buried beneath a snowbank.
- GP-03 was not monitored during March and May 2018 because water in the probe was drawn into the pump.
- GP-03 was not monitored during January 2019 because it was buried beneath a snowbank.

All instruments were calibrated daily according to the manufacturer's instructions, with calibration information recorded on data sheets.

7. Results and Discussion

Screening of landfill gas concentrations was conducted at nine monitoring points associated with SWMU 1 on eight occasions between February 2018 and January 2019. Table 1 summarizes the screening data. Except for GP-03, methane was detected in headspace samples from the SWMU 1 monitoring locations (Table 1, Figures 4 and 5) at concentrations up to 11.9 Vol% (TW-01). Methane was detected at the following concentrations during the reporting period:

- At GP-01, GP-02, MW-16I, and MW-26, methane was detected at concentrations above the GEM's detection limit (0.1 Vol%) and below 1 Vol%.
- At GP-04 and MW-18, methane was detected at concentrations between 1 and 5 Vol%.
- At MW-17 and TW-01, the screening limit for methane of 5 Vol% (100% of the LEL for methane) was exceeded during several monitoring events (Figure 6).
- At GP-03, methane was not detected during the reporting period.

Carbon dioxide and oxygen measurements are plotted on Figures 7 and 8, respectively. In general, methane concentrations appear to correlate positively with carbon dioxide concentrations and have an inverse relationship to oxygen concentrations.

Table 1 lists the concentrations of total VOCs, carbon monoxide, hydrogen sulfide, and sulfur dioxide. These gases were not detected at significant levels from the SWMU 1 landfill gas monitoring locations during the reporting period.

Groundwater elevations observed at the SWMU 1 monitoring wells (MW-16I, MW-17, MW-18, MW-26, and TW-01) are plotted along with methane concentrations and well screen intervals on Figure 9. There is no apparent relationship between changes in groundwater elevations and methane concentrations during the reporting period. Except for MW-16I, the observed groundwater elevations were generally within the screened intervals of the monitoring wells such that a portion of the perforated casing was unsaturated and exposed to formation gases. However, it should be noted that both MW-17 and TW-01 have the longest screened interval (10 feet) with the most consistently unwetted surface area of the landfill gas monitoring points (Figure 9), and they have the highest observed methane concentrations.

Figure 10 shows methane concentrations at SWMU 1 plotted against daily minimum and maximum air temperatures. Air temperature data were collected at the Geneva Research Farm weather station (Global Historical Climatology Network station ID USC00303184) (National Oceanic and Atmospheric Administration 2019) approximately 9 miles west of the site in Geneva, New York. A positive correlation between ambient air temperature and methane concentrations may exist for GP-04 and MW-17. The effects of air temperature on methane concentrations, if any, are less apparent for other locations.

8. Conclusions

The following conclusions are based on the results of this investigation:

- The presence of methane in SWMU 1 groundwater monitoring wells was not identified before December 2016. Methane may be accumulating beneath the SWMU 1 landfill cap completed in November 2016.
- The concentrations of methane at shallow landfill gas monitoring probes (GP-01, GP-03, and GP-04) along the western boundary of SWMU 1 are well below the LEL or below instrument detection limits.
- Concentrations of methane above 1 Vol% were detected at monitoring locations in the southwestern quadrant of SWMU 1 (GP-04, MW-17, MW-18, and TW-01).
- The nearest potential methane receptors along the western site boundary are occupied structures located west of East Water Street. Based on data collected to date, there is no risk to offsite receptors west of SWMU 1, given that methane concentrations do not exceed screening levels (the LEL for methane) along the western landfill boundary.
- Methane was detected at concentrations above the LEL in the headspaces of two SWMU 1 groundwater monitoring wells (MW-17 and TW-01) in the south-central area of SWMU 1.
- No identified potential methane receptors are along the southern landfill boundary. Features present south of SWMU 1 include the canal and unoccupied land owned by HCC. Based on data collected to date, there is no risk to offsite receptors south of SWMU 1.

9. Recommendations

The following recommended action will be conducted during 2019:

- Two additional landfill gas monitoring events will be conducted at SMWU 1 during the summer and fall of 2019 to evaluate methane concentrations using the same techniques and monitoring locations described in this reporting period.

10. References

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Tables

Table 1. Screening Measurements for SWMU 1 Landfill Gas Monitoring Locations
February 2018 to January 2019 SWMU 1 Landfill Gas Monitoring Report
Former Hampshire Chemical Corp. Facility, Waterloo, New York

Monitoring Date	Location	Differential Pressure Range	VOC (ppm)	Methane (%vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulfide (ppm)	Carbon Dioxide (%)	Oxygen (%)	Sulfur Dioxide (ppm)
2/8/2018	GP-01	0.01	--	0.1	2	5	0	6.5	19	--
	GP-02	0.01	--	0.0	0	3	0	0.1	17.5	--
	GP-03	0.01	--	0.0	0	0	0	2.0	20	--
	GP-04	-0.02	--	0.4	5	0	0	7.4	6.6	--
	MW-16I	0.01	--	0	2	0	0	0.0	20.8	--
	MW-17	0.01	--	2.3	48	0	0	11.7	0.2	--
	MW-18	0.01	--	0.0	0	0	0	1.0	19.6	--
	MW-26	--	--	--	--	--	--	--	--	--
	TW-01	0.01	--	6.0	>100	0	0	7.8	7.8	--
3/22/2018	GP-01	0.00625 - 0.023	0.3	0.0	0	0	0	8.3	6.4	0
	GP-02	0.00492 - 0.01472	0.5	0.0	0	5	0	2.6	13.4	0
	GP-03 ^a	0.0154 - 0.0615	--	--	--	--	--	--	--	--
	GP-04	0.00419 - 0.0134	0.2	0.9	18	0	0	9.3	0.9	0
	MW-16I	0.057 - 0.0898	0.1	0.0	0	0	0	0.1	21.5	0
	MW-17	0.045 - 0.0839	0.0	3.4	68	0	0	9.5	2.2	0
	MW-18	0.00541 - 0.0213	0.2	0.4	9	2	0	6.8	1.2	0
	MW-26	0.00267 - 0.01205	0.2	0.0	0	0	0	2.7	17.2	0
	TW-01	0.00325 - 0.02286	0.0	6.7	>100	0	0	7.1	6.3	0
4/12/2018	GP-01	0.00342 - 0.01367	0.4	0.1	2	0	0	9.3	1.9	--
	GP-02	0.00044 - 0.00233	0.2	0.0	0	0	0	2.3	16.5	--
	GP-03 ^a	-- - --	--	--	--	--	--	--	--	--
	GP-04	0.00985 - 0.01754	0.2	1.3	27	0	0	9.4	0.0	--
	MW-16I	0.0157 - 0.0243	0.2	0.1	2	0	0	0.5	20.4	--
	MW-17	0.001255 - 0.0045	0.0	4.1	83	0	0	10.1	0.0	--
	MW-18	0.0155 - 0.0312	0.0	3.1	62	0	0	7.1	0.0	--
	MW-26	0.00154 - 0.0031	0.3	0.0	0	0	0	3.3	16.1	--
	TW-01	-0.00033 - 0.00018	0.1	0.1	2	0	0	0.3	20.6	--
5/18/2018	GP-01	0.002 - 0.003	0.0	0.0	0	0	0	11.4	1.8	0
	GP-02	0.001 - 0.12	0.2	0.0	0	0	0	3.8	9.6	0
	GP-03	0.0184 - 0.0249	0.0	0.0	0	23	0	0.0	20.9	0
	GP-04	0.0069 - 0.0077	0.1	1.2	24	0	0	10.4	0.3	0
	MW-16I	-0.695 - -0.66	0.0	0.0	0	0	0	0.0	20.9	0
	MW-17	-0.012 - -0.008	0.0	4.8	96	0	0	9.0	0.3	0
	MW-18	0.00259 - 0.0144	0.0	1.3	26	0	0	6.2	6.2	0
	MW-26	0.0044 - 0.021	0.0	0.0	0	0	0	5.9	8.0	0
	TW-01	0.004 - 0.011	0.0	0.3	7	0	0	0.5	19.7	0
6/28/2018	GP-01	-0.024 - -0.006	0.0	0.0	0	0	0	14.4	1.8	0
	GP-02	-0.0102 - -0.0062	0.0	0.0	0	0	0	7.2	0.6	0
	GP-03	-0.0043 - -0.0012	0.0	0.0	0	0	0	0.0	7.1	0
	GP-04	0.0033 - 0.0092	0.0	1.3	25	0	0	12.4	0	0
	MW-16I	0.0073 - 0.021	0.0	0.0	0	0	0	0.1	20.2	0
	MW-17	0.0083 - 0.0104	0.0	5.7	>100	0	0	10.2	0	0
	MW-18	0.005 - 0.0068	0.1	0.3	6	0	0	12.6	0.4	0
	MW-26	0.0091 - 0.0123	0.0	0.0	0	0	0	9.8	5.3	0
	TW-01	0.0126 - 0.041	0.0	8.0	>100	0	0	9.3	3.2	0

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Monitoring Date	Location	Differential Pressure Range	VOC (ppm)	Methane (%vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulfide (ppm)	Carbon Dioxide (%)	Oxygen (%)	Sulfur Dioxide (ppm)
7/31/2018	GP-01	0.00582 - 0.021	0.2	0.2	4	0	0	17.1	1.4	0
	GP-02	-0.00271 - 0.0009	2.5	0.0	1	0	0	9.4	1	0
	GP-03	-0.00017 - 0.00095	0.0	0.0	0	0	0	12.4	10.6	0
	GP-04	-0.0227 - -0.0101	0.0	2.2	44	0	0	14.0	1.3	0
	MW-16I	0.0338 - 0.0634	0.0	0.0	0	0	0	0.0	21	0
	MW-17	0.00342 - 0.038	0.0	7.3	>100	1	0	12.0	0.8	0
	MW-18	-0.00678 - 0.00309	0.0	1.0	20	0	0	10.7	1.4	0
	MW-26	-0.00182 - 0.0005	0.0	0.0	0	0	0	12.8	1.7	0
	TW-01	-0.00115 - 0.00592	0.0	0	0	0	0	0.1	20.7	0
10/19/2018	GP-01	-0.00612 - -0.0006	0.2	0.0	1	2	0	14.0	1.7	0.2
	GP-02	0.00098 - 0.00762	0.0	0.0	0	0	0	7.6	3.6	0
	GP-03	-0.00328 - -0.00175	0.0	0.0	0	0	0	8.9	14.5	0
	GP-04	0.00172 - 0.00607	0.0	2.2	32	0	0	11.5	1.6	0.2
	MW-16I	0.0761 - 0.0808	0.0	0.0	0	0	0	0.1	21.3	0
	MW-17	-0.00046 - 0.00445	0.0	8.4	>100	0	0	13.2	0.7	0
	MW-18	-0.00432 - 0.012	0.0	2.2	27	0	0	9.6	1.5	0
	MW-26	-0.0037 - 0.00144	0.0	0.0	0	0	0	9.1	10.7	0
	TW-01	-0.0009 - 0.00798	0.0	8.6	>100	0	0	11.0	3.9	0.1
1/16/2019	GP-01	-0.00362 - 0.00032	0.1	0.1	3	0	0	0.0	18.6	0
	GP-02	-0.00762 - 0.00261	0.0	0.1	2	0	0	3.1	18	0
	GP-03 ^b	-- - --	--	--	--	--	--	--	--	--
	GP-04	-0.0111 - 0.00867	0.0	0.1	3	0	0	8.7	4	0
	MW-16I	-0.157 - -0.121	0.0	0.2	4	0	0	0.5	21.4	0
	MW-17	0.0163 - 0.0318	0.0	5.0	>100	0	0	12.2	0.4	0
	MW-18	-0.0155 - -0.00732	0.1	1.7	34	0	0	5.5	0	0
	MW-26	-0.00162 - 0.0806	0.0	0.1	2	0	0	2.7	20.2	0
	TW-01	-0.0631 - -0.0091	0.0	11.9	>100	0	0	11.6	2.8	0

Notes

a) Landfill gas probe GP-03 was flooded.

b) Landfill gas probe GP-03 could not be located below snow bank.

"--" - not measured or not applicable

%vol - percent by volume

LEL - lower explosive limit

VOC - volatile organic compound

ppm - parts per million

5 bold and shaded results are greater than or equal to 5% methane by volume (100% of the lower explosive limit).

Table 2. Purging Data for SWMU 1 Landfill Gas Measurements
February 2018 to January 2019 SWMU 1 Landfill Gas Monitoring Report
Former Hampshire Chemical Corp. Facility, Waterloo, New York

Monitoring Date	Location	Well Screen Interval (feet bgs)	Casing Diameter (inches)	Headspace Length/Depth to Water ^a (feet)	Headspace Volume (liters)	Purge Time (minutes)	Purge Rate (mL/min)	Volume Purged (liters)	Purge Method	Notes
				D	0.17D	T	R	TR		
2/8/2018	GP-01	5 -7	1	8.3	1.4	7.0	250	1.8	GEM 2000+	
	GP-02			7.0	1.2	6.0	250	1.5		
	GP-03			7.0	1.2	5.0	250	1.3		
	GP-04			8.3	1.4	7.0	250	1.8		
	MW-16I	30.5 - 35.5	2	26.89	17.7	20.0	250	5.0		Purged until readings stabilized
	MW-17	15.6 - 25.6		22.95	15.1	33.0	250	8.3		Purged until readings stabilized
	MW-18	6.1 - 12.1		12.23	8.1	10.0	250	2.5		Purged until readings stabilized
	MW-26	4.2 - 14.2		--	--	10.0	250	2.5		Purged until readings stabilized
3/22/2018	TW-01	9.4 - 19.9		17.45	11.5	20.0	250	5.0		Purged until readings stabilized
	GP-01	5 -7	1	8.3	1.4	5.2	250	1.3	GEM 2000+	
	GP-02			7.0	1.2	4.7	250	1.2		
	GP-03			7.0	1.2	--	--	--		water purged from gas probe
	GP-04			8.3	1.4	5.2	250	1.3		
	MW-16I	30.5 - 35.5	2	26.31	17.4	20.0	250	5.0		Purged until readings stabilized
	MW-17	15.6 - 25.6		22.66	15.0	33.3	250	8.3		Purged until readings stabilized
	MW-18	6.1 - 12.1		8.30	5.5	10.0	250	2.5		Purged until readings stabilized
	MW-26	4.2 - 14.2		8.30	5.5	10.0	250	2.5		Purged until readings stabilized
4/12/2018	TW-01	9.4 - 19.9		17.96	11.9	20.0	250	5.0		Purged until readings stabilized
	GP-01	5 -7	1	8.3	1.4	8.0	250	2.0	GEM 2000+	
	GP-02			7.0	1.2	8.0	250	2.0		
	GP-03			7.0	1.2	--	--	--		water purged from gas probe
	GP-04			8.3	1.4	8.0	250	2.0		
	MW-16I	30.5 - 35.5	2	24.95	16.5	See Table 4			air sampling pump	
	MW-17	15.6 - 25.6		22.35	14.8					
	MW-18	6.1 - 12.1		12.05	8.0					
	MW-26	4.2 - 14.2		11.64	7.7					
5/18/2018	TW-01	9.4 - 19.9		17.71	11.7					
	GP-01	5 -7	1	8.3	1.4	2.2	550	1.2	air sampling pump	
	GP-02			7.0	1.2	2.5	600	1.5		
	GP-03			7.0	1.2	2.0	600	1.2		
	GP-04			8.3	1.4	2.7	600	1.6		
	MW-16I	30.5 - 35.5	2	25.72	17.0	28.3	600	17.0		
	MW-17	15.6 - 25.6		22.25	14.7	25.0	600	15.0		
	MW-18	6.1 - 12.1		12.23	8.1	16.0	600	9.6		
6/28/2018	MW-26	4.2 - 14.2		11.55	7.6	12.7	600	7.6		
	TW-01	9.4 - 19.9		17.76	11.7	19.5	600	11.7		
	GP-01	5 -7	1	8.3	1.4	4.0	500	2.0	air sampling pump	
	GP-02			7.0	1.2	3.0	500	1.5		
	GP-03			7.0	1.2	3.0	500	1.5		
	GP-04			8.3	1.4	4.0	500	2.0		
	MW-16I	30.5 - 35.5	2	26.55	17.5	18.0	1000	18.0		
	MW-17	15.6 - 25.6		22.75	15.0	16.0	1000	16.0		
	MW-18	6.1 - 12.1		12.35	8.2	9.0	1000	9.0		
7/31/2018	MW-26	4.2 - 14.2		12.11	8.0	9.0	1000	9.0		
	TW-01	9.4 - 19.9		18.20	12.0	13.0	1000	13.0		
	GP-01	5 -7	1	8.3	1.4	4.0	600	2.4	GEM 5000	
	GP-02			7.0	1.2	4.0	600	2.4		
	GP-03			7.0	1.2	4.0	600	2.4		
	GP-04			8.3	1.4	3.0	600	1.8		
	MW-16I	30.5 - 35.5	2	25.84	17.1	17.0	500	8.5	air sampling pump	high-vacuum pump fault at about 25 minutes
	MW-17	15.6 - 25.6		22.26	14.7	34.0	600	20.4		
	MW-18	6.1 - 12.1		12.30	8.1	24.0	500	12.0		
	MW-26	4.2 - 14.2		11.63	--	15.0	600	9.0		
	TW-01	9.4 - 19.9		17.73	11.7	34.0	500	17.0		

Table 2. Purging Data for SWMU 1 Landfill Gas Measurements
February 2018 to January 2019 SWMU 1 Landfill Gas Monitoring Report
Former Hampshire Chemical Corp. Facility, Waterloo, New York

Monitoring Date	Location	Well Screen Interval (feet bgs)	Casing Diameter (inches)	Headspace Length/Depth to Water ^a (feet)	Headspace Volume (liters)	Purge Time (minutes)	Purge Rate (mL/min)	Volume Purged (liters)	Purge Method	Notes
				D	0.17D	T	R	TR		
10/19/2018	GP-01	5 -7	1	8.3	1.4	10.0	600	6.0	GEM 5000	
	GP-02			7.0	1.2	10.0	600	6.0		
	GP-03			7.0	1.2	10.0	600	6.0		
	GP-04			8.3	1.4	12.0	600	7.2		
	MW-16l	30.5 - 35.5	2	26.90	17.8	25.0	500	12.5	air sampling pump	high-vacuum pump fault at about 25 minutes
	MW-17	15.6 - 25.6		22.94	15.1	38.0	500	19.0		
	MW-18	6.1 - 12.1		12.40	8.2	20.0	500	10.0		
	MW-26	4.2 - 14.2		12.67	8.4	15.0	500	7.5		
	TW-01	9.4 - 19.9		17.99	11.9	25.0	500	12.5		
1/16/2019	GP-01	5 -7	1	8.3	1.4	10.0	250	2.5	GEM 2000+	
	GP-02			7.0	1.2	15.0	250	3.8		
	GP-03			7.0	1.2	--	--	--		well buried under snow bank
	GP-04			8.3	1.4	10.0	250	2.5		
	MW-16l	30.5 - 35.5	2	26.55	17.5	20.0	500	10.0	air sampling pump	high-vacuum pump fault at about 20 minutes
	MW-17	15.6 - 25.6		22.73	15.0	25.0	500	12.5		
	MW-18	6.1 - 12.1		12.29	8.1	20.0	500	10.0		
	MW-26	4.2 - 14.2		12.20	8.1	18.0	500	9.0		
	TW-01	9.4 - 19.9		17.91	11.8	21.0	500	10.5		

Notes

"--" - not measured or not applicable

bgs = below ground surface

mL/min = milliliters per minute

- a) For monitoring well locations, the headspace length measurement is the unwetted well volume (i.e., the depth to water from the top of casing).
For landfill gas probe locations, the headspace length measurement is equal to the total well length.

Table 3. SWMU 1 Monitoring Well Construction Data*February 2018 to January 2019 SWMU 1 Landfill Gas Monitoring Report**Former Hampshire Chemical Corp. Facility, Waterloo, New York*

Location	Well Diameter (inches)	Well Material	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Total Well Depth (feet bgs)	Screen Slot (inches)	Screen Interval (feet bgs)	Screen Interval (feet amsl)
MW-16I	2	Schedule 40 PVC	454.27	455.99	35.53	0.01	30.5 - 35.5	423.7 - 418.7
MW-17	2	Schedule 40 PVC	449.92	452.13	14.50	0.01	15.3 - 25.3	434.6 - 424.6
MW-18	2	Schedule 40 PVC	440.04	442.07	12.32	0.01	6.3 - 12.3	433.7 - 427.7
MW-26	2	Schedule 40 PVC	439.29	441.76	16.00	0.01	7.5 - 17.5	431.8 - 421.8
TW-01	2	Schedule 40 PVC	447.33	449.01	17.50	0.01	10.3 - 20.8	437.0 - 426.5

Notes

amsl = above mean sea level

bgs = below ground surface

PVC = polyvinyl chloride

Table 4. Comparison of Purging Rate and Duration on Screening Measurements at SMWU 1 Landfill Gas Screening Locations*February 2018 to January 2019 SWMU 1 Landfill Gas Monitoring Report**Former Hampshire Chemical Corp. Facility, Waterloo, New York*

Location	Date	Approx. Purge Rate (L/min)	Cumulative Purge Time (minutes)	Approx. Cumulative Purge Volume (liters)	VOC (ppm)	Methane (% vol.)	LEL Methane (%)	Carbon Monoxide (ppm)	Hydrogen Sulfide (ppm)	Carbon Dioxide (%)	Oxygen (%)	Sulfur Dioxide (ppm)	Remarks
GP-01	4/12/2018	0.0	0	0	0.3	0.0	0	0	0	7.7	8.8	-	Initial reading
	4/12/2018	0.3	8	2	0.4	0.1	2	0	0	9.3	1.9	-	
GP-02	4/12/2018	0.0	0	0	0.3	0.0	0	0	0	2.3	16.9	-	Initial reading
	4/12/2018	0.3	8	2	0.2	0.0	0	0	0	2.3	16.5	-	
GP-04	4/12/2018	0.0	0	0	0.2	1.3	27	0	0	9.0	2.3	-	Initial reading
	4/12/2018	0.3	8	2	0.2	1.3	27	0	0	9.4	0.0	-	
MW-16I	4/12/2018	0.0	0	0	0.3	0.5	10	0	0	1.7	17.9	-	Initial reading
	4/12/2018	0.5	40	20	0.2	0.1	2	0	0	0.5	20.4	-	Pump faulted at 1 and 2 L/min
MW-17	4/12/2018	0.0	0	0	0.0	2.5	46	0	0	5.3	11.2	-	Initial reading
	4/12/2018	0.5	35	17.5	0.0	4.1	83	0	0	10.1	0.0	-	Pump faulted at 1 and 2 L/min
MW-18	4/12/2018	0.0	0	0	0.0	2.0	40	0	0	6.2	0.3	-	Initial reading
	4/12/2018	0.5	20	10	0.0	2.7	55	0	0	6.7	0.0	-	
	4/12/2018	2.0	30	20	0.0	3.1	62	0	0	7.1	0.0	-	Purged at 2L/min for 10 minutes
MW-26	4/12/2018	0.0	0	0	0.3	0.0	0	0	0	3.0	17.1	-	Initial reading
	4/12/2018	0.5	0	0	0.3	0.0	0	0	0	3.3	16.1	-	
TW-01	4/12/2018	0.0	0	0	0.0	1.6	33	0	0	5.5	11.7	-	Initial reading
	4/12/2018	0.5	30	15	0.1	0.1	2	0	0	0.4	20.4	-	
	4/12/2018	2.0	40	20	0.1	0.1	2	0	0	0.3	20.6	-	Purged at 2L/min for 10 minutes

Notes

%vol - percent by volume

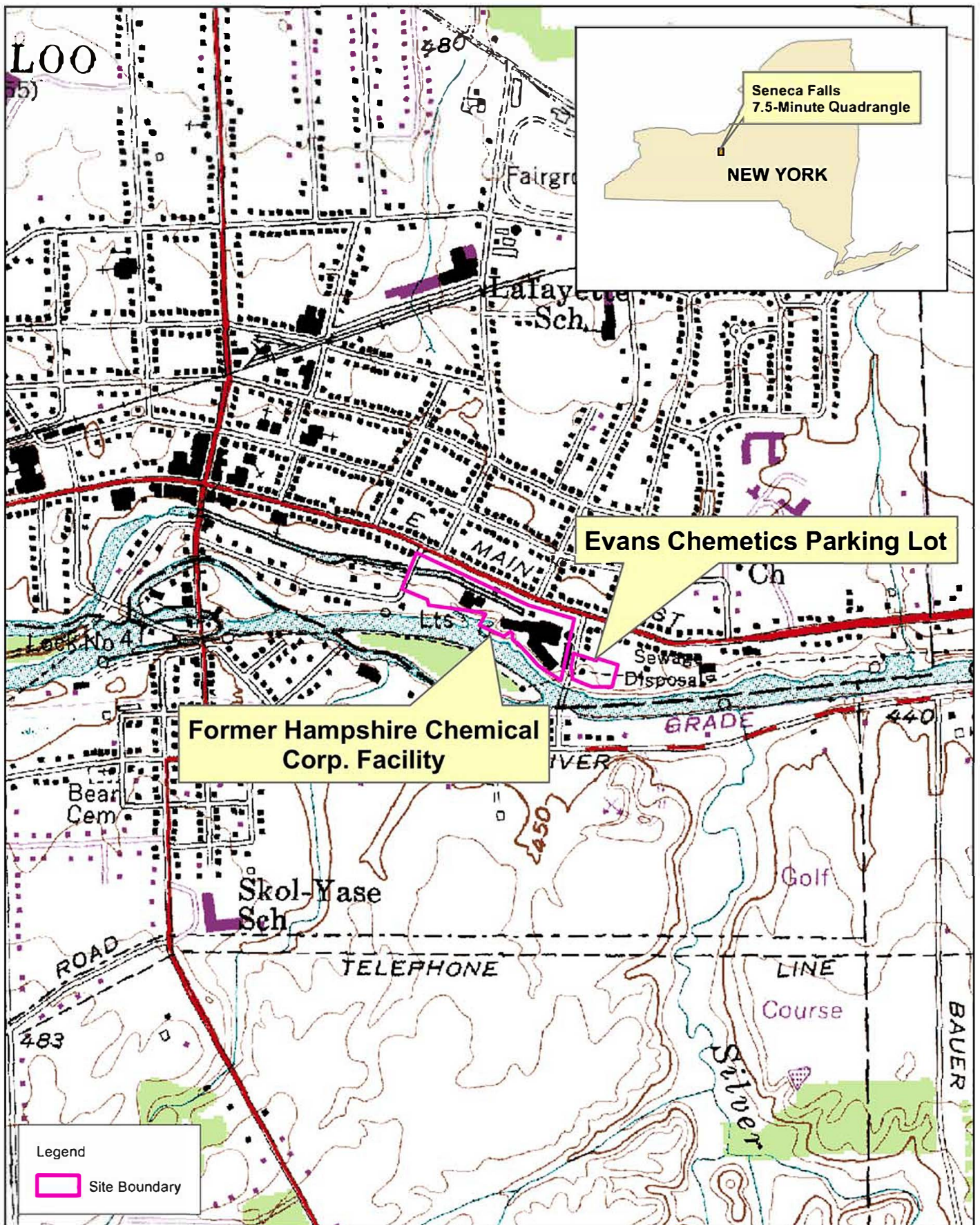
L/min - liters per minute

LEL - lower explosive limit

ppm - parts per million

VOC - volatile organic compound

Figures



0 500 1,000

Feet

Seneca Falls, NY 1953 Photo Revised 1978

Figure 1. Site Location

Former Hampshire Chemical Corp. Facility, Waterloo, NY

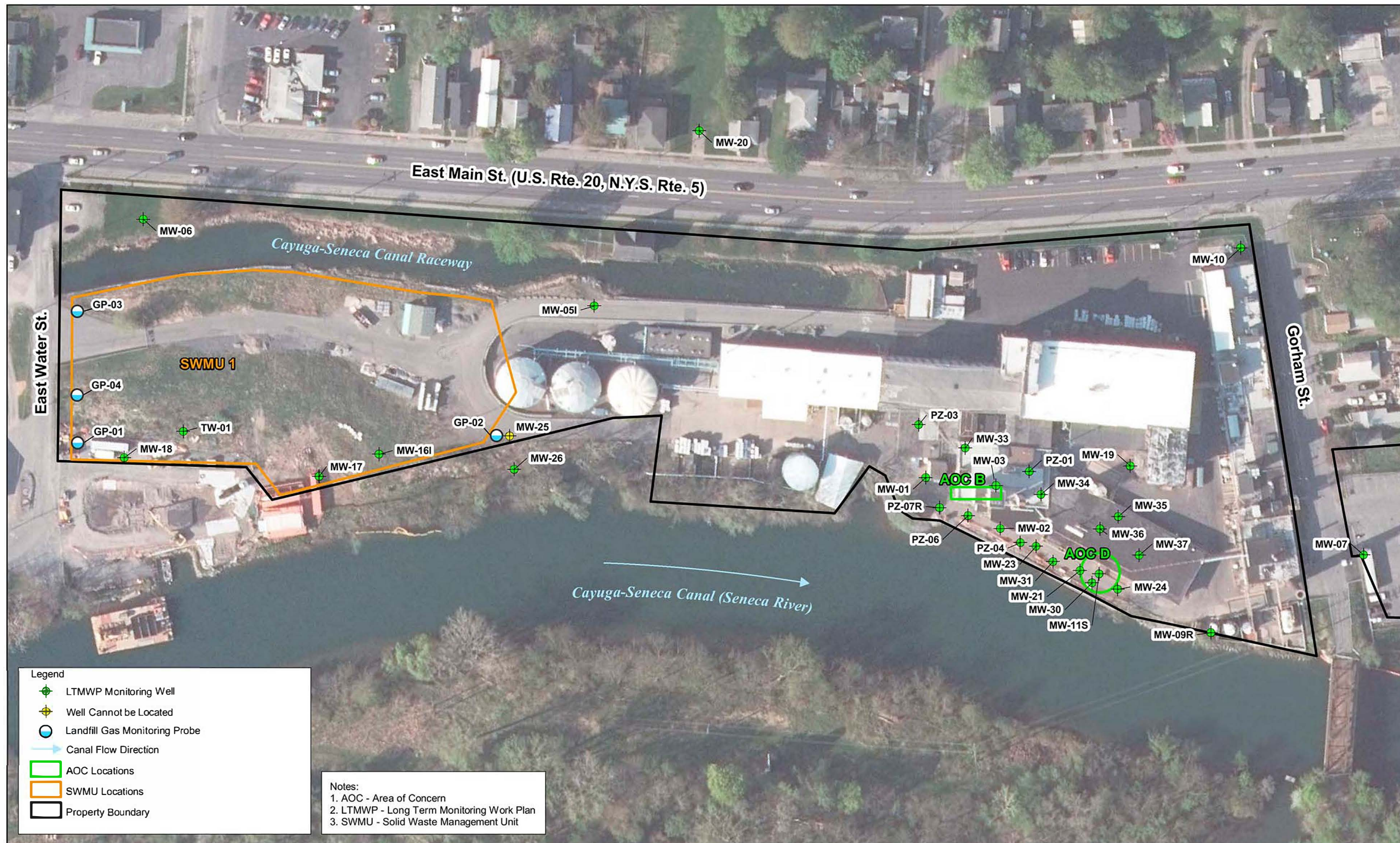
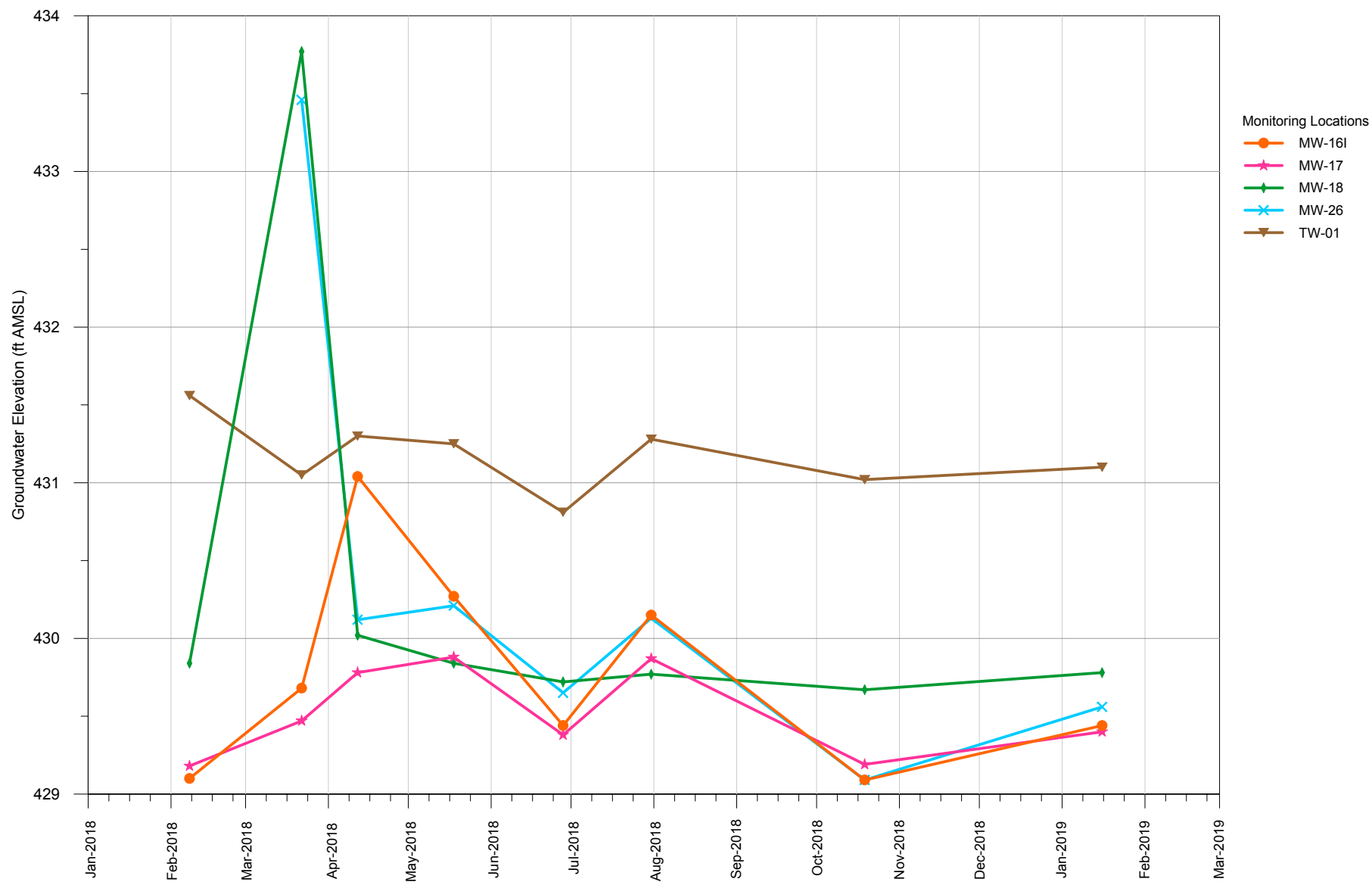


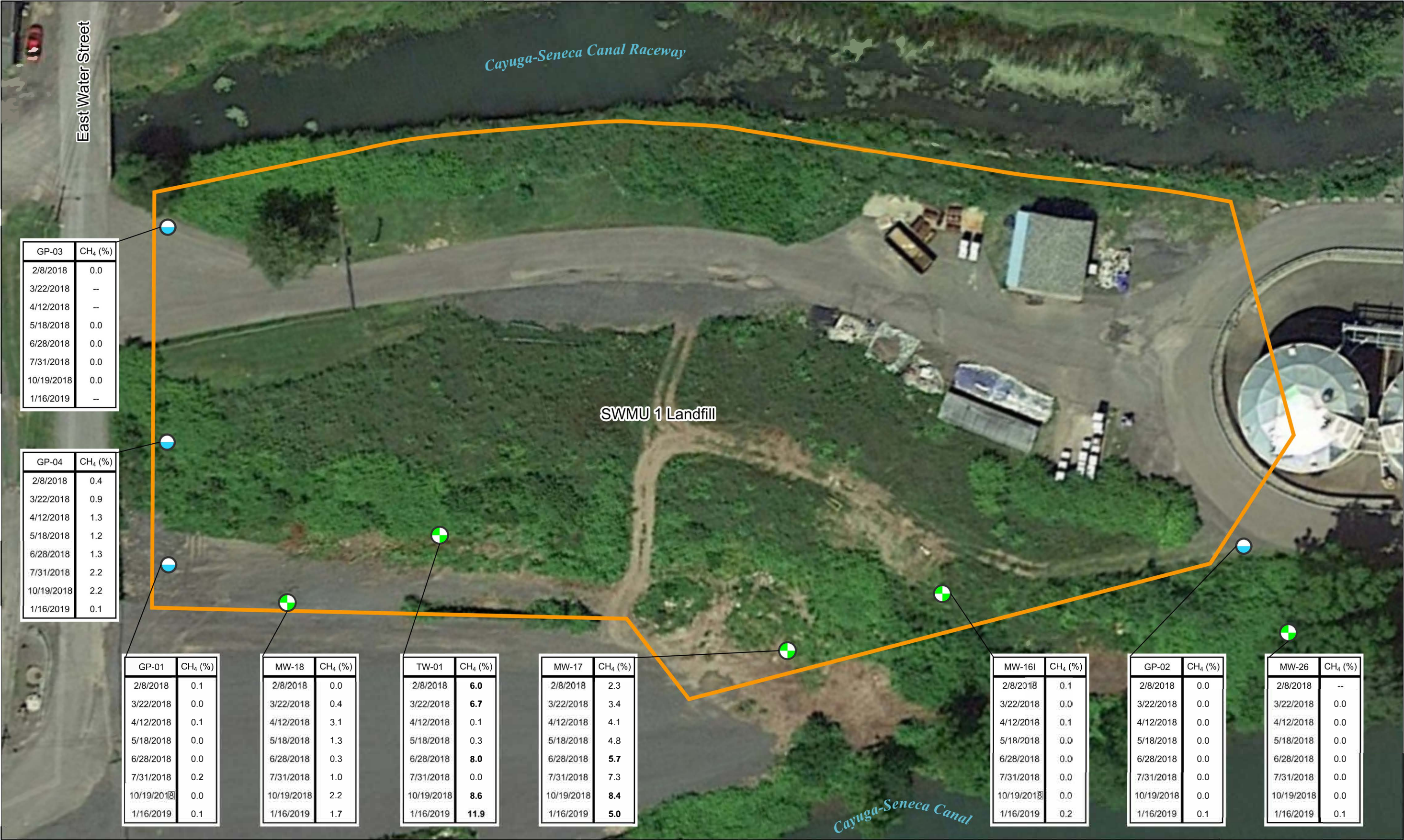
Figure 2. Site Layout Map
Former Hampshire Chemical Corp. Facility, Waterloo, NY

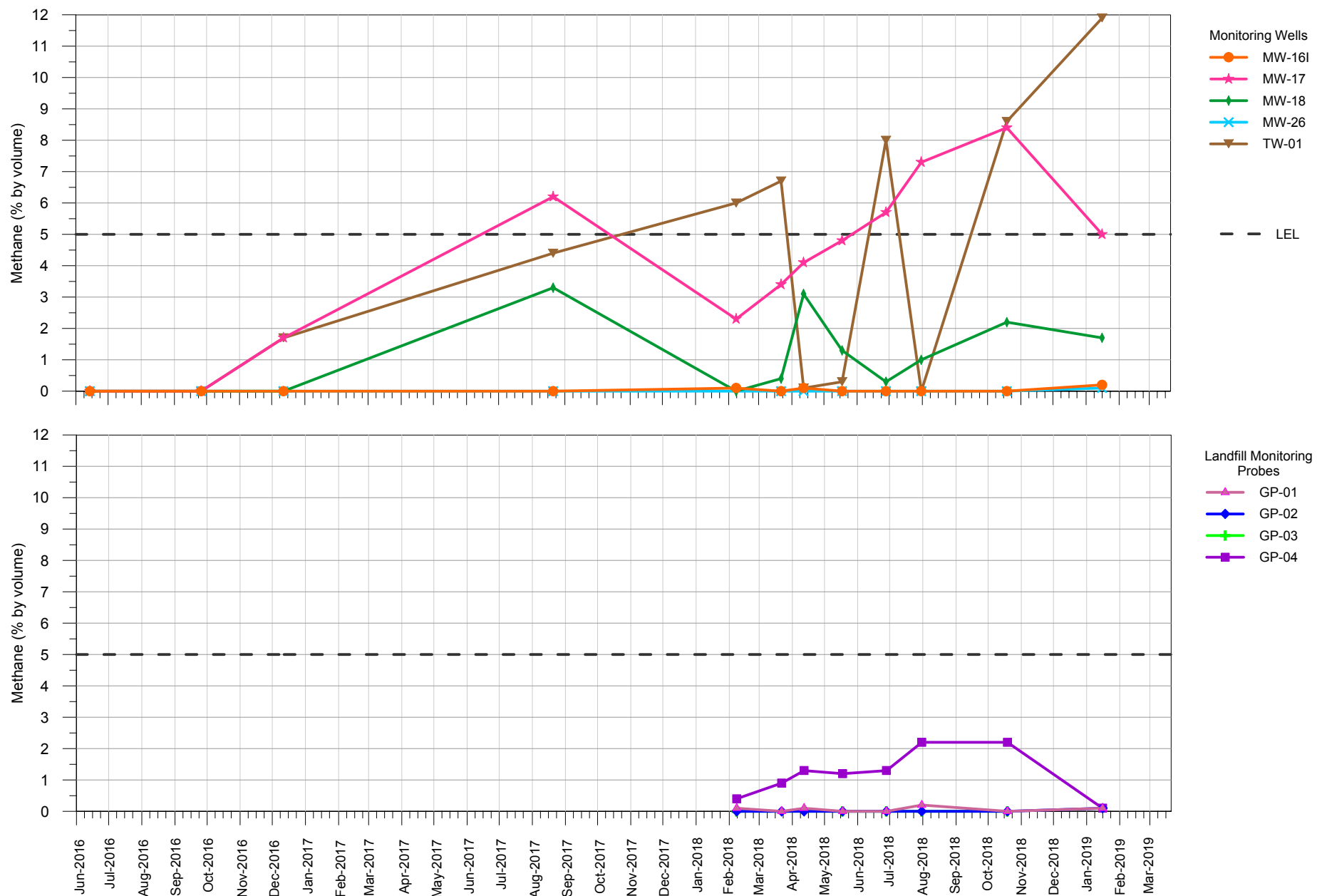


Notes

- 1) ft AMSL - feet above mean sea level
- 2) SWMU - solid waste management unit

**Figure 3. Groundwater Elevations at SMWU 1
Monitoring Wells**
Former Hampshire Chemical Corp. Facility, Waterloo, NY

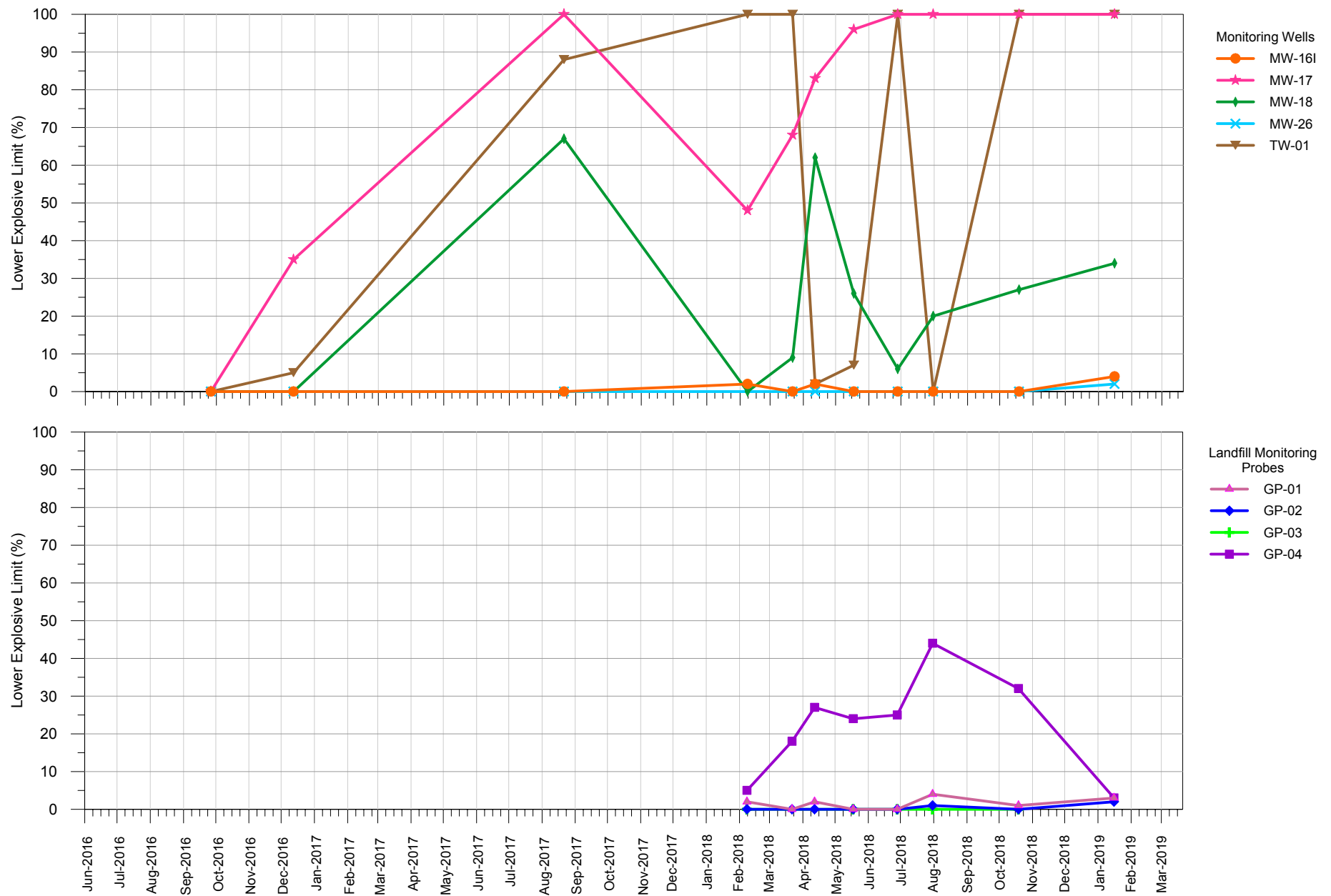




Notes

- 1) LEL - lower explosive limit
- 2) SWMU - solid waste management unit

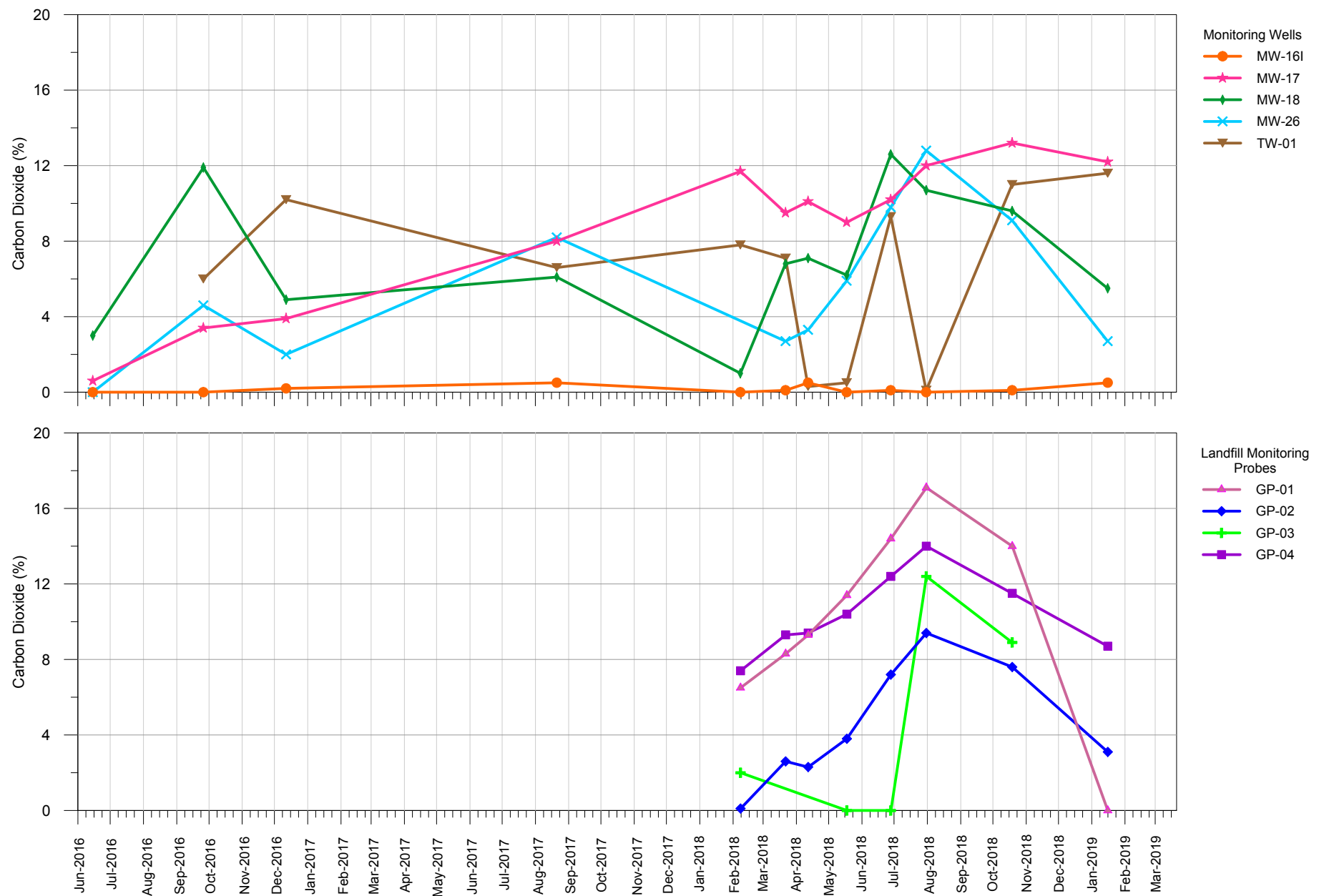
Figure 5. Methane Concentrations at SMWU 1 Landfill Gas Monitoring Points
Former Hampshire Chemical Corp. Facility, Waterloo, NY



Notes

- 1) SWMU - solid waste management unit
- 2) LEL - lower explosive limit
- 3) Measurements greater than 100% of the LEL plotted as 100%

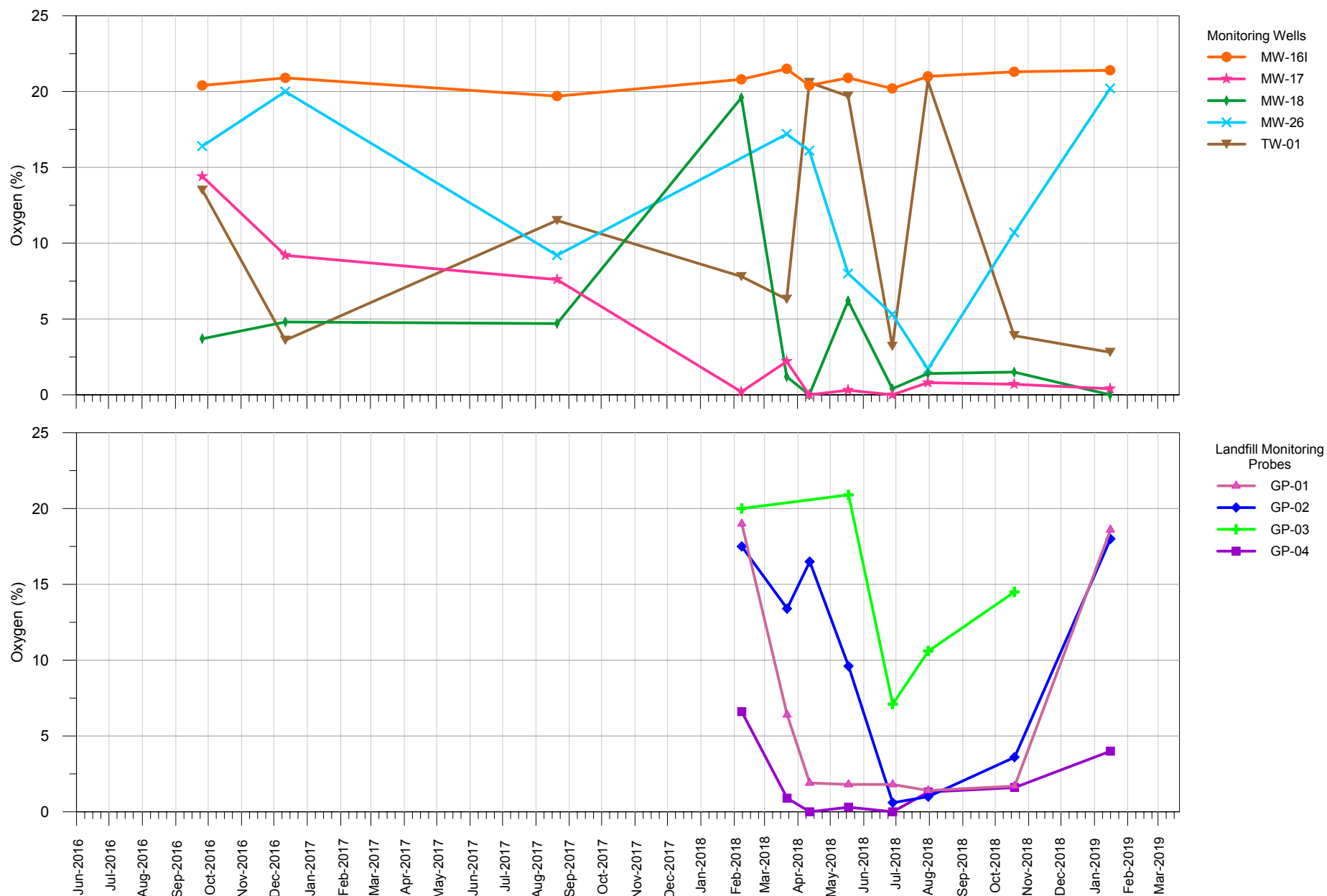
Figure 6. LEL Measurements at SMWU 1 Landfill Gas Monitoring Points
Former Hampshire Chemical Corp. Facility, Waterloo, NY



Notes

1) SWMU - solid waste management unit

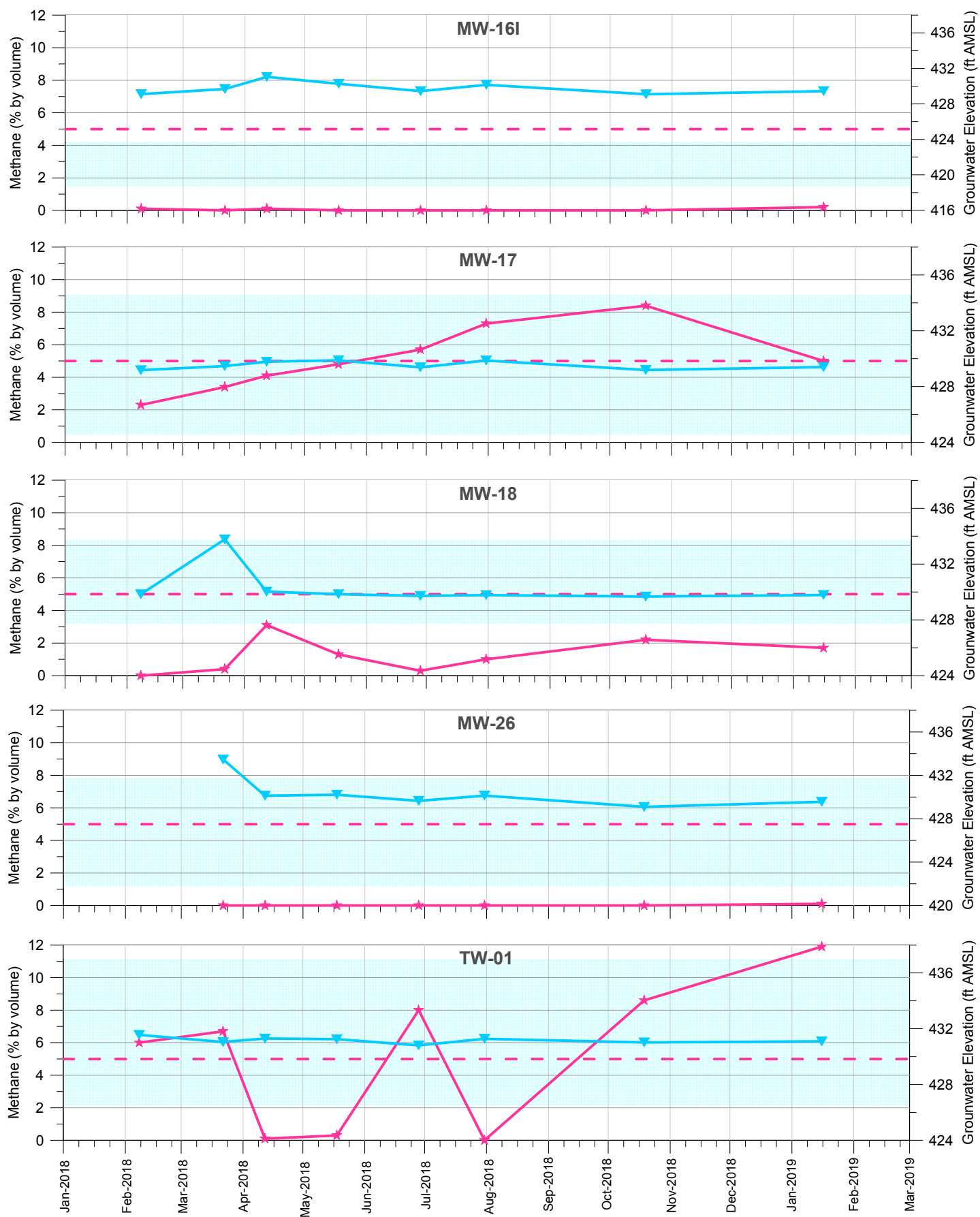
**Figure 7. Carbon Dioxide Concentrations at SMWU 1
Landfill Gas Monitoring Points
Former Hampshire Chemical Corp. Facility, Waterloo, NY**



Notes

1) SWMU - solid waste management unit

Figure 8. Oxygen Concentrations at SMWU 1 Landfill Gas Monitoring Points
Former Hampshire Chemical Corp. Facility, Waterloo, NY



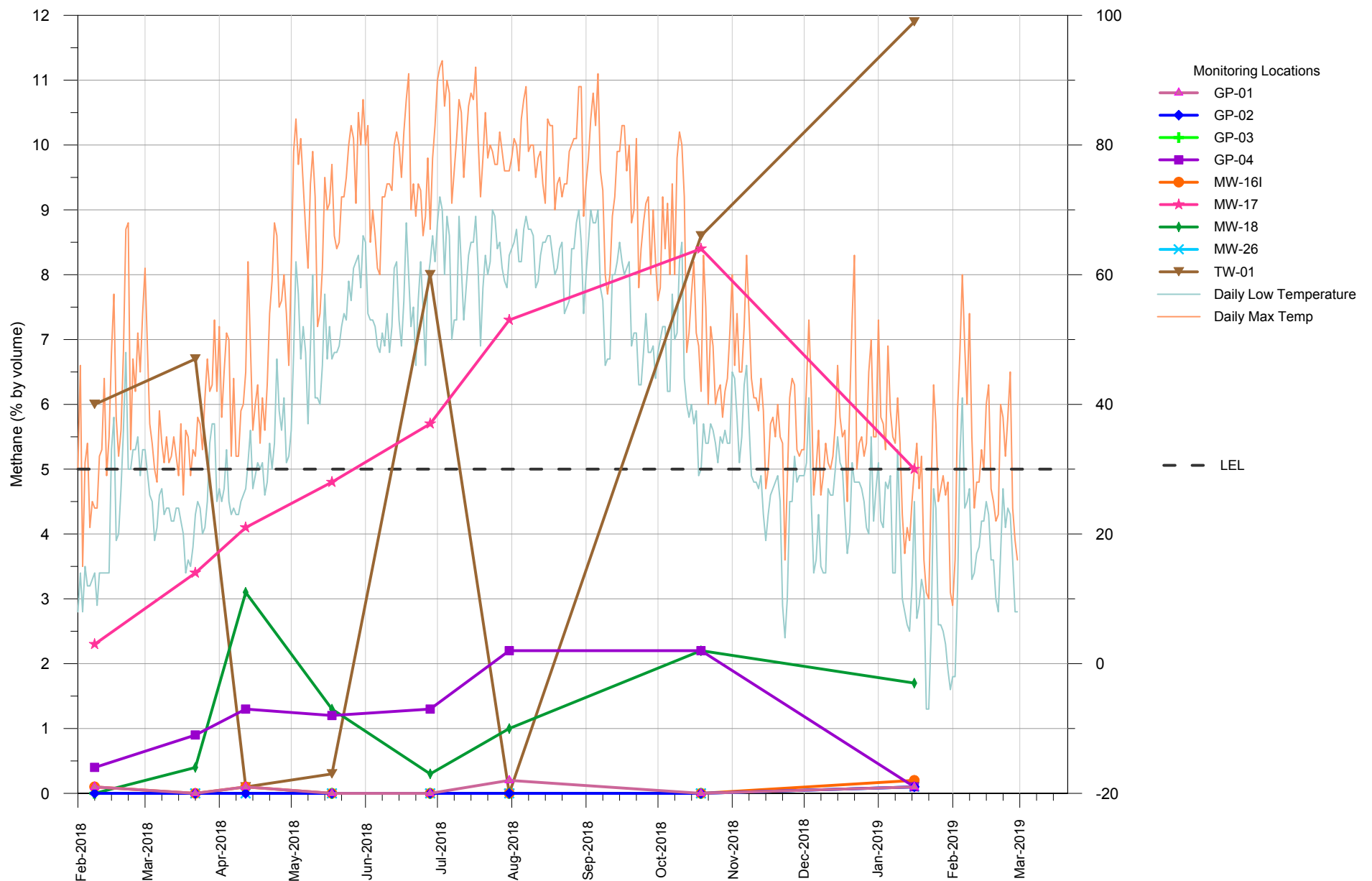
Legend

- ▲ Groundwater Elevation
- LEL
- ★ Methane
- Well Screen Interval

Notes

- 1) LEL - lower explosive limit
- 2) SWMU - solid waste management unit

Figure 9. Methane Concentrations and Groundwater Elevations at SMWU 1 Groundwater Monitoring Wells
Former Hampshire Chemical Corp. Facility, Waterloo, NY



Notes

- 1) LEL - lower explosive limit
- 2) SWMU - solid waste management unit
- 3) Air temperature data was collected at the Geneva Research Farm weather station (Global Historical Climatology Network station ID USC00303184)

Figure 10. Methane Concentrations and Daily Temperatures at SMWU 1 Landfill Gas Monitoring Points
Former Hampshire Chemical Corp. Facility, Waterloo, NY

Attachment 1

Soil Boring Logs

Site: WATERLOO	Boring ID GP-01	Sheet 1 of 1
----------------	-----------------	--------------

SOIL BORING LOG

Start Date & Time: 2/7/18 09:00

CH2M Logger: Taylor Salisbury

End Date & Time: 2/7/18

Drilling Contractor: PARATT WORK

Water Level, Date & Time:

Drilling Method: GEOPROBE 2 1/4 ID FOLLOW STEER

Feet BGS	Interval (ft)	Recovery (inches)	Soil PID (ppm)	USCS Code	Soil Description	Comments	
					USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)	
1	0	3.0	-	Fill SH - GW	0-3.1' DARK BROWN SILT + FINE GRAVEL, MOST (FROZEN) LITTLE FINE SAND, FILL, RED MOTTLE	PERFORATED CAP ACQUIRED 1.5' BGS	
2	4						PID IN OPEN BOREHOLE TO 4' WAS 1.4 PPIT NO OTHER HITS
3							
4		2.8	-	Fill SW - GW	3.1-5.2 LIGHT BROWN FINE-MEDIUM SAND + GRAVEL, LOOSE, DRY, SUBGRADED FINE GRAVEL		
5	4						
6	7						5.2-7.0 DARK BROWN SILT, MOST FINE - SOME GRAVEL + FINE SAND FROM 6.6-7.0'
7				SH	BOB 7.0' BGS		

Attachment 2
Well Completion Reports

LANDFILL GAS PROBE COMPLETION REPORT

Start Date: 2/7/2018

CH2M Logger: T. Salsburg

End Date: 2/7/2018

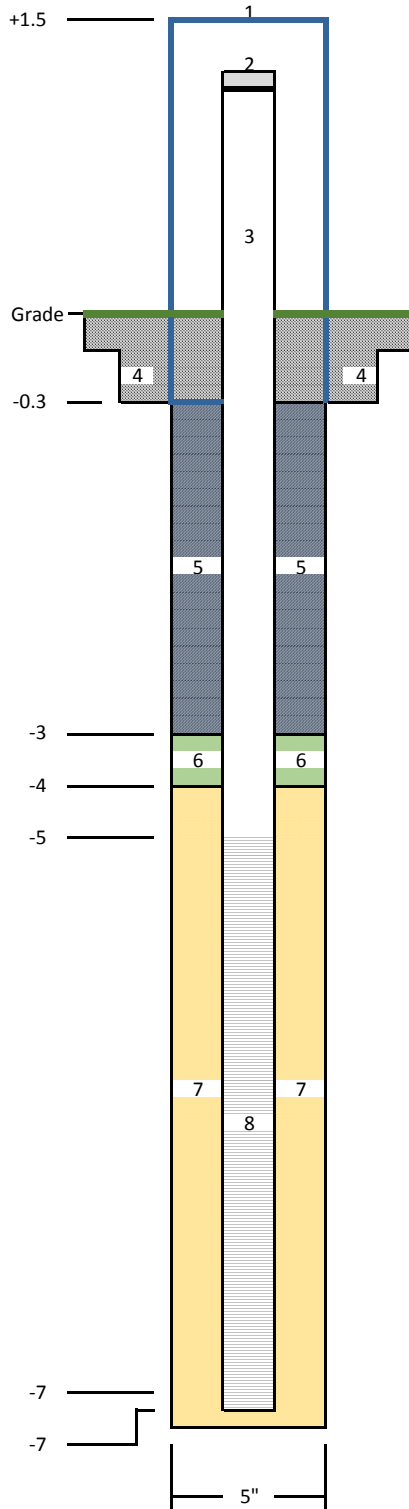
Drilling Contractor: Parratt-Wolff, Syracuse, NY

Latitude, Longitude: 42.902506, -76.8569642

Drilling Method: Hollow Stem Auger

Elevation
(feet)

Well Materials



1) **Well Monument**

4" x 4" locking steel stickup

2) **Riser Pipe Seal**

1-inch diameter expanding well plug with gas sampling valve

3) **Riser Pipe**

Material: 1-inch diameter Schedule 40 PVC

Quantity: 6.5 feet

4) **Well Pad**

Dimensions: 18" x 18" x 3"

Material: Sakcrete

5) **Grout**

Material: Portland cement

Bag Size: 90 lbs

Quantity: 1 bags

Placement: direct pour

6) **Seal**

Material: 3/8" medium Holeplug chips

Bag Size: 50 lbs

Quantity: 0.5 bags

7) **Filter Sand**

Material: #0 sand

Bag Size: 50 lbs

Quantity: 1 bags

8) **Well Screen**

Material: 1-inch diameter Schedule 40 PVC

Perforations: 0.010-inch factory mill-slotted

Quantity: 2 feet

Notes

LANDFILL GAS PROBE COMPLETION REPORT

Start Date: 2/7/2018

CH2M Logger: T. Salsburg

End Date: 2/7/2018

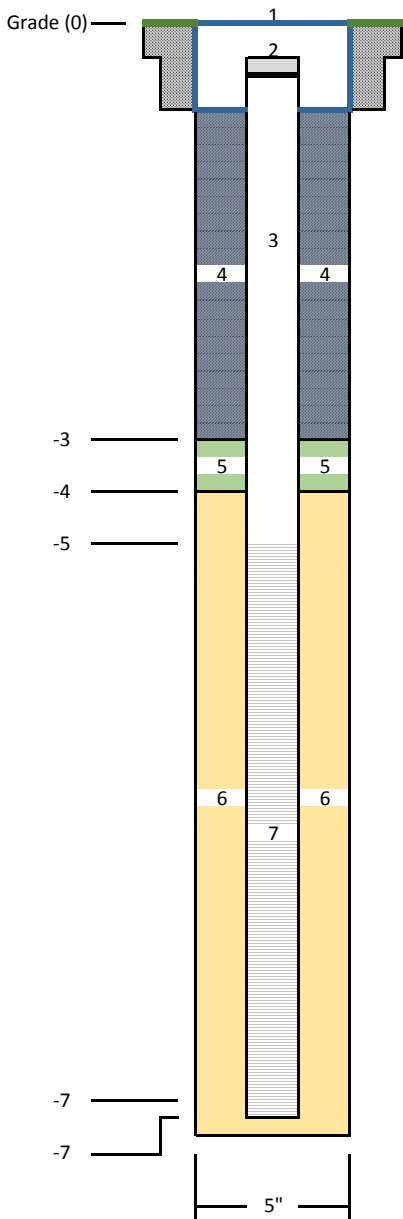
Drilling Contractor: Parratt-Wolff, Syracuse, NY

Latitude, Longitude: 42.9021238, -76.8553383

Drilling Method: Hollow Stem Auger

Elevation
(feet)

Well Materials



1) **Well Monument**

8-inch diameter flush-mounted road box

2) **Riser Pipe Seal**

1-inch diameter expanding well plug with gas sampling valve

3) **Riser Pipe**

Material: 1-inch diameter Schedule 40 PVC

Quantity: 5 feet

4) **Grout**

Material: Portland cement

Bag Size: 90 lbs

Quantity: 1 bags

Placement: direct pour

5) **Seal**

Material: 3/8" medium Holeplug chips

Bag Size: 50 lbs

Quantity: 0.5 bags

6) **Filter Sand**

Material: #0 sand

Bag Size: 50 lbs

Quantity: 1 bags

7) **Well Screen**

Material: 1-inch diameter Schedule 40 PVC

Perforations: 0.010-inch factory mill-slotted

Quantity: 2 feet

Notes

LANDFILL GAS PROBE COMPLETION REPORT

Start Date: 2/7/2018

CH2M Logger: T. Salsburg

End Date: 2/7/2018

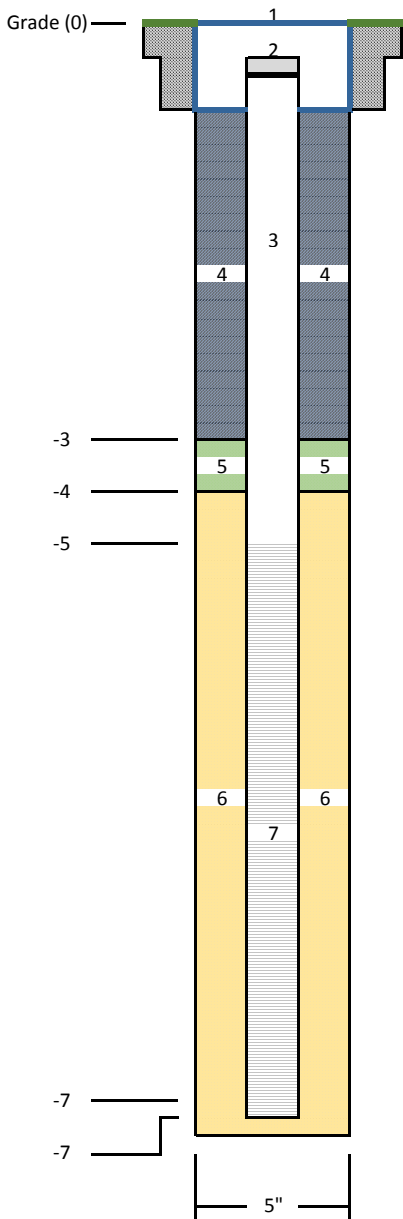
Drilling Contractor: Parratt-Wolff, Syracuse, NY

Latitude, Longitude: 42.9029218, -76.8567765

Drilling Method: Hollow Stem Auger

Elevation
(feet)

Well Materials



1) **Well Monument**

8-inch diameter flush-mounted road box

2) **Riser Pipe Seal**

1-inch diameter expanding well plug with gas sampling valve

3) **Riser Pipe**

Material: 1-inch diameter Schedule 40 PVC

Quantity: 5 feet

4) **Grout**

Material: Portland cement

Bag Size: 90 lbs

Quantity: 1 bags

Placement: direct pour

5) **Seal**

Material: 3/8" medium Holeplug chips

Bag Size: 50 lbs

Quantity: 0.5 bags

6) **Filter Sand**

Material: #0 sand

Bag Size: 50 lbs

Quantity: 1 bags

7) **Well Screen**

Material: 1-inch diameter Schedule 40 PVC

Perforations: 0.010-inch factory mill-slotted

Quantity: 2 feet

Notes

LANDFILL GAS PROBE COMPLETION REPORT

Start Date: 2/7/2018

CH2M Logger: T. Salsburg

End Date: 2/7/2018

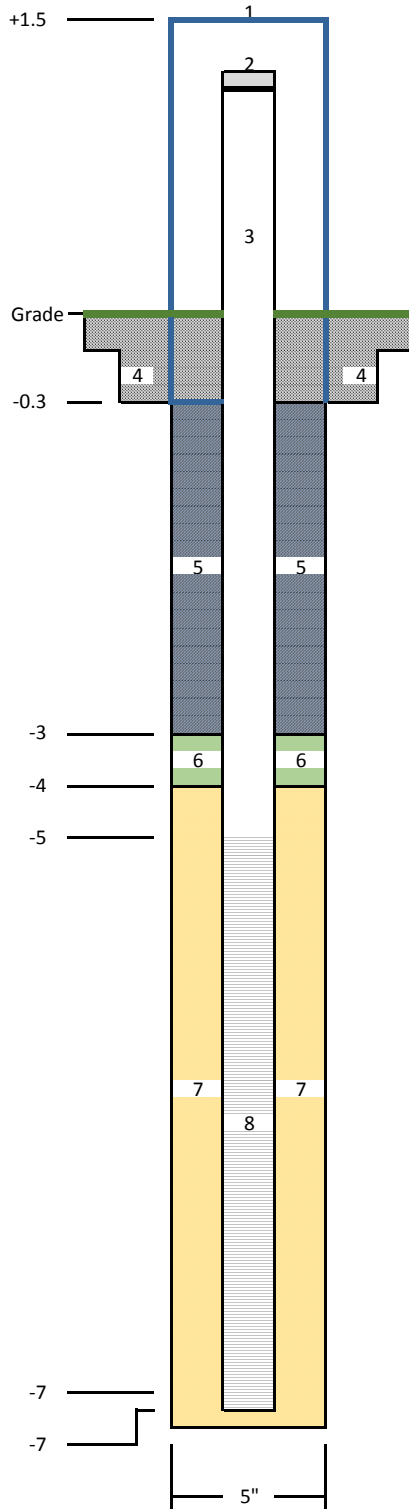
Drilling Contractor: Parratt-Wolff, Syracuse, NY

Latitude, Longitude: 42.9026313, -76.8569131

Drilling Method: Hollow Stem Auger

Elevation
(feet)

Well Materials



1) **Well Monument**

4" x 4" locking steel stickup

2) **Riser Pipe Seal**

1-inch diameter expanding well plug with gas sampling valve

3) **Riser Pipe**

Material: 1-inch diameter Schedule 40 PVC

Quantity: 6.5 feet

4) **Well Pad**

Dimensions: 18" x 18" x 3"

Material: Sakcrete

5) **Grout**

Material: Portland cement

Bag Size: 90 lbs

Quantity: 1 bags

Placement: direct pour

6) **Seal**

Material: 3/8" medium Holeplug chips

Bag Size: 50 lbs

Quantity: 0.5 bags

7) **Filter Sand**

Material: #0 sand

Bag Size: 50 lbs

Quantity: 1 bags

8) **Well Screen**

Material: 1-inch diameter Schedule 40 PVC

Perforations: 0.010-inch factory mill-slotted

Quantity: 2 feet

Notes

Attachment 3
Wellhead Screening Logs

0.509 L/min

2.024



SWMU 1 Landfill Gas Monitoring, March 2018
Former Hampshire Chemical Corp. Facility, Waterloo, New York

Date: 3/22/18

Well Data				Purge Time Calculations			Pre-Purge Values		Purge and Stabilized Measurements								
Well Number	Well Screen (ft bgs)	Dia-meter (inches)	Total Depth (feet BTOC)	Head-space Length (feet)	Head-space Volume (liters)	Min. Purge Time (minutes)	Static Casing Pressure	Diff. Pressure (in. WC)	Measurement	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	VOC (ppm)	SO ₂ (ppm)
				h_{ft}	$V_{headspace}$	T_{purge}											
GP-01	5 - 7	1	7.00 +1.30	8.3	1.3 1.2	5.2 4.7	+0.00625 +0.0236		Max:	0	0	0	0	8.2	6.4	—	—
									Stable:	0	0	0	0	8.3	6.4	0.3	0
GP-02	5 - 7	1	7.00	7	1.2	4.7	+0.00412 - +0.01472		Max:	2.0	20			5.0	3.1		
									Stable:	φ	φ	35	φ	2.6	13.4	φ.5	φ
GP-03	5 - 7	1	7.00	7	1.2	4.7	+0.00419 - +0.00340		Max:	water						—	—
									Stable:								
GP-04	5 - 7	1	7.00 +1.6	8.6	1.3 1.2	5.2 4.7	+0.01546 +0.0615 +0.0381		Max:	1.3	22.26	0	0	6.5	2.1	—	—
									Stable:	0.9	1.8	0	0	9.3	0.9	0.2	φ

Formulas

$$V_{headspace} = X \text{ liters} = \pi r_{well}^2 h_{ft} = (1000L/m^3)(3.142)(0.0133m)^2(h_{ft})(0.3048m/ft)$$

$$T_{purge} = X \text{ minutes} = (V_{headspace} * 1000ml/L) / (250ml/min)$$

Additional Notes

GP-03 hose barb on poppet valve broken. Did not collect unpaired diff pressure. Depth to water 3.42

Staff: C. Lettich

Meter Information:

Signature: *[Signature]*



SWMU 1 Landfill Gas Monitoring, March 2018
Former Hampshire Chemical Corp. Facility, Waterloo, New York

Date: 3/22/18

Well Data				Purge Time Calculations			Pre-Purge Values		Purge and Stabilized Measurements								
Well Number	Well Screen (ft bgs)	Dia-meter (inches)	Depth to Water (feet BTOC)	Head-space Length (feet)	Head-space Volume (liters)	Min. Purge Time (minutes)	Static Casing Pressure	Diff. Pressure (in. WC)	Measurement	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	VOC (ppm)	SO ₂ (ppm)
				h_{ft}	$V_{headspace}$	T_{purge}											
MW-16I	30.5 - 35.5	2	26.31 +1.5' stickup	27.81	18.4	73.6	+0.0898 -0.0028 +0.0570		Max:	0.2	1	0	0	0	21.3	-	-
									Stable:	0	0	0	0	0.1	21.5	0.1	0
MW-17	15.6 - 25.6	2	22.66 +1.95				+0.0839 +0.0450		Max:								
									Stable:	3.4	68	0	0	9.5	23.2	0	0
MW-18	6.1 - 12.1	2	12.24 +1.9				+0.0213 +0.00541		Max:	-	-	-	-	-	-	-	-
									Stable:	0.4	9	2	0	6.8	1.2	0.2	0
MW-26	4.2 - 14.2	2	11.96 +2.4 stickup	14.36	9.51 8.9	32.91 35	+0.00267 +0.01205		Max:								
									Stable:	0	0	0	0	2.7	17.2	0.2	0
TW-01	9.4 - 19.9	2	17.96 +1.65				+0.00325 +0.02286		Max:								
									Stable:	6.7	>100	0	0	7.1	6.3	0	0

Reference & Formulas

$$V_{headspace} = X \text{ liters} = \pi r_{well}^2 h_{ft} = (1000L/m^3)(3.142)(0.02625m)^2(h_{ft})(0.3048m/ft)$$

$$T_{purge} = X \text{ minutes} = (V_{headspace} * 1000ml/L) / (250ml/min)$$

Additional Notes

Installed pressure caps shortly before pressure measurements
Purge times MW-16I = 20 min (stable), MW-18 = 10 min (stable), TW-01 = 20 min (stable)
MW-17 = 2000 sec, MW-26 = 10 min (stable)



SWMU 1 Landfill Gas Monitoring, ^{April} March 2018
Former Hampshire Chemical Corp. Facility, Waterloo, New York

^{April 12}
Thursday, March 22, 2018
Project # 698563.01.VP

GP-01	② Probe Information		③ Purge Vol.	① Field Pressure Data	④ Field Purge Data			Notes
	Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	Diff. Pressure (inch WC)	T =	R =	Actual Volume Purged (liters)	
					Purge Time (minutes)	Purge Rate (ml/min)	= T * R	
	5 - 7	8.30	1.4	0.0 0.367 40.00762 342	8	250	2	
	⑤ Gas Concentration Field Measurements							
	CH ₄ (% vol.)	LEL CH₄ (%)	CO (ppm)	VOC (ppm)	SO ₂ (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)
Initial	0.0	0	0	0.3	—	0	7.7	8.8
Stable	0.1	2	0	0.4	—	0	9.3	1.9

GP-02	① Probe Information		② Purge Vol.	③ Field Pressure Data	④ Field Purge Data			Notes
	Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	Diff. Pressure (inch WC)	T =	R =	Actual Volume Purged (liters)	
					Purge Time (minutes)	Purge Rate (ml/min)	= T * R	
	5 - 7	7.00	1.2	0.00233 40.00044				
	⑤ Gas Concentration Field Measurements							
	CH ₄ (% vol.)	LEL CH₄ (%)	CO (ppm)	VOC (ppm)	SO ₂ (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)
Initial	0.0	0	0	0.3	—	0	2.3	16.9
Stable	0.0	0	0	0.2	—	0	2.3	16.5



SWMU 1 Landfill Gas Monitoring, March 2018
Former Hampshire Chemical Corp. Facility, Waterloo, New York

Thursday, March 22, 2018
Project # 698563.01.VP

① Probe Information		② Purge Vol.	③ Field Pressure Data		④ Field Purge Data			Notes
GP-03	Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	Diff. Pressure (inch WC)	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	Draw water
	5 - 7	7.00	1.2					
	⑤ Gas Concentration Field Measurements							
	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	VOC (ppm)	SO ₂ (ppm)	H ₂ S (ppm)	CO ₂ (%)	
Initial								
Stable								

① Probe Information		② Purge Vol.	③ Field Pressure Data		④ Field Purge Data			Notes
GP-04	Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	Diff. Pressure (inch WC)	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
	5 - 7	8.60	1.5	+0.01754	8	250	2	
	⑤ Gas Concentration Field Measurements							
	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	VOC (ppm)	SO ₂ (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)
Initial	1.3	27	0	0.2	-	0	9.0	2.3
Stable	1.3	27	0		-	0	9.4	0.0



SWMU 1 Landfill Gas Monitoring, March 2018
Former Hampshire Chemical Corp. Facility, Waterloo, New York

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MW-161	1 Probe Information		2 Purge Vol.	3 Field Pressure Data		4 Field Purge Data		Notes	
	Screen Interval (ft bgs)	D = Depth to Water (feet BTOC)	Volume (liters) = 0.66 * D	Diff. Pressure (inch WC)		T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	Faulted at 2L/min - 10min @ 1L/min - Faulted @ 1L/min Can't sustain higher Flow. Screen submerged
	30.5 - 35.5	24.95	16.5	+0.0243 +0.0157		40	~500	20	
	5 Gas Concentration Field Measurements								
	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	VOC (ppm)	SO ₂ (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	
	Initial	0.5	10	0	0.3	—	0	6.7	17.9
Stable	0.1	2	0	0.2	—	0	0.5	20.4	

MW-17	1 Probe Information		2 Purge Vol.	3 Field Pressure Data		4 Field Purge Data		Notes	
	Screen Interval (ft bgs)	D = Depth to Water (feet BTOC)	Volume (liters) = 0.66 * D	Diff. Pressure (inch WC)		T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	Faulted at 2L/min Set to 1L/min Faulted after 10min
	15.6 - 25.6	22.35	14.8	0.00450 0.00371255		296	500		
	5 Gas Concentration Field Measurements								
	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	VOC (ppm)	SO ₂ (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	
	Initial	2.5	46	0.0	0.0	—	0	5.3	11.2
Stable	4.1	83	0.0	0.0	—	0	10.1	0.0	

MW-18									
1 Probe Information		2 Purge Vol.		3 Field Pressure Data		4 Field Purge Data		Notes	
D =	Depth to Water (feet BTOC)	Volume (liters)	= 0.66 * D	Diff. Pressure (inch WC)	Purge Time (minutes)	R =	Purge Rate (ml/min)	Actual Volume	Set to 2L/min for (min - sustained de
6.1 - 12.1	12.05	8.0	± +0.0312	5 +0.0155	20	500			
5 Gas Concentration Field Measurements									
CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	VOC (ppm)	SO ₂ (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)		
2.0	40	0	0	-	0	6.2	0.3		
2.7	55	0	0	-	0	6.7	0.0		
Stable	Initial								



SWMU 1 Landfill Gas Monitoring, March 2018
Former Hampshire Chemical Corp. Facility, Waterloo, New York

April 12
Thursday, March 22, 2018
Project # 698563.01.VP

TW-01	1 Well Information		2 Purge Vol.	3 Field Pressure Data	4 Field Purge Data			Notes
	Screen Interval (ft bgs)	D = Depth to Water (feet BTOC)	Volume (liters) = 0.66 * D	Diff. Pressure (inch WC)	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	Purged at 2L/min for 10 min
				± 10.00033				
	9.4 - 19.9	17.71	11.7	± 0.00018	30	500		
	5 Gas Concentration Field Measurements							
	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	VOC (ppm)	SO ₂ (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)
Initial	1.6	33	0	0	—	0	5.5	11.7
Stable	0.1	2	0	0.1	—	0	0.4	20.4

2L 0.1 2 0 0.1 — 0 0.3 20.6



SWMU 1 Landfill Gas Monitoring, May 2018
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Project # 698563.01.MN

		1 Field Pressure Data		2 Probe Information		3 Purge Vol.	4 Field Purge Data			Notes
		Diff. Pressure (inch WC)	Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
GP-01	Hi	0.063	5 - 7	8.30	1.4	2.2	600	4	DIFF PRESS HIT " - " A FEW TIMES, SEEMS STABLE NEAR ZERO	
	Lo	0.002								
	5 Gas Concentration Field Measurements									
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)		SO ₂ (ppm)
	Initial	0.0	0	0	0	0	11.6	1.9		0
	Stable		0	0	0	0	11.4	1.8	0	

		1 Field Pressure Data		2 Probe Information		3 Purge Vol.	4 Field Purge Data			Notes
		Diff. Pressure (inch WC)	Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
GP-02	Hi	0.120	5 - 7	7.00	1.2	2.5	600	4		
	Lo	0.001								
	5 Gas Concentration Field Measurements									
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)		SO ₂ (ppm)
	Initial	0.2	0	0	0	0	3.7	9.8		0
	Stable	0.2	0	0	0	0	3.8	9.6	0	



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		1 Field Pressure Data		2 Probe Information		3 Purge Vol.	4 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
GP-03	Hi	0.0249		5 - 7	7.00	1.2	2	600	3	
	Lo	0.0184								
	5 Gas Concentration Field Measurements									HIGH CARBON MONOXIDE
	VOC (ppm)		CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
	Initial	0.0	0	0	20	0	0	21.3	0	
	Stable	0.0	0	0	23	0	0	20.9	0	

		1 Field Pressure Data		2 Probe Information		3 Purge Vol.	4 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
GP-04	Hi	0.0077		5 - 7	8.60	1.5	2.7	600	4	
	Lo	0.0069								
	5 Gas Concentration Field Measurements									
	VOC (ppm)		CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
	Initial	0.0	1.2	25	0	0	10.2	0.5	0	
	Stable	0.1	1.2	24	0	0	10.4	0.3	0	



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		1 Field Pressure Data		2 Probe Information		3 Purge Vol.		4 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOW)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
MW-18	Hi	0.0144		DTB 13.64	12.23	8.07	16	500	8.5		
	Lo	0.00259								6.1 - 12.1	
	5 Gas Concentration Field Measurements										
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
	Initial	0.0	1.5	34	7	1	5.4	3.4	0		
	Stable	0.0	1.3	26	0	0	6.2	6.2	0		

		1 Field Pressure Data		2 Probe Information		3 Purge Vol.		4 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOW)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
MW-26	Hi	0.0210		4.2 - 14.2	11.55	7.6	12.7	600	15		
	Lo	0.0044									
	5 Gas Concentration Field Measurements										
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
	Initial	0.0	0	0	0	0	4.9	10.3	0		
	Stable	0.0	0	0	0	0	5.9	8.0	0		



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		1 Field Pressure Data		2 Probe Information		3 Purge Vol.		4 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
MW-161	Hi	-0.695		30.5 - 35.5	25.72	16.98	28.3	600	34		
	Lo	-0.660									
	5 Gas Concentration Field Measurements									- Purge Rate Slowed	
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	to 400 AFTER APPROX		
									20 MIN		
	Initial	0	0	0	0	0	1.0	19.4	0	- SOME VACUUM IN TUBING	
Stable	0	0	0	0	0	0	20.9	0	WENT DISCONNECT SEE		

		1 Field Pressure Data		2 Probe Information		3 Purge Vol.		4 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
MW-17	Hi	-0.008		15.6 - 25.6	22.25	14.68	25	600	15		
	Lo	-0.012									
	5 Gas Concentration Field Measurements										
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)			
	Initial	6.0	5.0	OVER	1	0	9.2	0.6	0		
Stable	0.0	4.8	96	0	0	9.0	0.3	0			



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TW-01	1 Field Pressure Data		2 Probe Information		3 Purge Vol.	4 Field Purge Data			Notes
	Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
	HI	LO							
		0.011							
		0.009	9.4 - 19.9	17.76	11.72	19.5	600	14	
5 Gas Concentration Field Measurements									
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
Initial	6.0	0.2	4	0	0	0.2	19.3	0	
Stable	0.0	0.3	7	0	0	0.5	19.7	0	



SWMU 1 Landfill Gas Monitoring, May 2018
Former Hampshire Chemical Corp. Facility, Waterloo, New York

6/28/2018

Project # 698563.01.MN

GP-01	1 Field Pressure Data		2 Probe Information		3 Purge Vol.	4 Field Purge Data			Notes
	Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
	Hi	Lo							
	-0.0060	-0.0062							
	-0.0102	-0.024							
5 Gas Concentration Field Measurements									
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
Initial	0.0	0.0	0	0	0	13.6	2.9	0	
Stable	0.0	0.0	0	0	0	14.4	1.8	0	

GP-02	1 Field Pressure Data		2 Probe Information		3 Purge Vol.	4 Field Purge Data			Notes
	Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
	Hi	Lo							
	-0.0062	-0.0102							
5 Gas Concentration Field Measurements									
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
Initial	0.0	0.0	0.0	0	0	7.4	10.5	0	
Stable	0.0	0.0	0.0	0	0	7.2	0.6	0	

PID of 0.6 ppm H₂ on RFI,
0.0 on 11.7 eV PID



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GP-03		1 Field Pressure Data		2 Probe Information		3 Purge Vol.		4 Field Purge Data		Notes	
		Diff. Pressure (inch WC)	Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R			
HI		-0.0012	5-7	7.00	1.2	3	0.5	1.5			
LO		-0.0043									
5 Gas Concentration Field Measurements											
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
Initial		0.0	0.0	0	10.0	0	0	7.1	0		
Stable		0.0	0.0	0	11.6	0	0	7.1	0		

GP-04		1 Field Pressure Data		2 Probe Information		3 Purge Vol.		4 Field Purge Data		Notes	
		Diff. Pressure (inch WC)	Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R			
HI		0.0092	5-7	8.60	1.5	4	0.5	2.0			
LO		0.0033									
5 Gas Concentration Field Measurements											
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
Initial		0.0	0.1	1	0	0	4.6	3.8	0		
Stable		0.0	1.3	25	0	0	12.4	0.0	0		



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MW-16I	1 Field Pressure Data		2 Probe Information		3 Purge Vol.	4 Field Purge Data			Notes
	Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
	H	L							
		0.0210							
		0.0073	30.5 - 35.5	26.55	17.5	18	1.0	18	
5 Gas Concentration Field Measurements									
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
Initial	0.0	0.0	0.0	0	0	0.5	20.1	0	
Stable	0.0	0.0	0.0	0	0	0.1	20.2	0	

MW-17	1 Field Pressure Data		2 Probe Information		3 Purge Vol.	4 Field Purge Data			Notes
	Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
	H	L							
		0.0104							
		0.0083	15.6 - 25.6	22.75	15.0	16	1.0	16	
5 Gas Concentration Field Measurements									
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
Initial	0.2	6.1	over	0	0	10.6	2.0	0	
Stable	0.0	5.7	over	0	0	10.2	0	0	



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MW-18	1 Field Pressure Data		2 Probe Information		3 Purge Vol.	4 Field Purge Data			Notes
	Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
	H	L							
	H	0.0068							
L	0.0050	6.1 - 12.1	12.35	8.15	9	1.0	9		
5 Gas Concentration Field Measurements									
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
Initial	0.0	0.0	0.0	0	0	1.6	17.2	0	
Stable	0.1	0.3	6	0	0	12.6	0.4	0	

MW-26	1 Field Pressure Data		2 Probe Information		3 Purge Vol.	4 Field Purge Data			Notes
	Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
	H	L							
	H	0.0123							
L	0.0091	4.2 - 14.2	12.11	7.99	9	1.0	9	11.7 ev PID 0.0 ppm	
5 Gas Concentration Field Measurements									
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
Initial	0.0	0.0	0	0	0	7.6	8.6	0	
Stable	0.0	0.0	0	0	0	9.8	5.3	0	



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		① Field Pressure Data		② Probe Information		③ Purge Vol.	④ Field Purge Data			Notes
		Diff. Pressure (Inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
TW-01	H	0.0410		9.4 - 19.9	18.20	12.0	13	1.0	13	
	S	0.0120								
	⑤ Gas Concentration Field Measurements									
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
	Initial	6.1	0.4	9	0	0	0.7	18.5	0	
	Stable	0.0	8.0	OVER	0	0	9.3	3.2	0	



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		① Field Pressure Data	Probe Information		Purge Vol.	③ Field Purge Data			Notes	
		Diff. Pressure (inch WC)	Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
GP-01	H	+0.00582								
	L	+0.0210	5 - 7	8.30	1.4	4	600	2.4		
	Gas Concentration Field Measurements									
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
②	Initial	0.5	0.1	2	1	0	16.8	16.6	0	
④	Stable	0.2	0.2	4	0	0	17.1	1.4	0	

		① Field Pressure Data	Probe Information		Purge Vol.	③ Field Purge Data			Notes	
		Diff. Pressure (inch WC)	Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
GP-03 GP-02	H	+0.00095								Trace water at 6.93'
	L	-0.00017	5 - 7	7.00	1.2	4	600	2.4	bloc	
	Gas Concentration Field Measurements									
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
②	Initial	0	0	0	0	1	12.0	10.7	0	
④	Stable	0	0	0	0	0	12.4	10.6	0	



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GP-02 GP-03		1 Field Pressure Data		Probe Information		Purge Vol.	3 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T =	R =	Actual Volume Purged (liters) = T * R	
							Purge Time (minutes)	Purge Rate (ml/min)		
		Hi	+0.00090	5 - 7	7.00	1.2	4	600	2.4	
		Lo	-0.00271							
Gas Concentration Field Measurements										
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
2	Initial	1.3	0	1	0	0	9.4	1.2	0	
4	Stable	2.5	0	1	0	0	9.4	1.0	0	

GP-04	① Field Pressure Data		Probe Information		Purge Vol.	③ Field Purge Data			Notes	
	Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
	Hi	-0.0101								
	Lo	-0.0227								
			5 - 7	8.60	1.5	3	600	1.8		
	Gas Concentration Field Measurements									
	VOC (ppm)		CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
	② Initial	0	2.1	42	0	0	12.8	2.8	0	
	④ Stable	0	2.2	44	0	0	14.0	1.3	0	

MW-161	1 Field Pressure Data		3 Probe Information		4 Purge Vol.	5 Field Purge Data			Notes	
	Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	Flow fault at 25 mins. Possibly because screen submerged.	
	Hi									
	Lo									
		+0.0634								
		+0.0338	30.5 - 35.5	25.84	17	25	500	12.5		
	Gas Concentration Field Measurements									
	VOC (ppm)		CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
	2	Initial	0	0	0	0	0.3	20.5	0	
	6	Stable	0	0	0	0	0.0	21.0	0	

MW-17	1 Field Pressure Data		3 Probe Information		4 Purge Vol.	5 Field Purge Data			Notes	
	Diff. Pressure (Inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
	Hi	+0.0380								
	Lo	+0.00342	15.6 - 25.6	22.26	14.70	34	600	20		
	Gas Concentration Field Measurements									
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
	2 Initial	0	5.9	>100	1	0	10.5	2.0	0	
	6 Stable	0	7.3	>100	1	0	12.0	0.8	0	



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		① Field Pressure Data	③ Probe Information		④ Purge Vol.	⑤ Field Purge Data			Notes
		Diff. Pressure (inch WC)	Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
MW-18	Hi	0.00309							
	Lo	-0.00678	6.1 - 12.1	12.30	8.1	24	500	12	
	Gas Concentration Field Measurements								
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
	② Initial	0	0.6	11	0	1	8.2	3.8	0
⑥ Stable	0	1.0	20	0	0	10.7	1.4	0	

		① Field Pressure Data	③ Probe Information		④ Purge Vol.	⑤ Field Purge Data			Notes
		Diff. Pressure (inch WC)	Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
MW-26	Hi	+0.00050							
	Lo	-0.00182	4.2 - 14.2	11.63	7.7	15	600	9	
	Gas Concentration Field Measurements								
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
	② Initial	0	0	0	0	0	10.2	5.6	0
⑥ Stable	0	0	0	0	0	12.8	1.7	0	

		① Field Pressure Data		③ Probe Information		④ Purge Vol.	⑤ Field Purge Data			Notes
TW-01		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
	Hi	+0.00592								
	Lo	-0.00115		9.4 - 19.9	17.73	11.7	34	500	17	
	Gas Concentration Field Measurements									
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
②	Initial	0.3	0.2	5	0	1	2.9	16.4	0	
⑥	Stable	0.0	0	0	0	0	0.1	20.7	0	

		1 Field Pressure Data		Probe Information		Purge Vol.	3 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
GP-01	Hi	-0.00060		5 - 7	8.30	1.4	10	600	6.0	GLOBAL for event: $CH_4, CO, H_2S, CO_2, O_2$ monitored w/ GEM 5000. VOC with MiniRaе, SO_2 and LEL with VRge. See calibration sheets for this date. Monitoring performed by C. Lettich <i>[Signature]</i>
	Lo	-0.00612								
	Gas Concentration Field Measurements									
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
2	Initial	0.0	0.0	1	0	0	13.3	4.3	0.2	
4	Stable	0.2	0.0	1	0	0	14.0	1.7	0.2	

		1 Field Pressure Data		Probe Information		Purge Vol.	3 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
GP-02	Hi	+0.00762		5 - 7	7.00	1.2	10	600	6.0	
	Lo	+0.00098								
	Gas Concentration Field Measurements									
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
2	Initial	0.0	0	0	0	0	7.5	5.3	0	
4	Stable	0.0	0	0	0	0	7.6	3.6	0	

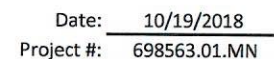


SWMU 1 Landfill Gas Monitoring, October 2018
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Date: 10/19/2018
Project #: 698563.01.MN

		① Field Pressure Data		Probe Information		Purge Vol.	③ Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
GP-03	Hi	-0.00175		5 - 7	7.00	1.2	10	600	6.0	
	Lo	-0.00328								
	Gas Concentration Field Measurements									
	VOC (ppm)		CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
	② Initial	0.0	0.0	0	0	0	9.4	14.1	0.60.2	
④ Stable	0.0	0.0	0	0	0	8.9	14.5	0.20.0		

		① Field Pressure Data		Probe Information		Purge Vol.	③ Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
GP-04	Hi	+0.00607		5 - 7	8.60	1.5	12	600	7.2	
	Lo	+0.00172								
	Gas Concentration Field Measurements									
	VOC (ppm)		CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
	② Initial	0.0	2.6	39	0	0	10.5	3.6	0.2	
④ Stable	0.0	2.2	32	0	0	11.5	1.6	0.2		



MW-161	1 Field Pressure Data		3 Probe Information		4 Purge Vol.	5 Field Purge Data			Notes	
	Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	Pump faulted after ~25 minutes. Possibly because screen submerged and high vacuum developed.	
	Hi	Lo								
	+0.0808	+0.0761								
	Gas Concentration Field Measurements									
	VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
	2 Initial	0.0	0	0	0	0	0.9	19.7		0
	6 Stable	0.0	0	0	0	0	0.1	21.3		0

MW-17		1 Field Pressure Data		3 Probe Information		4 Purge Vol.	5 Field Purge Data			Notes	
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
										Hi	Lo
				+0.00445							LEL over 100%
				-0.00046	15.6 - 25.6	22.94	15.1	38	500	19	
Gas Concentration Field Measurements											
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
2	Initial	0.0	7.6	>100	0	0	11.8	2.2	0.0		
6	Stable	0.0	8.4	>100	0	0	13.2	0.7	0.0		



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Project #: 698563.01.MN

		1 Field Pressure Data		3 Probe Information		4 Purge Vol.		5 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
MW-18	Hi	+0.0120								6.1 - 12.1	12.40
	Lo	-0.00432									
	Gas Concentration Field Measurements										
	VOC (ppm)		CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
2	Initial	0.0	1.2	12	0	0	9.7	1.0	0		
6	Stable	0.0	2.2	27	0	0	9.6	1.5	0		

		1 Field Pressure Data		3 Probe Information		4 Purge Vol.		5 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
MW-26	Hi	+0.00144								4.2 - 14.2	12.67
	Lo	-0.00370									
	Gas Concentration Field Measurements										
	VOC (ppm)		CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
2	Initial	0.0	0.0	0	0	0	6.2	14.0	0		
6	Stable	0.0	0.0	0	0	0	9.1	10.7	0		



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Former Hampshire Chemical Corp. Facility, Waterloo, New York

Date: 10/19/2018
Project #: 698563.01.MN

		1 Field Pressure Data		3 Probe Information		4 Purge Vol.		5 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
TW-01	HI	+0.00798		9.4 - 19.9	17.99	11.9	25	500	12.5	LEL over 100	
	LO	-0.0009									
	Gas Concentration Field Measurements										
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
2	Initial	0.0	5.0	>100	0	0	8.8	8.3	0.3		
6	Stable	0.0	8.6	>100	0	0	11.0	3.9	0.1		



SWMU 1 Landfill Gas Monitoring, January 2019
Former Hampshire Chemical Corp. Facility, Waterloo, New York

Date: 1/16/2019
Project #: 707538

		① Field Pressure Data		Probe Information		Purge Vol.	③ Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
GP-01	Hi	+ 0.00032		5 - 7	8.30	1.4	10			
	Lo	- 0.00362								
	Gas Concentration Field Measurements									
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
②	Initial	0.1	0.1	3	0	0	6.5	11.5	0	
④	Stable	0.1	0.1	3	0	0	0.0	18.6	0	

		① Field Pressure Data		Probe Information		Purge Vol.	③ Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
GP-02	Hi	0.00261		5 - 7	7.00	1.2	15			
	Lo	- 0.00762								
	Gas Concentration Field Measurements									
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
②	Initial	0	0.1	2	0	0	3.3	15.4	0	
④	Stable	0	0.1	2	0	0	2.7	20.2	0	
		0	0.1	2	0	0	3.1	18.0	0	

GP-03		1 Field Pressure Data		Probe Information		Purge Vol.	3 Field Purge Data			Notes
		Diff. Pressure (inch WC)	Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
Hi										
Lo										
			5 - 7	7.00	1.2					
Gas Concentration Field Measurements										
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
2 Initial										
4 Stable										

GP-04		1 Field Pressure Data		Probe Information		Purge Vol.	3 Field Purge Data			Notes
		Diff. Pressure (inch WC)	Screen Interval (ft bgs)	D = Probe Length (feet)	Volume (liters) = 0.17 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
Hi	- 0.0111									
Lo	- 0.00867									
			5 - 7	8.60	1.5					
Gas Concentration Field Measurements										
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
2 Initial	0	0.3	7	0	0	8.0	5.1	0		
4 Stable	0	0.1	3	0	0	8.7	4.0	0		

4.0



SWMU 1 Landfill Gas Monitoring, January 2019
Former Hampshire Chemical Corp. Facility, Waterloo, New York

Date: 1/16/2019
Project #: 707538

1 Field Pressure Data		3 Probe Information		4 Purge Vol.	5 Field Purge Data			Notes
Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
HI								
LO		30.5 - 35.5	26.55					
Gas Concentration Field Measurements								
VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
2 Initial	0	0.6	13	0	0	3.5	15.7	0
6 Stable	0	0.2	4	0	0	0.5	2.4	0

1 Field Pressure Data		3 Probe Information		4 Purge Vol.	5 Field Purge Data			Notes
Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
HI	0.121							
LO	-0.157	0.0163	22.73		25			
Gas Concentration Field Measurements								
VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
2 Initial	0	5.4	7100	0	0	12.1	1.0	0
6 Stable	0	10.2	17100	0	0	12.2	0.4	0

5.0



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		1 Field Pressure Data		3 Probe Information		4 Purge Vol.		5 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
MW-18	HI	-0.00732								6.1 - 12.1	12.29
	LO	+0.0155									
	Gas Concentration Field Measurements										
	VOC (ppm)		CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
	2 Initial	0.1	1.6	33	0	0	5.3	1.5	0		
6 Stable	0.1	1.7	34	0	0	5.5	0.0	0			

		1 Field Pressure Data		3 Probe Information		4 Purge Vol.		5 Field Purge Data			Notes
		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R		
MW-26	HI	-0.00162								4.2 - 14.2	12.20
	LO	+0.0806									
	Gas Concentration Field Measurements										
	VOC (ppm)		CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)		
	2 Initial	0.1	0.0	1	0	0	2.4	19.8	0		
6 Stable	0	0.1	2	0	0	2.7	20.2	0			



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		1 Field Pressure Data		3 Probe Information		4 Purge Vol.	5 Field Purge Data			Notes
TW-01		Diff. Pressure (inch WC)		Screen Interval (ft bgs)	D = Depth to Water (ft BTOC)	Volume (liters) = 0.66 * D	T = Purge Time (minutes)	R = Purge Rate (ml/min)	Actual Volume Purged (liters) = T * R	
	HI	-0.0091								
	LO	-0.0631		9.4 - 19.9	17.91		21			
	Gas Concentration Field Measurements									
		VOC (ppm)	CH ₄ (% vol.)	LEL CH ₄ (%)	CO (ppm)	H ₂ S (ppm)	CO ₂ (%)	O ₂ (%)	SO ₂ (ppm)	
2	Initial	6.0	12.1	2100	0	0	11.9	2.1	0	
6	Stable	0	11.9	2100	0	0	11.6	2.8	0	