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January 29, 2021

Mr. Andrew Zwack Project Manager New York State Department of Environmental Conservation 270 Michigan Ave. Buffalo, NY 14203-2915

Subject: GrafTech International Holdings Inc.

Site Number 932035 Hyde Park Boulevard

Niagara Falls, New York 14303

Dear Mr. Zwack:

GrafTech International Holdings Inc. (Graftech) is pleased to submit the Periodic Review Report (PRR) for Reporting Year 2020 for the GrafTech closed landfill site (Landfill), SWMF #32N03 (formerly Union Carbide Corporation, Carbon Products Division and UCAR Republic Site #932035).

Electronic copies (in an Adobe PDF file) of the cover letter and the PRR are being submitted to you by email only, in accordance with the established procedures and deadline per the State's Reminder Notice dated November 16, 2020.

If you have any questions or need additional information regarding the PRR, please contact me at (440) 724-9418 or <u>julianne.snyder@graftech.com</u>.

Respectfully submitted,

Julianne M. Snyder

Corporate HS&EP Manager

Julianne M. Fnyder

Enclosure



# **2020 PERIODIC REVIEW REPORT**

and

# ANNUAL SITE MANAGEMENT PLAN (SMP) REPORT

for the

# **CLOSED LANDFILL SITE SWMF #32N03**

(Formerly UCAR Carbon Company, Republic Site Registry No. 932035)
(Per the SMP Approved October 29, 2018)

Prepared by:

GrafTech International Holdings Inc. 982 Keynote Circle Brooklyn Heights, OH 44131

**January 29, 2021** 

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Copies of Quarterly Groundwater Well Inspection Reports – 2020

#### 1. Introduction

This Periodic Review Report (PRR) is being submitted for the GrafTech International Holdings Inc. (GrafTech) (formerly UCAR Carbon Company Inc.) closed landfill facility, SWMF #32N03 (Registry No. 932035) ("Landfill" or "Site"), under the provisions of the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER) Inactive Hazardous Waste Site Program. The Landfill is located in the Town of Niagara, Niagara County, State of New York, on Parcel Number 130.20-1.1. The Site is located off Hyde Boulevard behind the former UCAR Carbon Republic Plant. The Site is comprised of a 16.48 acres capped landfill on 61.60 acres of undeveloped land.

The 16.48-acre landfill was closed in accordance with a NYSDEC-approved closure plan under Part 360 Solid Waste Management Facility (SWMF) Guidelines, which included the installation of an engineered cap, completed in June 1987. A Preliminary Site Assessment (PSA) report was issued in April of 1995. The assessment involved the entire property in order to effectively characterize the Landfill and any on-site or off-site contaminant migration. Based on the results of the PSA, the state made a "no significant threat" determination and reclassified the Landfill in 1997 from Class 2a to a Class 4 Inactive Hazardous Waste Site. There have been no required remedial programs or remedial objectives established for this Site. GrafTech has continued to monitor the groundwater quality and implement the established institutional/engineered controls (IC/EC) at the Site, discussed in more detail in Sections 2.0 and 3.1, for over 30 years.

Prior to May 2016, this Site was being managed under the state programs of both the DER and the Division of Materials Management (DMM). On May 25, 2016, NYSDEC communicated to GrafTech that, going forward, the Site would be managed solely by the DER, thereby eliminating some prior reporting and oversight redundancies.

GrafTech voluntarily submitted a proposed Site Management Plan (SMP) to NYSDEC Region 9 on December 17, 2013, to bring the Plan in line with the state's Technical Guidance for Site Investigation and Remediation, DER 10. The more comprehensive SMP incorporated and replaced the prior Operation, Maintenance and Monitoring (OM&M) Plan, which the state had previously approved on November 4, 2009. NYSDEC issued a letter on November 17, 2016, approving GrafTech's proposed December 2013 SMP; the only change being that GrafTech would no longer be required to submit a separate annual groundwater monitoring report to the DMM.

The PRR for Reporting Year 2017 submitted in January 2018 included a request to downsize the groundwater monitoring plan and reduce the number of parameters that would be analyzed. NYSDEC issued the Site Management (SM) Periodic Review Report (PRR) Response Letter dated February 8, 2018, which approved GrafTech's proposal for a modified sampling program to only include sampling of monitoring wells BW-3, GW-8B and BW-4 with analysis of only volatile organic compounds (VOCs). Based on approval of the modified sampling program, GrafTech submitted a revised SMP dated October 23, 2018, to include the updated monitoring program requirements and to bring the SMP in line with the NYSDEC recommended SMP format. NYSDEC subsequently issued a letter dated October 29, 2018 accepting GrafTech's revised SMP.

The NYSDEC-approved SMP specifies the routine site inspection, maintenance and groundwater monitoring programs, and outlines the reporting and record retention requirements for the Site. In addition, the SMP describes provisions for an approved Excavation Plan to manage potentially contaminated soils at the Site in the event that GrafTech has future plans to excavate soil from any areas outside the footprint of the Landfill.

The purpose of this PRR is to document GrafTech's implementation and conformance with the post closure care procedures and Institutional Controls (IC)/Engineering Controls (EC) outlined in the SMP. This PRR covers the period of January 1, 2020 through December 31, 2020. It should be noted that, in past agreement with Mr. Michael Hinton, NYSDEC, DER, Region 9, the annual SMP compliance report for this Site is incorporated in this annual PRR to eliminate unnecessary redundancy.

For the report period specified above, GrafTech has designated the GrafTech Corporate Health, Safety and Environmental Protection (HS&EP) Manager, to be responsible for managing the Site. This position is currently filled by Ms. Julianne Snyder, who is located at the GrafTech Corporate Headquarters, 982 Keynote Circle, Brooklyn Heights, Ohio 44131. In addition, GrafTech has also contracted the services of National Maintenance Contracting Corporation (NMCC), a local general maintenance contractor, to act as the local point of-contact for the Site. NMCC is responsible for managing the routine operations at the Landfill, including site security; conducting the routine site inspections according to the schedule and protocols established in the SMP; completing or arranging for any needed maintenance and/or repairs at the Site; escorting approved visitors at the Site such as environmental contractors commissioned by GrafTech; responding to neighborhood requests, etc. All NMCC activities are supervised by Ms. Snyder.

NMCC is also responsible for communicating to Ms. Snyder whenever a significant event took place that could have possibly prevented full conformance with the SMP, or for any other important matters concerning the Landfill outside the scope of this Plan.

Ms. Snyder has been granted the authority by GrafTech to requisition the necessary resources so that appropriate corrective actions can then be promptly implemented to adequately address any identified deficiency and ensure full conformance with the provisions of the SMP.

#### 2. Institutional Controls and Engineering Controls (IC/EC)

There is no required Remedial Program or remedial objectives for this Site.

#### 2.1. Engineering Controls (EC)

The EC in place at the Landfill include a physical barrier installed in 1987, which is an engineered cap to contain and eliminate potential exposure pathways to the contaminants in the waste disposal area, and a groundwater monitoring well network. Another EC employed at the Site is a security system designed to prevent unauthorized access, which consists of an eight (8) foot high metal hurricane-style perimeter fence and two (2) locked gates. In addition, the casings on the groundwater monitoring wells are equipped with locking devices and padlocks to prevent unauthorized access and potential contamination to groundwater. These engineering controls were routinely inspected and repaired/replaced, as needed, to ensure that unauthorized access was restricted. The padlocks were kept locked except when drawing groundwater samples or when performing internal inspections of the monitoring wells.

As detailed in the Final Landfill Closure report<sup>1</sup>, the engineered cap is a low-permeability cap installed over the entire 16.48-acre Site, except for the wooded areas. The final cover consists of a 6-inch thick topsoil layer with vegetative cover (grass) overlying a 3-inch thick sand/gravel layer (drainage layer) overlying an 18-inch thick clay layer. The clay was placed and compacted to a hydraulic conductivity of less than  $1 \times 10^{-7}$  cm/sec. At the edge of the waste disposal area, the clay cover was keyed approximately two feet into the existing native fine-grained soils or to the top of bedrock, whichever was encountered first. The drainage layer was spread over the entire clay cap to laterally drain precipitation and reduce infiltration. The sand used for the drainage layer was obtained from Niagara Stone No. 1B. Geotechnical testing completed on this sand during source selection yielded a maximum hydraulic conductivity of  $2.68 \times 10^{-2}$  cm/sec. The topsoil layer was placed on top of the drainage layer and was seeded with a persistent vegetative species that was selected to effectively minimize erosion. The vegetative cover has a shallow root system which should not penetrate beyond the lateral drainage layer. The topsoil is a fertile loamy material obtained from an abandoned cornfield at Shevlin-Manning's mining operation.

The surface slope of the final cover was designed at 3 percent slope. The final slope varies slightly across the cover in order to accommodate the total amount of fill, but does not

<sup>&</sup>lt;sup>1</sup> Final Landfill Closure, Solid Waste Management Facility, Union Carbide Corporation, Republic Plant, Town of Niagara, New York, prepared by Conestoga-Rovers & Associates for Union Carbide Corporation, dated September 1987.

exceed 5 percent and is not less than 2 percent. Side slopes around the landfill portions of the Site are at a 3:1 slope (33 percent) or less.

The western area of the SWMF was never used for waste disposal, but was covered with a thin layer of carbonaceous material. This area was regraded and capped at a 2 percent slope with final contour elevations matching existing ground elevations around the perimeter of the Site. In order to accomplish this, the thickness of the clay, drainage, and topsoil layers was reduced over the last 100 feet to a total thickness of approximately 1.5 feet toward the edge of the Site. Surface water at the Site is allowed to follow natural drainage paths, given the slopes and runoff characteristics of the Site, engineered cap, and surrounding area. This decision was made at the time of closure and is further described in the closure report. There are no additional erosion/drainage controls in place at the Site.

#### 2.2. Institutional Controls (IC)

The IC at this Site is the implementation of the SMP, including the Operation and Monitoring Plan discussed below, which specifies the groundwater monitoring program; the routine facility inspections for the engineered cap and the security features of the Site; maintenance of the Site; and the recordkeeping and reporting requirements. These inspection and groundwater monitoring programs were conducted in 2020 in accordance with the state-approved SMP to ensure the EC remained in place, were properly maintained and continued to be effective.

Under the previous and current NYSDEC approved groundwater monitoring program for the Landfill, one (1) sampling event must occur in every calendar year; scheduling of the sample collection must be rotated every year between spring (every odd year) and fall (every even year). Groundwater elevation measurements are also recorded during each annual sampling campaign.

Annual groundwater monitoring for the identified Contaminants of Concern (COCs) was conducted per the rotating schedule established in the SMP, which in this compliance period was a fall sampling campaign for an even numbered year. Further details of the 2020 groundwater monitoring program are provided below in subsection 3.1 – Groundwater Monitoring.

No soil vapor monitoring program is required for the Landfill. In May 2007, Graftech submitted a Soil Intrusion Evaluation Report to the NYSDEC, which concluded that there is no threat to neighboring residential properties, and recommended that no further action regarding vapor studies was warranted. NYSDEC and NYSDOH informed Graftech on December 28, 2008, that they had reviewed the report and agreed that no further action

was needed regarding soil vapor intrusion. No vapor intrusion monitoring program is required at the landfill.

Inspections of the Site were performed and documented weekly and quarterly in accordance with the approved SMP. Further details of the 2020 site inspection programs are provided below in subsection 3.3 – Site Inspections and Records.

#### 3. Operations and Monitoring (O&M) Plan

#### 3.1. Groundwater Monitoring

Overview of the Historical Annual Groundwater Monitoring Program for the Landfill

The Landfill was capped and closed in 1987. The groundwater monitoring well network at the Landfill site currently consists of 11 active on-site wells; three (3) of which are sampled for analysis annually (BW-3, BW-4, and GW-8B) and another eight (8) of which are only subject to hydraulic monitoring requirements (BW-1, BW-2, BW-5, BW-6, GW-9B, MW-1, MW-2, and MW-3). Water levels were collected from all 11 active wells in 2020. In addition, there are seven (7) inactive groundwater wells (WW-1, OW-1, OW-2, GW-7B, GW-8A, GW-9A, and GW-11B), which are included in the Site inspection program only and are not subject to chemical or hydraulic monitoring. However, water levels were collected from inactive bedrock groundwater wells GW-7B and GW-11B in 2020 on a voluntary basis in order to better understand bedrock groundwater flow direction east of the landfill. A table listing the active and inactive monitoring wells and associated monitoring well details is presented as Table 1. Elevations of the top of riser, top of outer casing (where present), and ground surface at each of the 11 active wells and at the two inactive bedrock wells GW-7B and GW-11B were resurveyed on June 1, 2020. Table 1 also lists the full names of these wells, which appear on Site drawings and other documents. The abbreviated well names are used within this document.

The locations of the groundwater monitoring wells are shown on the map of the Landfill included as part of the Site inspection forms (refer to Appendix A) and on the groundwater contour maps provided in Appendix D.

Groundwater monitoring wells GW-10A and GW-10B are located outside the Landfill perimeter security fencing on neighboring property not owned by GrafTech. Following GrafTech's request during a state inspection of the Landfill in May 2010, NYSDEC subsequently reviewed the PSA records and confirmed that NYSDEC had installed and still owns these two (2) wells. Thus, GrafTech is not responsible to secure, maintain or sample these wells and, therefore, they were not covered under the SMP.

The history of the groundwater monitoring program is as follows.

#### <u> 1987 - 2005</u>

Between 1987 and 2000, groundwater monitoring was conducted quarterly. Following their review of the collected groundwater quality data, the NYSDEC DER and the Division of Solid and Hazardous Materials approved a modified semiannual sampling program in a letter dated January 18, 2000, in accordance with the requirements of 6

NYCRR Section 360 to monitor the effectiveness of the solid waste landfill closure in protecting groundwater quality. This new monitoring program was implemented from April 2000 to November 2005.

#### 2006 - 2017

Following a subsequent review of the post closure groundwater monitoring program and historical groundwater quality data, the NYSDEC DER and the Division of Solid and Hazardous Materials agreed to a modified annual post-closure groundwater monitoring program, which was first implemented in the fall of 2006.

The groundwater monitoring program remained in effect from 2006 through 2017 and consisted of sampling seven (7) of the 11 active on-site groundwater wells at the Landfill (specifically, bedrock wells BW-1, BW-2, BW-3, BW-4, GW-8B, GW-9B and the overburden monitoring well MW-3). The collected representative samples were analyzed for VOCs, Total and Dissolved Iron, Potassium and Zinc, Ammonia, Nitrite, and Total Kjeldahl Nitrogen (TKN) following EPA methodologies. Standard field measurements to assess well stabilization for sampling were also collected. Water level readings were taken on all of the active monitoring wells.

#### 2018 - Current

Based on a review of the Site's historical groundwater data through 2017 showing that concentrations remained relatively consistent, in the PRR for Reporting Year 2017, GrafTech proposed that the groundwater monitoring program be downsized from seven (7) wells to three (3) wells and that the COCs be reduced so that representative samples are tested for only VOCs, Total and Dissolved Iron, and Ammonia; thus, Potassium, Zinc, Nitrite and TKN would be dropped from the parameter list. In the SM PRR Response Letter dated February 8, 2018, NYSDEC accepted GrafTech's proposal for a reduced monitoring program. Beginning in the fall of 2018 and moving forward, only three (3) bedrock wells would require to be sampled (BW-3, GW-8B, and BW-4), and samples would only be analyzed for VOCs.

Summary of the 2020 Groundwater Sampling Campaign, Reports and Results

The annual groundwater sampling campaign was conducted by GHD on September 16, 2020. GHD's 2020 Annual Groundwater Monitoring Letter, dated October 30, 2020, is included as Appendix D. Samples collected from bedrock wells BW-3, BW-4, and GW-8B were submitted to Test America for analysis of VOCs. Analytical test results were compared to the New York State Class GA Groundwater Standards and Guidance Values ("criteria") and to the results of the historical monitoring data for the Landfill for analytes

of interest. The full analytical results for September 2020 are included in Appendix D and in Table 2 of this PRR. Table 2 identifies all analytes that were detected at concentrations above the criteria during the sampling event. Analytes that were detected above criteria during this monitoring event are also discussed below.

Water levels were collected from the three active overburden wells (MW-1, MW-2, and MW-3) and eight active bedrock wells (BW-1 through BW-6, GW-8B, and GW-9B) to document groundwater flow conditions in the overburden and bedrock at the time of the sampling event and to assist in evaluating the analytical results from the bedrock wells sampled. In addition, water levels were collected from inactive bedrock groundwater wells GW-7B and GW-11B on a voluntary basis in order to better understand bedrock groundwater flow direction east of the landfill. Based on the water level data collected, groundwater was flowing in a general southeasterly direction in the overburden and, in general, in an east-southeasterly direction across the landfill in the bedrock during the monitoring event with mounding and radial flow present at BW-6 on the western portion of the Site. This is generally consistent with groundwater flow directions observed during previous monitoring events.

Table 3 presents the current and historical concentration data for BW-3, BW-4, and GW-8B for tetrachloroethylene (PCE), trichloroethylene (TCE), cis-1,2-dichloroethylene (cis-1,2-DCE), and vinyl chloride. Although other VOCs have been detected in these wells, they have only been detected intermittently and at levels below or only slightly above criteria. The four above-listed VOCs have collectively been detected consistently and at elevated concentrations among these three bedrock wells, and as such their concentrations have been monitored through time. Figures 1 through 3 present the historical concentration data for these four VOCs, from March 2000 to the present. For BW-4, the average concentrations of the parent and duplicate samples were used for plotting.

The following is a brief discussion of the 2020 sampling results relative to historical concentrations for these four VOCs in the three bedrock wells sampled.

## BW-3 (Figure 1)

• Vinyl Chloride: Vinyl chloride was detected at a concentration of 4.9 micrograms per liter (μg/L) in September 2020, which was above the criteria of 2 μg/L. This concentration was similar to the previous vinyl chloride concentration of 5.1 μg/L detected in May 2019. Concentrations of vinyl chloride have either been non-detect or below 9 μg/L since September 2001 and appear to have historically shown seasonal variations with higher concentrations observed during the fall sampling events. Concentrations of vinyl chloride have been decreasing overall since September 2008.

- Cis-1,2-DCE: Cis-1,2-DCE was non-detect in September 2020 and has not been detected at concentrations at or above the criteria of 5 μg/L from March 2000 to the present.
- **PCE and TCE:** PCE and TCE were non-detect in September 2020 and have been non-detect since March 2000. As such, they are not shown on Figure 1.

#### BW-4 (Figure 2)

- Cis-1,2-DCE: Cis-1,2-DCE was detected at a concentration of 2,300 μg/L (1,900 μg/L in the duplicate) in September 2020, which was above the criteria of 5 μg/L. Concentrations of cis-1,2-DCE have been above criteria since March 2000. Concentrations have been gradually increasing overall since March 2000, with relatively large increases observed from September 2010 to October 2014 and from May 2019 to September 2020. The large increase in concentration observed from September 2010 to October 2014 was followed by a large decrease in concentration from October 2014 to September 2016, at which time concentrations returned to the roughly linear concentration trend that has been observed since March 2000. Future monitoring events will aid in determining if the increased concentration detected in September 2020 is part of an increasing trend or an additional fluctuation in the overall pattern of gradually increasing concentrations.
- PCE: PCE was detected at a concentration of 1,600 μg/L (1,200 μg/L in the duplicate) in September 2020, which was above the criteria of 5 μg/L. Concentrations of PCE have been above criteria since March 2000 and were relatively stable from March 2000 to May 2013. Concentrations were higher from October 2014 through May 2019 relative to the previous concentrations, but appeared to have been relatively stable overall. Future monitoring events will aid in determining if the increased concentration detected in September 2020 is part of an increasing trend or a fluctuation in the apparent stable trend that had been observed since October 2014.
- TCE: TCE was detected at a concentration of 1,200 μg/L (930 μg/L in the duplicate) in September 2020, which was above the criteria of 5 μg/L. Concentrations of TCE have been above criteria since March 2000 and increased from March 2009 to October 2014. Concentrations had been decreasing from October 2014 through May 2019. Future monitoring events will aid in determining if the increased concentration detected in September 2020 is part of an increasing trend or a fluctuation in the recent decreasing trend.
- Vinyl Chloride: Vinyl chloride was detected at a concentration of 480 μg/L (410 μg/Lin the duplicate) in September 2020, which was above the criteria of 2 μg/L. Concentrations of vinyl chloride have been above criteria since March 2000 and

gradually increased from March 2000 to October 2014. Concentrations appeared to have stabilized from October 2014 through May 2019. Future monitoring events will aid in determining if the increased concentration detected in September 2020 is part of an increasing trend or a fluctuation in the apparent stable trend that had been observed since October 2014.

• Other Analytes: Chloroform was detected at an estimated concentration of 29 µg/L (22 µg/L in the duplicate) in BW-4 during the September 2020 monitoring event, which was above criteria. Concentrations of chloroform have been increasing in this well since 2017. As the concentrations are not significantly above criteria, the concentrations will continue to be monitored, and chloroform will be added to the trends analysis for this well if the concentration increases are observed to be sustained.

#### GW-8B (Figure 3)

- Cis-1,2-DCE: Cis-1,2-DCE was detected at a concentration of 22 μg/L in September 2020, which was above the criteria of 5 μg/L. Concentrations of cis-1,2-DCE have been above criteria since March 2000, with the exception of a non-detect in September 2003, but appear to have remained stable since that time. Concentrations observed since September 2012 appear to be part of an overall decreasing or stable trend.
- Vinyl Chloride: Vinyl chloride was detected at a concentration of 6.0 μg/L in September 2020, which was above the criteria of 2 μg/L. Vinyl chloride was non-detect from March 2000 to March 2005 and has been detected at concentrations slightly above criteria since September 2006, with the exception of a non-detect in March 2007 and concentrations in May 2015 and May 2017 that were slightly below criteria. Concentrations appear to have remained stable since September 2006.
- TCE: TCE was detected at a concentration of 3.6 μg/L in September 2020, which was below the criteria of 5 μg/L. Concentrations have been decreasing since May 2015.
- PCE: PCE was non-detect in September 2020 and has been non-detect since March 2000. As such, PCE is not shown on Figure 3.

Concentrations of VOCs detected in the three (3) bedrock wells sampled were generally consistent with the concentrations detected during the May 2019 sampling event. The current and historical data has shown that concentrations of VOCs in well BW-3 remain low, with only vinyl chloride present at concentrations slightly above criteria. This well was hydraulically downgradient of the landfill during the September 2020 monitoring event, but has been shown to be hydraulically upgradient of the landfill during some previous monitoring events. These shifts in gradient direction may be due to seasonality,

as monitoring events have alternated between spring and fall. Concentrations of VOCs in GW-8B, which is hydraulically downgradient of the landfill (as observed during previous monitoring events), also remain low and have either stabilized or are decreasing. Due to the unusual mounding and radial flow observed proximate to BW-6 during the September 2020 monitoring event, the hydraulic position of GW-8B relative to the landfill was not readily apparent during this event, though has been consistently downgradient during previous events. As such, **no discernable negative trend in groundwater quality was observed for the Site.** Concentrations of VOCs in BW-4, which is hydraulically upgradient of the landfill based on the current and historical gauging events, remain elevated and are 2 to 3 orders of magnitude higher than VOC concentrations in the other bedrock monitoring wells. This strongly suggests an off-Site source.

#### Discussion of BW-4

The analytical results from the annual groundwater monitoring events have remained relatively stable since 2010, with the exception of the bedrock aquifer upgradient well BW-4. During the October 2014 sampling event, notable increases in concentration were observed in well BW-4 for the four (4) VOCs of interest - PCE, TCE, vinyl chloride, and cis-1,2-DCE. During the subsequent sampling events, these concentrations all decreased from the 2014 levels, and, by the May 2017 sampling event, all had generally returned to pre-2014 levels or similar except for PCE. However, the concentrations of these VOCs still remain well above criteria in this upgradient well, consistent with prior years.

In addition, concentrations of PCE, TCE, vinyl chloride, and cis-1,2-DCE have shown long-term, gradually increasing trends in BW-4 since March 2000. The reason for these long-term gradual increases is not known. Relatively large increases in concentration were observed from May 2019 to September 2020. Future monitoring events will aid in determining if the increased concentrations detected in September 2020 are part of a new, sharper increasing trend, or if they are fluctuations in the overall pattern of gradually increasing concentrations observed since March 2000. This well is hydraulically upgradient of the landfill, and does not represent groundwater quality at the Site.

A voluntary supplemental investigation of the entire groundwater well network at the Site conducted by Conestoga-Rovers & Associates (CRA) in January 2015 did not identify any structural abnormalities of the wells in the network that could account for the increases in VOC concentrations in BW-4. A copy of CRA's well inspection report was submitted as part of the 2014 PRR. BW-4 was redeveloped in fall 2016, the results of which were submitted as part of the 2016 PRR. No further investigations or developments of the monitoring wells have been conducted at the Site since 2016, other than the redevelopment

of bedrock wells BW-1 through BW-6 in April 2019 due to buildup of sediment/debris. It is noteworthy that the VOC exceedances of the applicable state criteria at bedrock monitoring well BW-4, which is upgradient of the landfilled area, continue to be at much higher concentrations (by 2 to 3 orders of magnitude) than the VOC levels at the other bedrock aquifer monitoring wells (refer to Table 3).

Furthermore, the significant increases in VOC concentrations detected at the upgradient bedrock aquifer well BW-4 during the 2014 sampling event were not observed in the other bedrock monitoring wells. Although not currently in the sampling plan, historically these VOCs have not been detected in the downgradient bedrock wells BW-2 and GW-9B. This indicates that contaminant migration has not occurred.

It is also significant that the more notable exceedances of the applicable VOC criteria are in the bedrock groundwater monitoring wells located along the northern border of the Site (BW-4 and GW-8B), which are adjacent to the Niagara Mohawk right-of-way (ROW). BW-4 is hydraulically upgradient of the landfill, and GW-8B is hydraulically downgradient of the landfill (as observed during previous monitoring events). Although GW-8B is hydraulically downgradient of the landfill, the proximity of upgradient well BW-4, with VOC impacts 2 to 3 orders of magnitude greater than in the other bedrock wells, strongly suggests that the VOC concentrations in both of these wells are the result of an off-site source. Nevertheless, as concentrations of VOCs in GW-8B are low and have either stabilized or are decreasing, concentrations in this well do not represent a negative trend in groundwater quality for the Site.

#### 3.2. Soil Vapor Monitoring

No soil vapor monitoring was required or performed during the report year.

#### 3.3. Site Inspections and Records

NYSDEC did not conduct a state inspection of the Landfill in 2020.

Based on a deficiency in the groundwater well inspection program that was identified by NYSDEC during its last Site inspection in May 2013, GrafTech increased the frequency of its inspections of the monitoring wells on a temporary basis between August 2013 through December 2013, by including them in the scheduled weekly inspections. GrafTech also proposed to NYSDEC a formal modification to the Site inspection program to consist of:

- weekly general and security inspections at the Site; and
- quarterly monitoring well inspections (increased from annually).

NYSDEC subsequently approved this proposal. GrafTech implemented the improved inspection program starting in January 2014.

GrafTech incorporated the modified Site inspection protocol and inspection forms into the proposed SMP, which was submitted to the state for approval in December 2013, and subsequently approved by NYSDEC in November 2016. There have been no other deficiencies identified in the approved IC/EC at this Site nor any other recommended improvements to the SMP during the prior or current certification periods.

Routine inspections continued to be performed at the Site in 2020 by the current contracted GrafTech Designated Representative, NMCC, in accordance with the modified protocol specified in the SMP. Further details are provided below.

Routine inspections of the facilities and established controls at the Landfill Site were conducted and the results documented by NMCC (refer to the standard forms for documenting the weekly and quarterly inspections in Appendix A). NMCC was responsible for scheduling and managing the routine maintenance, repairs or any other actions needed to correct any deficiencies identified during these periodic inspections, under the supervision of the GrafTech Representative, currently Julianne Snyder.

Details are provided below of the modified weekly and the quarterly inspection programs, first initiated in 2014.

#### 3.3.1. General Landfill and Site Security Inspections and Records - Weekly

The following areas were inspected once per week and the inspection results documented on the standard inspection form.

- Fence (general condition, evidence of security breaches).
- Gate (general condition, lock, evidence of security breaches).
- Cap (general condition, signs of erosion, adequate vegetation).
- Surrounding area (general condition).

Note: if any evidence of a Site security breach was found during the above inspections, the groundwater well installations were also inspected for potential tampering or damage, and those inspections were documented on the standard quarterly monitoring well inspection form.

Any noted deficiency was identified on the inspection record and the corrective action was documented on the same or a subsequent inspection record when completed. Any fence areas that were found to be damaged were also duly noted on the inspection map.

#### 3.3.2. Groundwater Monitoring Well Inspections and Records - Quarterly

The GrafTech-Designated Representative, currently NMCC, inspected all the active on-site GrafTech-owned groundwater monitoring well installations quarterly to ensure they were kept in good condition and were properly secured with a lock. The inspector recorded his/her name, the date and time of the inspection, the inspection results and any recommended corrective actions on the standard report form.

- Closed locks on the well casing caps.
- Condition of outer well casing.
- Condition of concrete seals.

Documentation of any needed corrective actions were recorded on the same or a subsequent inspection record when completed.

#### 3.4. Routine Maintenance and Repairs

The following maintenance and repair activities were conducted per the SMP:

- Repairs were made as needed by outside contractor(s) to timely correct any
  deficiencies discovered during the routine weekly Site security and quarterly
  monitoring well inspections. These included repairs to the perimeter security
  fencing and the concrete pads at the well installations, as needed.
- Mowing of the vegetative cover on the Landfill cap and the perimeter lawn of the Landfill, and other general care of the Site were scheduled, as needed.
- General clean-up of any debris found along the fence line and inside the Site were performed, as needed, to keep the Landfill and surrounding area clear of any objectionable or unsightly materials.

#### 3.5. Record Retention

All inspection records are being retained for a minimum period of three (3) years. Completed inspection forms are located in Appendices F (weekly inspections) and G (quarterly inspections). Completed inspection forms will be made available for review during scheduled NYSDEC Site inspections, or copies will be made available to the state upon reasonable written request.

## 4. Excavation Plan Status

No excavations were performed during 2020.

# 5. Property Transfer Status

No property transfer activities were completed in 2020.

#### 6. Conclusions and Recommendations

The GrafTech Landfill is a Class 4 Inactive Hazardous Waste Site, with no required Remedial Program or remedial objectives. Site inspections, monitoring and maintenance activities, and reporting requirements were implemented in conformance with the SMP for the Site during the certification period.

The analytical results from the 2020 groundwater monitoring campaign were consistent with the historical data. The groundwater monitoring program for the past 30+ years since closure of the Landfill has identified no negative trends in the groundwater quality associated with the landfill. VOC concentrations in well BW-4, which is upgradient of the landfill, continue to be 2 to 3 orders of magnitude higher than VOC concentrations detected in the other bedrock wells at the Site. This strongly suggests an off-site source.

The engineering controls and associated institutional controls are still in place, are performing properly, remain effective, and continue to be protective of public health and the environment. Based on GrafTech's review, there is no indication that changes to the IC/EC are needed. A copy of the completed and signed IC/EC Certification form is attached in Appendix E.

Due to the following facts:

- 1) this Landfill is a Class 4 Inactive Hazardous Waste Site;
- 2) there is no required Remedial Program or remedial objectives; and
- 3) the monitoring program for the past 33 years since closure of the Site has identified no negative trends in the groundwater quality at downgradient wells;

GrafTech recommends that compliance be maintained with the approved SMP during 2021. Once the spring 2021 groundwater monitoring campaign has been completed, and the data is available from the laboratory and has been validated by GHD, an assessment will be made at that time to determine whether modifications to the established Site management programs are recommended. GrafTech will communicate the results of its assessment to NYSDEC with its recommendations, if any, for proposed changes to the Site Management Plan for this Landfill.

# Table 1 Site Monitoring Well Details

Table 1
Site Monitoring Well Details

Well	Status Well Type Well Diameter (inches) D		Installed Depth (ft. bgs)	Ground Elevation (ft. AMSL)	Top of Riser Elevation (ft. AMSL)	Top of Casing Elevation (ft. AMSL)	Monitored Interval (ft. bgs)	Full Name of Well	
BW-1	Active	Bedrock/Open Hole	4/3	34.5	609.05	608.55	611.66*	19.5 to 34.5	BW1-86
BW-2	Active	Bedrock/Open Hole	4/3	35.0	605.37	606.58	608.40*	19.0 to 35.0	BW2-86
BW-3	Active	Bedrock/Open Hole	4/3	22.4	602.00	603.46	605.02*	7.4 to 22.4	BW3-86
BW-4	Active	Bedrock/Open Hole	4/3	25.0	604.33	605.47	607.13*	11.4 to 25.0	BW4-86
BW-5	Active	Bedrock/Open Hole	4/3	24.9	599.60	600.36	603.27*	10.0 to 24.9	BW5-86
BW-6	Active	Bedrock/Open Hole	4/3	32.9	607.59	607.08	611.11*	17.7 to 32.9	BW6-86
GW-7B	Inactive	Bedrock/Open Hole	3	29.7	599.80	602.49	603.81*	19.4 to 29.7	GW7B-93
GW-8A	Inactive	Overburden	3	17.5	601.50	NA	604.04*	12.4 to 17.4	GW8A-93
GW-8B	Active	Bedrock/Open Hole	3	27.5	601.38	603.30*	603.97	20.7 to 27.5	GW8B-93
GW-9A	Inactive	Overburden	3	20.3	601.50	NA	603.29*	15.3 to 20.3	GW9A-93
GW-9B	Active	Bedrock/Open Hole	3	29.5	600.55	602.74*	602.99	24.8 to 29.5	GW9B-93
GW-11B	Inactive	Bedrock/Open Hole	3	25.4	599.07	601.40*	601.66	16.0 to 25.4	GW11B-93
MW-1	Active	Overburden	4	18.3	608.55	608.97	611.13*	16.8 to 18.3	MW1-78
MW-2	Active	Overburden	4	20.1	607.04	611.62*	NP	17.5 to 18.0	MW2-78
MW-3	Active	Overburden	2	13.4	599.27	601.80*	602.18	8.0 to 13.0	MW3-79
WW-1	Inactive	Overburden	2	NA	NA	NA	NA	NA	WW1-86
OW-1	Inactive	Overburden	2	NA	NA	NA	NA	NA	OW1-88
OW-2	Inactive	Overburden	2	NA	NA	NA	NA	NA	OW2-88

<sup>\* =</sup> Reference elevation for determining groundwater elevation

NA = Not available

NP = Not present

4/3 = Casing diameter/corehole diameter

ft. bgs = Feet below ground surface

ft. AMSL = Feet above mean sea level

 $Table\ 2$   $Analytical\ Results\ Summary-September\ 2020$ 

Analytical Results Summary September 2020

Table 2

Sample Location: Sample ID:			BW-3 WG-11194450-091620-DT-002	BW-4 WG-11194450-091620-DT-003	BW-4 WG-11194450-091620-DT-004	GW-8B WG-11194450-091620-DT-001
Sample Date:			09/16/2020	09/16/2020	09/16/2020	09/16/2020
Parameters	Units	NYSDEC Class GA Criteria/TOGS			(Duplicate)	
Volatile Organic Compounds						
1,1,1-Trichloroethane	μg/L	5	1.0 U	40 U	40 U	1.0 U
1,1,2,2-Tetrachloroethane	μg/L	5	1.0 U	40 U	40 U	1.0 U
1,1,2-Trichloroethane	μg/L	1	1.0 U	40 U	40 U	1.0 U
1,1-Dichloroethane	μg/L	5	1.0 U	40 U	40 U	1.0 U
1,1-Dichloroethene	μg/L	5	1.0 U	40 U	40 U	1.0 U
1,2-Dichloroethane	μg/L	0.6	1.0 U	40 U	40 U	1.0 U
1,2-Dichloroethene (total)	μg/L		2.0 U	2300	1900	22
1,2-Dichloropropane	μg/L	1	1.0 U	40 U	40 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	μg/L	50	10 U	400 U	400 U	10 U
2-Hexanone	μg/L	50	5.0 U	200 U	200 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	μg/L	_	5.0 U	200 U	200 U	5.0 U
Acetone	μg/L	50	10 U	400 U	400 U	10 U
Benzene	μg/L	1	1.0 U	40 U	40 U	1.0 U
Bromodichloromethane	μg/L	50	1.0 U	40 U	40 U	1.0 U
Bromoform	μg/L	50	1.0 U	40 U	40 U	1.0 U
Bromomethane (Methyl bromide)	μg/L	5	1.0 U	40 U	40 U	1.0 U
Carbon disulfide	μg/L	60	1.0 U	40 U	40 U	1.0 U
Carbon tetrachloride	μg/L	5	1.0 U	40 U	40 U	1.0 U
Chlorobenzene	μg/L	5	1.0 U	40 U	40 U	1.0 U
Chloroethane	μg/L	5	1.0 U	40 U	40 U	1.0 U
Chloroform (Trichloromethane)	μg/L	7	1.0 U	29 J	22 J	1.0 U
Chloromethane (Methyl chloride)	μg/L	5	1.0 U	40 U	40 U	1.0 U
cis-1,2-Dichloroethene	μg/L	5	1.0 U	2300	1900	22
cis-1,3-Dichloropropene	μg/L	0.4	1.0 U	40 U	40 U	1.0 U
Dibromochloromethane	μg/L	50	1.0 U	40 U	40 U	1.0 U
Ethylbenzene	μg/L	5	1.0 U	40 U	40 U	1.0 U
Methylene chloride	μg/L	5	1.0 U	40 U	40 U	1.0 U
Styrene	μg/L	5	1.0 U	40 U	40 U	1.0 U
Tetrachloroethene	μg/L	5	1.0 U	1600	1200	1.0 U
Toluene	μg/L	5	1.0 U	40 U	40 U	1.0 U
trans-1,2-Dichloroethene	μg/L	5	1.0 U	40 U	40 U	1.0 U
trans-1,3-Dichloropropene	μg/L	0.4	1.0 U	40 U	40 U	1.0 U
Trichloroethene	μg/L	5	1.0 U	1200	930	3.6
Vinyl chloride	μg/L	2	4.9	480	410	6.0
Xylenes (total)	μg/L	5	2.0 U	80 U	80 U	2.0 U

Notes:

1600 Indicates exceedance of NYSDEC Class GA Criteria/TOGS

J - Estimated concentration

Class GA Criteria/TOGS - Groundwater Effluent Limitations/Technical and Operational Guidance Series

U - Not detected at the associated reporting limit

UJ - Not detected; associated reporting limit is estimated

Table 3

Summary of Bedrock Well Analytical Results: PCE, TCE, cis-1,2-DCE, and Vinyl Chloride

Table 3 Page 1 of 2

# Summary of Bedrock Well Analytical Results: PCE, TCE, cis-1,2-DCE, and Vinyl Chloride March 2000 - September 2020

Well Number	Parameter	Groundwater Criteria (ppb)	March 2000 (ppb)	Sept. 2001 (ppb)	March 2002 (ppb)	Sept. 2002 (ppb)	March 2003 (ppb)	Sept. 2003 (ppb)	March/April 2004 (ppb)	Sept. 2004 (ppb)	March 2005 (ppb)	Sept. 2006 (ppb)	March 2007 (ppb)
	Cis-1.2-DCE		10U	5U	5U	5U	5U	5U	5U	5U	5U	1.8	5U
	, ,	5				5U							
BW-3	PCE	5	10U	5U	5U	50	5U	5U	5U	5U	5U	5U	5U
DW 0	TCE	5	10U	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
	Vinyl Chloride	2	15	5U	5U	5U	5U	5U	5U	6.1	5U	5.7	5.0U
	Cis-1,2-DCE	5	14	23 (22)	26	27	22	5U	21	20	22	23	20
GW-8B	PCE	5	10U	5U (5U)	5U	5U	5U	5U	5U	5U	5U	5U	5U
GW-0D	TCE	5	10U	7.5 (7.2)	10	10	13	12	8.3	13	6.5	6.9	9.8
	Vinyl Chloride	2	10U	5U (5U)	5U	5U	5U	5U	5U	5U	5U	4.6J	5.0U
	_						-						
	Cis-1,2-DCE	5	180	270	420	300	230 (240)	500	660	370 (390)	540 (530)	620 (620)	710 (640)
BW-4	PCE	5	135	240	64	230	29 (30)	100	110	55 (56)	64 (65)	84 (86)	120 (110)
DVV-4	TCE	5	178	410	230	420	170 (170)	330	230	290 (290)	180 (180)	290 (290)	310 (280)
	Vinyl Chloride	2	115	74	92	59	41 (41)	100	180	75 (79)	180 (180)	140 (140)	170 (150)

Shaded cells indicate the concentrations exceeds the New York State Class GA Groundwater Criteria

Parentheses indicate the results of the duplicate sample

- \* Concentration represents total 1,2-DCE
- \*\* Concentration represents total DCE
- J Concentration is an estimated value
- U Not present at or above the associated value

Table 3 Page 2 of 2

#### Summary of Bedrock Well Analytical Results: PCE, TCE, cis-1,2-DCE, and Vinyl Chloride March 2000 - September 2020

Well Number	Parameter	Groundwater Criteria (ppb)	Sept. 2008 (ppb)	March 2009 (ppb)	Sept. 2010 (ppb)	May 2011 (ppb)	Sept. 2012 (ppb)	May 2013 (ppb)	Oct. 2014 (ppb)	May 2015 (ppb)	Sept. 2016 (ppb)	May 2017 (ppb)	Sept. 2018 (ppb)	May 2019 (ppb)	September 2020 (ppb)
	Cis-1,2-DCE	5	2.2	10U*	2.2J*	0.95J**	2	1.7	0.45	2.8	0.85	0.99	1.0U	1.2	1.0U
DW 0	PCE	5	5U	5U	5U	0.42U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
BW-3	TCE	5	5U	5U	5U	0.30U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
	Vinyl Chloride	2	8.2	5.0U	6.4	0.3U	5.7	6.0	4.1	3.2	3.1	1.0U	2.5	5.1	4.9
	0: 40 005	-	00	22*	I 00*	40**	00	00	1 00	47	0.4	44 (44)	04.0	40	
	Cis-1,2-DCE	5	23	20*	20*	19**	23	20	22	17	24	14 (14)	21.0	18	22
GW-8B	PCE	5	5U	5U	5U	0.42U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
GVV-0D	TCE	5	5.7	7.4	8.8	8.2	7.6	7.2	12	12	9.7	9.2 (9.2)	4.7	8.0	3.6
	Vinyl Chloride	2	4.7J	3.5J	3.5J	2.9J	3.5	3.8	2.7	1.6	3.1	1.7	3.5	2.1	6.0
									_			_			
	Cis-1,2-DCE	5	580 (540)	720*	740*	1000**	1700	1300	2200 (1700)	1300	930J	950	1000 (940)	1000 (1000)	2300 (1900)
BW-4	PCE	5	86 (79)	140J	97	92	120	92	390 (330)	300	240	250	390 (410)	390 (400)	1600 (1200)
DVV-4	TCE	5	320 (300)	220J	300	390	640	510	1300 (980)	790	660J	600	650 (640)	510 (540)	1200 (930)
	Vinyl Chloride	2	100 (100)	160J	170	190	290	240	350 (270)	270	180	240	150 (180)	230 (270)	480 (410)

Shaded cells indicate the concentrations exceeds the New York State Class GA Groundwater Criteria

Parentheses indicate the results of the duplicate sample

\* - Concentration represents total 1,2-DCE

\*\* - Concentration represents total DCE

J - Concentration is an estimated value

U - Not present at or above the associated value

# Figures

Figure 1 Historical Data Graph Well BW-3

#### Former Republic Landfill

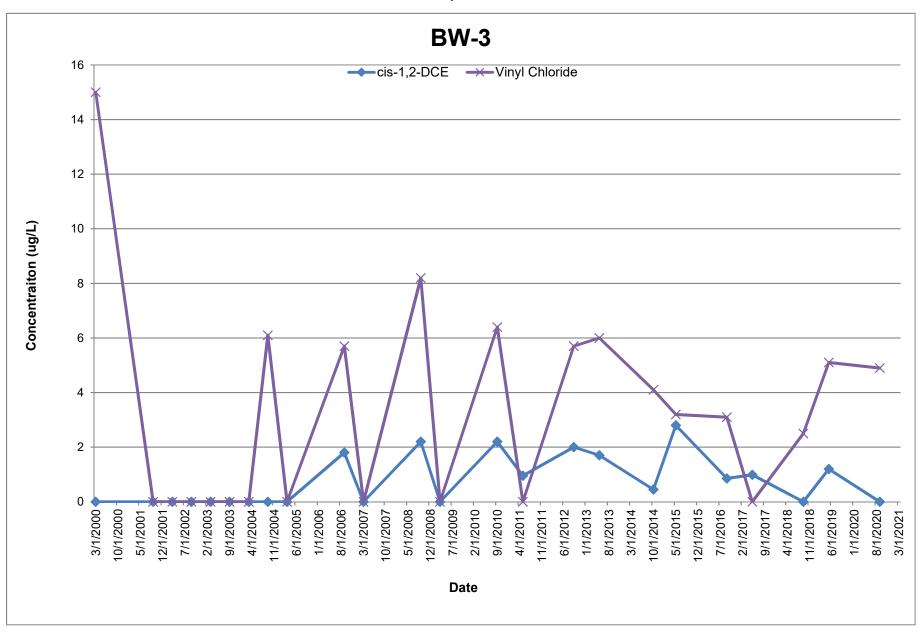


Figure 2 Historical Data Graph Well BW-4

#### Former Republic Landfill

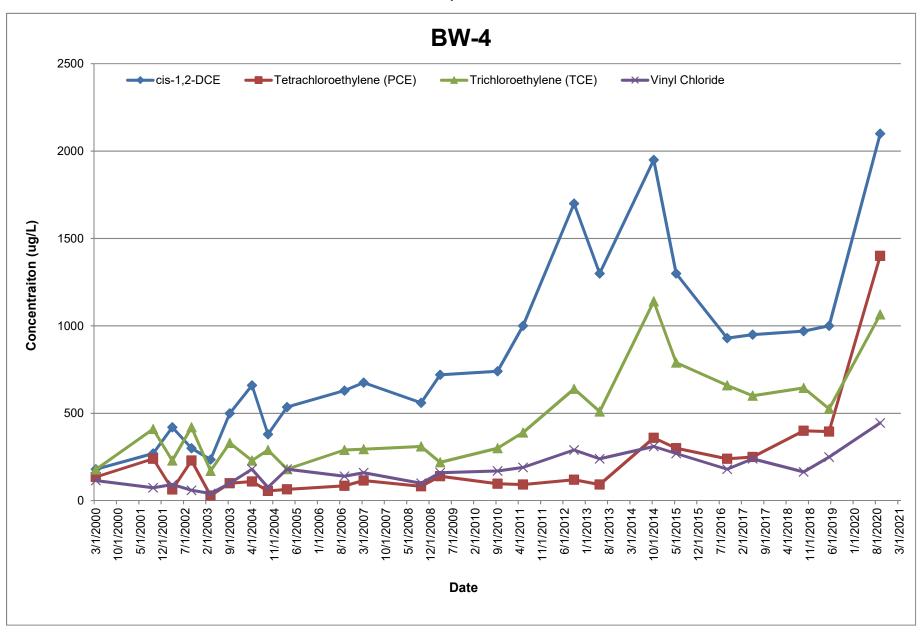
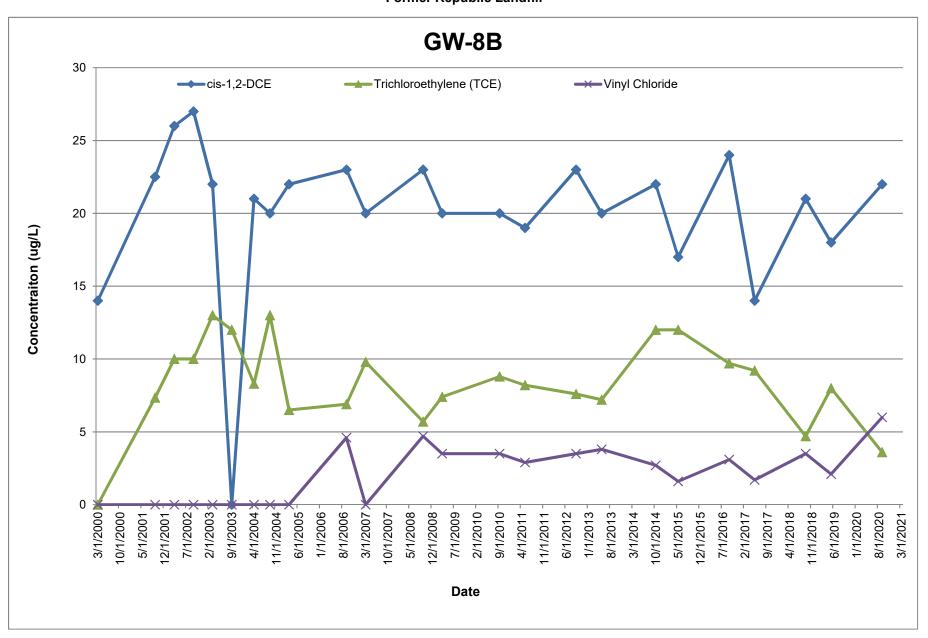


Figure 3 Historical Data Graph Well GW-8B

#### Former Republic Landfill



# Appendix A

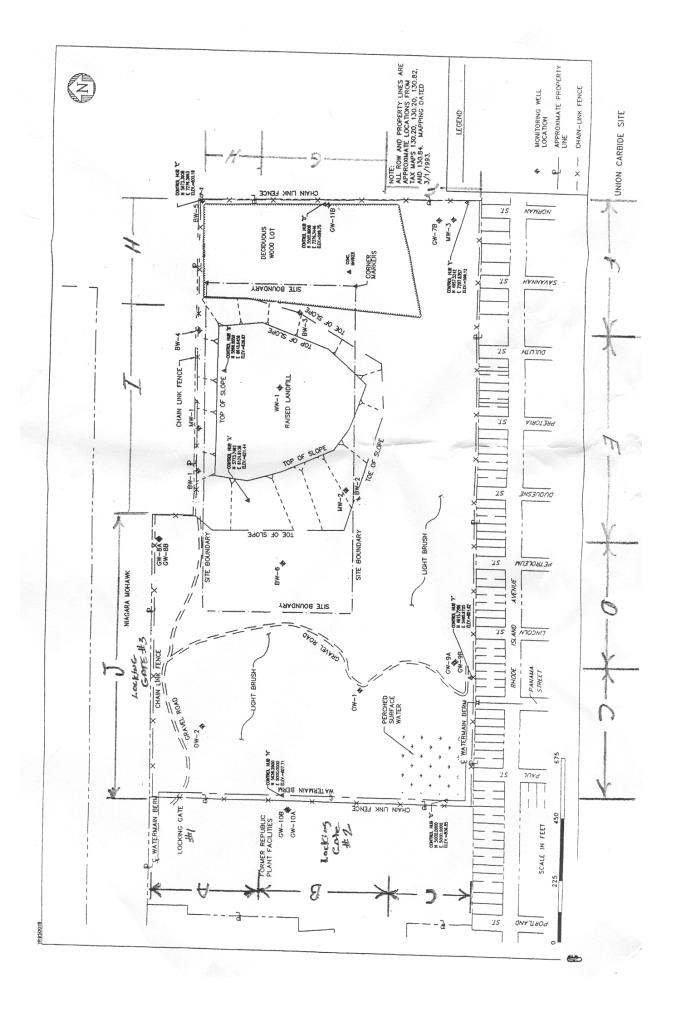
Weekly General Landfill and Site Security Inspection Report Form Quarterly Groundwater Well Inspection Report Form



## WEEKLY GENERAL LANDFILL AND SITE SECURITY INSPECTION REPORT

	DAT	E	TI	ME	INSPECTOR NAME						
FENCE AREA	ОК	DAMAGED	REPAIR DATE		REMARKS						
Α											
В											
С											
D											
E											
F											
G											
Н											
ı											
J											
			T								
GATE	OK	DAMAGED	REPAIR DATE		REMARKS						
1											
2											
3											
	SECURITY-RELATED ENGINEERED CONTROLS COMMENTS: (Check for condition, damage, signs of security breach)										
CAP COMMENTS: (Check for erosion and adequate vegetation)											
SURROUNDING AREA COMMENTS: (Check for condition, damage, signs of security breach)											
	RECORD THE DATE(S) THAT THE ENTIRE CAP WAS MOWED:										
IN THE EVEN	T THAT	<b>ANY SIGN OF</b>	A SITE SECURIT	Y BREACH IS IDE	NTIFIED DURING THE ABOVE SI						

IN THE EVENT THAT ANY SIGN OF A SITE SECURITY BREACH IS IDENTIFIED DURING THE ABOVE SITE INSPECTIONS, COMPLETE A FULL GROUNDWATER MONITORING WELL INSPECTION AND DOCUMENT RESULTS USING THE QUARTERLY GROUNDWATER WELL INSPECTION REPORT FORM (APPENDIX B) AND ATTACH TO THIS FORM.





#### **QUARTERLY GROUNDWATER WELL INSPECTION REPORT**

#### **GRAFTECH WELLS**

WELL I.D. NUMBER	WELL I.D. TAG INTACT (YES/NO)	LOCK CONDITION	OUTER CASING CONDITION	CONCRETE SEAL CONDITION	COMMENTS
MW1-78					
MW2-78					
MW3-79					
BW1-86					
BW2-86					
BW3-86					
BW4-86					
BW5-86					
BW6-86					
WW1-86					
OW1-88					
OW2-88					

#### **ON-SITE WELLS INSTALLED BY NYSDEC**

(Installed Sept./Oct. 93)

WELL I.D. NUMBER	WELL I.D. TAG INTACT (YES/NO)	LOCK CONDITION	OUTER CASING CONDITION	CONCRETE SEAL CONDITION	COMMENTS
GW7B-93					
GW8A-93					
GW8B-93					
GW9A-93					
GW9B-93					
GW11B-93					

#### Note:

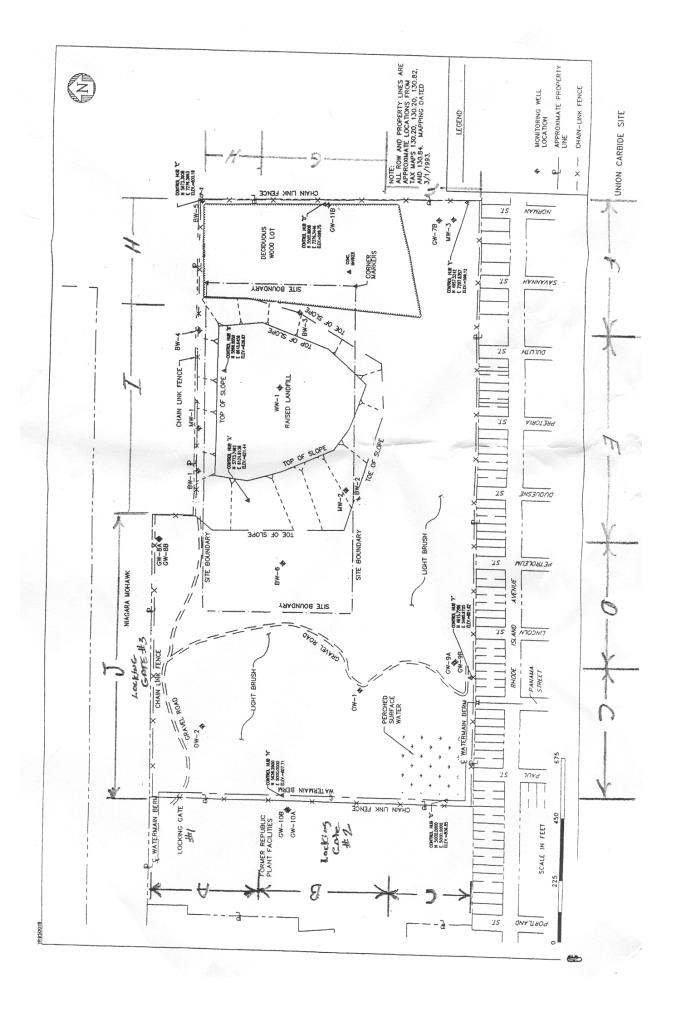
MW wells are installed in the overburden.

BW wells are bedrock wells.

GWA wells are installed in the overburden.

GWB wells are bedrock wells.

OW and WW wells are overburden wells installed with the screen above the till layer.



### Appendix B

Letter from NYSDEC, DER - Region 9, to GrafTech, dated July 9, 2020 (SM PRR Response Letter)

#### NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 9 270 Michigan Avenue, Buffalo, NY 14203-2915 P: (716) 851-7220 | F: (716) 851-7226 www.dec.ny.gov

July 9, 2020

Ms. Julianne Snyder Corporate Health, Safety and Environmental Manager GrafTech International Holdings Inc. 982 Keynote Circle Brooklyn Heights, OH 44131

Dear Ms. Snyder,

GrafTech International Holdings Inc. Site No. 932035 Niagara (T), Niagara County 2019 Periodic Review Report

The New York State Department of Environmental Conservation (Department) has reviewed the revised 2019 Periodic Review Report and Annual Site Management Plan Report (PRR) (June 2020) for the above referenced site, submitted by GrafTech International Holdings Inc. The revised PRR has addressed the Department's previous comments. The Department hereby accepts the PRR and associated Certification. The frequency of Periodic Reviews for this site is 1 year(s), your next PRR is due on February 1, 2021. You will receive a reminder letter and updated certification form 75-days prior to the due date. Regardless of receipt or not, of the reminder notice, the next PRR including the signed certification form, is still due on the date specified above.

Should you have any questions or would like to discuss the matter in further detail, feel free to contact me at <a href="mailto:andrew.zwack@dec.ny.gov">andrew.zwack@dec.ny.gov</a> or (716) 851-7220.

Sincerely,

Assistant Engineer Andrew Zwack

ec: Stanley Radon – NYSDEC, Region 9



### Appendix C

Letter from NYSDEC, DER - Region 9, to GrafTech, dated October 29, 2018 (Site Management Plan)

#### NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 9 270 Michigan Avenue, Buffalo, NY 14203-2915 P: (716) 851-7220 | F: (716) 851-7226 www.dec.ny.gov

October 29, 2018

GrafTech International Holdings, Inc. Juanita M. Bursley 982 Keynote Circle Brooklyn Heights, OH 44131

Dear Ms. Bursley:

Site Management Plan GrafTech International Holdings Inc. Niagara (T), Niagara County DER Site No.: 932035

The Department completed its review of GrafTech's Site Management Plan submitted on October 23, 2018. This correspondence provides formal transmittal that the Site Management Plan is accepted.

Sincerely,

Brian

Digitally agreed by Brian Sadowski, e-DEC,

Sadowski

Project Manager

Digitally agreed by Brian Sadowski, e-DEC,

Sadowski

Project Manager

ec: Stan Radon, NYSDEC, Buffalo Glenn May, NYSDEC, Buffalo



### Appendix D

GHD Letter to GrafTech, Reference No. 11194450, 2020 Annual Groundwater Monitoring Results Summary Letter



October 30, 2020 Reference No. 11194450

Ms. Julianne Snyder HSEP Manager GrafTech International Holdings Inc. 982 Keynote Circle Brooklyn Heights, OH 44131

Dear Ms. Snyder:

Re: 2020 Annual Groundwater Monitoring Results Summary Letter Former Republic Landfill, Niagara Falls, New York

GHD is presenting this 2020 Annual Groundwater Monitoring Results Summary Letter documenting the results of the annual groundwater monitoring event completed on September 16, 2020 at the Former Republic Landfill in Niagara Falls, New York (New York State Department of Environmental Conservation [NYSDEC] Site No. 932035). The monitoring event was conducted in accordance with the Field Sampling Plan (FSP) Post-Closure Monitoring Program for UCAR Carbon Solid Waste Management Unit (SWMU) No. 32NO3, prepared by Conestoga-Rovers & Associates (CRA), dated July 2000. This letter presents a summary of the completed Scope of Work and results of the annual monitoring event.

#### 1. Scope of Work

The Scope of Work for the monitoring event consisted of the following tasks:

- Measurement of groundwater depths (hydraulic monitoring) at ten bedrock wells (BW-1 through BW-6, GW-7B, GW-9B, and GW-11B) and three overburden wells (MW-1 through MW-3).
- Purging and collection of groundwater samples and quality assurance samples from bedrock wells BW-3, BW-4, and GW-8B for analysis of Target Compound List (TCL) volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method SW-846 8260C.
- Preparation of a groundwater monitoring letter report documenting the monitoring activities.

The results of the monitoring event are summarized below. The field notes for the monitoring event are located in Attachment A.

#### 2. Hydraulic Monitoring

Prior to sampling, GHD measured static water levels and well depths in bedrock wells BW-1 through BW-6, GW-7B, GW-8B, GW-9B, and GW-11B and in overburden wells MW-1 through MW-3 using an electronic water level tape. Measurements were collected from the top of the well's reference point (either top of casing or top of riser, depending on the well) and were completed to the nearest 0.01 foot.





Table 2.1 below presents the collected depth to water measurements and calculated groundwater elevations. Table 2.2 below presents the sounded well depths. Wells BW-1 through BW-6 were last redeveloped on April 24 and 25, 2019. The sounded well depths following the April 2019 redevelopment, as well as the reported installed well depths, are shown for comparison.

Table 2.1 Water Levels and Groundwater Elevations – September 16, 2020

Well ID	Well Type	Reference Point Elevation (ft. AMSL)	Depth to Water (ft. BTOR <sub>f</sub> )	Groundwater Elevation (ft. AMSL)
MW-1	Overburden	611.13 (TOC)	12.09	599.04
MW-2	Overburden	611.62 (TOR)	11.03	600.59
MW-3	Overburden	601.80 (TOR)	14.28	587.52
BW-1	Bedrock	611.66 (TOC)	18.79	592.87
BW-2	Bedrock	608.40 (TOC)	16.02	592.38
BW-3	Bedrock	605.02 (TOC)	15.62	589.40
BW-4	Bedrock	607.13 (TOC)	15.33	591.80
BW-5	Bedrock	603.27 (TOC)	13.69	589.58
BW-6	Bedrock	611.11 (TOC)	14.23	596.88
GW-7B	Bedrock	603.81 (TOC)	15.03	588.78
GW-8B	Bedrock	603.30 (TOR)	11.70	591.60
GW-9B	Bedrock	602.74 (TOR)	15.61	587.13
GW-11B	Bedrock	601.40 (TOR)	12.47	588.93
Notes:				
ft. AMSL	- Feet above me	ean sea level		
ft. BTOR <sub>f</sub>	- Feet below top	of reference point		
TOC	- Top of casing			
TOR	- Top of riser			



Table 2.2 Sounded Well Depths - September 16, 2020

Well ID	Well Type	Sounded Depth (ft. BTOR <sub>f</sub> )	Sounded Depth after April 2019 Redevelopment (ft. BTOR <sub>f</sub> )	Installed Depth (ft. BTOR <sub>f</sub> )
MW-1	Overburden	23.40	NA	20.88
MW-2	Overburden	24.70	NA	24.68
MW-3	Overburden	15.30	NA	15.93
BW-1	Bedrock	29.00	29.00	37.11
BW-2	Bedrock	26.80	27.63	38.03
BW-3	Bedrock	25.10	25.00	25.42
BW-4	Bedrock	27.11	27.10	27.80
BW-5	Bedrock	28.72	28.75	28.57
BW-6	Bedrock	25.70	30.40	36.42
GW-7B	Bedrock	33.91	NA	33.71
GW-8B	Bedrock	29.20	NA	29.42
GW-9B	Bedrock	32.05	NA	31.69
GW-11B	Bedrock	28.25	NA	27.73
Notes:				
ft. BTOR <sub>f</sub>	- Feet below top o	f reference point		
NA	- Not applicable			

Figures 2.1 and 2.2 present potentiometric surface maps for the observed groundwater elevations in the overburden and bedrock, respectively. Based on the maps, groundwater was flowing in a general southeasterly direction in the overburden and, in general, in an east-southeasterly direction across the landfill in the bedrock during the monitoring event with mounding and radial flow present at BW-6 on the western portion of the Site. These groundwater flow directions are generally consistent with groundwater flow directions observed during previous monitoring events.

#### 3. Groundwater Quality Monitoring

#### 3.1 Sample Collection

Following measurement of static water levels, GHD purged and sampled wells BW-3, BW-4, and GW-8B using a Masterflex® peristaltic pump with ¼-inch diameter Teflon tubing following USEPA low-flow sampling procedures. During the purging activities, field parameters (temperature, pH, specific conductivity, dissolved oxygen, oxidation-reduction potential, and turbidity) were measured in approximate 5-minute intervals. Attachment B presents the field parameters collected during the well purging. In accordance with the FSP, purge waters were discharged to the ground surface following the sampling event.



Following completion of purging, GHD collected groundwater samples from BW-3, BW-4, and GW-8B for analysis of TCL VOCs via USEPA Method SW-846 8260C. One field duplicate sample was collected from BW-4 and a matrix spike/matrix spike duplicate (MS/MSD) sample set was collected from BW-3. A trip blank prepared by the laboratory accompanied the sample bottles at all times and was also analyzed for VOCs. The samples were submitted on ice under standard chain of custody procedures to Eurofins TestAmerica Laboratories, Inc. in Amherst, New York, a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory.

#### 3.2 Analytical Results

The laboratory analytical data report for the groundwater samples submitted for analysis is included as Attachment C. Table 3.1 presents the analytical results. According to the laboratory report, the following analytes were detected at concentrations above the NYSDEC Class GA Standards and Guidance Values ("criteria"):

- BW-3: Vinyl chloride (VC)
- BW-4: Chloroform, cis-1,2-dichloroethylene (cis-1,2-DCE), tetrachloroethylene (PCE), trichloroethylene (TCE), and VC
- GW-8B: VC and cis-1,2-DCE

A GHD chemist completed a reduced data validation on the laboratory analytical data package from the sampling event. The chemist concluded that the laboratory data are acceptable without qualification. The data validation memo is included as Attachment D.

#### 3.3 Trends Analysis

Table 3.2 presents the current and historical concentration data for BW-3, BW-4, and GW-8B for PCE, TCE, cis-1,2-DCE, and VC. Although other VOCs have been detected in these wells, they have only been detected intermittently and at levels below or only slightly above criteria. The four above-listed VOCs have collectively been detected consistently and at elevated concentrations in these three bedrock wells, and, as such, their concentrations have been monitored through time. Figures 3.1 through 3.3 present the historical concentration data for these four VOCs from March 2000 to the present. Where duplicate samples were collected, the average concentrations detected among the duplicate samples are shown. The following is a brief discussion of the September 2020 sampling results relative to historical concentrations for these four VOCs in the three bedrock wells sampled.

#### **BW-3** (Figure 3.1)

VC was detected at a concentration of 4.9 micrograms per liter (μg/L) in September 2020, which was above the criteria of 2 μg/L. This concentration was similar to the previous VC concentration of 5.1 μg/L detected in May 2019. Concentrations of VC have either been non-detect or below 9 μg/L since September 2001 and appear to have historically shown seasonal variations with higher concentrations observed during the fall sampling events. Concentrations of VC have been decreasing overall since September 2008.



- cis-1,2-DCE was non-detect in September 2020 and has not been detected at concentrations at or above the criteria of 5 μg/L from March 2000 to the present.
- PCE and TCE were non-detect in September 2020 and have been non-detect since March 2000. As such, they are not shown on Figure 3.1.

#### BW-4 (Figure 3.2)

- cis-1,2-DCE was detected at a concentration of 2,300 μg/L (1,900 μg/L in the duplicate) in September 2020, which was above the criteria of 5 μg/L. Concentrations of cis-1,2-DCE have been above criteria since March 2000. Concentrations have been gradually increasing overall since March 2000, with relatively large increases observed from September 2010 to October 2014 and from May 2019 to September 2020. The large increase in concentration observed from September 2010 to October 2014 was followed by a large decrease in concentration from October 2014 to September 2016, at which time concentrations returned to the roughly linear concentration trend that has been observed since March 2000. Future monitoring events will aid in determining if the increased concentration detected in September 2020 is part of an increasing trend or an additional fluctuation in the overall pattern of gradually increasing concentrations.
- PCE was detected at a concentration of 1,600 μg/L (1,200 μg/L in the duplicate) in September 2020, which was above the criteria of 5 μg/L. Concentrations of PCE have been above criteria since March 2000 and were relatively stable from March 2000 to May 2013. Concentrations were higher from October 2014 through May 2019 relative to the previous concentrations, but appeared to have been relatively stable overall. Future monitoring events will aid in determining if the increased concentration detected in September 2020 is part of an increasing trend or a fluctuation in the apparent stable trend that had been observed since October 2014.
- TCE was detected at a concentration of 1,200 μg/L (930 μg/L in the duplicate) in September 2020, which was above the criteria of 5 μg/L. Concentrations of TCE have been above criteria since March 2000 and increased from March 2009 to October 2014. Concentrations had been decreasing from October 2014 through May 2019. Future monitoring events will aid in determining if the increased concentration detected in September 2020 is part of an increasing trend or a fluctuation in the recent decreasing trend.
- VC was detected at a concentration of 480 μg/L (410 μg/Lin the duplicate) in September 2020, which was above the criteria of 2 μg/L. Concentrations of VC have been above criteria since March 2000 and gradually increased from March 2000 to October 2014. Concentrations appeared to have stabilized from October 2014 through May 2019. Future monitoring events will aid in determining if the increased concentration detected in September 2020 is part of an increasing trend or a fluctuation in the apparent stable trend that had been observed since October 2014.
- Other analytes: Chloroform was detected at estimated concentrations of 29 μg/L (22 μg/L in the duplicate) in BW-4 during the September 2020 monitoring event, which was above criteria.
   Concentrations of chloroform have been increasing in this well since 2017. As the concentrations are



not significantly above criteria, the concentrations will continue to be monitored, and chloroform will be added to the trends analysis for this well if the concentration increases are observed to be sustained.

#### **GW-8B** (Figure 3.3)

- cis-1,2-DCE was detected at a concentration of 22 μg/L in September 2020, which was above the
  criteria of 5 μg/L. Concentrations of cis-1,2-DCE have been above criteria since March 2000, with the
  exception of a non-detect in September 2003, but appear to have remained stable since that time.
  Concentrations observed since September 2012 appear to be part of an overall decreasing or stable
  trend.
- VC was detected at a concentration of 6.0 μg/L in September 2020, which was above the criteria of 2 μg/L. VC was non-detect from March 2000 to March 2005 and has been detected at concentrations slightly above criteria since September 2006, with the exception of a non-detect in March 2007 and concentrations in May 2015 and May 2017 that were slightly below criteria. Concentrations appear to have remained stable since September 2006.
- TCE was detected at a concentration of 3.6 μg/L in September 2020, which was below the criteria of 5 μg/L. Concentrations have been decreasing since May 2015.
- PCE was non-detect in September 2020 and has been non-detect since March 2000. As such, PCE is not shown on Figure 3.3.

Concentrations of VOCs detected in bedrock wells BW-3 and GW-8B were generally consistent with the concentrations detected during the May 2019 sampling event. The current and historical data has shown that concentrations of VOCs in well BW-3 remain low, with only VC present at concentrations slightly above criteria. This well was hydraulically downgradient of the landfill during the September 2020 monitoring event, but has been shown to be hydraulically upgradient of the landfill during some previous monitoring events. These shifts in gradient direction may be due to seasonality, as monitoring events have alternated between spring and fall. Concentrations of VOCs in GW-8B, which is hydraulically downgradient of the landfill (as observed during previous monitoring events), also remain low and have either stabilized or are decreasing. Due to the unusual mounding and radial flow observed proximate to BW-6 during the September 2020 monitoring event, the hydraulic position of GW-8B relative to the landfill was not readily apparent during this event, though has been consistently downgradient during previous events. Concentrations of VOCs detected in bedrock well BW-4 have increased since May 2019.

Based on the decreasing or stable concentrations of VOCs observed in well BW-3 and GW-8B, no discernable negative trend in groundwater quality was observed for the Site. Concentrations of VOCs in BW-4, which is hydraulically upgradient of the landfill based on the current and historical gauging events, remain elevated and are 2 to 3 orders of magnitude higher than the VOC concentrations in the other bedrock monitoring wells. This strongly suggests an off-Site source.



#### 4. Closing/Recommendations

Results from the 2020 groundwater monitoring activities indicate that concentrations of cis-1,2-DCE, PCE, TCE, and VC are consistent with previous results. The groundwater monitoring program for the past 30 years since closure of the landfill has identified no negative trends in the groundwater quality associated with the landfill. VOC concentrations in well BW-4, which is upgradient of the landfill, continue to be 2 to 3 orders of magnitude higher than VOC concentrations detected in the other bedrock wells at the Site. This strongly suggests an off-Site source. The next groundwater monitoring event will occur in May 2021.

GHD appreciates the opportunity to conduct this work. If you have any questions regarding this or require additional assistance, please contact the undersigned at 716-297-6150 or margaret.popek@ghd.com.

Sincerely,

GHD

Margaret A. Popek

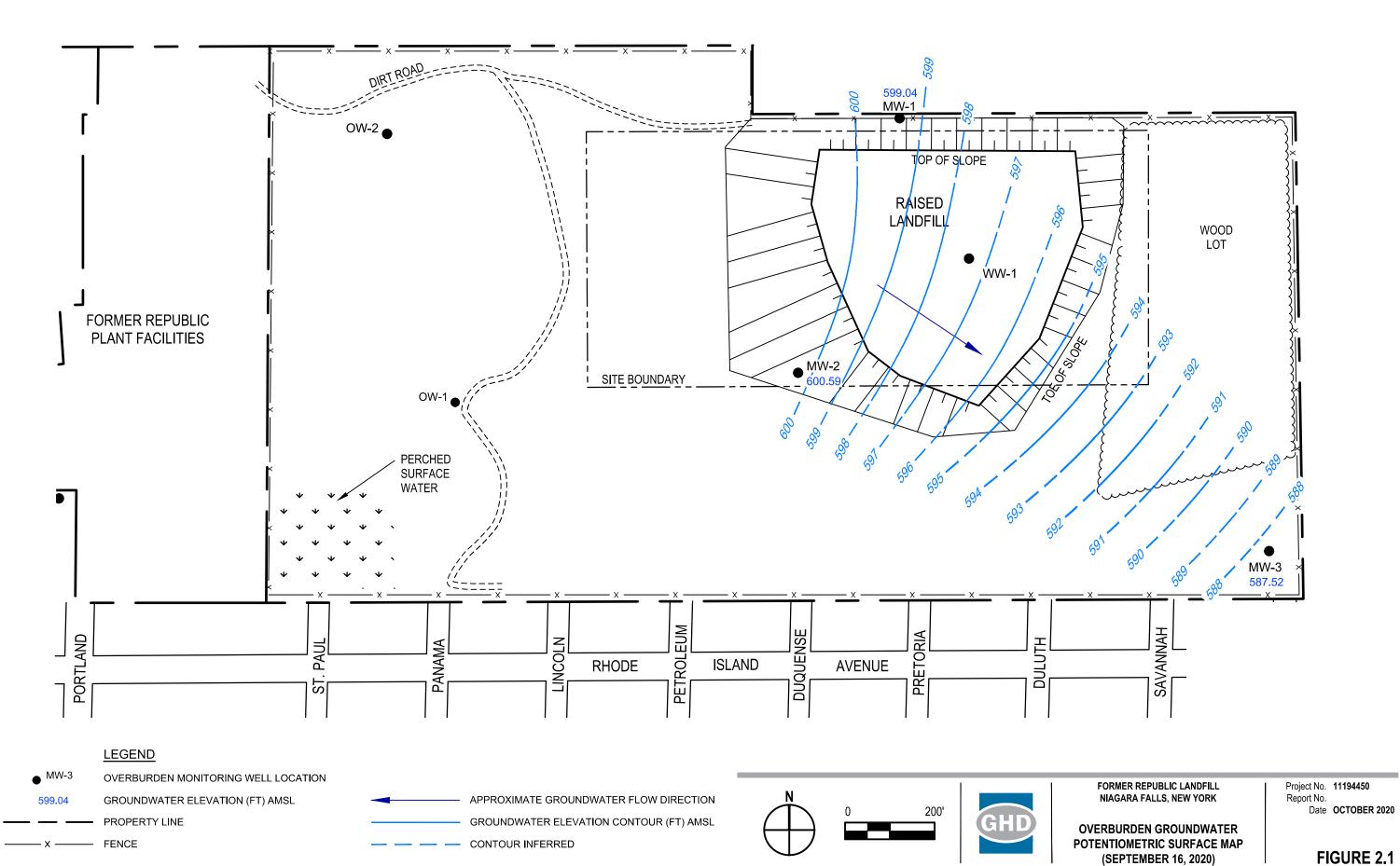
Margaret a Popek

Geologist

MP/adh

Encl.

cc: D. Hoyt, GHD



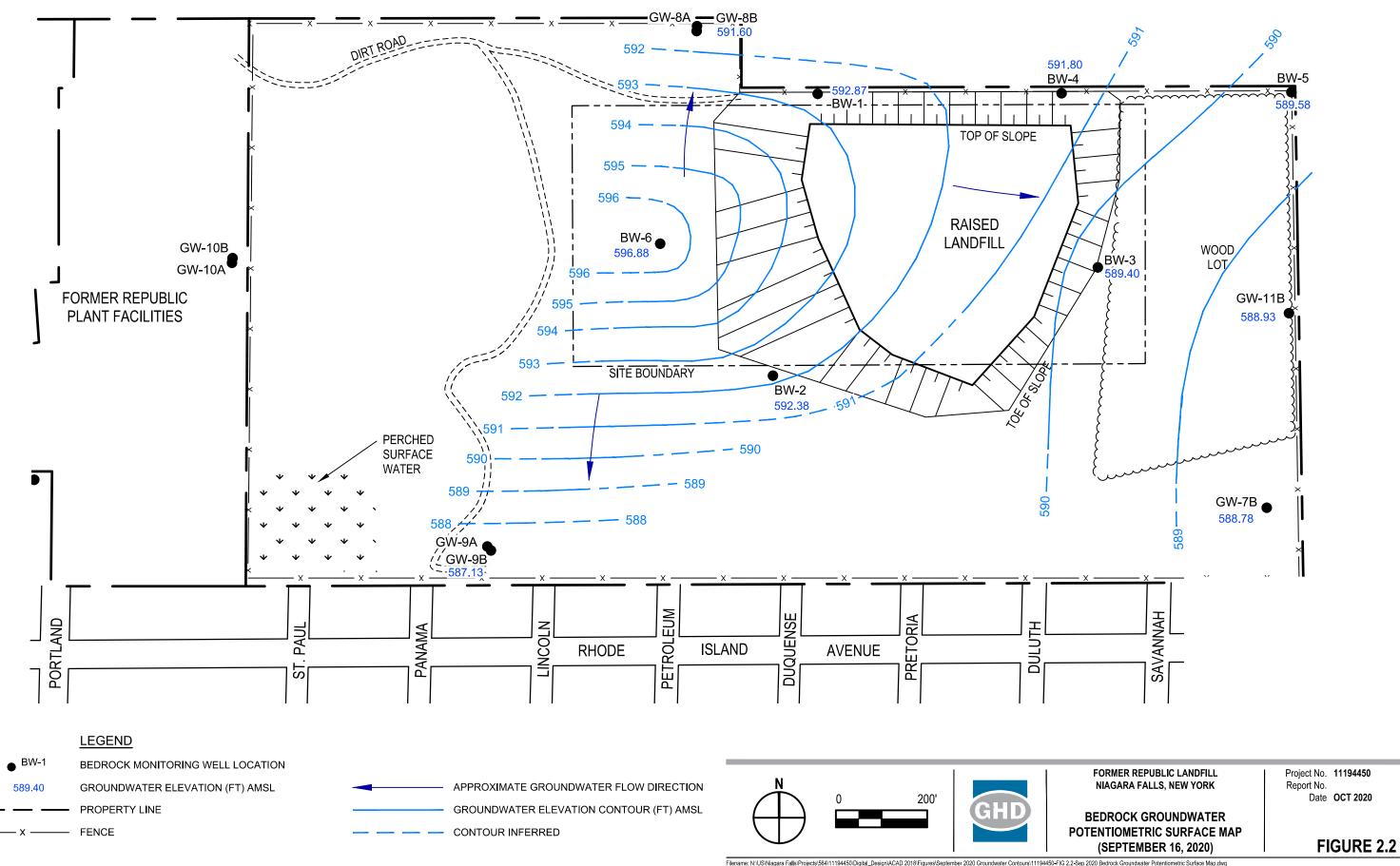


Figure 3.1 Historical Data Graph Well BW-3

#### Former Republic Landfill

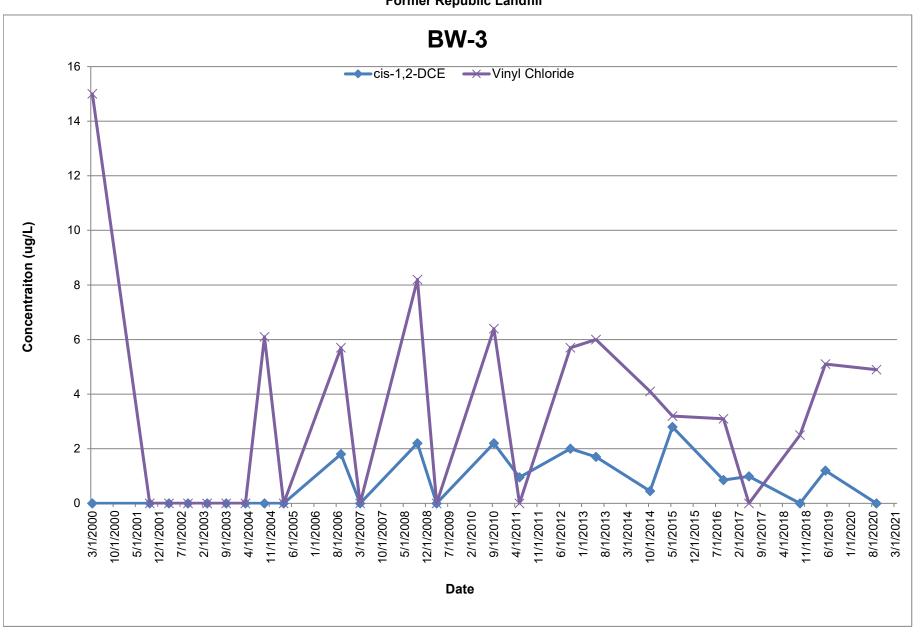


Figure 3.2 Historical Data Graph Well BW-4

#### Former Republic Landfill

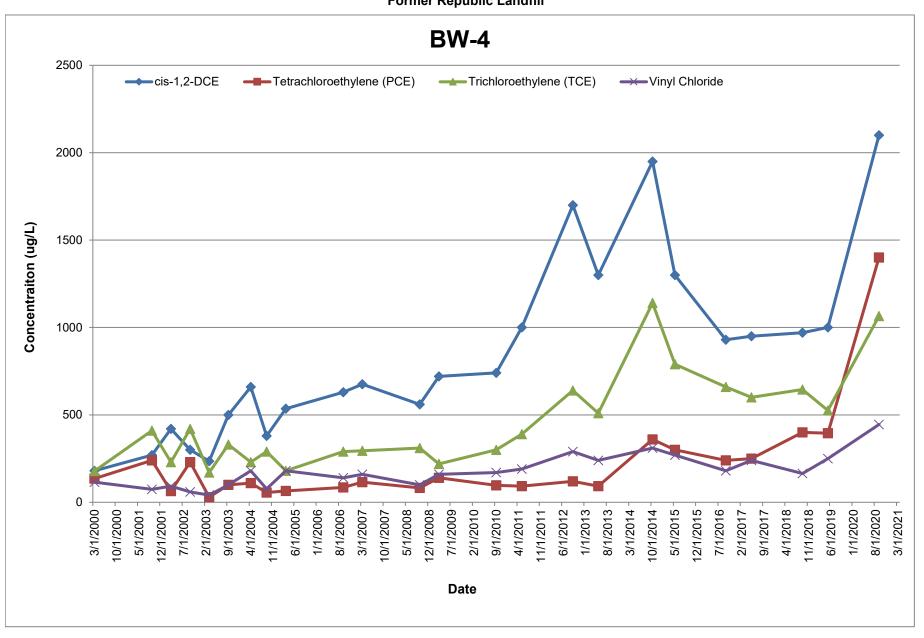


Figure 3.3 Historical Data Graph Well GW-8B

#### Former Republic Landfill

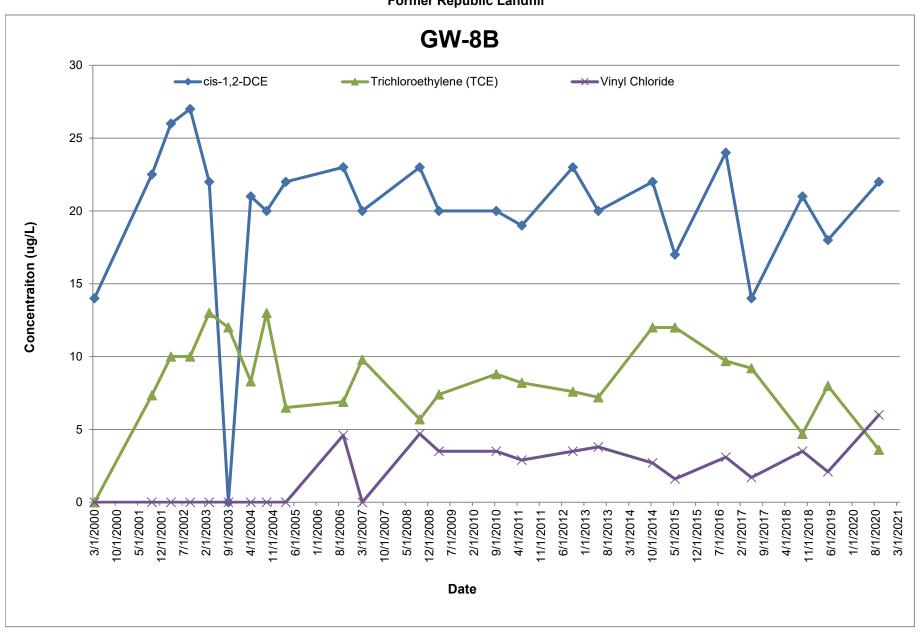


Table 3.1

# Analytical Results Summary Annual Groundwater Monitoring Program GrafTech International Holdings, Inc. Niagara Falls, New York September 2020

Parameters	Sample Location: Sample ID: Sample Date: Unit	NYSDEC	BW-3 WG-11194450-091620-DT-002 09/16/2020	BW-4 WG-11194450-091620-DT-003 09/16/2020	BW-4 WG-11194450-091620-DT-004 09/16/2020 (Duplicate)	GW-8B WG-11194450-091620-DT-001 09/16/2020
raidilleters	Offin	is Class GA Citteria/1003				
Volatile Organic Compounds						
1,1,1-Trichloroethane	μg/		1.0 U	40 U	40 U	1.0 U
1,1,2,2-Tetrachloroethane	μg/		1.0 U	40 U	40 U	1.0 U
1,1,2-Trichloroethane	μg/		1.0 U	40 U	40 U	1.0 U
1,1-Dichloroethane	μg/		1.0 U	40 U	40 U	1.0 U
1,1-Dichloroethene	μg/		1.0 U	40 U	40 U	1.0 U
1,2-Dichloroethane	μg/	L 0.6	1.0 U	40 U	40 U	1.0 U
1,2-Dichloroethene (total)	μg/	L	2.0 U	2300	1900	22
1,2-Dichloropropane	μg/		1.0 U	40 U	40 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	μg/		10 U	400 U	400 U	10 U
2-Hexanone	μg/	L 50	5.0 U	200 U	200 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	μg/	L	5.0 U	200 U	200 U	5.0 U
Acetone	μg/	L 50	10 U	400 U	400 U	10 U
Benzene	μg/	L 1	1.0 U	40 U	40 U	1.0 U
Bromodichloromethane	μg/	L 50	1.0 U	40 U	40 U	1.0 U
Bromoform	μg/	L 50	1.0 U	40 U	40 U	1.0 U
Bromomethane (Methyl bromide)	μg/		1.0 U	40 U	40 U	1.0 U
Carbon disulfide	μg/		1.0 U	40 U	40 U	1.0 U
Carbon tetrachloride	μg/		1.0 U	40 U	40 U	1.0 U
Chlorobenzene	μg/		1.0 U	40 U	40 U	1.0 U
Chloroethane	μg/		1.0 U	40 U	40 U	1.0 U
Chloroform (Trichloromethane)	μg/		1.0 U	29 J	22 J	1.0 U
Chloromethane (Methyl chloride)	μg/		1.0 U	40 U	40 U	1.0 U
cis-1,2-Dichloroethene	μg/		1.0 U	2300	1900	22
cis-1,3-Dichloropropene	μg/		1.0 U	40 U	40 U	1.0 U
Dibromochloromethane	μg/		1.0 U	40 U	40 U	1.0 U
Ethylbenzene	μg/		1.0 U	40 U	40 U	1.0 U
Methylene chloride	μg/		1.0 U	40 U	40 U	1.0 U
Styrene	μg/		1.0 U	40 U	40 U	1.0 U
Tetrachloroethene	μg/		1.0 U	1600	1200	1.0 U
Toluene	μg/		1.0 U	40 U	40 U	1.0 U
trans-1,2-Dichloroethene	μg/		1.0 U	40 U	40 U	1.0 U
trans-1,3-Dichloropropene	μg/		1.0 U	40 U	40 U	1.0 U
Trichloroethene	μg/		1.0 U	1200	930	3.6
Vinyl chloride	μg/		4.9	480	410	6.0
Xylenes (total)	μg/		2.0 U	80 U	80 U	2.0 U

#### Notes:

1600	- Indicates exceedance of NYSDEC Class GA Criteria/TOGS
J	- Estimated concentration
U	- Not detected at the associated reporting limit
Class GA Criteria/TOGS	- Groundwater Effluent Limitations/Technical and Operational Guidance Series
NYSDEC	- New York State Department of Environmental Conservation
-	- Not applicable

Table 3.2 Page 1 of 2

#### Summary of Bedrock Well Analytical Results: PCE, TCE, cis-1,2-DCE, and Vinyl Chloride Annual Groundwater Monitoring Program GrafTech International Holdings, Inc. Niagara Falls, New York

Well Number	Parameter	Groundwater Criteria (ppb)	March 2000 (ppb)	Sept. 2001 (ppb)	March 2002 (ppb)	Sept. 2002 (ppb)	March 2003 (ppb)	Sept. 2003 (ppb)	March/April 2004 (ppb)	Sept. 2004 (ppb)	March 2005 (ppb)	Sept. 2006 (ppb)	March 2007 (ppb)	Sept. 2008 (ppb)
	cis-1,2-DCE	5	10U	5U	5U	5U	5U	5U	5U	5U	5U	1.8	5U	2.2
BW-3	PCE	5	10U	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
DVV-3	TCE	5	10U	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
	Vinyl Chloride	2	15	5U	5U	5U	5U	5U	5U	6.1	5U	5.7	5.0U	8.2
		_		1								1		
	cis-1,2-DCE	5	14	23 (22)	26	27	22	5U	21	20	22	23	20	23
GW-8B	PCE	5	10U	5U (5U)	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
GW-0D	TCE	5	10U	7.5 (7.2)	10	10	13	12	8.3	13	6.5	6.9	9.8	5.7
	Vinyl Chloride	2	10U	5U (5U)	5U	5U	5U	5U	5U	5U	5U	4.6J	5.0U	4.7J
	cis-1,2-DCE	5	180	270	420	300	230 (240)	500	660	370 (390)	540 (530)	620 (620)	710 (640)	580 (540)
BW-4	PCE	5	135	240	64	230	29 (30)	100	110	55 (56)	64 (65)	84 (86)	120 (110)	86 (79)
DW-4	TCE	5	178	410	230	420	170 (170)	330	230	290 (290)	180 (180)	290 (290)	310 (280)	320 (300)
	Vinyl Chloride	2	115	74	92	59	41 (41)	100	180	75 (79)	180 (180)	140 (140)	170 (150)	100 (100)

#### Notes:

- Shaded cells indicate the concentrations exceeds the New York State Class GA Groundwater Criteria

- Parentheses indicate the results of the duplicate sample

- Concentration represents total 1,2-DCE

- Concentration represents total DCE

- Concentration is an estimated value

- Not present at or above the associated value

ppb - Parts per billion cis-1,2-DCE - cis 1,2 dichloroethylene

PCE - Tetrachloroethylene
TCE - Trichloroethylene

Table 3.2 Page 2 of 2

#### Summary of Bedrock Well Analytical Results: PCE, TCE, cis-1,2-DCE, and Vinyl Chloride Annual Groundwater Monitoring Program GrafTech International Holdings, Inc. Niagara Falls, New York

Well Number	Parameter	Groundwater Criteria (ppb)	March 2009 (ppb)	Sept. 2010 (ppb)	May 2011 (ppb)	Sept. 2012 (ppb)	May 2013 (ppb)	Oct. 2014 (ppb)	May 2015 (ppb)	Sept. 2016 (ppb)	May 2017 (ppb)	Sept. 2018 (ppb)	May 2019 (ppb)	September 2020 (ppb)
	cis-1.2-DCE	5	10U*	2.2J*	0.95J**	2	1.7	0.45	2.8	0.85	0.99	1.0U	1.2	1.0U
	PCE	5	5U	5U	0.42U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
BW-3	TCE	5	5U	5U	0.30U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
	Vinyl Chloride	2	5.0U	6.4	0.3U	5.7	6.0	4.1	3.2	3.1	1.0U	2.5	5.1	4.9
		_												
	cis-1,2-DCE	5	20*	20*	19**	23	20	22	17	24	14 (14)	21.0	18	22
GW-8B	PCE	5	5U	5U	0.42U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
GW-6B	TCE	5	7.4	8.8	8.2	7.6	7.2	12	12	9.7	9.2 (9.2)	4.7	8.0	3.6
	Vinyl Chloride	2	3.5J	3.5J	2.9J	3.5	3.8	2.7	1.6	3.1	1.7	3.5	2.1	6.0
	cis-1,2-DCE	5	720*	740*	1000**	1700	1300	2200 (1700)	1300	930J	950	1000 (940)	1000 (1000)	2300 (1900)
BW-4	PCE	5	140J	97	92	120	92	390 (330)	300	240	250	390 (410)	390 (400)	1600 (1200)
DVV-4	TCE	5	220J	300	390	640	510	1300 (980)	790	660J	600	650 (640)	510 (540)	1200 (930)
	Vinyl Chloride	2	160J	170	190	290	240	350 (270)	270	180	240	150 (180)	230 (270)	480 (410)

#### Notes:

- Shaded cells indicate the concentrations exceeds the New York State Class GA Groundwater Criteria

- Parentheses indicate the results of the duplicate sample

Concentration represents total 1,2-DCE
 Concentration represents total DCE

J - Concentration is an estimated value

U - Not present at or above the associated value

ppb - Parts per billion

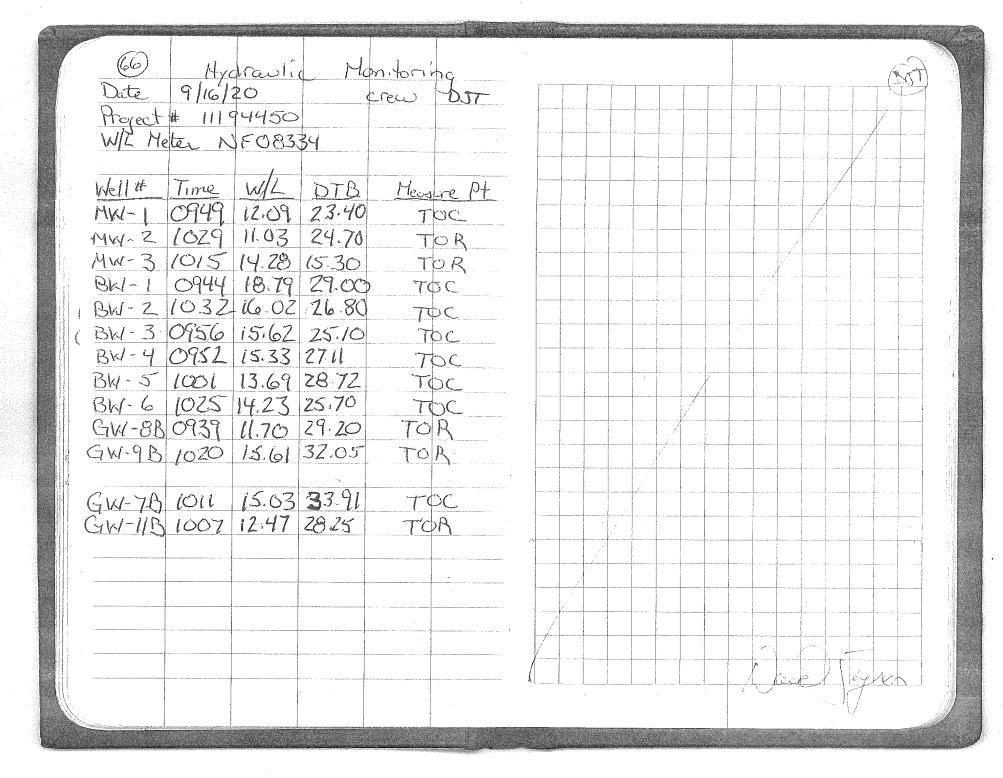
rcis-1,2-DCE - cis 1,2 dichloroethylene
PCE - Tetrachloroethylene
TCE - Trichloroethylene

# Attachment A Field Notes

## Graftech 11194450

DAILY LOG	
9/16/20 Calibrate YSI meter Control #	
NF07611 with auto Cal. Solution Lot# 19440208	
exp 11/24/20	
Before After	
Bar 747.2 Dog 89.2 94.3	
pH(400) 4.73 4.01	
Cond (4.49) 4.46 4-49	
0930 Dot on-5de Clear, 62-71°F winds	
55kr 7-13 mph	
0935 Start W/L round	
1036 Complete W/L'S, Set up on GW-8B	
purge & Sample Low flow	
1050 Setup masterflex on BW-3 & begin page	
Trip Blank = TB-11194450-091620-DT ZX40ml W/HCL	
145 Hook meter up on BW-3 complete purge & Semple	
135 Set up mosterflex on BW-4 begin purce	
1235 Hook meter up on BW-4 complete puge & Sample	
1305 Sampling Complete clean meter, pack Samples	
complete than of custody	16-20
(325 off-site	16"AD

Dwell year





Project Data:	Project Name: Ref. No.:	Graft	ech Annu	pal		Date: Personnel:	9/16	120		-		
Constructed Measured		BW-	3		aturated Screen I Depth to Pump Ir Well Diamet Well Screen Volu Initial Depth to	Length (m/ft): ntake (m/ft) <sup>(1)</sup> : er, D (cm/in): ume, V <sub>s</sub> (L) <sup>(2)</sup> :						
Time  1150 £155 1200 1205 1210 1215	Pumping Rate (mL/min)  (42  156  148	Depth to Water (m/ft) Prec (5-61 15-61 15-61	Drawdown from InItial Water Level (3) (m/ft) Ision Required (5); O-OO	Temperature  °C  ±3 %  12 3  12 3  12 5  12 1  12 3	Conductivity (mS/cm) ±0.005 or 0.01(0)  1.71 1.71 1.71 1.71	Turbidity NTU ±10 % 0.76 0.48 0.56 0.33 0.29 0.53	DO (mg/L) ±10 % 1.18 0.59 0.47 6.40 0.33 6.30 6.27	pH  ±0.1 Units  7, 30  7,09  7,01  7,03  7,07  7,09  7,07	ORP (mV) ±10 mV -50.1 -62.0 -66.2 -71.5 -74.5 -77.8 -79.3	Volume Purged, Vp (L)	No. of Well Screen Volumes Purged <sup>(4)</sup>	
Sample ID: Notes: (1) (2) (3) (4)	The pump intak The well screen For Imperial uni The drawdown i Purging will con	e will be placed volume will be ts, V <sub>s</sub> =n*(r²)*L' from the initial tinue until state be clearing, or	d at the well screen based on a 1.52 i * (2.54) <sup>3</sup> , where re water level should fillization is achieve	n mid-point or at a metres (5-foot) so and L are in inche not exceed 0.1 n ad or until 20 well n parameters are	a minimum of 0.6 n creen length (L). For es n (0.3 ft). The pum screen volumes has n varying slightly ou	n (2 ft) above a or metric units ping rate shou ave been purgi atside of the sta	ıld not exceed ed (unless pur abllization crit	accumulated in mL, where \$ 500 mL/min rge water rem eria and appe	at the well bo r (r=D/2) and nains visually ear to be	ottom. L. are in cm. turbid TC	Inst. Con IL NFO83: xb NFO8 INFO70	hol#3

GHD Form SP-09 - Revision 02 - August 8, 2017 Start Purge @ 1051

Project Data:  Monitoring W  We: Constructed V	Project Name: Ref. No.: Well Data: Well No.: apour PID (ppm): asurement Point: Well Depth (m/ft):	GW-8	Rech A	yrnel H	Saturated Screen L Depth to Pump In Well Diametr	ength (m/ft): take (m/ft) <sup>(1)</sup> ;						
Measured \	Well Depth (m/ft): f Sediment (m/ft):				Well Screen Volu Initial Depth to	Water (m/ft):	11.69	l				
Time (104 1109 1114 1119 1124	Pumping Rate (mL/min)	Depth to Water	Drawdown from InItial Water Level <sup>(3)</sup> (m/ft) sion Required <sup>(6)</sup> :	Temperature °C ±3 % 13 9 13 9 13 7 13 6	Conductivity (ms/cm) ±0.005 or 0.01(8) 1.54 1.56 1.58 1.60	Turbidity NTU ±10 % 0.83 (.29 0.91 1.05 1.18	DO (mg/L) ±10 % O.46 O.44 O.39 O.42 O.36	pH ±0.1 Units 7-75 7-53 7.34 7.25 7.19	ORP (mV) ±10 mV 70.6 -80.5 -87.5 -87.2	Volume Purged, Vp (L)	No. of Well Screen Volumes Purged <sup>(4)</sup>	
Sample ID:	WG:1119	1450-0	091620 - D	T-00 L		S	ample Time:	1125				
Notes: (1) (2) (3) (4)	The pump intake The well screen For imperial unit The drawdown fi Purging will cont and appears to b	a will be placed volume will be is, V <sub>s</sub> =n*(r <sup>2</sup> )*L* rom the initial vilue until stable of clearing, or	at the well screen based on a 1.52 n (2.54) <sup>3</sup> , where r a vater level should i lization is achieved unless stabilization	mid-point or at a netres (5-foot) so nd L are in inche not exceed 0.1 m d or until 20 well n parameters are	a minimum of 0.6 m sreen length (L). Fo es i (0.3 ft). The pump screen volumes ha varying slightly out 0.005 mS/cm or wh	olng rate shou ve been purge side of the sta	ld not exceed ad (unless pure abilization crite	500 mL/min. ge water rem rla and appe	ains visually fear to be	ttom. L are in cm.	Inst. Co V/L NFO Orbidity NF YSI NFO	5000 8334 7611

Start Perge @ 1040

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onitoring We			fech A 450-05				<u> </u>	7137		-	
	Well No. (pour PID (ppm)		<u>M-7</u>		Saturated Screen L	_ength (m/ft):				-  -	
Mea	surement Point			•	Depth to Pump In					. ]=	
nstructed W	/ell Depth (m/ft): /ell Depth (m/ft):	·			Well Diamet Well Screen Volu Initial Depth to	ime, $V_s(L)^{(2)}$ :					
Depth of	Sediment (m/ft):			•	Initial Depth to	Water (m/ft):	15	5,38		-	
	Pumping	Depth to	Drawdown from Initial			Turbidity	DO	Hq	ORP	Volume Purged, Vp	No. of Well Screen Volumes Purged <sup>(4)</sup>
Time	Rate (mL/min)	Water (m/ft)	Water Level <sup>(3)</sup> (m/ft)	Temperature °C	Conductivity (mS/cm)	NTU	(mg/L)		(mV)	(L)	·
Time	1	Preci	sion Required <sup>(5)</sup> :	±3 %	±0,005 or 0.01 <sup>(a)</sup>	±10 % <b>4.44</b>	±10 % /. 39	±0.1 Units	±10 mV		
1230	100	15.44	0.06	13.8	1.43	4.68	699	7.08	108.2	1	
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mpie io.	VX VIII	10/G-111	94450-0910	20 DT C	04						
	a Dup	WYCZ 101	et the well screen	mld-noint or at a	a minimum of 0.6 m	(2 ft) above a	ny sediment a	accumulated	at the well bot	ttom.	
•	The pump intak	e will be piaced volume will be	based on a 1.52 r	netres (5-foot) sc	a minimum or u.e m creen length (L). Fo	r metric units,	$V_s = \pi^*(r^2)^* L I$	n mL, where	r (r=D/2) and	L are in cm.	1 1
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	The drawdown f	from the InItIal v	vater level should	not exceed 0.1 m	(0.3 ft). The pump					urbld , , f	ME 08
	and appears to	be clearing, or i	uniess stabilizatioi	n parameters are	varying slightly out	side of the stal	bilization, crite	arla and appe	ar to be	W.	NF 08 NF 08 NF 088
,	stabilizing), No.	of Well Screen	Volumes Purged:	= Vp/Vs.	0.005 mS/cm or wh	E 0.3	by Sd m Clam	+0 01 m S/cm	3	lork	INFOT



### CHAIN OF CUSTODY RECORD

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# **Attachment B Field Parameters**

#### **Attachment B**

#### **Groundwater Quality Parameters Annual Groundwater Monitoring Program GrafTech International Holdings, Inc.** Niagara Falls, New York September 2020

Monitoring Well Location	Date	Time (hr:mm)	Purge Rate (mL/per minute)	Water Level (ft. BTOC)	Temperature (°C)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	pH (Units)	ORP (mv)
GW-8B	09/16/2020	11:04	84	12.22	13.9	1.54	0.83	0.46	7.75	-70.6
		11:09		12.34	13.9	1.56	1.29	0.44	7.53	-80.5
		11:14	96	NM	13.7	1.58	0.91	0.39	7.34	-87.5
		11:19		12.41	13.6	1.60	1.05	0.42	7.25	-87.2
		11:24		NM	13.6	1.60	1.18	0.36	7.19	-85.7
BW-3	09/16/2020	11:50	142	15.61	12.4	1.71	0.76	1.18	7.30	-50.1
		11:55		15.61	12.3	1.71	0.48	0.59	7.09	-62.0
		12:00	156	NM	12.3	1.71	0.56	0.47	7.01	-66.2
		12:05		15.61	12.5	1.71	0.33	0.40	7.03	-71.5
		12:10	148	NM	12.1	1.71	0.29	0.33	7.07	-74.5
		12:15		15.61	12.3	1.71	0.53	0.30	7.09	-77.8
		12:20		NM	12.5	1.71	0.31	0.27	7.07	-79.3
BW-4	09/16/2020	12:38	100	15.44	13.8	1.44	4.44	1.39	7.09	-100.4
		12:43	100	NM	14.1	1.43	4.68	0.94	7.08	-108.2
		12:48		15.44	14.2	1.43	5.10	0.93	7.09	-111.1
		12:53	88	NM	14.3	1.43	4.91	1.08	7.09	-111.3

Notes:

ft. BTOC - Feet below top of casing

NM - Not measured

DO - Dissolved Oxygen
ORP - Oxidation-Reduction Potential

# Attachment C Laboratory Report



# **Environment Testing America**

### **ANALYTICAL REPORT**

Eurofins TestAmerica, Buffalo 10 Hazelwood Drive Amherst, NY 14228-2298 Tel: (716)691-2600

Laboratory Job ID: 480-175171-1

Client Project/Site: 11194450, GrafTech

Revision: 1

#### For:

GHD Services Inc. 2055 Niagara Falls Blvd., Suite 3 Niagara Falls, New York 14304

Attn: Ms. Sue Scrocchi

Denise DHeckler

Authorized for release by: 10/6/2020 11:16:18 AM

Denise Heckler, Project Manager II

(330)966-9477

Denise.Heckler@Eurofinset.com

·····LINKS ······

Review your project results through

Total Access

**Have a Question?** 



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www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: GHD Services Inc. Project/Site: 11194450, GrafTech Laboratory Job ID: 480-175171-1

## **Table of Contents**

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#### **Definitions/Glossary**

Client: GHD Services Inc.

Job ID: 480-175171-1

Project/Site: 11194450, GrafTech

#### **Qualifiers**

#### **GC/MS VOA**

Qualifier Qualifier Description

F1 MS and/or MSD recovery exceeds control limits.

J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

#### **Glossary**

Abbreviation	These commonly	y used abbreviations ma	v or may not	be present in this repo
Appreviation	These common	y useu abbreviations ilia	y or may not	de present in tilis repo

Example 2 Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CFL Contains Free Liquid
CFU Colony Forming Unit
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level"

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
MPN Most Probable Number
MQL Method Quantitation Limit

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent POS Positive / Present

PQL Practical Quantitation Limit

PRES Presumptive
QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

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#### **Case Narrative**

Client: GHD Services Inc.

Job ID: 480-175171-1 Project/Site: 11194450, GrafTech

Job ID: 480-175171-1

Laboratory: Eurofins TestAmerica, Buffalo

**Narrative** 

Job Narrative 480-175171-1

#### Comments

A revised report was provided on October 6, 2020. Sample results were corrected for WG-11194450-091620-DT-001 and WG-11194450-091620-DT-002.

#### Receipt

The samples were received on 9/16/2020 1:15 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.2° C.

#### **GC/MS VOA**

Method 8260C: The following samples were diluted to bring the concentration of target analytes within the calibration range: WG-11194450-091620-DT-003 (480-175171-4) and WG-11194450-091620-DT-004 (480-175171-5). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# **Detection Summary**

Client: GHD Services Inc.

Job ID: 480-175171-1

Project/Site: 11194450, GrafTech

Client Sample ID: TB-11194450-091620-DT

Lab Sample ID: 480-175171-1

No Detections.

Client Sample ID: WG-11194450-091620-DT-001

Lab Sample ID: 480-175171-2

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2-Dichloroethene, Total	22	2.0	0.81	ug/L	1	_	8260C	Total/NA
cis-1,2-Dichloroethene	22	1.0	0.81	ug/L	1		8260C	Total/NA
Trichloroethene	3.6	1.0	0.46	ug/L	1		8260C	Total/NA
Vinyl chloride	6.0	1.0	0.90	ug/L	1		8260C	Total/NA

Client Sample ID: WG-11194450-091620-DT-002

Lab Sample ID: 480-175171-3

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
Vinyl chloride	4.9	1.0	0.90 ug/L		8260C	Total/NA

Client Sample ID: WG-11194450-091620-DT-003

Lab Sample ID: 480-175171-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2-Dichloroethene, Total	2300		80	32	ug/L	40	_	8260C	Total/NA
Chloroform	29	J	40	14	ug/L	40		8260C	Total/NA
cis-1,2-Dichloroethene	2300		40	32	ug/L	40		8260C	Total/NA
Tetrachloroethene	1600		40	14	ug/L	40		8260C	Total/NA
Trichloroethene	1200		40	18	ug/L	40		8260C	Total/NA
Vinyl chloride	480		40	36	ug/L	40		8260C	Total/NA

Client Sample ID: WG-11194450-091620-DT-004

Lab Sample ID: 480-175171-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2-Dichloroethene, Total	1900		80	32	ug/L	40	_	8260C	Total/NA
Chloroform	22	J	40	14	ug/L	40		8260C	Total/NA
cis-1,2-Dichloroethene	1900		40	32	ug/L	40		8260C	Total/NA
Tetrachloroethene	1200		40	14	ug/L	40		8260C	Total/NA
Trichloroethene	930		40	18	ug/L	40		8260C	Total/NA
Vinyl chloride	410		40	36	ug/L	40		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

10/6/2020 (Rev. 1)

Project/Site: 11194450, GrafTech

Client Sample ID: TB-11194450-091620-DT

Date Collected: 09/16/20 00:00 Date Received: 09/16/20 13:15 Lab Sample ID: 480-175171-1

Matrix: Water

Analyte	Result C	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			09/20/20 12:58	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			09/20/20 12:58	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			09/20/20 12:58	1
1,1-Dichlorethylene	ND		1.0	0.29	ug/L			09/20/20 12:58	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			09/20/20 12:58	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			09/20/20 12:58	1
1,2-Dichloroethene, Total	ND		2.0	0.81	ug/L			09/20/20 12:58	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			09/20/20 12:58	1
2-Butanone	ND		10	1.3	ug/L			09/20/20 12:58	1
2-Hexanone	ND		5.0	1.2	ug/L			09/20/20 12:58	1
4-Methyl-2-pentanone	ND		5.0	2.1	ug/L			09/20/20 12:58	1
Acetone	ND		10	3.0	ug/L			09/20/20 12:58	1
Benzene	ND		1.0	0.41	ug/L			09/20/20 12:58	1
Bromodichloromethane	ND		1.0	0.39				09/20/20 12:58	1
Bromoform	ND		1.0	0.26	-			09/20/20 12:58	1
Bromomethane	ND		1.0	0.69				09/20/20 12:58	1
Carbon disulfide	ND		1.0	0.19	ug/L			09/20/20 12:58	1
Carbon tetrachloride	ND		1.0		ug/L			09/20/20 12:58	1
Chlorobenzene	ND		1.0		ug/L			09/20/20 12:58	1
Chloroethane	ND		1.0	0.32	-			09/20/20 12:58	1
Chloroform	ND		1.0	0.34	ug/L			09/20/20 12:58	1
Chloromethane	ND		1.0	0.35	ug/L			09/20/20 12:58	1
cis-1,2-Dichloroethene	ND		1.0	0.81	-			09/20/20 12:58	1
cis-1,3-Dichloropropene	ND		1.0	0.36	•			09/20/20 12:58	1
Dibromochloromethane	ND		1.0	0.32				09/20/20 12:58	1
Ethylbenzene	ND		1.0	0.74	-			09/20/20 12:58	1
Methylene Chloride	ND		1.0	0.44	•			09/20/20 12:58	1
Styrene	ND		1.0	0.73				09/20/20 12:58	1
Tetrachloroethene	ND		1.0	0.36	•			09/20/20 12:58	1
Toluene	ND		1.0	0.51	•			09/20/20 12:58	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			09/20/20 12:58	1
trans-1,3-Dichloropropene	ND		1.0	0.37	-			09/20/20 12:58	1
Trichloroethene	ND		1.0	0.46	•			09/20/20 12:58	1
Vinyl chloride	ND		1.0		ug/L			09/20/20 12:58	1
Xylenes, Total	ND		2.0		ug/L			09/20/20 12:58	1
Surrogate	%Recovery G	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	109		77 - 120			-		09/20/20 12:58	1
4-Bromofluorobenzene (Surr)	103		73 - 120					09/20/20 12:58	1
Dibromofluoromethane (Surr)	109		75 - 123					09/20/20 12:58	1
Toluene-d8 (Surr)	100		80 - 120					09/20/20 12:58	1

Client Sample ID: WG-11194450-091620-DT-001

Date Collected: 09/16/20 11:25

Date Received: 09/16/20 13:15

Method: 8260C - Volatile Orga	ds by GC/MS							
Analyte	Result Qua	alifier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND	1.0	0.82	ug/L			09/20/20 13:46	1
1,1,2,2-Tetrachloroethane	ND	1.0	0.21	ug/L			09/20/20 13:46	1

Eurofins TestAmerica, Buffalo

Lab Sample ID: 480-175171-2

**Matrix: Water** 

Client: GHD Services Inc. Project/Site: 11194450, GrafTech

Client Sample ID: WG-11194450-091620-DT-001 Lab Sample ID: 480-175171-2 Date Collected: 09/16/20 11:25

**Matrix: Water** 

Date Received: 09/16/20 13:15

Analyte	Result	Qualifier	RL	MDL		D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			09/20/20 13:46	1
1,1-Dichlorethylene	ND		1.0	0.29	ug/L			09/20/20 13:46	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			09/20/20 13:46	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			09/20/20 13:46	1
1,2-Dichloroethene, Total	22		2.0	0.81	ug/L			09/20/20 13:46	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			09/20/20 13:46	1
2-Butanone	ND		10	1.3	ug/L			09/20/20 13:46	1
2-Hexanone	ND		5.0	1.2	ug/L			09/20/20 13:46	1
4-Methyl-2-pentanone	ND		5.0	2.1	ug/L			09/20/20 13:46	1
Acetone	ND		10	3.0	ug/L			09/20/20 13:46	1
Benzene	ND		1.0	0.41	ug/L			09/20/20 13:46	1
Bromodichloromethane	ND		1.0	0.39	ug/L			09/20/20 13:46	1
Bromoform	ND		1.0	0.26	ug/L			09/20/20 13:46	1
Bromomethane	ND		1.0	0.69	ug/L			09/20/20 13:46	1
Carbon disulfide	ND		1.0	0.19	ug/L			09/20/20 13:46	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			09/20/20 13:46	1
Chlorobenzene	ND		1.0	0.75	ug/L			09/20/20 13:46	1
Chloroethane	ND		1.0	0.32	ug/L			09/20/20 13:46	1
Chloroform	ND		1.0	0.34	ug/L			09/20/20 13:46	1
Chloromethane	ND		1.0	0.35	ug/L			09/20/20 13:46	1
cis-1,2-Dichloroethene	22		1.0	0.81	ug/L			09/20/20 13:46	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			09/20/20 13:46	1
Dibromochloromethane	ND		1.0	0.32	ug/L			09/20/20 13:46	1
Ethylbenzene	ND		1.0	0.74	ug/L			09/20/20 13:46	1
Methylene Chloride	ND		1.0	0.44	ug/L			09/20/20 13:46	1
Styrene	ND		1.0	0.73	ug/L			09/20/20 13:46	1
Tetrachloroethene	ND		1.0	0.36	ug/L			09/20/20 13:46	1
Toluene	ND		1.0	0.51	ug/L			09/20/20 13:46	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			09/20/20 13:46	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			09/20/20 13:46	1
Trichloroethene	3.6		1.0	0.46	ug/L			09/20/20 13:46	1
Vinyl chloride	6.0		1.0	0.90	ug/L			09/20/20 13:46	1
Xylenes, Total	ND		2.0	0.66	ug/L			09/20/20 13:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	109		77 - 120			-		09/20/20 13:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	109		77 - 120		09/20/20 13:46	1
4-Bromofluorobenzene (Surr)	102		73 - 120		09/20/20 13:46	1
Dibromofluoromethane (Surr)	103		75 - 123		09/20/20 13:46	1
Toluene-d8 (Surr)	100		80 - 120		09/20/20 13:46	1

Client Sample ID: WG-11194450-091620-DT-002

Lab Sample ID: 480-175171-3 **Matrix: Water** 

Date Collected: 09/16/20 12:25 Date Received: 09/16/20 13:15

Method: 8260C - Volatile Organic Compounds by GC/MS										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
1,1,1-Trichloroethane	ND	F1	1.0	0.82	ug/L			09/20/20 13:22	1	
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			09/20/20 13:22	1	
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			09/20/20 13:22	1	
1,1-Dichlorethylene	ND	F1	1.0	0.29	ug/L			09/20/20 13:22	1	

Client: GHD Services Inc. Project/Site: 11194450, GrafTech

Client Sample ID: WG-11194450-091620-DT-002

Date Collected: 09/16/20 12:25 Date Received: 09/16/20 13:15 Lab Sample ID: 480-175171-3

**Matrix: Water** 

Method: 8260C -	Volatile Organic Compounds by GC/MS (	Continue	d)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethane	ND		1.0	0.38	ug/L			09/20/20 13:22	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			09/20/20 13:22	1
1,2-Dichloroethene, Total	ND	F1	2.0	0.81	ug/L			09/20/20 13:22	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			09/20/20 13:22	1
2-Butanone	ND		10	1.3	ug/L			09/20/20 13:22	1
2-Hexanone	ND		5.0	1.2	ug/L			09/20/20 13:22	1
4-Methyl-2-pentanone	ND		5.0	2.1	ug/L			09/20/20 13:22	1
Acetone	ND		10	3.0	ug/L			09/20/20 13:22	1
Benzene	ND		1.0	0.41	ug/L			09/20/20 13:22	1
Bromodichloromethane	ND		1.0	0.39	ug/L			09/20/20 13:22	1
Bromoform	ND		1.0	0.26	ug/L			09/20/20 13:22	1
Bromomethane	ND		1.0	0.69	ug/L			09/20/20 13:22	1
Carbon disulfide	ND		1.0	0.19	ug/L			09/20/20 13:22	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			09/20/20 13:22	1
Chlorobenzene	ND		1.0	0.75	ug/L			09/20/20 13:22	1
Chloroethane	ND		1.0	0.32	ug/L			09/20/20 13:22	1
Chloroform	ND		1.0	0.34	ug/L			09/20/20 13:22	1
Chloromethane	ND		1.0	0.35	ug/L			09/20/20 13:22	1
cis-1,2-Dichloroethene	ND	F1	1.0	0.81	ug/L			09/20/20 13:22	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			09/20/20 13:22	1
Dibromochloromethane	ND		1.0	0.32	ug/L			09/20/20 13:22	1
Ethylbenzene	ND		1.0	0.74	ug/L			09/20/20 13:22	1
Methylene Chloride	ND		1.0	0.44	ug/L			09/20/20 13:22	1
Styrene	ND		1.0	0.73	ug/L			09/20/20 13:22	1
Tetrachloroethene	ND		1.0	0.36	ug/L			09/20/20 13:22	1
Toluene	ND		1.0	0.51	ug/L			09/20/20 13:22	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			09/20/20 13:22	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			09/20/20 13:22	1
Trichloroethene	ND		1.0		ug/L			09/20/20 13:22	1
Vinyl chloride	4.9		1.0		ug/L			09/20/20 13:22	1
Xylenes, Total	ND		2.0		ug/L			09/20/20 13:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	106		77 - 120		9/20/20 13:22	1	
4-Bromofluorobenzene (Surr)	100		73 - 120	09	9/20/20 13:22	1	
Dibromofluoromethane (Surr)	101		75 - 123	09	9/20/20 13:22	1	
Toluene-d8 (Surr)	100		80 - 120	OS	9/20/20 13:22	1	

Client Sample ID: WG-11194450-091620-DT-003

Date Collected: 09/16/20 13:00 Date Received: 09/16/20 13:15

Lab Sample ID: 480-175171-4

**Matrix: Water** 

Method: 8260C - Volatile Org	ganic Compounds by GC	/MS						
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND -	40	33	ug/L			09/20/20 14:12	40
1,1,2,2-Tetrachloroethane	ND	40	8.4	ug/L			09/20/20 14:12	40
1,1,2-Trichloroethane	ND	40	9.2	ug/L			09/20/20 14:12	40
1,1-Dichlorethylene	ND	40	12	ug/L			09/20/20 14:12	40
1,1-Dichloroethane	ND	40	15	ug/L			09/20/20 14:12	40
1,2-Dichloroethane	ND	40	8.4	ug/L			09/20/20 14:12	40

Client: GHD Services Inc. Project/Site: 11194450, GrafTech

Client Sample ID: WG-11194450-091620-DT-003

Date Collected: 09/16/20 13:00 Date Received: 09/16/20 13:15 Lab Sample ID: 480-175171-4

**Matrix: Water** 

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethene, Total	2300		80	32	ug/L			09/20/20 14:12	40
1,2-Dichloropropane	ND		40	29	ug/L			09/20/20 14:12	40
2-Butanone	ND		400	53	ug/L			09/20/20 14:12	40
2-Hexanone	ND		200	50	ug/L			09/20/20 14:12	40
4-Methyl-2-pentanone	ND		200	84	ug/L			09/20/20 14:12	40
Acetone	ND		400	120	ug/L			09/20/20 14:12	40
Benzene	ND		40	16	ug/L			09/20/20 14:12	40
Bromodichloromethane	ND		40	16	ug/L			09/20/20 14:12	40
Bromoform	ND		40	10	ug/L			09/20/20 14:12	40
Bromomethane	ND		40	28	ug/L			09/20/20 14:12	40
Carbon disulfide	ND		40	7.6	ug/L			09/20/20 14:12	40
Carbon tetrachloride	ND		40	11	ug/L			09/20/20 14:12	40
Chlorobenzene	ND		40	30	ug/L			09/20/20 14:12	40
Chloroethane	ND		40	13	ug/L			09/20/20 14:12	40
Chloroform	29	J	40	14	ug/L			09/20/20 14:12	40
Chloromethane	ND		40	14	ug/L			09/20/20 14:12	40
cis-1,2-Dichloroethene	2300		40	32	ug/L			09/20/20 14:12	40
cis-1,3-Dichloropropene	ND		40	14	ug/L			09/20/20 14:12	40
Dibromochloromethane	ND		40	13	ug/L			09/20/20 14:12	40
Ethylbenzene	ND		40	30	ug/L			09/20/20 14:12	40
Methylene Chloride	ND		40	18	ug/L			09/20/20 14:12	40
Styrene	ND		40	29	ug/L			09/20/20 14:12	40
Tetrachloroethene	1600		40	14	ug/L			09/20/20 14:12	40
Toluene	ND		40	20	ug/L			09/20/20 14:12	40
trans-1,2-Dichloroethene	ND		40	36	ug/L			09/20/20 14:12	40
trans-1,3-Dichloropropene	ND		40	15	ug/L			09/20/20 14:12	40
Trichloroethene	1200		40	18	ug/L			09/20/20 14:12	40
Vinyl chloride	480		40	36	ug/L			09/20/20 14:12	40
Xylenes, Total	ND		80	26	ug/L			09/20/20 14:12	40
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	109		77 - 120			-		09/20/20 14:12	40
4-Bromofluorobenzene (Surr)	102		73 - 120					09/20/20 14:12	40
Dibromofluoromethane (Surr)	100		75 - 123					09/20/20 14:12	40
Toluene-d8 (Surr)	98		80 - 120					09/20/20 14:12	40

Client Sample ID: WG-11194450-091620-DT-004

Date Collected: 09/16/20 13:00

Date Received: 09/16/20 13:15

Lab Samp	le ID:	480-175	171-5
			107 4

**Matrix: Water** 

Analyte	Result Qua	alifier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND	40	33	ug/L			09/20/20 14:35	40
1,1,2,2-Tetrachloroethane	ND	40	8.4	ug/L			09/20/20 14:35	40
1,1,2-Trichloroethane	ND	40	9.2	ug/L			09/20/20 14:35	40
1,1-Dichlorethylene	ND	40	12	ug/L			09/20/20 14:35	40
1,1-Dichloroethane	ND	40	15	ug/L			09/20/20 14:35	40
1,2-Dichloroethane	ND	40	8.4	ug/L			09/20/20 14:35	40
1,2-Dichloroethene, Total	1900	80	32	ug/L			09/20/20 14:35	40
1,2-Dichloropropane	ND	40	29	ug/L			09/20/20 14:35	40

# **Client Sample Results**

Client: GHD Services Inc.

Job ID: 480-175171-1

Project/Site: 11194450, GrafTech

Client Sample ID: WG-11194450-091620-DT-004

Date Collected: 09/16/20 13:00

Date Received: 09/16/20 13:15

Lab Sample ID: 480-175171-5

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone	ND		400	53	ug/L			09/20/20 14:35	40
2-Hexanone	ND		200	50	ug/L			09/20/20 14:35	40
4-Methyl-2-pentanone	ND		200	84	ug/L			09/20/20 14:35	40
Acetone	ND		400	120	ug/L			09/20/20 14:35	40
Benzene	ND		40	16	ug/L			09/20/20 14:35	40
Bromodichloromethane	ND		40	16	ug/L			09/20/20 14:35	40
Bromoform	ND		40	10	ug/L			09/20/20 14:35	40
Bromomethane	ND		40	28	ug/L			09/20/20 14:35	40
Carbon disulfide	ND		40	7.6	ug/L			09/20/20 14:35	40
Carbon tetrachloride	ND		40	11	ug/L			09/20/20 14:35	40
Chlorobenzene	ND		40	30	ug/L			09/20/20 14:35	40
Chloroethane	ND		40	13	ug/L			09/20/20 14:35	40
Chloroform	22	J	40	14	ug/L			09/20/20 14:35	40
Chloromethane	ND		40	14	ug/L			09/20/20 14:35	40
cis-1,2-Dichloroethene	1900		40	32	ug/L			09/20/20 14:35	40
cis-1,3-Dichloropropene	ND		40	14	ug/L			09/20/20 14:35	40
Dibromochloromethane	ND		40	13	ug/L			09/20/20 14:35	40
Ethylbenzene	ND		40	30	ug/L			09/20/20 14:35	40
Methylene Chloride	ND		40	18	ug/L			09/20/20 14:35	40
Styrene	ND		40	29	ug/L			09/20/20 14:35	40
Tetrachloroethene	1200		40	14	ug/L			09/20/20 14:35	40
Toluene	ND		40	20	ug/L			09/20/20 14:35	40
trans-1,2-Dichloroethene	ND		40	36	ug/L			09/20/20 14:35	40
trans-1,3-Dichloropropene	ND		40	15	ug/L			09/20/20 14:35	40
Trichloroethene	930		40	18	ug/L			09/20/20 14:35	40
Vinyl chloride	410		40	36	ug/L			09/20/20 14:35	40
Xylenes, Total	ND		80	26	ug/L			09/20/20 14:35	40
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	112		77 - 120			-		09/20/20 14:35	40
4-Bromofluorobenzene (Surr)	100		73 - 120					09/20/20 14:35	40
Dibromofluoromethane (Surr)	106		75 - 123					09/20/20 14:35	40
Toluene-d8 (Surr)	99		80 - 120					09/20/20 14:35	40

# **Surrogate Summary**

Client: GHD Services Inc.

Job ID: 480-175171-1

Project/Site: 11194450, GrafTech

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water Prep Type: Total/NA

			Pe	ercent Surre	ogate Reco
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(77-120)	(73-120)	(75-123)	(80-120)
480-175171-1	TB-11194450-091620-DT	109	103	109	100
480-175171-2	WG-11194450-091620-DT-001	109	102	103	100
480-175171-3	WG-11194450-091620-DT-002	106	100	101	100
480-175171-3 MS	WG-11194450-091620-DT-002	109	103	106	102
480-175171-3 MSD	WG-11194450-091620-DT-002	107	100	107	102
480-175171-4	WG-11194450-091620-DT-003	109	102	100	98
480-175171-5	WG-11194450-091620-DT-004	112	100	106	99
LCS 480-550309/5	Lab Control Sample	107	104	106	100
MB 480-550309/7	Method Blank	111	107	112	101

DCA = 1,2-Dichloroethane-d4 (Surr)

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane (Surr)

TOL = Toluene-d8 (Surr)

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Client: GHD Services Inc. Job ID: 480-175171-1

Project/Site: 11194450, GrafTech

## Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 480-550309/7

**Matrix: Water** 

1,1,1-Trichloroethane

1,1,2-Trichloroethane

1,1,2,2-Tetrachloroethane

Analyte

**Analysis Batch: 550309** 

Client Sample ID: Method Blank **Prep Type: Total/NA** 

MB MB Result Qualifier RL **MDL** Unit Dil Fac D Prepared Analyzed ND 1.0 0.82 ug/L 09/20/20 11:07 ND 1.0 0.21 ug/L 09/20/20 11:07 1.0 ND 0.23 ug/L 09/20/20 11:07 ND 1.0 0.29 ug/L 09/20/20 11:07

1,1-Dichlorethylene 1,1-Dichloroethane ND 1.0 0.38 ug/L 09/20/20 11:07 1,2-Dichloroethane ND 1.0 0.21 ug/L 09/20/20 11:07 1,2-Dichloroethene, Total ND 2.0 0.81 ug/L 09/20/20 11:07 1,2-Dichloropropane ND 1.0 0.72 ug/L 09/20/20 11:07 2-Butanone ND 10 09/20/20 11:07 1.3 ug/L 2-Hexanone ND 5.0 09/20/20 11:07

1.2 ug/L 4-Methyl-2-pentanone ND 5.0 2.1 ug/L 09/20/20 11:07 Acetone ND 10 3.0 ug/L 09/20/20 11:07 ND 1.0 0.41 ug/L Benzene 09/20/20 11:07 Bromodichloromethane ND 1.0 0.39 ug/L 09/20/20 11:07 Bromoform ND 1.0 0.26 ug/L 09/20/20 11:07

ND 0.69 Bromomethane 1.0 ug/L 09/20/20 11:07 Carbon disulfide ND 1.0 0.19 ug/L 09/20/20 11:07 Carbon tetrachloride ND 1.0 0.27 ug/L 09/20/20 11:07 Chlorobenzene ND 1.0 0.75 ug/L 09/20/20 11:07 Chloroethane ND 1.0 0.32 ug/L 09/20/20 11:07 Chloroform 0.34 ug/L ND 1.0 09/20/20 11:07

Chloromethane ND 1.0 0.35 ug/L 09/20/20 11:07 cis-1,2-Dichloroethene ND 1.0 0.81 ug/L 09/20/20 11:07 ND 1.0 cis-1,3-Dichloropropene 0.36 ug/L 09/20/20 11:07 Dibromochloromethane ND 1.0 0.32 ug/L 09/20/20 11:07 Ethylbenzene ND 1.0 0.74 ug/L 09/20/20 11:07 Methylene Chloride ND 1.0 0.44 ug/L 09/20/20 11:07 Styrene ND 1.0 0.73 ug/L 09/20/20 11:07

Tetrachloroethene ND 1.0 0.36 ug/L 09/20/20 11:07 Toluene ND 1.0 0.51 ug/L 09/20/20 11:07 trans-1,2-Dichloroethene ND 0.90 ug/L 1.0 09/20/20 11:07 trans-1,3-Dichloropropene ND 1.0 0.37 ug/L 09/20/20 11:07 1.0 Trichloroethene ND 0.46 ug/L 09/20/20 11:07 Vinyl chloride 1.0 0.90 ug/L 09/20/20 11:07 ND Xylenes, Total ND 2.0 0.66 ug/L 09/20/20 11:07

MB MB Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac 1,2-Dichloroethane-d4 (Surr) 111 77 - 120 09/20/20 11:07 107 4-Bromofluorobenzene (Surr) 73 - 120 09/20/20 11:07 Dibromofluoromethane (Surr) 112 75 - 123 09/20/20 11:07 Toluene-d8 (Surr) 101 80 - 120 09/20/20 11:07

Lab Sample ID: LCS 480-550309/5

**Matrix: Water** 

Analysis Batch: 550309								
	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
1.1.1-Trichloroethane	25.0	27.0		ua/L		108	73 - 126	

Eurofins TestAmerica, Buffalo

Prep Type: Total/NA

**Client Sample ID: Lab Control Sample** 

Client: GHD Services Inc. Project/Site: 11194450, GrafTech

# Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 480-550309/5

**Matrix: Water** 

**Analysis Batch: 550309** 

**Client Sample ID: Lab Control Sample** 

**Prep Type: Total/NA** 

Allalysis Batch. 330303	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
1,1,2,2-Tetrachloroethane	25.0	22.5		ug/L		90	76 - 120	
1,1,2-Trichloroethane	25.0	23.8		ug/L		95	76 - 122	
1,1-Dichlorethylene	25.0	25.0		ug/L		100	66 - 127	
1,1-Dichloroethane	25.0	24.6		ug/L		98	77 - 120	
1,2-Dichloroethane	25.0	24.2		ug/L		97	75 - 120	
1,2-Dichloroethene, Total	50.0	50.4		ug/L		101	72 - 124	
1,2-Dichloropropane	25.0	23.8		ug/L		95	76 - 120	
2-Butanone	125	116		ug/L		93	57 - 140	
2-Hexanone	125	119		ug/L		95	65 - 127	
4-Methyl-2-pentanone	125	114		ug/L		91	71 - 125	
Acetone	125	132		ug/L		105	56 - 142	
Benzene	25.0	23.8		ug/L		95	71 - 124	
Bromodichloromethane	25.0	25.3		ug/L		101	80 - 122	
Bromoform	25.0	24.2		ug/L		97	61 - 132	
Bromomethane	25.0	24.8		ug/L		99	55 - 144	
Carbon disulfide	25.0	24.4		ug/L		98	59 - 134	
Carbon tetrachloride	25.0	27.9		ug/L		112	72 - 134	
Chlorobenzene	25.0	23.3		ug/L		93	80 - 120	
Chloroethane	25.0	24.5		ug/L		98	69 - 136	
Chloroform	25.0	24.1		ug/L		96	73 - 127	
Chloromethane	25.0	22.6		ug/L		90	68 - 124	
cis-1,2-Dichloroethene	25.0	25.0		ug/L		100	74 - 124	
cis-1,3-Dichloropropene	25.0	24.5		ug/L		98	74 - 124	
Dibromochloromethane	25.0	25.3		ug/L		101	75 - 125	
Ethylbenzene	25.0	25.1		ug/L		100	77 - 123	
Methylene Chloride	25.0	22.9		ug/L		92	75 - 124	
Styrene	25.0	24.7		ug/L		99	80 - 120	
Tetrachloroethene	25.0	24.5		ug/L		98	74 - 122	
Toluene	25.0	23.9		ug/L		96	80 - 122	
trans-1,2-Dichloroethene	25.0	25.4		ug/L		102	73 - 127	
trans-1,3-Dichloropropene	25.0	24.9		ug/L		100	80 - 120	
Trichloroethene	25.0	24.0		ug/L		96	74 - 123	
Vinyl chloride	25.0	24.7		ug/L		99	65 - 133	
Xylenes, Total	50.0	50.2		ug/L		100	76 - 122	

LCS LCS

Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	107		77 - 120
4-Bromofluorobenzene (Surr)	104		73 - 120
Dibromofluoromethane (Surr)	106		75 - 123
Toluene-d8 (Surr)	100		80 - 120

Lab Sample ID: 480-175171-3 MS

**Matrix: Water** 

**Analysis Batch: 550309** 

•	Sample	Sample	Spike	MS	MS				%Rec.			
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits			
1,1,1-Trichloroethane	ND	F1	25.0	30.6		ug/L		122	73 - 126			
1,1,2,2-Tetrachloroethane	ND		25.0	26.6		ug/L		106	76 - 120			

Page 13 of 22

Client Sample ID: WG-11194450-091620-DT-002

Prep Type: Total/NA

Client: GHD Services Inc. Project/Site: 11194450, GrafTech

# Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 480-175171-3 MS

**Matrix: Water** 

**Analysis Batch: 550309** 

Client Sample ID: WG-11194450-091620-DT-002

**Prep Type: Total/NA** 

	-	Sample	Spike		MS				%Rec.
Analyte		Qualifier	Added		Qualifier	Unit	D	%Rec	Limits
1,1,2-Trichloroethane	ND		25.0	26.6		ug/L		107	76 - 122
1,1-Dichlorethylene	ND	F1	25.0	30.8		ug/L		123	66 - 127
1,1-Dichloroethane	ND		25.0	29.7		ug/L		119	77 - 120
1,2-Dichloroethane	ND		25.0	28.6		ug/L		114	75 - 120
1,2-Dichloroethene, Total	ND	F1	50.0	58.8		ug/L		118	72 - 124
1,2-Dichloropropane	ND		25.0	27.7		ug/L		111	76 - 120
2-Butanone	ND		125	132		ug/L		105	57 - 140
2-Hexanone	ND		125	137		ug/L		109	65 - 127
4-Methyl-2-pentanone	ND		125	136		ug/L		108	71 - 125
Acetone	ND		125	140		ug/L		112	56 - 142
Benzene	ND		25.0	28.4		ug/L		114	71 - 124
Bromodichloromethane	ND		25.0	29.0		ug/L		116	80 - 122
Bromoform	ND		25.0	27.8		ug/L		111	61 - 132
Bromomethane	ND		25.0	27.6		ug/L		111	55 - 144
Carbon disulfide	ND		25.0	28.2		ug/L		113	59 - 134
Carbon tetrachloride	ND		25.0	30.7		ug/L		123	72 - 134
Chlorobenzene	ND		25.0	27.1		ug/L		109	80 - 120
Chloroethane	ND		25.0	27.7		ug/L		111	69 - 136
Chloroform	ND		25.0	28.5		ug/L		114	73 - 127
Chloromethane	ND		25.0	25.9		ug/L		104	68 - 124
cis-1,2-Dichloroethene	ND	F1	25.0	29.1		ug/L		117	74 - 124
cis-1,3-Dichloropropene	ND		25.0	26.5		ug/L		106	74 - 124
Dibromochloromethane	ND		25.0	28.9		ug/L		116	75 - 125
Ethylbenzene	ND		25.0	27.1		ug/L		108	77 - 123
Methylene Chloride	ND		25.0	27.1		ug/L		109	75 - 124
Styrene	ND		25.0	27.8		ug/L		111	80 - 120
Tetrachloroethene	ND		25.0	26.5		ug/L		106	74 - 122
Toluene	ND		25.0	27.4		ug/L		110	80 - 122
trans-1,2-Dichloroethene	ND		25.0	29.7		ug/L		119	73 - 127
trans-1,3-Dichloropropene	ND		25.0	26.9		ug/L		108	80 - 120
Trichloroethene	ND		25.0	27.7		ug/L		111	74 - 123
Vinyl chloride	4.9		25.0	33.8		ug/L		115	65 - 133
Xylenes, Total	ND		50.0	56.3		ug/L		113	76 - 122
	MS	MS							

Surrogate **%Recovery Qualifier** Limits 1,2-Dichloroethane-d4 (Surr) 109 77 - 120 103 4-Bromofluorobenzene (Surr) 73 - 120 Dibromofluoromethane (Surr) 106 75 - 123 Toluene-d8 (Surr) 102 80 - 120

Lab Sample ID: 480-175171-3 MSD

**Matrix: Water** 

**Analysis Batch: 550309** 

Client Sample ID: WG-11194450-091620-DT-002

Prep Type: Total/NA

_	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
1,1,1-Trichloroethane	ND	F1	25.0	32.3	F1	ug/L		129	73 - 126	5	15
1,1,2,2-Tetrachloroethane	ND		25.0	26.4		ug/L		106	76 - 120	1	15
1,1,2-Trichloroethane	ND		25.0	25.5		ug/L		102	76 - 122	5	15

# **QC Sample Results**

Job ID: 480-175171-1 Client: GHD Services Inc.

Project/Site: 11194450, GrafTech

# Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 480-175171-3 MSD

**Matrix: Water** 

**Analysis Batch: 550309** 

Client Sample ID: WG-11194450-091620-DT-002

**Prep Type: Total/NA** 

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added		Qualifier	Unit	D	%Rec	Limits	RPD	Limit
1,1-Dichlorethylene	ND	F1	25.0	32.0	F1	ug/L		128	66 - 127	4	16
1,1-Dichloroethane	ND		25.0	30.0		ug/L		120	77 - 120	1	20
1,2-Dichloroethane	ND		25.0	27.6		ug/L		110	75 - 120	4	20
1,2-Dichloroethene, Total	ND	F1	50.0	62.8	F1	ug/L		126	72 - 124	7	20
1,2-Dichloropropane	ND		25.0	26.5		ug/L		106	76 - 120	5	20
2-Butanone	ND		125	121		ug/L		97	57 - 140	8	20
2-Hexanone	ND		125	129		ug/L		104	65 - 127	5	15
4-Methyl-2-pentanone	ND		125	132		ug/L		106	71 - 125	2	35
Acetone	ND		125	145		ug/L		116	56 - 142	4	15
Benzene	ND		25.0	27.7		ug/L		111	71 - 124	3	13
Bromodichloromethane	ND		25.0	27.9		ug/L		112	80 - 122	4	15
Bromoform	ND		25.0	28.0		ug/L		112	61 - 132	1	15
Bromomethane	ND		25.0	30.0		ug/L		120	55 - 144	8	15
Carbon disulfide	ND		25.0	30.0		ug/L		120	59 - 134	6	15
Carbon tetrachloride	ND		25.0	33.3		ug/L		133	72 - 134	8	15
Chlorobenzene	ND		25.0	27.2		ug/L		109	80 - 120	0	25
Chloroethane	ND		25.0	30.2		ug/L		121	69 - 136	9	15
Chloroform	ND		25.0	28.7		ug/L		115	73 - 127	1	20
Chloromethane	ND		25.0	27.8		ug/L		111	68 - 124	7	15
cis-1,2-Dichloroethene	ND	F1	25.0	31.2	F1	ug/L		125	74 - 124	7	15
cis-1,3-Dichloropropene	ND		25.0	24.4		ug/L		98	74 - 124	8	15
Dibromochloromethane	ND		25.0	28.6		ug/L		115	75 - 125	1	15
Ethylbenzene	ND		25.0	28.7		ug/L		115	77 - 123	6	15
Methylene Chloride	ND		25.0	28.6		ug/L		115	75 - 124	5	15
Styrene	ND		25.0	27.2		ug/L		109	80 - 120	2	20
Tetrachloroethene	ND		25.0	28.3		ug/L		113	74 - 122	7	20
Toluene	ND		25.0	27.7		ug/L		111	80 - 122	1	15
trans-1,2-Dichloroethene	ND		25.0	31.6		ug/L		126	73 - 127	6	20
trans-1,3-Dichloropropene	ND		25.0	25.7		ug/L		103	80 - 120	5	15
Trichloroethene	ND		25.0	27.8		ug/L		111	74 - 123	0	16
Vinyl chloride	4.9		25.0	36.8		ug/L		127	65 - 133	8	15
Xylenes, Total	ND		50.0	58.2		ug/L		116	76 - 122	3	16

Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	107		77 - 120
4-Bromofluorobenzene (Surr)	100		73 - 120
Dibromofluoromethane (Surr)	107		75 - 123
Toluene-d8 (Surr)	102		80 - 120

# **QC Association Summary**

Client: GHD Services Inc.

Job ID: 480-175171-1

Project/Site: 11194450, GrafTech

# **GC/MS VOA**

### Analysis Batch: 550309

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-175171-1	TB-11194450-091620-DT	Total/NA	Water	8260C	
480-175171-2	WG-11194450-091620-DT-001	Total/NA	Water	8260C	
480-175171-3	WG-11194450-091620-DT-002	Total/NA	Water	8260C	
480-175171-4	WG-11194450-091620-DT-003	Total/NA	Water	8260C	
480-175171-5	WG-11194450-091620-DT-004	Total/NA	Water	8260C	
MB 480-550309/7	Method Blank	Total/NA	Water	8260C	
LCS 480-550309/5	Lab Control Sample	Total/NA	Water	8260C	
480-175171-3 MS	WG-11194450-091620-DT-002	Total/NA	Water	8260C	
480-175171-3 MSD	WG-11194450-091620-DT-002	Total/NA	Water	8260C	

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**Matrix: Water** 

**Matrix: Water** 

**Matrix: Water** 

**Matrix: Water** 

Client: GHD Services Inc.

Project/Site: 11194450, GrafTech

Client Sample ID: TB-11194450-091620-DT

Date Collected: 09/16/20 00:00 Date Received: 09/16/20 13:15 Lab Sample ID: 480-175171-1

Lab Sample ID: 480-175171-2

Lab Sample ID: 480-175171-3

Lab Sample ID: 480-175171-4

Lab Sample ID: 480-175171-5

**Matrix: Water** 

Batch Dilution Batch Batch Prepared Method or Analyzed **Prep Type** Type Run **Factor** Number Analyst Lab Total/NA 8260C 09/20/20 12:58 TAL BUF Analysis 550309 AMM

Client Sample ID: WG-11194450-091620-DT-001

Date Collected: 09/16/20 11:25

Date Received: 09/16/20 13:15

Dilution **Batch Prepared** 

Batch Batch **Prep Type** Type Method Run **Factor** Number or Analyzed Analyst Lab Total/NA Analysis 8260C 550309 09/20/20 13:46 AMM TAL BUF

Client Sample ID: WG-11194450-091620-DT-002

Date Collected: 09/16/20 12:25 Date Received: 09/16/20 13:15

Prepared Batch Batch Dilution Batch **Prep Type** Method **Factor** Number or Analyzed Type Run Analyst Lab TAL BUF Total/NA Analysis 8260C 550309 09/20/20 13:22 AMM

Client Sample ID: WG-11194450-091620-DT-003

Date Collected: 09/16/20 13:00

Date Received: 09/16/20 13:15

Batch Batch Dilution Batch **Prepared Prep Type** Method Number or Analyzed Type Run **Factor** Analyst Lab Analysis 8260C 550309 09/20/20 14:12 AMM TAL BUF Total/NA 40

Client Sample ID: WG-11194450-091620-DT-004

Date Collected: 09/16/20 13:00

Date Received: 09/16/20 13:15

Batch Batch Dilution Batch Prepared Method Factor Number or Analyzed **Prep Type** Type Run Analyst Lab Total/NA Analysis 8260C 40 550309 09/20/20 14:35 AMM TAL BUF

**Laboratory References:** 

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

# **Accreditation/Certification Summary**

Client: GHD Services Inc.

Job ID: 480-175171-1

Project/Site: 11194450, GrafTech

# Laboratory: Eurofins TestAmerica, Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority New York  The following analyte the agency does not	s are included in this rep	Program  JELAP  Doort, but the laboratory is r	10026 not certified by the governing authority.	Expiration Date 09-20-20  This list may include analytes for when the state of the
Analysis Method	Prep Method	Matrix	Analyte	
8260C	<u>-</u>			-

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# **Method Summary**

Client: GHD Services Inc.

Project/Site: 11194450, GrafTech

Job ID: 480-175171-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL BUF
5030C	Purge and Trap	SW846	TAL BUF

### **Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### **Laboratory References:**

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

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# **Sample Summary**

Client: GHD Services Inc.

Project/Site: 11194450, GrafTech

Job ID: 480-175171-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asse
480-175171-1	TB-11194450-091620-DT	Water	09/16/20 00:00	09/16/20 13:15	
480-175171-2	WG-11194450-091620-DT-001	Water	09/16/20 11:25	09/16/20 13:15	
480-175171-3	WG-11194450-091620-DT-002	Water	09/16/20 12:25	09/16/20 13:15	
480-175171-4	WG-11194450-091620-DT-003	Water	09/16/20 13:00	09/16/20 13:15	
480-175171-5	WG-11194450-091620-DT-004	Water	09/16/20 13:00	09/16/20 13:15	

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CHAIN OF CUSTODY RECORD Phone:\_\_

COC NO.: 55215 -- PAGE \_ L OF \_ !

SAMPLE IDENTIFICATION  CONTACTOR  SAMPLE IDENTIFICATION  THE FITTH STATES  WIG 11194450 091620 DT 000 9 16 20 1300 WG G N X  WIG 11194450 091620 DT 000 9 16 20 1300 WG G N X  WIG 11194450 091620 DT 000 9 16 20 1300 WG G N X  WIG 11194450 091620 DT 000 9 16 20 1300 WG G N X  WIG 11194450 091620 DT 000 9 16 20 1300 WG G N X  WIG 11194450 091620 DT 000 9 16 20 1300 WG G N X  WIG 11194450 091620 DT 000 9 16 20 1300 WG G N X  WIG 11194450 091620 DT 000 9 16 20 1300 WG G N X  WIG 11194450 091620 DT 000 9 16 20 1300 WG G N X	Project No/ Phase/Task Code:	EUROPINS TEST AMERICA BUTCO	Lab Location:	SSOW ID:
Professional Superson	reflect Anna GW Sampling		Amherst	Cooler No:
SAMPLE IDENTIFICATION  Concursos to continue to contin	Holect Locationix Blud @ Without Rd			
SAMPLE IDENTIFICATION  Continued to each simple may be combrided on one fine)  T.B.: 11194450 O91620 DT 9: 16-20  WG: 11194450 O91620 DT 002 9: 16-20 125 WG: 9 N X  WG: 11194450 O91620 DT 002 9: 16-20 125 WG: 9 N X  WG: 11194450 O91620 DT 003 9: 16-20 1300 WG: 9 N X  WG: 11194450 O91620 DT 003 9: 16-20 1300 WG: 9 N X  WG: 11194450 O91620 DT 003 9: 16-20 1300 WG: 9 N X  WG: 11194450 O91620 DT 004 9: 16-20 1300 WG: 9 N X  WG: 111944	SHD Chemistry Contact:	(2)		400
SAMPLE IDENTIFICATION  Continuer for each simple may be combined on one line)  PRESERVATION (SEE BACK OF COC FOR ABBREVIATIONS)  TR-11194450 O91620 DT 9-16-20  WG-11194450 O91620 DT 9-16-20  WG-11194450 O91620 DT 002 9-16-20  WG-11194450 O91620 DT 002 9-16-20  WG-11194450 O91620 DT 002 9-16-20  WG-11194450 O91620 DT 003 9-16-20	Sampler(s):  D. Tyran	Comp (	tsent	# of Containers:
PRESERVATION - (SEE BACK OF COC FOR ABBREVIATIONS) \$\frac{7}{\times}\$\$  TB : 111944450 \( \text{O91620} \) \( \text{D1} \) \( \text{G-N} \) \( \text{C} \) \( \text{LB} \) \(	SAMPLE IDENTIFICATION (Containers for each sample may be combined on one line)	Matrix Code (see back o		COMMENTS/ SPECIAL INSTRUCTIONS:
TB-11194450 091620 DT 9-16-20 TB G M K  WG-11194450 091620 DT-002 9-16-20 1125 WG G M K  WG-11194450 091620 DT-002 9-16-20 1255 WG G M K  WG-11194450 091620 DT-003 9-16-20 1300 WG G M K  WG-11194450 091620 DT-003 9-16-20 1300 WG G M K  WG-11194450 091620 DT-003 9-16-20 1300 WG G M K  WG-11194450 091620 DT-004 9-16-20 1300 WG G M	PRESERVATION - (SEE BACK OF COC FOR			
WG-11194450-091620-05-001 9-16-20 1125 WG G-N X  WG-11194450-091620-05-003 9-16-20 1255 WG G-N X  WG-11194450-091620-05-003 9-16-20 1300 WG G-N X  WG-11194450-091620-05-004 9-16-20 1300 WG G-N X	TB-11194450 091620 DT	-	2	
WG-11194450-091620-DT-002 9-16-20-12257WG-G-N-X WG-11194450-091620-DT-003-9-16-20-13-00WG-G-N-X WG-11194450-091620-DT-004-9-16-20-13-00WG-G-N-X WG-11194450-091620-DT-004-9-16-20-13-00WG-G-N-X WG-11194450-091620-DT-004-9-16-20-13-00WG-G-N-X WG-11194450-091620-DT-004-9-16-20-13-00WG-G-N-X WG-11194450-091620-DT-004-9-16-20-13-00WG-G-N-X WG-11194450-091620-DT-004-9-18-20-13-00WG-G-N-X WG-11194450-091620-DT-004-9-18-20-18	WG 11194450 0862 51-001 9 16-20	WG GN	3	
WG 11194450 091620 Dr.003 9 16-20 1300WG G N X  WG 11194450 091620 Dr.004 9 16-20 1300WG G N X	-	G N	Xb	
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THE CHAIN OF CUSTODY IS A LEGAL DOCUMENT – ALL FIELDS MUST BE COMPLETED ACCURATELY
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GOLDENRO WHITE - Fully Executed Copy (CRA)

GOLDENROD - Sampling Crew

GHD Form: COC-10B (20110804)

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Client: GHD Services Inc.

Job Number: 480-175171-1

Login Number: 175171 List Source: Eurofins TestAmerica, Buffalo

List Number: 1

Creator: Wallace, Cameron

Creator. Wallace, Califeron		
Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time (Excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	GHD
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

# Attachment D Data Validation Memo



# Memorandum

October 14, 2020

To: Maggie Popek Ref. No.: 11194450

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From: Susan Scrocchi/adh/2 Tel: 716-205-1984

Subject: Analytical Results and Reduced Validation

Annual Groundwater Monitoring Program GrafTech International Holdings, Inc.

Niagara Falls, New York

September 2020

### 1. Introduction

This document details a validation of analytical results for groundwater samples collected in support of the Annual Groundwater Monitoring Program at the Niagara Falls, New York Site in September 2020. Samples were submitted to Eurofins-TestAmerica Laboratory located in Amherst, New York. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Standard Level 2 report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody form, finished report forms, method blank data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spikes (MS), and field QC samples.

The QA/QC criteria by which these data have been assessed are outlined in the analytical method referenced in Table 3 and applicable guidance from the document entitled "USEPA National Functional Guidelines for Superfund Organic Methods Data Review", United States Environmental Protection Agency (USEPA) 540-R-2016-002, September 2016, subsequently referred to as the "Guidelines" in this Memorandum.

## 2. Sample Holding Time and Preservation

The sample holding time criterion for the analysis is summarized in Table 3. The sample chain of custody document and analytical report were used to determine sample holding times. All samples were prepared and analyzed within the required holding time.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).





# 3. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method blank results were non-detect for the compounds of interest.

### 4. Surrogate Spike Recoveries

In accordance with the method employed, all samples, blanks, and QC samples analyzed for volatile organic compounds (VOCs) are spiked with surrogate compounds prior to sample analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for VOC determinations were spiked with the appropriate number of surrogate compounds prior to sample analysis.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries met the laboratory criteria.

## 5. Laboratory Control Sample Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the method employed, independent of sample matrix effects.

For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS contained all compounds of interest. All LCS recoveries were within the laboratory control limits, indicating acceptable analytical accuracy.

### 6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with known concentrations of the analytes of concern and analyzed as MS/MSD samples. The relative percent difference (RPD) between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed. If only the MS or MSD recovery was outside of control limits, no qualification of the data was performed based on the acceptable recovery of the companion spike and the acceptable RPD.

MS/MSD analysis was performed as specified in Table 1.

11194450Memo-2 2



The MS/MSD sample was spiked with all compounds of interest. All above criteria were met, indicating good analytical accuracy and precision.

# 7. Field QA/QC Samples

The field QA/QC consisted of one trip blank sample and one field duplicate sample set.

### 7.1 Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, a trip blank was submitted to the laboratory for VOC analysis. All results were non-detect for the compounds of interest.

### 7.2 Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, a field duplicate sample set was collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with the duplicate sample must be less than 50 percent for water samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criterion is one times the RL value for water samples.

All field duplicate results were in agreement, demonstrating acceptable sampling and analytical precision.

## 8. Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the RL but greater than the MDL were reported as estimated (J) in Table 2 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the RL in Table 2.

### 9. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable without qualification.

11194450Memo-2

Table 1

### **Sample Collection and Analysis Summary Annual Groundwater Monitoring Program** GrafTech International Holdings, Inc. Niagara Falls, New York September 2020

Sample						Analysis/Parameters	<u>-</u>
Delivery Group	Sample Identification	Location Matrix		Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	VOC	Comments
4801751711	TB-11194450-091620-DT	-	Water	09/16/2020	00:00	X	Trip Blank
4801751711	WG-11194450-091620-DT-001	GW-8B	Groundwater	09/16/2020	11:25	X	·
4801751711	WG-11194450-091620-DT-002	BW-3	Groundwater	09/16/2020	12:25	X	Matrix Spike/Matrix Spike Duplicate
4801751711	WG-11194450-091620-DT-003	BW-4	Groundwater	09/16/2020	13:00	X	
4801751711	WG-11194450-091620-DT-004	BW-4	Groundwater	09/16/2020	13:00	X	FD(WG-11194450-091620-DT-003)

### Notes:

FD - Field Duplicate sample of sample in parenthesis VOC - Volatile Organic Compounds

- Not applicable

Table 2

### Analytical Results Summary Annual Groundwater Monitoring Program GrafTech International Holdings, Inc. Niagara Falls, New York September 2020

Location ID: Sample Name: Sample Date:		BW-3 WG-11194450-091620-DT-002 09/16/2020	BW-4 WG-11194450-091620-DT-003 09/16/2020	BW-4 WG-11194450-091620-DT-004 09/16/2020 Duplicate	GW-8B WG-11194450-091620-DT-001 09/16/2020
Parameters	Unit				
Volatile Organic Compounds					
1,1,1-Trichloroethane	μg/L	1.0 U	40 U	40 U	1.0 U
1,1,2,2-Tetrachloroethane	μg/L	1.0 U	40 U	40 U	1.0 U
1,1,2-Trichloroethane	μg/L	1.0 U	40 U	40 U	1.0 U
1,1-Dichloroethane	μg/L	1.0 U	40 U	40 U	1.0 U
1,1-Dichloroethene	μg/L	1.0 U	40 U	40 U	1.0 U
1,2-Dichloroethane	μg/L	1.0 U	40 U	40 U	1.0 U
1,2-Dichloroethene (total)	μg/L	2.0 U	2300	1900	22
1,2-Dichloropropane	μg/L	1.0 U	40 U	40 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	μg/L	10 U	400 U	400 U	10 U
2-Hexanone	μg/L	5.0 U	200 U	200 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK		5.0 U	200 U	200 U	5.0 U
Acetone	μg/L	10 U	400 U	400 U	10 U
Benzene	μg/L	1.0 U	40 U	40 U	1.0 U
Bromodichloromethane	μg/L	1.0 U	40 U	40 U	1.0 U
Bromoform	μg/L	1.0 U	40 U	40 U	1.0 U
Bromomethane (Methyl bromide)	μg/L	1.0 U	40 U	40 U	1.0 U
Carbon disulfide	μg/L	1.0 U	40 U	40 U	1.0 U
Carbon tetrachloride	μg/L	1.0 U	40 U	40 U	1.0 U
Chlorobenzene	μg/L	1.0 U	40 U	40 U	1.0 U
Chloroethane	μg/L	1.0 U	40 U	40 U	1.0 U
Chloroform (Trichloromethane)	μg/L	1.0 U	29 J	22 J	1.0 U
Chloromethane (Methyl chloride)	μg/L	1.0 U	40 U	40 U	1.0 U
cis-1,2-Dichloroethene	μg/L	1.0 U	2300	1900	22
cis-1,3-Dichloropropene	μg/L	1.0 U	40 U	40 U	1.0 U
Dibromochloromethane	μg/L	1.0 U	40 U	40 U	1.0 U
Ethylbenzene	μg/L	1.0 U	40 U	40 U	1.0 U
Methylene chloride	μg/L	1.0 U	40 U	40 U	1.0 U
Styrene	μg/L	1.0 U	40 U	40 U	1.0 U
Tetrachloroethene	μg/L	1.0 U	1600	1200	1.0 U
Toluene	μg/L	1.0 U	40 U	40 U	1.0 U
trans-1,2-Dichloroethene	μg/L	1.0 U	40 U	40 U	1.0 U
trans-1,3-Dichloropropene	μg/L	1.0 U	40 U	40 U	1.0 U
Trichloroethene	μg/L	1.0 U	1200	930	3.6
Vinyl chloride	μg/L	4.9	480	410	6.0
Xylenes (total)	μg/L	2.0 U	80 U	80 U	2.0 U

#### Notes:

U - Not detected at the associated reporting limit

J - Estimated concentration

### Table 3

# Analytical Methods Annual Groundwater Monitoring Program GrafTech International Holdings, Inc. Niagara Falls, New York September 2020

			Holding Time Collection to Analysis
Parameter	Method	Matrix	(Days)
Volatile Organic Compounds (VOCs)	SW-846 8260B	Groundwater	14

Notes:

Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

# Appendix E

Copy of Signed Institutional and Engineering Controls Certification Form

### NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation

625 Broadway, 11<sup>th</sup> Floor, Albany, NY 12233-7020 P: (518)402-9543 | F: (518)402-9547 www.dec.ny.gov

11/16/2020

Ms. Julianne Snyder Project Manager GrafTech International Holdings, Inc. 982 Keynote Circle Brooklyn Heights, OH 44131 julianne.snyder@graftech.com

Re: Reminder Notice: Site Management Periodic Review Report and IC/EC Certification Submittal

Site Name: GrafTech Intl. Hlds. Inc. (formerly Union Carbide)

Site No.: 932035

**Site Address:** Hyde Park Boulevard

Niagara, NY 14303

### Dear Ms. Julianne Snyder:

This letter serves as a reminder that sites in active Site Management (SM) require the submittal of a periodic progress report. This report, referred to as the Periodic Review Report (PRR), must document the implementation of, and compliance with, site-specific SM requirements. Section 6.3(b) of DER-10 *Technical Guidance for Site Investigation and Remediation* (available online at http://www.dec.ny.gov/regulations/67386.html) provides guidance regarding the information that must be included in the PRR. Further, if the site is comprised of multiple parcels, then you as the Certifying Party must arrange to submit one PRR for all parcels that comprise the site. The PRR must be received by the Department no later than **January 30, 2021**. Guidance on the content of a PRR is enclosed.

Site Management is defined in regulation (6 NYCRR 375-1.2(at)) and in Chapter 6 of DER-10. Depending on when the remedial program for your site was completed, SM may be governed by multiple documents (e.g., Operation, Maintenance, and Monitoring Plan; Soil Management Plan) or one comprehensive Site Management Plan.

A Site Management Plan (SMP) may contain one or all of the following elements, as applicable to the site: a plan to maintain institutional controls and/or engineering controls ("IC/EC Plan"); a plan for monitoring the performance and effectiveness of the selected remedy ("Monitoring Plan"); and/or a plan for the operation and maintenance of the selected remedy ("O&M Plan"). Additionally, the technical requirements for SM are stated in the decision document (e.g., Record of Decision) and, in some cases, the legal agreement directing the remediation of the site (e.g., order on consent, voluntary agreement, etc.).

When you submit the PRR (by the due date above), include the enclosed forms documenting that all SM requirements are being met. The Institutional Controls (ICs) portion of the form (Box 6) must be signed by you or your designated representative. The Engineering Controls (ECs) portion of the form (Box 7) must be signed by a Qualified Environmental Professional (QEP). If you cannot certify that all SM requirements are being met, you must submit a Corrective Measures Work Plan that identifies the actions to be taken to restore compliance. The work plan must include a schedule to be approved by the Department. The Periodic Review process will not be considered complete until all necessary corrective measures are completed and all required controls are certified. Instructions for completing the certifications are enclosed.



All site-related documents and data, including the PRR, must be submitted in electronic format to the Department of Environmental Conservation. The required format for documents is an Adobe PDF file with optical character recognition and no password protection. Data must be submitted as an electronic data deliverable (EDD) according to the instructions on the following webpage:

### https://www.dec.ny.gov/chemical/62440.html

Documents may be submitted to the project manager either through electronic mail or by using the Department's file transfer service at the following webpage:

### https://fts.dec.state.ny.us/fts/

The Department will not approve the PRR unless all documents and data generated in support of the PRR have been submitted using the required formats and protocols.

You may contact Andrew Zwack, the Project Manager, at 716-851-7284 or andrew.zwack@dec.ny.gov with any questions or concerns about the site. Please notify the project manager before conducting inspections or field work. You may also write to the project manager at the following address:

New York State Department of Environmental Conservation 270 Michigan Ave

Buffalo, NY 14203-2915

### **Enclosures**

PRR General Guidance Certification Form Instructions Certification Forms

ec: w/ enclosures

Andrew Zwack, Project Manager

Stanley Radon, Hazardous Waste Remediation Supervisor, Region 9

### **Enclosure 1**

#### **Certification Instructions**

### **I. Verification of Site Details** (Box 1 and Box 2):

Answer the three questions in the Verification of Site Details Section. The Owner and/or Qualified Environmental Professional (QEP) may include handwritten changes and/or other supporting documentation, as necessary.

### II. Certification of Institutional Controls/ Engineering Controls (IC/ECs)(Boxes 3, 4, and 5)

- 1.1.1. Review the listed IC/ECs, confirming that all existing controls are listed, and that all existing controls are still applicable. If there is a control that is no longer applicable the Owner / Remedial Party should petition the Department separately to request approval to remove the control.
- 2. In Box 5, complete certifications for all Plan components, as applicable, by checking the corresponding checkbox.
- 3. If you <u>cannot</u> certify "YES" for each Control listed in Box 3 & Box 4, sign and date the form in Box 5. Attach supporting documentation that explains why the **Certification** cannot be rendered, as well as a plan of proposed corrective measures, and an associated schedule for completing the corrective measures. Note that this **Certification** form must be submitted even if an IC or EC cannot be certified; however, the certification process will not be considered complete until corrective action is completed.

If the Department concurs with the explanation, the proposed corrective measures, and the proposed schedule, a letter authorizing the implementation of those corrective measures will be issued by the Department's Project Manager. Once the corrective measures are complete, a new Periodic Review Report (with IC/EC Certification) must be submitted within 45 days to the Department. If the Department has any questions or concerns regarding the PRR and/or completion of the IC/EC Certification, the Project Manager will contact you.

### **III. IC/EC Certification by Signature** (Box 6 and Box 7):

If you certified "YES" for each Control, please complete and sign the IC/EC Certifications page as follows:

- For the Institutional Controls on the use of the property, the certification statement in Box 6 shall be completed and may be made by the property owner or designated representative.
- For the Engineering Controls, the certification statement in Box 7 must be completed by a Professional Engineer or Qualified Environmental Professional, as noted on the form.



# Enclosure 2 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION Site Management Periodic Review Report Notice Institutional and Engineering Controls Certification Form



Sit	e No.	Site Details 932035	Box 1						
Site Name GrafTech Intl. Hlds. Inc. (formerly Union Carbide)									
City	Site Address: Hyde Park Boulevard Zip Code: 14303 City/Town: Niagara County: Niagara Site Acreage: 61.800								
Re	Reporting Period: December 31, 2019 to December 31, 2020								
			YES	NO					
1.	Is the inform	mation above correct?	$\checkmark$						
	If NO, inclu	de handwritten above or on a separate sheet.							
2.		or all of the site property been sold, subdivided, merged, or undergone a nendment during this Reporting Period?		<b>√</b>					
3.		peen any change of use at the site during this Reporting Period RR 375-1.11(d))?		V					
4.		ederal, state, and/or local permits (e.g., building, discharge) been issued e property during this Reporting Period?		$\checkmark$					
		wered YES to questions 2 thru 4, include documentation or evidence nentation has been previously submitted with this certification form.							
5.	Is the site of	currently undergoing development?		$\checkmark$					
			Box 2						
			YES	NO					
6.	Is the curre	ent site use consistent with the use(s) listed below?	<b>√</b>						
7.	Are all ICs	in place and functioning as designed?   √							
IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.									
A Corrective Measures Work Plan must be submitted along with this form to address these issues.									
		N/A							
Sia	nature of Ow	ner. Remedial Party or Designated Representative Date							

SITE NO. 932035 Box 3

**Description of Institutional Controls** 

**Parcel** 

Owner

**Institutional Control** 

130.20-1-1

GrafTech International Holdings Inc.

Site Management Plan

Monitoring Plan

Per the Site Management Plan dated December 17, 2013; groundwater monitoring and landfill cap maintenance is required.

Box 4

**Description of Engineering Controls** 

Parcel

**Engineering Control** 

130.20-1-1

Monitoring Wells Fencing/Access Control

Cover System

Constructed cover system and closed under Division of Materials Management Part 360 in 1987.

Box 5
-------

	Periodic Review Report (PRR) Certification Statements							
1.	I certify by checking "YES" below that:							
	a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the Engineering Control certification;							
	b) to the best of my knowledge and belief, the work and conclusions described in this certifica are in accordance with the requirements of the site remedial program, and generally accepted							
	engineering practices; and the information presented is accurate and compete.  YES NO							
	lacksquare							
2.	For each Engineering control listed in Box 4, I certify by checking "YES" below that all of the following statements are true:							
	(a) The Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;							
	(b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;							
	<ul><li>(c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;</li><li>(d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and</li></ul>							
	(e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.							
	YES NO							
	$oldsymbol{arNotation}$							
IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.								
A Corrective Measures Work Plan must be submitted along with this form to address these issues.								
	N/A							
Signature of Owner, Remedial Party or Designated Representative Date								

### IC CERTIFICATIONS SITE NO. 932035

Box 6

### SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 1,2, and 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Thomas R. Jacques		Brooklyn Heights, Ohio 44131,
print name	print business	address
am certifying as Designated Re	epresentative of Owner	(Owner or Remedial Party)
for the Site named in the Site De	etails Section of this form.	
1. R. Jayme		1-21-21
Signature of Owner, Remedial F Rendering Certification	Party, or Designated Representative	Date

### **EC CERTIFICATIONS**

Box 7

# **Qualified Environmental Professional Signature**

I certify that all information in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Julianne M. Snyder	at 982 Keynote Circ	le, Brooklyn Heigh	ts, Ohio 44131,	
print name	print bus	print business address		
am certifying as a Qualified Environn	nental Professional for the	e Owner		
		(Owner or Remedial Party)		
Os. 1: 100 S	X 1			
<u>Chilianne M. E</u>	myser	N/A	1/21/2021	
Signature of Qualified Environmenta		Stamp	Date	
the Owner of Remedial Party, Rende	ering Certification	(Required for PE)		

# Enclosure 3 Periodic Review Report (PRR) General Guidance

### I. Executive Summary: (1/2-page or less)

- A. Provide a brief summary of site, nature and extent of contamination, and remedial history.
- B. Effectiveness of the Remedial Program Provide overall conclusions regarding;
  - 1. progress made during the reporting period toward meeting the remedial objectives for the site
  - 2. the ultimate ability of the remedial program to achieve the remedial objectives for the site.

### C. Compliance

- 1. Identify any areas of non-compliance regarding the major elements of the Site Management Plan (SMP, i.e., the Institutional/Engineering Control (IC/EC) Plan, the Monitoring Plan, and the Operation & Maintenance (O&M) Plan).
- 2. Propose steps to be taken and a schedule to correct any areas of non-compliance.

### D. Recommendations

- 1. recommend whether any changes to the SMP are needed
- 2. recommend any changes to the frequency for submittal of PRRs (increase, decrease)
- 3. recommend whether the requirements for discontinuing site management have been met.

### II. Site Overview (one page or less)

- A. Describe the site location, boundaries (figure), significant features, surrounding area, and the nature extent of contamination prior to site remediation.
  - B. Describe the chronology of the main features of the remedial program for the site, the components of the selected remedy, cleanup goals, site closure criteria, and any significant changes to the selected remedy that have been made since remedy selection.

### III. Evaluate Remedy Performance, Effectiveness, and Protectiveness

Using tables, graphs, charts and bulleted text to the extent practicable, describe the effectiveness of the remedy in achieving the remedial goals for the site. Base findings, recommendations, and conclusions on objective data. Evaluations and should be presented simply and concisely.

### IV. IC/EC Plan Compliance Report (if applicable)

- A. IC/EC Requirements and Compliance
  - 1. Describe each control, its objective, and how performance of the control is evaluated.
  - 2. Summarize the status of each goal (whether it is fully in place and its effectiveness).
  - 3. Corrective Measures: describe steps proposed to address any deficiencies in ICECs.
  - 4. Conclusions and recommendations for changes.

### B. IC/EC Certification

1. The certification must be complete (even if there are IC/EC deficiencies), and certified by the appropriate party as set forth in a Department-approved certification form(s).

### V. Monitoring Plan Compliance Report (if applicable)

- A. Components of the Monitoring Plan (tabular presentations preferred) Describe the requirements of the monitoring plan by media (i.e., soil, groundwater, sediment, etc.) and by any remedial technologies being used at the site.
- B. Summary of Monitoring Completed During Reporting Period Describe the monitoring tasks actually completed during this PRR reporting period. Tables and/or figures should be used to show all data.
- C. Comparisons with Remedial Objectives Compare the results of all monitoring with the remedial objectives for the site. Include trend analyses where possible.
- D. Monitoring Deficiencies Describe any ways in which monitoring did not fully comply with the monitoring plan.
- E. Conclusions and Recommendations for Changes Provide overall conclusions regarding the monitoring completed and the resulting evaluations regarding remedial effectiveness.

### VI. Operation & Maintenance (O&M) Plan Compliance Report (if applicable)

- A. Components of O&M Plan Describe the requirements of the O&M plan including required activities, frequencies, recordkeeping, etc.
- B. Summary of O&M Completed During Reporting Period Describe the O&M tasks actually completed during this PRR reporting period.
- C. Evaluation of Remedial Systems Based upon the results of the O&M activities completed, evaluated

- the ability of each component of the remedy subject to O&M requirements to perform as designed/expected.
- D. O&M Deficiencies Identify any deficiencies in complying with the O&M plan during this PRR reporting period.
- E. Conclusions and Recommendations for Improvements Provide an overall conclusion regarding O&M for the site and identify any suggested improvements requiring changes in the O&M Plan.

### VII. Overall PRR Conclusions and Recommendations

- A. Compliance with SMP For each component of the SMP (i.e., IC/EC, monitoring, O&M), summarize;
  - 1. whether all requirements of each plan were met during the reporting period
  - 2. any requirements not met
  - 3. proposed plans and a schedule for coming into full compliance.
- B. Performance and Effectiveness of the Remedy Based upon your evaluation of the components of the SMP, form conclusions about the performance of each component and the ability of the remedy to achieve the remedial objectives for the site.

### C. Future PRR Submittals

- 1. Recommend, with supporting justification, whether the frequency of the submittal of PRRs should be changed (either increased or decreased).
- 2. If the requirements for site closure have been achieved, contact the Departments Project Manager for the site to determine what, if any, additional documentation is needed to support a decision to discontinue site management.

### VIII. Additional Guidance

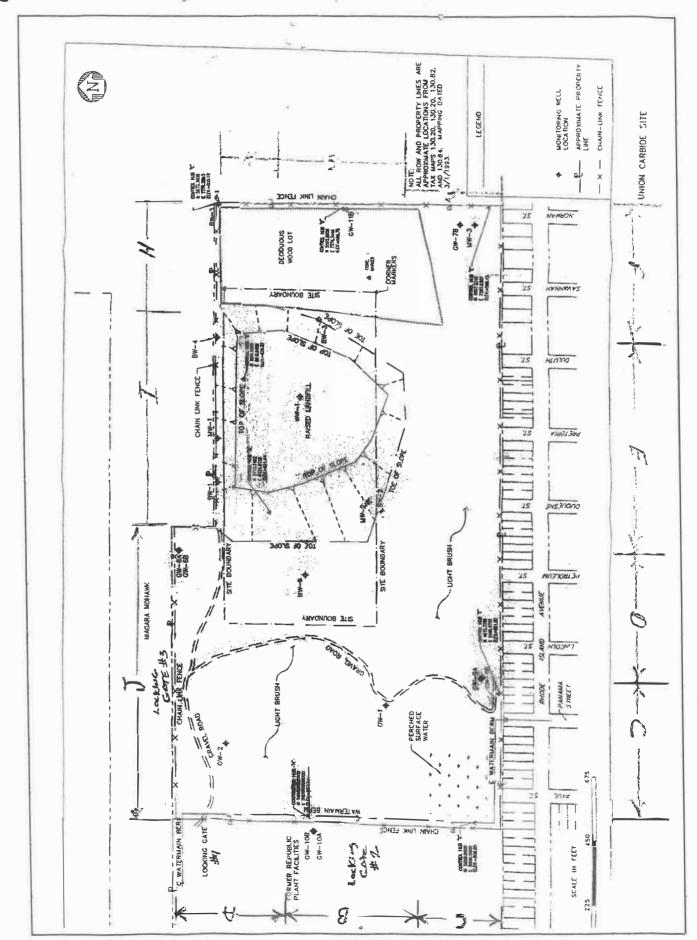
Additional guidance regarding the preparation and submittal of an acceptable PRR can be obtained from the Departments Project Manager for the site.

## Appendix F

 $Copies\ of\ Weekly\ General\ Land fill\ and\ Site\ Security\ Inspection\ Reports-2020$ 

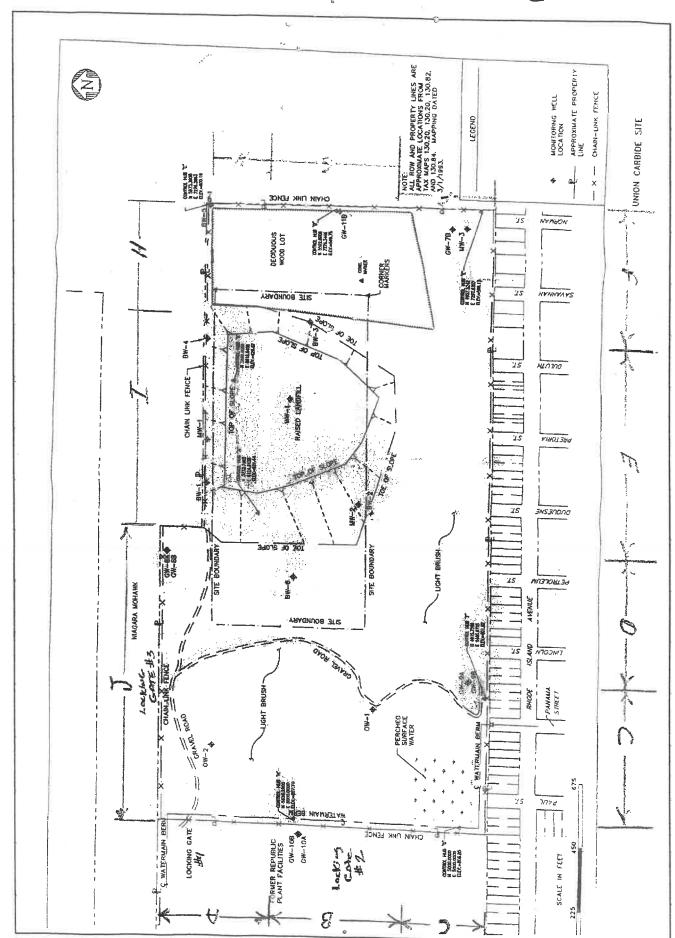
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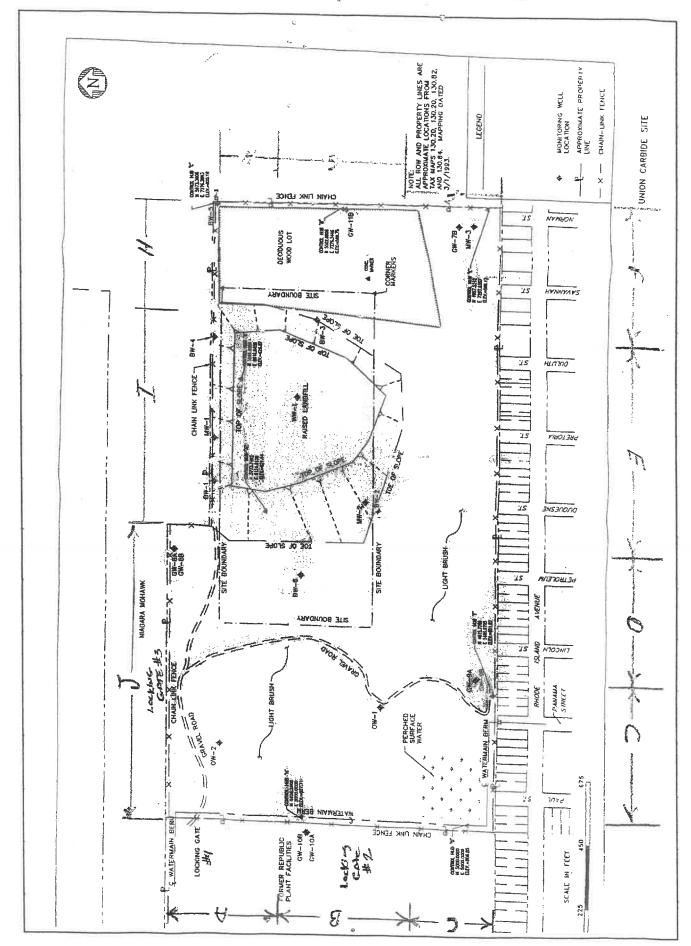
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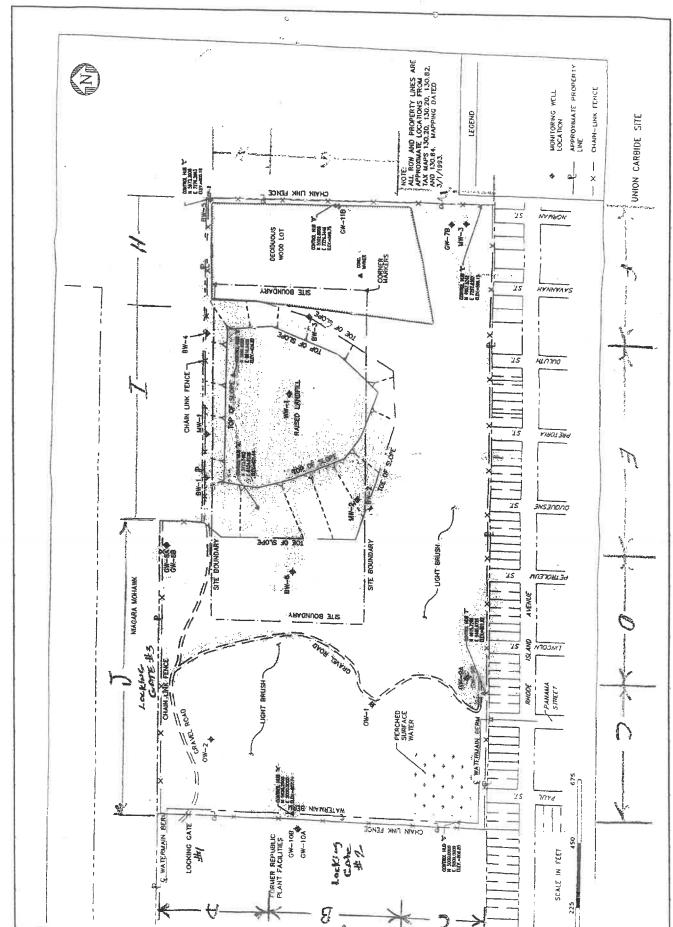
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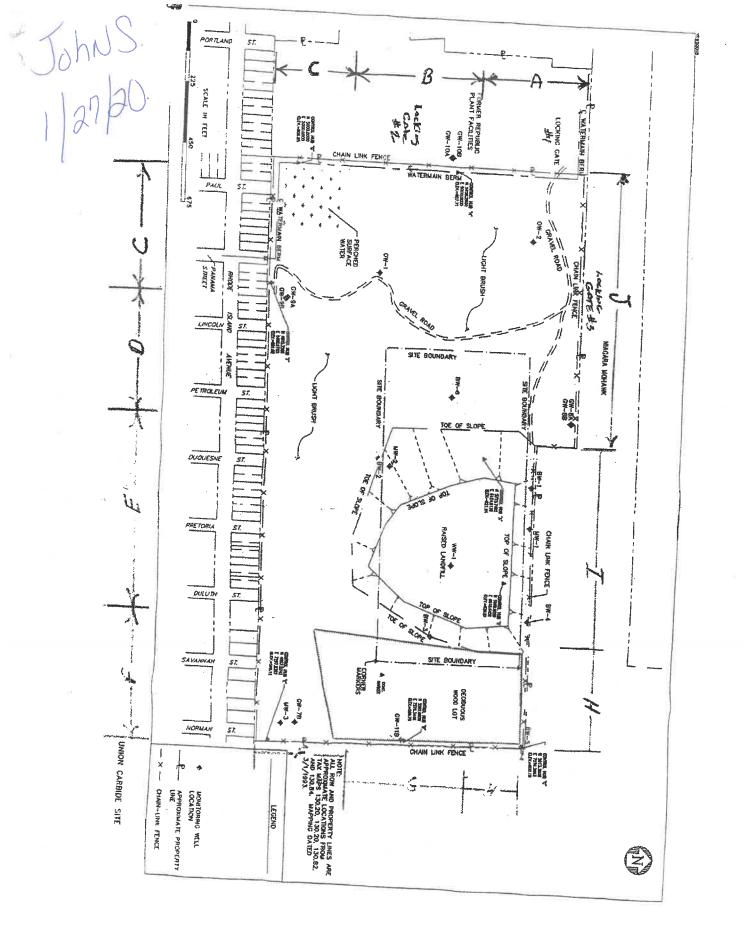
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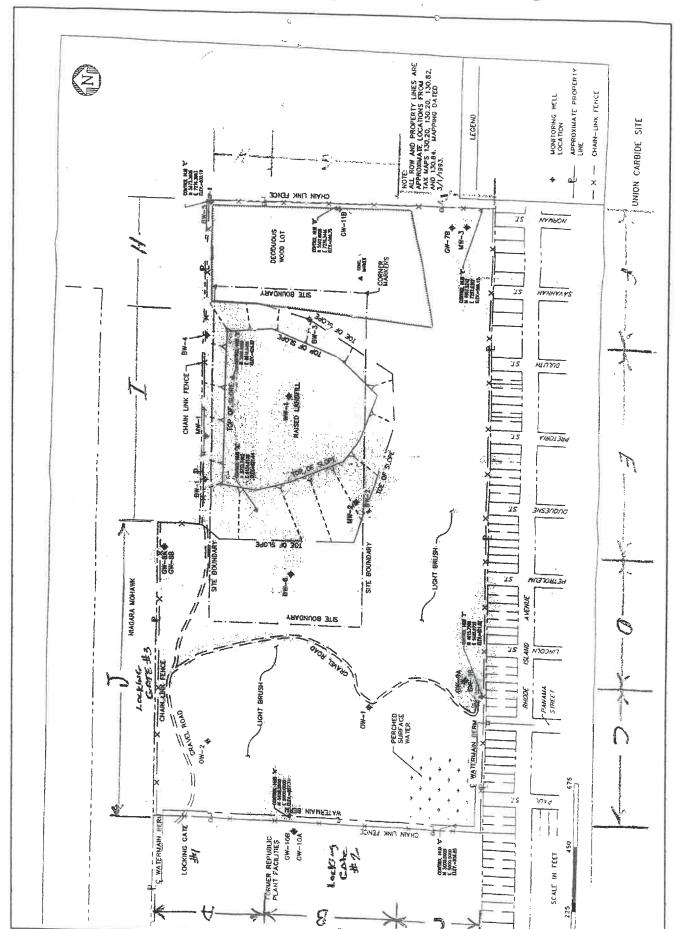


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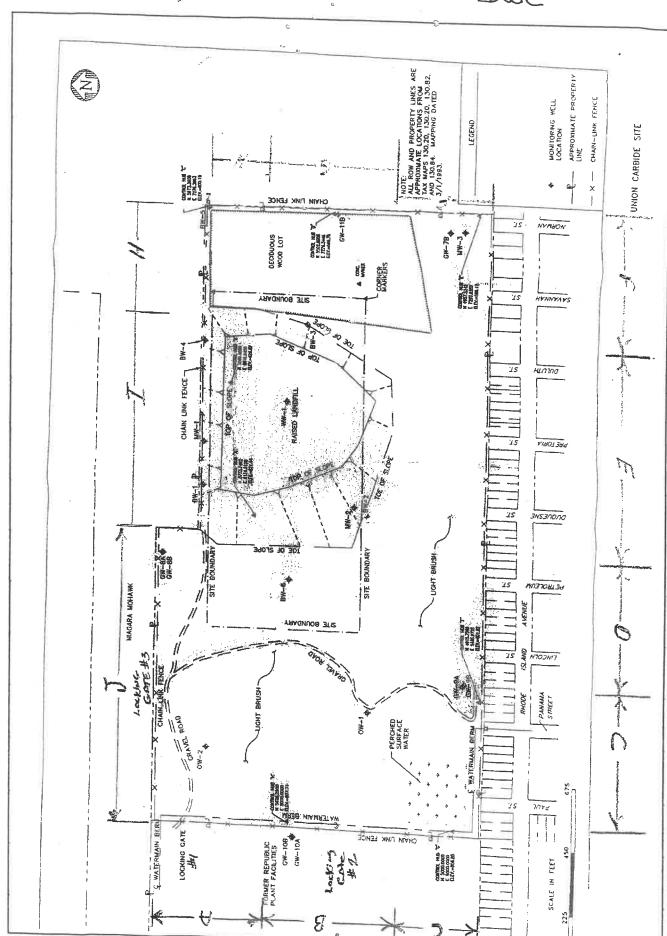
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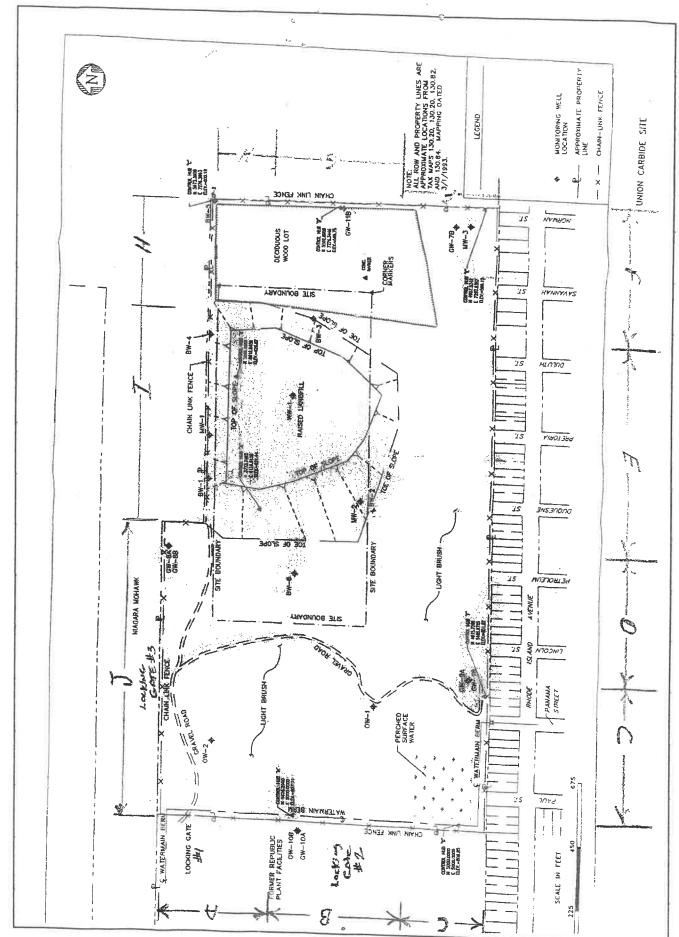
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# APPENDIX A - WEEKLY GENERAL LANDFILL AND SITE SECURITY INSPECTION REPORT

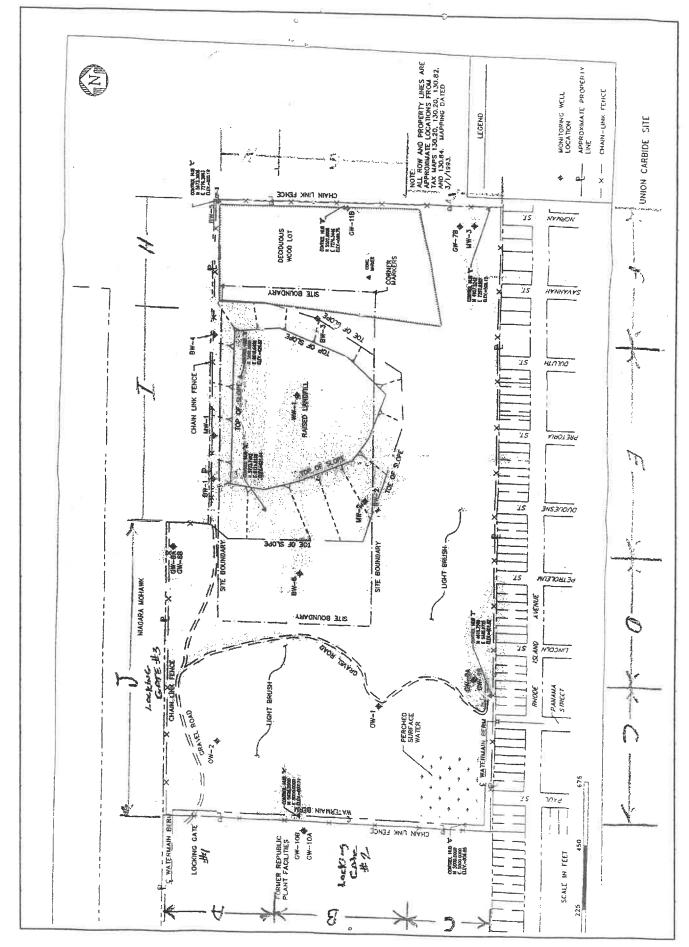
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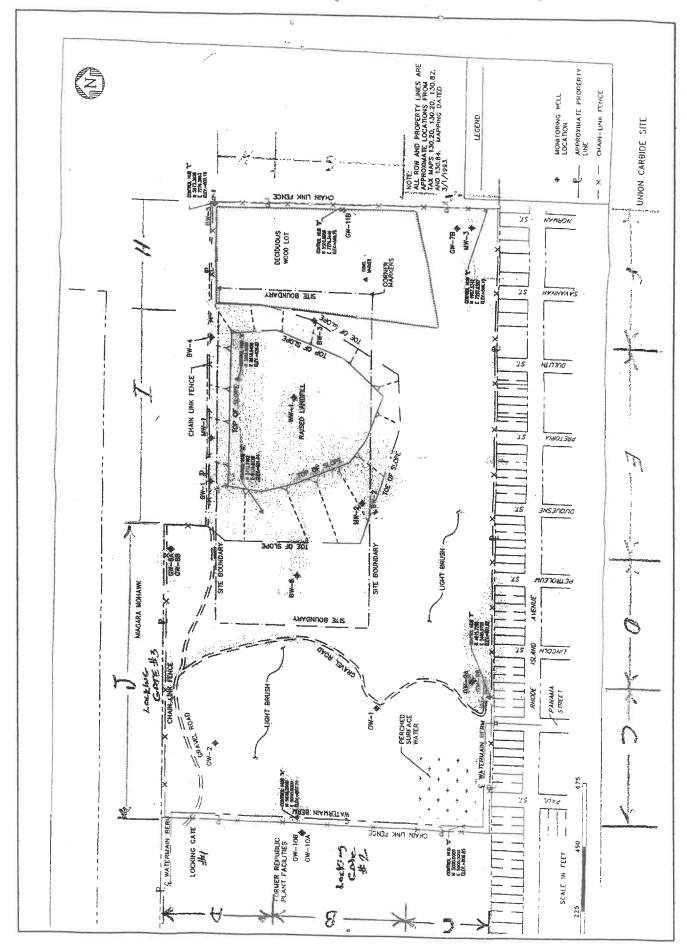
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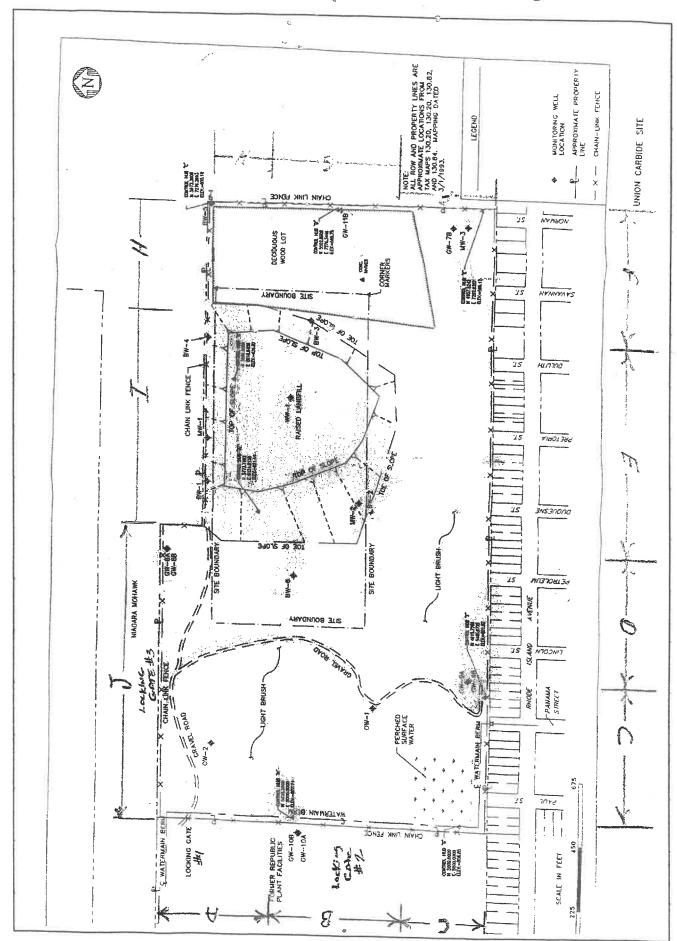
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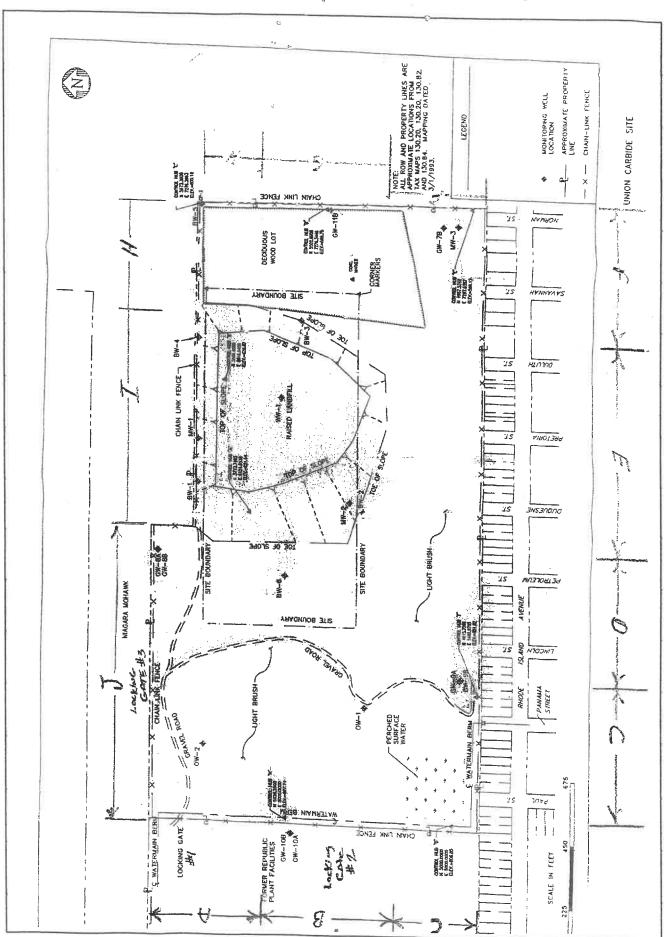
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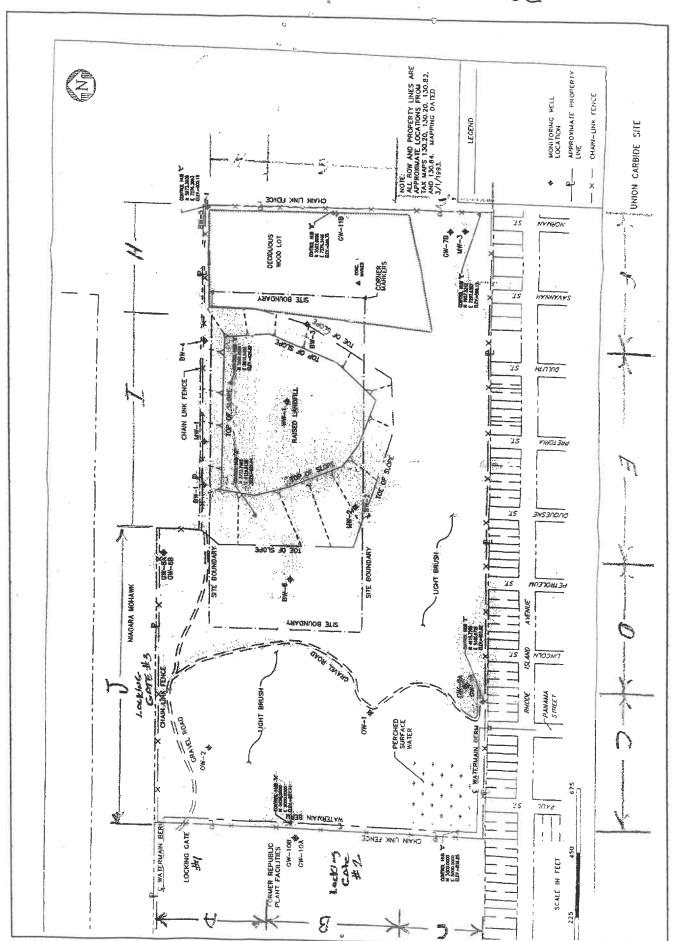


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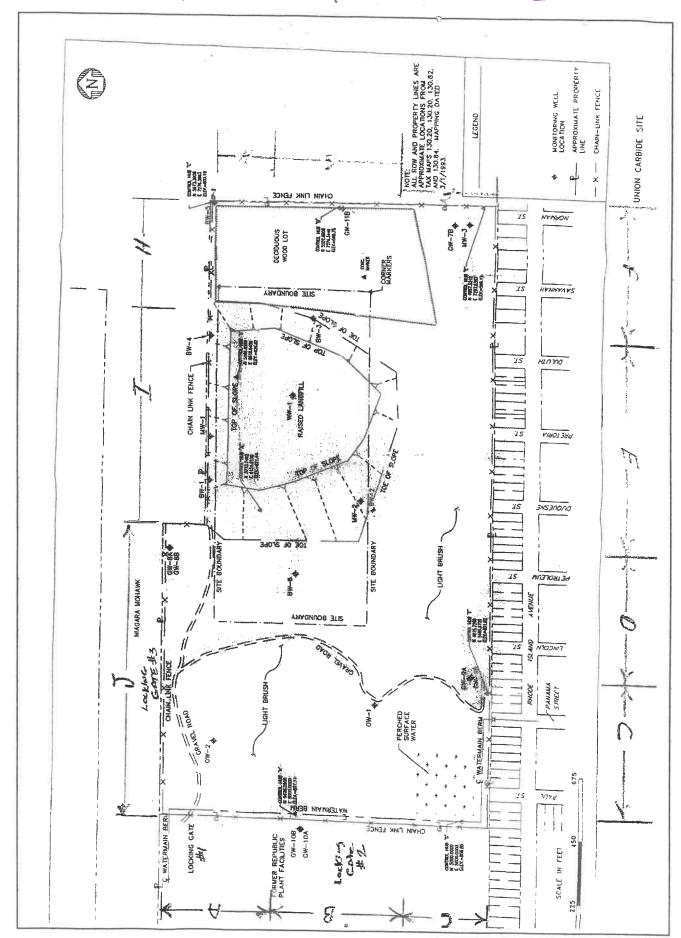
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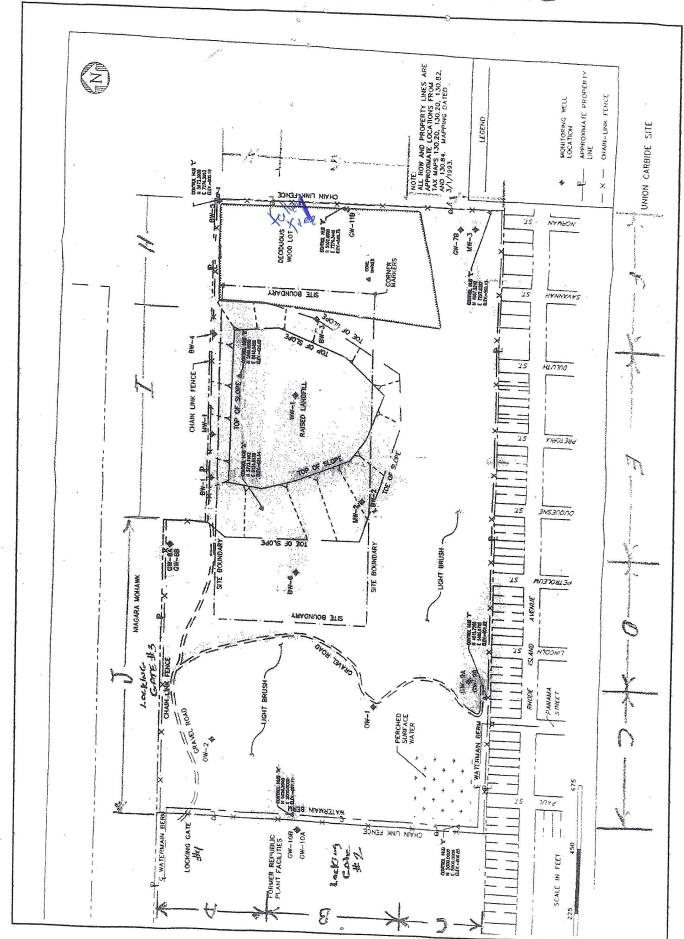
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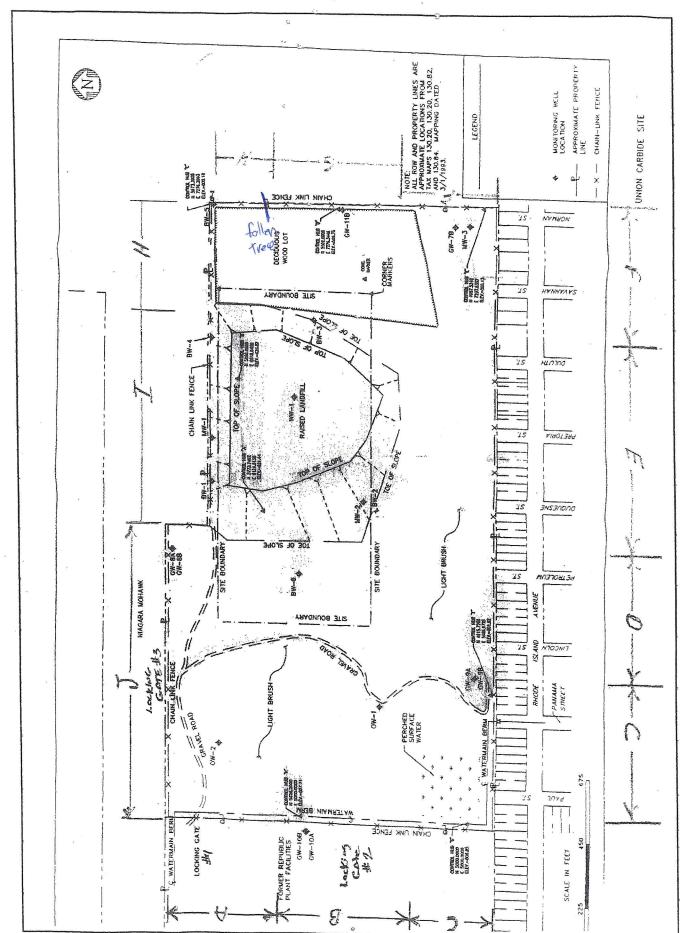
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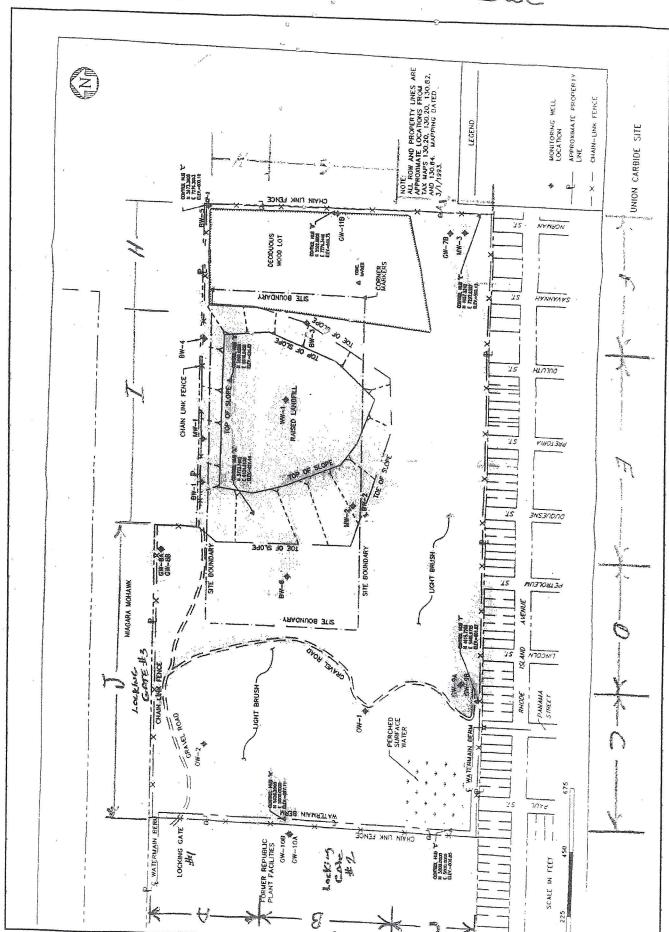
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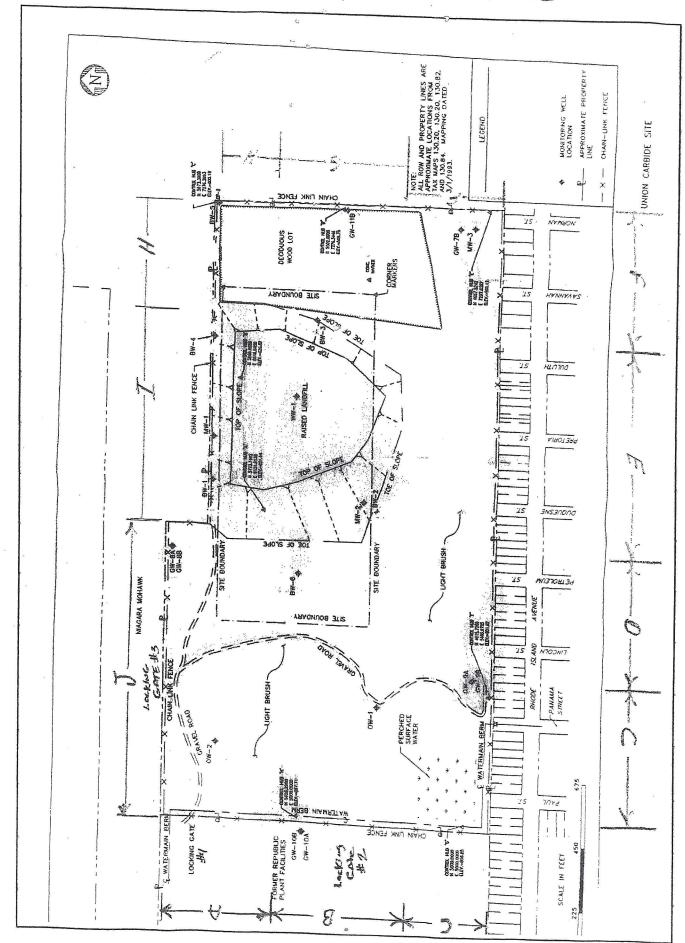
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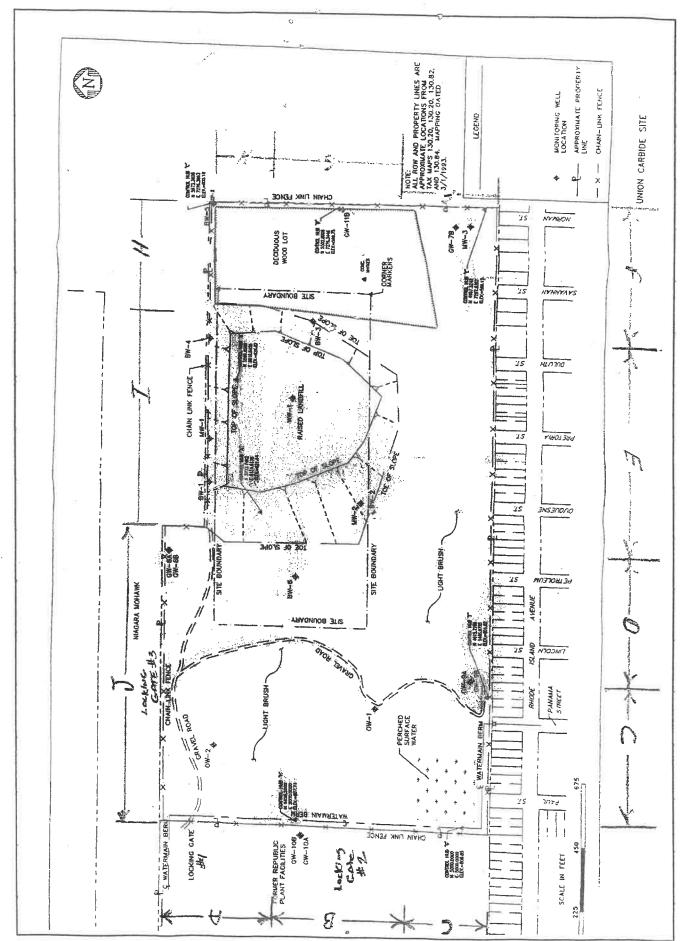
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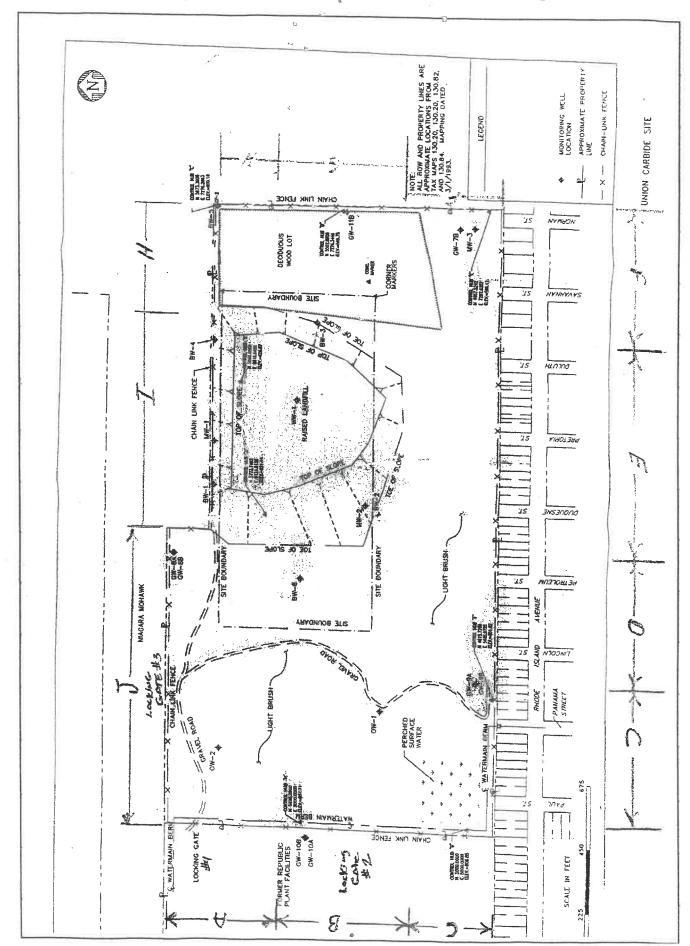
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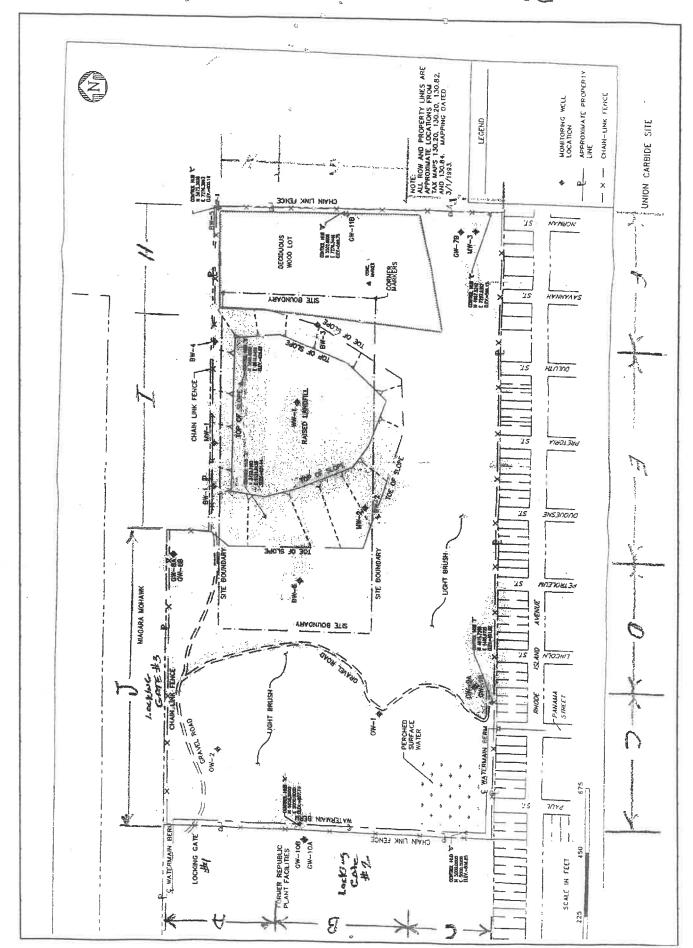
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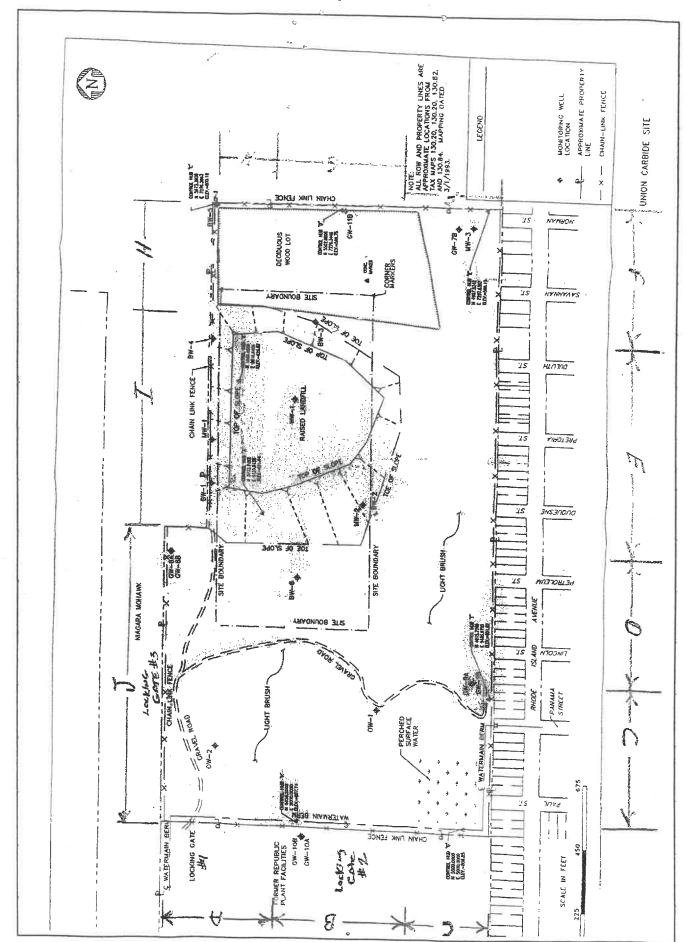
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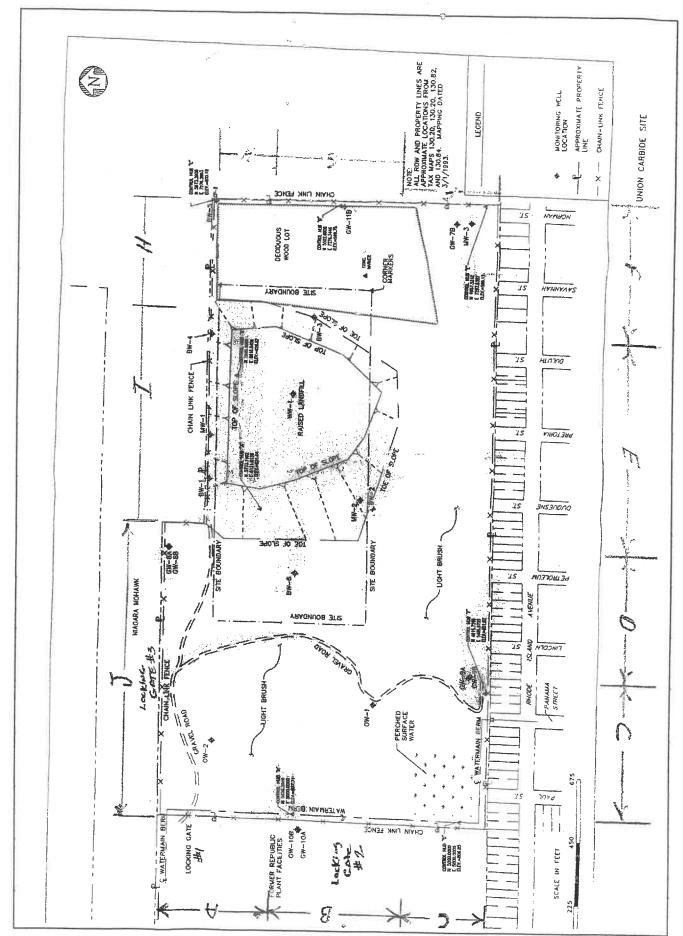


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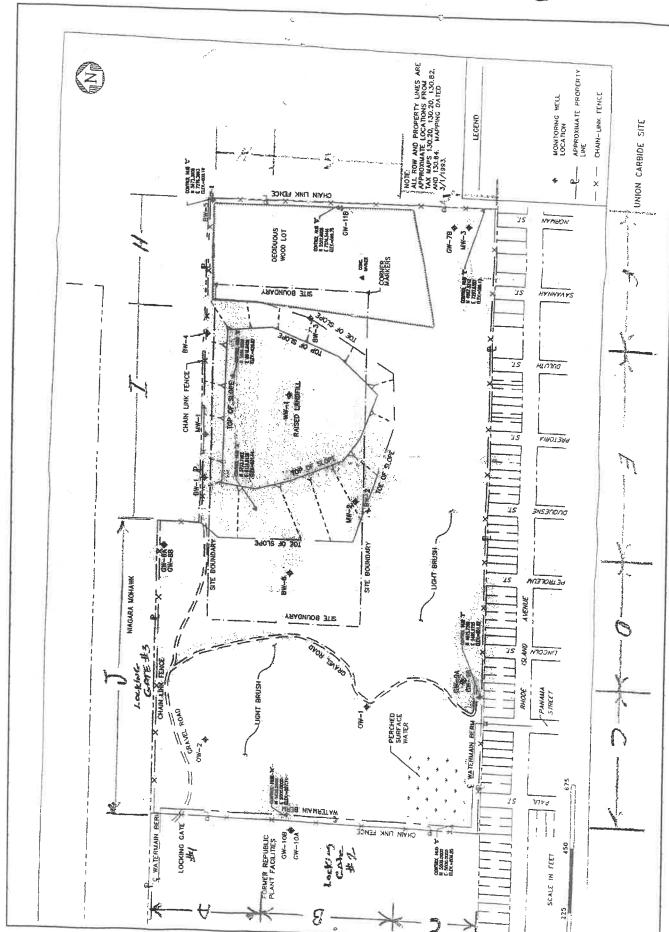
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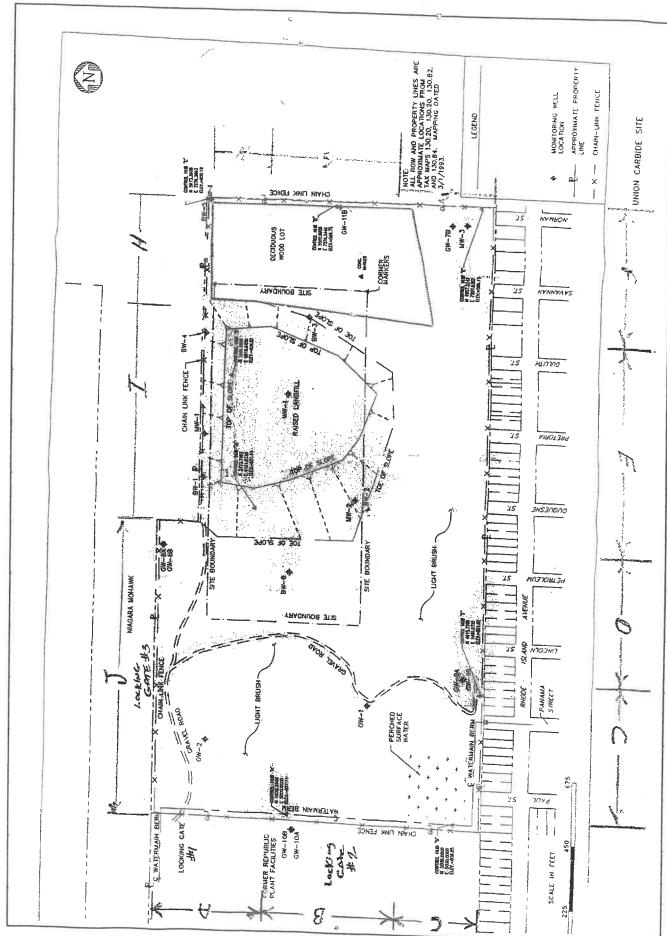
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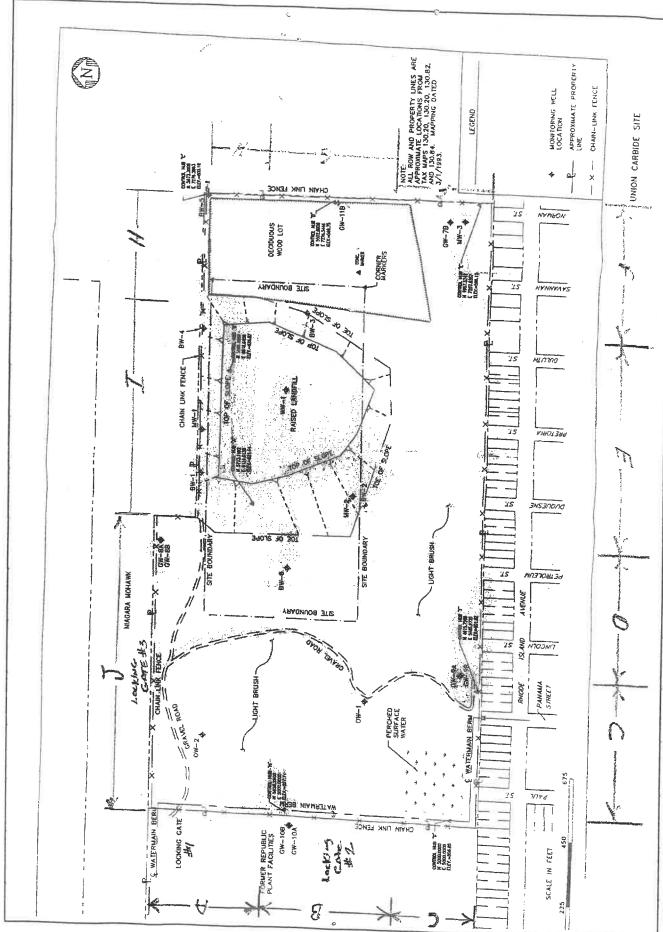


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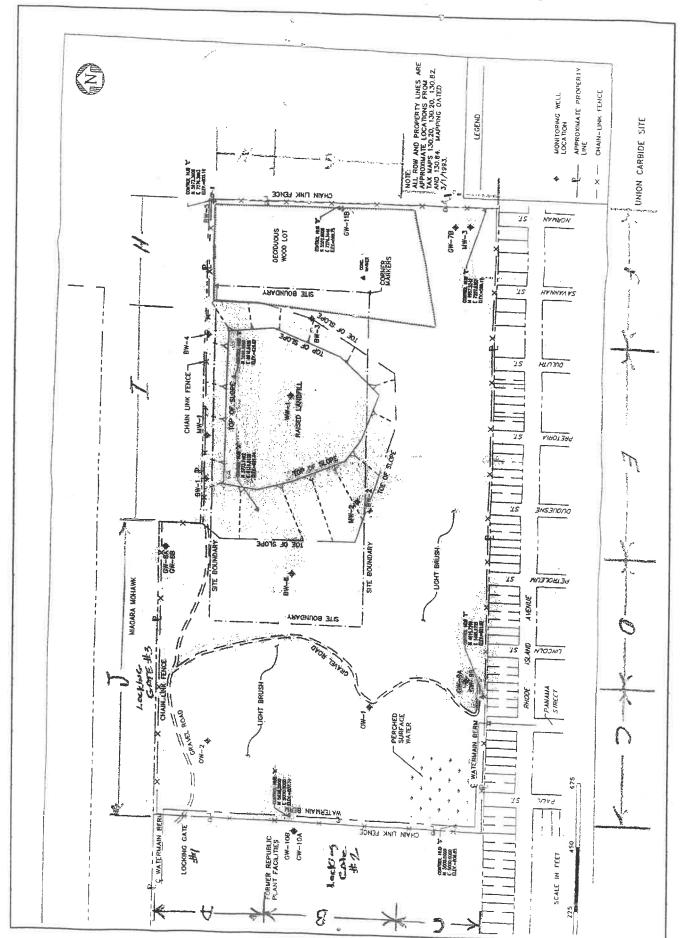
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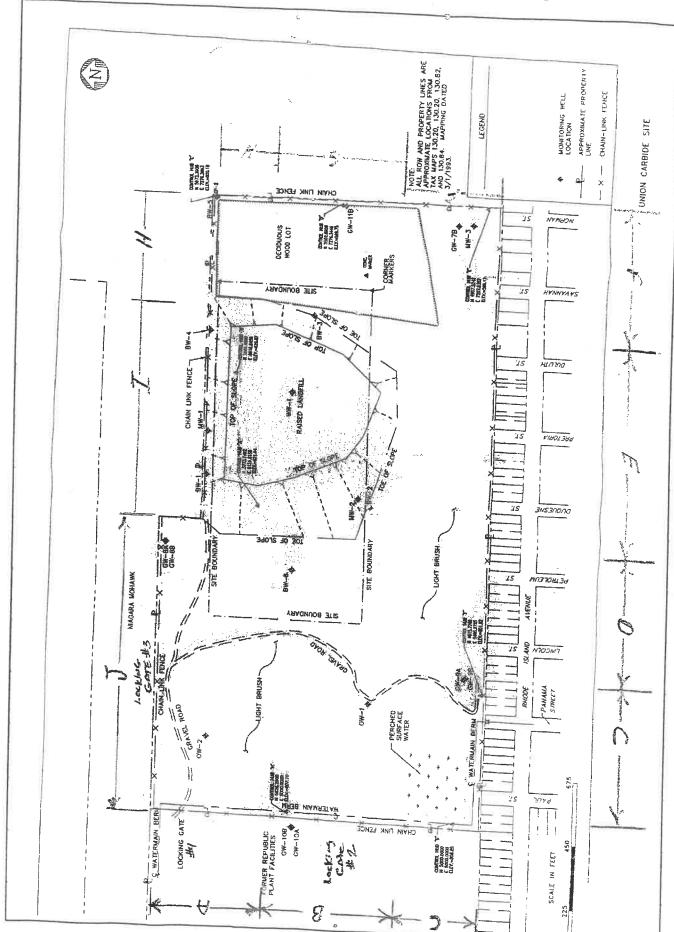


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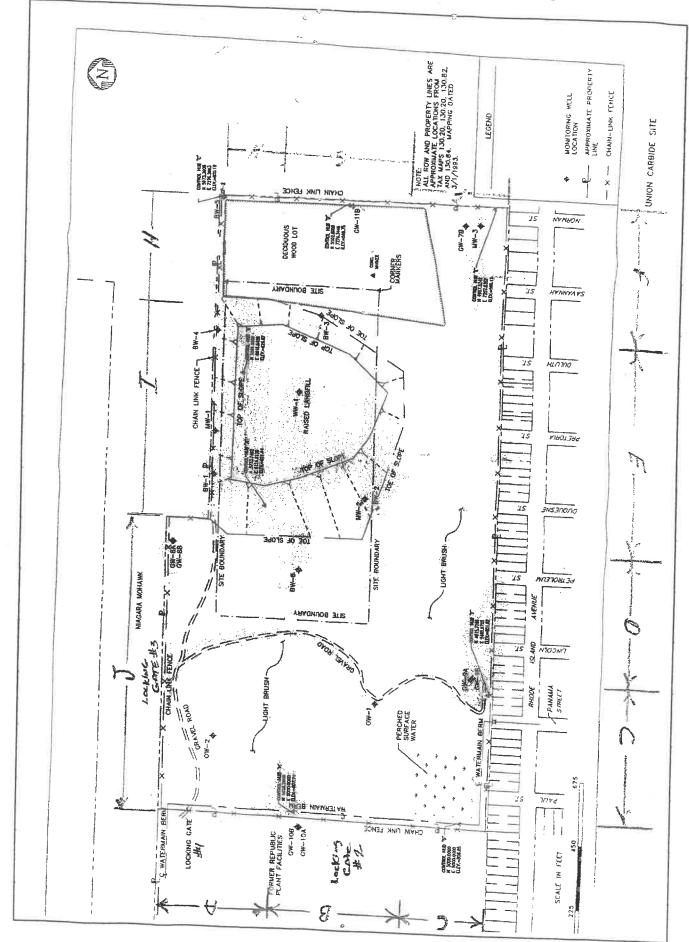
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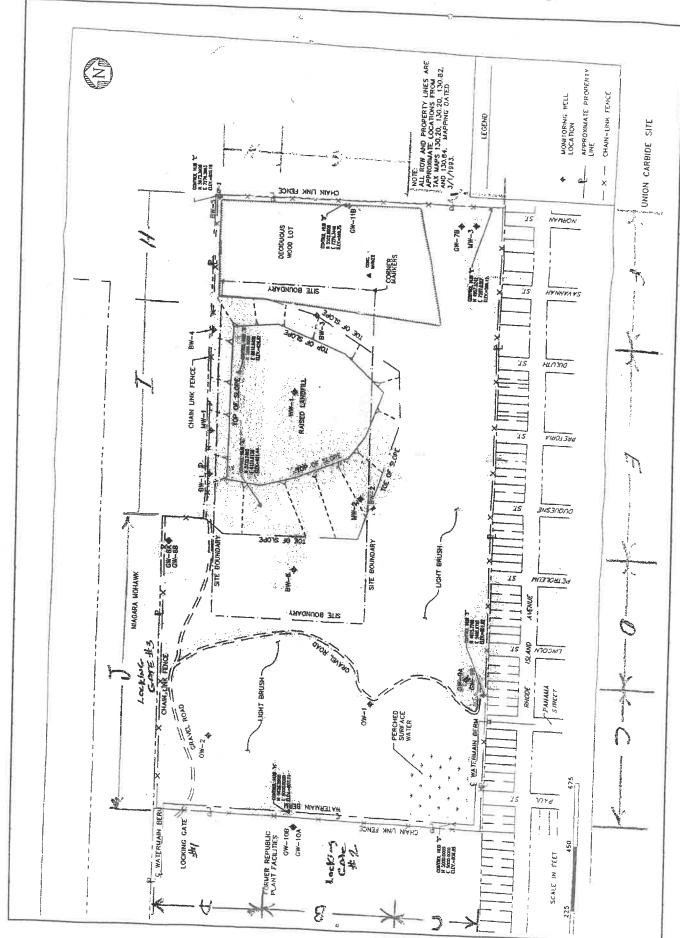
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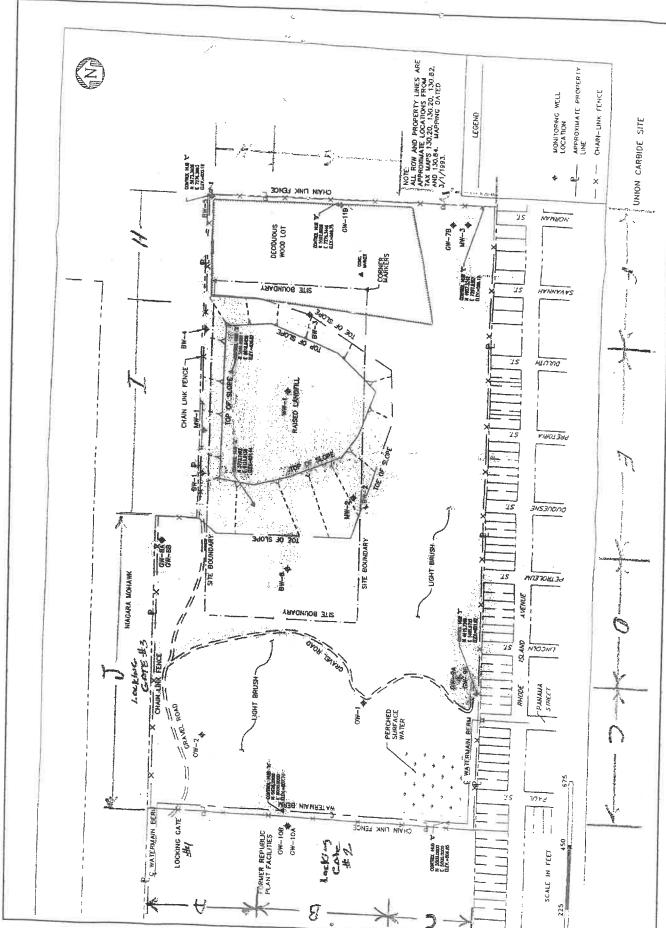
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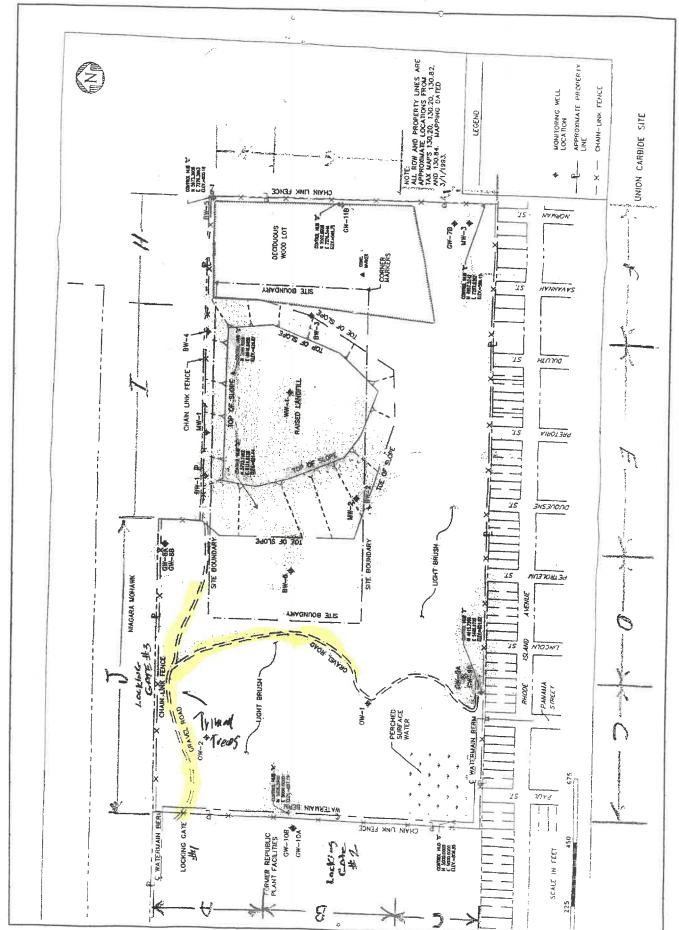
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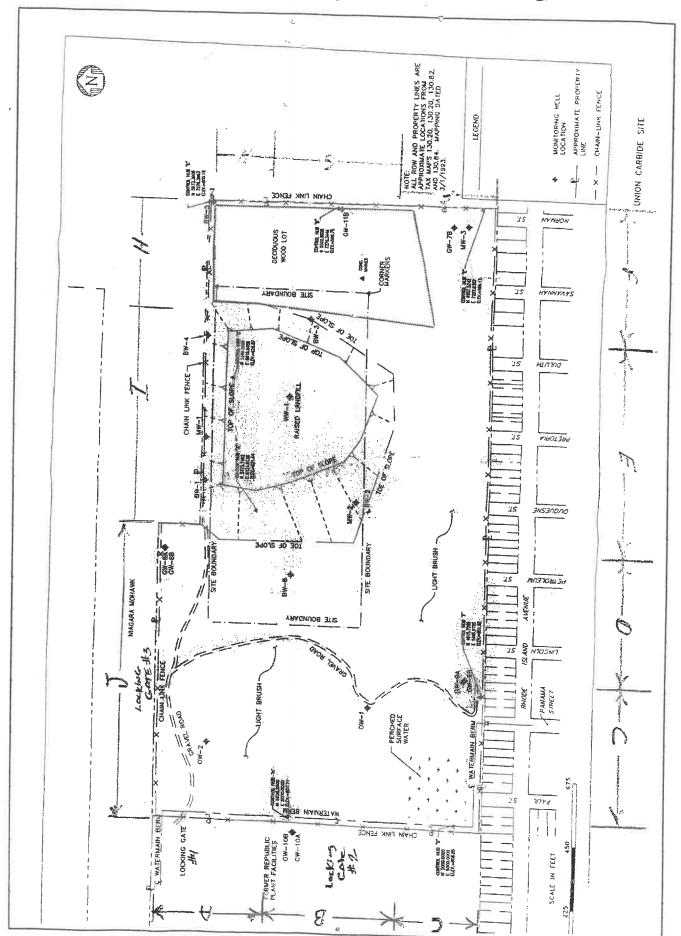
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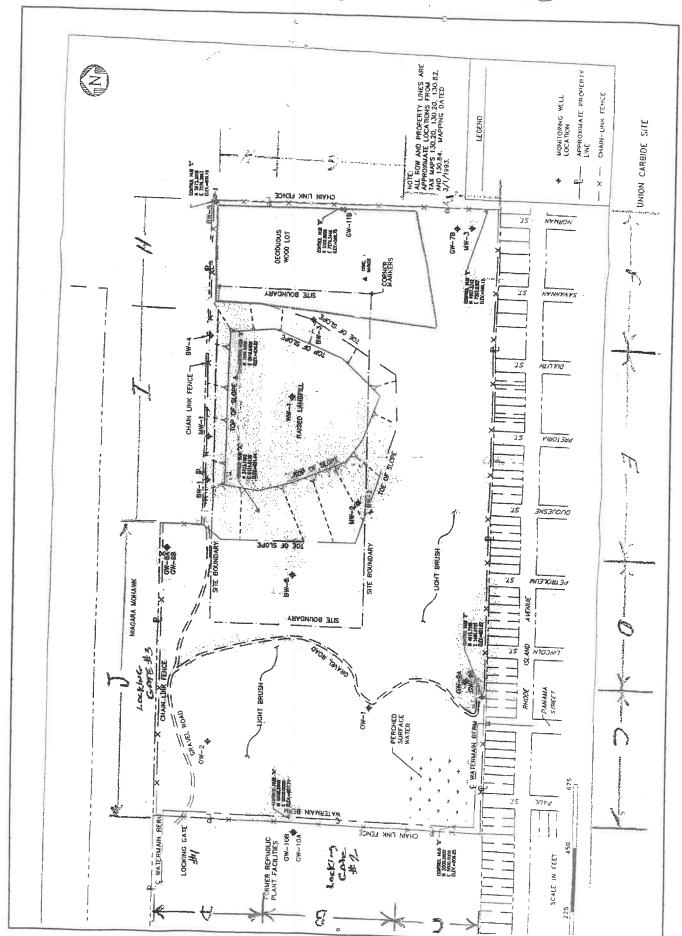
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John Employee

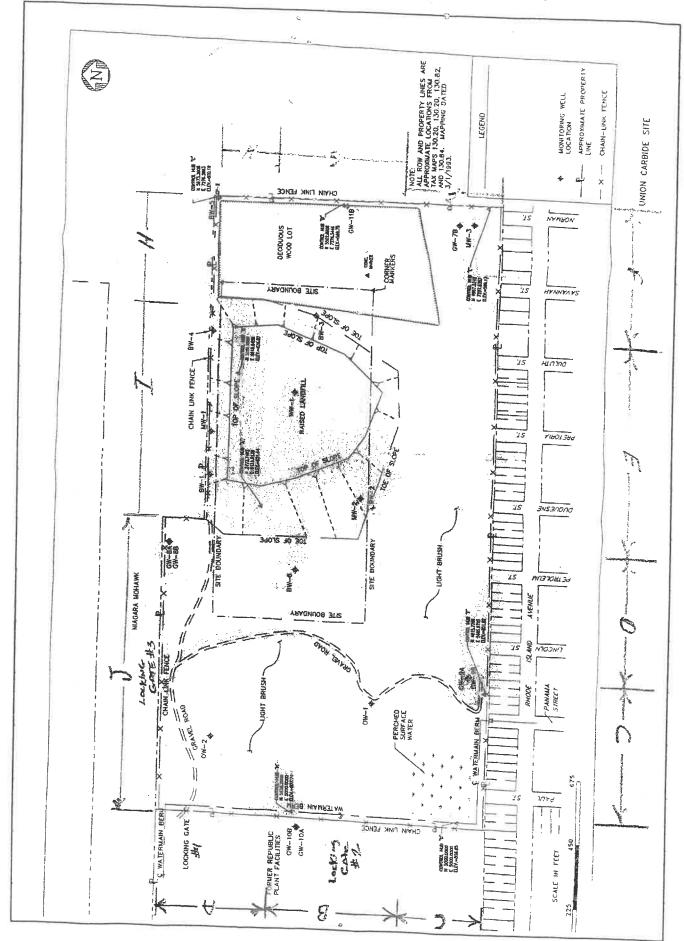
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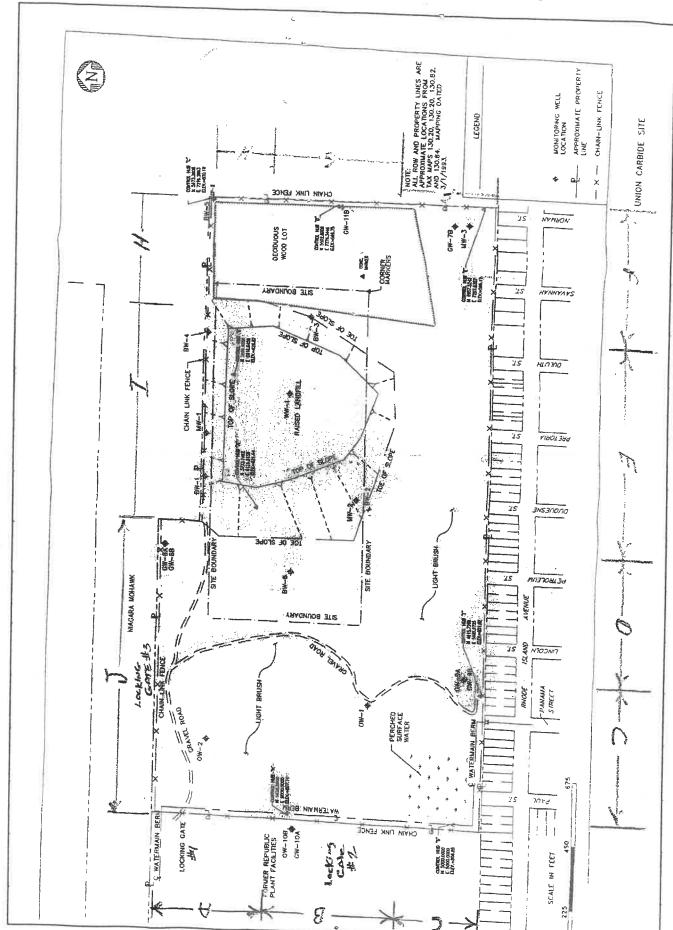
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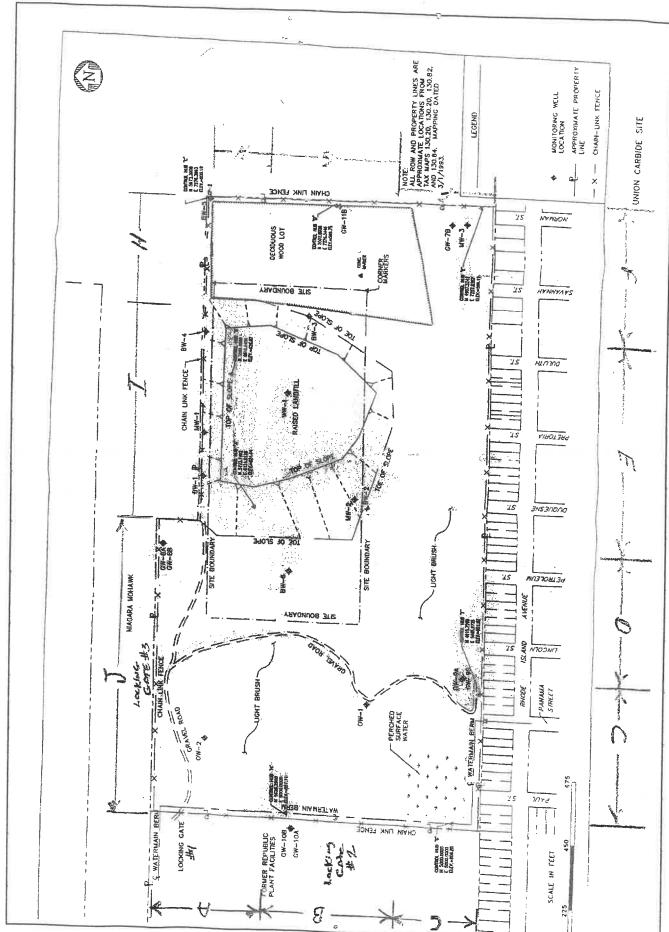
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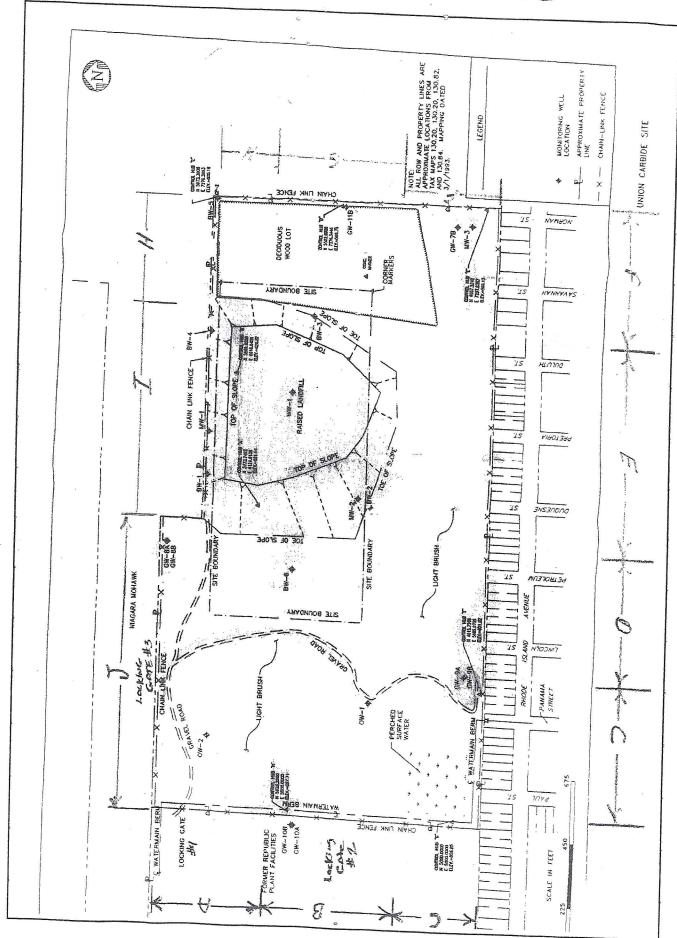
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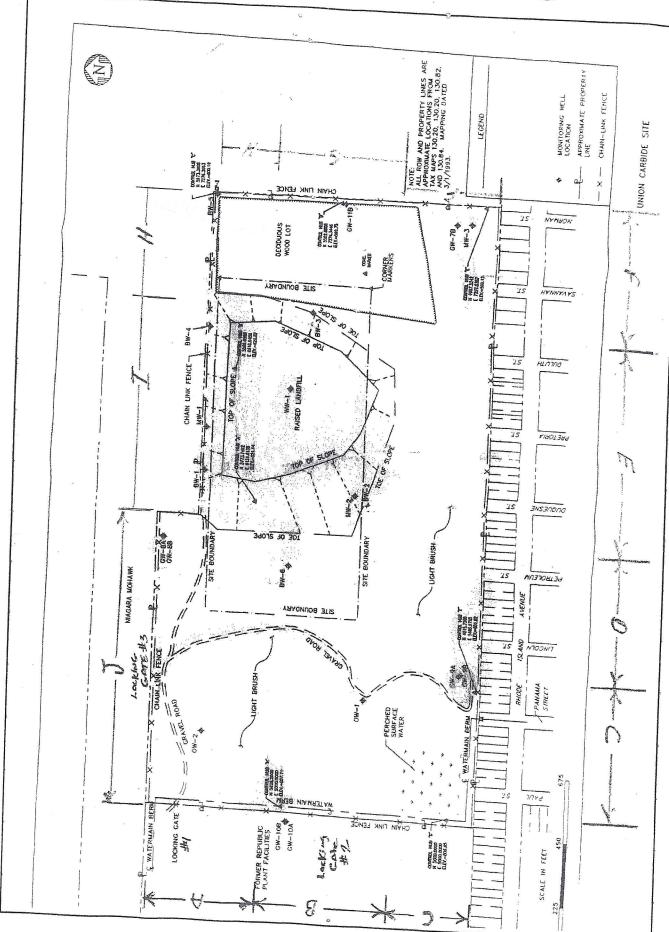
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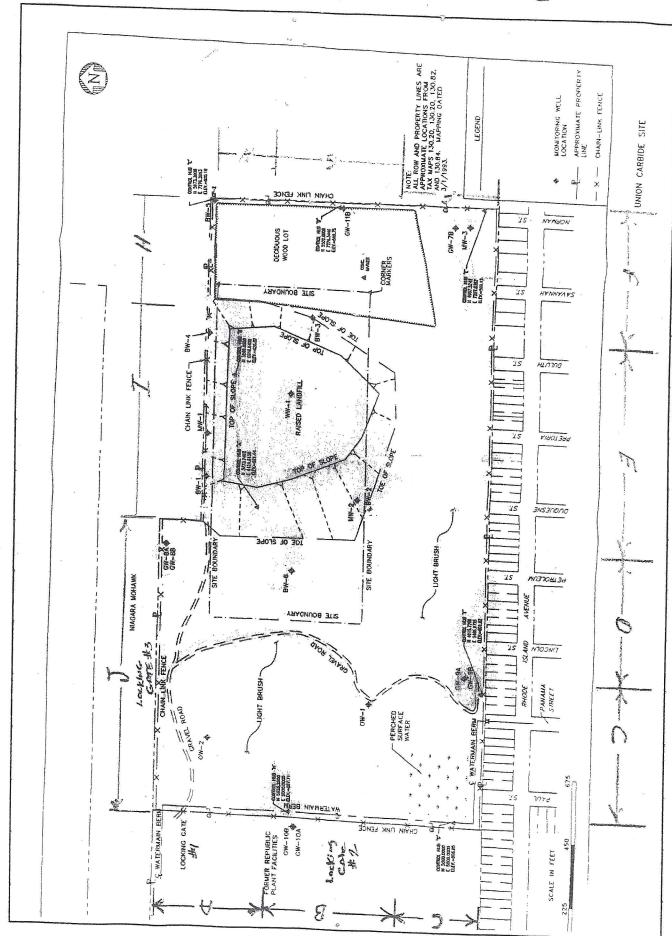




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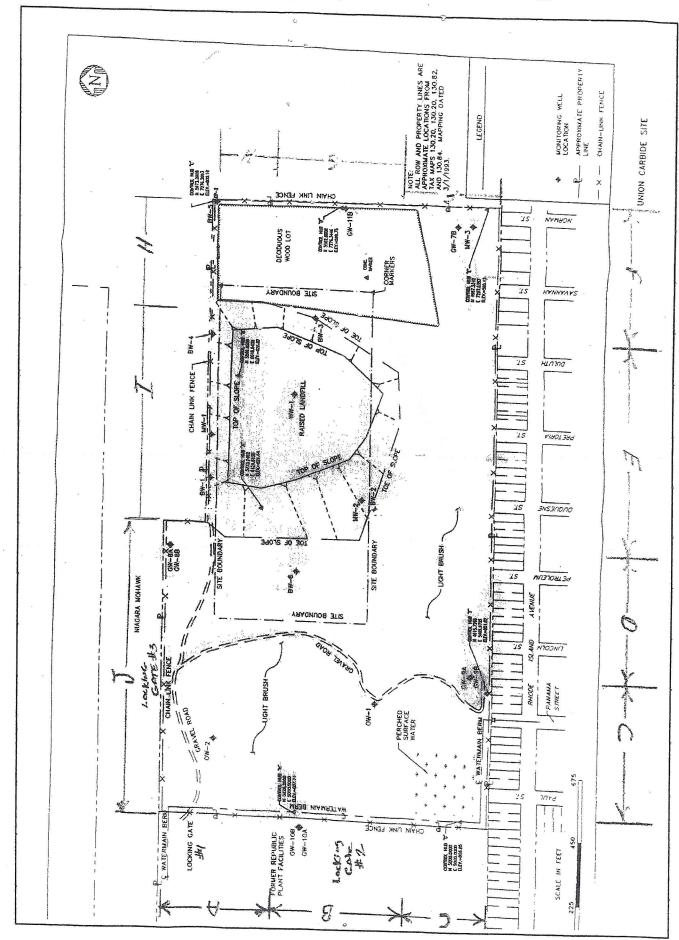
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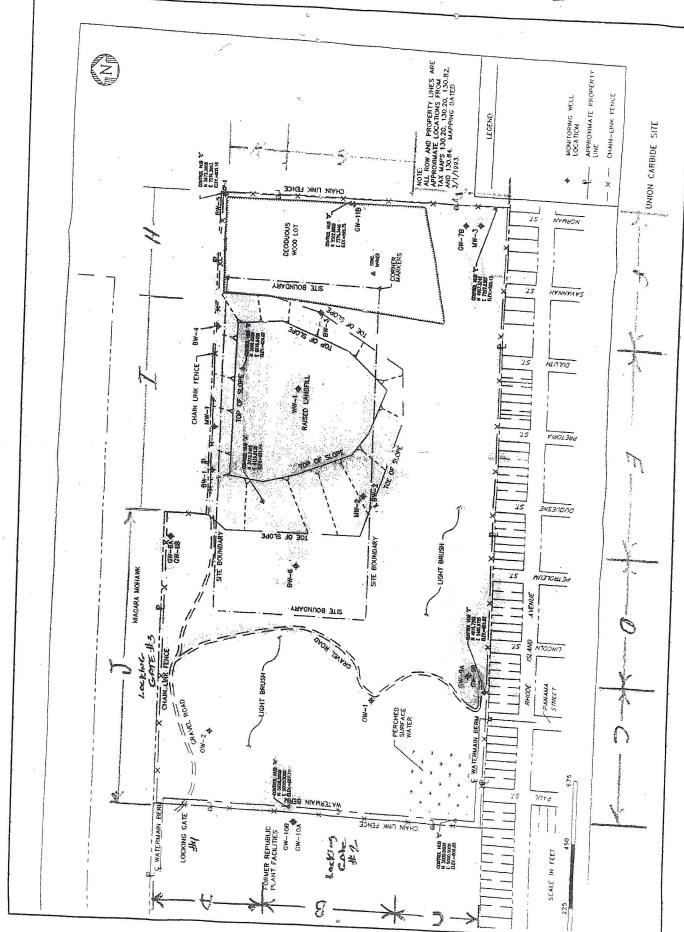
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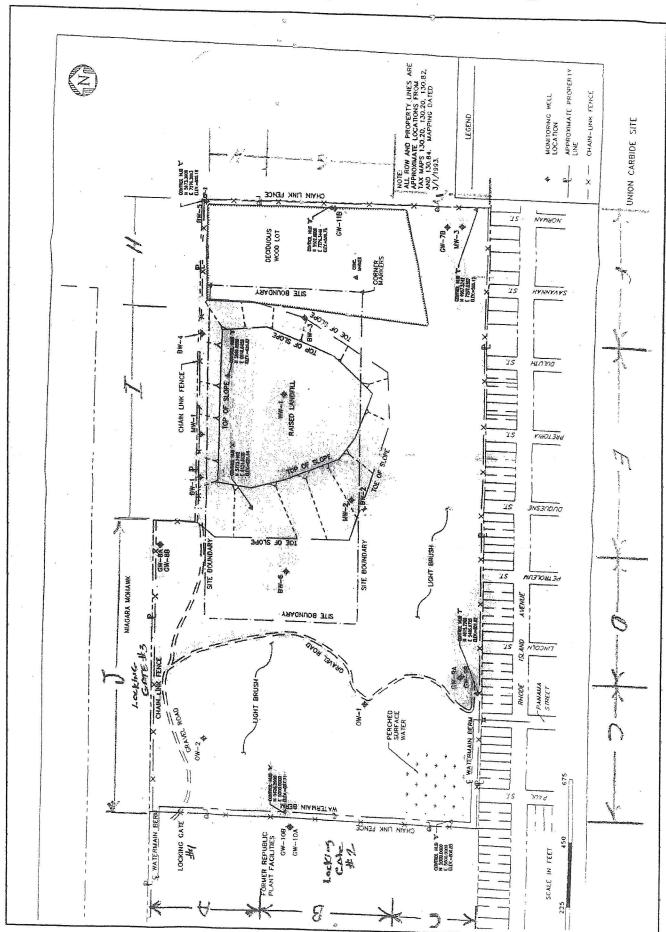
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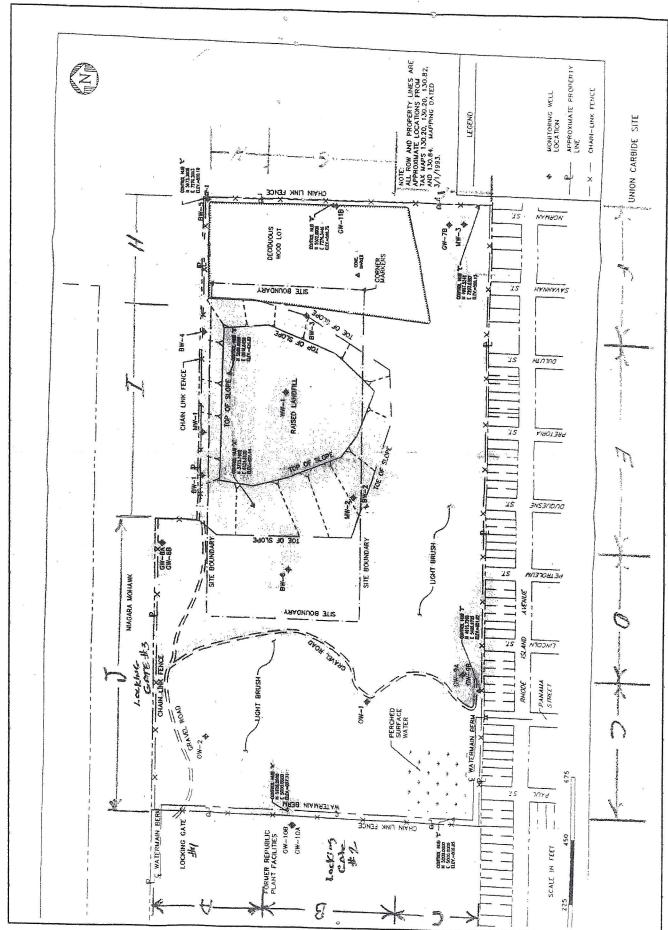
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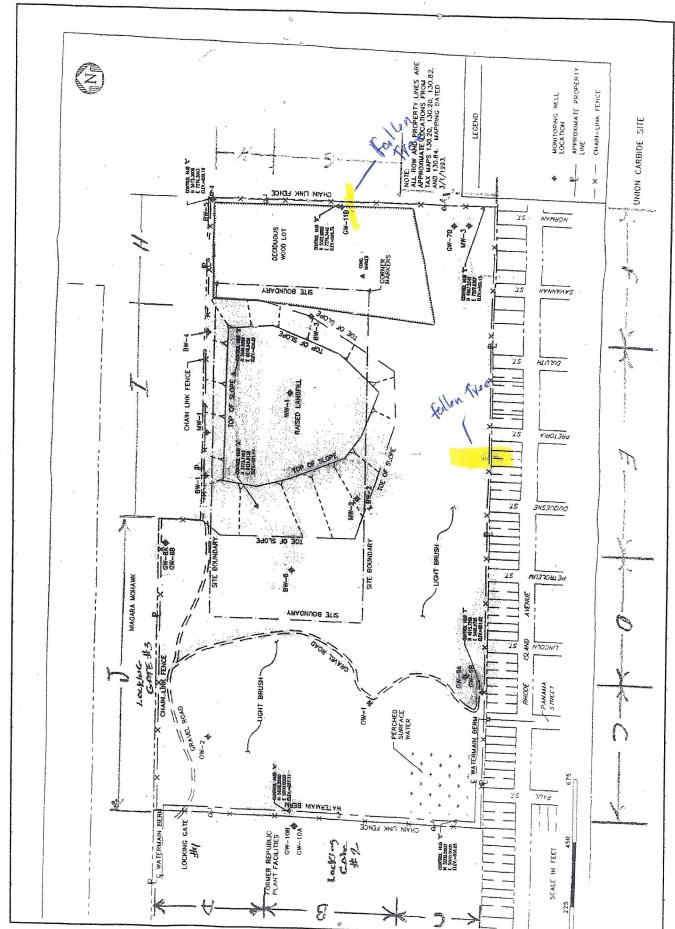
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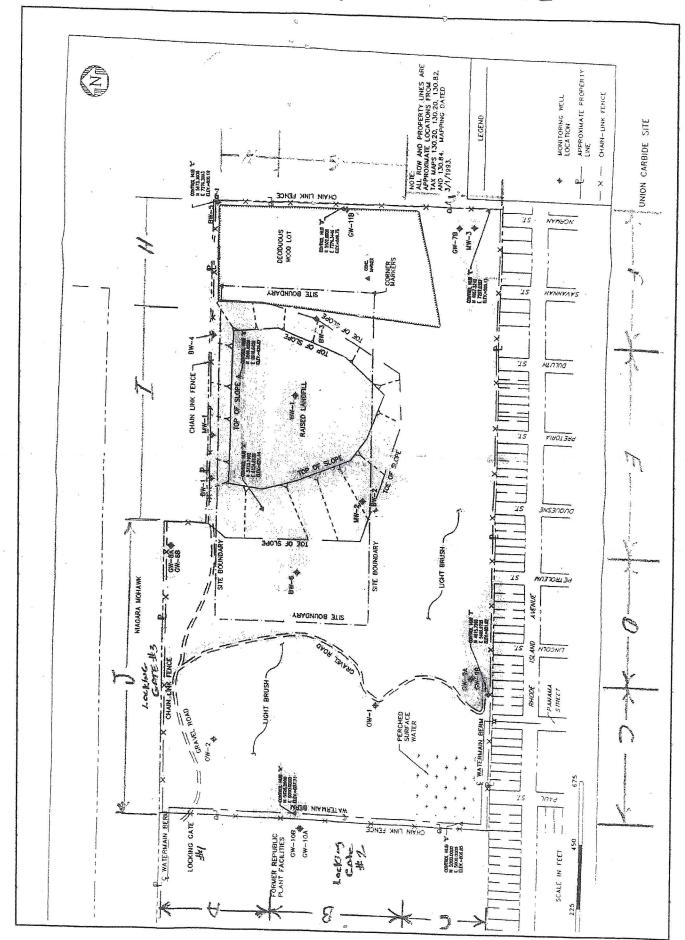
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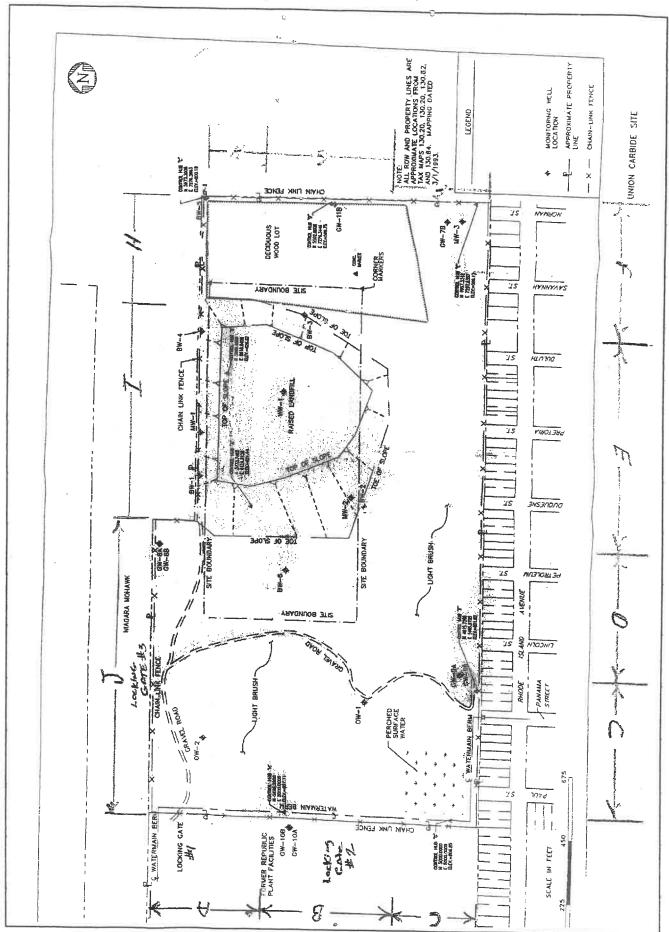
John S Employee 11/28/2020 Dode



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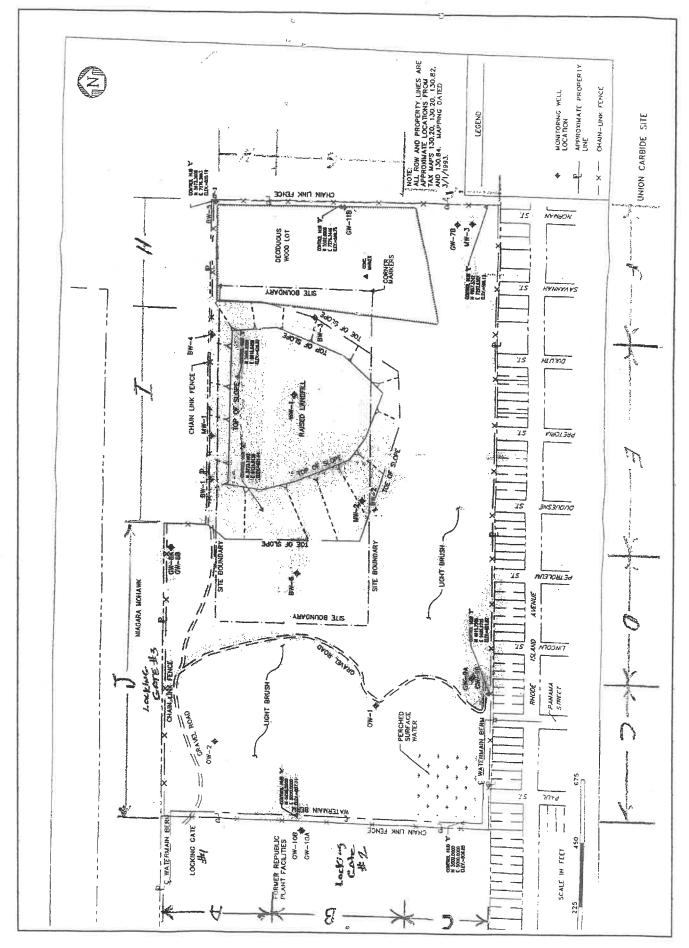




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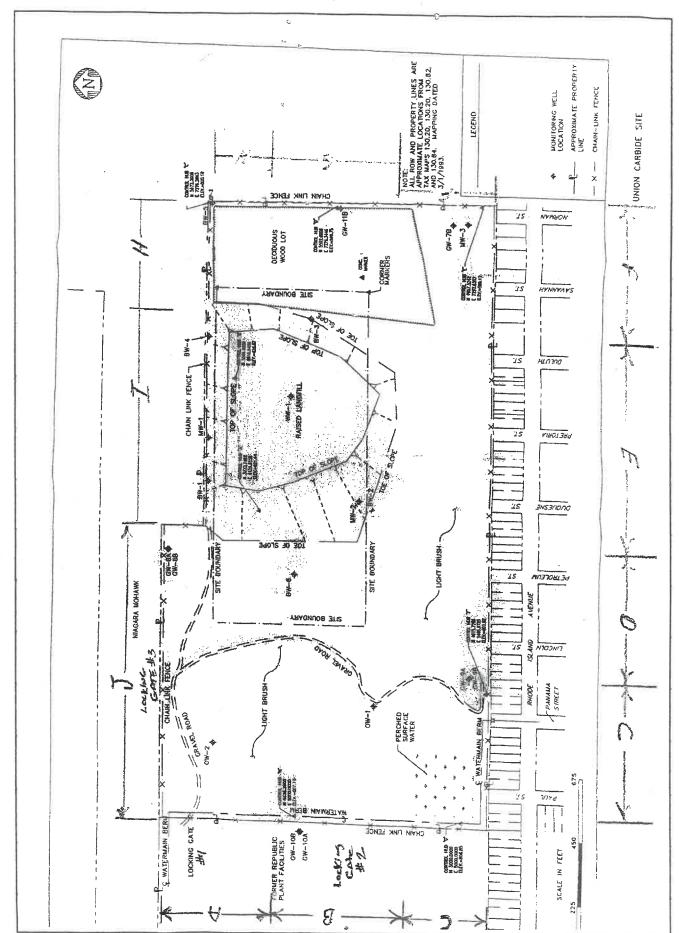
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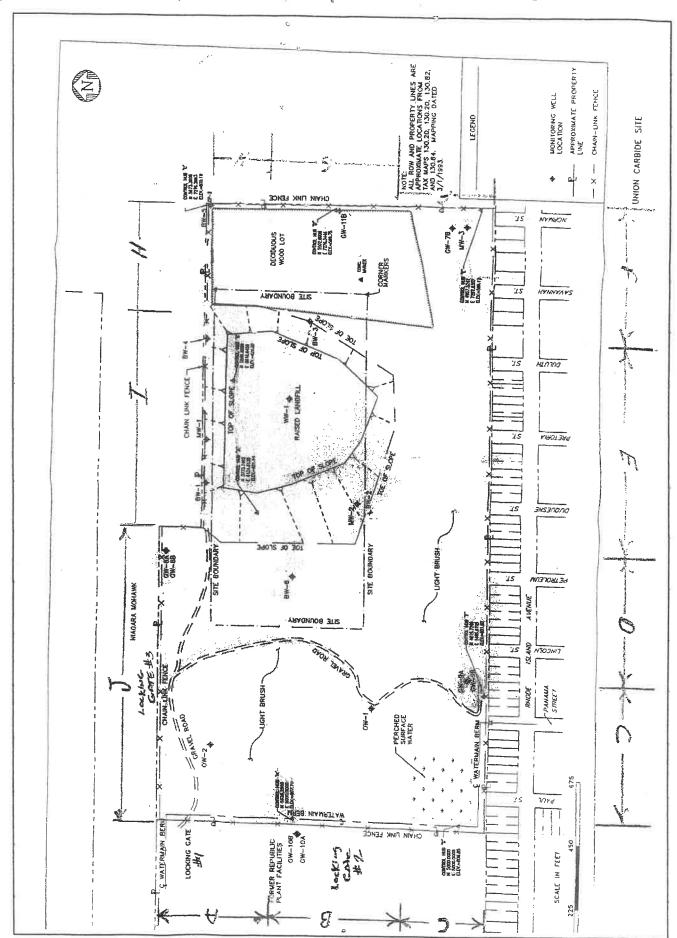
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### Appendix G

 $Copies\ of\ Quarterly\ Groundwater\ Well\ Inspection\ Reports-2020$ 

#### **APPENDIX B - QUARTERLY GROUNDWATER WELL INSPECTION REPORT**

John Sara	PKYL	3/15/20	GRAFTECH	I WELLS	•
WELL I.D. NUMBER	WELL I.D. TAG INTACT (YES/NO)	LOCK	OUTER CASING CONDITION	CONCRETE SEAL CONDITION	COMMENTS
MW1-78	Urs	unal	oxad	and	
MW2-78	ivs	ocad	goat	rand	
MW3-79	ines	Good	god	exad	
BW1-86	(NS	and	and	wood	
BW2-86	LV"S	ciced	good	escel	\
BW3-86	Nes	and	land	wat	
BW4-86	Vies	dood	and	Mod	
` BW5-86	Yes.	wood	good	ciacked	\
BW6-86	ws	bord	crod	cracked	
WW1-86	ches	wood	wood	not viscble	
OW1-88	Yes	Good	good	Notvisole	
OW2-88	UKS	Cooch	cooc	Notvisable	

#### **ON-SITE WELLS INSTALLED BY NYSDEC**

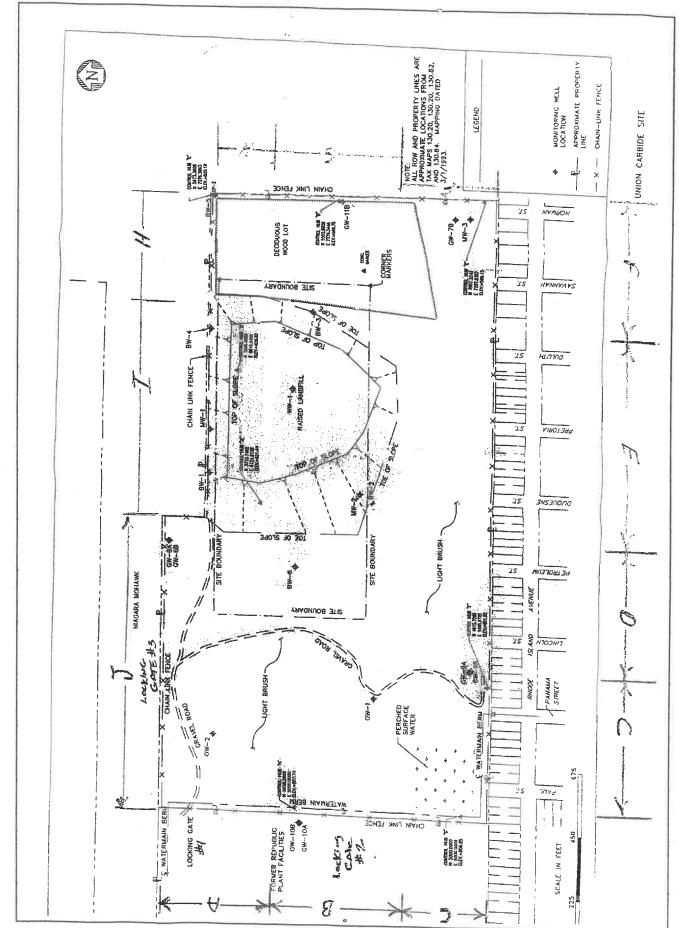
(Installed Sept./Oct. 93)

WELL I.D. NUMBER	WELL I.D. TAG INTACT (YES/NO)	LOCK CONDITION	OUTER CASING CONDITION	CONCRETE SEAL CONDITION	COMMENTS
GW7B-93	UNS.	vad	ocod	feally loose	
GW8A-93	ches	Exel	oxed	10056	
GW8B-93	LIME	word	cood	ocast .	,
GW9A-93	ites	cxcd	god	1005e	
GW9B-93	INS	Cood	wad	locse	
GW11B-93	Cyes:	ocad	wad	and	

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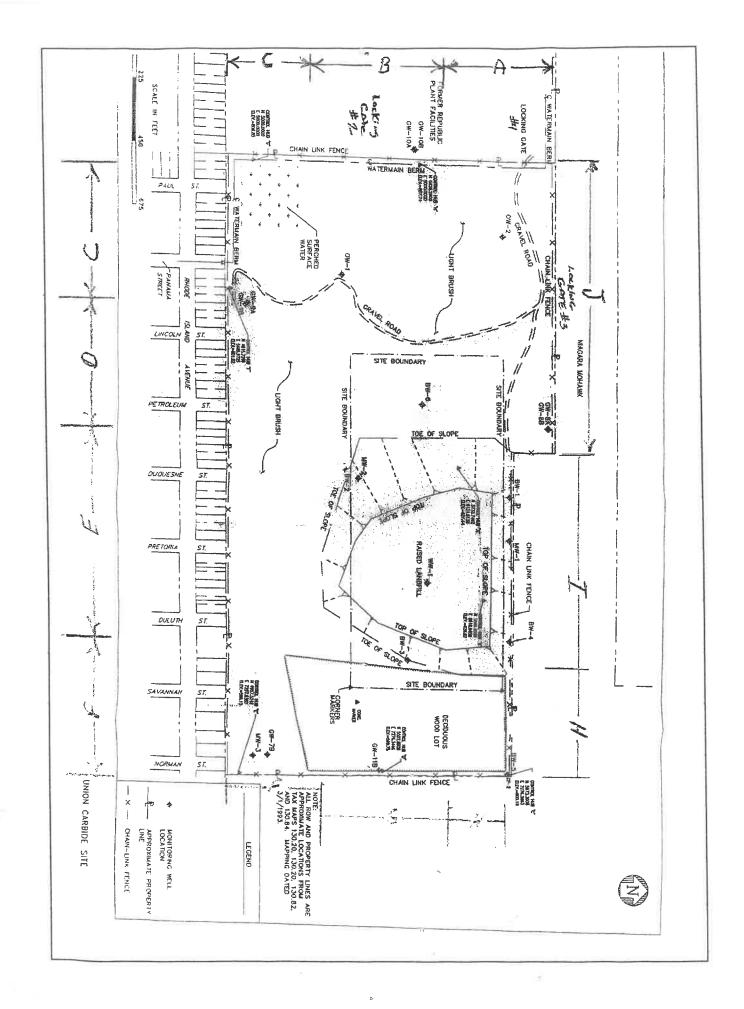
#### APPENDIX B - QUARTERLY GROUNDWATER WELL INSPECTION REPORT

John Science	1911 B/10	1/20 122	GRAFTECH	WELLS	
WELL I.D. NUMBER	WELL I.D. TAG INTACT (YES/NO)	LOCK	OUTER CASING CONDITION	CONCRETE SEAL CONDITION	COMMENTS
MW1-78	Wes	locked	good	good	
MW2-78	ines .	locked	good	godd	
MW3-79	Ojes	locked	good	ejacil	
BW1-86	(Je3	locked	good	accel	
BW2-86	yes	locked	good	good	
BW3-86	yes	locked	good	good	
BW4-86	iles	locked	acod	oped	
BW5-86	6108	lached	anced	opad	
BW6-86	yes	locked	cood	cicokal	
WW1-86	wes	boked	good	Not visable	
OW1-88	ives	locked	good	Not visable	
OW2-88	Jes	Lactive	opod	Not vsable	ν,

#### **ON-SITE WELLS INSTALLED BY NYSDEC**

(Installed Sept./Oct. 93)

WELL I.D. NUMBER	WELL I.D. TAG INTACT	LOCK	OUTER CASING CONDITION	CONCRETE SEAL CONDITION	COMMENTS
	(YES/NO)				
GW7B-93	(10)	tocked	cred	loosa	concret, not allached to avoid
GW8A-93	yes	Locked	good	loose	concepts most up from ground and wood
GW8B-93	Crs	Lactical	good	cood	7 100
GW9A-93	Urs	lacted	good	lonse	contrite not attached to grand
GW9B-93	405	locked	acod	loose	concrete Not attachal to grand
GW11B-93	Ches	locked	good	Hocal	The state of the s



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#### APPENDIX B - QUARTERLY GROUNDWATER WELL INSPECTION REPORT

Som Sureal engin 9/7/20 GRAFTER	CH WELLS
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WELL I.D. NUMBER	WELL I.D. TAG INTACT (YES/NO)	LOCK	OUTER CASING CONDITION	CONCRETE SEAL CONDITION	COMMENTS
MW1-78	yes	booked	good	good	
MW2-78	ue)	locked.	good	yord	
MW3-79	ches	bc Kel	good	cool	
BW1-86	Ues	locked,	good	good	
BW2-86	Mes	bocker	good	apad	
BW3-86	yes	locked	good	Noturable	
BW4-86	yes	locked	oped	Story C	~~!
BW5-86	()-S	lacked	god.	CVCX Kod 9	<del>004</del>
BW6-86	45	9000	good	cracked	
WW1-86	405	and	crowl	Not usable	0
OW1-88	Mes	agard	goad	Not visable	
OW2-88	ues	locked	Cload	Not usable	

#### **ON-SITE WELLS INSTALLED BY NYSDEC**

(Installed Sept./Oct. 93)

WELL I.D. NUMBER	WELL I.D. TAG INTACT	LOCK CONDITION	OUTER CASING CONDITION	CONCRETE SEAL CONDITION	COMMENTS
	(YES/NO)				
GW7B-93	ye)	locked	accol	locse	
GW8A-93	yes	tooked	Good	cose	
GW8B-93	ues	locked.	gaal	leste good	
GW9A-93	405	lacked	you	locze	
GW9B-93	yes	locked	cond	loose	Ruchia V M
GW11B-93	ges	locked	yard	cood	SEP 07 2020

LANDFILL SITE MANAGEMENT PLAN FOR SWMF #32N03 (REGISTRY NO. 932035)

#### **APPENDIX B - QUARTERLY GROUNDWATER WELL INSPECTION REPORT**

Tom Swe	eculencien	12-2-	GRAFTECH	I WELLS	
WELL I.D. NUMBER	WELL I.D. TAG INTACT (YES/NO)	LOCK	OUTER CASING CONDITION	CONCRETE SEAL CONDITION	COMMENTS
MW1-78	ojes	herdon?	cool	CERCI	
MW2-78	ines	lockal/and	god	carl	
MW3-79	yes	bekelfood	good		
BW1-86	UN CO	hoke land	good	gard	
BW2-86	Ges	lockelland	and	god	
BW3-86	yes	tocke / cod	good	croekd	
BW4-86	tree	lock de la 1	9	crost	
BW5-86	yes	lookel load	good	1	V
BW6-86	ya	boldrand	good	good	
WW1-86	yes	bake and	epod	not inpube	
OW1-88	95	bock /go	good	9000	

#### **ON-SITE WELLS INSTALLED BY NYSDEC**

OW2-88

(Installed Sept./Oct. 93)

WELL I.D. NUMBER	WELL I.D. TAG INTACT	LOCK	OUTER CASING CONDITION	CONCRETE SEAL CONDITION	COMMENTS
	(YES/NO)				
GW7B-93	Q.eS	lockel/mol	doch	loose	
GW8A-93	ues	lockel/and	grad	cool	
GW8B-93	Cles	locked and	cool	bose	
GW9A-93	yes	locked and	good	bose	5
GW9B-93	Ches	locked/ood	god	loser	
GW11B-93	iles	locked/good	and	and	