Division of Environmental Remediation

Emerging Contaminants Monitoring Report

Niagara Sanitation Landfill
Wheatfield, Niagara County, New York
Site Number 932054

December 2024

New York State Department of Environmental Conservation
Region 9
270 Michigan Avenue
Buffalo, New York 14203

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1.0 INTRODUCTION

In 2017 the New York State Department of Environmental Conservation (NYSDEC) began a Statewide evaluation of remediation sites to better understand the risk posed to New Yorkers by 1,4-dioxane and per- and polyfluoroalkyl substances (PFAS). Historically, PFAS have not been evaluated at remediation sites, and 1,4-dioxane had not been evaluated at concentrations that were now thought to represent a health concern. This initiative was undertaken as a result of these "emerging contaminants" having been found in a number of drinking water supplies in New York State. An evaluation of these emerging contaminants was subsequently extended to the NYSDEC Brownfield Cleanup Program.

1.1 PFAS Compounds

Carbon tetrafluoride, the simplest perfluorocarbon (PFC), was first produced in 1886 (Banks et al., 1994). Other PFCs have been made since at least the 1930s (Gaines, 2023). PFAS with functional groups have been made since at least the 1940s, and since at least the 1950s have been used in various industries and products due to their unique properties (Prevedouros et al., 2006). These properties make them resistant to heat, oil, stains, grease, and water, and useful in a wide variety of everyday products (NYSDEC, undated). PFAS was also widely used in fire-fighting foam (NYSDEC, undated).

Gaines (2023) lists 25 industries or groups of products in which PFAS is used. These industries/groups include the following: adhesives; the building and construction industry; ceramics and nanostructures synthesis; cleaning products; coatings, wax, paint, varnish, and inks; cosmetics and personal care; dry cleaning; the electronics industry; etching; explosives, propellants, and ammunition; fire-fighting foam; medical uses; metal plating and finishing; the mining industry; the oil and gas industry; packaging (paper and cardboard); pesticides and fertilizers; the photography and lithography industries; plastics, resins, and rubber; recycling and material recovery; refrigerants; scientific (general use); the semiconductor industry; textiles; and the transportation industry (Gaines, 2023).

Gaines (2023) also provides a series of tables listing specific products or uses for some of these industries/groups. Many of these products can be found in municipal waste, such as that found at the Niagara Sanitation Landfill. The list that follows is only a brief summary of those items

observed in the municipal waste at the Niagara Sanitation Landfill or which were likely to have been disposed of in the landfill. For a complete list of products, see Gaines (2023).

Building products observed in the Niagara Sanitation Landfill include roofing material. Cleaning products in which PFAS is used, and that were likely disposed of in the landfill include automobile waxes, car wash products, carpet spot cleaners, dishwashing liquids, floor polish, glass cleaner, and shampoos. Many products or materials coated with PFAS that were likely disposed of in the Niagara Sanitation Landfill include adhesives, caulks, cellulose, ceramics, cookware/bakeware, floor waxes, inks, metals, paint, plastics, polishes, resins, sealers, stains (floor, wood, etc.), varnish, and waxes.

A large number of cosmetics and personal care products contain PFAS. These products include acne treatment, blush/highlighter, creams, eye cream, eyeshadow, foundation, hair conditioner, hair creams, hair shampoos, hand sanitizer, lip balm/sticks, lotions, mascara/lash products, nail polish, shaving cream, and sunscreen. Containers with residues from these products were likely disposed of in the Niagara Sanitation Landfill.

Packaging (paper and cardboard) containing PFAS include baking paper, butter wrappers, carbonless forms, folding cartons, food plates, bowls, etc., kraft paper, pet food bags, pizza boxes, paper food straws, take-out food containers, food wraps, and wallpaper. Most of these items are common in households and ultimately end up in municipal landfills.

Different plastic products where PFAS is used during manufacturing include citrus product containers, cleaning chemical containers, cookware, fishing line, flavor, fragrance, and essential oil containers, pesticide containers, polish containers, and wax containers. Many plastic containers have been observed in the waste at the Niagara Sanitation Landfill (Appendix H). PFAS can also be found in gaskets, geotextiles, and rope.

The textile industry uses PFAS extensively for their ability to repel oil, water, and stains. Many types of outerwear, household products, interior automobile parts, and outdoor equipment are treated with PFAS. Some of these products that commonly appear in municipal waste include carpets, clothing apparel, gloves, home textiles, jackets, leather, shoes, and umbrellas.

Products associated with the transportation industry that can end up in municipal landfills include gaskets and hoses.

The unique properties of PFAS that make them useful in a wide variety of everyday products also make them a challenge when found in the environment. PFAS do not break down easily and persist in the environment, especially in water. Because of widespread use, PFAS releases into the environment have been detected in surface water, groundwater, animals, and humans worldwide (NYSDEC, undated).

1.2 1,4-Dioxane

1,4-Dioxane, a manmade chemical first synthesized in 1863, has been used in a variety of industrial applications (ITRC, 2020). It is estimated that 90% of this synthetic, organic compound has been used to stabilize the chlorinated solvent 1,1,1-trichloroethane (1,1,1-TCA) (ATSDR 2012). U.S. commercial manufacturing began at a small scale in 1929, with production increasing in 1951 and then spiking in the early 1970s and again in the mid-1980s (ITRC, 2020). Production of 1,4-dioxane began to decline after 1985 and continued to decline post-1995 as use of 1,1,1-TCA declined substantially after it was phased out as an "ozone-depleting material" (ITRC, 2020).

1,4-dioxane has also been used as a component of printing inks (Mohr et al. 2020), was present in the resins used to make paints and in paint strippers, fabric dyes, and some felt tip pens (Mohr et al. 2020), has been used as an additive in adhesives (Wilke, Jann, and Brödner, 2004), as a surface preparation prior to the application of epoxy adhesives, and may have been present as a contaminant in adhesives using 1,1,1-TCA as a solvent (HSDB 2010), was used as an additive, or was an impurity, in antifreeze and aircraft deicing fluids (UC 1989), was used in brake fluids, brake cleaning fluids, loosening fluids, and rust remover (Mohr et al. 2020), and is commonly present in raw materials used in the production of many consumer products, including cleaners, detergents, shampoos, and cosmetics (ITRC, 2020). In addition, 1,4-Dioxane is used by the rubber and plastics industry (ITRC, 2020).

1,4-Dioxane has been found in groundwater at sites throughout the United States, particularly in the sole source aquifer of Long Island, New York and in association with legacy industrial and hazardous waste sites (NYSDEC, undated).

1.3 NYSDEC Emerging Contaminants Monitoring Report

The NYSDEC has prepared this Emerging Contaminants Monitoring Report to summarize groundwater, soil, and surface water sampling activities completed between December 12, 2017 and

October 23, 2023 at the Niagara Sanitation Landfill located on Nash Road in the Town of Wheatfield, Niagara County, New York (Figure 1-1). These sampling activities were completed to evaluate the presence of emerging contaminants in groundwater, soil, and surface water at and near the site. Other contaminants detected in groundwater and surface water at the Niagara Sanitation Landfill are described in the NYSDEC Remedial Investigation Report (LiRo, 2019), the 2019/20 Groundwater & Surface Water Monitoring Report (NYSDEC, 2022), and the 2021 Groundwater Monitoring Report (NYSDEC, 2023). These reports can be found online at https://www.dec.ny.gov/data/DecDocs/932054/.

The remaining sections of this report are organized as follows:

- **Section 2.0, Site History and Background:** This section describes the site, discusses the history and previous investigations completed at the site, and summarizes site geology and hydrogeology;

- **Section 3.0, Emerging Contaminants Sampling Events:** This section describes the sampling activities for emerging contaminants that were completed at the site in December 2017, February 2018, February 2019, October 2021, and October 2023, and discusses the analytical results of the groundwater and surface water samples that were collected;

- **Section 4.0, Discussion and Recommendations:** In this section the groundwater results are evaluated collectively to determine the extent of emerging contaminants at and near the site. This section also discusses potential source areas for the emerging contaminants, and makes recommendations for future activities at the site; and

- **Section 5.0, References:** This section contains a list of references utilized or cited in this report.

2.0 SITE HISTORY AND BACKGROUND

2.1 Site Description

The Niagara Sanitation Company Site, also known as the Nash Road or Niagara Sanitation Landfill, is an inactive landfill located on Nash Road in the Town of Wheatfield, Niagara County, New York (Figure 1-1). The property is owned by the Town of Wheatfield and is adjacent to the municipal boundary that separates the Town of Wheatfield from the City of North Tonawanda (Figure 2-1). The landfill is located approximately 1,400 feet east of Nash Road (Figures 1-1 and 2-1). The majority of historic landfilling operations took place on the portion of the property that is rectangular in shape, which consists of approximately 18.7 acres of the 20.8-acre parcel (Figure 2-2). The property is zoned for Public Service use.

The site is bordered by the Society of Catholic Apostolate property to the north; a property that contains a former motel and livery service to the east; a utility right-of-way (both overhead electric and underground natural gas and brine lines) and residential properties to the south; and Nash Road and residential properties to the west (Figures 1-1 and 2-1).

2.2 Site Features

The Niagara Sanitation property is vacant and overgrown with mature trees, dense brush, and marsh vegetation (e.g., phragmites). The site is poorly drained and contains delineated wetlands in the western, northern, and eastern portions of the property (Figure 2-2). These wetlands, however, are dry during the summer and early fall months. In December 2017, the Town of Wheatfield installed a 6-foot-tall perimeter fence with locking gates that encompasses most of the landfill. Prior to that time access to the site was not restricted.

Historic landfilling activities resulted in irregular ground surface topography across the site. Numerous soil/debris mounds predominate in the western two-thirds of the site but can be observed throughout the site, with general municipal (i.e., non-hazardous) waste protruding at most mounded locations.

2.3 Site History

Available records indicate that the site was operated as a landfill by the Niagara Sanitation Company from approximately 1955 to 1968. The landfill accepted both municipal and industrial solid wastes, including caustic materials, plating tank sludge, fly ash, salt solids, graphite, carbon, scrap adhesives, and miscellaneous laboratory chemicals. Records from the NYSDEC indicate that Bell Aerospace, Carborundum, and Graphite Specialties disposed of waste at the site.

In June 1968, shortly before the site's formal disposal operations were discontinued, the New York State Department of Transportation (NYSDOT) discovered waste while constructing the LaSalle Expressway in Niagara Falls. This material was excavated from the area that later became known as Love Canal. Niagara Sanitation Landfill records indicate that approximately 1,600 cubic yards of excavated materials were placed into a 30-foot wide by 100-foot long by 27-foot deep trench at the eastern end of the landfill. The waste was reportedly placed from the bottom of the trench to 15 feet below ground surface and covered with 12 feet of excavated native soil.

The NYSDEC completed a Phase I Investigation (historical records review and site walk over) of the site in 1983, a Phase II Investigation (on-site data collection) in 1985, and a Supplemental Phase II Investigation in 1989. In association with these investigations, the New York State Department of Health (NYSDOH) completed surface soil sampling in 1991 to evaluate potential exposure risks. At that time, it was determined that the site did not pose a significant threat to public health or the environment because the exposure was limited; the wastes were buried, contained, or sufficiently covered to avoid significant exposure. Groundwater as a potential exposure path was also limited because the area was served by public water and the closest private well was approximately one mile away. As a result, the site was designated as Class 3 (action can be deferred) in the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites. These reports can be found online at https://www.dec.ny.gov/data/DecDocs/932054/.

NYSDEC continuously monitors and evaluates sites on the Registry of Inactive Hazardous Waste Disposal Sites. In 2013, as part of these efforts, the NYSDEC completed a Site Characterization Study to re-evaluate the Class 3 NYSDEC Registry designation for the site, to confirm the location of the wastes from the LaSalle Expressway project, and to re-evaluate the potential for direct contact exposures. The Site Characterization was heavily focused on the eastern portion of the site where the wastes associated with the construction of the LaSalle Expressway were placed (Figure 2-3). This report can be found online at https://www.dec.ny.gov/data/DecDocs/932054/.

Later in 2013, Glenn Spring Holdings, an affiliate of the Occidental Chemical Corporation, began an Interim Remedial Measure (IRM) to characterize and remove the LaSalle Expressway wastes. These wastes were excavated from the site during the Fall/Winter of 2014 and the Winter/Spring of 2015 and transported out of state for incineration. The IRM Closure Report can be found online at https://www.dec.ny.gov/data/DecDocs/932054/.

In 2014, the NYSDEC conducted a Supplemental Site Characterization Study to characterize the municipal and industrial waste in the remainder of the landfill. While most of the site contained contaminant concentrations typical of non-hazardous municipal/industrial waste, three locations were identified that contained hazardous concentrations of lead or PCBs. Several surface soil samples exceeded residential soil cleanup objectives (SCOs) for polycyclic aromatic hydrocarbons (PAHs) and metals. Groundwater within the footprint of the landfill contained elevated concentrations of volatile organic compounds, semi-volatile organic compounds, pesticides, and metals that exceeded the NYSDEC groundwater standards or guidance values. These results are described in more detail in the Supplemental Site Characterization Study Report (GES, 2014), which can be found online at https://www.dec.ny.gov/data/DecDocs/932054/.

Based upon the results of the Site Characterization and Supplemental Site Characterization Studies, the NYSDEC reclassified the site to Class 2 (represents a significant threat to public health and/or the environment) and completed a comprehensive, state funded Remedial Investigation of the site in 2017. A more detailed history of the Niagara Sanitation Landfill, along with the analytical results of the samples collected, are presented in the Remedial Investigation Report (LiRo, 2019). This report can be found online at https://www.dec.ny.gov/data/DecDocs/932054/.

Between October 22, 2019 and January 9, 2020, the NYSDEC completed additional groundwater and surface water sampling activities at the site to evaluate current groundwater and surface water conditions, and to supplement the results contained in the Remedial Investigation Report (LiRo, 2019). The 2019/20 results are discussed in the Groundwater & Surface Water Monitoring Report (NYSDEC, 2022), which can be found online at https://www.dec.ny.gov/data/DecDocs/932054/.

In an ongoing effort by the NYSDEC to investigate the Niagara Sanitation Landfill, groundwater samples were collected from the site between October 29, 2021 and November 8, 2021. These sampling activities were completed to evaluate current groundwater conditions at the site, and to supplement the results contained in the Remedial Investigation Report (LiRo, 2019) and the

2019/20 Groundwater & Surface Water Monitoring Report (NYSDEC, 2022). The 2021 results are discussed in the 2021 Groundwater Monitoring Report (NYSDEC, 2023), which can be found online at https://www.dec.ny.gov/data/DecDocs/932054/.

2.4 Site Geology and Hydrogeology

There are eight stratigraphic units underlying the Niagara Sanitation Landfill, which are summarized as follows:

- Fill: General refuse (e.g., glass, plastic, cloth, etc.) mixed with native fine sand and clay that ranges in thickness from 0.5 to >12 feet;
- Silt and Clay: An upper brown silt & clay deposit that ranges in thickness from 0.5 to 4.0 feet;
- Upper Sand: An upper yellow-brown sand deposit that ranges in thickness from 0.4 to 11.0 feet;
- Silty Clay: A gray-brown lacustrine silty clay that ranges in thickness from 2.0 to 8.0 feet;
- Layered Clay: A red-gray layered lacustrine clay containing thin sand seams. This deposit ranges in thickness from 18.5 to 33.0 feet;
- Lower Sand: A lower red-brown sand deposit that ranges in thickness from 0.2 to 5.0 feet;
- Glacial Till: A dense reddish brown to gray till that ranges in thickness from 22.0 to 42.2 feet; and
- Bedrock: Dolostone bedrock encountered at depths ranging from 66.0 to 70.3 feet below ground surface.

The gray-brown silty clay deposit and underlying red-gray layered clay act as a groundwater aquitard that prevents the downward migration of groundwater and contaminants from the upper sand and fill water bearing unit to the lower water-bearing zones. As a result, the focus of the sampling events described in this report was on the fill/upper sand water-bearing unit. Well construction diagrams for wells that screen this unit (and were sampled for emerging contaminants) are given in Appendix A.

A groundwater contour map for the fill/upper sand water-bearing zone was generated during the NYSDEC Remedial Investigation from water levels measured on September 25, 2017 (Figure 2-4). This figure shows that groundwater generally flows toward the south and east. During the NYSDEC Remedial Investigation, however, groundwater elevations in the fill/upper sand water-bearing zone were observed to fluctuate in direct response to significant (i.e., >1.0-inch within 24-hours) precipitation events. The September 25, 2017 elevation measurements were recorded at the end of an approximate 2-week long dry period with little to no precipitation.

Subsequent water level measurements were collected on October 17, 2017 following a significant precipitation event. Figure 2-5 is a groundwater contour map generated from that data, which shows that the groundwater flow direction was generally inward toward the central portion of the landfill. As a result, groundwater flow in the southern portion of the landfill reversed and was now to the north. Groundwater flow to the east, however, was still observed at the eastern portion of the site.

Figure 2-6 is a groundwater contour map generated from the water level data collected on November 7, 2017 when groundwater elevations were high. This contour shows that groundwater from the southern portion of the landfill was flowing to the north toward two groundwater sinks. The largest sink, located in the western portion of the landfill, was centered on wells OW-16, OW-32, OW-35, OW-37, LPZ-04S, and LPZ-09S. The smaller sink is located in the eastern portion of the landfill.

Water levels measurements were also collected on November 21, 2019, April 3, 2020, and November 23, 2021. Groundwater contour maps generated from these data are provided as Figures 2-7 through 2-9, respectively. Figure 2-7 shows that groundwater flow was inward toward a well-defined groundwater sink in the central portion of the landfill and centered on wells OW-32, OW-33, LPZ-09S, and LPZ-13S. Smaller sinks were observed in the western (e.g., well OW-16) and eastern (e.g., wells OW-21 and OW-22) portions of the landfill. As a result, groundwater flow in the southern portion of the landfill was to the north toward these sinks.

Figure 2-8 is a groundwater contour map generated from the water level data collected on April 3, 2020. This contour shows that groundwater flow was to the north with a northwest flow component at the eastern portion of the landfill.

Figure 2-9 is a groundwater contour map generated from the water level data collected on

November 23, 2021. This contour is similar to Figure 2-8 and shows that groundwater flow was to the north with a northwest flow component at the eastern portion of the landfill.

In summary, numerous groundwater contour maps have been generated for the fill/upper sand water-bearing zone (Figures 2-4 through 2-9). These contours, however, do not show a consistent pattern of groundwater flow across the Niagara Sanitation Landfill. Groundwater flow has been documented to the north (Figures 2-8 and 2-9), south (Figure 2-4), and inward (Figures 2-5, 2-6, and 2-7). In the eastern portion of the site, an eastward component to groundwater flow was observed on September 25, 2017 (Figure 2-4) and October 17, 2017 (Figure 2-5) while flow to the west or northwest was observed in this portion of the landfill on November 7, 2017 (Figure 2-6), April 3, 2020 (Figure 2-8), and November 23, 2021 (Figure 2-9).

3.0 EMERGING CONTAMINANTS SAMPLING EVENTS

3.1 Introduction

Most of the field activities for the Remedial Investigation were complete by the time the NYSDEC implemented its emerging contaminants initiative. As a result, a separate sampling event was completed in December 2017 to sample select fill/upper sand monitoring wells for analysis of emerging contaminants. A second round of groundwater sampling took place in February 2018. Based upon the results of these sampling events, select fill/upper sand monitoring wells were sampled in February 2019.

On July 21, 2020, National Fuel Gas (NFG) encountered municipal landfill waste in an excavation completed on their Nash Road property, and west of the Niagara Sanitation Landfill. Four (4) excavations were completed by NFG to facilitate repairs to their high-pressure 24-inch gas pipeline. These excavations were inspected by NYSDEC staff on July 21st and July 22nd. All four (4) excavations contained municipal waste from about 6-inches to 9-feet depth. Depth to the bottom of the waste material was not determined. There were no odors, sheens, discoloration, or elevated PID readings. As a result, samples were not collected for analysis.

To determine if the municipal landfill waste on the National Fuel Gas property had adversely impacted groundwater in this area, the NYSDEC used a Standby Spill Contractor to install two (2) monitoring wells in 2021 (LPZ-14S & LPZ-15S) that screen the fill/upper sand water bearing zone with three (3) additional fill/upper sand wells (LPZ-16S, LPZ-17S, and LPZ-18S) installed in 2023. Two (2) of these wells were installed on National Fuel Gas property (LPZ-17S & LPZ-18S), while the remaining wells (LPZ-14S, LPZ-15S, and LPZ-16S) were installed along the gravel access road leading to the landfill. The locations of these wells are shown on Figure 3-1, while the well construction diagrams are given in Appendix A. These wells were installed in general accordance with a NYSDEC work plan entitled "*Well Installation Scope of Work*", May 2021, which can be found online at: https://www.dec.ny.gov/data/DecDocs/932054/.

The five (5) new monitoring wells, along with six (6) additional fill/upper sand monitoring wells, were sampled in October 2023 for analysis of emerging contaminants.

All groundwater analytical results were evaluated against the water quality standards and guidance values contained in the NYSDEC publication entitled "*Technical and Operational Guidance*

Series (TOGS) 1.1.1: Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations", Division of Water, June 1998, with addenda (hereafter called NYSDEC groundwater standards or guidance values). The groundwater guidance values for emerging contaminants were taken directly from Table 1 of the June 2021 addendum.

All groundwater analytical results from 2017, 2018, and 2019 were validated by Vali-Data of WNY, LLC, a certified data validator, in accordance with NYSDEC DER-10 and USEPA Region II data validation procedures. The groundwater analytical results from 2023 were validated by AECOM, a NYSDEC Engineering Consultant. The Data Usability Summary Reports are included in Appendix F (2017, 2018, and 2019) and Appendix E (2023), while the validated analytical results are summarized in Table 3-2 (December 2017), Table 3-3 (February 2018), Table 3-4 (February 2019), and Table 3-5 (October 2023).

3.2 December 2017 Groundwater Sampling Event

On December 12, 2017, groundwater samples were collected from monitoring wells OW-36, LDP-01, LDP-02, and LDP-03 by a NYSDEC Standby Spill Contractor. These wells are located near the perimeter of the landfill as shown on Figure 3-1.

Prior to sampling, each well was purged using the low-flow method with a peristaltic pump. During purging, temperature, pH, oxidation reduction potential (ORP), conductivity, turbidity, and dissolved oxygen were measured using a multi-parameter meter to ensure that the well had stabilized prior to sampling. All groundwater samples were submitted to TestAmerica in Amherst, New York for chemical analysis of per- and polyfluoroalkyl substances (PFAS) using USEPA Method 537 Modified. These samples were not analyzed for 1,4-dioxane. Information concerning sample collection and analysis is given in Table 3-1. The purge and sample logs are included in Appendix B, while the laboratory reports are included in Appendix D.

Twelve (12) PFAS compounds were detected in the groundwater samples collected in December 2017 (Table 3-2). Exceedances of the NYSDEC groundwater guidance values were only documented in monitoring well MW-36 (primary sample and duplicate) for perfluorooctanoic acid (PFOA) (100.0 and 110.0 ng/L) and perfluorooctanesulfonic acid (PFOS) (480.0 and 500.0 ng/L). These exceedances are summarized in Table 3-2 and shown on Figure 3-2. The NYSDEC groundwater guidance values for PFOA and PFOS are 6.7 ng/L and 2.7 ng/L, respectively. No other PFAS compounds were detected above 100.0 ng/L (Table 3-2).

3.3 February 2018 Groundwater Sampling Event

On February 6, 2018, groundwater samples were collected from monitoring wells OW-14BR, LPZ-04S, and LDP-04 by a NYSDEC Standby Spill Contractor. These wells are located near the perimeter of the landfill as shown on Figure 3-1.

Prior to sampling, each well was purged using the low-flow method with a peristaltic pump. During purging, temperature, pH, oxidation reduction potential (ORP), conductivity, turbidity, and dissolved oxygen were measured using a multi-parameter meter to ensure that the well had stabilized prior to sampling. All groundwater samples were submitted to TestAmerica in Amherst, New York for chemical analysis of per- and polyfluoroalkyl substances (PFAS) using USEPA Method 537 Modified. These samples were not analyzed for 1,4-dioxane. Information concerning sample collection and analysis is given in Table 3-1. The purge and sample logs are included in Appendix B, while the laboratory reports are included in Appendix D.

Ten (10) PFAS compounds were detected in the groundwater samples collected in February 2018 (Table 3-3). Exceedances of the NYSDEC groundwater guidance values for PFOA and PFOS were documented in all three (3) monitoring wells sampled. These exceedances are summarized in Table 3-3 and shown on Figure 3-2. Concentrations of PFOA ranged from 36.0 ng/L (well LPZ-04S) to 120.0 ng/L (well LDP-04), while concentrations of PFOS ranged from 10.0 ng/L (well LPZ-04S) to 80.0 ng/L (well LDP-04) (Table 3-3). The NYSDEC groundwater guidance values for PFOA and PFOS are 6.7 ng/L and 2.7 ng/L, respectively.

Other PFAS compounds detected at concentrations above 100.0 ng/L included perfluorobutanesulfonic acid (PFBS) in monitoring well LPZ-04S at concentrations of 500.0 and 490.0 ng/L (primary sample and duplicate), and perfluorohexanoic acid (PFHxA) in monitoring well LPZ-04S at a concentration of 150.0 ng/L in both the primary sample and duplicate (Table 3-3). There are no NYSDEC groundwater standards or guidance values for these PFAS compounds.

3.4 February 2019 Groundwater Sampling Event

On February 11, 2019, groundwater samples were collected from monitoring wells OW-14BR, OW-36, LDP-01, LDP-02, and LDP-04 by a NYSDEC Standby Spill Contractor. These wells are located near the perimeter of the landfill as shown on Figure 3-1.

Prior to sampling, each well was purged using the low-flow method with a peristaltic pump.

During purging, temperature, pH, oxidation reduction potential (ORP), conductivity, turbidity, and dissolved oxygen were measured using a multi-parameter meter to ensure that the well had stabilized prior to sampling. All groundwater samples were submitted to TestAmerica in Amherst, New York for chemical analysis of per- and polyfluoroalkyl substances (PFAS) using USEPA Method 537 Modified and 1,4-Dioxane using USEPA Method 8270D-SIM. Information concerning sample collection and analysis is given in Table 3-1. The purge and sample logs are included in Appendix B, while the laboratory reports are included in Appendix D.

Fourteen (14) PFAS compounds were detected in the groundwater samples collected in February 2019 (Table 3-4). Exceedances of the NYSDEC groundwater guidance values for PFOA and PFOS were documented in four (4) of the five (5) monitoring wells sampled. These exceedances are summarized in Table 3-4 and shown on Figure 3-2. Concentrations of PFOA ranged from 2.1 ng/L (well LDP-02) to 110.0 ng/L (well OW-36), while concentrations of PFOS ranged from 0.49 J ng/L (well LDP-01) to 460.0 ng/L (well OW-36) (Table 3-4). The NYSDEC groundwater guidance values for PFOA and PFOS are 6.7 ng/L and 2.7 ng/L, respectively. No other PFAS compounds were detected above 100.0 ng/L (Table 3-4).

The groundwater results from the February 2019 sampling event documented the presence of 1,4-dioxane in two (2) of the five (5) monitoring wells sampled (Table 3-4). The concentrations of 1,4-dioxane in monitoring well MW-36 (1.2 J µg/L in both the primary and duplicate samples) exceeded the NYSDEC groundwater guidance value (0.35 µg/L) for this contaminant (Table 3-4). These exceedances are shown on Figure 3-2.

3.5 October 2023 Groundwater Sampling Event

Between October 15 and 23, 2023, groundwater samples were collected from monitoring wells OW-13, OW-14BR, OW-35, OW-36, LPZ-03S, LPZ-04S, LPZ-14S, LPZ-15S, LPZ-16S, LPZ-17S, and LPZ-18S by a NYSDEC Standby Spill Contractor. These wells are located near the perimeter of the landfill (wells OW-14BR, OW-36, LPZ-03S, LPZ-04S), within the interior of the landfill (wells OW-13 and OW-35), or west of the landfill along the gravel access road (wells LPZ-14S, LPZ-15S, LPZ-16S, LPZ-17S, and LPZ-18S). The locations of these wells are shown on Figure 3-1. Wells OW-13 and OW-35 were added to this sampling round because elevated contaminant concentrations were previously documented in these wells (e.g., BTEX, phenols, pesticides, and/or metals). Wells LPZ-14S, LPZ-15S, LPZ-16S, LPZ-17S, and LPZ-18S were also sampled in 2023 to determine if the municipal landfill

waste encountered on the National Fuel Gas property had adversely impacted groundwater in this area.

Prior to sampling, each well was purged using the low-flow method with a peristaltic pump. During purging, temperature, pH, oxidation reduction potential (ORP), conductivity, turbidity, and dissolved oxygen were measured using a multi-parameter meter to ensure that the well had stabilized prior to sampling. All groundwater samples were submitted to Con-Test, a Pace Analytical Laboratory, in East Longmeadow, Massachusetts for chemical analysis of per- and polyfluoroalkyl substances (PFAS) using USEPA Draft Method 1633 and 1,4-Dioxane using USEPA Method SW-846 8270E. Information concerning sample collection and analysis is given in Table 3-1. The purge and sample logs are included in Appendix B, while the laboratory reports are included in Appendix C.

Sixteen (16) PFAS compounds were detected in the groundwater samples collected in October 2023 (Table 3-5). Exceedances of the NYSDEC groundwater guidance value for PFOA were documented in ten (10) of the eleven (11) monitoring wells sampled, while PFOS exceedances were documented in nine (9) of the eleven (11) monitoring wells sampled. These exceedances are summarized in Table 3-5 and shown on Figure 3-2. Concentrations of PFOA ranged from 2.9 ng/L (well LPZ-16S) to 130.0 ng/L (well LPZ-04S), while concentrations of PFOS ranged from non-detect (wells LPZ-04S and LPZ-16S) to 380.0 ng/L (well LPZ-17S) (Table 3-5). The NYSDEC groundwater guidance values for PFOA and PFOS are 6.7 ng/L and 2.7 ng/L, respectively.

Other PFAS compounds detected at concentrations above 100.0 ng/L included perfluorobutanesulfonic acid (PFBS) in monitoring well LPZ-04S (120.0 ng/L) and perfluoro-hexanesulfonic Acid (PFHxA) in monitoring well LPZ-04S (190.0 ng/L) (Table 3-5). There are no NYSDEC groundwater standards or guidance values for these PFAS compounds.

The groundwater results from the October 2023 sampling event documented the presence of 1,4-dioxane in ten (10) of the eleven (11) monitoring wells sampled (Table 3-5). Exceedances of the NYSDEC groundwater guidance value for 1,4-dioxane were documented in eight (8) of those wells (Table 3-5). Concentrations of 1,4-dioxane ranged from non-detect (well OW-14BR) to 7.9 µg/L (well OW-35). The NYSDEC groundwater guidance value for 1,4-dioxane is 0.35 µg/L. These exceedances are shown on Figure 3-2.

3.6 2021 & 2023 Soil/Fill Samples

Two (2) soil borings were completed on October 19, 2021 to facilitate the installation of monitoring wells LPZ-14S & LPZ-15S, with three (3) additional soil borings completed in early October 2023 to facilitate the installation of monitoring wells LPZ-16S, LPZ-17S, and LPZ-18S. Two (2) of these borings were completed on National Fuel Gas property (LPZ-16S & LPZ-17S), while the remaining borings (LPZ-14S, LPZ-15S, and LPZ-18S) were completed along the gravel access road leading to the landfill. The locations of these borings are shown on Figure 3-3, while the soil boring logs are included in Appendix G.

At each soil boring location, one (1) fill or native soil sample was collected for chemical analysis. Samples were collected by the Standby Spill Contractor in consultation with the NYSDEC field representative. The samples collected in 2021 were submitted to Eurofins Buffalo in Amherst, New York, while the 2023 samples were submitted to Con-Test, a Pace Analytical Laboratory, in East Longmeadow, Massachusetts for chemical analysis. The 2021 samples were analyzed for per- and polyfluoroalkyl substances (PFAS) using USEPA Method 537 Modified, while the 2023 samples were analyzed for 1,4-Dioxane using USEPA Methods SW-846 8260D and SW-846 8270E. Information concerning sample collection and analysis is given in Table 3-1.

The soil/fill analytical results from 2021 were validated by Vali-Data of WNY, LLC, a certified data validator, in accordance with NYSDEC DER-10 and USEPA Region II data validation procedures. The soil/fill analytical results from 2023 were validated by AECOM, a NYSDEC Engineering Consultant. The Data Usability Summary Reports are included in Appendix F (2021) and Appendix E (2023), while the validated analytical results are summarized in Table 3-6.

Soil/fill analytical results for 1,4-dioxane were evaluated against the restricted residential, commercial, and groundwater protection soil cleanup objectives contained in the NYSDEC publication entitled "*6NYCRR Part 375: Environmental Remediation Programs*", Division of Environmental Remediation, December 2006. The soil cleanup objectives for 1,4-dioxane were taken directly from Tables 375-6.8(a) and 375-6.8(b) of that document.

The soil cleanup objectives for per- and polyfluoroalkyl substances (PFAS) were taken from the NYSDEC publication entitled "*Sampling, Analysis, and Assessment of Per-and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs*", Division of Environmental Remediation, April 2023.

Four (4) PFAS compounds were detected in the soil/fill samples collected in October 2021 (Table 3-6). None of the concentrations, however, exceeded the NYSDEC soil cleanup objectives. 1,4-dioxane was not detected in the three (3) soil/fill samples collected in October 2023 (Table 3-6).

3.7 October 2023 Surface Water Sampling Event

Six (6) surface water samples were proposed for collection at the locations shown on Figure 3-4. Only one (1) sample was collected, however, as the other locations remained dry through the end of 2023 when the Spill Contract expired. The surface water sample collected was submitted to Con-Test, a Pace Analytical Laboratory, in East Longmeadow, Massachusetts for chemical analysis of per- and polyfluoroalkyl substances (PFAS) using USEPA Draft Method 1633 and 1,4-Dioxane using USEPA Method SW-846 8270E. Information concerning sample collection and analysis is given in Table 3-1, while the laboratory reports are included in Appendix C.

All surface water analytical results were evaluated against the water quality standards and guidance values contained in the NYSDEC publication entitled "*Technical and Operational Guidance Series (TOGS) 1.1.1: Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*", Division of Water, June 1998, with addenda. The surface water guidance values for emerging contaminants were taken directly from Table 1 of the June 2021 addendum.

The surface water analytical results were validated by AECOM, a NYSDEC Engineering Consultant, in accordance with NYSDEC DER-10 and USEPA Region II data validation procedures. The Data Usability Summary Report is included in Appendix E, while the validated analytical results are summarized in Table 3-7.

Eleven (11) PFAS compounds were detected in the surface water sample collected in October 2023 (Table 3-7). Concentrations of PFOA and PFOS in this sample were 85.0 and 180.0 ng/L, respectively, both of which exceeded the NYSDEC surface water guidance values for these contaminants. These exceedances are summarized in Table 3-7 and shown on Figure 3-5. The NYSDEC surface water guidance values for PFOA and PFOS are 6.7 ng/L and 2.7 ng/L, respectively.

The results from October 2023 revealed that 1,4-dioxane was not detected in the surface water sample collected (Table 3-7).

3.8 Drilling Water

One (1) drilling water sample was collected on October 19, 2021. This sample was collected because drilling water was poured into each boring to hydrate the bentonite pellets during the installation of monitoring wells LPZ-14S & LPZ-15S. This sample was submitted to Eurofins Buffalo in Amherst, New York for chemical analysis of per- and polyfluoroalkyl substances (PFAS) using USEPA Method 537 Modified. Information concerning sample collection and analysis is given in Table 3-1, while the laboratory report is included in Appendix D.

The drilling water sample was validated by Vali-Data of WNY, LLC, a certified data validator, in accordance with NYSDEC DER-10 and USEPA Region II data validation procedures. The Data Usability Summary Report is included in Appendix F, while the validated analytical results are summarized in Table 3-8.

Four (4) PFAS compounds were detected in the drilling water sample collected in October 2021 (Table 3-8). None of the concentrations, however, exceeded the NYSDEC groundwater guidance values for these contaminants.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 Discussion

Soil/fill, groundwater, and surface water samples from the Niagara Sanitation Landfill have been collected on numerous occasions since 2017 for the analysis of emerging contaminants. The results from the samples collected between 2017 and 2023 were discussed by sampling round in Section 3.0 of this report. In Section 4.0, the groundwater results are evaluated collectively to determine the extent of emerging contaminants at and near the site. Potential source areas of those contaminants are evaluated by discussing the soil/fill results coupled with groundwater flow patterns across the site. The extent of emerging contaminants in surface water cannot be determined due to the paucity of results, so surface water is not discussed further in Section 4.0.

4.1.1 *Groundwater*

Groundwater samples for analysis of emerging contaminants were collected from select monitoring wells in 2017, 2018, 2019, and 2023. The locations of these wells are shown on Figure 3-1. The results obtained from these samples are summarized by well in Table 4-1 and discussed in this section of the report.

Eight (8) groundwater samples have been collected from wells along the southern boundary of the main landfill (LPZ-03S, LPZ-04S, LDP-01, LDP-02, and LDP-03) (Figure 3-1). Table 4-1A shows that emerging contaminants have been detected in all five (5) wells, with PFOA exceedances documented in wells LPZ-03S and LPZ-04S (Figure 3-2). PFOS exceedances were documented in wells LPZ-03S, LPZ-04S, and LDP-02 (Figure 3-2; Table 4-1A). In well LPZ-04S, the concentration of PFOA increased from 36.0 ng/L in 2018 to 130.0 ng/L in 2023, while the concentration of PFOS decreased from 10.0 ng/L in 2018 to non-detect in 2023 (Table 4-1A). For the other PFAS compounds detected in this well, some increased between 2018 and 2023 while others decreased (Table 4-1A). For well LDP-01, eight (8) PFAS compounds were detected in 2017 compared to only two (2) in 2019 (Table 4-1A). 1,4-dioxane exceeded the NYSDEC groundwater guidance value in wells LPZ-03S and LPZ-04S, but was not detected in wells LDP-01, LDP-02 (Table 4-1A).

Eight (8) groundwater samples have been collected from wells along or near the northern boundary of the main landfill (OW-14BR, OW-36, and LDP-04) (Figure 3-1). Table 4-1B shows that

emerging contaminants have been detected in all three (3) wells, with PFOA and PFOS exceedances documented in all eight (8) samples (Figure 3-2; Table 4-1B). Concentrations of PFOA in well OW-14BR were similar in 2018 and 2019 (56.0 and 55.0 ng/L, respectively) but decreased to 28.0 ng/L in 2023 (Table 4-1B). Likewise, concentrations of PFOS in this well were similar in 2018 and 2019 (30.0 and 39.0 ng/L, respectively) but decreased to 15.0 ng/L in 2023 (Table 4-1B). A similar relationship was documented in well OW-36. PFOA concentrations in 2018 and 2019 (100.0 and 110.0 ng/L, respectively) decreased to 82.0 ng/L in 2023, while PFOS concentrations in 2018 and 2019 (480.0 and 460.0 ng/L, respectively) decreased to 370.0 ng/L in 2023 (Table 4-1B). The concentrations of PFOS in well OW-36 were the highest PFOS concentrations documented at the site (Figure 3-2; Tables 4-1A through 4-1D). 1,4-dioxane was only detected in well OW-36, with the concentrations of both samples exceeding the NYSDEC groundwater guidance value (Table 4-1B).

Two (2) groundwater samples have been collected from wells within the Niagara Sanitation Landfill (OW-13 and OW-35) (Figure 3-1). Table 4-1C shows that emerging contaminants have been detected in both wells, with PFOA and PFOS exceedances documented in both samples (Figure 3-2; Table 4-1C). 1,4-dioxane was detected in both wells with the concentration in well OW-35 exceeding the NYSDEC groundwater guidance value (Table 4-1C). The concentration of 1,4-dioxane in this well (7.9 µg/L) was the highest 1,4-dioxane concentration documented at the site (Figure 3-2; Tables 4-1A through 4-1D).

Five (5) groundwater samples have been collected from wells installed west of the main Niagara Sanitation Landfill along the gravel access road (wells LPZ-14S, LPZ-15S, LPZ-16S, LPZ-17S, and LPZ-18S) (Figure 3-1). Table 4-1D shows that emerging contaminants have been detected in all five (5) wells, with PFOA and PFOS exceedances documented in all wells except LPZ-16S (Figure 3-2). 1,4-dioxane was also detected in all five (5) wells, with concentrations exceeding the NYSDEC groundwater guidance value in all wells except LPZ-16S (Figure 3-2; Table 4-1D).

In general, concentrations of PFOA and PFOS were lower in wells along the southern boundary of the main landfill than at other locations (Tables 4-1A through 4-1D). The exception is well LPZ-04S, where the concentration of PFOA increased from 36.0 ng/L in 2018 to 130.0 ng/L in 2023 (Table 4-1A). It is possible that a groundwater flow reversal accounts for this increase (see Section 4.2 for more detail).

Concentrations of PFOA were similar in wells OW-13, OW-14BR, LPZ-14S, and LPZ-15S, generally ranging from 51.0 to 56.0 ng/L (Tables 4-1B, 4-1C, and 4-1D). Wells OW-13 and OW-14BR

are located in the eastern portion of the main landfill, while wells LPZ-14S, and LPZ-15S are located west of the main landfill along the gravel access road (Figure 3-1). Likewise, concentrations of PFOA were similar in wells OW-35, OW-36, LDP-04, LPZ-17S, and LPZ-18S, generally ranging from 94.0 to 120.0 ng/L (Tables 4-1B, 4-1C, and 4-1D). Wells OW-35, OW-36, and LDP-04 are located in the northwestern portion of the main landfill, while wells LPZ-17S, and LPZ-18S are located west of the main landfill along the gravel access road (Figure 3-1). In 2023, concentrations of PFOA decreased in wells OW-14BR and OW-36 (Table 4-1B). It is possible that a groundwater flow reversal accounts for this decrease (see Section 4.2 for more detail).

Unlike the concentrations of PFOA, the concentrations of PFOS were quite variable for wells located along or near the northern boundary of the main landfill (OW-14BR, OW-36, and LDP-04), within the landfill (OW-13 and OW-35), and west of the main landfill along the gravel access road (wells LPZ-14S, LPZ-15S, LPZ-16S, LPZ-17S, and LPZ-18S) (Figure 3-1; Tables 4-1B, 4-1C, and 4-1D). Concentrations of PFOS in these wells ranged from a low of 15.0 ng/L in well OW-14BR to 480.0 ng/L in well OW-36 (Tables 4-1B, 4-1C, and 4-1D). Both of these wells are located along or near the northern boundary of the main landfill (Figure 3-1).

4.1.2 *Soil and Fill*

At the Niagara Sanitation Landfill, emerging contaminant results for soil and fill are extremely limited, with results being restricted to the area west of the main landfill (Figure 3-3). Only two (2) samples have been analyzed for PFAS, while only three (3) samples have been analyzed for 1,4-dioxane (Table 3-6). Of these samples, only one (1) was collected from fill material, the most likely source of the emerging contaminants detected in groundwater and surface water at the landfill.

Four (4) PFAS compounds were detected in the soil/fill samples collected in October 2021 (Table 3-6). None of the concentrations, however, exceeded the NYSDEC soil cleanup objectives. 1,4-dioxane was not detected in the three (3) soil/fill samples collected in October 2023 (Table 3-6).

Due to the absence of emerging contaminant results for soil and fill from the main landfill, the extent of emerging contaminants in soil and fill cannot be determined.

4.2 Potential Source Areas

As discussed in Section 1.1, many products that ultimately end up in municipal landfills

contain PFAS. Some of these products have been observed in the municipal waste at the Niagara Sanitation Landfill. Others were likely to have been disposed there. Municipal waste, however, isn't the only potential source of PFAS at the Niagara Sanitation Landfill. An area in the south-central portion of the site contains elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) with the surface fill having an ash-like appearance (see Figure H-14 in Appendix H). This is suggestive of surface burning, in which case there is the potential that fire-fighting foam was used. The absence of emerging contaminant results for soil and fill from the main landfill, however, prevents a direct determination that landfill waste and/or fire-fighting foam is (are) the source(s) of the emerging contaminants detected in groundwater and surface water at the landfill.

The concentrations of PFAS compounds in groundwater appear to rule out fire-fighting foam as the source. In the Village of Mayville, Chautauqua County, New York, PFAS have been detected in the public water supply system (NYSDEC, 2022). Investigations by the NYSDEC determined that these compounds were related to the historic use of fire-fighting foam (NYSDEC, 2022). Groundwater samples from a source area monitoring well (well MW-7) contained PFNA at a concentration of 110,000 ng/L, PFUnA at a concentration of 20,000 ng/L, PFOA at a concentration of 2,000 ng/L, and numerous other PFAS compounds with elevated concentrations (Table 4-2). The PFAS identified at Mayville are different from those documented at the Niagara Sanitation Landfill (compare Table 4-2 with Tables 4-1A through 4-1D). In addition, the concentrations at Mayville are far higher than any detected at the Niagara Sanitation Landfill, indicating that fire-fighting foam is not the PFAS source.

It is possible that groundwater flow patterns in relationship to wells with PFOA and PFOS exceedances may provide insight into potential on-site source areas. As discussed in Section 2.4, groundwater contour maps do not show a consistent pattern of groundwater flow across the Niagara Sanitation Landfill. Throughout the year, groundwater can flow toward the north, south or into the landfill, with eastward components of flow also being prevalent (Figures 2-4 through 2-9). As a result, it would be beneficial if groundwater contour maps were available for each of the EC sampling events. For example, downgradient wells with EC exceedances would suggest that groundwater flowing through the landfill was becoming contaminated with emerging contaminants, especially if the upgradient wells had no contamination or lower concentrations of these compounds. Unfortunately, complete well gauging events were not completed during any of the EC sampling events, so groundwater contour maps are not available.

As an alternative, maps showing the wells gauged during each sampling event, along with

their groundwater elevations, may provide some insight into groundwater flow directions. These maps are shown as Figure 4-1 (2017 sampling event), Figure 4-2 (2018 sampling event), Figure 4-3 (2019 sampling event), and Figure 4-4 (2023 sampling event). Water level data obtained during the sampling events are summarized in Table 4-3.

Figure 4-1 shows that groundwater elevations in the four (4) wells sampled in 2017 are nearly the same. Combined with the spatial distribution of these wells it is not possible to infer a groundwater flow direction. There are only three (3) groundwater elevations available for 2018 (Figure 4-2). These elevations suggest that groundwater flow was toward the northeast across the landfill. Such a flow pattern, however, is inconsistent with documented groundwater flow patterns at the site (Figures 2-4 through 2-9).

Figure 4-3 shows the groundwater elevations in four (4) wells sampled in 2019. The elevations in three (3) of the four (4) wells are nearly the same. Like Figure 4-2, these elevations suggest that groundwater flow was toward the northeast across the landfill. As stated above, such a flow pattern is inconsistent with documented groundwater flow patterns at the site (Figures 2-4 through 2-9).

Figure 4-4 shows the groundwater elevations in eleven (11) wells sampled in 2023. For the main landfill, elevations for wells OW-14BR and OW-13 suggest groundwater flow to the south, as do the elevations for wells OW-35, OW-36, LPZ-03S, and LPZ-04S. This groundwater flow pattern has been documented at the Niagara Sanitation landfill, and would explain why the concentration of PFOA in well LPZ-04S increased from 36.0 ng/L in 2018 to 130.0 ng/L in 2023 (Table 4-1A); this well was downgradient of the landfill in 2023. This would also explain why the concentrations of PFOA in wells OW-14BR and OW-36 decreased in 2023 (Table 4-1B); these wells were upgradient of the landfill.

The groundwater flow direction west of the landfill is less clear because the spatial distribution of the wells in a north-south direction is small. The groundwater elevation for well LPZ-16S appears to be anomalously low (Figure 4-4), but this well recovered slower than the other fill/upper sand wells. As a result, this well will not be discussed further. Well pairs LPZ-15S and LPZ-17S suggest southward groundwater flow, while well pairs LPZ-14S and LPZ-18S suggest northward flow (Figure 4-4). What is clear, however, is that the two (2) wells installed closest to the municipal landfill waste encountered on the National Fuel Gas property (wells LPZ-17S and LPZ-18S) generally contained higher concentrations of PFOA and PFOS than the two (2) wells located farther from the

waste (wells LPZ-14S and LPZ-15S) (Figure 3-2; Table 4-1D).

4.3 Recommendations

In 2023, thirteen (13) fill/upper sand monitoring wells were proposed for groundwater sampling (Table 3-1). Only eleven (11) wells were sampled as wells OW-16 and LDP-04 remained dry through the end of 2023 when the Standby Spill Contract expired. In addition, six (6) surface water samples were proposed for collection at the locations shown on Figure 3-4. Only one (1) sample was collected, however, as the other locations remained dry through the end of 2023.

It is recommended that the thirteen (13) fill/upper sand monitoring wells proposed for groundwater sampling in 2023 be sampled during the Spring of 2025 when groundwater elevations are the highest. It is also recommended that the surface water bodies proposed for sampling in 2023 be sampled during the Spring of 2025 as part of the groundwater sampling event. This will allow correlations to be made between the groundwater and surface water results. Prior to groundwater sampling, it is recommended that all fill/upper sand wells at the Niagara Sanitation Landfill be gauged so that a detailed groundwater contour map can be generated.

It is further recommended that surface water bodies adjacent to the National Fuel Gas property and along the access road be sampled to evaluate impacts on surface water in this area by the municipal landfill waste encountered on the National Fuel Gas property. This sampling should also take place during the Spring of 2025 as part of the groundwater sampling event.

To evaluate the extent of emerging contaminants in soil and fill in the main landfill, it is recommended that soil borings be completed with samples collected for emerging contaminants analysis.

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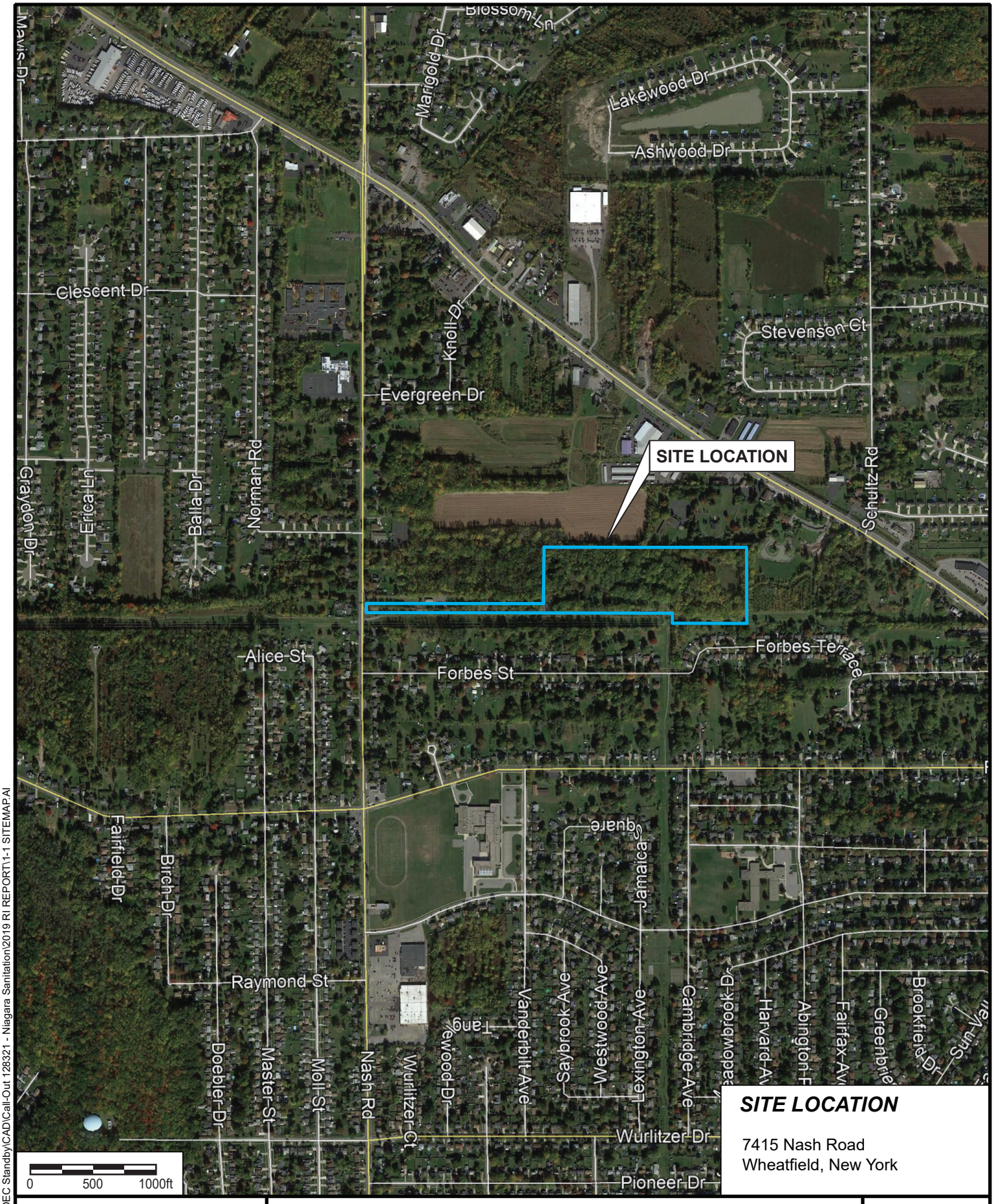
FIGURES



SITE LOCATION

7415 Nash Road
Wheatfield, New York

LiRo-Engineers, Inc.
690 Delaware Ave.
Buffalo, New York

NIAGARA SANITATION LANDFILL
SITE LOCATION MAP

FIGURE NO.

1-1

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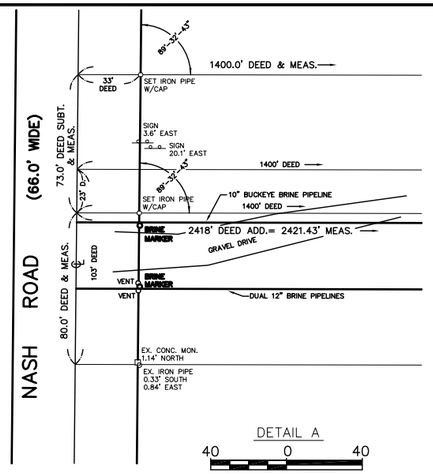
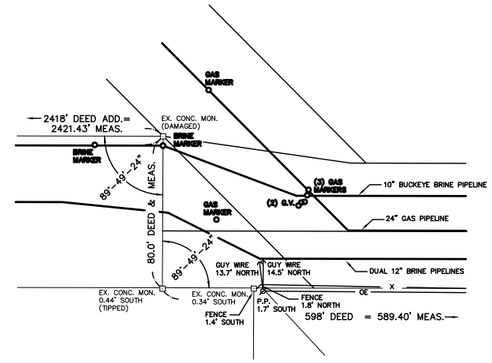


DETAIL A

40 0 40

SCALE IN FEET



DETAIL B

40 0 40

SCALE IN FEET

N

REPUTED OWNER
SOCIETY OF THE CATHOLIC APOSTOLATE
L-1263, P-201
L-1263, P-242

EX. IRON PIPE 0.26' SOUTH
EX. IRON PIPE (TALL) 0.49' SOUTH 0.49' EAST
EX. IRON PIPE (TALL) 1.56' NORTH 1.45' WEST
(66.0' WIDE)
EAST LINE LOT-29
WEST LINE LOT-22
SET IRON PIPE W/CAP
EX. ANGLE IRON 1.3' WEST
EX. ANGLE IRON 0.5' WEST
EX. ANGLE IRON 1.1' WEST
1602.0' DEED & MEAS.
PARALLEL WITH SOUTH LINE LOT-22
NORTH LINE WILLIAM VOLKSTADT L-668, P-85
N.E. COR. L-668, P-85
SET IRON PIPE W/CAP
EX. IRON PIPE 5.49' SOUTH 8.05' WEST
90°-25'-27"
448.0' MEAS. 521' DEED
PARALLEL WITH ℄ NASH ROAD
EAST LINE L-668, P-85
601.0' DEED & MEAS.
PARALLEL WITH EAST LINE LOT-22 (DEED)
REPUTED OWNER
CAROL GUIDO
L-1438, P-914
L-3325, P-938
REPUTED OWNER
JAMES LOVELAND
L-1434, P-829
REPUTED OWNER
ROBERT J. & ELAINE McCALL
L-1817, P-137
EX. ANGLE IRON
EX. REBAR 0.13' EAST
REPUTED OWNER
TOWN OF WHEATFIELD
L-1110, P-505
2ND DESCRIBED PARCEL
22.636±Ac.
EX. REBAR 11.95' SOUTH 16.15' WEST
EX. REBAR W/CAP 0.85' NORTH
REPUTED OWNER
IROQUOIS GAS CORPORATION
L-1469, P-559
200' DEED
REPUTED OWNER
JONATHON M. PETERSON
L-3305, P-765
1400' DEED
150' DEED
100' DEED
SEE DETAIL A
200' DEED
REPUTED OWNER
TOWN OF WHEATFIELD
L-1110, P-505
1ST DESCRIBED PARCEL
REPUTED OWNER
IROQUOIS GAS CORPORATION
L-1482, P-771
REPUTED OWNER
THE TOWN OF WHEATFIELD
L-1269, P-587
CHAIN LINK FENCE
FENCE 1.6' SOUTH
1400.0' DEED & MEAS.
FENCE 1.3' SOUTH
1400' DEED
PARALLEL WITH SOUTH LINE LOT-22
GATE POST
GRAVEL DR.
GATE POST
23' DEED
80.0' DEED & MEAS.
EX. CONC. MON. 1.14' NORTH
EX. IRON PIPE 0.33' SOUTH 0.84' EAST
2418' DEED ADDITION = 2421.43' MEAS.
NORTH LINE NIAGARA FALLS POWER COMPANY (DEED)
TOWN OF WHEATFIELD
CITY OF NORTH TONAWANDA
REPUTED OWNER
NIAGARA MOHAWK POWER CORP.
SOUTH LINE LOT-22
NORTH LINE LOT-21
EAST LINE NIAGARA FALLS POWER COMPANY
EX. CONC. MON.
SEE EASEMENT TO NATIONAL FUEL GAS DISTRIBUTION CORPORATION L-2383, P-49
REPUTED OWNER
NIAGARA MOHAWK POWER CORP.
24" GAS PIPELINE
GAS MARKER
GAS MARKER
SEE 66' WIDE RIGHT OF WAY & EASEMENT TO IROQUOIS GAS CORPORATION L-1482, P-806
SEE DETAIL B
SEE RIGHT OF WAY TO BUCKEYE PIPE LINE COMPANY (INC.) L-1507, P-939, PARCEL NO. 1
89°-34'-33"
1018' DEED
120.00' D.
80.0' D. & M.
GUY WIRE 10.4' NORTH
498.16' DEED
10" BUCKEYE BRINE PIPELINE
24" GAS PIPELINE 322.15' DEED
596.00' DEED = 589.40' MEAS.
DUAL 12" BRINE PIPELINES
SAT. DISH 0.4' NORTH
P.P. 1.1' SOUTH
BRINE MARKER
GAS MARKER
BRINE MARKER
P.P. 2.4' SOUTH
FENCE 1.1' SOUTH
P.P. 1.1' SOUTH
FENCE 0.6' SOUTH
FENCE 0.1' SOUTH
P.P. 1.2' SOUTH
FENCE 0.7' NORTH
FENCE 0.1' SOUTH
P.P. NG 508 NYT 508 0.8' SOUTH
SET IRON PIPE W/CAP
SHED
FENCE 1.8' SOUTH
FORBES TERRACE (60.0'
SEE 30' WIDE EASEMENT TO TEXAS BRINE CORPORATION L-2072, P-269
SEE NON-EXCLUSIVE RIGHT OF WAY & EASEMENT TO BUCKEYE PIPE LINE COMPANY (INC.) L-1507, P-176 (GRANTED OVER EASEMENT IN L-1482, P-806)
FORBES STREET

LEGEND

OE	OVERHEAD ELECTRIC
ø P.P.	POWER POLE
o G.V.	GAS VALVE
-o-o-	SIGN

100 0 100

SCALE IN FEET

SURVEY PROVIDED BY:
McINTOSH & McINTOSH, P.C.
CONSULTING ENGINEERS, LAND SURVEYORS, PLANNERS
429 PINE STREET, LOCKPORT, NEW YORK 14094
PHONE 433-2535 PHONE 625-8360

WARNING

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NO.	DATE	DESCRIPTION
		REVISIONS

Liro Engineers, Inc.
690 Delaware Avenue
Buffalo, New York

PROJ. ENG.:	
DESIGNED BY:	
CHECKED BY:	
DRAWN BY:	
CLIENT:	NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation
DATE:	SEPTEMBER 2021
SCALE:	AS SHOWN

JOB TITLE AND LOCATION:
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

DRAWING TITLE:
NIAGARA SANITATION LANDFILL PROPERTY MAP

LIRO JOB NO.: 17-013-0289
SHEET OF
FIGURE NO. 2-1

J:\17-013-0289 NYSDEC Standby\CAD\Coll-Out 128321 - Niagara Sanitation\2019 RI REPORT\2-1 PROPERTY MAP.dwg 9/21/2021 1:38 PM

N

LEGEND

- US ARMY CORPS OF ENGINEERS FIELD DELINATED FRESHWATER FORESTED SHRUB WETLAND
- GRAVEL ROAD
- WELL ACCESS PATHWAY
- LANDFILL AREA OF INVESTIGATION

REPUTED OWNER
SOCIETY OF THE CATHOLIC APOSTOLATE
L–1263, P–201
L–1263, P–242

1602.0' DEED / & MEAS.

SET IRON PIPE W/CAP

SET IRON PIPE W/CAP

EX. ANGLE IRON 1.3' WEST

EX. ANGLE IRON 0.5' WEST

EX. ANGLE IRON 1.1' WEST

EX. ANGLE IRON 0.4' EAST

EX. REBAR 0.13' EAST

EX. REBAR 11.95' SOUTH 16.15' WEST

REPUTED OWNER
THE TOWN OF WHEATFIELD
L–1269, P–587

SET IRON PIPE

PARALLEL WITH SOUTH LINE LOT–22

23' DEED

1018' DEED

2418' DEED ADDITION = 2421.43' MEAS.

NORTH LINE NIAGARA FALLS POWER COMPANY (DEED)

WHEATFIELD

TONAWANDA

REPUTED OWNER
NIAGARA MOHAWK POWER CORP.

ROD = 66' DEED

24" GAS PIPELINE

GAS MARKER

GAS MARKER

SEE 66' WIDE RIGHT OF WAY & EASEMENT TO IROQUOIS GAS CORPORATION L–1462, P–806

10" BUCKEYE BRINE PIPELINE

DUAL 12" BRINE PIPELINES

SOUTH LINE LOT–22

NORTH LINE LOT–21

EAST LINE NIAGARA FALLS POWER COMPANY

EX. CONC. MON.

SEE EASEMENT TO NATIONAL FUEL GAS DISTRIBUTION CORPORATION

GUY WIRE

DISH 0.4' NORTH

P.P. 1.1' SOUTH

681.46' DEED

REPUTED OWNER
IROQUOIS GAS CORPORATION
L–1496, P–986

24" GAS PIPELINE 622.15' DEED

BRINE MARKER

GAS MARKER

BRINE MARKER

P.P. 2.4' SOUTH

FENCE 1.1' SOUTH

P.P. 1.1' SOUTH

FENCE 0.6' SOUTH

FENCE 0.1' SOUTH

P.P. 1.2' SOUTH

FENCE 0.7' NORTH

FENCE 0.1' SOUTH

P.P. NG 50R NYT 50R 0.8' SOUTH

SHED

FENCE 1.8' SOUTH

P.P. NG 62R NYT 62

FORBES TERRACE (60.0' WIDE)

SEE 30' WIDE EASEMENT TO TEXAS BRINE CORPORATION L–2072, P–269

80 0 80
SCALE IN FEET

WARNING
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NO.	DATE	DESCRIPTION
REVISIONS		

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, New York

PROJ. ENG.:
DESIGNED BY:
CHECKED BY:
DRAWN BY:

CLIENT: NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

DATE: SEPTEMBER 2021
SCALE: AS SHOWN

JOB TITLE AND LOCATION:
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

LIRO JOB NO.: 17–013–0289
SHEET OF

DRAWING TITLE:
SITE BOUNDARY MAP SHOWING WETLANDS

FIGURE NO.
2-2

J:\17–013–0289 NYSDEC Standby\CAD\Coll–Out 128321 – Niagara Sanitation\2019 RI REPORT\2–2 SITE MAP WETLANDS.dwg 9/21/2021 1:38 PM

N

LEGEND

- FRESHWATER FORESTED/ SHRUB WETLAND
- GRAVEL ROAD
- LANDFILL AREA OF INVESTIGATION
- 2013 SURFACE SOIL SAMPLE LOCATION
- 2013 SOIL BORING SAMPLE LOCATION
- 2013 SURFACE WATER SAMPLING LOCATIONS
- 2013 MONITORING WELL SAMPLE LOCATION
- 2013 SEDIMENT SAMPLE LOCATION

SET IRON PIPE W/CAP
EX. ANGLE IRON 1.3' WEST
EX. ANGLE IRON 0.5' WEST
EX. ANGLE IRON 1.1' WEST
EX. ANGLE IRON
EX. REBAR 0.13' EAST
EX. REBAR 11.95' SOUTH 16.15' WEST
1602.0' DEED & MEAS.
SET IRON PIPE W/CAP
SW-6
SED-1
SW-2
OW-2
OW-1
OW-14B
SB-E
SW-5
SOIL-10
SW-4
SW-3
OW-21/SB-D
SOIL-9
OW-11
SB-J
SB-H
SB-M
SW-7
SB-G
OW-13
SOIL-7
SB-B/OW-25
SOIL-6
SOIL-11
SB-I
SOIL-5
OW-16
OW-23/SB-F
SB-L
OW-22/SB-C
SOIL-8
SB-K
SOIL-1
SB-A/OW-24
REPUTED OWNER
THE TOWN OF WHEATFIELD
L-1269, P-587
4' ROS @ 66' DEED
24" GAS PIPELINE
GAS MARKER
GAS MARKER
SOIL-4
SET IRON PIPE W/CAP
SEE 66' WIDE RIGHT OF WAY & EASEMENT TO IROQUOIS GAS CORPORATION L-1482, P-806
PARALLEL WITH SOUTH LINE LOT-22
23' DEED
1018' DEED
GUY WIRE 10.4' NORTH
SAT. DISH 0.4' NORTH
P.P. 1.1' SOUTH
681.46' DEED
499.16' DEED
BRINE MARKER
GAS MARKER
BRINE MARKER
24" GAS PIPELINE 522.15' DEED
REPUTED OWNER
IROQUOIS GAS CORPORATION
L-1496, P-986
2418' DEED ADDITION = 2421.43' MEAS.
10" BUCKEYE BRINE PIPELINE
DUAL 12" BRINE PIPELINES
SOIL-3
SOIL-2
NORTH LINE NIAGARA FALLS POWER COMPANY (DEED)
SOUTH LINE LOT-22
NORTH LINE LOT-21
EAST LINE NIAGARA FALLS POWER COMPANY
EX. CONC. MON.
P.P. 2.4' SOUTH
FENCE 1.1' SOUTH
P.P. 1.1' SOUTH
FENCE 0.6' SOUTH
FENCE 0.1' SOUTH
P.P. 1.2' SOUTH
FENCE 0.7' NORTH
FENCE 0.1' SOUTH
P.P. NG 50R NYT 50R 0.8' SOUTH
SHED
FENCE 1.8' SOUTH
P.P. NG 62R NYT 62
SEE EASEMENT TO NATIONAL FUEL GAS DISTRIBUTION CORPORATION
EATFIELD
ONAWANDA
REPUTED OWNER
NIAGARA MOHAWK POWER CORP.
FORBES TERRACE (60.0' WIDE)
SEE 30' WIDE EASEMENT TO TEXAS BRINE CORPORATION L-2072, P-269

80 0 80
SCALE IN FEET

NO.	DATE	DESCRIPTION

REVISIONS

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, New York

PROJ. ENG.:
DESIGNED BY:
CHECKED BY:
DRAWN BY:

CLIENT: NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

DATE: SEPTEMBER 2021
SCALE: AS SHOWN

JOB TITLE AND LOCATION:
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

LIRO JOB NO.: 17-013-0289
SHEET OF

DRAWING TITLE:
2013 SITE CHARACTERIZATION
SAMPLE LOCATION MAP

FIGURE NO. 2-3

N

LEGEND

- FRESHWATER FORESTED/ SHRUB WETLAND
- GRAVEL ROAD
- LIMITS OF 2014/2015 IRM EXCAVATION
- LANDFILL AREA OF INVESTIGATION
- MONITORING WELL AND PIEZOMETER LOCATIONS
- 2017 HAND DRILLED 1–INCH ID PIEZOMETER LOCATION
- 2017 STAFF GAUGE LOCATION
- (573.67) GROUNDWATER ELEVATION (FT. MSL)
- 573.00 GROUNDWATER CONTOUR (FT. MSL)
- INTERPRETED GROUNDWATER FLOW DIRECTION

LDP–04 (572.81)
OW–36 (574.02)
LPZ–12S (573.34)
OW–35 (573.91)
OW–37 (573.71)
LPZ–11S (573.53)
LPZ–01S (573.76)
OW–14BR (573.67)
SG–01 (DRY)
OW–1 (573.07)
OW–14B (574.24)
SG–02 (DRY)
OW–21 (572.77)
LPZ–09S (573.77)
OW–33 (573.29)
LPZ–02S (574.02)
OW–13 (573.34)
OW–16 (573.34)
OW–32 (573.67)
LPZ–08S (574.14)
OW–22 (572.99)
OW–23
LPZ–13S (573.02)
LPZ–10S (573.26)
OW–31 (572.49)
OW–34 (572.64)
LPZ–03S (572.36)
LPZ–04S (572.45)
LPZ–05S (572.82)
LPZ–06S (572.76)
LPZ–07S (572.37)
LDP–01 (DRY)
LDP–02R (572.64)
LDP–03 (572.60)

572.50 573.00 573.50 574.00

80 0 80
SCALE IN FEET

NO.	DATE	DESCRIPTION
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Buffalo, New York

PROJ. ENG.:
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DRAWN BY:

CLIENT: NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

DATE: SEPTEMBER 2021
SCALE: AS SHOWN

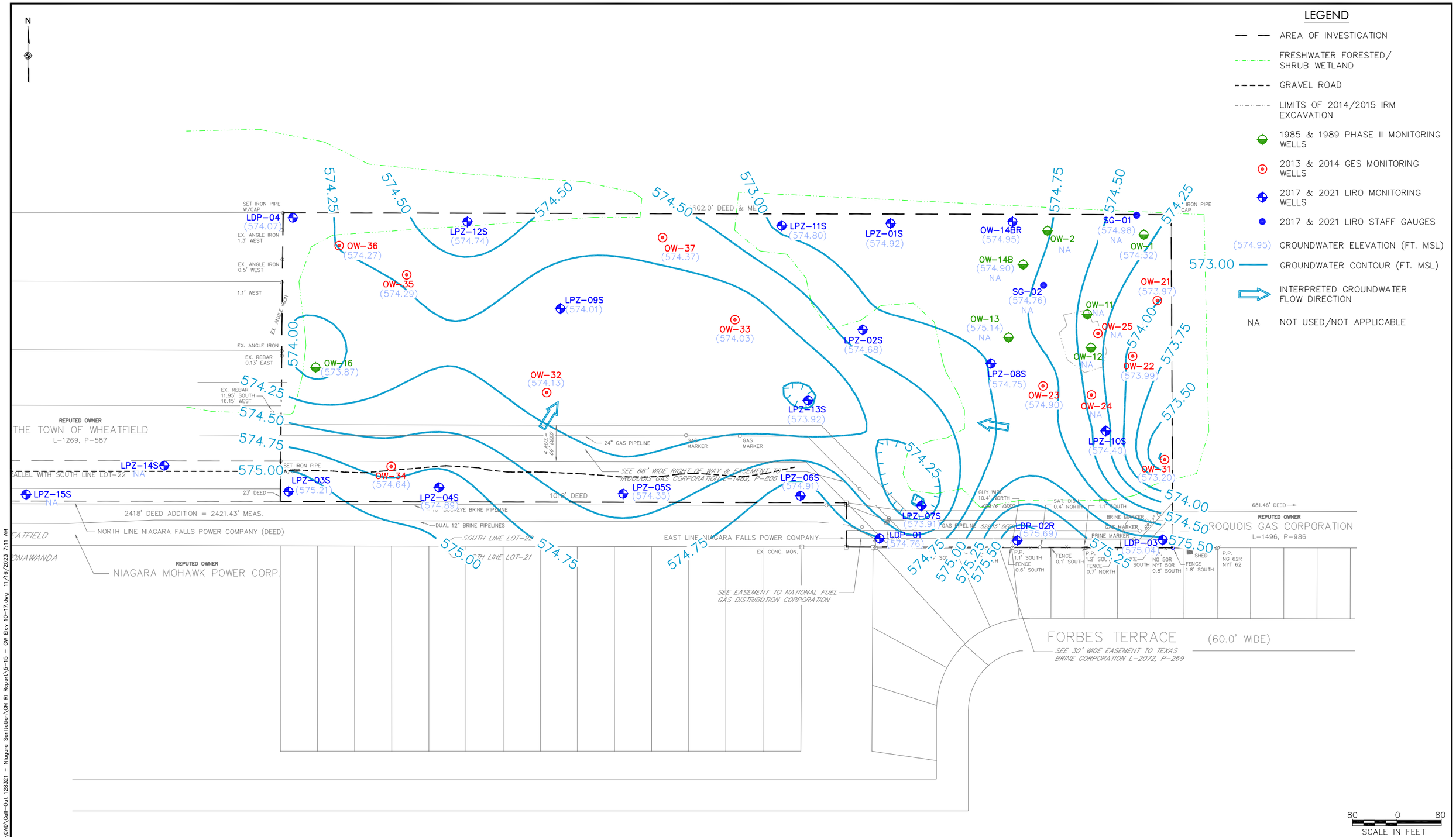
JOB TITLE AND LOCATION:
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

LIRO JOB NO.: 17–013–0289
SHEET OF

DRAWING TITLE:
GROUNDWATER ELEVATION CONTOUR MAP
FILL/UPPER SAND: SEPTEMBER 25, 2017

FIGURE NO. 2-4

J:\17-013-0289 NYSDEC Standby\CAD\Cell-Out 128321 - Niagara Sanitation\2019 RI REPORT\2-4 CONTOUR SEPT 25.dwg 9/21/2021 1:38 PM



J:\17-013-0289 NYSDEC Standby\CAD\Coll-Out 128321 - Niagara Sanitation\GM RI Report\5-15 - GW Elev 10-17.dwg 11/16/2023 7:11 AM

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NO.	DATE	DESCRIPTION

REVISIONS

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690 Delaware Avenue
Buffalo, New York

PROJ. ENG.:
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DRAWN BY:

CLIENT: NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

DATE: NOVEMBER 2023

SCALE: AS SHOWN

JOB TITLE AND LOCATION:
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

LIRO JOB NO.: 17-013-0289

SHEET OF

DRAWING TITLE:
GROUNDWATER ELEVATION CONTOUR MAP
FILL/UPPER SAND: OCTOBER 17, 2017

FIGURE NO.: 2-5

N

LEGEND

- AREA OF INVESTIGATION
- FRESHWATER FORESTED/ SHRUB WETLAND
- GRAVEL ROAD
- LIMITS OF 2014/2015 IRM EXCAVATION
- 1985 & 1989 PHASE II MONITORING WELLS
- 2013 & 2014 GES MONITORING WELLS
- 2017 & 2021 LIRO MONITORING WELLS
- 2017 & 2021 LIRO STAFF GAUGES
- (574.95) GROUNDWATER ELEVATION (FT. MSL)
- 573.00 GROUNDWATER CONTOUR (FT. MSL)
- INTERPRETED GROUNDWATER FLOW DIRECTION
- NA NOT USED/NOT APPLICABLE

LDP-04 (575.33) NA
OW-36 (575.30)
LPZ-12S (575.36)
OW-37 (574.96)
OW-35 (574.93)
LPZ-09S (574.90)
OW-16 (574.88)
OW-32 (574.88)
OW-33 (575.02)
LPZ-11S (575.41)
LPZ-01S (575.27)
LPZ-02S (575.28)
LPZ-13S (575.29)
LPZ-08S (575.24)
OW-14BR (575.31) NA
OW-14B (575.40) NA
OW-2 NA
SG-02 (575.35) NA
OW-13 (575.32) NA
OW-11 NA
OW-25 NA
OW-12 NA
OW-23 (575.50)
OW-24 NA
LPZ-10S (575.65)
SG-01 (575.33) NA
OW-1 (575.79)
OW-21 (575.94)
OW-22 (575.71)
OW-31 (575.87)
LPZ-14S NA
LPZ-03S (576.35)
OW-34 (576.00)
LPZ-04S (574.66)
LPZ-06S (574.68)
LPZ-05S (576.56)
LPZ-15S NA
LPZ-07S (575.66)
LDP-01 (576.37)
LDP-02R (576.48)
LDP-03 (576.48)

575.25, 575.00, 575.50, 575.75, 576.00, 576.25, 576.50, 576.75

SET IRON PIPE W/CAP
EX. ANGLE IRON 1.3' WEST
EX. ANGLE IRON 1.1' WEST
EX. ANGLE IRON
EX. REBAR 11.95' / 16.15'
1602.0' DEED MEAS.
681.46' DEED
23' DEED
1318' DEED
2418' DEED ADDITION = 2421.43' MEAS.
522.16' DEED
GUY WIRE 10.4' NORTH
SAT. DISH 0.4' NORTH
P.P. 1.1' SOUTH
P.P. 2.4' SOUTH
FENCE 1.1' SOUTH
FENCE 0.6' SOUTH
FENCE 0.1' SOUTH
P.P. 1.2' SOUTH
FENCE 0.7' NORTH
FENCE 0.1' SOUTH
NG 50R NYT 50R 0.8' SOUTH
SHED 1.8' SOUTH
P.P. NG 62R NYT 62
BRINE MARKER
GAS MARKER
24" GAS PIPELINE
4" GAS 66' DEED
SEE 66' WIDE RIGHT-OF-WAY & EASEMENT TO IROQUOIS GAS CORPORATION L-1482, P-506
10" BUCKEYE BRINE PIPELINE
DUAL 12" BRINE PIPELINES
SOUTH LINE LOT-22
NORTH LINE LOT-21
EAST LINE NIAGARA FALLS POWER COMPANY
EX. CONC. MON.
SEE EASEMENT TO NATIONAL FUEL GAS DISTRIBUTION CORPORATION
NORTH LINE NIAGARA FALLS POWER COMPANY (DEED)
PARALLEL WITH SOUTH LINE LOT-22
EATFIELD
ONAWANDA

REPUTED OWNER
THE TOWN OF WHEATFIELD
L-1269, P-587

REPUTED OWNER
NIAGARA MOHAWK POWER CORP.

REPUTED OWNER
IROQUOIS GAS CORPORATION
L-1496, P-986

FORBES TERRACE (60.0' WIDE)
SEE 30' WIDE EASEMENT TO TEXAS BRINE CORPORATION L-2072, P-269

80 0 80
SCALE IN FEET

NO.	DATE	DESCRIPTION
REVISIONS		

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, New York

PROJ. ENG.:
DESIGNED BY:
CHECKED BY:
DRAWN BY:

CLIENT: NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

DATE: NOVEMBER 2023
SCALE: AS SHOWN

JOB TITLE AND LOCATION:
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

LIRO JOB NO.: 17-013-0289
SHEET OF

DRAWING TITLE:
GROUNDWATER ELEVATION CONTOUR MAP
FILL/UPPER SAND: NOVEMBER 7, 2017

FIGURE NO. 2-6

N

LEGEND

- AREA OF INVESTIGATION
- FRESHWATER FORESTED/ SHRUB WETLAND
- GRAVEL ROAD
- LIMITS OF 2014/2015 IRM EXCAVATION
- 1985 & 1989 PHASE II MONITORING WELLS
- 2013 & 2014 GES MONITORING WELLS
- 2017 & 2021 LIRO MONITORING WELLS
- (574.95) GROUNDWATER ELEVATION (FT. MSL)
- 573.00 GROUNDWATER CONTOUR (FT. MSL)
- INTERPRETED GROUNDWATER FLOW DIRECTION
- NA NOT USED/NOT APPLICABLE

SET IRON PIPE W/CAP

1602.0' DEED, MEAS.

SET IRON PIPE W/CAP

LDP-04 (574.02)

LPZ-12S (574.95)

LPZ-11S (575.21)

LPZ-01S (575.01)

OW-14BR (575.10)

OW-2 (575.10)

OW-1 (574.58)

OW-3 (574.31)

OW-37 (574.68)

OW-14B (574.78) NA

OW-35 (574.16)

LPZ-09S (573.72)

OW-33 (573.85)

LPZ-02S (574.23)

OW-11 NA

OW-21 (574.06)

OW-13 (575.70) NA

OW-25 NA

OW-16 (573.16)

OW-32 (573.64)

LPZ-08S (574.59)

OW-12 NA

OW-22 (574.01)

OW-23 (574.78)

OW-24 NA

LPZ-13S (573.23)

LPZ-10S (574.35)

REPUTED OWNER
THE TOWN OF WHEATFIELD
L-1269, P-587

24" GAS PIPELINE

GAS MARKER

SEE 66' WIDE RIGHT OF WAY & EASEMENT TO IROQUOIS GAS TRANSMISSION CORPORATION L-7452, P-802

LPZ-14S NA

OW-34 (575.20)

OW-31 NA

LPZ-15S NA

LPZ-03S (575.80)

LPZ-04S (576.05)

LPZ-05S (575.65)

LPZ-06S (575.69)

LPZ-07S (573.97)

LDP-01 (576.51)

LDP-02R (576.45)

LDP-03 (576.33)

2418' DEED ADDITION = 2421.43' MEAS.

NORTH LINE NIAGARA FALLS POWER COMPANY

DUAL 12" BRINE PIPELINES

SOUTH LINE LOT-22

NORTH LINE LOT-21

EAST LINE NIAGARA FALLS POWER COMPANY

SEE EASEMENT TO NATIONAL FUEL GAS DISTRIBUTION CORPORATION

REPUTED OWNER
NIAGARA MOHAWK POWER CORP.

REPUTED OWNER
IROQUOIS GAS CORPORATION
L-1496, P-986

FORBES TERRACE (60.0' WIDE)

SEE 30' WIDE EASEMENT TO TEXAS BRINE CORPORATION L-2072, P-269

80 0 80
SCALE IN FEET

WARNING

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NO.	DATE	DESCRIPTION
REVISIONS		

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, New York

PROJ. ENG.:
DESIGNED BY:
CHECKED BY:
DRAWN BY:

CLIENT: NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

DATE: NOVEMBER 2023

SCALE: AS SHOWN

JOB TITLE AND LOCATION:
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

LIRO JOB NO.: 17-013-0289

SHEET OF

DRAWING TITLE:
GROUNDWATER ELEVATION CONTOUR MAP
FILL/UPPER SAND: NOVEMBER 21, 2019

FIGURE NO. 2-7

J:\17-013-0289 NYSDEC Standby\CAD\Call-Out 128321 - Niagara Sanitation\GM RI Report\5-20 - GW Elev 11-19.dwg 11/16/2023 10:24 AM

N

LEGEND

- AREA OF INVESTIGATION
- FRESHWATER FORESTED/ SHRUB WETLAND
- GRAVEL ROAD
- LIMITS OF 2014/2015 IRM EXCAVATION
- 1985 & 1989 PHASE II MONITORING WELLS
- 2013 & 2014 GES MONITORING WELLS
- 2017 & 2021 LIRO MONITORING WELLS
- (574.95) GROUNDWATER ELEVATION (FT. MSL)
- 573.00 GROUNDWATER CONTOUR (FT. MSL)
- INTERPRETED GROUNDWATER FLOW DIRECTION
- NA NOT USED/NOT APPLICABLE

576.75 576.50 576.25 576.00 575.75 575.75 576.00 576.25 576.50

SET IRON PIPE W/CAP — 1602.0' DEED & MEAS. — SET IRON PIPE W/CAP

LDP-04 (576.76) | LPZ-12S (576.73) | LPZ-11S (576.20) | LPZ-01S (575.76) | OW-14BR (575.62) | OW-2 (575.10) | OW-1 (576.58)

OW-36 (576.72) | OW-37 (576.55) | OW-14B (576.20) NA

EX. ANGLE IRON 1.3' WEST

EX. ANGLE IRON 0.5' WEST

EX. ANGLE IRON 1.1' WEST

OW-35 (576.72) | LPZ-09S (576.72) | OW-21 (577.01) | OW-11 NA

EX. ANGLE IRON

EX. REBAR 0.13' EAST

OW-33 (576.35) | LPZ-02S (576.23) | OW-13 (576.12) NA | OW-25 NA

OW-16 (576.98) | OW-12 NA

OW-32 (576.68) | LPZ-08S (575.99) | OW-22 (576.97)

EX. REBAR 11.95' SOUTH 16.15' WEST

OW-23 (576.17) | OW-24 NA

REPUTED OWNER
THE TOWN OF WHEATFIELD
L-1269, P-587

4 RODS = 66' DEED

24" GAS PIPELINE — GAS MARKER — GAS MARKER

LPZ-13S (576.22) | LPZ-10S (576.95) | OW-31 (577.13)

LPZ-14S NA — SET IRON PIPE W/CAP — OW-34 (576.95) — SEE 66' WIDE RIGHT-OF-WAY & EASEMENT TO IROQUOIS GAS CORPORATION L-1482, P-806

577.00

GUY WIRE 10.4' NORTH — 499.16' DEED — SAT. DISH 0.4' NORTH — P.P. 1.1' SOUTH

LPZ-15S NA | LPZ-03S (576.75) | LPZ-04S (576.72) | LPZ-05S (577.13) | LPZ-06S (577.03) | LPZ-07S (576.96)

23' DEED — 1018' DEED — 681.46' DEED

576.75

2418' DEED ADDITION = 2421.43' MEAS.

16" BUCKEYE BRINE PIPELINE

DUAL 12" BRINE PIPELINES

GAS PIPELINE 522.15' DEED

BRINE MARKER — BRINE MARKER — BRINE MARKER

576.25

REPUTED OWNER
OQUOIS GAS CORPORATION
L-1496, P-986

NORTH LINE NIAGARA FALLS POWER COMPANY (DEED)

SOUTH LINE LOT-22

EAST LINE NIAGARA FALLS POWER COMPANY

LDP-01 (576.78) | LDP-02R (576.91) | LDP-03 (576.39)

EX. CONC. MON.

NORTH LINE LOT-21

577.00 — 577.00

P.P. 2.4' SOUTH — FENCE 1.1' SOUTH — P.P. 1.1' SOUTH — FENCE 0.6' SOUTH — FEN 0.1' — TH — P.P. 1.2' SOUTH — FENCE 0.7' NORTH — FENCE 0.1' SOUTH — NG 50R NYT 50R 0.8' SOUTH — SHED — FENCE 1.8' SOUTH — P.P. NG 62R NYT 62

576.75

REPUTED OWNER
NIAGARA MOHAWK POWER CORP.

SEE EASEMENT TO NATIONAL FUEL GAS DISTRIBUTION CORPORATION

FORBES TERRACE (60.0' WIDE)

SEE 30' WIDE EASEMENT TO TEXAS BRINE CORPORATION L-2072, P-269

80 0 80
SCALE IN FEET

WARNING

IT IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON, OTHER THAN THOSE WHOSE SEAL APPEARS ON THIS DRAWING, TO ALTER IN ANY WAY AN ITEM ON THIS DRAWING. IF AN ITEM IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

NO.	DATE	DESCRIPTION
		REVISIONS

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, New York

PROJ. ENG.:
DESIGNED BY:
CHECKED BY:
DRAWN BY:

CLIENT: NEW YORK STATE OF OPPORTUNITY — Department of Environmental Conservation

DATE: NOVEMBER 2023

SCALE: AS SHOWN

JOB TITLE AND LOCATION:
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

LIRO JOB NO.: 17-013-0289
SHEET OF

DRAWING TITLE:
GROUNDWATER ELEVATION CONTOUR MAP
FILL/UPPER SAND: APRIL 03, 2020

FIGURE NO. 2-8

J:\17-013-0289 NYSDEC Standby\CAD\Coll-Out 128321 - Niagara Sanitation\GM RI Report\5-21 - GW Elev 4-20.dwg 11/16/2023 10:24 AM

N

LEGEND

- AREA OF INVESTIGATION
- FRESHWATER FORESTED/ SHRUB WETLAND
- GRAVEL ROAD
- LIMITS OF 2014/2015 IRM EXCAVATION
- 1985 & 1989 PHASE II MONITORING WELLS
- 2013 & 2014 GES MONITORING WELLS
- 2017 & 2021 LIRO MONITORING WELLS
- (574.95) GROUNDWATER ELEVATION (FT. MSL)
- 573.00 GROUNDWATER CONTOUR (FT. MSL)
- INTERPRETED GROUNDWATER FLOW DIRECTION
- NA NOT USED/NOT APPLICABLE

LDP-04 (575.78)
OW-36 (575.75)
LPZ-12S (575.74)
OW-37 (576.24)
OW-35 (575.36)
LPZ-09S (575.37)
OW-33 (575.29)
OW-32 (575.29)
OW-16 (576.88)
LPZ-11S (575.53)
LPZ-01S (575.39)
LPZ-02S (575.41)
OW-14BR (575.40)
OW-14B (575.57) NA
OW-2 NA
OW-1 (576.09)
OW-13 (575.52) NA
OW-11 NA
OW-21 (576.42)
OW-25 NA
OW-12 NA
OW-22 (576.35)
LPZ-08S (575.41)
OW-23 (575.55)
OW-24 NA
LPZ-13S NA
LPZ-10S (576.38)
OW-31 (576.69)
LPZ-14S NA
OW-34 (576.18)
LPZ-03S (576.38)
LPZ-15S NA
LPZ-04S (576.48)
LPZ-05S (576.32)
LPZ-06S (577.62)
LPZ-07S NA
LDP-01 (576.70)
LDP-02R NA
LDP-03 (576.60)

575.75 575.50 575.50 575.50 575.75 576.00 576.25 576.50 576.75 577.00 577.25 577.25 577.00 576.75 576.50 576.50 576.50 576.25 576.00 575.75 575.50 573.00

SET IRON PIPE W/CAP
EX. ANGLE IRON 1.3' WEST
EX. ANGLE IRON 0.5' WEST
EX. ANGLE IRON 1.1' WEST
EX. ANGLE IRON
EX. REBAR 1.1' EAST
EX. REBAR 11.95' SOUTH 16.15' WEST
1602.0' DEED & MEAS.
REPUTED OWNER
THE TOWN OF WHEATFIELD
L-1269, P-587
SET IRON PIPE W/CAP
PARALLEL WITH SOUTH LINE LOT-22
23' DEED
1018' DEED
2418' DEED ADDITION = 2421.43' MEAS.
NORTH LINE NIAGARA FALLS POWER COMPANY (DEED)
REPUTED OWNER
NIAGARA MOHAWK POWER CORP.
4" ROCK 66' DEED
24" GAS PIPELINE
GAS MARKER
GAS MARKER
SEE 66' WIDE RIGHT OF WAY & EASEMENT TO NIAGARA GAS CORPORATION L-1455, P-806
10" BULL'S EYE BRINE PIPELINE
DUAL 12" BRINE PIPELINES
SOUTH LINE LOT-22
NORTH LINE LOT-21
EAST LINE NIAGARA FALLS POWER COMPANY
EX. CONC. MON.
SEE EASEMENT TO NATIONAL FUEL GAS DISTRIBUTION CORPORATION
ONLY WIRE 10.4' NORTH
499.16' DEED
SAT. DISH 0.4' NORTH
P.P. 1.1' SOUTH
BRINE MARKER
GAS MARKER
BRINE MARKER
522.15' DEED
4" GAS PIPELINE
P.P. 2.4' SOUTH
P.P. 1.1' SOUTH
FENCE 0.6' SOUTH
FENCE 0.1' SOUTH
P.P. 1.2' SOUTH
FENCE 0.7' NORTH
FENCE 0.1' SOUTH
NG 50R NYT 50R 0.8' SOUTH
SHED
FENCE 1.8' SOUTH
P.P. NG 62R NYT 62
681.46' DEED
REPUTED OWNER
IROQUOIS GAS CORPORATION
L-1496, P-986
FORBES TERRACE (60.0' WIDE)
SEE 30' WIDE EASEMENT TO TEXAS BRINE CORPORATION L-2072, P-269

80 0 80
SCALE IN FEET

NO.	DATE	DESCRIPTION
REVISIONS		

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, New York

PROJ. ENG.:
DESIGNED BY:
CHECKED BY:
DRAWN BY:

CLIENT: NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

DATE: NOVEMBER 2023
SCALE: AS SHOWN

JOB TITLE AND LOCATION:
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

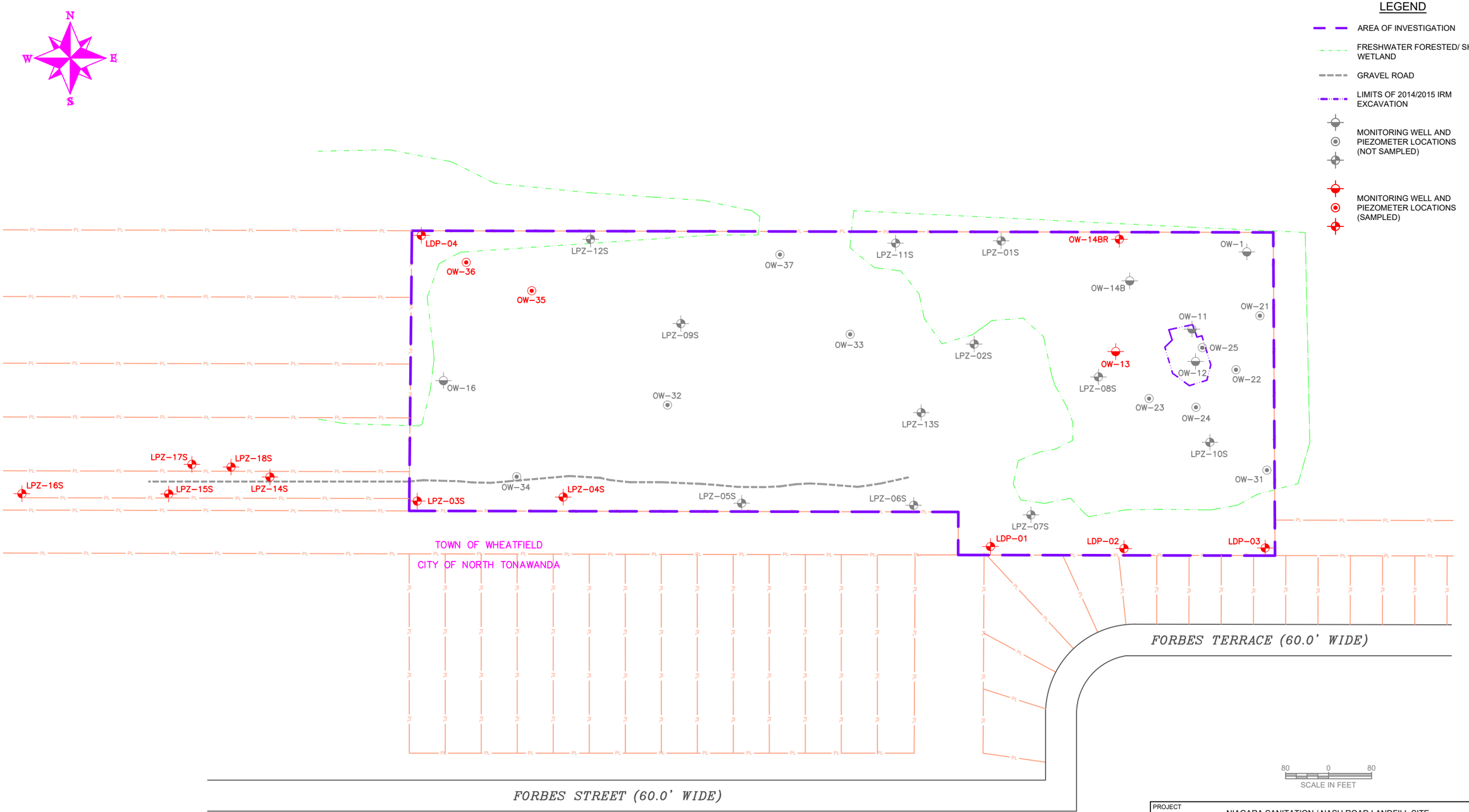
LIRO JOB NO.: 17-013-0289
SHEET OF

DRAWING TITLE:
GROUNDWATER ELEVATION CONTOUR MAP
FILL/UPPER SAND: NOVEMBER 23, 2021

FIGURE NO. 2-9

J:\17-013-0289 NYSDEC Standby\CAD\Coll-Out 128321 - Niagara Sanitation\GM RI Report\5-22 - GW Elev 11-21.dwg 11/16/2023 10:24 AM

Drawing Name: 01 Sites - Active/Niagara Sanitation/2024 EC Sampling/AutoCAD/Niagara Sanitation - EC Sampling Report - 2024-08-12.dwg
Operator Name: Glenn M. May Plot Date: August 13, 2024



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GENERAL SURVEY NOTES:

1. ORIGINAL SURVEY COMPLETED BY McINTOSH & McINTOSH, P.C. IN 2014 FOR THE OCCIDENTAL CHEMICAL CORPORATION.
2. LIRO USED THIS SURVEY AS THEIR BASE MAP FOR THE 2017 NYSDEC REMEDIAL INVESTIGATION.
3. LIRO FIGURE 5-1 (MONITORING WELL LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO REPRODUCE THIS FIGURE.
4. LIRO FIGURE 4-1 (SOIL BORING LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO OBTAIN THE SOIL BORING LOCATIONS.

GENERAL SURVEY NOTES (CONTINUED):

5. THE NYSDEC BORDER TEMPLATE WAS IMPORTED INTO THE DRAWING ON OCTOBER 8, 2023.

PROJECT
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

TITLE
FILL/UPPER SAND MONITORING WELL LOCATION MAP

NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

SITE NO.: C915299 A			FILE NO.: NOT APPLICABLE		
DESIGN	GMM	10/08/2023	SCALE AS SHOWN	REV.	0
CADD	GMM	10/08/2023			
REVISED	GMM	08/13/2024			
REVIEW					

FIGURE 3-1

Drawing Name: 01 Sites - Active/Niagara Sanitation/2024 EC Sampling/AutoCAD/Niagara Sanitation - EC Sampling Report - 2024-08-12.dwg
Operator Name: Glenn M. May Plot Date: August 13, 2024

OW-36	Criteria	12/12/17	12/12/17	02/11/19	02/11/19	10/19/23
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	100.0	110.0	110.0	100.0	82.0
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	480.0	500.0	460.0	460.0	370.0
1,4-Dioxane	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	NA	NA	1.2 J	1.2 J	1.5

OW-13	Criteria	10/23/23
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	51.0
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	56.0
1,4-Dioxane	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	0.27

OW-14BR	Criteria	02/06/18	02/11/19	10/23/23
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	56.0	55.0	28.0
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	30.0	39.0	15.0
1,4-Dioxane	**ug/L**	**ug/L**	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	NA	ND (0.19)	ND (0.032)

LDP-04	Criteria	02/6/18	02/11/19
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	120.0	82.0
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	80.0	72.0
1,4-Dioxane	**ug/L**	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	ND	0.3

OW-35	Criteria	10/23/23
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	100.0
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	21.0
1,4-Dioxane	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	7.9

LPZ-18S	Criteria	10/15/23
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	96.0
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	20.0
1,4-Dioxane	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	0.59

LPZ-17S	Criteria	10/15/23
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	94.0
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	380.0
1,4-Dioxane	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	1.2

LPZ-14S	Criteria	10/19/23
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	52.0
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	130.0
1,4-Dioxane	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	1.2

LPZ-15S	Criteria	10/19/23
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	52.0
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	230.0
1,4-Dioxane	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	0.38

LPZ-04S	Criteria	02/6/18	10/19/23
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	36.0	130.0
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	10.0	ND (20)
1,4-Dioxane	**ug/L**	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	NA	0.49

LPZ-03S	Criteria	10/19/23
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	16.0
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	4.4
1,4-Dioxane	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	1.7

LDP-02	Criteria	12/12/17	02/11/19
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	4.2	2.1
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	2.6	3.0
1,4-Dioxane	**ug/L**	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	NA	ND (0.19)

LPZ-16S
LPZ-17S
LPZ-18S
LPZ-15S
LPZ-14S
LPZ-03S
LPZ-04S
LPZ-05S
LPZ-06S
LPZ-07S
LDP-04
LDP-01
LDP-02
LDP-03
OW-36
OW-35
OW-37
OW-34
OW-16
OW-32
OW-33
OW-31
LPZ-12S
LPZ-09S
LPZ-11S
LPZ-01S
LPZ-02S
LPZ-08S
LPZ-13S
LPZ-10S
OW-14BR
OW-13
OW-14B
OW-1
OW-21
OW-11
OW-25
OW-12
OW-22
OW-23
OW-24

TOWN OF WHEATFIELD
CITY OF NORTH TONAWANDA

FORBES TERRACE (60.0' WIDE)

FORBES STREET (60.0' WIDE)

LEGEND

- AREA OF INVESTIGATION
- FRESHWATER FORESTED/ SHRUB WETLAND
- GRAVEL ROAD
- LIMITS OF 2014/2015 IRM EXCAVATION
- MONITORING WELL AND PIEZOMETER LOCATIONS (NOT ANALYZED)
- GROUNDWATER SAMPLING LOCATIONS WITH NO EXCEEDANCES OF APPLICABLE STANDARDS OR CRITERIA
- GROUNDWATER SAMPLING LOCATIONS WITH ONE OR MORE COMPOUNDS REPORTED AT CONCENTRATIONS ABOVE APPLICABLE STANDARDS OR CRITERIA
- NA — NOT ANALYZED
- ND (0.9) — NOT DETECTED AT THE DETECTION LIMIT GIVEN IN PARENTHESES
- RED SHADED VALUES ARE NOT EXCEEDANCES

80 0 80
SCALE IN FEET

WARNING:
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GENERAL SURVEY NOTES:
1. ORIGINAL SURVEY COMPLETED BY McINTOSH & McINTOSH, P.C. IN 2014 FOR THE OCCIDENTAL CHEMICAL CORPORATION.
2. LIRO USED THIS SURVEY AS THEIR BASE MAP FOR THE 2017 NYSDEC REMEDIAL INVESTIGATION.
3. LIRO FIGURE 5-1 (MONITORING WELL LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO REPRODUCE THIS FIGURE.
4. LIRO FIGURE 4-1 (SOIL BORING LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO OBTAIN THE SOIL BORING LOCATIONS.

GENERAL SURVEY NOTES (CONTINUED):
5. THE NYSDEC BORDER TEMPLATE WAS IMPORTED INTO THE DRAWING ON OCTOBER 8, 2023.

PROJECT
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

TITLE
EMERGING CONTAMINANT EXCEEDANCES IN FILL/UPPER SAND WELLS

NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

SITE NO.: C915299 A			FILE NO.: NOT APPLICABLE		
DESIGN	GMM	10/08/2023	SCALE AS SHOWN	REV.	0
CADD	GMM	10/08/2023			
REVISED	GMM	08/13/2024			
REVIEW					

FIGURE 3-2

Drawing Name: 01 Sites - Active/Niagara Sanitation/2024 EC Sampling/AutoCAD/Niagara Sanitation - EC Sampling Report - 2024-08-12.dwg
Operator Name: Glenn M. May Plot Date: August 13, 2024

N
W E
S

LEGEND

- AREA OF INVESTIGATION
- FRESHWATER FORESTED/ SHRUB WETLAND
- GRAVEL ROAD
- LIMITS OF THE 2014 & 2015 IRM EXCAVATION
- 2021 & 2023 LIRO SOIL BORING

LPZ-17S
LPZ-18S
LPZ-16S
LPZ-15S
LPZ-14S

TOWN OF WHEATFIELD
CITY OF NORTH TONAWANDA

FORBES TERRACE (60.0' WIDE)

FORBES STREET (60.0' WIDE)

80 0 80
SCALE IN FEET

GENERAL SURVEY NOTES:

1. ORIGINAL SURVEY COMPLETED BY McINTOSH & McINTOSH, P.C. IN 2014 FOR THE OCCIDENTAL CHEMICAL CORPORATION.
2. LIRO USED THIS SURVEY AS THEIR BASE MAP FOR THE 2017 NYSDEC REMEDIAL INVESTIGATION.
3. LIRO FIGURE 5-1 (MONITORING WELL LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO REPRODUCE THIS FIGURE.
4. LIRO FIGURE 4-1 (SOIL BORING LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO OBTAIN THE SOIL BORING LOCATIONS.

GENERAL SURVEY NOTES (CONTINUED):

5. THE NYSDEC BORDER TEMPLATE WAS IMPORTED INTO THE DRAWING ON OCTOBER 8, 2023.

WARNING:

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PROJECT
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

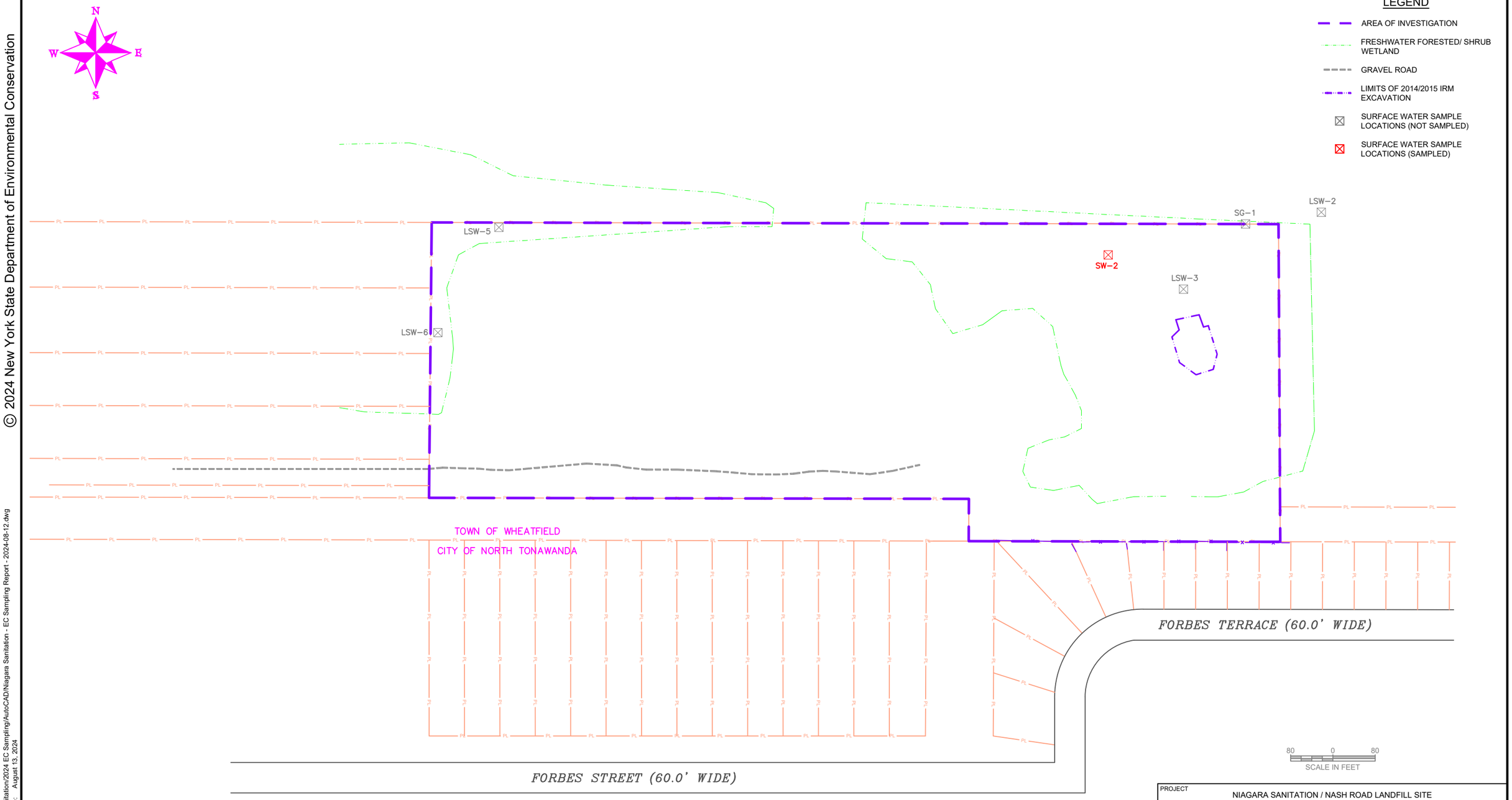
TITLE
SOIL BORING LOCATION MAP

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

SITE NO.: C915299 A			FILE NO.: NOT APPLICABLE	
DESIGN	GMM	10/08/2023	SCALE AS SHOWN	REV. 0
CADD	GMM	10/08/2023		
REVISED	GMM	08/13/2024		
REVIEW				

FIGURE 3-3

Drawing Name: 01 Sites - Active\Niagara Sanitation\2024 EC Sampling\AutoCAD\Niagara Sanitation - EC Sampling Report - 2024-08-12.dwg
Operator Name: Glenn M. May Plot Date: August 13, 2024



GENERAL SURVEY NOTES:

1. ORIGINAL SURVEY COMPLETED BY McINTOSH & McINTOSH, P.C. IN 2014 FOR THE OCCIDENTAL CHEMICAL CORPORATION.
2. LIRO USED THIS SURVEY AS THEIR BASE MAP FOR THE 2017 NYSDEC REMEDIAL INVESTIGATION.
3. LIRO FIGURE 5-1 (MONITORING WELL LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO REPRODUCE THIS FIGURE.
4. LIRO FIGURE 4-1 (SOIL BORING LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO OBTAIN THE SOIL BORING LOCATIONS.

GENERAL SURVEY NOTES (CONTINUED):

5. THE NYSDEC BORDER TEMPLATE WAS IMPORTED INTO THE DRAWING ON OCTOBER 8, 2023.

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PROJECT

NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

TITLE

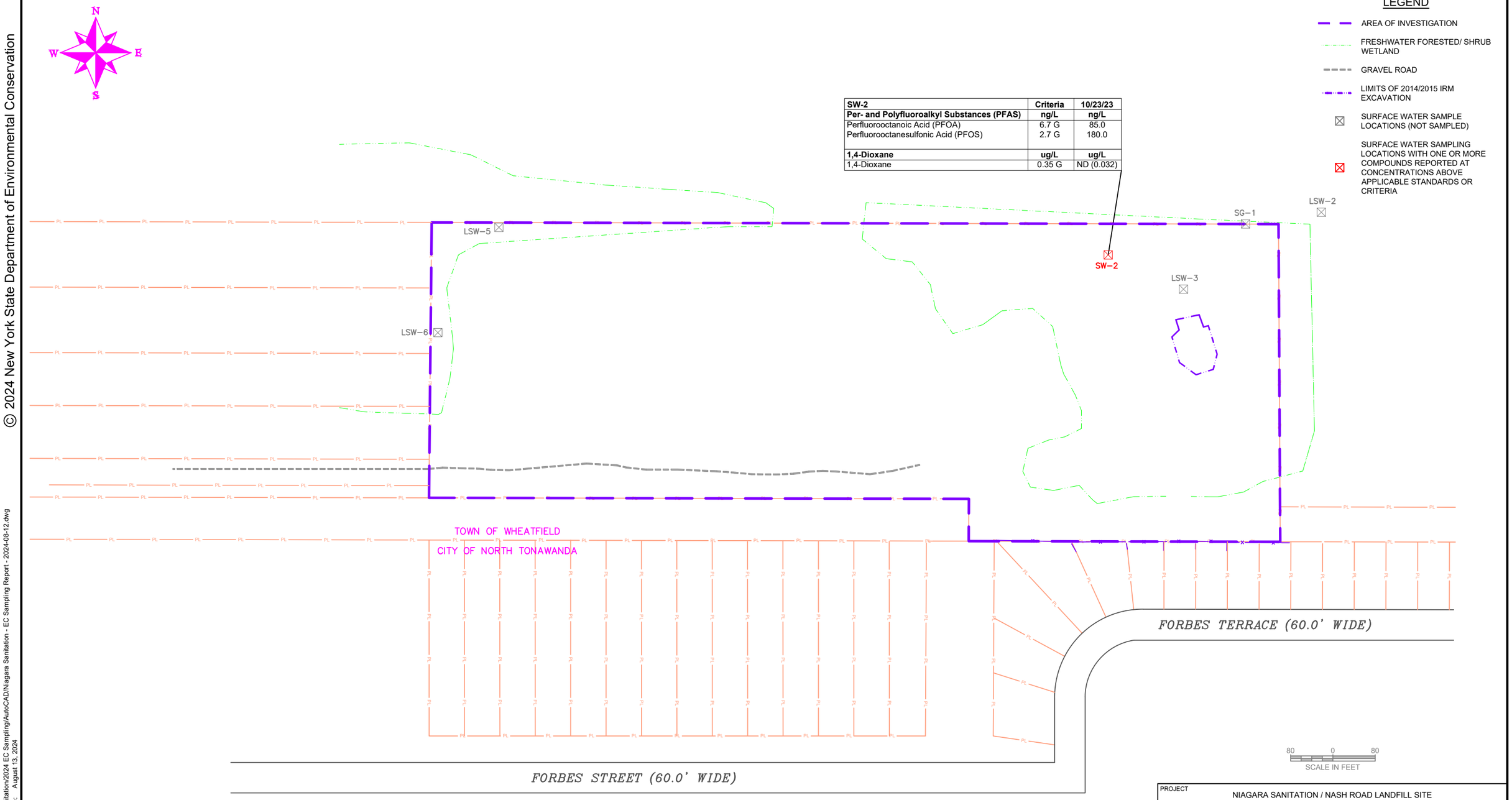
SURFACE WATER SAMPLE LOCATION MAP

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

SITE NO.: C915299 A			FILE NO.: NOT APPLICABLE		
DESIGN	GMM	10/08/2023	SCALE AS SHOWN	REV.	0
CADD	GMM	10/08/2023			
REVISED	GMM	08/13/2024			
REVIEW					

FIGURE 3-4

Drawing Name: 01 Sites - Active\Niagara Sanitation\2024 EC Sampling\AutoCAD\Niagara Sanitation - EC Sampling Report - 2024-08-12.dwg
Operator Name: Glenn M. May Plot Date: August 13, 2024



SW-2	Criteria	10/23/23
Per- and Polyfluoroalkyl Substances (PFAS)	**ng/L**	**ng/L**
Perfluorooctanoic Acid (PFOA)	6.7 G	85.0
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	180.0
1,4-Dioxane	**ug/L**	**ug/L**
1,4-Dioxane	0.35 G	ND (0.032)

GENERAL SURVEY NOTES:

1. ORIGINAL SURVEY COMPLETED BY McINTOSH & McINTOSH, P.C. IN 2014 FOR THE OCCIDENTAL CHEMICAL CORPORATION.
2. LIRO USED THIS SURVEY AS THEIR BASE MAP FOR THE 2017 NYSDEC REMEDIAL INVESTIGATION.
3. LIRO FIGURE 5-1 (MONITORING WELL LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO REPRODUCE THIS FIGURE.
4. LIRO FIGURE 4-1 (SOIL BORING LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO OBTAIN THE SOIL BORING LOCATIONS.

GENERAL SURVEY NOTES (CONTINUED):

5. THE NYSDEC BORDER TEMPLATE WAS IMPORTED INTO THE DRAWING ON OCTOBER 8, 2023.

WARNING:

IT IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON, OTHER THAN THOSE WHOSE SEAL APPEARS ON THIS DRAWING, TO ALTER IN ANY WAY AN ITEM ON THIS DRAWING. IF AN ITEM IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

PROJECT

NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

TITLE

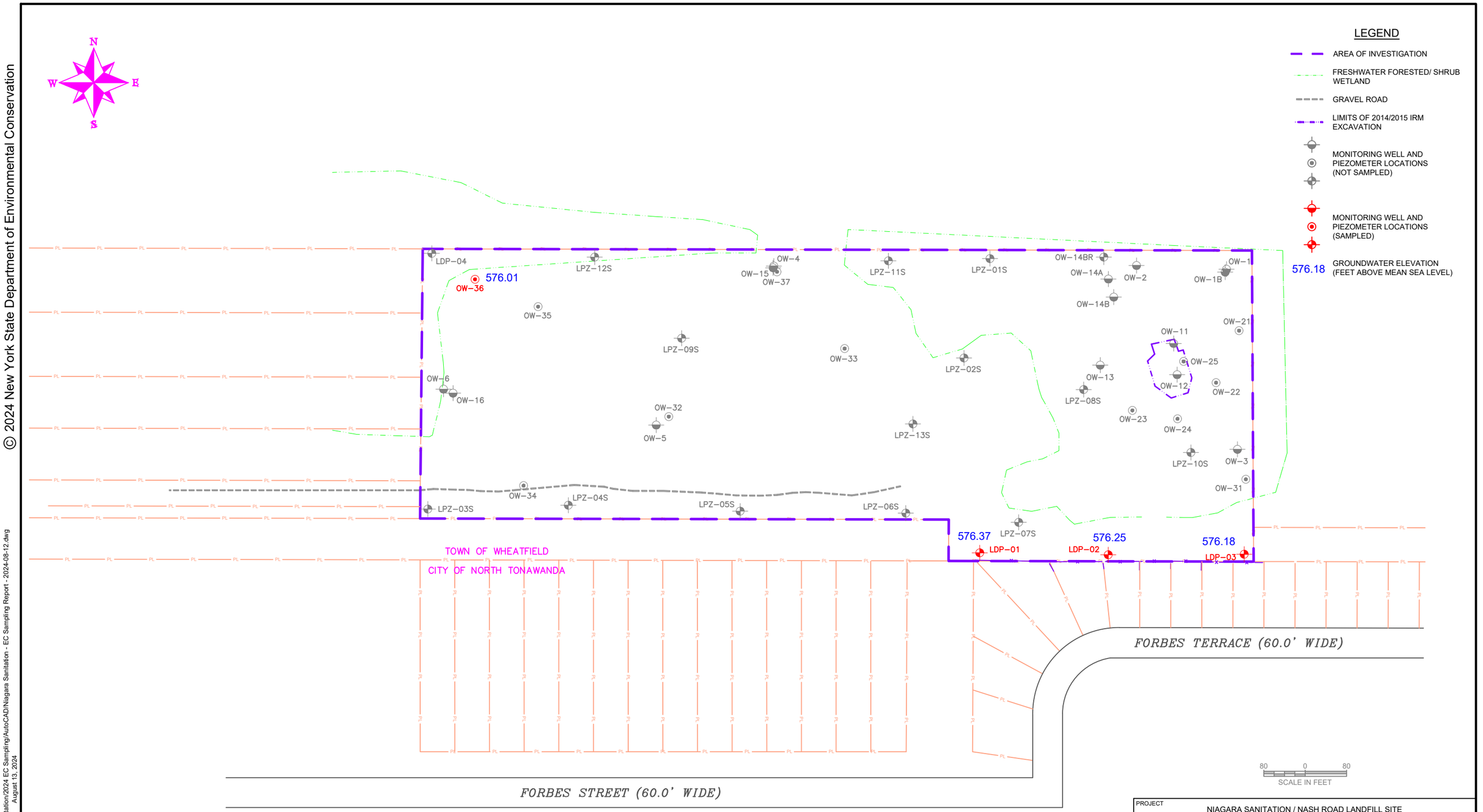
EMERGING CONTAMINANT EXCEEDANCES IN SURFACE WATER SAMPLES

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

SITE NO.: C915299 A			FILE NO.: NOT APPLICABLE	
DESIGN	GMM	10/08/2023	SCALE AS SHOWN	REV. 0
CADD	GMM	10/08/2023		
REVISED	GMM	08/13/2024		
REVIEW				

FIGURE 3-5

Drawing Name: 01 Sites - Active/Niagara Santation/2024 EC Sampling/AutoCAD/Niagara Santation - EC Sampling Report - 2024-08-12.dwg
Operator Name: Glenn M. May Plot Date: August 13, 2024



GENERAL SURVEY NOTES:

1. ORIGINAL SURVEY COMPLETED BY McINTOSH & McINTOSH, P.C. IN 2014 FOR THE OCCIDENTAL CHEMICAL CORPORATION.
2. LIRO USED THIS SURVEY AS THEIR BASE MAP FOR THE 2017 NYSDEC REMEDIAL INVESTIGATION.
3. LIRO FIGURE 5-1 (MONITORING WELL LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO REPRODUCE THIS FIGURE.
4. LIRO FIGURE 4-1 (SOIL BORING LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO OBTAIN THE SOIL BORING LOCATIONS.

GENERAL SURVEY NOTES (CONTINUED):

5. THE NYSDEC BORDER TEMPLATE WAS IMPORTED INTO THE DRAWING ON OCTOBER 8, 2023.

PROJECT

NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

TITLE

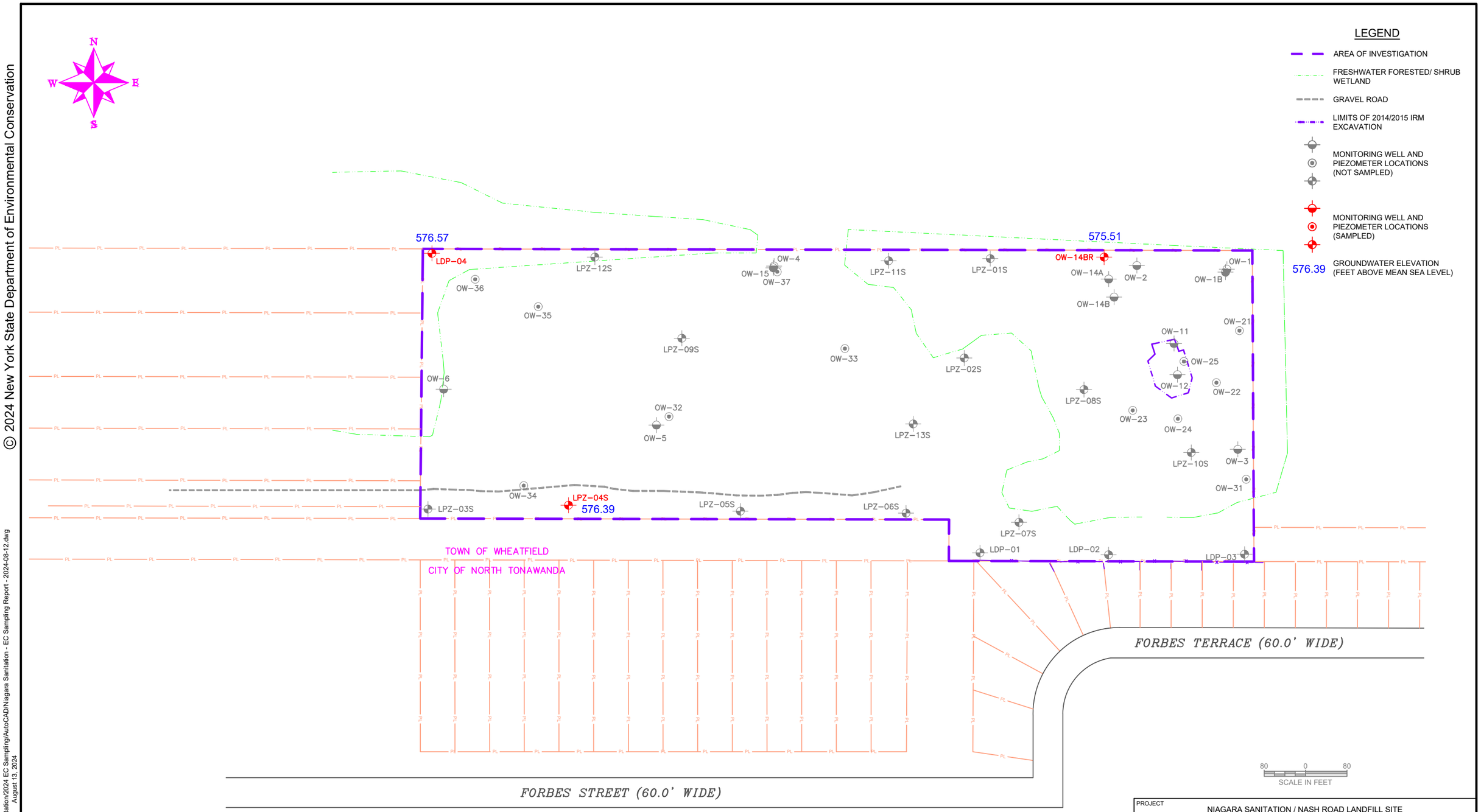
GROUNDWATER ELEVATIONS IN FILL/ UPPER SAND WELLS - DECEMBER 2017

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

SITE NO.: C915299 A			FILE NO.: NOT APPLICABLE	
DESIGN	GMM	10/08/2023	SCALE AS SHOWN	REV. 0
CADD	GMM	10/08/2023		
REVISED	GMM	08/13/2024		
REVIEW				

FIGURE 4-1

Drawing Name: 01 Sites - Active/Niagara Santation/2024 EC Sampling/AutoCAD/Niagara Santation - EC Sampling Report - 2024-08-12.dwg
Operator Name: Glenn M. May Plot Date: August 13, 2024



LEGEND

- AREA OF INVESTIGATION
- FRESHWATER FORESTED/ SHRUB WETLAND
- GRAVEL ROAD
- LIMITS OF 2014/2015 IRM EXCAVATION
- MONITORING WELL AND PIEZOMETER LOCATIONS (NOT SAMPLED)
- MONITORING WELL AND PIEZOMETER LOCATIONS (SAMPLED)
- 576.39 GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)

WARNING:

IT IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON, OTHER THAN THOSE WHOSE SEAL APPEARS ON THIS DRAWING, TO ALTER IN ANY WAY AN ITEM ON THIS DRAWING. IF AN ITEM IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

GENERAL SURVEY NOTES:

1. ORIGINAL SURVEY COMPLETED BY McINTOSH & McINTOSH, P.C. IN 2014 FOR THE OCCIDENTAL CHEMICAL CORPORATION.
2. LIRO USED THIS SURVEY AS THEIR BASE MAP FOR THE 2017 NYSDEC REMEDIAL INVESTIGATION.
3. LIRO FIGURE 5-1 (MONITORING WELL LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO REPRODUCE THIS FIGURE.
4. LIRO FIGURE 4-1 (SOIL BORING LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO OBTAIN THE SOIL BORING LOCATIONS.

GENERAL SURVEY NOTES (CONTINUED):

5. THE NYSDEC BORDER TEMPLATE WAS IMPORTED INTO THE DRAWING ON OCTOBER 8, 2023.

PROJECT

NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

TITLE

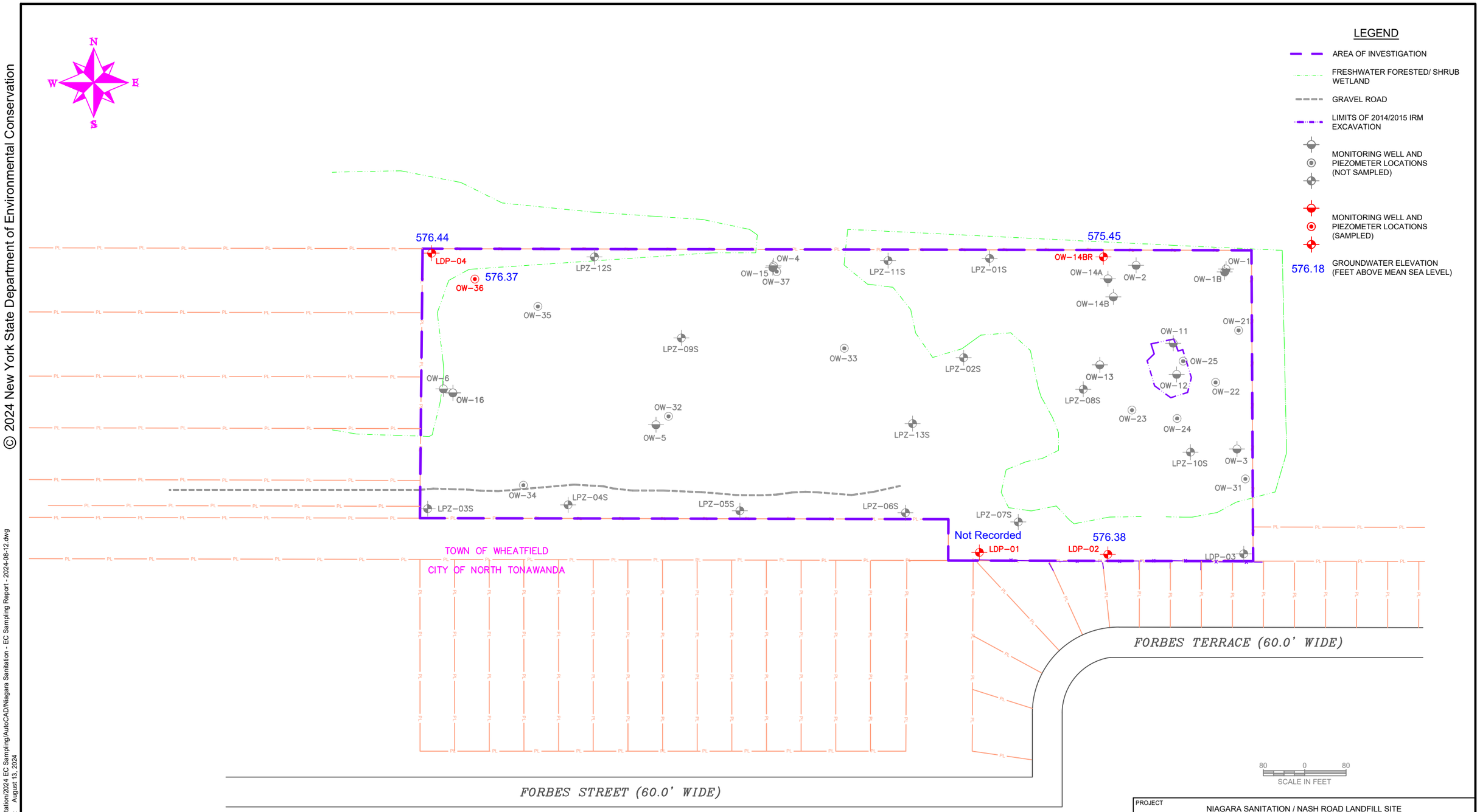
GROUNDWATER ELEVATIONS IN FILL/ UPPER SAND WELLS - FEBRUARY 2018

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

SITE NO.: C915299 A			FILE NO.: NOT APPLICABLE	
DESIGN	GMM	10/08/2023	SCALE AS SHOWN	REV. 0
CADD	GMM	10/08/2023		
REVISED	GMM	08/13/2024		
REVIEW				

FIGURE 4-2

Drawing Name: 01 Sites - Active/Niagara Sanitation/2024 EC Sampling/AutoCAD/Niagara Sanitation - EC Sampling Report - 2024-08-12.dwg
Operator Name: Glenn M. May Plot Date: August 13, 2024



LEGEND

- AREA OF INVESTIGATION
- FRESHWATER FORESTED/ SHRUB WETLAND
- GRAVEL ROAD
- LIMITS OF 2014/2015 IRM EXCAVATION
- MONITORING WELL AND PIEZOMETER LOCATIONS (NOT SAMPLED)
- MONITORING WELL AND PIEZOMETER LOCATIONS (SAMPLED)
- 576.18 GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)

GENERAL SURVEY NOTES:

1. ORIGINAL SURVEY COMPLETED BY McINTOSH & McINTOSH, P.C. IN 2014 FOR THE OCCIDENTAL CHEMICAL CORPORATION.
2. LIRO USED THIS SURVEY AS THEIR BASE MAP FOR THE 2017 NYSDEC REMEDIAL INVESTIGATION.
3. LIRO FIGURE 5-1 (MONITORING WELL LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO REPRODUCE THIS FIGURE.
4. LIRO FIGURE 4-1 (SOIL BORING LOCATION MAP) WAS IMPORTED INTO AUTOCAD BY GMM IN SEPTEMBER 2023 TO OBTAIN THE SOIL BORING LOCATIONS.

GENERAL SURVEY NOTES (CONTINUED):

5. THE NYSDEC BORDER TEMPLATE WAS IMPORTED INTO THE DRAWING ON OCTOBER 8, 2023.

PROJECT
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

TITLE
GROUNDWATER ELEVATIONS IN FILL/ UPPER SAND WELLS - FEBRUARY 2019

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

SITE NO.: C915299 A			FILE NO.: NOT APPLICABLE		
DESIGN	GMM	10/08/2023	SCALE AS SHOWN	REV.	0
CADD	GMM	10/08/2023			
REVISED	GMM	08/13/2024			
REVIEW					

FIGURE 4-3

Drawing Name: 01 Sites - Active/Niagara Sanitation/2024 EC Sampling/AutoCAD/Niagara Sanitation - EC Sampling Report - 2024-08-12.dwg
Operator Name: Glenn M. May Plot Date: August 13, 2024

N W E S

LEGEND

- AREA OF INVESTIGATION
- FRESHWATER FORESTED/ SHRUB WETLAND
- GRAVEL ROAD
- LIMITS OF 2014/2015 IRM EXCAVATION
- MONITORING WELL AND PIEZOMETER LOCATIONS (NOT SAMPLED)
- MONITORING WELL AND PIEZOMETER LOCATIONS (SAMPLED)
- 574.12 GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)

LDP-04
573.98 OW-36
573.60 OW-35
LPZ-12S
OW-4
OW-15
OW-37
575.34
OW-14BR
LPZ-11S
LPZ-01S
OW-14A
OW-2
OW-1
OW-1B
OW-14B
OW-21
OW-11
OW-25
OW-12
OW-22
574.12 OW-13
LPZ-08S
OW-23
OW-24
LPZ-10S
OW-3
OW-31
LPZ-09S
OW-33
LPZ-02S
OW-6
OW-16
OW-32
OW-5
LPZ-13S
573.10 LPZ-17S
572.12 LPZ-18S
572.67 LPZ-14S
569.55 LPZ-16S
572.73 LPZ-15S
571.76 LPZ-03S
OW-34
LPZ-04S 572.33
LPZ-05S
LPZ-06S
LPZ-07S
LDP-01
LDP-03
TOWN OF WHEATFIELD
CITY OF NORTH TONAWANDA
FORBES TERRACE (60.0' WIDE)
FORBES STREET (60.0' WIDE)

80 0 80
SCALE IN FEET

WARNING:
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GENERAL SURVEY NOTES (CONTINUED):
5. THE NYSDEC BORDER TEMPLATE WAS IMPORTED INTO THE DRAWING ON OCTOBER 8, 2023.

PROJECT
NIAGARA SANITATION / NASH ROAD LANDFILL SITE
7415 NASH ROAD
TOWN OF WHEATFIELD, NIAGARA COUNTY, NEW YORK
NYSDEC SITE NUMBER 932054

TITLE
GROUNDWATER ELEVATIONS IN FILL/ UPPER SAND WELLS - OCTOBER 2023

NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

SITE NO.: C915299 A			FILE NO.: NOT APPLICABLE		
DESIGN	GMM	10/08/2023	SCALE AS SHOWN	REV.	0
CADD	GMM	10/08/2023			
REVISED	GMM	08/13/2024			
REVIEW					

FIGURE 4-4

TABLES

Table 3-1A
Summary of Groundwater Samples Collected for Emerging Contaminants Analysis
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Sample ID	Date Sampled	Time Sampled	Interval Sampled *	Analytical Parameters	Well Location	Table Reference
2017 Groundwater Sampling Event						
OW-36	12/12/17	1225	3.0' - 8.0'	PFAS	Northwestern corner of the Niagara Sanitation Landfill.	3-2
LDP-01	12/12/17	0915	4.3' - 5.3'	PFAS	Southeastern property line of the Niagara Sanitation Landfill.	3-2
LDP-02	12/12/17	0945	4.3' - 5.3'	PFAS	Southeastern property line of the Niagara Sanitation Landfill.	3-2
LDP-03	12/12/17	1020	4.1' - 5.1'	PFAS	Southeastern property line of the Niagara Sanitation Landfill.	3-2
2018 Groundwater Sampling Event						
OW-14BR	02/06/18	0945	5.0' - 7.0'	PFAS	Northeastern property line of the Niagara Sanitation Landfill.	3-3
LPZ-04S	02/06/18	1015	3.0' - 6.0'	PFAS	Southwestern property line of the Niagara Sanitation Landfill.	3-3
LDP-04	02/06/18	1105	4.3' - 5.3'	PFAS	Northwestern corner of the Niagara Sanitation Landfill.	3-3
2019 Groundwater Sampling Event						
OW-14BR	02/11/19	1520	5.0' - 7.0'	PFAS, 1,4-Dioxane	Northeastern property line of the Niagara Sanitation Landfill.	3-4
OW-36	02/11/19	1330	3.0' - 8.0'	PFAS, 1,4-Dioxane	Northwestern corner of the Niagara Sanitation Landfill.	3-4
LDP-01	02/11/19	1005	4.3' - 5.3'	PFAS, 1,4-Dioxane	Southeastern property line of the Niagara Sanitation Landfill.	3-4
LDP-02	02/11/19	1045	4.3' - 5.3'	PFAS, 1,4-Dioxane	Southeastern property line of the Niagara Sanitation Landfill.	3-4
LDP-04	02/11/19	1400	4.3' - 5.3'	PFAS, 1,4-Dioxane	Northwestern corner of the Niagara Sanitation Landfill.	3-4
2023 Groundwater Sampling Event						
OW-13	10/23/23	1045	3.0' - 5.0'	PFAS, 1,4-Dioxane	Eastern portion of the Niagara Sanitation Landfill west of the IRM area.	3-5
OW-14BR	10/23/23	1215	5.0' - 7.0'	PFAS, 1,4-Dioxane	Northeastern property line of the Niagara Sanitation Landfill.	3-5
OW-16	NS	N/A	5.0' - 10.0'	PFAS, 1,4-Dioxane	Western property line of the Niagara Sanitation Landfill.	3-5

Table 3-1A
Summary of Groundwater Samples Collected for Emerging Contaminants Analysis
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Sample ID	Date Sampled	Time Sampled	Interval Sampled *	Analytical Parameters	Well Location	Table Reference
2023 Groundwater Sampling Event (continued)						
OW-35	10/23/23	0930	4.0' - 9.0'	PFAS, 1,4-Dioxane	Northwestern portion of the Niagara Sanitation Landfill.	3-5
OW-36	10/19/23	1410	3.0' - 8.0'	PFAS, 1,4-Dioxane	Northwestern corner of the Niagara Sanitation Landfill.	3-5
LPZ-03S	10/19/23	1205	3.0' - 8.0'	PFAS, 1,4-Dioxane	Southwestern property line of the Niagara Sanitation Landfill.	3-5
LPZ-04S	10/19/23	1330	3.0' - 6.0'	PFAS, 1,4-Dioxane	Southwestern property line of the Niagara Sanitation Landfill.	3-5
LPZ-14S	10/19/23	1140	4.0' - 9.0'	PFAS, 1,4-Dioxane	Along the gravel access road west of the Niagara Sanitation Landfill.	3-5
LPZ-15S	10/19/23	1030	3.0' - 8.0'	PFAS, 1,4-Dioxane	Along the gravel access road west of the Niagara Sanitation Landfill.	3-5
LPZ-16S	10/18/23	0955	5.0 - 15.0	PFAS, 1,4-Dioxane	Along the gravel access road west of the Niagara Sanitation Landfill.	3-5
LPZ-17S	10/15/23	1130	5.0 - 15.0	PFAS, 1,4-Dioxane	On National Fuel Gas property west of the Niagara Sanitation Landfill.	3-5
LPZ-18S	10/15/23	1415	5.0 - 15.0	PFAS, 1,4-Dioxane	On National Fuel Gas property west of the Niagara Sanitation Landfill.	3-5
LDP-04	NS	N/A	4.3' - 5.3'	PFAS, 1,4-Dioxane	Northwestern corner of the Niagara Sanitation Landfill.	3-5

Notes:

*** = Sample interval represents the well screen top and bottom depths.**

N/A = Not applicable.

NS = Not sampled. Well was dry.

PFAS = Per- and Polyfluoroalkyl Substances.

Table 3-1B
Summary of Soil and Fill Samples Collected for Emerging Contaminants Analysis
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Sample ID	Date Sampled	Time Sampled	Interval Sampled *	Analytical Parameters	Sample Description and Location	Table Reference
2021 Well Installation Event						
LPZ-14S	10/19/21	1145	2.0 - 5.0	PFAS	Silty sand with trash. Along the gravel access road west of the Niagara Sanitation Landfill.	3-6
LPZ-15S	10/19/21	0900	5.0 - 7.0	PFAS	Fine sand with some silt. Along the gravel access road west of the Niagara Sanitation Landfill.	3-6
2023 Well Installation Event						
LPZ-16S	10/04/23	1330	2.0 - 4.0	1,4-Dioxane	Fine sand and silt. Along the gravel access road west of the Niagara Sanitation Landfill.	3-6
LPZ-17S	10/03/23	1050	0.0 - 2.0	1,4-Dioxane	Silt with clay and fine sand. On National Fuel Gas property west of the Niagara Sanitation Landfill.	3-6
LPZ-18S	10/04/23	1100	4.0 - 6.0	1,4-Dioxane	Fine sand with some silt. On National Fuel Gas property west of the Niagara Sanitation Landfill.	3-6

Notes:

*** = Sample interval in feet below ground surface.**

N/A = Not applicable.

NS = Not sampled. Well was dry.

PFAS = Per- and Polyfluoroalkyl Substances.

Table 3-1C
Summary of Water Samples Collected for Emerging Contaminants Analysis
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Sample ID	Date Sampled	Time Sampled	Interval Sampled *	Analytical Parameters	Sample Location	Table Reference
Surface Water						
SG-1	NS	N/A	N/A	PFAS, 1,4-Dioxane	Northern Boundary Ditch along northeastern property line of the Niagara Sanitation Landfill.	3-7
SW-2	10/23/23	1140	N/A	PFAS, 1,4-Dioxane	On-site pond on the northeastern portion of the Niagara Sanitation Landfill.	3-7
LSW-2	NS	N/A	N/A	PFAS, 1,4-Dioxane	Northern Boundary Ditch northeast of the Niagara Sanitation Landfill.	3-7
LSW-3	NS	N/A	N/A	PFAS, 1,4-Dioxane	On-site pond on the northeastern portion of the Niagara Sanitation Landfill.	3-7
LSW-5	NS	N/A	N/A	PFAS, 1,4-Dioxane	Ditch near the northwestern corner of the Niagara Sanitation Landfill.	3-7
LSW-6	NS	N/A	N/A	PFAS, 1,4-Dioxane	Ditch along the western property line of the Niagara Sanitation Landfill.	3-7
Drilling Water						
Drilling Water	10/19/21	1215	N/A	PFAS	Water tank on drill rig.	3-8

Notes:

*** = Sample interval in feet below ground surface.**

N/A = Not applicable.

NS = Not sampled. Surface water body was dry.

PFAS = Per- and Polyfluoroalkyl Substances.

Table 3-2
Summary of the 2017 Groundwater Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Date Well Screen Interval (ft bgs) Screened Unit	NYSDEC Groundwater Standard ●	OW-36 12/12/17 3.0 - 8.0 Fill/Sand	OW-36 ♦ 12/12/17 3.0 - 8.0 Fill/Sand	LDP-01 12/12/17 4.3 - 5.3 Sand	LDP-02 12/12/17 4.3 - 5.3 Sand/SC	LDP-03 12/12/17 4.1 - 5.1 Sand/SC	
Perfluoroalkyl Carboxylic Acids (ng/L)							
Perfluorobutanoic Acid (PFBA)	NS	20.0	23.0	13.0	13.0	0.95 J	
Perfluoropentanoic Acid (PFPeA)	NS	4.5	5.0	1.4 J	2.3		
Perfluorohexanoic Acid (PFHxA)	NS	16.0	16.0	1.4 J	1.0 J		
Perfluoroheptanoic Acid (PFHpA)	NS	16.0	16.0	0.94 J	0.66 J		
Perfluorooctanoic Acid (PFOA)	6.7 G	**100.0**	**110.0**	3.8	4.2		
Perfluorononanoic Acid (PFNA)	NS	0.65 J	0.74 J				
Perfluorodecanoic Acid (PFDA)	NS						
Perfluoroundecanoic Acid (PFUnA)	NS						
Perfluorododecanoic Acid (PFDoA)	NS						
Perfluorotridecanoic Acid (PFTrDA)	NS						
Perfluorotetradecanoic Acid (PFTeDA)	NS						
Perfluoroalkyl Sulfonic Acids (ng/L)							
Perfluorobutanesulfonic Acid (PFBS)	NS	4.0	3.7	8.3	3.9	1.1 J	
Perfluorohexanesulfonic Acid (PFHxS)	NS	58 JH	59 JH	2.2 JH	3.6 JH		
Perfluoroheptanesulfonic Acid (PFHpS)	NS	25.0	25.0				
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	**480.0**	**500.0**	1.0 J	2.6		
Perfluorodecanesulfonic Acid (PFDS)	NS	0.59 J	0.76 J				
Fluorotelomer Sulfonic Acids (ng/L)							
1H,1H,2H,2H-Perfluorooctane Sulfonic Acid (6:2FTS)	NS	NA	NA	NA	NA	NA	
1H,1H,2H,2H-Perfluorodecane Sulfonic Acid (8:2FTS)	NS	NA	NA	NA	NA	NA	
Perfluorooctane Sulfonamides (ng/L)							
Perfluorooctanesulfonamide (PFOSA)	NS	1.0 J	0.81 J		0.42 J		
N-Methyl Perfluoroocatnesulfonamide (NMeFOSA)	NS	NA	NA	NA	NA	NA	
Perfluorooctane Sulfonamidoacetic Acids (ng/L)							
N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS	NA	NA	NA	NA	NA	
1,4-Dioxane (µg/L)							
1,4-Dioxane (P-Dioxane)	0.35 G	NA	NA	NA	NA	NA	

Table 3-2

Summary of the 2017 Groundwater Analytical Results for Emerging Contaminants

Niagara Sanitation Site, Site No. 932054

Wheatfield, New York

Notes:

- **● = NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, with addenda through 2004.**
- **♦ = Duplicate sample.**
- **G = Guidance value.**
- **J = Compound reported at an estimated concentration below the reporting limit.**
- **JH = Compound is positively identified and reported at an estimated concentration that is probably high.**
- **NA = Not analyzed.**
- **NS = No standard or guidance value available.**
- **SC = Silty clay.**
- **ng/L = nanograms per liter or parts per trillion.**
- **ug/L = micrograms per liter or parts per billion.**
- **Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.**
- **Yellow shaded values exceed NYSDEC groundwater standards or guidance values.**
- **The original table was modified on May 10, 2022 with the data validator's qualifiers.**
- **On November 7, 2023 I reordered the contaminants in this table by PFAS subgroup.**

Table 3-3
Summary of the 2018 Groundwater Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Date Well Screen Interval (ft bgs) Screened Unit	NYSDEC Groundwater Standard ●	OW-14BR 02/06/18 5.0 - 7.0 Sand	LPZ-04S 02/06/18 3.0 - 6.0 Sand/SC	LPZ-04S ♦ 02/06/18 3.0 - 6.0 Sand/SC	LDP-04 02/06/18 4.3 - 5.3 Sand		
Perfluoroalkyl Carboxylic Acids (ng/L)							
Perfluorobutanoic Acid (PFBA)	NS	55 JH	48 JH	47 JH	25 JH		
Perfluoropentanoic Acid (PFPeA)	NS	2.2	50.0	51.0	33.0		
Perfluorohexanoic Acid (PFHxA)	NS	2.1	150.0	150.0	55.0		
Perfluoroheptanoic Acid (PFHpA)	NS	1.8 J	58.0	58.0	25.0		
Perfluorooctanoic Acid (PFOA)	6.7 G	**56.0**	**36.0**	**55.0**	**120.0**		
Perfluorononanoic Acid (PFNA)	NS	0.47 J			0.82 J		
Perfluorodecanoic Acid (PFDA)	NS						
Perfluoroundecanoic Acid (PFUnA)	NS						
Perfluorododecanoic Acid (PFDoA)	NS						
Perfluorotridecanoic Acid (PFTrDA)	NS						
Perfluorotetradecanoic Acid (PFTeDA)	NS						
Perfluoroalkyl Sulfonic Acids (ng/L)							
Perfluorobutanesulfonic Acid (PFBS)	NS	15.0	500.0	490.0	74.0		
Perfluorohexanesulfonic Acid (PFHxS)	NS	28 JH	69 JH	65 JH	80 JH		
Perfluoroheptanesulfonic Acid (PFHpS)	NS	2.1	0.77 J	0.69 J	7.1		
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	**30.0**	**10.0**	**10.0**	**80.0**		
Perfluorodecanesulfonic Acid (PFDS)	NS						
Fluorotelomer Sulfonic Acids (ng/L)							
1H,1H,2H,2H-Perfluorooctane Sulfonic Acid (6:2FTS)	NS	NA	NA	NA	NA		
1H,1H,2H,2H-Perfluorodecane Sulfonic Acid (8:2FTS)	NS	NA	NA	NA	NA		
Perfluorooctane Sulfonamides (ng/L)							
Perfluorooctanesulfonamide (PFOSA)	NS						
N-Methyl Perfluoroocatnesulfonamide (NMeFOSA)	NS	NA	NA	NA	NA		
Perfluorooctane Sulfonamidoacetic Acids (ng/L)							
N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS	NA	NA	NA	NA		
1,4-Dioxane (µg/L)							
1,4-Dioxane (P-Dioxane)	0.35 G	NA	NA	NA	NA		

Table 3-3

Summary of the 2018 Groundwater Analytical Results for Emerging Contaminants

Niagara Sanitation Site, Site No. 932054

Wheatfield, New York

Notes:

- **● = NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, with addenda through 2004.**
- **♦ = Duplicate sample.**
- **G = Guidance value.**
- **J = Compound reported at an estimated concentration below the reporting limit.**
- **JH = Compound is positively identified and reported at an estimated concentration that is probably high.**
- **NA = Not analyzed.**
- **NS = No standard or guidance value available.**
- **SC = Silty clay.**
- **ng/L = nanograms per liter or parts per trillion.**
- **ug/L = micrograms per liter or parts per billion.**
- **Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.**
- **Yellow shaded values exceed NYSDEC groundwater standards or guidance values.**
- **The original table was modified on May 10, 2022 with the data validator's qualifiers.**
- **On November 7, 2023 I reordered the contaminants in this table by PFAS subgroup.**

Table 3-4
Summary of the 2019 Groundwater Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Date Well Screen Interval (ft bgs) Screened Unit	NYSDEC Groundwater Standard ●	OW-14BR 02/11/19 5.0 - 7.0 Sand	OW-36 02/11/19 3.0 - 8.0 Fill/Sand	OW-36 ♦ 02/11/19 3.0 - 8.0 Fill/Sand	LDP-01 02/11/19 4.3 - 5.3 Sand	LDP-02 02/11/19 4.3 - 5.3 Sand/SC	LDP-04 02/11/19 4.3 - 5.3 Sand
Perfluoroalkyl Carboxylic Acids (ng/L)							
Perfluorobutanoic Acid (PFBA)	NS	19 JH		8.5 JH		4.5 JH	19 JH
Perfluoropentanoic Acid (PFPeA)	NS	0.65 J				1.4 J	12.0
Perfluorohexanoic Acid (PFHxA)	NS	0.8 J	17.0	17.0		0.71 J	31.0
Perfluoroheptanoic Acid (PFHpA)	NS	1.6 J	12.0	13.0		0.41 J	13.0
Perfluorooctanoic Acid (PFOA)	6.7 G	**55.0**	**110.0**	**100.0**		2.1	**82.0**
Perfluorononanoic Acid (PFNA)	NS	0.55 J	0.63 J	0.70 J		0.9 J	0.8 J
Perfluorodecanoic Acid (PFDA)	NS		0.30 J	0.32 J		0.28 J	
Perfluoroundecanoic Acid (PFUnA)	NS						
Perfluorododecanoic Acid (PFDoA)	NS						
Perfluorotridecanoic Acid (PFTrDA)	NS						
Perfluorotetradecanoic Acid (PFTeDA)	NS						
Perfluoroalkyl Sulfonic Acids (ng/L)							
Perfluorobutanesulfonic Acid (PFBS)	NS	14.0	4.9	5.1	2.5	2.1	90.0
Perfluorohexanesulfonic Acid (PFHxS)	NS	37 JH	52 JH	53 JH			66 JH
Perfluoroheptanesulfonic Acid (PFHpS)	NS	2.6	27.0	26.0			8.3
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	**39.0**	**460.0**	**460.0**	0.49 J	**3.0**	**72 T**
Perfluorodecanesulfonic Acid (PFDS)	NS		1.3 J	1.0 J			
Fluorotelomer Sulfonic Acids (ng/L)							
1H,1H,2H,2H-Perfluorooctane Sulfonic Acid (6:2FTS)	NS						
1H,1H,2H,2H-Perfluorodecane Sulfonic Acid (8:2FTS)	NS						
Perfluorooctane Sulfonamides (ng/L)							
Perfluorooctanesulfonamide (PFOSA)	NS	2.6	0.74 J	0.72 J			
N-Methyl Perfluoroocatnesulfonamide (NMeFOSA)	NS						
Perfluorooctane Sulfonamidoacetic Acids (ng/L)							
N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS		83.0	75.0			
1,4-Dioxane (µg/L)							
1,4-Dioxane (P-Dioxane)	0.35 G		**1.2 J**	**1.2 J**			0.30

Table 3-4

Summary of the 2019 Groundwater Analytical Results for Emerging Contaminants

Niagara Sanitation Site, Site No. 932054

Wheatfield, New York

Notes:

- **● = NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, with addenda through 2004.**
- **♦ = Duplicate sample.**
- **G = Guidance value.**
- **J = Compound reported at an estimated concentration below the reporting limit.**
- **JH = Compound is positively identified and reported at an estimated concentration that is probably high.**
- **NA = Not analyzed.**
- **NS = No standard or guidance value available.**
- **SC = Silty clay.**
- **T = Reported result below associated quantitation limit but above MDL.**
- **ng/L = nanograms per liter or parts per trillion.**
- **ug/L = micrograms per liter or parts per billion.**
- **Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.**
- **Yellow shaded values exceed NYSDEC groundwater standards or guidance values.**
- **The original table was modified on May 10, 2022 with the data validator's qualifiers.**
- **On November 7, 2023 I reordered the contaminants in this table by PFAS subgroup.**

Table 3-5A
Summary of the 2023 Groundwater Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Date Well Screen Interval (ft bgs) Screened Unit	NYSDEC Groundwater Standard ●	OW-13 10/23/23 3.0 - 5.0 Sand	OW-14BR 10/23/23 5.0 - 7.0 Sand	OW-16 N/A 5.0 - 10.0 Fill/SC	OW-35 10/23/23 4.0 - 9.0 Fill/Sand	OW-36 10/19/23 3.0 - 8.0 Fill/Sand	LPZ-03S 10/19/23 3.0 - 8.0 Sand/SC	LPZ-04S 10/19/23 3.0 - 6.0 Sand/SC
Perfluoroalkyl Carboxylic Acids (ng/L)								
Perfluorobutanoic Acid (PFBA)	NS	54.0	28.0	N/A	20.0		4.6	
Perfluoropentanoic Acid (PFPeA)	NS			"	45.0			61.0
Perfluorohexanoic Acid (PFHxA)	NS	7.3	1.1	"	29.0	14.0	2.5	46.0
Perfluoroheptanoic Acid (PFHpA)	NS	6.3	0.94 J	"	21.0	10.0	1.7	34.0
Perfluorooctanoic Acid (PFOA)	6.7 G	**51.0**	**28.0**	"	**100.0**	**82.0**	**16.0**	**130.0**
Perfluorononanoic Acid (PFNA)	NS		0.74 J	"	0.66 J			
Perfluorodecanoic Acid (PFDA)	NS			"	0.18 J			
Perfluoroundecanoic Acid (PFUnA)	NS			"				
Perfluorododecanoic Acid (PFDoA)	NS			"				
Perfluorotridecanoic Acid (PFTrDA)	NS			"				
Perfluorotetradecanoic Acid (PFTeDA)	NS			"				
Perfluoroalkyl Sulfonic Acids (ng/L)								
Perfluorobutanesulfonic Acid (PFBS)	NS	23.0	9.7	N/A	23.0	7.0	2.3	120.0
Perfluoropentanesulfonic acid (PFPeS)	NS	18.0	8.3	"	32.0	12.0	2.2	100.0
Perfluorohexanesulfonic Acid (PFHxS)	NS	30.0	19.0	"	66.0	56.0	6.3	190.0
Perfluoroheptanesulfonic Acid (PFHpS)	NS	2.0 J	4.1	"	4.1	20.0		
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	**56.0**	**15.0**	"	**21.0**	**370.0**	**4.4**	
Perfluorononanesulfonic acid (PFNS)	NS			"				
Perfluorodecanesulfonic Acid (PFDS)	NS			"				
Perfluorododecanesulfonic acid (PFDoS)	NS			"				
Fluorotelomer Sulfonic Acids (ng/L)								
1H,1H,2H,2H-Perfluorohexane Sulfonic Acid (4:2FTS)	NS			N/A				
1H,1H,2H,2H-Perfluorooctane Sulfonic Acid (6:2FTS)	NS	16.0 J		"			6.2	
1H,1H,2H,2H-Perfluorodecane Sulfonic Acid (8:2FTS)	NS			"				
Perfluorooctane Sulfonamides (ng/L)								
Perfluorooctanesulfonamide (PFOSA)	NS		0.32 J	N/A	0.35 J			
N-Methyl Perfluoroocatnesulfonamide (NMeFOSA)	NS			"				
N-Ethyl Perfluorooctanesulfonamide (NEtFOSA)	NS			"				

Table 3-5A
Summary of the 2023 Groundwater Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Date Well Screen Interval (ft bgs) Screened Unit	NYSDEC Groundwater Standard ●	OW-13 10/23/23 3.0 - 5.0 Sand	OW-14BR 10/23/23 5.0 - 7.0 Sand	OW-16 NA 5.0 - 10.0 Fill/SC	OW-35 10/23/23 4.0 - 9.0 Fill/Sand	OW-36 10/19/23 3.0 - 8.0 Fill/Sand	LPZ-03S 10/19/23 3.0 - 8.0 Sand/SC	LPZ-04S 10/19/23 3.0 - 6.0 Sand/SC
Perfluorooctane Sulfonamidoacetic Acids (ng/L)								
N-Methyl Perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	NS			N/A				
N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS			"	3.0	63.0		
Perfluorooctane Sulfonamide Ethanols (ng/L)								
N-Methyl Perfluorooctanesulfonamidoethanol (NMeFOSE)	NS			N/A				
N-Ethyl Perfluorooctanesulfonamidoethanol (NEtFOSE)	NS			"				
Per- and Polyfluoroether Carboxylic Acids (ng/L)								
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	NS			N/A				
4,8-Dioxa-3H-Perfluorononanoic Acid (ADONA)	NS			"				
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	NS			"				
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	NS			"				
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	NS			"				
Ether Sulfonic Acids (ng/L)								
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	NS			N/A				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	NS			"				
Perfluoro(2-ethoxyethane)sulfonic Acid	NS			"				
Fluorotelomer Carboxylic Acids (ng/L)								
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	NS			N/A				
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA)	NS			"	11.0 J			
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	NS			"				
1,4-Dioxane (µg/L)								
1,4-Dioxane (P-Dioxane)	0.35 G	0.27		N/A	**7.9**	**1.5**	**1.7**	**0.49**

Notes:

● = NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, with addenda through 2021.
G = Guidance value.
J = Compound reported at an estimated concentration below the reporting limit.
JH = Compound is positively identified and reported at an estimated concentration that is probably high.
N/A = Not applicable. No sample collected as the well was dry.
ND = Not detected at or above the laboratory detection limit given in parentheses.

Table 3-5A

Summary of the 2023 Groundwater Analytical Results for Emerging Contaminants

Niagara Sanitation Site, Site No. 932054

Wheatfield, New York

Notes (continued):

NS = No standard or guidance value available.

SC = Silty clay.

ng/L = nanograms per liter or parts per trillion.

ug/L = micrograms per liter or parts per billion.

Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.

Yellow shaded values exceed NYSDEC groundwater standards or guidance values.

This table was modified on August 12, 2024 with the data validator's qualifiers.

Table 3-5B
Summary of the 2023 Groundwater Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Date Well Screen Interval (ft bgs) Screened Unit	NYSDEC Groundwater Standard ●	LPZ-14S 10/19/23 4.0 - 9.0 Sand	LPZ-15S 10/19/23 3.0 - 8.0 Sand	LPZ-16S 10/18/23 5.0 - 15.0 Sand/SC	LPZ-17S 10/15/23 5.0 - 15.0 Sand/SC	LPZ-18S 10/15/23 5.0 - 15.0 Sand/SC	LDP-04 N/A 4.3 - 5.3 Sand	
Perfluoroalkyl Carboxylic Acids (ng/L)								
Perfluorobutanoic Acid (PFBA)	NS	17.0		25.0	16.0	22.0	N/A	
Perfluoropentanoic Acid (PFPeA)	NS	9.1		2.7	22.0	29.0	"	
Perfluorohexanoic Acid (PFHxA)	NS	9.2	7.8	2.8	15.0	14.0	"	
Perfluoroheptanoic Acid (PFHpA)	NS	6.1	6.9	1.5	15.0	13.0	"	
Perfluorooctanoic Acid (PFOA)	6.7 G	**52.0**	**52.0**	2.9	**94.0**	**96.0**	"	
Perfluorononanoic Acid (PFNA)	NS					1.9	"	
Perfluorodecanoic Acid (PFDA)	NS						"	
Perfluoroundecanoic Acid (PFUnA)	NS						"	
Perfluorododecanoic Acid (PFDoA)	NS						"	
Perfluorotridecanoic Acid (PFTrDA)	NS						"	
Perfluorotetradecanoic Acid (PFTeDA)	NS						"	
Perfluoroalkyl Sulfonic Acids (ng/L)								
Perfluorobutanesulfonic Acid (PFBS)	NS	13.0	7.3	6.1	7.0	8.1	N/A	
Perfluoropentanesulfonic acid (PFPeS)	NS	11.0	8.6	2.6	10.0	11.0	"	
Perfluorohexanesulfonic Acid (PFHxS)	NS	27.0	24.0	1.6	36.0	34.0	"	
Perfluoroheptanesulfonic Acid (PFHpS)	NS	5.1	5.6		8.4	5.5	"	
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	**130.0**	**230.0**		**380.0**	**20.0**	"	
Perfluorononanesulfonic acid (PFNS)	NS						"	
Perfluorodecanesulfonic Acid (PFDS)	NS						"	
Perfluorododecanesulfonic acid (PFDoS)	NS						"	
Fluorotelomer Sulfonic Acids (ng/L)								
1H,1H,2H,2H-Perfluorohexane Sulfonic Acid (4:2FTS)	NS						N/A	
1H,1H,2H,2H-Perfluorooctane Sulfonic Acid (6:2FTS)	NS						"	
1H,1H,2H,2H-Perfluorodecane Sulfonic Acid (8:2FTS)	NS						"	
Perfluorooctane Sulfonamides (ng/L)								
Perfluorooctanesulfonamide (PFOSA)	NS				1.9 J		N/A	
N-Methyl Perfluoroocatnesulfonamide (NMeFOSA)	NS						"	
N-Ethyl Perfluorooctanesulfonamide (NEtFOSA)	NS						"	

Table 3-5B
Summary of the 2023 Groundwater Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Date Well Screen Interval (ft bgs) Screened Unit	NYSDEC Groundwater Standard ●	LPZ-14S 10/19/23 4.0 - 9.0 Sand	LPZ-15S 10/19/23 3.0 - 8.0 Sand	LPZ-16S 10/18/23 5.0 - 15.0 Sand/SC	LPZ-17S 10/15/23 5.0 - 15.0 Sand/SC	LPZ-18S 10/15/23 5.0 - 15.0 Sand/SC	LDP-04 NA 4.3 - 5.3 Sand	
Perfluorooctane Sulfonamidoacetic Acids (ng/L)								
N-Methyl Perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	NS						N/A	
N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS	1.9	15.0		30.0		"	
Perfluorooctane Sulfonamide Ethanols (ng/L)								
N-Methyl Perfluorooctanesulfonamidoethanol (NMeFOSE)	NS						N/A	
N-Ethyl Perfluorooctanesulfonamidoethanol (NEtFOSE)	NS						"	
Per- and Polyfluoroether Carboxylic Acids (ng/L)								
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	NS						N/A	
4,8-Dioxa-3H-Perfluorononanoic Acid (ADONA)	NS						"	
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	NS						"	
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	NS						"	
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	NS						"	
Ether Sulfonic Acids (ng/L)								
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	NS						N/A	
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	NS						"	
Perfluoro(2-ethoxyethane)sulfonic Acid	NS						"	
Fluorotelomer Carboxylic Acids (ng/L)								
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	NS						N/A	
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA)	NS				57.0 J		"	
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	NS						"	
1,4-Dioxane (µg/L)								
1,4-Dioxane (P-Dioxane)	0.35 G	**1.2**	**0.38**	0.12	**1.2**	**0.59**	N/A	

Notes:

● = NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, with addenda through 2021.
G = Guidance value.
J = Compound reported at an estimated concentration below the reporting limit.
JH = Compound is positively identified and reported at an estimated concentration that is probably high.
N/A = Not applicable. No sample collected as the well was dry.
ND = Not detected at or above the laboratory detection limit given in parentheses.

Table 3-5B
Summary of the 2023 Groundwater Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Notes (continued):

NS = No standard or guidance value available.
SC = Silty clay.
ng/L = nanograms per liter or parts per trillion.
ug/L = micrograms per liter or parts per billion.
Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.
Yellow shaded values exceed NYSDEC groundwater standards or guidance values.
This table was modified on August 12, 2024 with the data validator's qualifiers.

Table 3-6
Summary of Soil/Fill Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Date Sample Interval (ft bgs) Screened Unit	NYSDEC Restricted Residential SCOs ●	NYSDEC Commercial SCOs ●	NYSDEC Groundwater Protection SCOs ●	LPZ-14S 10/19/21 2.0 - 5.0 Fill (1)	LPZ-15S 10/19/21 5.0 - 7.0 Sand (2)	LPZ-16S 10/04/23 2.0 - 4.0 Sand (3)	LPZ-17S 10/03/23 0.0 - 2.0 Silt (4)	LPZ-18S 10/04/23 4.0 - 6.0 Sand (2)
Perfluoroalkyl Carboxylic Acids (µg/kg)								
Perfluorobutanoic Acid (PFBA)	NS	NS	NS			NA	NA	NA
Perfluoropentanoic Acid (PFPeA)	NS	NS	NS			NA	NA	NA
Perfluorohexanoic Acid (PFHxA)	NS	NS	NS			NA	NA	NA
Perfluoroheptanoic Acid (PFHpA)	NS	NS	NS			NA	NA	NA
Perfluorooctanoic Acid (PFOA)	33 G	500 G	0.8 G	0.28		NA	NA	NA
Perfluorononanoic Acid (PFNA)	NS	NS	NS			NA	NA	NA
Perfluorodecanoic Acid (PFDA)	NS	NS	NS			NA	NA	NA
Perfluoroundecanoic Acid (PFUnA)	NS	NS	NS			NA	NA	NA
Perfluorododecanoic Acid (PFDoA)	NS	NS	NS			NA	NA	NA
Perfluorotridecanoic Acid (PFTrDA)	NS	NS	NS			NA	NA	NA
Perfluorotetradecanoic Acid (PFTeDA)	NS	NS	NS			NA	NA	NA
Perfluoroalkyl Sulfonic Acids (µg/kg)								
Perfluorobutanesulfonic Acid (PFBS)	NS	NS	NS			NA	NA	NA
Perfluorohexanesulfonic Acid (PFHxS)	NS	NS	NS	0.11 J		NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	NS	NS	NS			NA	NA	NA
Perfluorooctanesulfonic Acid (PFOS)	44 G	440 G	1 G	0.79	0.48	NA	NA	NA
Perfluorodecanesulfonic Acid (PFDS)	NS	NS	NS			NA	NA	NA
Fluorotelomer Sulfonic Acids (µg/kg)								
1H,1H,2H,2H-Perfluorooctane Sulfonic Acid (6:2FTS)	NS	NS	NS			NA	NA	NA
1H,1H,2H,2H-Perfluorodecane Sulfonic Acid (8:2FTS)	NS	NS	NS			NA	NA	NA
Perfluorooctane Sulfonamides (µg/kg)								
Perfluorooctanesulfonamide (PFOSA)	NS	NS	NS			NA	NA	NA
N-Methyl Perfluoroocatnesulfonamide (NMeFOSA)	NS	NS	NS			NA	NA	NA
Perfluorooctane Sulfonamidoacetic Acids (µg/kg)								
N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS	NS	NS	0.81		NA	NA	NA
1,4-Dioxane (mg/kg)								
1,4-Dioxane (P-Dioxane)	13.0	130.0	0.1	NA	NA			

Table 3-6
Summary of Soil/Fill Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

Notes:

- **● = Sampling, Analysis, and Assessment of Per-and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs, NYSDEC, April 2023; or 6 NYCRR Part 375: Environmental Remediation Programs, Soil Cleanup Objectives, NYSDEC, 2006.**
- **µg/kg = micrograms per kilogram or parts per billion.**
- **(1) = Silty sand with trash.**
- **(2) = Fine sand with some silt.**
- **(3) = Fine sand and silt.**
- **(4) = Silt with clay and fine sand.**
- **G = Guidance value.**
- **J = Compound reported at an estimated concentration below the reporting limit.**
- **NA = Not analyzed.**
- **NS = No standard or guidance value available.**
- **Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.**
- **Yellow shaded values exceed the NYSDEC restricted residential soil cleanup objectives but not the commercial soil cleanup objectives.**
- **Orange shaded values exceed the NYSDEC commercial soil cleanup objectives.**
- **Blue shaded values exceed the NYSDEC protection of groundwater soil cleanup objectives.**
- **This table was modified on May 10, 2022 with the data validator's qualifiers for the 2021 results.**
- **On November 7, 2023 I reordered the contaminants in this table by PFAS subgroup.**
- **This table was modified on August 12, 2024 with the data validator's qualifiers for the 2023 results.**

Table 3-7
Summary of the 2023 Surface Water Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Sample Number Sample Date Sample Location	NYSDEC Surface Water Standard ●	SG-1 N/A NE Ditch	SW-2 10/23/23 On-Site NE Pond	LSW-2 N/A NE Ditch	LSW-3 N/A On-Site NE Pond	LSW-5 N/A On-Site NW Ditch	LSW-6 N/A On-Site W Ditch
Perfluoroalkyl Carboxylic Acids (ng/L)							
Perfluorobutanoic Acid (PFBA)	NS	N/A	56.0	N/A	N/A	N/A	N/A
Perfluoropentanoic Acid (PFPeA)	NS	"	24.0	"	"	"	"
Perfluorohexanoic Acid (PFHxA)	NS	"	15.0	"	"	"	"
Perfluoroheptanoic Acid (PFHpA)	NS	"	12.0	"	"	"	"
Perfluorooctanoic Acid (PFOA)	6.7 G	"	**85.0**	"	"	"	"
Perfluorononanoic Acid (PFNA)	NS	"	2.3 J	"	"	"	"
Perfluorodecanoic Acid (PFDA)	NS	"		"	"	"	"
Perfluoroundecanoic Acid (PFUnA)	NS	"		"	"	"	"
Perfluorododecanoic Acid (PFDoA)	NS	"		"	"	"	"
Perfluorotridecanoic Acid (PFTrDA)	NS	"		"	"	"	"
Perfluorotetradecanoic Acid (PFTeDA)	NS	"		"	"	"	"
Perfluoroalkyl Sulfonic Acids (ng/L)							
Perfluorobutanesulfonic Acid (PFBS)	NS	N/A	22.0	N/A	N/A	N/A	N/A
Perfluoropentanesulfonic acid (PFPeS)	NS	"	17.0	"	"	"	"
Perfluorohexanesulfonic Acid (PFHxS)	NS	"	41.0	"	"	"	"
Perfluoroheptanesulfonic Acid (PFHpS)	NS	"	4.2 J	"	"	"	"
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	"	**180.0**	"	"	"	"
Perfluorononanesulfonic acid (PFNS)	NS	"		"	"	"	"
Perfluorodecanesulfonic Acid (PFDS)	NS	"		"	"	"	"
Perfluorododecanesulfonic acid (PFDoS)	NS	"		"	"	"	"
Fluorotelomer Sulfonic Acids (ng/L)							
1H,1H,2H,2H-Perfluorohexane Sulfonic Acid (4:2FTS)	NS	N/A		N/A	N/A	N/A	N/A
1H,1H,2H,2H-Perfluorooctane Sulfonic Acid (6:2FTS)	NS	"		"	"	"	"
1H,1H,2H,2H-Perfluorodecane Sulfonic Acid (8:2FTS)	NS	"		"	"	"	"
Perfluorooctane Sulfonamides (ng/L)							
Perfluorooctanesulfonamide (PFOSA)	NS	N/A		N/A	N/A	N/A	N/A
N-Methyl Perfluoroocatnesulfonamide (NMeFOSA)	NS	"		"	"	"	"
N-Ethyl Perfluorooctanesulfonamide (NEtFOSA)	NS	"		"	"	"	"

Table 3-7
Summary of the 2023 Surface Water Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Sample Number Sample Date Sample Location	NYSDEC Surface Water Standard ●	SG-1 NA NE Ditch	SW-2 10/23/23 On-Site NE Pond	LSW-2 NA NE Ditch	LSW-3 NA On-Site NE Pond	LSW-5 NA On-Site NW Ditch	LSW-6 NA On-Site W Ditch
Perfluorooctane Sulfonamidoacetic Acids (ng/L)							
N-Methyl Perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	NS	N/A		N/A	N/A	N/A	N/A
N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS	"		"	"	"	"
Perfluorooctane Sulfonamide Ethanols (ng/L)							
N-Methyl Perfluorooctanesulfonamidoethanol (NMeFOSE)	NS	N/A		N/A	N/A	N/A	N/A
N-Ethyl Perfluorooctanesulfonamidoethanol (NEtFOSE)	NS	"		"	"	"	"
Per- and Polyfluoroether Carboxylic Acids (ng/L)							
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	NS	N/A		N/A	N/A	N/A	N/A
4,8-Dioxa-3H-Perfluorononanoic Acid (ADONA)	NS	"		"	"	"	"
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	NS	"		"	"	"	"
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	NS	"		"	"	"	"
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	NS	"		"	"	"	"
Ether Sulfonic Acids (ng/L)							
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	NS	N/A		N/A	N/A	N/A	N/A
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	NS	"		"	"	"	"
Perfluoro(2-ethoxyethane)sulfonic Acid	NS	"		"	"	"	"
Fluorotelomer Carboxylic Acids (ng/L)							
3-Perfluoropropyl Propanoic Acid (3:3FTCA)	NS	N/A		N/A	N/A	N/A	N/A
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3FTCA)	NS	"		"	"	"	"
3-Perfluoroheptyl Propanoic Acid (7:3FTCA)	NS	"		"	"	"	"
1,4-Dioxane (µg/L)							
1,4-Dioxane (P-Dioxane)	0.35 G	N/A		N/A	N/A	N/A	N/A

Notes:

● = NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, with addenda through 2021.
G = Guidance value.
J = Compound reported at an estimated concentration below the reporting limit.
N/A = Not applicable. No sample collected as the surface water body was dry.
ND = Not detected at or above the laboratory detection limit given in parentheses.
NS = No standard or guidance value available.

Table 3-7
Summary of the 2023 Surface Water Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

Notes (continued):

ng/L = nanograms per liter or parts per trillion.

ug/L = micrograms per liter or parts per billion.

Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.

Yellow shaded values exceed NYSDEC surface water standards or guidance values.

This table was modified on August 12, 2024 with the data validator's qualifiers.

Table 3-8
Summary of the 2021 Drilling Water Analytical Results for Emerging Contaminants
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Sample Number Sample Type Sample Date Sample Location	NYSDEC Groundwater Standard ●	Drilling Water * Potable Water 10/19/21 Tank ♦
Perfluoroalkyl Carboxylic Acids (ng/L)		
Perfluorobutanoic Acid (PFBA)	NS	
Perfluoropentanoic Acid (PFPeA)	NS	1.6 J
Perfluorohexanoic Acid (PFHxA)	NS	1.8 J
Perfluoroheptanoic Acid (PFHpA)	NS	
Perfluorooctanoic Acid (PFOA)	6.7 G	1.6 J
Perfluorononanoic Acid (PFNA)	NS	
Perfluorodecanoic Acid (PFDA)	NS	
Perfluoroundecanoic Acid (PFUnA)	NS	
Perfluorododecanoic Acid (PFDoA)	NS	
Perfluorotridecanoic Acid (PFTrDA)	NS	
Perfluorotetradecanoic Acid (PFTeDA)	NS	
Perfluoroalkyl Sulfonic Acids (ng/L)		
Perfluorobutanesulfonic Acid (PFBS)	NS	
Perfluorohexanesulfonic Acid (PFHxS)	NS	0.90 J
Perfluoroheptanesulfonic Acid (PFHpS)	NS	
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	
Perfluorodecanesulfonic Acid (PFDS)	NS	
Fluorotelomer Sulfonic Acids (ng/L)		
1H,1H,2H,2H-Perfluorooctane Sulfonic Acid (6:2FTS)	NS	
1H,1H,2H,2H-Perfluorodecane Sulfonic Acid (8:2FTS)	NS	
Perfluorooctane Sulfonamides (ng/L)		
Perfluorooctanesulfonamide (PFOSA)	NS	
N-Methyl Perfluoroocatnesulfonamide (NMeFOSA)	NS	
Perfluorooctane Sulfonamidoacetic Acids (ng/L)		
N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS	
1,4-Dioxane (µg/L)		
1,4-Dioxane (P-Dioxane)	0.35 G	NA

Table 3-8

Summary of the 2021 Drilling Water Analytical Results for Emerging Contaminants

Niagara Sanitation Site, Site No. 932054

Wheatfield, New York

Notes:

- **● = NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, with addenda through 2021.**
- *** = Drilling water came from East Auraora, New York.**
- **♦ = Sample collected from the water tank on the drill rig.**
- **G = Guidance value.**
- **J = Compound reported at an estimated concentration below the reporting limit.**
- **NA = Not analyzed.**
- **NS = No standard or guidance value available.**
- **ng/L = nanograms per liter or parts per trillion.**
- **ug/L = micrograms per liter or parts per billion.**
- **Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.**
- **Yellow shaded values exceed NYSDEC groundwater standards or guidance values.**
- **The table was generated on August 12, 2024 by GMM.**
- **This table was modified on August 12, 2024 with the data validator's qualifiers.**

Table 4-1A
Summary of Groundwater Analytical Results for Emerging Contaminants
from Fill/Upper Sand Wells Along the Southern Landfill Boundary
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Date Well Screen Interval (ft bgs) Screened Unit	NYSDEC Groundwater Standard ●	LPZ-03S 10/19/23 3.0 - 8.0 Sand/SC	LPZ-04S 02/06/18 3.0 - 6.0 Sand/SC	LPZ-04S 10/19/23 3.0 - 6.0 Sand/SC	LDP-01 12/12/17 4.3 - 5.3 Sand	LDP-01 02/11/19 4.3 - 5.3 Sand	LDP-02 ♦ 12/12/17 4.3 - 5.3 Sand/SC	LDP-02 ♦ 02/11/19 4.3 - 5.3 Sand/SC	LDP-03 12/12/17 4.1 - 5.1 Sand/SC
Perfluoroalkyl Carboxylic Acids (ng/L)									
Perfluorobutanoic Acid (PFBA)	NS	4.6	48 JH		13.0		13.0	4.5 JH	0.95 J
Perfluoropentanoic Acid (PFPeA)	NS		50.0	61.0	1.4 J		2.3	1.4 J	
Perfluorohexanoic Acid (PFHxA)	NS	2.5	150.0	46.0	1.4 J		1.0 J	0.71 J	
Perfluoroheptanoic Acid (PFHpA)	NS	1.7	58.0	34.0	0.94 J		0.66 J	0.41 J	
Perfluorooctanoic Acid (PFOA)	6.7 G	**16.0**	**36.0**	**130.0**	3.8		4.2	2.1	
Perfluorononanoic Acid (PFNA)	NS							0.9 J	
Perfluorodecanoic Acid (PFDA)	NS							0.28 J	
Perfluoroundecanoic Acid (PFUnA)	NS								
Perfluorododecanoic Acid (PFDoA)	NS								
Perfluorotridecanoic Acid (PFTrDA)	NS								
Perfluorotetradecanoic Acid (PFTeDA)	NS								
Perfluoroalkyl Sulfonic Acids (ng/L)									
Perfluorobutanesulfonic Acid (PFBS)	NS	2.3	500.0	120.0	8.3	2.5	3.9	2.1	1.1 J
Perfluoropentanesulfonic acid (PFPeS)	NS	2.2		100.0					
Perfluorohexanesulfonic Acid (PFHxS)	NS	6.3	69 JH	190.0	2.2 JH		3.6 JH		
Perfluoroheptanesulfonic Acid (PFHpS)	NS		0.77 J						
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	**4.4**	**10.0**		1.0 J	0.49 J	2.6	**3.0**	
Perfluorodecanesulfonic Acid (PFDS)	NS								
Fluorotelomer Sulfonic Acids (ng/L)									
1H,1H,2H,2H-Perfluorooctane Sulfonic Acid (6:2FTS)	NS	6.2	NA		NA		NA		NA
1H,1H,2H,2H-Perfluorodecane Sulfonic Acid (8:2FTS)	NS		NA		NA		NA		NA
Perfluorooctane Sulfonamides (ng/L)									
Perfluorooctanesulfonamide (PFOSA)	NS						0.42 J		
N-Methyl Perfluoroocatnesulfonamide (NMeFOSA)	NS		NA		NA		NA		NA
Perfluorooctane Sulfonamidoacetic Acids (ng/L)									
N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS		NA		NA		NA		NA
1,4-Dioxane (µg/L)									
1,4-Dioxane (P-Dioxane)	0.35 G	**1.7**	NA	**0.49**	NA		NA		NA

Table 4-1A

Summary of Groundwater Analytical Results for Emerging Contaminants

from Fill/Upper Sand Wells Along the Southern Landfill Boundary

Niagara Sanitation Site, Site No. 932054

Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Notes:

- **● = NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, with addenda through 2021.**
- **♦ = Well was found damaged during the 2021 sampling event and was not replaced.**
- **G = Guidance value.**
- **J = Compound reported at an estimated concentration below the reporting limit.**
- **JH = Compound is positively identified and reported at an estimated concentration that is probably high.**
- **NA = Not analyzed.**
- **NS = No standard or guidance value available.**
- **SC = Silty clay.**
- **ng/L = nanograms per liter or parts per trillion.**
- **ug/L = micrograms per liter or parts per billion.**
- **Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.**
- **Yellow shaded values exceed NYSDEC groundwater standards or guidance values.**
- **This table was modified on May 10, 2022 with the data validator's qualifiers for the 2017, 2018, and 2019 results.**
- **On November 7, 2023 I reordered the contaminants in this table by PFAS subgroup.**
- **This table was modified on August 12, 2024 with the data validator's qualifiers for the 2023 results.**

Table 4-1B
Summary of Groundwater Analytical Results for Emerging Contaminants
from Fill/Upper Sand Wells Along the Northern Landfill Boundary
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Date Well Screen Interval (ft bgs) Screened Unit	NYSDEC Groundwater Standard ●	OW-14BR 02/06/18 5.0 - 7.0 Sand	OW-14BR 02/11/19 5.0 - 7.0 Sand	OW-14BR 10/23/23 5.0 - 7.0 Sand	OW-36 12/12/17 3.0 - 8.0 Fill/Sand	OW-36 02/11/19 3.0 - 8.0 Fill/Sand	OW-36 10/19/23 3.0 - 8.0 Fill/Sand	LDP-04 02/06/18 4.3 - 5.3 Sand	LDP-04 02/11/19 4.3 - 5.3 Sand
Perfluoroalkyl Carboxylic Acids (ng/L)									
Perfluorobutanoic Acid (PFBA)	NS	55 JH	19 JH	28.0	20.0			25 JH	19 JH
Perfluoropentanoic Acid (PFPeA)	NS	2.2	0.65 J		4.5			33.0	12.0
Perfluorohexanoic Acid (PFHxA)	NS	2.1	0.8 J	1.1	16.0	17.0	14.0	55.0	31.0
Perfluoroheptanoic Acid (PFHpA)	NS	1.8 J	1.6 J	0.94 J	16.0	12.0	10.0	25.0	13.0
Perfluorooctanoic Acid (PFOA)	6.7 G	**56.0**	**55.0**	**28.0**	**100.0**	**110.0**	**82.0**	**120.0**	**82.0**
Perfluorononanoic Acid (PFNA)	NS	0.47 J	0.55 J	0.74 J	0.65 J	0.63 J		0.82 J	0.8 J
Perfluorodecanoic Acid (PFDA)	NS					0.3 J			
Perfluoroundecanoic Acid (PFUnA)	NS								
Perfluorododecanoic Acid (PFDoA)	NS								
Perfluorotridecanoic Acid (PFTrDA)	NS								
Perfluorotetradecanoic Acid (PFTeDA)	NS								
Perfluoroalkyl Sulfonic Acids (ng/L)									
Perfluorobutanesulfonic Acid (PFBS)	NS	15.0	14.0	9.7	4.0	4.9	7.0	74.0	90.0
Perfluoropentanesulfonic acid (PFPeS)	NS			8.3			12.0		
Perfluorohexanesulfonic Acid (PFHxS)	NS	28 JH	37 JH	19.0	58 JH	52 JH	56.0	80 JH	66 JH
Perfluoroheptanesulfonic Acid (PFHpS)	NS	2.1	2.6	4.1	25.0	27.0	20.0	7.1	8.3
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	**30.0**	**39.0**	**15.0**	**480.0**	**460.0**	**370.0**	**80.0**	**72 T**
Perfluorodecanesulfonic Acid (PFDS)	NS				0.59 J	1.3 J			
Fluorotelomer Sulfonic Acids (ng/L)									
1H,1H,2H,2H-Perfluorooctane Sulfonic Acid (6:2FTS)	NS	NA			NA				
1H,1H,2H,2H-Perfluorodecane Sulfonic Acid (8:2FTS)	NS	NA			NA				
Perfluorooctane Sulfonamides (ng/L)									
Perfluorooctanesulfonamide (PFOSA)	NS		2.6	0.32 J	1.0 J	0.74 J			
N-Methyl Perfluoroocatnesulfonamide (NMeFOSA)	NS	NA			NA				
Perfluorooctane Sulfonamidoacetic Acids (ng/L)									
N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS	NA			NA	83.0	63.0		
1,4-Dioxane (µg/L)									
1,4-Dioxane (P-Dioxane)	0.35 G	NA			NA	**1.2 J**	**1.5**		0.3

Table 4-1B
Summary of Groundwater Analytical Results for Emerging Contaminants
from Fill/Upper Sand Wells Along the Northern Landfill Boundary
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Notes:

- **● = NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, with addenda through 2021.**
- **G = Guidance value.**
- **J = Compound reported at an estimated concentration below the reporting limit.**
- **JH = Compound is positively identified and reported at an estimated concentration that is probably high.**
- **NA = Not analyzed.**
- **NS = No standard or guidance value available.**
- **T = Reported result below associated quantitation limit but above MDL.**
- **ng/L = nanograms per liter or parts per trillion.**
- **ug/L = micrograms per liter or parts per billion.**
- **Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.**
- **Yellow shaded values exceed NYSDEC groundwater standards or guidance values.**
- **This table was modified on May 10, 2022 with the data validator's qualifiers for the 2017, 2018, and 2019 results.**
- **On November 7, 2023 I reordered the contaminants in this table by PFAS subgroup.**
- **This table was modified on August 12, 2024 with the data validator's qualifiers for the 2023 results.**

Table 4-1C
Summary of Groundwater Analytical Results for Emerging Contaminants
from Fill/Upper Sand Wells Within the Landfill
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Date Well Screen Interval (ft bgs) Screened Unit	NYSDEC Groundwater Standard ●	OW-13 10/23/23 3.0 - 5.0 Sand	OW-35 10/23/23 4.0 - 9.0 Fill/Sand
Perfluoroalkyl Carboxylic Acids (ng/L)			
Perfluorobutanoic Acid (PFBA)	NS	54.0	20.0
Perfluoropentanoic Acid (PFPeA)	NS		45.0
Perfluorohexanoic Acid (PFHxA)	NS	7.3	29.0
Perfluoroheptanoic Acid (PFHpA)	NS	6.3	21.0
Perfluorooctanoic Acid (PFOA)	6.7 G	**51.0**	**100.0**
Perfluorononanoic Acid (PFNA)	NS		0.66 J
Perfluorodecanoic Acid (PFDA)	NS		0.18 J
Perfluoroundecanoic Acid (PFUnA)	NS		
Perfluorododecanoic Acid (PFDoA)	NS		
Perfluorotridecanoic Acid (PFTrDA)	NS		
Perfluorotetradecanoic Acid (PFTeDA)	NS		
Perfluoroalkyl Sulfonic Acids (ng/L)			
Perfluorobutanesulfonic Acid (PFBS)	NS	23.0	23.0
Perfluoropentanesulfonic acid (PFPeS)	NS	18.0	32.0
Perfluorohexanesulfonic Acid (PFHxS)	NS	30.0	66.0
Perfluoroheptanesulfonic Acid (PFHpS)	NS	2.0 J	4.1
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	**56.0**	**21.0**
Perfluorodecanesulfonic Acid (PFDS)	NS		
Fluorotelomer Sulfonic Acids (ng/L)			
1H,1H,2H,2H-Perfluorooctane Sulfonic Acid (6:2FTS)	NS	16.0 J	
1H,1H,2H,2H-Perfluorodecane Sulfonic Acid (8:2FTS)	NS		
Perfluorooctane Sulfonamides (ng/L)			
Perfluorooctanesulfonamide (PFOSA)	NS		0.35 J
N-Methyl Perfluoroocatnesulfonamide (NMeFOSA)	NS		
Perfluorooctane Sulfonamidoacetic Acids (ng/L)			
N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS		3.0
1,4-Dioxane (µg/L)			
1,4-Dioxane (P-Dioxane)	0.35 G	0.27	**7.9**

Table 4-1C
Summary of Groundwater Analytical Results for Emerging Contaminants
from Fill/Upper Sand Wells Within the Landfill
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Notes:

- **● = NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, with addenda through 2021.**
- **G = Guidance value.**
- **J = Compound reported at an estimated concentration below the reporting limit.**
- **JH = Compound is positively identified and reported at an estimated concentration that is probably high.**
- **NA = Not analyzed.**
- **NS = No standard or guidance value available.**
- **ng/L = nanograms per liter or parts per trillion.**
- **ug/L = micrograms per liter or parts per billion.**
- **Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.**
- **Yellow shaded values exceed NYSDEC groundwater standards or guidance values.**
- **On November 7, 2023 I reordered the contaminants in this table by PFAS subgroup.**
- **This table was modified on August 12, 2024 with the data validator's qualifiers for the 2023 results.**

Table 4-1D
Summary of Groundwater Analytical Results for Emerging Contaminants
from Fill/Upper Sand Wells West of the Main Landfill
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Date Well Screen Interval (ft bgs) Screened Unit	NYSDEC Groundwater Standard ●	LPZ-14S 10/19/23 4.0 - 9.0 Sand	LPZ-15S 10/19/23 3.0 - 8.0 Sand	LPZ-16S 10/18/23 5.0 - 15.0 Sand/SC	LPZ-17S 10/15/23 5.0 - 15.0 Sand/SC	LPZ-18S 10/15/23 5.0 - 15.0 Sand/SC
Perfluoroalkyl Carboxylic Acids (ng/L)						
Perfluorobutanoic Acid (PFBA)	NS	17.0		25.0	16.0	22.0
Perfluoropentanoic Acid (PFPeA)	NS	9.1		2.7	22.0	29.0
Perfluorohexanoic Acid (PFHxA)	NS	9.2	7.8	2.8	15.0	14.0
Perfluoroheptanoic Acid (PFHpA)	NS	6.1	6.9	1.5	15.0	13.0
Perfluorooctanoic Acid (PFOA)	6.7 G	**52.0**	**52.0**	2.9	**94.0**	**96.0**
Perfluorononanoic Acid (PFNA)	NS					1.9
Perfluorodecanoic Acid (PFDA)	NS					
Perfluoroundecanoic Acid (PFUnA)	NS					
Perfluorododecanoic Acid (PFDoA)	NS					
Perfluorotridecanoic Acid (PFTrDA)	NS					
Perfluorotetradecanoic Acid (PFTeDA)	NS					
Perfluoroalkyl Sulfonic Acids (ng/L)						
Perfluorobutanesulfonic Acid (PFBS)	NS	13.0	7.3	6.1	7.0	8.1
Perfluoropentanesulfonic acid (PFPeS)	NS	11.0	8.6	2.6	10.0	11.0
Perfluorohexanesulfonic Acid (PFHxS)	NS	27.0	24.0	1.6	36.0	34.0
Perfluoroheptanesulfonic Acid (PFHpS)	NS	5.1	5.6		8.4	5.5
Perfluorooctanesulfonic Acid (PFOS)	2.7 G	**130.0**	**230.0**		**380.0**	**20.0**
Perfluorodecanesulfonic Acid (PFDS)	NS					
Fluorotelomer Sulfonic Acids (ng/L)						
1H,1H,2H,2H-Perfluorooctane Sulfonic Acid (6:2FTS)	NS					
1H,1H,2H,2H-Perfluorodecane Sulfonic Acid (8:2FTS)	NS					
Perfluorooctane Sulfonamides (ng/L)						
Perfluorooctanesulfonamide (PFOSA)	NS				1.9 J	
N-Methyl Perfluoroocatnesulfonamide (NMeFOSA)	NS					
Perfluorooctane Sulfonamidoacetic Acids (ng/L)						
N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS	1.9	15.0		30.0	
1,4-Dioxane (µg/L)						
1,4-Dioxane (P-Dioxane)	0.35 G	**1.2**	**0.38**	0.12	**1.2**	**0.59**

Table 4-1D

Summary of Groundwater Analytical Results for Emerging Contaminants

from Fill/Upper Sand Wells West of the Main Landfill

Niagara Sanitation Site, Site No. 932054

Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Notes:

● = NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, with addenda through 2021.

G = Guidance value.

J = Compound reported at an estimated concentration below the reporting limit.

JH = Compound is positively identified and reported at an estimated concentration that is probably high.

NA = Not analyzed.

NS = No standard or guidance value available.

SC = Silty clay.

ng/L = nanograms per liter or parts per trillion.

ug/L = micrograms per liter or parts per billion.

Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.

Yellow shaded values exceed NYSDEC groundwater standards or guidance values.

On November 7, 2023 I reordered the contaminants in this table by PFAS subgroup.

This table was modified on August 12, 2024 with the data validator's qualifiers for the 2023 results.

Table 4-2

Summary of the 2021 Groundwater Analytical Results for Emerging Contaminants

Mayville Water Supply Contamination, Spill No. 2008000

Mayville, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number Sample Location Sample Date Well Screen Interval (ft bgs) Screened Unit	NYSDEC Groundwater Standard ●	Supply Well No. 3 Patterson St 08/23/21 59.0' - 71.0' Sand & Gravel	MW-4 (NYSDEC Well) Patterson St 08/24/21 52.5' - 67.5' Sand & Gravel	MW-5 (NYSDEC Well) Patterson St 08/25/21 51.0' - 66.0' Sand & Gravel	MW-6 (NYSDEC Well) TCMB 08/25/21 7.0' - 17.0' Silt/Fine Sand	MW-7 (NYSDEC Well) TCMB 08/25/21 5.0' - 20.0' Silt/Fine Sand
Per- and Polyfluoroalkyl Substances (PFAS) (ng/L)						
Perfluorobutanoic acid (PFBA)	NS	2.2 J	3.2 J		4.8	450 J
Perfluorobutanesulfonic acid (PFBS)	NS	0.65 J	0.41 J		1.8	
Perfluoropentanoic acid (PFPeA)	NS	3.6	2.7		1.4 J	1,700
Perfluorohexanoic acid (PFHxA)	NS	2.3	3.4		1.5 J	1,700
Perfluorohexanesulfonic acid (PFHxS)	NS				1.4 J	0.56 J
Perfluoroheptanesulfonic Acid (PFHpS)	NS					
Perfluoroheptanoic acid (PFHpA)	NS	1.2 J	1.3 J		1.1 J	1,700
Perfluorooctanoic acid (PFOA)	6.7	3.3	2.8		4.0	**2,000**
Perfluorooctanesulfonic acid (PFOS)	2.7				1.3 J	**8.7**
Perfluorononanoic acid (PFNA)	10.0 *	**140.0**	**100.0**		**55.0**	**110,000 E**
Perfluorodecanoic acid (PFDA)	NS			0.28 J	0.57 J	790.0
Perfluorodecanesulfonic acid (PFDS)	NS					
Perfluoroundecanoic acid (PFUnA)	NS				20.0	20,000
Perfluorododecanoic acid (PFDoA)	NS					5.3
Perfluorotridecanoic acid (PFTriA)	NS				1.2 J	7.1
Perfluorotetradecanoic acid (PFTeA)	NS					
Perfluorooctanesulfonamide (FOSA)	NS	1.0 J				
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NS					
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	NS					
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NS					2,600
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NS				0.59 J	1,600
4,8-Dioxa-3h-perfluorononanoic acid (DONA)	NS					
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	NS					
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	NS					
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	NS					

Table 4-2

Summary of the 2021 Groundwater Analytical Results for Emerging Contaminants

Mayville Water Supply Contamination, Spill No. 2008000

Mayville, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Notes:

- **● = NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, with addenda through 2021.**
- *** = NYSDOH, Updated August 26, 2020. Guidance value for PFNA is a NYSDOH recommended site-specific screening value.**
- **E = Result exceeds the calibration range.**
- **J = Compound reported at an estimated concentration below the reporting limit.**
- **ND = Non-detect**
- **NS = No standard or guidance value available.**
- **ng/L = nanograms per liter or parts per trillion.**
- **TCMB = Town of Chautauqua Municipal Building**
- **Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.**
- **Yellow shaded values exceed NYSDEC groundwater standards or guidance values.**

Table 4-3
Summary of Groundwater Elevations in Fill/Upper Sand Monitoring Wells
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number	Top of Riser Elevation	Depth to Water	Water Elevation	Depth to Water *	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation
		12/12/17		02/05/18		02/11/19		10/10/23		10/17/23	
Highland Plaza BCP Site (C915293)											
OW-13	579.33							4.32	575.01		
OW-14BR	580.03			4.52	575.51	4.58	575.45				
OW-16	581.88							Dry	NA		
OW-35	581.57										
OW-36	580.95	4.94	576.01			4.58	576.37	6.97	573.98		
LPZ-03S	581.16							9.22	571.94		
LPZ-04S	579.68			3.29	576.39			7.15	572.53		
LPZ-14S	582.13							9.33	572.80		
LPZ-15S	581.43							8.48	572.95		
LPZ-16S	580.13							13.69	566.44		
LPZ-17S	579.45							6.24	573.21	6.35	573.10
LPZ-18S	581.90							9.68	572.22	9.78	572.12
LDP-01	580.34	3.97	576.37			NR	NA				
LDP-02	581.03	4.78	576.25			4.65	576.38				
LDP-03	580.73	4.55	576.18								
LDP-04	581.42			4.85	576.57	4.98	576.44	Dry	NA		

Notes:

NA = Not Applicable.

NR = Not Recorded.

Elevations are referenced to Datum NAVD 88 and given in feet above mean sea level.

Depths are given in feet.

Blanks indicate that a water level measurement was not made.

Table 4-3
Summary of Groundwater Elevations in Fill/Upper Sand Monitoring Wells
Niagara Sanitation Site, Site No. 932054
Wheatfield, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Well Number	Top of Riser Elevation	Depth to Water	Water Elevation	Depth to Water *	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation
		10/18/23		10/19/23		10/23/23		10/17-23/2023			
Highland Plaza BCP Site (C915293)											
OW-13	579.33					5.21	574.12	5.21	574.12		
OW-14BR	580.03					4.69	575.34	4.69	575.34		
OW-16	581.88										
OW-35	581.57					7.97	573.60	7.97	573.60		
OW-36	580.95			6.97	573.98			6.97	573.98		
LPZ-03S	581.16			9.40	571.76			9.40	571.76		
LPZ-04S	579.68			7.35	572.33			7.35	572.33		
LPZ-14S	582.13			9.46	572.67			9.46	572.67		
LPZ-15S	581.43			8.70	572.73			8.70	572.73		
LPZ-16S	580.13	10.58	569.55					10.58	569.55		
LPZ-17S	579.45							6.35	573.10		
LPZ-18S	581.90							9.78	572.12		
LDP-01	580.34										
LDP-02	581.03										
LDP-03	580.73										
LDP-04	581.42										

Notes:

NA = Not Applicable.

NR = Not Recorded.

Elevations are referenced to Datum NAVD 88 and given in feet above mean sea level.

Depths are given in feet.

Blanks indicate that a water level measurement was not made.