FOURTH FIVE-YEAR REVIEW REPORT FOR PFOHL BROTHERS LANDFILL SUPERFUND SITE CHEEKTOWAGA COUNTY, NEW YORK STATE

Prepared by

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LIST OF ABBREVIATIONS & ACRONYMS

CFR	Code of Federal Regulations
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
IRM	Interim Remedial Measure
ICs	Institutional Controls
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
ng/L	Nanograms per Liter
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
OU	Operable Unit
O&M	Operation and Maintenance
PFOS	Perfluorooctanesulfonic acid
PFOA	Perfluorooctanoic acid
PFAS	Polyfluoroalkyl Substances
PRPs	Potentially Responsible Parties
RAOs	Remedial Action Objectives
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SVOCs	Semi-Volatile Organic Compounds
UU/UE	Unlimited Use and Unrestricted Exposure
VFPE	Very Flexible Polyethylene
VOCs	Volatile Organic Compounds

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act Section 121, consistent with the National Contingency Plan (40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fourth FYR for the Pfohl Brothers Landfill Superfund site. The triggering action for this statutory review is June 16, 2016, the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The site consists of two operable units (OUs). OU1 consists of two landfilled areas (Area B and Area C). OU2 consists of a soil borrow area (Area A) and off-site groundwater. Only OU1 will be addressed in this FYR. A 1994 Record of Decision (ROD) chose no action for OU2; therefore, it is not subject to this FYR.

The FYR was led by Pamela Tames, EPA Remedial Project Manager. Participants included Stephanie Kim, EPA human health risk assessor, Rachel Griffiths, EPA hydrogeologist, and Chuck Nace, EPA ecological risk assessor. The FYR began on June 8, 2020.

Site Background

The Pfohl Brothers Landfill site is a 130-acre area with an inactive landfill located in a commercial/residential area in the Town of Cheektowaga, Erie County, New York, approximately one mile northeast of Buffalo Niagara International Airport (see Appendix A, Figure 1, attached). The site is bordered by wetlands, Aero Lake, Aero Creek, and the New York State Thruway to the north. The remaining boundaries consist of Transit Road to the east, a Niagara Mohawk Power easement and wetlands to the west, and residential yards (along the north side of Pfohl Road) and Conrail tracks to the south. In addition, the site is bisected by Aero Drive. The road and wetlands divide the site into three distinct areas—Areas A, B, and C (see Appendix A, Figure 2, attached).

The site consists of two capped fill areas. One fill area (approximately 70 acres) is located on Area B and the other (approximately 24 acres) is located on Area C. The two capped areas are individually fenced and there are two entrance gates along Aero Drive—one on the north side for Area B and another on the south side for Area C. A utility building is located inside the entrance gate on the north side of Aero Drive. The capped areas have evenly distributed gas vents for the landfill gas control system. Several engineered drainage swales, ditches, and culverts divert surface water off the caps.

A portion of Area A was used as a borrow area by the New York Thruway Authority for road fill material. Aero Lake, a 40-acre man-made lake, was created from the borrow pit. The remainder of Area A contains the Thruway ramp and tollbooths, as well as a trucking firm.

Thirty-six acres of the landfilled areas located on either side of Aero Drive and along Pfohl Road were excavated during the remedial action and are now available for redevelopment.

Appendix B, attached, summarizes the documents utilized to prepare this FYR.

Appendix C, attached, summarizes the site's surface drainage, geology/hydrogeology and land use. For more details related to background, physical characteristics, geology/hydrogeology, land/resource use, and history related to the site, please refer to https:/www.epa.gov/superfund/pfohl-brothers .

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Pfohl Brothers Landfill		
EPA ID: NYD980507495		
Region: 2	**State:** NY	**City/County:** Cheektowaga

SITE STATUS	
NPL Status: Deleted	
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA ***[If "Other Federal Agency", enter Agency name]*:**
Author name (Federal or State Project Manager): Pamela Tames
Author affiliation: EPA
Review period: 7/1/2016 – 11/1/2020
Date of site inspection: 10/5/2020
Type of review: Statutory
Review number: 4
Triggering action date: 6/30/2016
Due date *(five years after triggering action date)*: 6/30/2021

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The New York State Department of Environmental Conservation (NYSDEC) initiated a remedial investigation/feasibility study (RI/FS) in 1988, which identified significant soil, surface water/sediment and groundwater contamination. Contaminants of concern included polycyclic aromatic hydrocarbons, polychlorinated biphenyls, volatile organic compounds (VOCs), and metals. The RI/FS also concluded that the site posed unacceptable human health risks attributable to dermal exposure to leachate seeps, dermal absorption and ingestion of contaminated sediments, and ingestion and dermal contact with site soils and groundwater. In addition, the setting of the site adjacent to freshwater wetlands, fishing areas and creeks, as well as the uncovered and exposed waste at the site, presented a high potential for terrestrial and aquatic wildlife exposure, with resultant degradation of these critical environmental areas.

In 1992, NYSDEC initiated an off-property RI to study the influence of the landfilled areas on off-site groundwater contamination and to determine if Area A required remediation. Based upon the results of this investigation, it was determined that Area A was not used for the disposal of hazardous substances and significant levels of groundwater contamination were not detected.

In 1993, the site was proposed for inclusion on the National Priorities List (NPL).

Response Actions

Remedy Selection

Based upon the results of the above-noted investigations, on February 11, 1992, a ROD was signed for Operable Unit (OU1). The remedial action objectives (RAOs) identified in the ROD were as follows:

- Reduce organic and inorganic contaminant loads to the surface water streams from leachate seeps and groundwater to assist in meeting Class B and D stream standards;
- Reduce carcinogenic and non-carcinogenic risks caused by dermal exposure to leachate seeps;
- Reduce carcinogenic risks caused by dermal absorption and ingestion of sediments;
- Prevent migration of contaminants from sediments that could result in surface water exceedance of Class B or D stream standards;
- Reduce carcinogenic and non-carcinogenic risks caused by ingestion and dermal contact of landfill soils;
- Reduce risk or exposure to groundwater via ingestion and dermal contact; and
- Minimize migration of contaminants into uncontaminated groundwater.

The selected remedy included:

- Construction of a barrier wall containment system around the perimeter of the landfilled areas;
- Construction of a leachate collection and conveyance system;
- Construction of 6 NYCRR Part 360 (regulations for Solid Waste Management Facilities) compliant landfill caps over the landfilled areas in Areas B and C;
- Treatment and disposal of the collected leachate either on- or off-site;
- Operation and maintenance of the caps and leachate collection system, and long-term groundwater monitoring;
- Institutional controls (ICs) to restrict access to the landfilled areas in order to prevent the use of groundwater beneath the site and protect the integrity of the cap; and
- An Interim Remedial Measure (IRM) to remove drums and phenolic tars within the 100-year flood plain and at concentrated areas of the site.

Based on the off-property investigations discussed above, on January 10, 1994, a no action ROD was signed for OU2.

Status of Implementation

NYSDEC initiated the IRM required by the OU1 ROD by performing drum removal and excavation activities 1992 to 1993. A total of 2,928 drums containing wastes were removed, placed in metal overpack drums, and staged on-site for later off-site disposal. Another 1,619 empty drums were recovered and later reburied on-site. Fifteen drums containing low-level radioactive waste were overpacked and staged on-site for later disposal off-site.

Four hundred and forty cubic yards of visibly-contaminated soil were excavated from Areas B and C and were staged on-site in roll-off containers for later disposal off-site.

An Order on Consent to complete the IRM was signed by NYSDEC and the potentially responsible parties (PRPs) in October 1993. Field work, which was performed from 1994 to 1995, included the excavation and off-site disposal of 392 cubic yards of visibly-contaminated soils previously staged by NYSDEC, removal and off-site disposal of 1,724 drums and 990 cubic yards of visibly-contaminated soils and tar materials discovered during the final phase of the IRM, rehabilitation of the site to pre-IRM conditions, and removal of all appropriate IRM support facilities.

Negotiations with the PRPs for the performance of the remedial design/remedial action (RD/RA) related to the selected remedy resulted in 34 PRPs signing a Consent Decree in 1993. The Pfohl Brothers Landfill Site Steering Committee represented the PRP group. The RD, which started in 1994, was approved by NYSDEC in 2001. RA activities commenced thereafter pursuant to a consent decree.

To facilitate future development along Pfohl Road and Aero Drive, approximately 36 acres of the landfilled areas, consisting of about 540,000 cubic yards of waste located along these roads (the edges of Areas B and C) were excavated and consolidated on the interior portions of Areas B and C. In addition, 9,200 cubic yards of contaminated soil and waste were excavated to protect the wetlands and consolidated on the interior portions of Areas B and C. Post-excavation soil samples showed that the remaining soils met New York State Technical and Administrative Guidance

Memorandum No. 94-HWR-4046 January 24, 1994 cleanup objectives. The excavated areas were backfilled with clean fill and topsoil and were reseeded. Two caps totaling 94 acres were constructed over the consolidated wastes in conformance with New York State 6 NYCRR Part 360 closure requirements. Each cap consists of a six-inch gas venting layer overlain by a layer of filter fabric, a 40-mil thick very flexible polyethylene (VFPE) liner, a 24-inch barrier protection layer of clean soil, and topped with six inches of topsoil capable of supporting vegetation. Forty-nine gas vents were installed to convey the gas from beneath the low permeability layer of the caps via the gas venting layer to the atmosphere.

The leachate collection system consists of an eight-inch diameter perforated collection pipe set in a granular material-filled trench, which runs along the 10,000-foot perimeter of the landfilled areas at a depth of approximately five to 22 feet bgs. An additional 1,000 feet of collection drain was installed eight to 14 feet bgs in the southwest interior of Area B to promote an upward gradient from the bedrock to the overburden within the confines of the perimeter barrier containment system. All of the collected leachate is discharged directly to the Buffalo Sewer Authority's Treatment Plant via the Town of Cheektowaga's sewer system through six collection wet wells and a force main that was connected to a sewer interceptor. Twenty-eight manholes were installed to facilitate monitoring and maintenance. A VFPE wall keyed into 24 inches of undisturbed clay at the bottom of the perimeter trench was installed as a vertical barrier to prevent the collection drain system from collecting clean off-site groundwater and dewatering the adjacent wetlands. The polyethylene wall was connected to the VFPE liner in the landfill caps.

All disturbed areas of the site were subsequently restored. A vegetative layer consisting of hardy, shallow rooted grasses was established on the surface of the landfill caps. The grass serves to stabilize the soil against erosion, minimize percolation of precipitation, promote evapotranspiration of soil moisture, and is aesthetically pleasing.

Due to meandering wetland boundaries, the construction of the landfill caps led to the permanent removal of 0.16 acre of wetlands along a portion of the western boundary of Area B. As mitigation, 0.50 acre of wetland was reestablished along the northern boundary of Area B, resulting in a net gain of 0.34 acre of wetland.

Based upon the results of a final inspection of the site conducted in 2002 by NYSDEC and EPA, it was determined that all construction activities had been completed and that the implemented remedy was consistent with the 1992 and 1994 RODs and the design documents.

The site was deleted from the NPL on September 22, 2008.

Institutional Controls

The 1992 ROD called for ICs to restrict access to the landfilled areas in order to prevent the use of groundwater beneath the site and protect the integrity of the cap.

Restrictions were placed on Areas B and C in the form of Declarations of Covenants and Restrictions and Grant of Access signed by each of the seven owners whose parcels make up the site. Five of the seven agreements were signed in 2003 and the last two were signed in 2005. Each

Declaration requires that the owners agree to not use any on-site groundwater other than for monitoring the remedial action, that no on-site surface water cisterns be constructed, that the capped areas not be accessed without prior written approval of NYSDEC, that on-site soil not be excavated, removed, or disturbed without NYSDEC written approval, and that trees and shrubs whose roots may breach the cap not be planted.

Access agreements were needed to perform O&M. On October 21, 2005, the final access agreement was recorded.

Institutional Controls Summary Table

Table 1**,** below, summarizes the status of the ICs.

Table 1: Summary of Planned and/or Implemented Institutional Controls

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater, surface water, and soil	Yes	Yes	Areas B and C	No use of on-site groundwater other than for monitoring the remedial action, that no on-site surface water cisterns be constructed, that the capped areas not be accessed without prior written approval of NYSDEC, that on-site soil not be excavated, removed, or disturbed without NYSDEC written approval, and that trees and shrubs whose roots may breach the cap not be planted.	Declarations of Covenants and Restrictions and Grant of Access 2003 and 2005

Systems Operations/Operation & Maintenance

An operation and maintenance (O&M) plan, which provides for a long-term monitoring program for the cover system, the drainage system, the groundwater, and the institutional controls, was approved in 2006. The O&M activities at the site are being performed by the Town of

Cheektowaga. Semiannual O&M reports are reviewed by NYSDEC and EPA. The elements of the O&M plan are discussed in more detail below.

The Operation, Maintenance, and Monitoring Manual for the site contains the procedures for inspecting and evaluating the landfill caps, off-site disposal of the collected leachate and extracted groundwater, provision and certification of institutional controls, monitoring of groundwater, surface water and wetlands in the immediate perimeter of the landfilled areas, and long-term monitoring of downgradient groundwater wells. Repairs are to be made to the cap, drainage, and leachate collection systems as necessary, to control the effects of settling, subsidence, erosion or other events that might interfere with the performance of the remedy.

The site is inspected on a monthly basis as follows:

- The manholes and wet wells are inspected to determine that each one is free of obstructions, in good condition, and locked securely; and
- The wetlands are inspected and checked for bare areas, washouts, dead/dying/undesirable plants, build-up of sediments, flow restrictions, the stability of erosion protection, and the general condition of the water budget and water levels.

The site is inspected on a quarterly basis as follows:

- The landfill caps are inspected for signs of erosion, bare areas, washouts, leachate seeps, length of grass, dead/dying grass and signs of burrowing animals;
- The surface water drainage system is inspected for signs of sediment build-up, erosion, obstructions, and dead/dying grass in the drainage ditches;
- The landfill gas venting system is inspected for any damage to the vents;
- The access roads are inspected for erosion, obstructions, potholes, puddles and debris;
- The integrity of the two landfill perimeter fences, gates, locks, and placement and condition of signs are checked;
- The utility building is inspected for vandalism, damage, and if secure; and
- The site is inspected for debris, litter and/or waste.

The leachate is collected in a trench collection system and is discharged to the Buffalo Sewer Authority's Treatment Plant via the Town of Cheektowaga's sewer system. Sampling of the leachate was performed monthly for the first two years and is now performed quarterly in accordance with the requirements of Discharge Permit No. 02-11-CH016 between the Buffalo Sewer Authority and the Town of Cheektowaga. As a condition for renewal of this permit, an analysis of all constituents within the leachate, not just metals, is required within every three year period.

In 2007, NYSDEC approved the Town of Cheektowaga's request to eliminate radionuclides, dioxins, and dibenzofurans from their list of test parameters because they were not detected in the leachate since monitoring commenced in 2005. NYSDEC approved the PRPs' request to end surface water and sediment sampling in 2008.

The groundwater monitoring wells are sampled every six months.

Potential site impacts from climate change have been assessed. The performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the site.

III. PROGRESS SINCE THE LAST REVIEW

The protectiveness determinations from the last FYR are summarized in Table 2, below.

Table 2: Protectiveness Determinations/Statements from the 2016 FYR

OU #	Protectiveness Determination	Protectiveness Statement
01	Protective	The implemented actions under OU1 protect human health and the environment. The landfilled areas have been capped, removing direct contact (*i.e.,* ingestion or dermal contact of soil) exposures to the public. ICs are in place to further prevent potential exposures to the public, including trespassers. The potential impacts to groundwater are being addressed through the caps that reduce or prevent percolation through the landfilled areas. Leachate from the leachate collection system is being discharged to a publicly-owned treatment works further reducing potential exposures to the population.
Sitewide	Protective	The implemented actions protect human health and the environment. The landfilled areas have been capped, removing direct contact (*i.e*., ingestion or dermal contact of soil) exposures to the public. ICs are in place to further prevent potential exposures to the public, including trespassers. The potential impacts to groundwater are being addressed through the caps that reduce or prevent percolation through the landfilled areas. Leachate from the leachate collection system is being discharged to a publicly-owned treatment works further reducing potential exposures to the population.

There were no recommendations in the previous FYR report.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

On September 22, 2020, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at Superfund sites in New York, New Jersey, Puerto Rico

and the U.S. Virgin Islands, including the Pfohl Brothers Landfill site. The announcement can be found at the following web address: https://www.epa.gov/superfund/R2-fiveyearreviews.

In addition to this notification, a notice of the commencement of the FYR was sent to local public officials. The notice was provided to the Town of Cheektowaga by email on October 22, 2020 with a request that the notice be posted in public areas in the town hall. The purpose of the public notice was to inform the community that the EPA would be conducting a FYR to ensure that the remedy implemented at the site remains protective of public health and is functioning as designed. In addition, the notice included contact information, including addresses and telephone numbers, for questions related to the FYR process or the site.

Once the FYR is completed, the results of the review and the FYR report will be made available online (https://www.epa.gov/superfund/pfohl-brothers) and at the site information repositories. The information repositories are maintained at the Anna M Reinstein Public Library, 2580 Harlem Road, Cheektowaga, NY and EPA Region 2 Superfund Records Center, 290 Broadway, 18th Floor, New York, New York, as well as on the EPA's website.

Data Review

Semiannual groundwater sampling was conducted during the review period using overburden and bedrock monitoring wells GW-01D, GW-01S, GW-03D, GW-03S, GW-04D, GW-04S, GW-07D, GW-07S, GW-08D, GW-08SR, GW-26D, GW-28S, GW-29S, GW-30S, GW-31S, GW-32S, GW-33S, GW-34S, and GW-35S (see Appendix A, Figure 3, attached).

During the review period, there were few and infrequent detections of VOCs and semi-volatile organic compounds (SVOCs). Specifically, 1,4-dichlorobenzene was detected marginally above its Class GA water quality standard of 3.0 micrograms per liter (µg/L) on four occasions in monitoring well GW-03D (3.1 µg/L in May 2017, 3.8 µg/L in November 2017, 4.2 µg/L in November 2018, and 3.6 µg/L in November 2019) and bis(2- ethylhexyl)phthalate was detected twice in monitoring well GW-07D at 5.4 µg/L, slightly exceeding its Class GA water quality standard of 5.0 µg/L in November 2018 and at 4.0 µg/L in November 2019.

During the review period, iron, magnesium, manganese, and sodium routinely exceeded their Class GA standards of 0.3 milligrams per liter (mg/L), 35 mg/L, 0.3 mg/L, and 20 mg/L, respectively in most site wells. The highest concentrations of iron were predominantly in monitoring well GW-07D. The iron concentrations in this well spiked from 5.8 mg/L in May 2016 to 50.8 mg/L in May 2017; the iron concentration in this well decreased in 2018 before spiking to 48.4 mg/L in May 2019. The latest iron concentration was 15.0 µg/L in November 2019. The fluctuations are consistent with the range of detected concentrations at this location since 2004. The levels of magnesium were fairly stable during the review period, ranging from a maximum concentration of 101 mg/L in May 2016 to 92.7 mg/L in November 2019 in monitoring well GW-03S, the well with the highest concentrations. Manganese concentrations were fairly stable during the review period, ranging from 1.4 mg/L in May 2016 to 1.2 mg/kg in May 2019 in monitoring well GW-03S, the well with some of the highest concentrations. Sodium concentrations were generally elevated in bedrock monitoring wells GW-01D, GW-03D, GW-08D, and GW-26D and a shallow monitoring wells GW-01S, GW-03S, and GW-08SR. In monitoring well GW-26D, one of the

wells with the highest sodium concentrations, concentrations ranged from 295 mg/L in May 2016 to 351 mg/L in May 2019 and most recently to 310 mg/L in November 2019. The elevated sodium concentrations in the bedrock wells may be attributed to the bedrock composition and the elevated concentrations in the shallow wells may be the result of seasonal road de-icing activities.

During the review period, there were sporadic exceedances of antimony, cadmium, and chromium in monitoring well GW-07D. In May 2017 and May 2019, antimony (Class GA standard is 0.003 mg/L) was detected at 0.018 mg/L and 0.01 mg/L, respectively, cadmium (Class GA standard is 0.005 mg/L) was detected at 0.0067 mg/L and 0.054 mg/L, respectively, and chromium (Class GA standard is 0.05 mg/L) was detected at 1.4 mg/L and 1.8 mg/L, respectively.

Emerging contaminants 1,4-dioxane and per- and polyfluoroalkyl substances (PFAS) were sampled in November 2018 at four monitoring wells (GW-08D, GW-08SR, GW-26D, and GW-35S). Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) results were compared to New York State's drinking water standards of 10 nanograms per liter (ng/L). While PFAS was detected in each of the wells sampled, the concentrations of PFOA and PFOS were slightly above 10 ng/L in three of the wells, but below the screening value of 40 ng/L defined in the December 19, 2019 "Interim Recommendations to Address Groundwater Contaminated with Perfluorooctanoic Acid and Perfluorooctanesulfonate (OLEM Directive No 9283.1-47)." The levels of Total PFOA and PFOS ranged from 6.15 ng/L in GW-08SR to 18.6 ng/L in GW-08D. 1,4-dioxane was not detected in the four wells sampled. EPA will continue to work with NYSDEC to determine if further sampling is necessary.

Groundwater level data indicate that the landfill perimeter collection system is maintaining an inward hydraulic gradient, as demonstrated by higher groundwater levels outside the collection system when compared to manholes inside the collection system.

Site Inspection

A site inspection was conducted on October 5, 2020. In attendance were Pete Lisichenko, EPA On-Scene Coordinator, Brian Sadowski on behalf of NYSDEC, Patrick Bowen and John Nichy on behalf of the Town of Cheektowaga, and Rob Murphy of AECOM, the Town's consultant. The inspection identified several areas where maintenance is required. Specifically, several areas show rill development and evidence of ponding, animal burrowing was observed, woody growth was seen along fencing, damaged grounding rods and covers were noted, and sheening was observed at several wet wells and manholes. Photographs showing some of the noted observations can be found in Appendix D, attached.

V. TECHNICAL ASSESSMENT

QUESTION A: *Is the remedy functioning as intended by the decision documents?*

While exceedances of metals are present in groundwater samples collected during the review period, the exceedances correspond to those also found in the local background wells. Very small amounts of other constituents (primarily SVOCs) were found sporadically. Other components,

such as sodium, are likely due to the location of the nearby New York State Thruway toll plaza and Transit Road, a major local roadway, and copious use of road salt during the long winter season. Overall, the concentrations of metals and other constituents in the groundwater have been consistent with data collected since 2004.

Based on the remedial actions implemented at the site, including capping the landfill, perimeter fencing, and leachate collection system, the remedy is functioning as intended and human and ecological exposure pathways have been eliminated. The ICs which restrict development on top of the cap and use of groundwater are in place and effective.

QUESTION B: *Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?*

The exposure assumptions and toxicity data used to estimate potential risks and hazards to human health followed general risk assessment practices at the time the risk assessment was conducted. Although the risk assessment process has since been updated, and specific parameters and toxicity values may have changed, the risk assessment process that was used is consistent with current practice and the need to implement the remedial action remains valid.

The exposures to soil at the site have been interrupted by the placement of the cap, leachate collection system, and vertical barriers. ICs and environmental easements were placed on the property to ensure that no activities are conducted on the consolidated waste area that would disturb the cap. The cap prevents direct contact with the waste materials. Overall, the remedial action to address soil contamination continues to interrupt exposures and the soil remedy is protective of human health. NYSDEC's Division of Hazardous Waste Remediation, Technology Section, Draft Soil Cleanup Guideline Values were used as soil cleanup objectives for the areas which were excavated and are now ready for development. Although some of the soil cleanup objectives have changed since the 1992 ROD, they are still within EPA's risk range. Areas of the site that were not included in the capped area, such as the areas from which the consolidated waste originated (*i.e.*, buffers between cap and roadway), were sampled post-excavation to ensure that the remaining soil was below the soil cleanup values. As indicated above, the values used for soil cleanup values are still valid and protective. These areas would be acceptable for redevelopment as long as the development adheres to the ICs that are in place.

The cleanup levels that were chosen for the on-site groundwater were the state Class A groundwater standards. These levels are still valid.

An exposure pathway that was not considered in the original assessment is vapor intrusion into indoor air. However, since the low levels of VOCs sporadically found in the groundwater are located within the containment system and are at a great distance from the residences, the potential for soil vapor intrusion issues related to this site is highly unlikely.

As reported in the previous FYR, although the ecological risk assessment methodology used to support the 1992 ROD has changed over time, the landfill cap eliminates any potential risk from surface soil contaminants to terrestrial receptors. Additionally, the previous FYR concluded that surface water, sediment and groundwater did not present any significant potential risk to ecological

receptors. These conclusions remain valid. Therefore, ecological receptors are not impacted by site contaminants and the remedy is protective of ecological receptors.

The RAOs are still valid.

QUESTION C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No other information had come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

There are no recommendations or follow-up actions for this FYR.

OTHER FINDINGS

The site inspection noted several areas where maintenance is required. Evidence of poor drainage in Area B requires corrections to the surface drainage. Woody growth needs to be cleared along the fence of landfill Area C. Damaged grounding rods and covers in Area B should be repaired. Animal burrows in Area B should be mitigated. Water depth gauges in two pump chambers are offline and do not run automatically and may require rewiring to communicate with the Control House. Sheening observed at the wet wells and manholes along the western perimeter of Area B should be investigated further to confirm if it is naturally-occurring or from the landfill.

VII. PROTECTIVENESS STATEMENT

Table 3, below, presents the OU and Sitewide protectiveness statements.

Table 3: Protectiveness Statements

Protectiveness Statement(s)		
Operable Unit: 01	*Protectiveness Determination:* Protective	*Planned Addendum Completion Date:* N/A
Protectiveness Statement: The remedy at OU1 is protective of human health and the environment.		
Sitewide Protectiveness Statement		
Protectiveness Determination: Protective		*Planned Addendum Completion Date:* N/A

Protectiveness Statement: The sitewide remedy is protective of human health and the environment.

VIII. NEXT REVIEW

The next FYR report for the Pfohl Brothers Landfill Superfund Site is required five years from the completion date of this review.

APPENDIX A – FIGURES

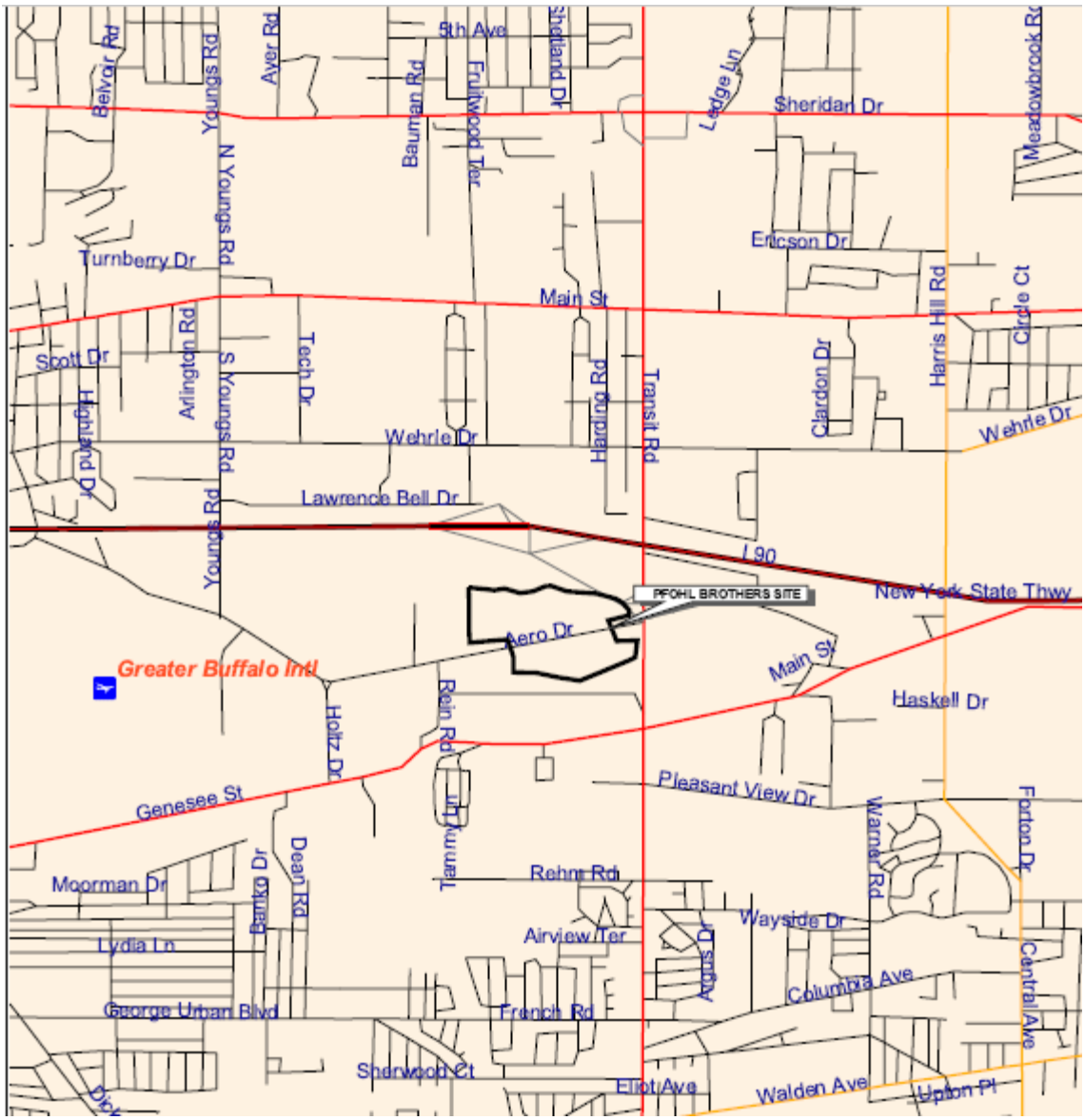


Figure 1—Site Location

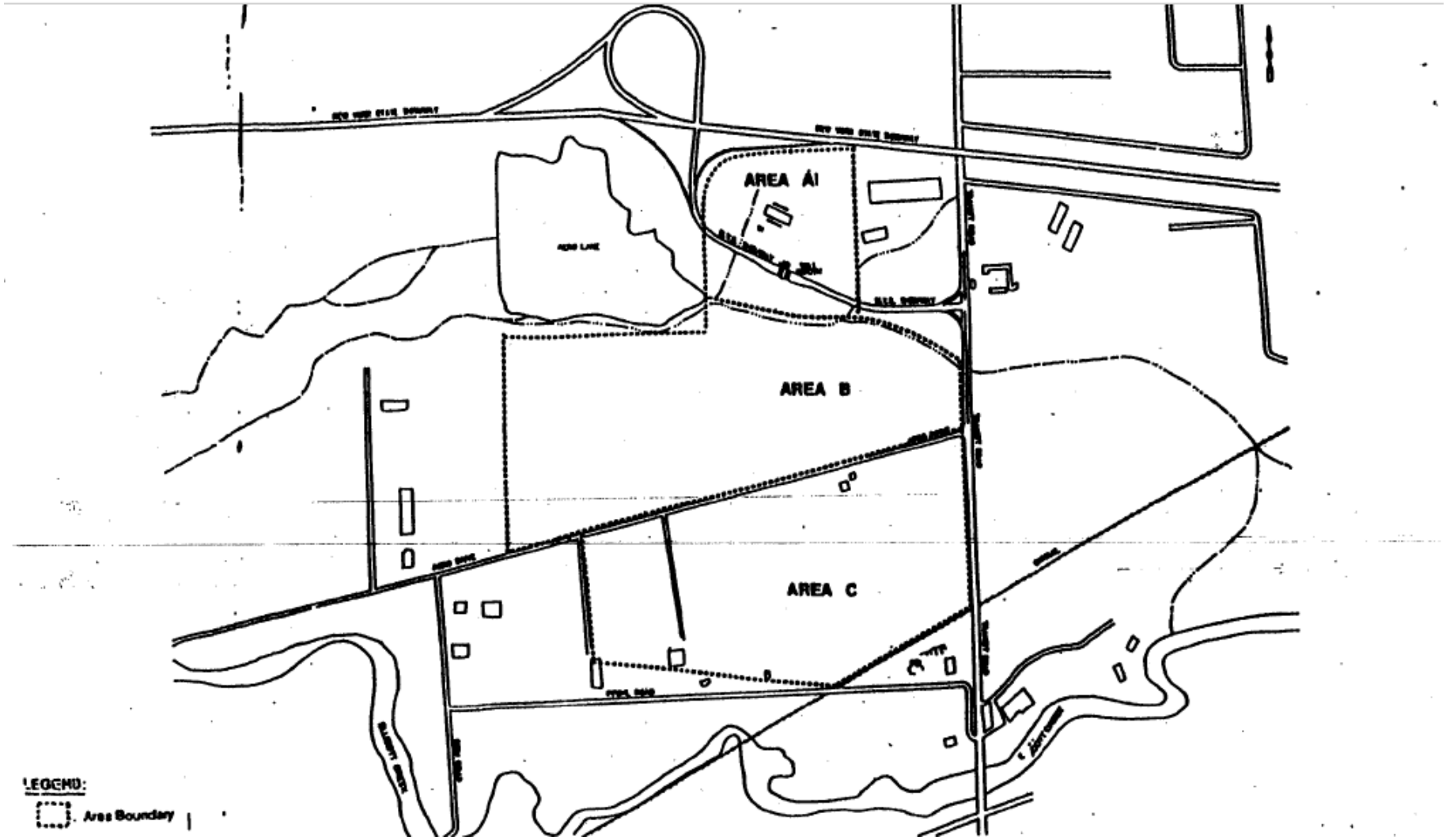


Figure 2—Site Plan

Figure 3—Monitoring Well Locations

APPENDIX B – REFERENCE LIST

Table 2: Documents, Data, and Information Reviewed in Completing the Five-Year Review	
Document Title, Author	**Date**
Remedial Investigation/Feasibility Study, Camp, Dresser & McKee	1992
Off-Site Remedial Investigation, NYSDEC	1993
Record of Decision, NYSDEC	1992
Record of Decision, NYSDEC	1994
Drum and soil Interim Remedial Measure Final Remediation Report, URS Corporation	1996
Interim Remedial Measures Completion Report, Conestoga-Rovers & Associates	1995
Final (100%) Design Documents, Conestoga-Rovers & Associates	1999
Remedial Action Report, Conestoga-Rovers & Associates	2003
Final Close-Out Report, EPA	2007
First Five-Year Review Report – Pfohl Brothers Landfill, Town of Cheektowaga, NY	2006
Second Five-Year Review Report - Pfohl Brothers Landfill, Town of Cheektowaga, NY	2011
Third Second Five-Year Review Report - Pfohl Brothers Landfill, Town of Cheektowaga, NY	2016
Semi-Annual Report, Operation and Maintenance, January 2016 to June 2016, Pfohl Brothers Landfill, Cheektowaga, NY, URS Corporation	2016
Semi-Annual Report, Operation and Maintenance, July 2016 to December 2016, Pfohl Brothers Landfill, Cheektowaga, NY, URS Corporation	2016
Semi-Annual Report, Operation and Maintenance, January 2017 to June 2017, Pfohl Brothers Landfill, Cheektowaga, NY, URS Corporation	2017
Semi-Annual Report, Operation and Maintenance, July 2017 to December 2017, Pfohl Brothers Landfill, Cheektowaga, NY, URS Corporation	2017
Semi-Annual Report, Operation and Maintenance, January 2018 to June 2018, Pfohl Brothers Landfill, Cheektowaga, NY, URS Corporation	2018
Semi-Annual Report, Operation and Maintenance, July 2018 to December 2018, Pfohl Brothers Landfill, Cheektowaga, NY, URS Corporation	2018
Semi-Annual Report, Operation and Maintenance, January 2019 to June 2019, Pfohl Brothers Landfill, Cheektowaga, NY, URS Corporation	2019

Table 2: Documents, Data, and Information Reviewed in Completing the Five-Year Review	
Semi-Annual Report, Operation and Maintenance, July 2019 to December 2019, Pfohl Brothers Landfill, Cheektowaga, NY, URS	2020

APPENDIX C— PHYSICAL CHARACTERISTICS, GEOLOGY/HYDROGEOLOGY AND LAND USE

Physical Characteristics

Existing flood insurance maps (Federal Emergency Management Agency, 1983) indicate that the site is not in the Ellicott Creek Floodway. Changes to the flood elevation in Ellicott Creek did not occur as a result of site construction. The areas just outside the boundary of Area B (i.e., Aero Lake, Aero Creek, and adjacent wetlands) are within the 100-year flood zone elevation of 696.8 feet, as are several areas within Area C located adjacent to Aero Drive, Transit Road, and Pfohl Road.

Vegetation patterns at the site are a mixture of herbaceous field, weed, and grass species. Both open field, wetland, and forested habitats characterize the surrounding area. These habitats support a variety of avian and mammalian species. No New York State Department of Environmental Conservation (NYSDEC) Significant Habitat Areas are found on-site, and no endangered or threatened species were identified in this area.

Site Geology/Hydrogeology

The Pfohl Brothers Landfill is located in the Lake Erie Plain. The topographic setting consists of gently rolling hills and intervening flatlands 6 to 12 miles in width formed by Pleistocene glaciation. The region is underlain by gently dipping bedrock of sedimentary nature (e.g., sandstones, siltstones, and shales). The advancement, melting and subsequent retreat of the glacier resulted in the deposition of till and lacustrine sediments in the vicinity of the site. The sediments consist of clay with discontinuous bands of silt and very fine sand.

The underlying bedrock, located approximately 20 feet below ground surface (bgs), consists of Onondaga Limestone and also serves as the principal aquifer within the area of the landfill. Most of the groundwater flow occurs through rock fractures and interconnected cavities. Recharge to the aquifer occurs mainly through precipitation, which averages about 36 inches per year.

The landfill lies within the Erie-Niagara drainage basin and is surrounded by Aero Lake to the north and Ellicott Creek to the south. Data obtained from surface water level measurements in creeks and tributaries surrounding the landfilled areas imply that the aforementioned surface-water features act as hydraulic boundaries to groundwater flow and that groundwater from the landfilled areas discharges, in part, into nearby surface waters.

The regional groundwater flow in the unconsolidated aquifer is generally in a south-southwest direction and eventually discharges into both Aero Lake and Ellicott Creek. During the wet seasons, the groundwater moves radially outward from the site in all directions, except to the northeast, due to local groundwater mounding. During those times, Aero Lake and the wetlands surrounding the site serve as local discharge areas for the aquifer.

Land and Resource Use

Land use in the vicinity of the site consists of a mix of residential, commercial, and industrial properties. The Buffalo Niagara International Airport is located just one mile to the west of the site. Several residences are located to the southwest within 1,000 feet of the site boundary.

The New York State Thruway borders Area A to the north. A toll plaza and an access ramp for the Thruway are located in the southern half of Area A. Aero Lake, a 40-acre man-made lake formed from a borrow pit used during the construction of the Thruway, is located to the west of Area A and north of Area B. The 40-acre, 20-foot deep man-made Aero Lake is classified as Class D water and is used by local residents for fishing in the warmer months. Ellicott Creek, classified as Class B and Class C, depending on the section, may receive surface waters from a small unnamed creek located adjacent to Aero Lake and from adjacent drainage swales.

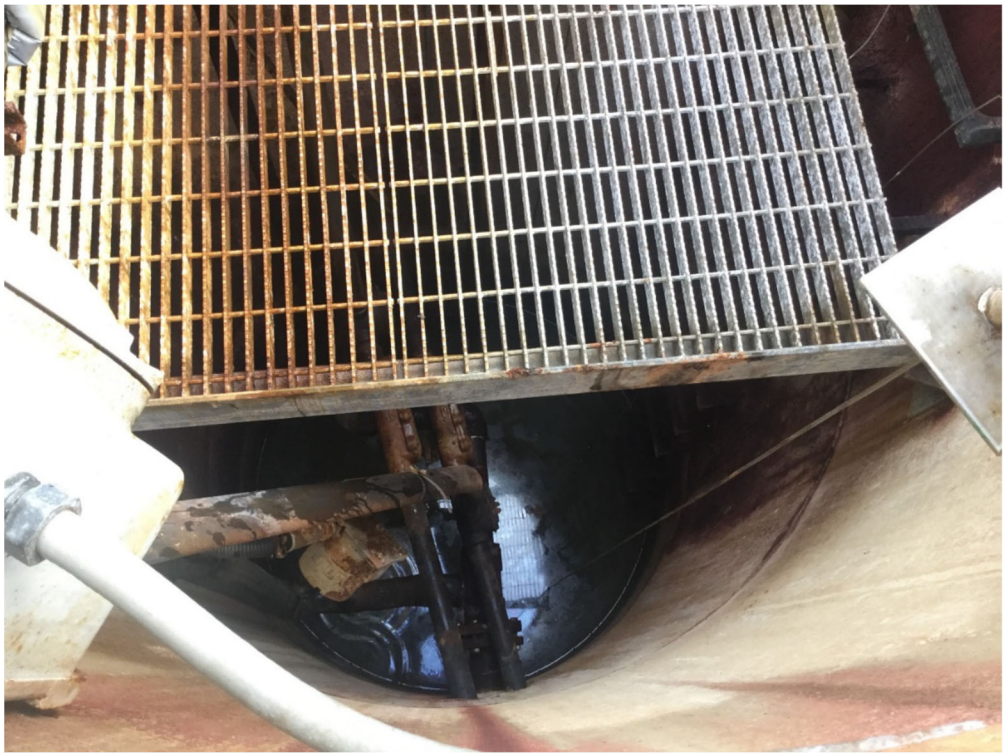
Thirty-six acres of the landfilled areas located on either side of Aero Drive and along Pfohl Road were excavated during the remedial action and are now available for redevelopment.

APPENDIX D—FIVE-YEAR REVIEW INSPECTION PHOTOGRAPHS

Animal burrow

Rill development

Wooded vegetation on fence line



Sheening on the surface of the water at the bottom of Wet Well 6

Photographs were taken by Pete Lisichenko, EPA, on October 5, 2020.