

3.7.5 GREENHILLS LANDFILL

Facility Name: Greenhills Landfill
A.K.A.: N/A
Location: 1300 West Sharon Road
Parcel #: 59100170006
Lat, Long: 39.276987 -84.529820
Region: Forest Park, OH 45240
Owner: Village of Greenhills
Operation (yrs): 1938 – 1981 (based on records)



FACILITY OVERVIEW

The former Greenhills Landfill is located in the City of Forest Park, Hamilton County, Ohio. The parcel is located north of West Sharon Road, and west of Winton Road. Hamilton County Auditor records address the property as 1300 West Sharon Road, Cincinnati, OH 45240. The site is surrounded by Winton Woods County Park on the west, north, and east sides.

Topography of the former landfill was created as the site was developed as a hillside fill where waste material was pushed from the ridgeline over the slope from west to east. Filling also occurred south and west of the ridgeline however documentation has indicated this was likely hard fill materials (may include C&DD). Figure

3.7.5-B illustrates today's topography of the site. The red line represents areas that appear to have been filled based on comparison of topographic maps from 1937 (Figure 3.7.5-A) and today. The yellow line delineates areas of waste placement as reported in the facility's explosive gas monitoring plan or EGMP.

FIGURE 3.7.5-A

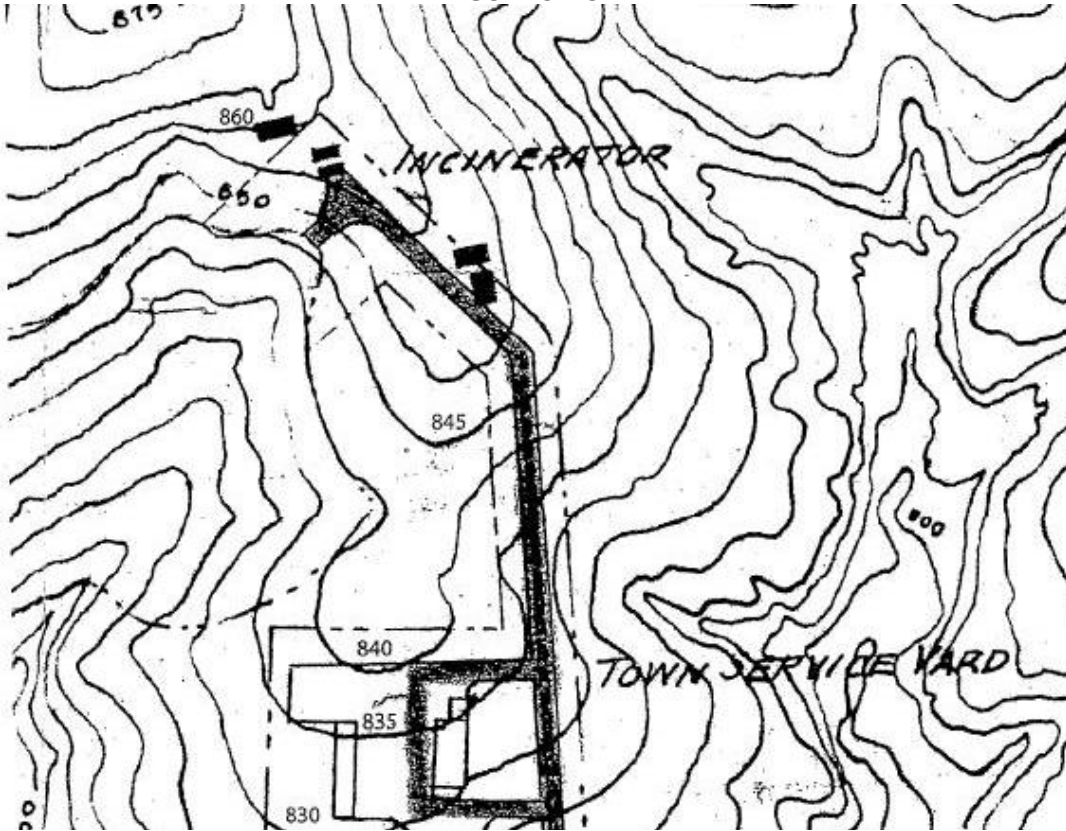
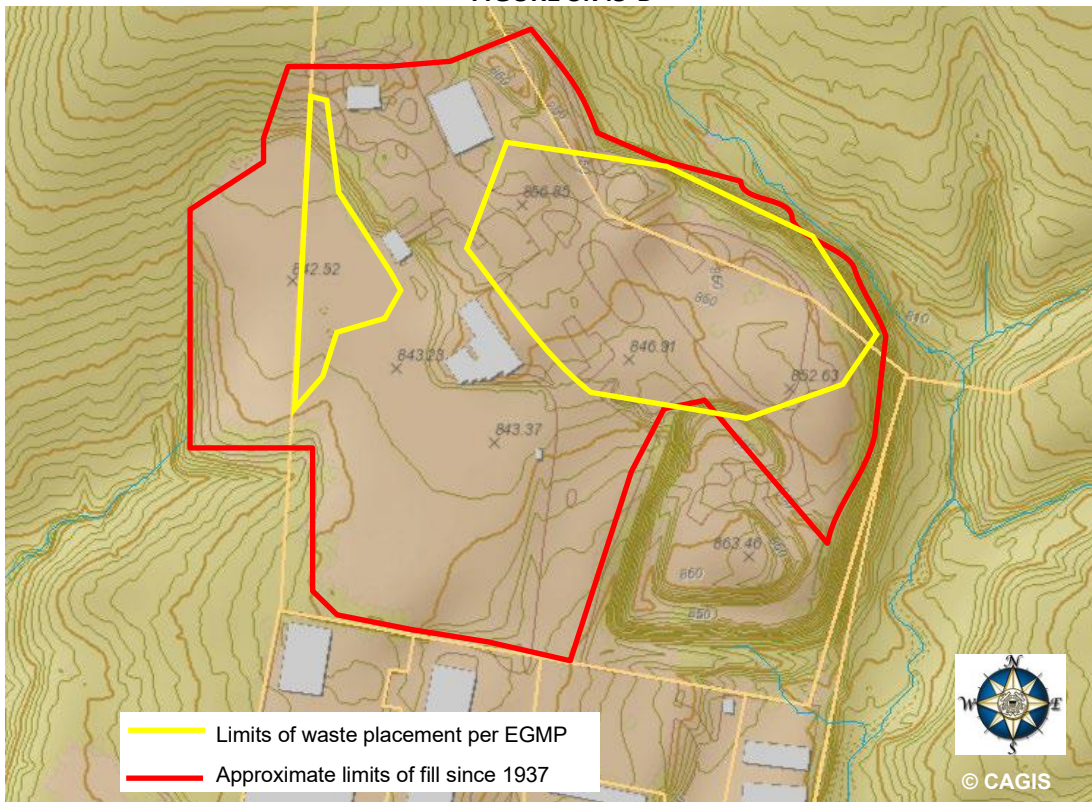
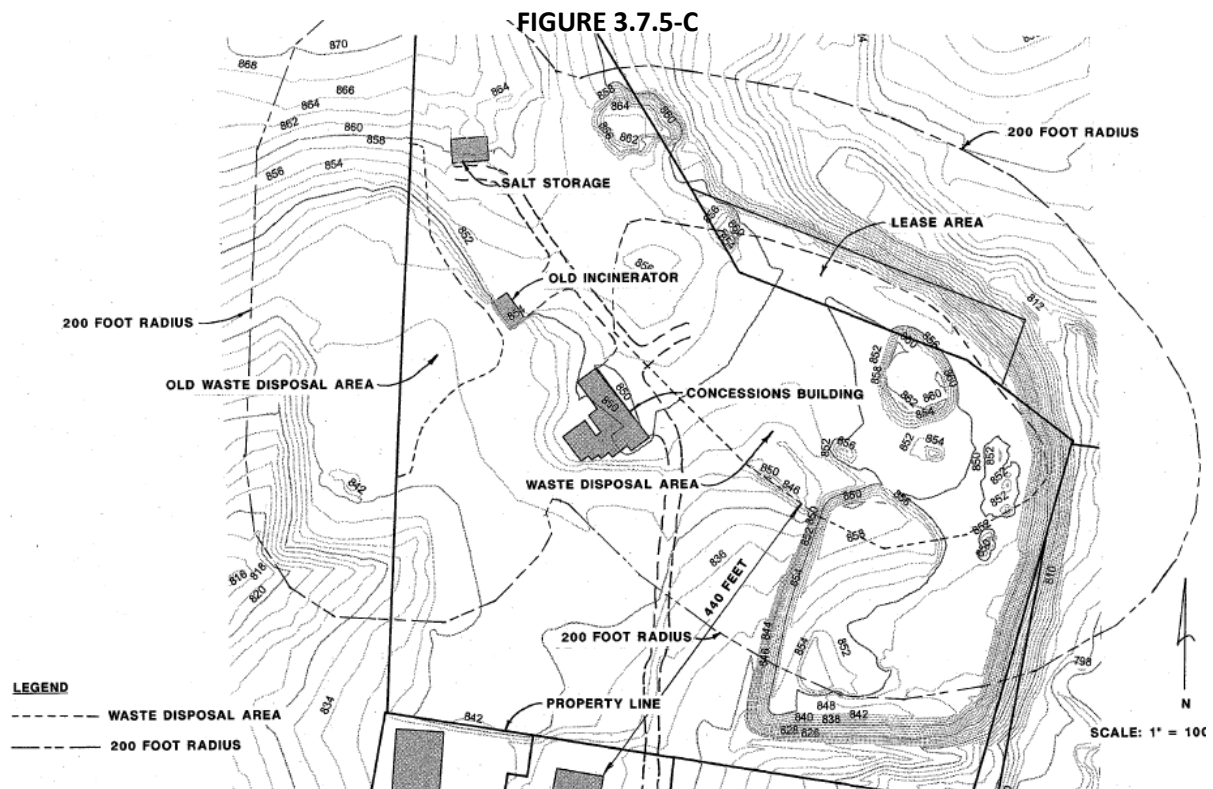


FIGURE 3.7.5-B



Based on records, operation of the landfill for the disposal of putrescible waste and incinerator ash dates to 1938. The site served primarily as disposal for incinerator ash for an onsite incinerator operated by the Federal Government until 1951, and by The Village until 1968, when it was closed. From 1968, the landfill disposed of mostly debris from the Village of Greenhills until sometime in the early 1970's. The majority of waste disposed at the landfill from 1968 until 1981 consisted of yard waste and an occasional load of putrescible waste. The facility maintained an operating license issued by the Hamilton County General Health District until 1981. All putrescible waste and incinerator ash was disposed on the northern side of the landfill property. A letter from HCPH to the village, dated 2/8/1989, indicates the landfill is operating a "demolition fill site" but is accepting some prohibited solid waste items such as furniture, appliances, and tires. A HCPH report from 1991 indicates that the site has been operating as a C&DD facility for approximately 3 yrs. Acceptance of C&DD ceased sometime prior to 1997 when licensing of C&DD landfills was established. The incinerator was torn down and removed in 2018. Presently the Village accepts clean hard fill; organic material is also accepted at an Ohio EPA registered class IV compost facility operated by the village. Figure 3.7.5-C illustrating prior waste disposal for the site follows:



SAMPLING RESULTS

Sampling for the Greenhills Landfill is performed in a small creek downstream from the landfill. No upstream sampling location is available. The sample site (S-1) below the Greenhills landfill is a narrow run located south of Sharon Road. Samples around Greenhills Landfill were collected on November 3, 2022. During sampling, the water was clear and the bottom of the pool was gravelly and silty. The referenced location is shown on Figure 3.7.5-C. Since there is no upstream sample site, a 5-year moving average trend line is added to the graphs to better show trends in the data. In 2002, 2007, and 2008 the stream was dry at the time of sampling, so no samples were obtained.

Manganese has been above the SMCL of 0.05 mg/L during every sampling event since it was added to our analysis in 2010. However, the concentration observed in 2022 (0.521 mg/L) was a historical high for the

location. Prior to 2020 sampling TDS had consistently been above the SMCL of 500 mg/L every year a sample had been collected. The TDS concentration in 2020 was 438 mg/L, just slightly below the SMCL. However, in 2022 sampling TDS returned to a concentration above the SMCL with a result of 564 mg/L. Iron, with a concentration of 0.27 mg/L in 2022, dropped below the SMCL of 0.3 mg/L. The SMCL for Iron had been exceeded during the previous 3 sampling events. Sulfate concentrations in 2020 (75.7 mg/L) were a historical high for the site. 2022 results were only slightly below this with a concentration of 74.8mg/L but remain well below the SMCL of 250 mg/L. Chloride, sodium, nitrite-nitrate, phosphorus, and barium all displayed high concentrations in 2014 relative to what has historically been observed. Starting in 2016 and continuing through 2022 sampling, all have returned to previously observed concentrations (Appendix A) and all were below any relevant MCL or SMCLs.

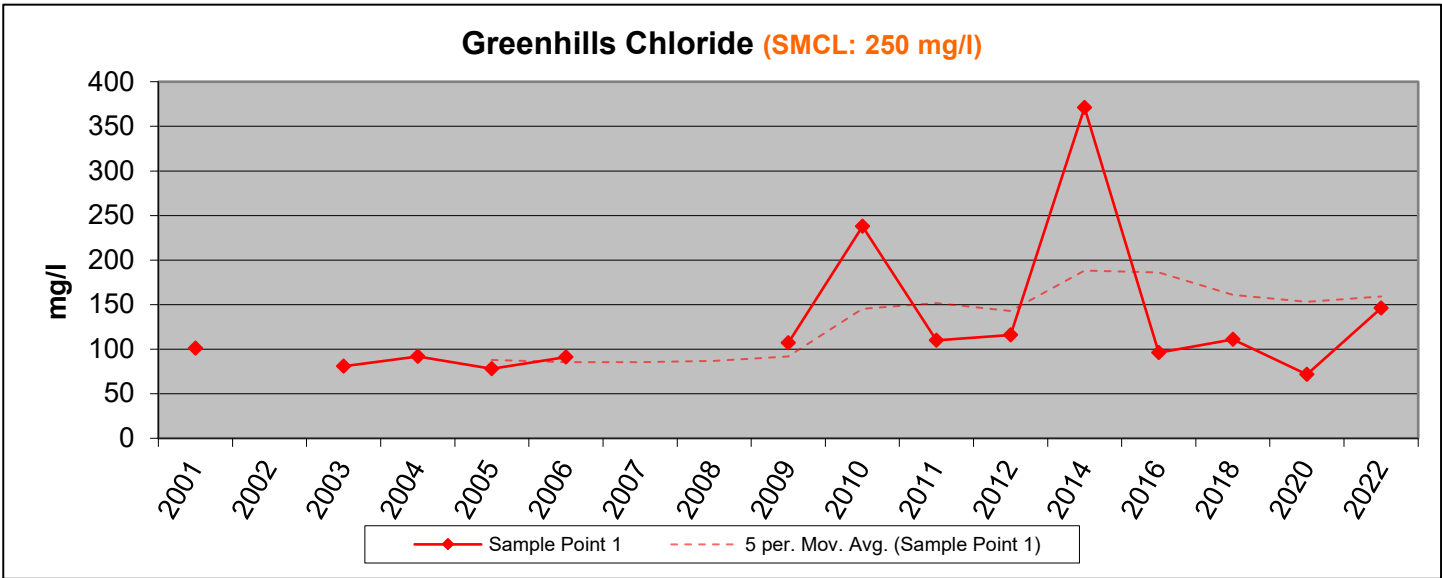
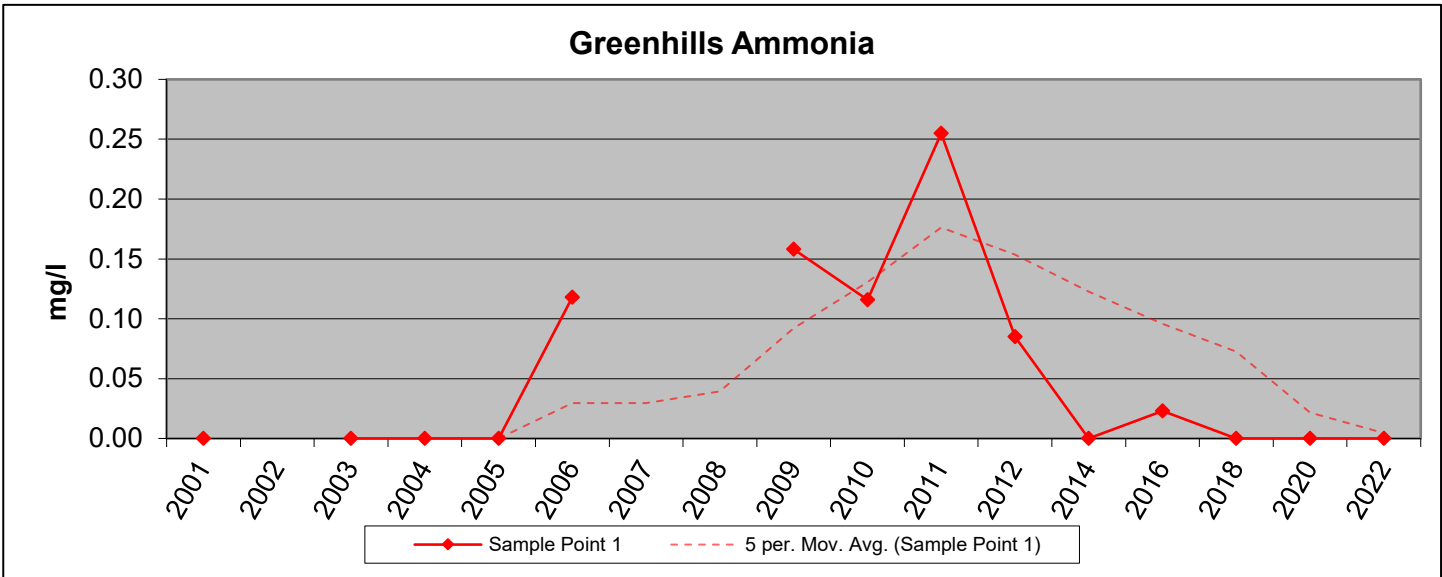
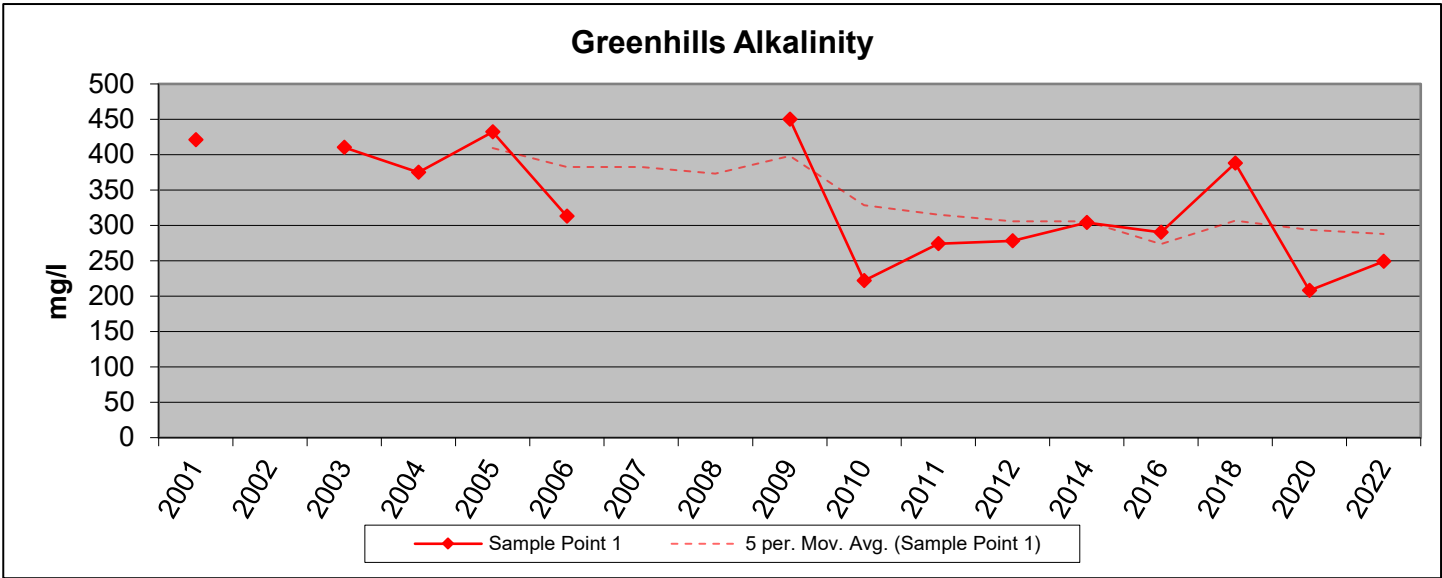
During the sampling completed in 2014, chloride and sodium both exceeded the SMCL (250 mg/L) for the first time. Additionally, nitrite-nitrate, phosphorus, conductivity, bicarbonate, calcium, and barium all exhibited high levels compared to historically observed concentrations since sampling began in 2001. In response to these results, Waste Management staff walked the entire creek in May 2015, to look for possible sources of these elevated parameters. A large red or rust colored seep was identified near the southeast corner of the old landfill. When staff returned to sample the seep it was dry and when checked again later in the year it continued to be inactive. The seep was checked again in May of 2016 and was active. It was determined that a sample would be collected both from the seep and the regular sampling point in order to accurately compare the two.

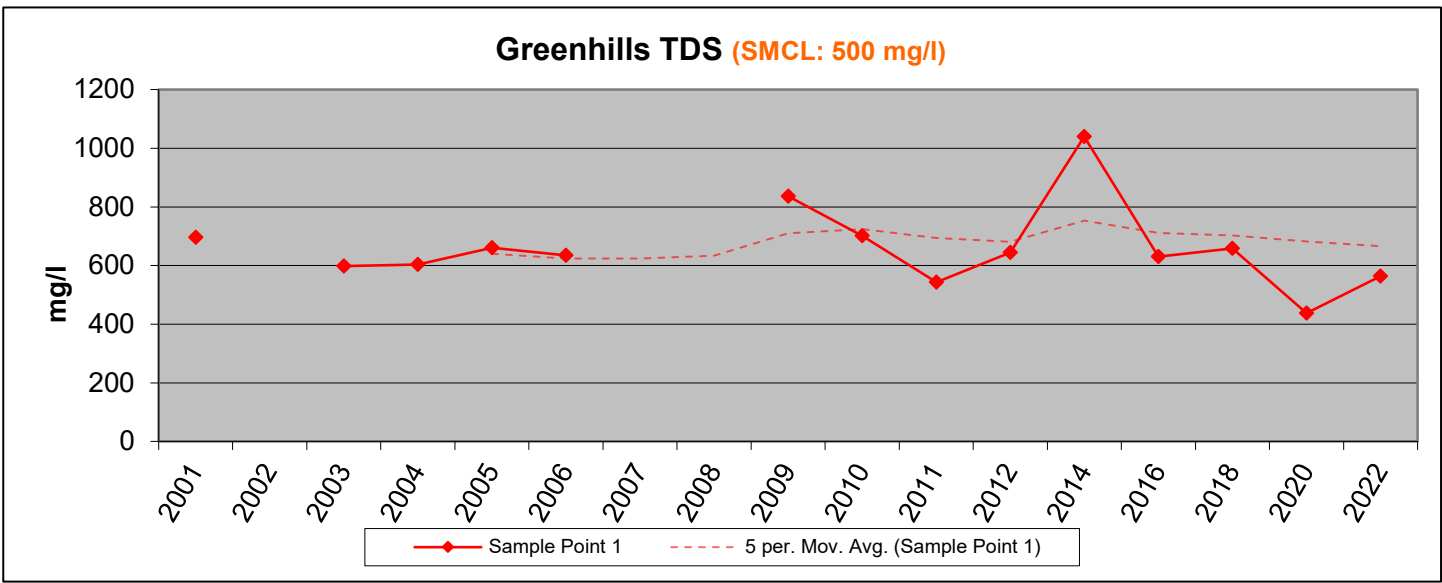
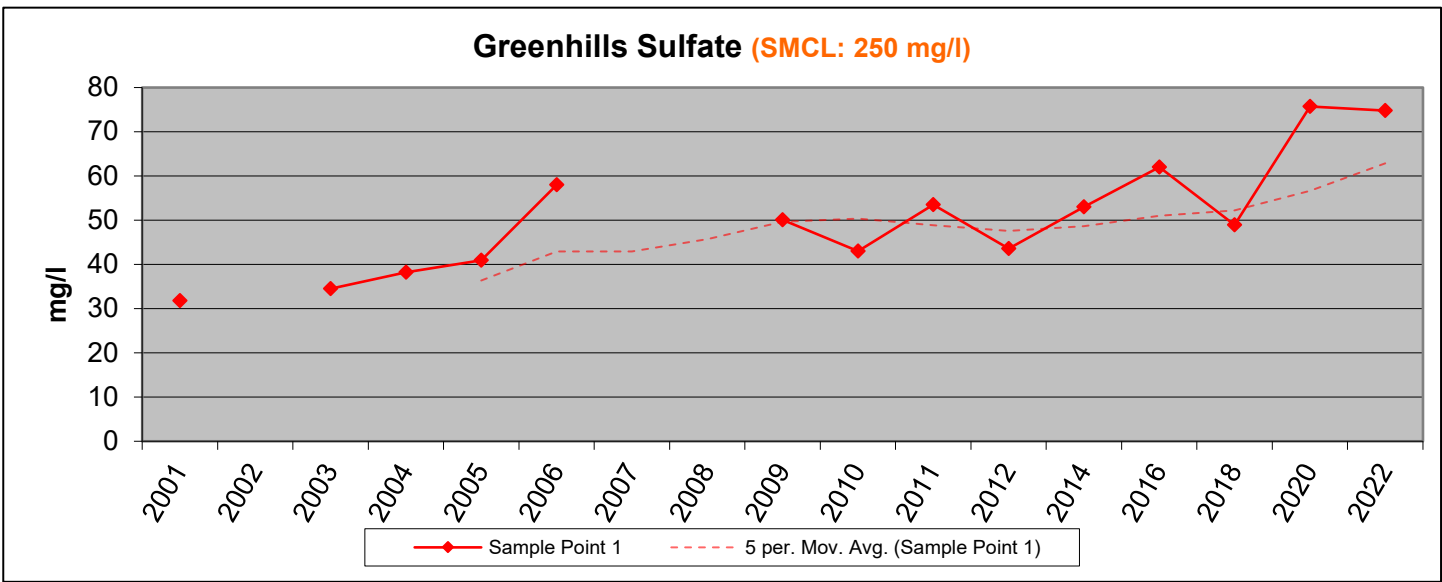
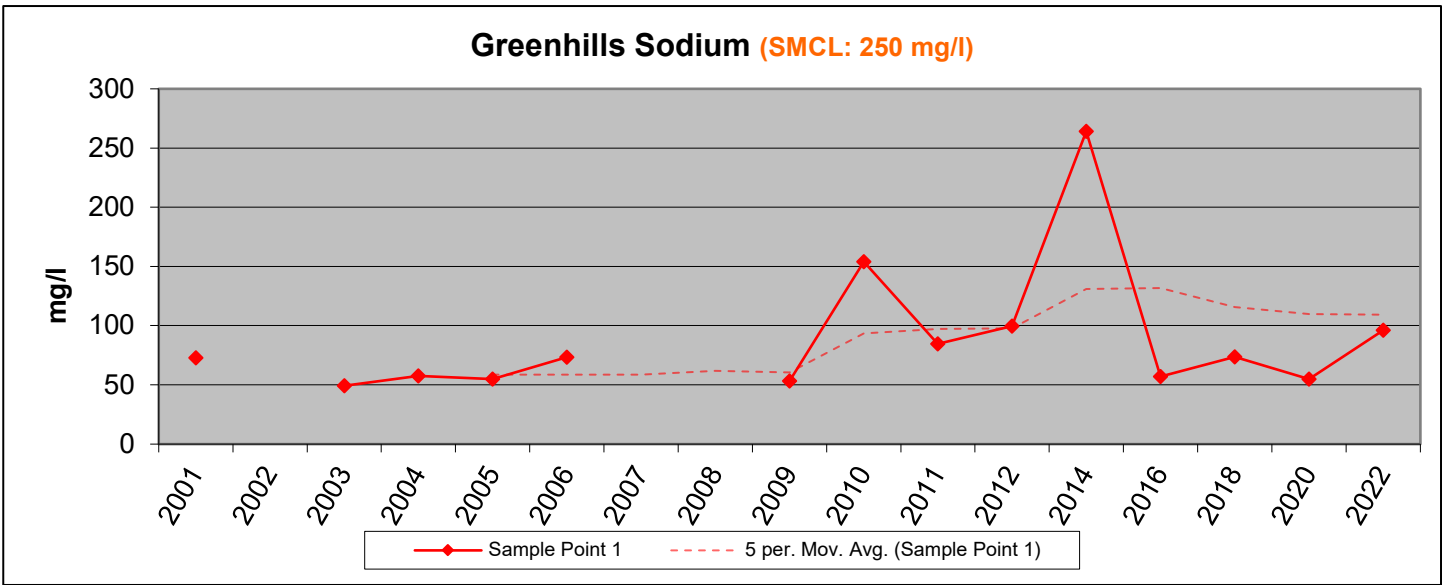
Staff compared the 2014 sampling to the 2016 sampling of both sample point 1 and the seep itself and had the following observations:

- Several of the parameters associated with landfills such as chloride and sulfate were well below the SMCL at the seep itself. In fact, both parameters were higher at S-1 than the seep.
- Some elevated parameters during 2014 were not high at the seep itself. Nitrite-Nitrate and sodium were observed at elevated levels in 2014. In 2016, concentrations were observed at low levels for both S-1 and the seep.
- Some of the parameters that were "high" at the seep itself were not elevated at S-1 during either the 2014 or the 2016 sampling. Parameters such as COD, alkalinity, lead, and aluminum would fall into this categorization.

Location	Year	Nitrite-Nitrate	Chloride	Sulfate	COD	Alkalinity	Sodium	Aluminum	Barium	Lead
#1	2014	3.07	371	53	19.6	304	264	0.101	0.0907	<0.001
#1	2016	0.77	96	62	17	290	57	0.43	0.05	<0.005
Seep	2016	ND	68	11	220	650	68	36	2.4	0.23

Because of the above reasons it is unlikely the seep caused the elevated concentrations observed in 2014. Staff will continue to monitor the landfill and areas surrounding it. Surface water chemical data is illustrated for Greenhills Landfill in the graphs on the subsequent pages.





Organisms found in the unnamed creek were typical organisms that inhabit unpolluted streams (Table 3.7.5-A). In 2020 these included tadpoles, sow bugs, riffle beetles, and scuds. During 2020 sampling, 7 total organisms were found, with four of them being indicators of high or moderate water quality. This is similar to 2018 sampling when six types of organisms were found with five of them being indicators of higher or moderate water quality. During 2016 sampling, seven types of organisms were observed with 4 of them being indicators of higher or moderate quality. Generally, the results indicate good environmental conditions were present and agreed with water quality results.

Table 3.7.5-A

		GROUP 1 (Higher Quality)											GROUP 2 (Moderate Quality)											GROUP 3 (Lower Quality)											Non-indicative																						
		Micropterus	Notropis	Etheostoma	Amphibia	Gastropoda	Gastropoda	Coleoptera	Coleoptera	Coleoptera	Coleoptera	Trichoptera	Ephemeroptera	Plecoptera	Plecoptera	Chelydra	Dorosoma	Pimephales	Amphibia	Amphibia	Pelecypoda	Pelecypoda	Diptera	Diptera	Diptera	Hemiptera	Odonata	Odonata	Odonata	Odonata	Isopoda	Amphipoda	Decapoda	Turbellaria	Nematoda	Annelida	Annelida	Gastropoda	Diptera	Diptera	Diptera	Diptera	Diptera	Diptera	Hemiptera	Hemiptera	Hemiptera	Hemiptera									
		Bass	Shiner	Darter	Plethodontinae (Salamander)	Lymnaea (Snail)	Planorbidae (Snail)	Dytiscidae (Crawling Water Beetle)	Hydrophilidae (Beetle Larva)	Psephenidae (Water Penny)	Elmidae (Adult Riffle)	Caddis Fly	Mayfly	Stonelyf Nymph	Stonelyf Adult	Snapping Turtle	Gizzard Shad	Minnow	Ranidae (Frogs)	Tadpoles	Fingernail Clam	Other Clams	Crane Fly Pupae	Crane Fly Adult	Ptychopteridae (Phantom Crane Fly)	Sialidae (Alderfly)	Dragonfly Nymph	Dragonfly Adult	Damselfly Nymph	Damselfly Adult	Sow Bug	Scud	Crayfish	Flat Worm	Round Worm	Oligochaeta (Aquatic Worm)	Hirudinea (Leech)	Physa (Pouch Snail)	Simuliidae (Blackfly)	Tendipedidae Tenipede (Midge)	Tendipedidae Psychoda (Northfly)	Culex (Mosquito Larva)	Culex (Mosquito)	Tubifera (Rat-Tailed Maggot)	Unknown Larva	Gerridae (Water Strider)	Notonectidae (Back Swimmer)	Corixidae (Water Boatman)	Belostomatidae (Giant Water Bug)								
Location S-1																																																									
9/13/2001																																																									
8/14/2003																																										3			2			*									
7/28/2004															6																																										
9/22/2005																																																									
8/31/2006															12																																										
10/9/2007		No Sampling (Stream Dry)																																																							
10/30/2008		No Sampling (Stream Dry)																																																							
11/9/2009															1																																					1		1			
9/16/2010															8					2																																		5	12		
9/15/2011																																																					5	6			
9/13/2012															>50																																										
9/10/2014															5																																										
5/16/2016																																																									
10/1/2018																																																				1					
10/13/2020															4																																						*		1		

* - Observed while sampling

The Village of Greenhills Landfill Explosive Gas Monitoring Plan (EGMP) was approved by Ohio EPA on November 5, 2008. On December 8, 2008, three permanent monitors, one permanent punch bar station, and two gas alarms were installed at the Village of Greenhills Landfill (Figure 3.7.5-C).

On May 14, 2012, SCS Engineers, on behalf of the Village of Greenhills, submitted a request to cease gas monitoring on the site. The request was accompanied by data from punch bar monitoring completed on April 24, 2012. Ohio EPA responded in a June 26, 2012, letter indicating that because measurable levels of methane gas was detected in six of the sixteen punchbar sampling locations, gas monitoring must continue at the site. However, OEPA did approve a reduction in sampling frequency to semi-annually. Gas monitoring was performed at the closed landfill in June and July of 2013 with no methane detected during either sampling. No gas sampling results were submitted during 2014 or 2015. A notice of violation was issued to the facility in April of 2016 for failure to comply with EGMP. As a result, the facility submitted a bar punch monitoring report from February 2015. The report showed that methane was detected at 10 of 15 sampling locations. In April of 2016, the facility again submitted a request to cease monitoring the landfill for explosive gas. The facility did complete semi-annual monitoring during 2016. No detections of methane were made during the monitoring. No monitoring results were received by HCPH in 2017, 2018, or 2019.

In February of 2020 the facility again submitted a request to cease gas monitoring. No detections of methane occurred during 2020 semiannual gas monitoring. In April of 2021 Ohio EPA conducted an explosive gas investigation at the property which included monitoring 17 punchbar locations, 3 permanent monitoring points, and 1 permanent punchbar station. Methane was detected at 4 locations ranging from 0.5 % to 10 % methane. Based on these results the village was required to perform another year of semi-annual gas monitoring of the permanent monitoring points, as well as two rounds of punchbar investigations. The Ohio EPA’s April punchbar investigation was counted as the first of these punchbar investigations. The second punchbar investigation was completed on December 3, 2021, and resulted in 2 detections of methane (0.2% and 1.0%). The semi-annual gas monitoring of the permanent monitoring points was completed on June 30, 2021 and December 3, 2021. No detections of methane occurred during either monitoring event.

The Ohio EPA requested another punchbar investigation be completed in 2022. The punchbar investigation, completed in June 2022, included monitoring 10 punchbar locations and resulted in 5 detections of methane ranging from 0.1 – 1.5 % methane. The semi-annual gas monitoring of the permanent monitoring points was completed on June 27, 2022 and December 2, 2022 with no detections of methane occurring during either event. In February 2023 the Village again submitted a request to cease gas monitoring. In March 2023 the Village submitted an addendum to the request which included a summary table of punchbar readings from the various punchbar investigations between 2020 and 2022 (Table 3.7.5-B). After reviewing the request OEPA concurred with the request and authorized the Village to cease explosive gas monitoring at the facility. *(Monitoring data for this landfill is in the files at Hamilton County Public Health).*

TABLE 3.7.5-B

Bar Punch Location #	1/21/2020		4/28/2021		12/3/2021		6/27/2022	
	Peak Methane %	Sustained Methane %	Peak Methane %	Peak Methane %	Sustained Methane %	Peak Methane %	Sustained Methane %	
1 / PB-13	0.0	0.0	0.0	1.0	0.7	0.0	0.0	
2 / PB-11	0.0	0.0	0.0	0.0	0.0	0.2	0.0	
3 / PB-10	0.0	0.0	0.0	0.0	0.0	0.1	0.0	
4 / PB-9	0.0	0.0	4.5	0.2	0.0	0.1	0.0	
5 / PB-8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
6 / PB-7	0.0	0.0	1.3	0.0	0.0	0.0	0.0	
7 / PB-15	0.0	0.0	10.0	0.0	0.0	0.0	0.0	
8 / PB-16	0.0	0.0	0.0	0.0	0.0	1.5	0.1	
9 / PB-14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10 / PB-12	0.0	0.0	0.5	0.0	0.0	0.4	0.0	

FACILITY INSPECTIONS



The site was inspected by HCPH on December 28, 2023. No violations or nuisance conditions were observed on the site. During past inspections, minimal amounts of exposed waste have been observed on the east slopes of the former landfill. However, these slopes are completely covered with established trees and removal/re-covering would not be practical at this time.

SITE PRESENT DAY

The property is currently used by the Village of Greenhills as a recreational area with baseball fields, a concessions structure, and associated gravel parking lots. Other uses of the property include equipment and material storage. Additionally, the village operates an Ohio EPA registered Class IV Composting Facility and a clean hard fill disposal area on the property.



Figure 3.7.5-C
Greenhills Closed Landfill
1260 West Sharon Road

-  = Surface Water Sampling Location
-  = Approximate Limits of Fill Since 1937

