# 3.0 Environmental Assessment

## 3.1 Description of Existing Natural Resources

The following sections describe the existing natural resources present at the proposed Geneva Landfill, Inc. (GLI) expansion site located in Ashtabula County, Ohio. The topics addressed in this section include environmental setting; streams and wetlands; rare, threatened and endangered species; and human health benefits and other environmental issues associated with water resources at the site.

***Environmental Setting***

The proposed GLI expansion consists of approximately 49 acres of existing landfill within its property holdings of ± 436 acres. GLI has been exploring potential expansion alternatives for their landfill operations since the late 1990's. Presently, the landfill has a permitted footprint of 48.6 acres, but its capacity for additional waste placement has been nearly exhausted. In the last few years there have been renewed and recently successful efforts to rezone additional GLI acreage for continued use as a municipal waste landfill facility.

GLI is located north of Interstate 90, approximately 8.25 miles northwest of Jefferson, Ohio (the County Seat), and immediately south of the Lake Erie remnant post-glacial lake (beach) ridge that roughly parallels Route 84 to the north. In the vicinity of the GLI property, the Cowles Creek corridor runs in a roughly northeast to southwest direction between the GLI holdings and the Route 84 right-of-way to the north. The GLI property is situate at the northern limit of the till and lacustrine sediment plain that is collectively referred to as the Allegheny Plateau. The Grand River lowland drainage corridor lies approximately 2.4 miles to the south of the GLI holdings. However, all surface water draining from the GLI holdings flows to the north to Cowles Creek. Portions of three unnamed tributaries (UNT-1, UNT-2 and UNT-3) to Cowles Creek are located on and adjacent to the GLI property. These tributaries flow from south to north and enter Cowles Creek just to the north of the GLI property.

Outside of the municipal and industrial areas of nearby Ashtabula and Geneva, land in the vicinity of GLI is used primarily as cropland, for forage production, livestock grazing, vineyard, orchard, or remains in forest. Oil and gas production are historically common as well. Industrial enterprises and shipping in nearby Ashtabula and Geneva municipalities have been reduced significantly from past times of peak production. Most of the GLI property has historically been in crop production, vineyard, nursery, and forestland use. The original "Doherty Landfill" was started on the GLI property in the 1950's without the benefit of current OEPA permitting protocols. As noted above, the GLI acreage involved in the proposed expansion project area is now zoned entirely as "WM" in Geneva Township (zoned for Waste Management uses).

Geneva Landfill has few nearby neighbors and is located in a lightly populated area of the County. The closest residences lie primarily to the east and south of the site.

All occupied buildings that occur between Cowles Creek (to the north) and its unnamed tributary that parallels the western side of the GLI property are owned by GLI. Three residential buildings owned by GLI occur immediately to the north and northeast of current landfill operations (at the 90º bend in Tuttle Road and immediately east of UNT-2). However, all three structures are vacant and are scheduled for demolition

The general nature of Ashtabula County is described in the USDA Natural Resources Conservation Service Soil Survey as follows. "Ashtabula County is in the far northeastern corner of Ohio with an area of 455,104 acres, or 711 square miles, including land covered by water, making it the largest county in Ohio. The population of the county was 101,278 in 2000. Jefferson, the county seat, is located in the north central part of the county (approximately 8.25 miles southeast of the GLI site). The largest city is Ashtabula. The heaviest industry is centered in the north, especially around the city of Ashtabula. Shipping docks are located at Ashtabula Harbor. Ashtabula County soils range widely in natural drainage, texture and other characteristics. Most coarse textured soils are found on the lake plain (north of Route 84), in soils formed from (ancestral) beach deposits, and in the Pymatuning River Valley, in soils formed from (glacial) outwash deposits. Finer textured soils, formed in glacial till and lacustrine sediments, account for the majority of county soils. Topography is generally nearly level or gently sloping with the greatest relief found in areas of stream dissection, on beach ridges, and the bluffs along Lake Erie. The major management concerns for cultivated crops are wetness and erosion. Most of the larger farms are found south of Interstate 90. Grain and dairy farms are important agricultural industries. Nurseries and orchards are important industries located mostly in the northern part of the county, on the postglacial beaches within the lake plain.

Approximately 50 percent of the county is wooded (Soil Conservation Service. 1985.). This includes former croplands and pasture fields that are reverting to woodland. Areas that are difficult to drain are (were) often left idle. More productive, better-drained fields are kept in crop production."

The Soil Survey of Ashtabula County, Ohio goes on to describe the general physiography of the county in its association with past glaciations. Dr. Charles Carter, Associate Professor of Geology, The University of Akron, helped prepare this section of the soil survey. **"**Ashtabula County is in two contrasting major physiographic provinces. The northern part, a belt about 3-1/2 to 5-1/2 miles wide adjacent to Lake Erie, is in the Eastern Lake Section of the Central Lowland Province or commonly referred to as the Lake Plain. To the south of the Lake Plain is the Southern New York Section of the Appalachian Plateau Province commonly referred to as the Allegheny Plateau. The Grand River Lowland is within the plateau on the western side of the County (approximately 2.4 miles due south of the GLI properties). The Portage Escarpment, sometimes referred to as the Mississippian Escarpment, generally separates these two provinces. The Portage Escarpment in Ashtabula County is a composite feature, which averages about 1-1/2 miles wide, but in places is about 3 miles wide. The Escarpment extends from central New York westward to Cleveland and then south to Kentucky and acted as a significant hindrance to the flow of glaciers across it. The Allegheny Plateau

rises gradually to the south of the Escarpment. Except for areas of stream dissection the plateau's surface is relatively flat, averaging ten to twenty feet of fall per mile. The plateau is divided into four sections: Western, West Central, Central and Southeastern. The Grand River Lowland separates the Western and West Central sections. The Lowland was the site of ancient lakes during past glaciations. Glacial erosion dramatically planed, rounded and smoothed the hills and enlarged existing valleys. Subsequent glacial depositions filled and flattened the valley floors. The relief of the county is primarily nearly level and gently undulating in the northern, western and south central parts of the county. Steep areas are along the streams. The two morainic areas and areas of Venango and Cambridge soils are more rolling than the rest of the county. Elevation above sea level ranges from 572 feet at the Lake Erie shoreline to slightly over 1,180 feet at Owens Hill in Andover. In the plateau region the dominant elevation mostly ranges from 950 to 1,100 feet AMSL. Drainageways are generally poorly developed on broad nearly level uplands but are better developed on marginal and steeper slopes (UNT-1, UNT-2, and UNT-3). The better drainage of the marginal slopes of the Allegheny Plateau is suggested by the closely spaced parallel streams flowing down the slopes to major streams. These well-defined trellis-pattern drainage systems have been called the finest examples of this type in Ohio. Trellis drainage patterns are almost always the result of (geologic) structural control by dipping bedrock……"

The Geneva Landfill properties are located at the unique geo-morphological interface between glacial tills (to the south), lacustrine sediments and beach deposits of glacial/post-glacial Lake Erie to the north, and various other glacial/post glacial features associated with past glaciation events. As noted above, the remnant "beach-front" of the former Lake Erie high-water elevations (following the Wisconsin Glaciation retreat ±14,000 years ago) occurs just to the north of the site (and north of Cowles Creek), at and parallel to State Route 84.

The parent materials of the soils on the GLI property are a combination of deep lacustrine sediments and glacial tills. A relatively small area of sandy soils derived from former "beach-deposits" was noted in the extreme northwestern corner of the property along the plateau escarpment that drops to UNT-1 and Cowles Creek. Most of the remainder of the site lies on the glacial till and morainal plain that extends south of the Lake Erie basin and is well above the elevation of the Cowles Creek flow path. Soils and soil parent materials are variable in depth, but are estimated from anecdotal accounts of geo-technical drilling crews to be ≥ 90 feet to bedrock over much of the upper plain elevations of the proposed expansion area.

As previously stated, the parent materials that underlie the soils throughout the proposed expansion area are predominantly lake sediments and glacial tills that are extremely slowly permeable. These materials restrict vertical and lateral water movement to rates well below 0.01 inch per month ($10^{-7}$ cm/sec). As a result, the GLI expansion area possesses uniform natural subgrade geo-technical conditions that qualify the potential expansion area as uniquely appropriate for construction of modern landfill facilities (additional details are provided in the GLI "Hydrogeologic Investigation Report" prepared by Eagon & Associates, Inc., March 2010).

For the past several thousand years, Cowles Creek and its tributaries, have gradually cut vertically into the till, sediments, and ancestral beach deposits along their corridors as they have been conveying surface waters from the southern till plain watershed. In places, UNT-1 is more than 50-feet below the upper "flat" that supports the current landfill operations. UNT-2 does not drain as large a surface area as UNT-1 and is not as deeply scoured. Near its confluence with Cowles Creek, UNT-3 is comparable in size and depth to UNT-1 although its drainage area is about half as large. A small first-order stream originates at the outflow of a wetland area constructed on the landfill property in 2001/2002. This small stream is at the upper headwaters limits of the UNT-3 corridor.

The stream "beds and banks" of these three unnamed tributaries are scoured and eroded and are somewhat unstable due to occasional high volume and high-energy runoff events in combination with shifting sediment bed-loads. Small fish were noted throughout scattered pools along the UNT-1 corridor, but no fish were observed in UNT-2. Lower reaches of UNT-3 are located off of the GLI property and are not within the radius of potential impact from this project.

Historically, the relatively flat terrain between UNT-1 and UNT-2 has been wooded, but a large area was cleared and farmed following settlement by European colonials. Over the years, the farming operations endeavored to improve surface and subsurface water drainage through use of open drainage ditches, tile drainage, and "raised beds" for cultivated and orchard/nursery/vineyard crops. Remnants of these drainage practices are readily apparent throughout the project area. As noted above, the nature of the soil parent materials in the flatter portions of the site restricts vertical infiltration of water, and, as a result, soils are often saturated in winter and early spring. Soils found along the slopes that drop into the UNT corridors are better drained and generally have higher percentages of sand and gravel materials. Tree species in these wooded areas include red maple, sugar maple, American beech, green ash, white ash, tulip poplar, cucumber tree, basswood, big-tooth aspen, quaking aspen, cottonwood, tupelo, occasional white oak, pin oak, red oak and various hickories. Overall, the dominant tree species is red maple. In places, the understory sapling/shrub layer is sparse, but sapling red maple, northern arrowwood, saplings of green and white ash, and occasional barberry, honeysuckle, and red-panicled dogwood often dominate this vegetation layer. *Glyceria striata* is an herbaceous-layer grass that provides a strong indication of springtime inundation and/or soil saturation.

The primary soils that affect the delineation of the GLI wetlands are associated with the Mill, Platea, and Darien soil series (note soils mapping and descriptions provided as addenda in Wetlands Delineation Report). Platea soils are somewhat poorly drained but do not meet hydric soil indicator requirements. The Mill soils are poorly drained (and in places very poorly drained) and readily meet one or more of the hydric soil indicators. However, due to past drainage modifications on the landfill properties, there are places where the Mill soils no longer possess appropriate springtime hydrology to classify an area as a wetland. The Darien soils are described as being somewhat poorly drained, and soil mapping units containing Darien soils are listed in the Ashtabula

County Hydric Soils List as non-hydric with potential to have up to 5% hydric soil inclusions. The Darien soils are also listed as non-hydric in the National Hydric Soil Listing maintained by the USDA Natural Resources Conservation Service (NRCS). The official soil series description (OSD) for Darien soils posted by the NRCS supports the non-hydric designation. However, the typical soil profile description for Darien soils found in the local and recently published *Soil Survey of Ashtabula County, Ohio* (2007) meets the hydric soil requirements specified for **Hydric Soil Indicator: F3**. Field data from the Geneva Landfill site confirmed areas that are consistent with both the positive F3 Hydric Soil Indicator and the slightly better drained versions of the same Darien series that fall within the "range of characteristics" described for Darien soils in the *Soil Survey of Ashtabula County, Ohio*. Therefore, field delineation flagging of wetland areas were not necessarily facilitated by the soils mapping for the property. Rather, delineation efforts concentrated on the *in-situ* field morphology of the soils in any area possessing potential to be delineated as a wetland.

In addition to the soils discussion presented above, over time, the wooded areas within the proposed expansion project area have experienced multiple modifications to their hydrologic condition due to past farming, logging, and subsequent development of the adjacent landfill operations. Remnant agricultural drainage practices are in evidence throughout the site; and the construction, maintenance, and improvements made to Tuttle Road over the years also have affected water flow patterns. In addition, the drainage patterns that pre-dated development of current landfill operations on lands to the south… and the former Doherty Landfill to the west… were modified and re-directed through diversions, road ditches, storm water piping, waterways, storm water management facilities, and erosion/sedimentation control structures installed by County road maintenance crews and authorized landfill operations. The effect of these modifications on hydrology patterns within the proposed expansion area was apparent during the summer 2009 field-flagging of the wetland boundaries. In several places, hydric soil indicators did not always appear to be consistent with the presence of current hydrology indicators.

The landfill property is shown on the USGS Geneva Quadrangle map and aerial views that accompany this submittal.

Wetlands

Wetland functional assessments using the Ohio Rapid Assessment Method (ORAM) Version 5.0 were performed from September through November 2009 for seventeen separate ORAM scoring areas within or near the proposed landfill expansion project. The results of the ORAM assessment including the assessment forms are provided as a separate attachment with this submittal.

Wetlands associated with the largely wooded UNT-1 corridor to the west of the expansion footprint were field mapped as Wetlands C, D, F, G, H, I, J, K, L, M, N, O, P, Q, R, and S. These wetlands range from essentially undisturbed forested bottomland (within and along the UNT-1 floodplain) to abandoned former sediment detention basins and ponds that appear to have been part of non-coal surface mining and landfill

operations of the distant past. The undisturbed wetland areas along the UNT-1 corridor were rated as Category 3 (highest rating) wetland resources using the Ohio Rapid Assessment Method (ORAM Version 5.0). Other wetlands along this corridor received much lower ORAM scores, but were subjectively re-rated as Category 2 and/or Category 3 resources due to their proximity to UNT-1 channel and their functions as filtering protective buffers for a stream that is accessible to fish within the Lake Erie drainage basin. Similarly, much of the Wetland X corridor immediately adjacent to or within the UNT-2 stream corridor was also scored as an ORAM Category 3 resource. Consequently, both the UNT-1 and UNT-2 corridors were immediately recognized as higher value areas to avoid in the development of the landfill expansion plans.

Wetlands delineated in the plateau "flat" or "plain" between UNT-1 and UNT-2 were identified as Wetlands A, B, E, T, U, V, X and Z. These wetlands include man-made ponds, a mono-cultural stand of *Phragmites australis*, an open meadow that was formerly farmed, and significant areas of third-growth "flatwoods" that were formerly used as tree/shrub nursery, vineyard, and/or as cropland. Portions of these wooded areas also have been logged; and remnant roads, ruts from heavy equipment, and depressions left from logging staging operations are scattered throughout. A few remnant "natural" vernal pool depressions were also found within the flatwoods. Collectively, these wetland areas were difficult to delineate due to the extent of modification to surrounding land uses and apparent changes in site hydrology.

Approximately, 36.22 acres of wetlands were delineated in or near the currently proposed landfill expansion footprint. Additional wetland areas that occur on GLI property outside of the proposed project area add an estimated ±15.0 acres putting the total GLI wetlands area at ≥ 50.0 acres. There are also approximately 14,957 linear feet of bed and banks channels that are likely to be regulated by the USACE as Non-Navigable Relatively Permanent Waters (RPW). At this time, only road ditches, man-made drainage ditches, and a poorly defined ephemeral flow path "channel" will be affected by the currently proposed minimal degradation expansion footprint as "Non-Navigable, Not Relatively Permanent Waters **with "nexus"** to UNT-2".

The currently proposed landfill footprint will affect 9.68 acres of Wetlands A, B, X and Y (as they were delineated in August of 2009 and modified with USACE input during the 2010 growing season). The highest quality wetland and waters resources on and in the vicinity of the expansion area are being avoided to the maximum extent possible.

The three tables that follow provide a summary of the wetland areas delineated to date and the linear feet of surface water conveyances noted as likely Jurisdictional Waters during the Corps' on-site Jurisdictional Determination visits of the Investigation Area from September 2009 through August 2010. In addition to the wetlands delineated within the 2009/2010 "Investigation Area", the wetlands constructed by GLI in 2001 were also flagged and GPS surveyed. The constructed wetlands were originally intended to be at least 6 acres in size and were found to occupy 6.48 acres in the August 2009 delineation.

**TABLE 3-1-1. DELINEATED WETLAND ACREAGES[a] (As Adjusted with USACE 10/2010)**

| WETLAND NAME | COWARDIN CLASSIFICATION | SIZE OF DELINEATED WETLANDS | | |
|---|---|---|---|---|
| | | ACRES[b] | SQUARE FEET | ACREAGE FLAGGED BEYOND PROPERTY LINE |
| WETLAND A | PFO | 13.42 | 636,177 | -1.18 |
| WETLAND B | PFO | 0.01 | 265 | - |
| WETLAND C | PEM | 0.39 | 16,976 | - |
| WETLAND D | PFO | 1.00 | 112,098 | -1.57 |
| WETLAND E | POW | 0.26 | 11,142 | - |
| " | PEM | 0.18 | 7,869 | - |
| WETLAND F | PEM | 0.01 | 1,825 | - 0.03 |
| WETLAND G | PEM | 0.07 | 2,902 | - |
| WETLAND H | PEM | 0.03 | 3,767 | -0.06 |
| WETLAND I | PEM | 0.50 | 21,609 | - |
| WETLAND J | PEM | 0.06 | 2,702 | - |
| WETLAND K | PEM | 0.58 | 25,161 | - |
| WETLAND L | PEM | 0.03 | 1,435 | - |
| WETLAND M | PEM | 0.01 | 308 | - |
| WETLAND N | PEM | 0.01 | 413 | - |
| WETLAND O | POW | 0.08 | 3,613 | - |
| " | PEM/PFO | 0.26 | 11,336 | - |
| WETLAND P | PEM | 0.13 | 5,514 | - |
| WETLAND Q | PEM | 0.94 | 40,788 | - |
| WETLAND R | PEM | 0.002 | 91 | - |
| WETLAND S | PEM | 0.01 | 517 | - |
| WETLAND T | POW | 0.09 | 3,782 | - |
| WETLAND TE | PEM | 0.43 | 18,681 | - |
| WETLAND U | POW | 0.39 | 17,099 | - |
| " | PEM | 0.11 | 4.806 | - |
| WETLAND V | PEM | 0.72 | 31,567 | - |
| WETLAND W | PEM | <0.001 | 32 | - |
| WETLAND X | PFO | 11.64 | 511,036 | -0.09 |
| " | PEM | 1.89 | 82,345 | - |
| WETLAND Y | PEM | 0.003 | 113 | - |
| WETLAND Z | PEM | 0.04 | 1,562 | - |
| MITIGATION WETLAND 2001 | PEM | 6.48 | 282,269 | (Mitigation Wetland is located on GLI property, but not shown on most recent updated delineation map.) |
| | **TOTAL** | **39.76 acres** | **1,859,799 sq ft** | **Beyond GLI Property Line: 2.93 acres** |

[a] As shown on Wetlands Delineation Map 1 of 1, 11/05/2010 presented in APPENDIX C.

[b] Acreage as shown within the Investigation Area plotted on the updated Wetlands Delineation Map dated 11/05/2010. Portions of wetlands A, D, F, H and X extend outside of the Investigation Area, or beyond the GLI property line. The full off-site extent of Wetlands A, D, and X were not delineated. Therefore, the off-site extent of these wetlands is not known. Wetlands F and H also extend beyond the GLI property lines, but the full extent of each of these wetlands is shown on the updated Delineation Map. Other wetlands known to exist outside of the 2009/2010 Investigation Area but still within the GLI holdings are estimated to exceed 10.5 acres. Therefore, the total acres of wetlands contained within the current GLI holdings are estimated to exceed 50.0 acres.

| TABLE 3-1-2: LATITUDE AND LONGITUDE OF DELINEATED WETLANDS (at approximate center) | | | |
|---|---|---|---|
| Wetland ID | Cowardin Classification | Latitude | Longitude |
| | | | |
| A | PFO | 41°47'58.027"N | 80°54'40.704"W |
| B | PFO | 41°47'47.653"N | 80°54'39.412"W |
| C | PEM | 41°47'56.898"N | 80°54'54.314"W |
| D | PFO | 41°47'56.505"N | 80°54'58.964"W |
| E | POW | 41°47'43.648"N | 80°54'40.531"W |
| " | PEM | " | " |
| F | PEM | 41°47'47.455"N | 80°55'0.074"W |
| G | PEM | 41°47'45.692"N | 80°54'59.367"W |
| H | PEM | 41°47'44.434"N | 80°54'59.631"W |
| I | PEM | 41°47'44.47"N | 80°54'57.147"W |
| J | PEM | 41°47'42.194"N | 80°54'57.389"W |
| K | PEM | 41°47'40.994"N | 80°54'54.232"W |
| L | PEM | 41°47'42.602"N | 80°54'56.442"W |
| M | PEM | 41°47'41.606"N | 80°54'55.436"W |
| N | PEM | 41°47'39.943"N | 80°54'54.351"W |
| O | POW | 41°47'37.027"N | 80°54'48.752"W |
| " | PEM & PFO | " | " |
| P | PEM | 41°47'29.658"N | 80°54'45.048"W |
| Q | PEM | 41°47'29.972"N | 80°54'39.136"W |
| R | PEM | 41°47'31.48"N | 80°54'39.802"W |
| S | PEM | 41°47'31.492"N | 80°54'38.747"W |
| T | POW | 41°47'39.546"N | 80°54'41.117"W |
| TE | PEM | 41°47'38.95"N | 80°54'41.729"W |
| U | POW | 41°47'40.74"N | 80°54'24.544"W |
| " | PEM | " | " |
| V | PEM | 41°47'42.888"N | 80°54'21.961"W |
| W | PEM | 41°47'41.888"N | 80°54'27.715"W |
| X | PFO | 41°47'44.073"N | 80°54'35.394"W |
| " | PEM | " | " |
| Y | PEM | 41°47'46.85"N | 80°54'26.891"W |
| Z | PEM | 41°47'50.377"N | 80°54'25.153"W |
| MITIGATION WETLAND 2001 | PEM | 41º47'04.470" N | 80º54'17.860"W |

**TABLE 3-1-3: SURFACE WATER CHANNELS/CONVEYANCES OCCURRING WITHIN THE 2009/2010 GLI INVESTIGATION AREA (As shown on Wetlands Delineation Map 1 of 1, 11/05/2010 as presented in APPENDIX C)**

| CHANNEL NAME | NATURE OF CHANNEL FLOW | LENGTH WITHIN INVESTIGATION AREA (Linear feet) |
|---|---|---|
| | | |
| DD-1 (Drainage Ditch 1) | Ephemeral | 1715 |
| DD-2 (Drainage Ditch 2) | Ephemeral | 796 |
| DD-3/AD-1 (Drainage Ditch 3/Agriculture Drainage 1) | Ephemeral | 1369 |
| AD-2 (Agriculture Drainage 2) | Ephemeral | 415 |
| ED-1 (Ephemeral Drainage 1) | Ephemeral | 229 |
| ED-2 (Ephemeral Drainage 2) | Ephemeral | 632 |
| UNT-2 (Unnamed Tributary 2) | Perennial | 3566 |
| NC-1 (Natural Conveyance 1) | Intermittent | 321 |
| | | |

Physical & Biological Characteristics of Wetlands Within the Currently Proposed Expansion Footprint

**Wetlands A and B** are in an area of second or third-growth palustrine forest "flatwoods" on the west side of Tuttle Road. This wooded area is reverting to a more mature condition since it was last farmed circa 1954. Dominant trees are mostly red maple. The watershed for Wetland A is essentially limited to the wooded area immediately adjacent to and west of Tuttle Road.

This area currently supports a few scattered remnant natural and man-induced (logging/farming) vernal depressions that are capable of supporting amphibian reproduction. However, amphibian use of these seasonally inundated areas appears to be limited due to their proximity to landfill operations, the active truck traffic on Tuttle Road, and their limited duration of seasonal inundation.

The remainder of the "flatwoods" wetlands surrounding or adjacent to the vernal pools have sufficient slope to allow surface waters to drain to better-defined drainageways within the wooded areas. However, like most of Ashtabula County, soils in these areas remain saturated to the surface for several days during the onset of the growing season in most years. Saturation extends from the soil surface to the depth of the very slowly-permeable underlying till and sediment parent materials and/or

"fragipan" pedogenic features (prismatic soil structure). As the trees and other vascular plants growing on these areas begin to "leaf-out" in spring, water is withdrawn from the soil aggressively through enhanced evapotranspiration, and the zone of full soil saturation is diminished (in an manner much like liquids are removed from a "frozen" crushed-ice "slurpee" drink through a soda straw).

In areas where soil saturation does not persist (as it does in the wheel ruts and vernal depressions), the soils tend to "dry-out" fairly soon after the on-set of warmer spring and summer weather. Consequently, although these areas meet criteria for classification as wetlands, outside of the more obvious vernal depressions wetland functions are decidedly limited. These parts of the flatwood wetlands do not recharge groundwater in a significant way. They do not provide persistent habitat to support animals or plants that are dependent on long-duration wet conditions. They do not filter waters or trap sediments from other sources; and during the times when the soils in these wooded areas are fully saturated, they are not as efficient at capturing, infiltrating, and storing precipitation and runoff as are the adjoining upland wooded areas. Other than their early growing-season saturation, ecological and environment functions associated with these wooded areas are difficult to distinguish from adjoining non-wetland wooded areas.

**Wetland Y and portions of Wetland X** occupy the "flatwoods" area east of Tuttle Road and west of UNT-2. These wetlands also include an "open" emergent meadow adjacent to Tuttle Road that was formerly farmed and now transitions into mowed and maintained lawn that surrounds an occupied residence. The open meadow has a significant population of *Phragmites australis*, but includes a mix of various sedges, rushes, grasses, and pioneering shrubs. The wooded area east of the open meadow was actively managed as a tree and shrub nursery in the past but has been abandoned for that use for several years. Remnant raised beds and open drainage ditches are readily apparent in the wooded understory. A few rows of former nursery shrubs (*Leucothoe* spp., *Taxus* spp., *Pieris* spp, *Rhodedendron* spp.) and trees (*Quercus palustris* and *Fraxinus americana*) can be found in the understory and along the fringes of the wetlands. The dominant pioneering overstory trees are red maple. A few scattered green ash, white ash, yellow poplar, and hickories are also found around the fringes of the flagged wetland boundaries. Tartarian honeysuckle and multiflora rose are scattered in the understory, and poison ivy is abundant nearly throughout the herbaceous layer. Northern arrowwood (*Viburnum recognitum*) and red-panicled dogwood are common shrubs found along the wooded transition into the open meadow. The remnant drainageways and depressions resulting from the former nursery operations act as potential breeding sites for amphibians. During the course of the August 2009 field delineation a single green frog was found and two terrestrial American toads were noted as well.

There have been multiple efforts to redirect water during past farming/nursery operations and through improvements made to Tuttle Road. These past modifications have affected site hydrology in both the open meadow and wooded portions of this wetland complex. Nevertheless, persistent scattered inundation is evident throughout the

wooded understory and in the depressions of the open meadow. Much like Wetland A, soils that are not inundated remain saturated for several days early in the growing season and following heavy rains. Similar to Wetland A, these wetlands have limited value for the functions they perform exclusively as "wetlands".

Some **Existing Ponds and Open Water Areas** are proposed to be removed as part of the landfill expansion. These areas are identified in the Wetlands Delineation Report as "Wetlands" E, T, and U. All three of these areas occur within or adjacent to existing landfill operations or closure areas. None are "natural" in origin and all were fashioned by excavation and/or grading operations for past agricultural or landfill support functions.

Wetland E is a pond that is directly adjacent to the footprint of the "Doherty Landfill Closure" near the current landfill offices. This pond was originally proposed to be removed as part of the permitted improvements made to the Doherty Closure Area Cap circa 1999, and mitigation for this impact may have already been completed with the construction and monitoring of replacement wetlands installed in the headwaters of UNT-3. Why this pond was not removed during the 1999 improvements is not known. However, water impounded directly adjacent to the closure area may still have potential to move laterally into the closure footprint. Therefore, it would be imperative that this pond be removed in order to remediate and relocate waste currently buried in the Doherty Landfill Closure area.

Wetland U is a former irrigation pond used to provide water for the now abandoned shrub/tree nursery operation within Wetland X. Although only a portion of this pond must be filled in order to create the expansion landfill structural footprint, the entire area of open water should be removed to ensure that water from this impoundment does not move laterally toward the expansion landfill cell(s).

Wetland T is an existing pond. The open water and associated emergent area surrounding this pond are bordered by existing and active landfill roads and storage lots for equipment and empty waste containers. This pond does not have an apparent surface water connection to other wetlands or waters, and it may be designated as an isolated wetland resource upon further evaluation by OEPA and the USACE. Although this pond remains persistently inundated in most years, it is surrounded by a depressional area dominated by emergent vegetation that has *Phragmites australis* as a significant component.

Functional Assessment

The Ohio Rapid Assessment Method (ORAM) rates wetlands on the basis of their relative function and value, sensitivity to disturbance, and rarity. The possibility of mitigation for the wetland loss through restoration or new wetland creation is also considered in the rating process. Ratings are used to identify a wetland as one of the following three antidegradation categories, as defined in Ohio's Wetland Water Quality Standards (OAC Rule 3745-1-54).

1) Category 1 wetlands are those that provide minimal wetland functions. No rare or endangered species are found in these wetlands. Category 1 wetlands have low species diversity, are dominated by non-native plant species, have no significant wildlife habitat or use and often are hydrologically isolated.

2) Category 2 wetlands provide hydrological, habitat, recreational and other wetland functions. Category 2 wetlands may have some degree of degradation, but have the potential for reestablishing/restoring lost wetland functions. Native plant species are present in these wetlands, however, rare or endangered species of plants and animals are not known to be present.

3) Category 3 wetlands have a high degree of biodiversity and functional value. These wetlands are most likely to contain habitats for threatened of endangered species or consist of mature forested riparian wetlands or bogs and fens.

ORAM provides both a qualitative and a quantitative evaluation of wetland value. The screening assessment (qualitative) is used to determine whether any of the wetlands are immediately classified as Category 3 (i.e., those having "irreplaceable ecological functions") or Category 1 (i.e. "highly disturbed or low value"). Quantitative assessment assigns a numerical score to a wetland, based on its ecological characteristics and the extent to which the wetland may provide wildlife habitat or protect stream water quality. Table 3-1-4 presents ORAM scores and categories for the wetlands within the GLI proposed expansion footprint. The ORAM Scoring forms for the project area wetlands are included in Appendix D to this application.

**TABLE 3-1-4: Ecological Characteristics and Ohio Rapid Assessment Method Functional Assessment of Wetlands - ORAM Categories [a]**

| Wetland ID | ORAM[b] Grouping (acres) | Hydrogeomorphic Classification | ORAM Score | ORAM Category |
|---|---|---|---|---|
| A, B | 14.61 | Slope<br>Depressional | 34.5 | 2 |
| C | 0.39 | Riverine<br>Headwater Slope | 29.5 | 1 |
| D | 2.57 | Riverine | 80.5 | 3 |
| E (Pond) | 0.44 | Depressional | 26.5 | 1 |
| F | 0.04 | Depressional | 4.0 | 1 |
| G, H, I, J, K, L, M, N | 1.35 | Riverine<br>Depressional | 65.5 | 3 |
| O | 0.34 | Depressional | 28.0 | 1 |
| P | 0.13 | Slope | 32.0 | 3 (narrative)[c] |
| Q, R, S | 0.95 | Riverine<br>Depressional | 23.0 | 2 (narrative) |
| T (Pond) | 0.52 | Depressional | 27.5 | 1 |
| U (Pond) | 0.50 | Depressional | 27.0 | 1 |
| V (Phrag.) | 0.72 | Slope | 7.0 | 1 |
| W & X Nursery | 2.88 | Depressional | 34.5 | 2 |
| X (drainage ditch) | 0.47 | Riverine | 33.5 | 2 |
| X (meadow and woods) | 2.09 | Depressional | 28.5 | 1 |
| Y(X) Terrace Vernal pool | 0.21 | Slope<br>Depressional | 52.5 | 2 |
| X & Z Riparian Corridor | 7.63 | Riverine | 63.0 | 3 |
| Other GLI Wetlands | ± 14.29 | Wetlands on GLI Property but not within the proposed project area. | Not Scored | NA |

[a] Data compiled from "Ohio Rapid Assessment Method (ORAM) Scoring of Wetlands" completed for Geneva Landfill, Inc., Ashtabula County, Ohio, September/November 2009.
[b] Boundaries of Wetland groupings for ORAM scoring were determined primarily based on hydrologic transitions noted in the field (*i.e.* a drainage ditch conveyance excavated from a depressional wetland to a point of discharge in a nearby stream corridor would justify scoring the depressional wetland separately.)
[c] "narrative" indicates an increase in the ORAM Category due to characteristics of the wetland that are discussed in the Narrative Scoring section of the ORAM forms.

Rare, Threatened, and Endangered Species

Ohio Department of Natural Resources has not identified "rare species or unique natural features at or within a half mile of the proposed GLI expansion area. (Please see ODNR letter response provided as an addendum to this submittal.)

Environmental and Human Health Benefits

Despite past farming and other land use influences, the wetland resources identified to be affected by the GLI proposed expansion are performing identifiable wetland functions and are of some value within their associated sub-watersheds. Functions noted include storm water storage/detention, localized nutrient assimilation/filtration, sediment retention, and some limited food chain support and wildlife habitat. These functions are considerably more pronounced in and along the riparian corridors of UNT-1 and UNT-2 (areas receiving ORAM Category 3 ratings). As a result, with input from their biological consultants, OEPA, and the U.S. Army Corps of Engineers, the GLI design team has prepared numerous iterations of potential landfill footprints that have endeavored to mitigate impacts by systematically avoiding and minimizing encroachments into higher quality wetland and waters resources (in particular, the UNT-2 corridor).

The current minimal degradation alternative footprint proposal has evolved to avoid all Category 3 Wetlands and "waters" with potential to support native fish. This proposal also endeavors to provide significant buffer setbacks from these sensitive areas. In addition, specific functions and the societal value of each function identified in the wetland areas that are proposed for impact have been identified and are targeted as primary objectives of the wetland replacement plan for the site.

Replacement wetlands are proposed to be constructed within the Cowles Creek watershed at an area approximately twice the size of the planned acreage of wetland impact. Careful planning of hydrology and the structure of the replacement wetlands is expected to result in efficient replacement of wetlands. Replacement of appropriate functions to provide adequate "in kind" compensation for temporary losses is the focus of the wetlands mitigation effort. All replacement wetlands are proposed to be constructed concurrent with or prior to filling of areas permitted for wetland impact. In addition, mitigation enhancement efforts in Wetland A and remediation of wetlands hydrology for Wetland X (discharge of outflows from storm water detention/sedimentation basins to these wetlands to offset hydrology modifications associated with landfill grading and development) are also part of the Wetlands Mitigation Plan.

## *3.2 Environmental Impacts of Proposed Expansion*

The purpose of the Geneva Landfill expansion project is two-fold. First, the physical expansion of the landfill footprint will add waste disposal capacity to the existing landfill and will thereby provide a long-term cost effective solid waste disposal site for Ashtabula County and surrounding area residents and businesses without a

disruptive break in service. Second, this project is being undertaken to remediate "closed" portions of the GLI property where landfill activities performed by previous owners are presumed to be out of compliance with current OEPA solid waste disposal standards. The proactive upgrade of these former waste placement areas is intended to lower the potential for future ground and surface water contamination. These proposed remediation actions are intended to address an environmental issue of clear import and consequence to the local community and to the Lake Erie drainage basin. The old Doherty Landfill closure areas will be exhumed, and the old waste will be relocated to a "new" lined waste disposal "cell" within the proposed "state-of-the-art" landfill expansion area.

Development of the landfill expansion area will encroach upon portions of wetland resources and "bed & banks" ditches located within the footprint of the currently proposed minimal degradation expansion design alternative. Due to these proposed impacts, authorization of construction activities to implement the currently proposed design alternative require the completion of applications for an Individual Section 404 Department of Army Permit and a Section 401 Water Quality Certification for the Ohio EPA.

The following sections describe proposed environmental impacts, including environmental benefits lost or gained, for the currently proposed and preferred minimal degradation alternative design.

Tables 3-3-1 and 3-3-2 identify in tabular format the features discussed in the following paragraphs. Tables 3-3-3, and 3-3-4 provide a summary accounting of proposed wetland and waters impacts for the *Minimal Degradation Alternative Design*.

### *3.2.1 Originally Preferred Alternative*

Physical Impacts

Site excavation to increase the airspace volume available waste disposal will be required to extend the service life of the GLI facilities. The originally preferred design proposed to physically alter or remove wetland and waters features as described in Section 2.2.1. This proposal put forth a design that would maximize landfill airspace volume while conforming to all required OEPA setbacks from occupied buildings, property lines, etc.. Implementation of this design would remove 22.47 acres of wetlands and ponds, 2511 linear feet of maintained road drainage ditches, 1784 linear feet of open drainage ditch and former agricultural drainage ditches, >800 linear feet of ephemeral flow paths within the wooded understory, and ± 2370 linear feet of natural stream channel in the UNT-2 corridor. 6.49 acres of the wetlands impacted by this design are Category 3 wetlands.

Mitigation

This originally proposed design impacts ≥ 22.47 acres of wetlands, including the higher quality Category 3 wetlands. Replacement wetlands were proposed to be

constructed within the GLI property and at other off-site locations at an area approximately 2.0 times that of the planned impact acreage. Stream channel mitigation was proposed within on-site unnamed tributaries of Cowles Creek and by construction of replacement stream channel to convey waters around the eastern side of the proposed expansion footprint.

Flora and Fauna

The originally proposed design would remove approximately 22.49 acres of wetlands and ponds, 2511 linear feet of maintained road drainage ditches, 1784 linear feet of open drainage ditch and former agricultural drainage ditches, >800 linear feet of ephemeral flow paths within the wooded understory, and ± 2370 linear feet of natural stream channel in the UNT-2 corridor. Since higher quality Category 3 wetlands are included in these impacts, the potential would have been high for long-term and/or permanent impacts to flora and fauna.

On-site macroinvertebrate populations associated with the UNT-2 channel would have been eliminated, and this would in turn have impacts on downstream waters and potentially on native fish known to use the waters of Cowles Creek. Numerous songbird species, amphibians, reptiles, and mammals that use the UNT-2 corridor would also be displaced in this scenario.

The UNT-2 corridor supports a diverse mix of herbaceous species, shrubs, and trees. Species include marsh fern, sensitive fern, various *Polygonum* species, *Aster puniceus*, joe-pye-weed, elderberry, swamp candles, *Carex lurida*, *C. vulpinoidea*, and buttonbush, northern arrowwood, silky dogwood, red-panicled dogwood, etc.. Few invasive species were noted in the downstream reaches of UNT-2.

Rare, Threatened and Endangered Species

Ohio Department of Natural Resources has not identified "rare species or unique natural features at or within a half mile of the proposed GLI properties. Nevertheless, several larger diameter shagbark hickories were noted along the UNT-2 corridor. The exfoliating and platy bark of these trees may provide nursery habitat for various bat species. Several of these trees would have been lost with the implementation of the originally preferred design.

Water Quality

Higher quality Category 3 Wetlands would be lost employing the originally proposed design. Storm water detention ponds; erosion, sediment, and pollutant controls; and installation of replacement wetlands were proposed to ameliorate potential impacts to water quality originating from construction and operation of the expansion facilities. Nevertheless, some degree of impact on long-term water quality could be expected within Cowles Creek as a result of the loss of much of the UNT-2 corridor.

Flow Patterns

The originally proposed design would eliminate and attempt to relocate approximately 4000 linear feet of natural stream channel (and wetlands) that occur in the UNT-2 corridor.

The proposed storm water management system for the originally proposed expansion area was to be designed to attenuate peak discharges from the site to pre-development levels for design storm water events. Culverts, channels, and sedimentation basins were to be designed for storm water flow based on the 100-year storm event. Despite these efforts, some degree of modification of current flow patterns could be expected.

Aquatic Habitat

The originally preferred design would result in a permanent loss of 22.49 acres of wetland habitat and approximately 2370 linear feet of natural stream channel. Unique high quality Category 3 wetlands are included in the impact area thus the project would be expected to affect sensitive aquatic resources.

Human Health:

The originally preferred design would not be expected to directly affect human health.

### *3.2.2 Interim Avoidance Alternative*

Physical Impacts

Employing this design, site excavation to increase the airspace of the landfill disposal area would still be required for the expansion. The interim avoidance design proposed to physically alter or remove wetland and waters features as described in Section 2.2.2. Implementation of this design would remove 16.08 acres of on-site wetlands, 2511 linear feet of maintained road drainage ditches, 1784 linear feet of open drainage ditch and former agricultural drainage ditches, and 629 linear feet of ephemeral flow paths within the wooded understory; but would avoid higher quality Category 3 wetlands. This alternative also eliminates impacts to approximately 2370 linear feet of natural stream channel that would have been effectively removed with the original design.

Mitigation

This interim avoidance design impacts ± 16.08 acres of mostly intermittently dry "flatwoods" wetlands. Replacement wetlands were proposed to be constructed within the GLI property and at other off-site locations at an area approximately 2.0 times that of the planned impact acreage. Stream channel mitigation was expected to be minimal and limited to compensatory mitigation for impacts to man-made ditches. Stream channel mitigation efforts were proposed within on-site unnamed tributaries of Cowles Creek, but

alternative mitigation projects in other nearby streams would also be considered. Vernal pool construction was also proposed within areas of replacement wetlands.

Flora and Fauna

The interim avoidance design would restrict wetland impacts primarily to man-made ponds, flatwoods wetlands, and vernal depressions within flatwoods areas. This alternative avoids impacts to the UNT-2 corridor and leaves that resource essentially intact and with some degree of buffering. Loss of the man-made ponds would have minimal impact on native fish species and other aquatic animals of significance in the Lake Erie watershed, but could reduce feeding opportunities for fish-eating birds (i.e. kingfishers) and bats that feed over open water areas. Most of the flatwoods vernal pools were assessed as having "limited" potential for amphibian reproduction. Nevertheless, loss of these features would be expected to have a small impact on local amphibian numbers. The habitat associated with most the flatwoods wetlands is not highly productive for amphibians, songbirds, or mammals. However, these areas do provide some foraging opportunities for specialized bird species such as woodcock (and some amphibians and reptiles) that feed on macroinvertebrates in damp soils.

The wetlands proposed for impact are predominantly closed-canopy red maple woods with significant woody debris (dead branches) in the understory and sparse shrub and herbaceous vegetation. In general, there is limited vegetative diversity in these areas.

Rare, Threatened and Endangered Species

Ohio Department of Natural Resources has not identified "rare species or unique natural features at or within a half mile of the proposed GLI properties. The larger diameter shagbark hickories noted along the UNT-2 corridor could be avoided in this scenario thereby leaving trees that could provide nursery habitat for various bat species. Several of these trees would have been lost with the implementation of the originally preferred design.

Water Quality

Higher quality Category 3 Wetlands and approximately 2370 liner feet of natural channel would be avoided with this design. Storm water detention ponds; erosion, sediment, and pollutant controls; establishment of vegetated buffers, and installation of replacement wetlands were proposed to ameliorate potential impacts to water quality originating from construction and operation of the expansion facilities. Potential water quality impacts are considerably less having avoided the UNT-2 corridor.

Flow Patterns

The originally proposed design would eliminate and attempt to relocate approximately 2370 linear feet of natural stream channel (and wetlands) that occur in the UNT-2 corridor. These impacts are eliminated with the interim avoidance alternative design.

The proposed storm water management system for the interim avoidance alternative was also intended to be designed to attenuate peak discharges from the site to pre-development levels for design storm water events. Culverts, channels, and sedimentation basins were to be designed for storm water flow based on the 100-year storm event.

Aquatic Habitat

The originally preferred design would result in a permanent loss 22.49 acres of wetlands and ponds, 2511 linear feet of maintained road drainage ditches, 1784 linear feet of open drainage ditch and former agricultural drainage ditches, >800 linear feet of ephemeral flow paths within the wooded understory, and ± 2370 linear feet of natural stream channel in the UNT-2 corridor. Unique high quality Category 3 wetlands are included in the impact area, thus the project would be expected to affect irreplaceable aquatic resources. With the elimination of the impacts originally proposed within the UNT-2 corridor, the interim avoidance alternative has greatly reduced direct impacts to aquatic habitat.

Human Health

The interim avoidance design would not be expected to directly affect human health.

### 3.2.3 *Minimal Degradation Alternative (Currently proposed Design)*

Physical Impacts

In order to achieve expansion of the landfill, this design alternative also requires site excavation and fill placement to increase the airspace of the existing landfill disposal area. The minimal degradation alternative or "currently proposed design" will physically alter or remove 9.68 acres of wetland/ponds, 2511 linear feet of maintained road drainage ditches, 1784 linear feet of open drainage ditch and former agricultural drainage ditches, and 629 linear feet of ephemeral flow paths within the wooded understory. No natural channel impacts occur with this design. The impacts proposed have been arrived at by systematically reducing the size of the landfill expansion footprint while projecting economic returns of the landfill operation over the next three decades. The economic return is necessary to provide a minimally acceptable return to landfill operations while ensuring adequate financing to install all appropriate remediation and environmental protection measures.

Mitigation

The minimal degradation alternative proposes to offset wetland impacts by avoiding higher quality wetland resources, providing buffers for remaining wetland areas, performing enhancement (vernal pool replacement construction) in selected wetlands, and through construction of approximately 18.0 acres of replacement flatwoods wetlands. The replacement wetlands will be sited, designed, and constructed in the Cowles Creek watershed to ensure development of "in kind" functions and societal values similar to those occurring in the 9.68 acres of jurisdictional resources to be permanently affected by

the landfill development. Other alternative and/or additional mitigation actions may include establishment of permanent buffers and conservation easements, enhancement of wooded wetlands through development of in-kind vernal pool habitat, and enhancement of existing natural stream channel habitats employing Rosgen restoration design concepts.

Flora and Fauna

The minimal degradation alternative will remove approximately 9.68 acres of wetlands in the expansion area. No fish have been observed within the proposed wetland impact areas that drain to local streams, and macroinvertebrate populations normally associated with stream ecosystems are not likely to persist in the predominantly flatwoods areas and vernal depressions. However, habitat for various amphibians that currently use the vernal depressions will be affected by this design alternative. Replacement vernal pool habitats are planned to ameliorate some of these habitat losses.

Overall, the wooded areas are not unique vegetatively, and the intensity of wildlife use within the areas to be cleared and reconfigured is moderately low to low.

Rare, Threatened and Endangered Species

There are no known rare, threatened, or endangered species of wetland-dependant plant or animal life that have been identified on or within one half mile of the site. Based on this information, the development of the minimal degradation alternative is not expected to have adverse impact on rare, threatened or endangered species. This design alternative also protects and preserves several large shagbark hickories that could provide summer nursery for various bat species, and leaves the wooded tract between UNT-2 and UNT-3 entirely intact.

Water Quality

The development of the minimal degradation alternative design may impact water quality in two primary ways:

1) Expansion of the landfill may impact local surface water turbidity during construction and intermittently during the operation of the landfill facilities; and

2) Expansion may affect storm water drainage patterns, and water filtering capabilities of remaining wetlands through the installation of liner materials, leachate collection systems, and storm water management ponds.

Both of these issues can be addressed with adequate erosion and sedimentation control; and, through design of integrated storm water management system that directs and discharges water at pre-development water volumes to each of the UNT watercourses.

Additionally, under some circumstances even modern landfills may present a small but potential risk to groundwater quality. However, in this case, the nature and depth of the underlying tills and lake sediments occurring throughout this site are extremely well suited to ensuring that groundwater contamination will not occur…even in the unlikely event of a liner and/or leachate collection system malfunction.

GLI proposes to apply best management practices before and during the construction and operation of the expansion area. In addition, landfill construction components such as synthetically lined cells, leachate and natural gas management systems, and water treatment facilities permitted under the National Pollutant Discharge Elimination System (NPDES) program will be utilized.

Although some wetlands in the proposed expansion area will be lost, storm water detention ponds; erosion, sediment, and pollutant controls; and installation of replacement wetlands are expected to fully offset or exceed the effectiveness of the wetland functions currently being performed on the site.

Flow Patterns

The minimal degradation alternative will convert old-field and forested areas between the UNT-1 and UNT-2 corridors to a lined operational landfill facility, and eventually to a capped landfill closure area. The site development will permanently remove a total of 9.68 acres of wetlands and ponds, 2477 linear feet of maintained road drainage ditches, 1784 linear feet of open drainage ditch and former agricultural drainage ditches, and 629 linear feet of ephemeral flow paths within the wooded understory in the UNT-2 corridor. The proposed storm water management system is designed to attenuate peak discharges from the site to pre-development levels for assigned design storm events. Culverts and channels are designed for storm water flow based on the 100-year storm event. The sedimentation basins are designed to accommodate a 100-year storm event, and replacement wetlands will provide ≥ 50% more storm water storage than the wetlands currently being proposed for impact. As a result of this increased storm water storage and properly designed storm water management facilities for the landfill, peak rates of discharge within the UNT corridors should be lowered while still maintaining appropriate flow volumes. These changes are expected to improve currently "flashy" and erosive flow conditions within the headwaters of Cowles Creek and thereby lower sediment loads.

Aquatic Habitat

The minimal degradation alternative will result in the removal of 9.68 acres of wetland habitat and relocation/fill of man-made drainage ditches and somewhat telltale ephemeral drainage flow paths that do not support aquatic macroinvertebrate species. However, because the on-site wetlands are not highly functioning resources and are not unique in the region, the proposed project is not expected to affect irreplaceable aquatic resources. Replacement wetlands proposed for mitigation are expected to perform similar functions to those noted in the existing wetlands but at approximately two-times the surface area. Mitigative measures in existing unnamed tributaries to Cowles Creeks

and substantial buffering measures are also expected to offset and ameliorate impacts associated with displacement of on-site drainage ditches.

Human Health

The minimal degradation alternative is not expected to adversely affect human health.

### 3.2.3 *Off-Site Alternative*

A new landfill facility in a new location with similar disposal capacity would require a larger facility footprint than currently proposed at the GLI expansion site. Siting another landfill, or several smaller disposal facilities, to replace the proposed expansion capacity of the GLI facilities could reasonably be expected to occur in or near Ashtabula County, Ohio. However, given the topographic, geologic, and watershed characteristics of this region it is probable that wetlands would also exist on any property large enough to support a facility with similar capacity (please see real estate alternative site survey that accompanies this application). In fact, most candidate replacement properties are expected to include similar or larger areas of existing wetlands. Thus, while the impacts to flora and fauna; rare, threatened and endangered species; water quality; flow patterns; and aquatic habitat are mostly unknown without costly site specific investigations, it is reasonable to expect that these "unknown" impacts would be significant on other sites in the region.

### *3.2.4 Non-Degradation Alternative*

Physical Impacts

This alternative is designed to avoid impacts to all jurisdictional wetlands and waters resources identified at the American Landfill site. The non-degradation or "nominal" degradation alternative does not meet the project purpose and need. Furthermore, a non-degradation alternative developed within the available project area uplands would mean that the random geometric configuration of the potential landfill air spaces would be largely impossible to construct, maintain, and manage as a "state-of-the-science" "environmentally-safe" facility.

Mitigation

In this scenario, the footprint of the expansion for the GLI facilities would be configured to avoid all wetlands at the site (see Figure C), thus mitigation for wetland areas would not be required.

Flora and Fauna

No jurisdictional wetland areas will be affected by the construction of this design alternative. The impact of this alternative on floral and faunal communities associated with wetlands and waters would be expected to be minimal.

Rare, Threatened and Endangered Species

There are no known rare, threatened, or endangered species of wetland dependant plant or animal life that have been identified on or within one half mile of the site.

Water Quality

Since this alternative is designed for nominal degradation (no impact) to surface waters, existing wetland and waters resources would remain essentially undisturbed. Nevertheless, best management practices for erosion and sedimentation controls would still be necessary at various scales. Unfortunately, the scattered nature of any potential disposal areas that might be large enough to be developed with appropriate grades and infrastructure for waste disposal would severely compromise the effectiveness of probable E & S controls.

Flow Patterns

The nominal degradation alternative will alter existing flow patterns within the project area by converting a portion of the site from woodlands and open areas to small individually lined municipal waste landfills "pods". Nevertheless, rainfall collected from these smaller areas would still need to be collected and managed as storm water runoff . Although flow patterns in the Cowles Creek watershed would not be expected to change significantly, it is possible that multiple points of discharge would result from this scattered approach to storm water management. Multiple points of discharge would complicate issues related to NPDES permitting.

Aquatic Habitat

No jurisdictional wetland or waters will be affected by the construction of this design alternative, thus no loss of aquatic habitat is expected.

Human Health

In this design, although the 9.68 acres of wetlands and linear feet of drainage ditches/ephemeral flow paths referred to earlier would be undisturbed, the waste disposal capacity available for this region is greatly reduced, and the resulting life expectancy of the landfill is reduced as well. Current users of the landfill would have to seek other means of waste disposal…which could require considerably more carbon emissions associated with longer trucking/hauling distances. Pursuit of alternative waste disposal areas has potential to result in greater financial cost to the community and greater environmental impact over time.

### *3.3 Summary Tables and Comparisons*

**Table 3-3-1. Comparison of Alternatives for Geneva Landfill Expansion Project, Ashtabula County, Ohio**

| Alternative | Wetland/Waters Impacts (acres) | Landfill Volume (cu.yds) | Landfill Capacity (years) | Exclusionary Criteria |
|---|---|---|---|---|
| **Originally Preferred** | **• 22.49 acres of Wetlands and ≥ 7450 linear feet of "channel" impacts** | 19.1 million | ± 75 | Impacts to Category 3 Wetlands (and 2370 linear feet of "natural" stream channel) |
| **Interim Avoidance Alternative** | **• 16.08 Wetlands** | 16.7 million | ± 50 | None |
| **Minimal Degradation** (the currently proposed alternative) | **• 9.68 Wetlands** | 14.6 million | ± 35 | None |
| **Off-Site Alternative** | Unknown | Feasibility uncertain. Volume unknown. | Unknown | Introduction of an additional regional waste disposal facility requiring long-term maintenance and environmental monitoring. Escalation of costs to maintain and manage an additional "stand-alone" landfill facility increasing costs to clientele. Rezoning of a land parcel for "Waste Management/Disposal" at another location in the region. Increased costs for environmental assessment (wetlands, waters, geo-technical, endangered species, etc.) of potential sites, cost of land acquisition, additional engineering design costs, costs of additional permitting, costs for construction and operation, etc…..all of which would have to be passed along to regional clientele. |
| **Nominal Degradation Alternative** | None | _____ [a] | _____ [a] | Required landfill expansion space/volume is not provided and remediation of the Doherty Landfill Closure area is difficult to impossible to achieve. |

[a] Conceptual estimates indicate that this option is not technically competent and, if attempted, would be entirely cost prohibitive.

**Table 3-3-2. Comparison of Impacts for the Various Alternatives**

| PARAMETER | Originally Preferred Alternative | Interim Avoidance Alternative | Minimal Degradation Alternative | Off-Site Alternative | Non-Degradation Alternative |
|---|---|---|---|---|---|
| **On-site Physical Characteristics** | Wetlands impacted: ≥ 22.49 acres including 6.49 acres of Category 3 wetlands. Impacts to ≥ 7450 linear feet of natural stream channel and drainage ditches | Wetlands impacted: 16.03 acres (No Category 3 Wetlands affected.) No natural stream channel impacts. (Still involves impacts to existing drainage ditches and ephemeral flow patterns) | Wetlands impacted: 9.68 acres (No Category 3 Wetlands affected.) No natural stream channel impacts. (Still involves impacts to existing drainage ditches and ephemeral flow patterns) | Wetlands impacted: Unknown | Wetlands impacted: 0 acres |
| **Flora and Fauna** | High | Moderate | Low | Moderate to High | Minimal |
| **Rare, Threatened and Endangered Species** | None | None | None | Unknown | None |
| **Water Quality** | Moderate to High | Moderate to Low | Low | Unknown | Minimal to Moderate |
| **Flow Patterns** | High | Moderate to Low | Minimal | Unknown | Minimal |
| **Aquatic Habitat** | High | Moderate to Low | Low | Unknown | None |
| **Human Health*** | Minimal | Minimal | Minimal | Minimal | Minimal |

* The Ohio Environmental Protection Agency review and permitting restrictions for landfill facilities would not be expected to allow development with significant Human Health impact potential. Modern design and very favorable regional soil conditions for natural sequestration of pollutants are also factors that limit potential Human Health effects.

**TABLE 3-3-3: *Minimal Degradation Alternative***
**Proposed Wetlands Impacts**

| Wetland ID | Cowardin Classification | Current Acreage | ORAM Category | Proposed Impact | |
|---|---|---|---|---|---|
| | | Acres[a] | | Acres | Sq. Ft. |
| A | PFO | 13.42 | 2 | 3.97 | 172,985 |
| B | PFO | 0.01 | 2 | 0.01 | 265 |
| C | PEM | 0.39 | 1 | 0.00 | 0 |
| D | PFO | 1.00 | 3 | 0.00 | 0 |
| E | POW | 0.26 | 1 | 0.26 | 11,142 |
| " | PEM | 0.18 | 1 | 0.18 | 7,869 |
| F | PEM | 0.01 | 1 | 0.002 | 88 |
| G | PEM | 0.07 | 3 | 0.00 | 0 |
| H | PEM | 0.03 | 3 | 0.00 | 0 |
| I | PEM | 0.50 | 3 | 0.00 | 0 |
| J | PEM | 0.06 | 3 | 0.00 | 0 |
| K | PEM | 0.58 | 2 | 0.08 | 3,522 |
| L | PEM | 0.03 | 3 | 0.00 | 0 |
| M | PEM | 0.01 | 3 | 0.00 | 0 |
| N | PEM | 0.01 | 3 | 0.00 | 0 |
| O | POW | 0.08 | 1 | 0.00 | 0 |
| " | PEM & PFO | 0.26 | 1 | 0.00 | 0 |
| P | PEM | 0.13 | 3 | 0.00 | 0 |
| Q | PEM | 0.94 | 2 | 0.00 | 0 |
| R | PEM | 0.0002 | 2 | 0.00 | 0 |
| S | PEM | 0.01 | 2 | 0.00 | 0 |
| T | POW | 0.09 | 1 | 0.09 | 3,782 |
| TE | PEM | 0.43 | 1 | 0.43 | 18,681 |
| U | POW | 0.39 | 1 | 0.39 | 17,099 |
| " | PEM | 0.11 | 1 | 0.11 | 4,806 |
| V | PEM | 0.72 | 1 | 0.00 | 0 |
| W | PEM | 0.0007 | 2 | 0.0007 | 32 |
| X | PFO | 11.64 | 2 | 3.01 | 131,145 |
| " | PEM | 1.89 | 2 | 1.15 | 49,986 |
| Y | PEM | 0.003 | 2 | 0.003 | 113 |
| Z | PEM | 0.04 | 3 | 0.000 | 0 |
| | TOTAL | 33.30 | | 9.68 | 421,514 |

[a] Acres of wetlands within the Investigation Area/Project Area boundary

**TABLE 3-3-4: *Minimal Degradation Alternative***
**Proposed Impacts to Watercourses**

| Channel Name | Stream Classification | Existing Length (Linear Ft.) | Proposed Impact (Linear Ft.) | Latitude | Longitude |
|---|---|---|---|---|---|
| DD-1 | Ephemeral | 1715 | 1681 | 41°47'51.043"N | 80°54'36.072"W |
| DD-2 | Ephemeral | 796 | 796 | 41°47'49.022"N | 80°54'36.859"W |
| DD-3 / AD-1 | Ephemeral | 1369 | 1290 | 41°47'45.535"N | 80°54'30.719"W |
| AD-2 | Ephemeral | 415 | 388 | 41°47'40.971"N | 80°54'25.804"W |
| ED-1 | Ephemeral | 229 | 80 | 41°47'53.977"N | 80°54'31.361"W |
| ED-2 | Ephemeral | 632 | 549 | 41°47'49.965"N | 80°54'29.376"W |
| UNT-2 | Perennial | 3566 | 0 | 41°47'54.431"N | 80°54'28.817"W |
| NC-1 | Intermittent | 321 | 0 | 41°47'57.813"N | 80°54'57.394"W |