

Proposed Rapp Road Landfill Eastern Expansion

Analysis of Wetland Impact Avoidance, Minimization & Alternatives

City of Albany, New York

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1.0 INTRODUCTION

The proposed Albany Landfill Eastern Expansion has the potential to impact wetlands within the project area. As a result, a discussion of measures to avoid and minimize impacts to wetlands and other waters of the U.S is required. Avoidance and minimization of impacts to sensitive ecological communities, including wetlands, have been a key component throughout the process of siting and designing the proposed expansion and have been thoroughly explored in SDEIS Sections 2.0, 5.1 and Appendix K (Alternative Sites Analysis). The purpose of this document is to provide a consolidated discussion of avoidance and minimization measures and alternatives to facilitate agency review. The Alternative Sites Analysis is not restated in this document but can be viewed in its entirety in SDEIS Appendix K.

2.0 OFF-SITE ALTERNATIVES SUMMARY

Alternative sites considered in this analysis included sites within the City of Albany and a site in the Town of Coeymans, owned by the City and known as Site C-2. As the City lacks the power of eminent domain outside its municipal boundaries, Site C-2 is the only site outside the City's boundary considered in this alternatives analysis.

2.1 SITES WITHIN THE CITY OF ALBANY

Ten sites within the City were evaluated in the Third Supplemental Draft Environmental Impact Statement, P-4 Project Landfill Expansion (C.T. Male Associates, P.C. 1999) and are re-evaluated herein and in greater detail in SDEIS Appendix K. This evaluation was completed by using numerical values associated with the favorability of meeting criteria to determine their suitability for the development of a new landfill. Criteria used for evaluations included prohibited siting areas as stipulated in Part 360-1.7(a) (2) regulations and restricted areas (Part 360-2.12 (c)).

As part of the analysis for this report, the sites were re-visited to identify any visible changes to site characteristics that might be applicable to the alternatives analysis. Such changes would include a change in site use and development and land use changes surrounding the sites. Photos of some of the sites are provided in SDEIS Appendix K.

Evaluation criteria used for this study included unconsolidated deposits, proximity to water supply sources, natural topography, wetland and aquatic resources, local land use (including incompatible structures and zoning), site acquisition, and site access. Values of 1 for unfavorable, 2 for acceptable and 3 for favorable were applied to each criterion. The highest ranking site is deemed to be the most favorable landfill site. Based on the evaluation criteria applied to each site, Site 10, the proposed Eastern Expansion of the Rapp Road Landfill, has the highest ranking of the alternative sites evaluated. The following table summarizes scores for each site.

**Table 1
Site Scores**

Site Identification	Score
Site 1 (Erie Boulevard)	18
Site 2 (Frisbie Avenue)	15
Site 3 (Normanskill Farm)	12
Site 4 (Graceland Cemetery)	13
Site 5 (Kenwood/ Mt. Hope)	15
Site 6 (Corporate Woods)	16
Site 7 (Krumkill Road)	14
Site 8 (Fuller East)	16
Site 9 (Fuller West)	15
Site 10 (Eastern Expansion)	19

As shown, the scores range from 12 for Site 3 to 19 for Site 10. Several sites do not have appropriate area or configurations to accommodate landfill operations. For instance, Site 6 with a score of 16 covers only about 10 acres of land and therefore would not be a viable option for a landfill facility due to its size. Similarly, Site 8 is situated on the University at Albany's campus representing an incompatible land use and therefore not a viable alternative (refer to the specific evaluation criteria for each site related to the area available for landfilling).

Based on Table 2, which presents prohibited and restricted siting criteria applied to the City, the following table provides a summary of the number of prohibited and restricted siting criterion that apply to each site.

Table 2
Prohibited & Restricted Siting Criteria Scores

Site Identification	# of Prohibited Criteria	# of Restricted Criteria
Site 1 (Erie Boulevard)	1	2
Site 2 (Frisbie Avenue)	0	1
Site 3 (Normanskill Farm)	1	2
Site 4 (Graceland Cemetery)	1	2
Site 5 (Kenwood/ Mt. Hope)	0	1
Site 6 (Corporate Woods)	1	1
Site 7 (Krumkill Road)	1	2
Site 8 (Fuller East)	2	2
Site 9 (Fuller West)	1	2
Site 10 (Eastern Expansion)	0	2

Prohibited siting areas applied to the City included 100-year floodplains, DEC-mapped wetlands, threatened and endangered species, and the Pine Bush Preserve. Sites 1, 3, 4, and 7 have a portion of their area covered by the 100-year floodplain. Initially, no sites were found to be situated within a DEC-mapped wetland area. However, through on-site wetland delineation, wetlands which qualify to be mapped as State regulated wetlands are located on and adjacent to the Eastern Expansion alternative. These wetlands were not previously mapped. The prohibited siting criteria contained in Part 360 relating to State regulated wetlands only apply to new landfills, not expansions of existing wetlands. Therefore, this prohibited siting criteria does not apply to the Eastern Expansion. Regarding restricted siting criteria, it is important to note that eight of the ten sites reviewed for this study are either mapped entirely or partially as an unconfined aquifer that could be considered a principal aquifer.

The following list provides a summary of whether each site is considered to be a viable alternative landfill site and why:

Table 3
Summary of Viable Alternatives

Site Designation	Viable Alternative?	Primary Reasoning
Site 1	No	Lack of sufficient area for landfilling.
Site 2	No	Lack of sufficient area for landfilling.
Site 3	No	Irregular geometry of level areas.
Site 4	No	Slopes and unnamed tributaries to the Normans Kill bisect the site.
Site 5	No	Significant slopes exist on the site.
Site 6	No	Site is primarily developed already.
Site 7	No	Topography of the site not conducive to landfilling.
Site 8	No	Lack of sufficient area for landfilling.
Site 9	No	Lack of sufficient area for landfilling.
Site 10	Yes	Expansion of existing landfill accompanied by a comprehensive habitat restoration plan

Although there are adverse impacts related to the Eastern Expansion, it provides the best opportunity for a short term solution (6-7 years) to address the needs of the ANSWERS communities and the region. It is considered the only viable short term option to address landfill needs within the remaining life of the current P-4 expansion (approximately 3 years).

Please refer to SDEIS Appendix K for the full study.

2.2 SITE C-2 (TOWN OF COEYMANS)

In 1992 the City of Albany adopted a Generic Environmental Impact Statement/Solid Waste Management Plan (“SWMP”) for the Wasteshed. The history of this process is outlined in Section 2.1. The SWMP concluded that a new long-term landfill should be developed to serve the Wasteshed. The SWMP determined that an estimated 100 to 130 acres of landfill area would be needed to serve the planning unit for a twenty-year period and that approximately 250 acres should be acquired to provide a site size sufficient to support administrative activities and to provide an appropriate buffer area. As a result, the SWMP identified a process for an extensive, multi-phased, criteria-based siting study. The criteria were established in the SWMP, after

public review, and were largely driven by requirements in the 6 NYCRR Part 360 regulations (Part 360), as well as by environmental and planning guidelines.

Initially, the siting study identified fifteen potential sites that satisfied the criteria established in the SWMP. Of those sites, three were located in Guilderland, nine in Bethlehem, and three in Coeymans. The second phase report, which was issued in 1992, recommended three of the fifteen initial sites for further study. Following a detailed investigation of the three sites in accordance with the criteria established in the SWMP, Part 360 and environmental and planning guidelines, a third report was prepared in August, 1994, selecting Site C-2 as the preferred site for the landfill.

An option for purchase of the site was negotiated with the property owners and detailed site investigations ensued. As a result, the site was found to contain over 100 acres of wetlands and water courses, approximately 80 acres of which would be impacted by the landfill. Given the extent of State and federal wetland impact associated with the Site C-2 project, it could be a few years before approvals are in place or it is possible that the project might not meet the standards for permit issuance.

Based on initial discussions with the U.S. Army Corps of Engineers (USACE) it was suggested that if permits were granted they would likely allow for an initial phase encompassing the lands containing the poorer quality, farmed wetlands and old fields. The potential to permit future phases that would impact higher quality wetland (forested areas) would depend on the success of mitigation constructed to address all phases of development. The City decided that they could not justify the risks associated with the potential for mitigation failure or delayed approval. The infrastructure costs to establish a new landfill are too great to move forward without assurances that the full design would be approved. NYSDEC has rendered no judgment if the site can meet all regulatory standards and be granted permits. With the capacity of P-4 expected to be exhausted by November 2009, this is not a reasonable alternative to meet the current needs, but remains a potential long term solution.

3.0 ON-SITE ALTERNATIVES

Five on-site alternatives have been considered for the expansion of the Rapp Road Landfill. The location of each alternative is shown on Figure 1. Table 4 provides a quick comparison of the

potential impacts associated with each alternative and the discussion that follows provides more information on the magnitude and significance of the impacts.

**Table 4
Impacts Associated with Alternative Expansion Layouts**

IMPACTS	ALTERNATIVES				
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Topography, Geology and Soils	Y	Y	Y	Y	Y
Surface Water	N	N	Y	N	Y
Groundwater	N	N	N	N	N
Wetlands	Y	Y	Y	Y	N
Threatened and Endangered Species	N	Y	N	Y	N
Pine Bush Preserve	Y	Y	N	Y	N
Traffic	N	N	N	N	N
Fox Run Estates	Y	N	N	N	N
Odor	N	N	N	N	N
Noise	Y	Y	Y	Y	Y
Air	N	N	N	N	N
Visual	Y	Y	Y	Y	Y
Wildlife	Y	Y	Y	Y	N
Cultural	N	N	N	Y	N

Y= indicates a potential impact, N= no impact associated with the expansion.

3.1 ALTERNATIVE 1

Alternative 1 involves a 24-acre landfill expansion onto Fox Run Estates mobile home park, a City-owned parcel that, at the time it was considered as an alternative, had not yet been dedicated to the Albany Pine Bush Preserve Commission (APBPC or the Commission). Since that time, the property has been dedicated to the Commission. This option would include substantial alterations to the site’s topography due to the scale of expansion. Surface water runoff has the potential to cause erosion and sedimentation during construction phases and upon capping and closure, as do the other alternatives; however, this impact is not expected to be significant due to the use of erosion and sedimentation controls and the eventual development of a Stormwater Treatment Train, as discussed in Section 3.2. Approximately 10% of the area occupied under

Alternative 1 is classified as wetland, which is less than under Alternative 3 but more than under Alternatives 2 or 4.

Because all land included in Alternative 1 has been previously disturbed by development, this option would have a minimal impact on wildlife. Alternative 1 land area does not contain any habitat of known importance to threatened or endangered species, but has been deemed an important area that – if properly restored – would provide a linkage between high-quality habitat to the east and west of the landfill. This alternative is not desirable as it would not allow such linkage to occur.

Social impacts associated with Alternative 1 include the displacement of remaining Fox Run Estates residents. However, this process is inevitable since the land has been dedicated to APBPC. As is true for each of the alternatives, Alternative 1 is not expected to have significant visual impact due to a final height of only 10 feet above what is currently approved for the landfill. Traffic will not increase since the Landfill will not accept more waste than what is currently permitted on a daily basis. The noise assessment did not reveal any noise impacts as a result of this alternative. Alternative 1 involves expansion on a large scale, and its capacity to accommodate a greater volume of waste implies potentially greater opportunity for odor releases. A 19th or early 20th century structure is located on the Alternative 1 area, but this cultural resource was determined not to be significant.

3.2 ALTERNATIVE 2

Alternative 2 involves a 24-acre expansion westward from the existing Rapp Road Landfill onto City-owned lands that have been dedicated to the APBPC for preservation. Its large scale and height would alter the existing topography of this area.

Expansion of the landfill under Alternative 2 would potentially have the greatest impact upon threatened and endangered species and the unique Pine Bush ecosystem. This alternative is not desirable due to these impacts and the loss of dedicated Preserve lands.

Alternative 2 would be visible from all six viewpoints evaluated during the Visual Impact Analysis (Section 3.6 and Appendix H). However, visual impacts are tempered by the fact that the final elevations would be only slightly higher than the currently approved elevation of the landfill.

As with Alternative 1, the potential for odor impacts would be greater than Alternatives 3 and 4 due to the larger capacity of the expansion. This alternative would not result in significant noise impacts to residents. The J. Vant Historic Site (Loci A and B) is located within the Alternative 2 area and would be impacted by the project.

Alternative 2 has been dismissed from consideration because its impacts to the Pine Bush are unacceptable.

3.3 ALTERNATIVE 3

Alternative 3 is a scaled-back expansion eastward from the landfill's current location, and is located entirely on City-owned land that has not been dedicated to the Pine Bush Preserve. Alterations to the site's topography would be less dramatic because this alternative would occupy less land area than those previously discussed. Surface water management would require the filling and relocation of a ditched stream, which has regulatory implications. Alternative 3 would result in impacts to approximately 5.05 acres of degraded, partially dewatered, forested wetland. This impact is greater than any of the other alternatives. Very substantial mitigation is proposed for the loss of wetlands, as described in the Habitat Plan (Section 2.8). Additionally, as discussed below, the overall significance of the impact on habitat is much less than what would occur under Alternatives 2 and 4.

Impacts to wildlife under Alternative 3 include potential mortality and the displacement of some common species, but the low quality of this previously disturbed habitat implies minimal impacts to species closely associated with the Pine Bush. Based on detailed site investigations, no rare, threatened, or endangered species – or high-quality Pine Bush habitat – will be impacted by Alternative 3. This option is much less disruptive to unique pine barrens habitat and its resident wildlife than Alternatives 2 and 4. Furthermore, Alternative 3 will not impact APBPC plans to provide east-west habitat linkage through the mobile home park (Alternative 1).

Preserve lands may experience “edge effect” impacts under all alternatives. The Habitat Plan includes measures to reduce if not eliminate the edge effect through the control of runoff and ultimately by the restoration of the entire landfill surface to pine barrens and related communities. The pursuit of this alternative would eliminate the City-owned parcel from future acquisition by the APBPC as proposed in its 2002 Management Plan; however the significant beneficial implications of the Habitat Plan far outweigh the loss.

Alternative 3 has the least potential for land use conflict, despite the expanded landfill's relatively close proximity to homes along Rapp Road. As with other alternatives, visual impacts may be noticeable, but are insignificant relative to the currently permitted height of the landfill. Like the other alternatives, Alternative 3 will result in a change in topography within the expansion area, creating a distinct interface with the adjacent lands. However, this expansion does not create a new or unusual landform adjacent to the Preserve land that is not already present around the existing landfill. The slopes and magnitude of the expansion will be similar to existing landfill features. The Habitat Plan will provide natural features by incorporating sand and native Pine Bush vegetation on the landfill cap after closure, emulating the natural features in the Preserve. The Habitat Plan will certainly soften the appearance of the landfill as a landscape feature, particularly at the landfill/Preserve interface where there is currently abrupt topographic and vegetative differences. The intent of the Habitat Plan is to address this interface to the extent practicable so as to erase the sharp contrast and expand important pine barrens habitat across the landfill.

Odors attributable to this expansion scenario will be reduced in comparison to Alternatives 1 and 2, which involve greater landfill capacity. However, it is important to note that significant efforts are already underway to address existing and future odor issues, as discussed in Section 3.8. Additional noise and traffic implications are minimal, relative to current conditions. Cultural resources located in the proposed Alternative 3 expansion area include a precontact site located adjacent to an existing house that will be avoided and preserved. A plan showing the proposed avoidance measures has been submitted to OPRHP for review.

From among the five possible scenarios, Alternative 3 has been identified as the most favorable because it is technically feasible and poses the least interference to surrounding areas.

3.4 ALTERNATIVE 4

Alternative 4 represents a less intrusive, scaled-back version of Alternative 2 that may impact less Pine Bush habitat (approximately 8 acres in total) with the balance as an overflow of the Greater Albany Landfill. Topographic alterations may be less dramatic than under Alternatives 1 and 2 because the expansion occupies a relatively smaller land area. Surface water and wetland impacts would be minimal.

Although scaled back from Alternative 2, Alternative 4 would still impact high-quality pine barrens. Threatened, endangered, and other Pine Bush wildlife would be impacted as pine barrens habitat is converted to suit landfill activities. This expansion scenario is not a reasonable alternative due to its impacts to the dedicated Preserve lands.

Expansion into the Pine Bush Preserve would result in direct impacts to public parkland. However, visual impacts from Alternative 4 would be less intrusive than under Alternative 2, and the potential for odor problems would be reduced. Additional noise and traffic impacts would be minimal, relative to current conditions. An historic site is located within this area: J. Vant Historic Site – Loci A and B. Although the site is not registered on the National Register of Historic Places, it is Register Eligible. The Alternative 4 expansion option would impact both portions of this historic site.

3.5 ALTERNATIVE 5

Alternative 5 includes the utilization of portions of the existing footprint of the entire Rapp Road Landfill. The City began accepting wastes at the Rapp Road site in the 1970's. The initial unlined portion of the landfill area encompasses approximately 80 acres on the western portion of the site referred to as the Greater Albany Landfill (GAL). The GAL was closed and capped in 1991-92. Landfill operations then continued in 1991 with an area know as the Albany Interim Landfill (AIL) located north and east of the GAL. The AIL, the first double-lined landfill in New York, was approximately 14 acres in size. In 1997, the "Wedge" area was constructed and included a "piggyback" landfill over a portion of the GAL, tying into the AIL. This area was operated until the year 2000.

Upon filling of the Wedge area in 2000, the City developed an area known as P-4. The P-4 area provided both a horizontal and vertical expansion of the AIL area in the northeastern portion of the site and an overfill of portions of the GAL and AIL. The City is currently utilizing the P-4 area.

Landfill design and operation in New York State are governed by 6 NYCRR Part 360. These regulations mandate landfill liner system requirements including establishment of maximum slopes for liner systems, waste placement, and closure caps. In this day and age with disposal capacity at a premium and with the significant cost of developing new landfill facilities, design engineers typically attempt to maximize landfill space by designing facilities with maximum permitted slopes.

The GAL was not designed and operated in accordance with the current Part 360 regulations. In general, some of the side slopes of areas that have not been overfilled as previously discussed are not at the maximum slopes allowed by Part 360 regulations. In addition, waste that was previously placed in these areas was not placed at the currently achieved waste densities and, as a result, these areas have settled further resulting in less steep side slopes.

From a purely geometric perspective, there appears to be additional landfill capacity in old landfill areas that have not been more recently overfilled. It could be possible to overfill these areas to achieve maximum slopes and height thus creating new disposal capacity. However, given that these areas are not currently permitted, use of the areas would be subject to a permit modification similar the modification sought for the Eastern Expansion.

The permitting of these older areas would be complex based on a variety of technical and social issues. Given that some of the older areas of the facility do not have liner systems that meet current requirements, any overfill of those areas would require construction of a new liner system over the previously filled areas. The construction of new liner systems over previously filled areas can be difficult due to concerns of settlement which could result in the disruption of leachate collection lines within the new liner system. Utilization of special geotechnical engineering products designed to limit the potential settlement of new liner systems over previously filled areas may be effective, however, this would add significant costs to construction.

Environmental monitoring of new landfill space over previously filled areas is also significantly more complex. The Part 360 regulations require that new landfill space be able to be monitored distinctly from areas where previous waste has been placed. Similar to concerns about settlement of new liner systems, additional systems would be required to be designed and constructed to ensure distinct monitoring could take place. If an effective system could be designed and approved by the NYSDEC, it would significantly increase construction costs.

Based on a review of the current landfill operations and existing topographic conditions at the site, it appears the only significant area where a new lined landfill area over the top of previously filled areas is conceivable is in the area of the GAL. This area consists of a mounded area with side slopes of about 4H:1V and a top area with limited width. Additional landfill volume in this area would be created by increasing side slopes to 3H:1V; which would allow placement of waste on the top of this area to an elevation of about 440 feet, or a maximum of about 36 feet

above the existing grade in this area as shown on Figure 2. This would provide approximately 1.2 years of landfill life at a capacity of approximately 525,000 cubic yards per the calculations below:

Total Volume (above liner system):	975,000 cy
Less liner volume:	- 285,000 cy
Less cap volume:	-165,000 cy
Net Volume:	525,000 cy
$525,000 \text{ cy} \times 1500 \text{ lbs/cy} \div 2000 \text{ lbs/ton} = 393,750 \text{ tons}$	
$393,750 \text{ tons} \div (1250 \text{ tons/day} \times 22 \text{ days/mo.}) = 14.3 \text{ months} = 1.2 \text{ yrs.}$	

.Note: these calculations are not based on a detailed design and are therefore approximate.

As previously stated, overfilling in this area would require construction of a liner system. Due to the existing topography in the area, construction of a liner system would require substantial soil fill on the existing side slopes to re-configure the grades to allow for effective leachate collection. Placement of the soil fill would use much of the air space within the side slope areas and would surcharge the existing landfill; creating potential for settlement and subsequent damage to an overfill liner system. The potential for distinct monitoring of an overfill cell in this area is also questionable.

Overfilling in this area would also return landfill operations to the western side of the site and in closer proximity to more sensitive areas of the Pine Bush Preserve. Additional facilities required for landfill gas and leachate collection would also be required beyond the limits of the existing waste mass within the more sensitive areas. Discussions with both the Albany Pine Bush Commission and The Nature Conservancy regarding potential expansion of the landfill in a westward direction yielded significant negative comments.

Based on the above, Alternative 5 has been dismissed due to the significant engineering and logistic issues, the high likelihood of settlement and subsequent failure of the leachate collection system and the likelihood of direct impacts to the Pine Bush Preserve.

4.0 ALTERNATIVE LAYOUT

This section evaluates potential alternative configurations for the Eastern Expansion that could reduce the impacts on natural communities, particularly wetlands, in accordance with SEQR regulations and the avoidance and minimization requirements of Section 404/401, NYS

Freshwater Wetlands Act, 6 NYCRR 663 and 6 NYCRR 665. Two impact-minimizing alternatives and one avoidance scenario were considered in this analysis. The avoidance scenario involves an overfill and expansion only onto previously disturbed lands within the landfill area. One of the minimization alternatives attempts to achieve the same landfill volume as the proposed layout but reduces the expansion footprint by excavating closer to the water table. The last alternative provides a more feasible reduction of the footprint, allowing for a better Habitat Plan design (preferred alternative). The benefits and issues associated with each are discussed below.

4.1 AVOIDANCE SCENARIO

This alternative would include an overfill of the existing landfill and expansion onto landfill property currently used for roads, a detention pond, maintenance building, recyclables building, and the slope adjacent to the forested wetlands, as currently proposed for the Eastern Expansion. However, it would not include an expansion into the wetlands and thus would not require a federal wetland permit nor would it trigger the need to address State and federal standards for permit issuance relative to direct wetland impacts. It would, however, still require an Article 24 Freshwater Wetlands Permit for impacts to the 100 foot Adjacent Area and the evaluation of the State standards for permit issuance for Adjacent Area impacts. Figure 3 illustrates the proposed containment berm and final cover system grading for this design alternative.

An expansion of approximately six acres is possible without impacting existing wetlands. The total landfill cell volume was estimated to be approximately 1,250,000 cubic yards. This volume translates to a projected cell life of about 2.8 years based on current operating practices including waste flow, days of operation, and in-place waste density as shown in the calculations below:

Total Volume (above liner system):	1,271,858 cy
Less cap volume:	- 24,382 cy
Net Volume:	1,247,476 cy
$1,247,476 \text{ cy} \times 1500 \text{ lbs/cy} \div 2000 \text{ lbs/ton} = 935,607 \text{ tons}$	
$935,607 \text{ tons} \div (1250 \text{ tons/day} \times 22 \text{ days/mo.}) = 34 \text{ months} = 2.8 \text{ yrs.}$	

The capital costs associated with construction of the landfill liner and cover systems and reconstruction or re-location of existing site facilities, which alone could be over \$4 million, were weighed against the benefits of the proposed facility. The relatively short operational life of the six acre expansion does not meet the intended purpose to maintain current levels of service to the

ANSWERS communities and provide sufficient time to address budgetary issues and properly and for and implement future solid waste management solutions. This conclusion holds true even if recycling goals proposed in the SWMP Modification are achieved. At best, the recycling efforts would increase the life of this alternative from 2.8 to 3.3 years, which is still quite insufficient to identify and prepare for an alternative solid waste management plan.

From an ecological perspective, this alternative might reasonably pull the expansion footprint back to the top of the slope and utilize only previously disturbed lands. This would address wetland buffering and preservation of some upland habitat but would further reduce the life of the landfill and would not be feasible.

Consideration was given to the combination of Alternative 5 with this avoidance scenario as a means of eliminating wetland impact and providing greater landfill life and capacity. However, as discussed under Alternative 5, it is not a technically and environmentally prudent alternative to overfill the old landfill footprint due to the high likelihood of settlement and failure of the leachate collection and liner system. Therefore, the combination of the two alternatives is not technically prudent.

Although it is recognized that the P-4 and “Wedge” expansions involved overfills, they are not comparable projects to a GAL overfill. The technical issues are not the same. P-4 involved lateral expansion of the existing GAL limits of waste off of one side of the landfill. Waste was put in this “new” area and also piggy-backed (overfilled) against the side slope of the GAL. Both the new cell area and the existing side slope were lined with a new liner system. This is very different from trying to overfill the remaining GAL on all sides (where side slopes are steep already) without expanding the current limits of waste. The Wedge involved filling in the valley between the AIL (which was another lateral expansion of the existing GAL limits of waste) and the GAL. Both the Wedge and P-4 were founded on a stable base that lessens the potential for liner and leachate collection system failure. A GAL overfill that does not include expansion onto adjacent lands for support presents a technically difficult and unstable scenario that would offer small volume and the high potential for failure as previous stated.

Although Alternative 5 could be engineered, the existing steep side slopes prevent the provision of any significant landfill capacity (only about 1.2 years) without a lateral expansion and, as previously mentioned, present a high potential for settlement and subsequent failure of both the liner and leachate collection systems. The Wetland Avoidance Scenario provides very little

capacity (2.8 years) with a significant cost associated with moving existing infrastructure. Combination of the two scenarios is not feasible, as previously discussed for the GAL overflow.

4.2 FOOTPRINT MINIMIZATION VIA DEEPER CELL

Consideration was given to minimize the proposed expansion footprint (thereby minimizing wetland impacts) while maintaining enough cell life to make the project economically feasible by increasing the depth of the proposed landfill cell. This alternative would require a variance from the Park 360 regulations that mandate a five foot separation between groundwater and the liner. Typically, in order to make this type of design alternative technically feasible when a high groundwater table similar to that at the Rapp Road Landfill exists, a pore pressure relief system must be constructed below the landfill liner system to prevent damage of the liner due to the build-up of hydrostatic pressures.

Pore pressure relief systems, however, are only effective when the underlying site soils are of low permeability and excess pore pressure can be relieved in a passive manner by a higher permeability drainage layer. Because the underlying soils at the Rapp Road Landfill site are not low permeability soils, the option of minimizing wetland impacts by designing a smaller but deeper expansion cell is not technically feasible. The following further illustrates these points.

The current cell design maximizes cell depth with respect to the liner system/groundwater separation requirements in 6 NYCRR 360. A maximum cell depth increase of 5 feet could be achieved if a variance from the separation requirements was granted. This would require construction of a pore pressure relief system below the landfill liner. Any additional cell depth below the water table would not be feasible as the subgrade soils consist of sands and silts that cannot be drained by a pore pressure relief system due to the relatively high permeability of these soils, as noted above. Therefore, based on the maximum additional 5 feet of depth, approximately 83,000 cy of air space (less than 2 months of capacity) is provided based on the proposed cell area and configuration. Considering the intent of going deeper is to reduce the landfill footprint, even less landfill capacity would be realized. Given the additional costs of the system and the environmental concerns associated with constructing a liner system at the groundwater elevation, a deeper cell would not be recommended.

4.3 HABITAT PROTECTION SCENARIO

The proposed Eastern Expansion would require the relocation of an existing stream channel that flows through the expansion area. The initial expansion proposal extended grading to the limits of the City's property (Figure 4). As a result, the relocated stream would be constructed through high quality forested wetland habitat with a significant number of vernal pools located to the east of the expansion area. Therefore, an alternative was investigated that would provide ample room to relocate a portion of the stream on City land, eliminating the need to construct a stream channel through the wetland and vernal pools. This became the preferred alternative.

Figure 5 shows the proposed containment berm and final cover system grading for this design alternative. The total landfill cell volume was estimated to be approximately 2,870,000 cubic yards. This volume translates to a projected cell life of about 6.5 years based on current operating practices including waste flow, days of operation, and in-place waste density. Cell life calculations are provided below:

Total Volume (above liner system):	3,013,352 cy
Less cap volume:	- 146,310 cy
Net Volume:	2,867,042 cy
$2,867,042 \text{ cy} \times 1500 \text{ lbs/cy} \div 2000 \text{ lbs/ton} = 2,150,282 \text{ tons}$	
$2,150,282 \text{ tons} \div (1250 \text{ tons/day} \times 22 \text{ days/mo.}) = 78.2 \text{ months} = 6.5 \text{ yrs.}$	

The operational life under the initial alternative (extended grading limits) is 6.6 years. Also, wetland impacts were slightly reduced from 5.6 acres to 5.05 acres and the higher quality wetlands and associated habitat to the east was preserved.

The capital costs associated with construction of the landfill liner and cover systems and re-construction or re-location of existing site facilities were weighed against the benefits of proposed facility. Because the reduction of the operational life due to the proposed reduction in the expansion footprint is relatively small compared to other alternatives, this design option was determined to be feasible and preferred.

5.0 SOURCE REDUCTION

The following alternatives evaluate other means of reducing the need for landfilling and thus extending the life of the existing landfill and the proposed expansion.

5.1 REDUCE, REUSE, RECYCLE

The 1992 SWMP was developed to meet the solid waste management needs of the ANSWERS communities in an efficient manner, aligned with statewide directives. Waste reduction is a primary focus of the SWMP and is achieved through source reduction, reuse of materials, and recycling. New York State has proposed a long-term goal of 50% statewide waste reduction, with 40-42% of all waste being reduced through reuse and recycling. The ANSWERS Planning Unit has developed a recycling program aiming to achieve these goals.

The original approved SWMP set a recycling goal of 40%, but explicitly noted that these specific numerical goals are not intended to be used as regulatory requirements. Since the approval of the original SWMP, the City and other members of the Planning Unit have undertaken most of the waste reduction and recycling measures called for by the original SWMP.

In the ANSWERS Wasteshed, materials eligible for recycling include paper and cardboard, bottles and cans, plastics, metals, waste oil, leaf and yard waste, construction and demolition debris, tires, and white goods. The City of Albany, the Villages of Green Island and Voorheesville, and the Towns of Bethlehem and New Scotland, provide for curbside collection of residential recyclables either through the use of municipal forces, or by contract or requirement with the private sector. Recycling drop-off facilities are also available to residents and businesses of the other municipalities in the planning unit, as well as in several of those listed above. Individual communities are responsible for developing programs to facilitate and promote the achievement of waste reduction goals.

Every two years, on behalf of the ANSWERS Planning Unit, the City of Albany prepares a SWMP Compliance Report, the most recent of which was submitted in 2007 and covers the calendar years 2005 and 2006. As part of the SWMP Modification, CHA reviewed the data, made follow-up contacts with appropriate municipal officials, as necessary, and based upon an evaluation of each, made some modifications to the recycling summary tables for 2005 and 2006.

Based upon that analysis, the total municipal residential waste diversion rate for the Planning unit was over 32 % in both 2005 and 2006. These diversion rates vary significantly between municipalities, in large measure due to varying quantities of yard waste recovered for recycling. All of the urban and suburban communities have fully implemented yard waste collection and recycling programs, but there is wide variation between municipalities in the amount of yard waste recovered for composting or recycling. Because of their denser land use patterns, urban municipalities like the City of Albany will generate less yard waste than more suburban municipalities like Bethlehem and Guilderland. In communities that are more rural, less yard waste is generated for off-site management because more residents manage their yard waste on their own property.

While these rates might appear to fall short of the original State-designated goal of 40-42% recovery, that is not necessarily the case because they do not include most residential and commercial, industrial and institutional (CII) sector recycling serviced by commercial haulers and they do not include the recycling and/or re-use of C&D debris.

From the responses to the commercial waste generator survey conducted as part of the SWMP Modification, significant commercial waste recycling program elements were being implemented among the largest employers in the Planning Unit. Waste diversion or recycling rates calculated from those respondents reporting numerical data ranged from a low of 11 % at St. Peter's to a high of 59 % for the OGS. The weighted average diversion rate calculated for the private sector commercial generators is 20%. An overall weighted average commercial waste diversion rate of 46% results when the OGS recycling and waste disposal tonnage is included. While we do not assume that this average diversion rate would be applicable across the entire commercial, industrial and institutional waste sector, the results do show significant implementation efforts are presently on-going with respect to waste reduction and recycling programs in the Planning Unit. As part of this SWMP Modification, measures were proposed to enhance the implementation of commercial recycling and waste reduction.

Finally, the recycling and diversion rates noted above do not account for the recycling of C&D debris, which is a significant component of the solid waste stream. Based on the results of the SWMP Modification, CHA estimates that total C&D generation amounts to about 4 lb per person per day, and that approximately 75 % of C&D is recovered for re-use and recycling. While there is a limited amount of data reported to the Planning Unit with which to confirm this estimate, several components of the C&D waste stream are recycled at the Rapp Road Landfill, including soil from construction projects and other alternative daily cover materials. These

materials amounted to nearly 68,000 tons in 2006, and this does not include the over 72,000 tons of petroleum contaminated soil (PCS) accepted and also used for alternative daily cover in 2006. Because much of the PCS is believed to originate outside of the Planning Unit, it is not being considered in this discussion of C&D material recycling. It is also worth noting that the City of Albany has significantly reduced the tonnage of ADC it accepted at the Landfill in 2007. It is assumed that this recovered material is being directed to other facilities for use as ADC. W.M. Biers Solid Waste Facility, a C&D Processing facility located in the Port of Albany, reportedly recovered over 7,200 tons of material for recycling in 2006. Taken together, these measured data represent approximately 51% of the estimated quantity of C&D generated in the Planning Unit in 2006.

CHA has also documented reduction and recycling in the planning unit in 2007, based on surveys administered as part of the SWMP Modification and on Annual Reports for 2007 submitted to the NYSDEC by solid waste management facilities. These results indicate that nearly 34,000 tons of MSW were recycled from municipal and commercial programs. This does not include recycling by the NY SOGS because it has not yet compiled these results for 2007. The results also indicate that over 96,000 tons of C&D materials have been recycled in the Planning Unit in 2007, including soil and other materials (but not PCS) recycled as ADCM at the Rapp Road Landfill, and recycled concrete and asphalt from several C&D processing facilities in Albany County. In total, in 2007 approximately 130,000 tons of material were documented as recovered for recycling.

Net waste disposal from the planning unit was determined by adding the reported waste quantities delivered to the Rapp Road Landfill, the Town of Bethlehem C&D Landfill, with waste generated in the planning unit waste which disposed outside the planning unit (i.e. waste delivered to Waste Management's Boat Street transfer station, which is disposed of at High Acres Landfill and the Hudson Falls Waste to Energy Facility). Net waste disposal also subtracts the tonnage delivered to the Rapp Road landfill from the Schenectady Transfer Station, even though some of the waste delivered to that transfer station is believed to originate in the Planning Unit. Overall, net waste disposal in 2007 amounted to over 226,000 tons as noted below:

- Disposal at Rapp Road Landfill - 253,300 tons
- Disposal at Bethlehem Landfill – 1,959 tons
- Waste exported for Disposal - 66,714 tons
- Tonnage from Schenectady Transfer Station – (95,502)

Net Waste Disposal from the Planning Unit – 226,471 tons

Based on these recovered material and disposal quantities, the overall Planning Unit diversion rate in 2007 was over 36%. This may underestimate the actual recyclable diversion rate because there are likely additional recyclables recovered that are not quantified here (e.g., the OGS recyclables) whereas the disposal tonnage is very well quantified.

The Eastern Expansion has been proposed to address capacity issues as the volume of waste held at Rapp Road Landfill approaches permitted limits. ANSWERS waste reduction extends the landfill's life span by diverting a substantial volume of material to other locations. Future diversion rates may be further improved through stricter enforcement of Chapter 313-16 of the City of Albany Solid Waste Code that mandates "all commercial, industrial and institutional establishments within an area of the City subject to a curbside program...shall source-separate and arrange for the collection...of all designated recyclables." Through the SWMP Modification the City has committed to increase the education and enforcement of this requirement, and as a condition of future landfill use, will require its member communities to do likewise.

As noted previously, a SWMP Modification has been prepared and is currently under review. The SWMP Modification has re-evaluated the existing options for the Planning Unit to reduce, re-use and recycle solid waste so that disposal quantities can be minimized. No changes to the maximum recycling goals set forth in the original SWMP are proposed as part of the SWMP Modification. Among other things, the SWMP Modification outlines certain program improvements that will be made, particularly with respect to education and enforcement of mandatory recycling among commercial, industrial and institutional waste generators. These are presented in Section 2.1 of the SDEIS.

Implementation of the waste reduction and recycling measures identified in the SWMP modification will reduce the quantity of waste requiring land disposal and as a result, will extend the useful life of both the existing landfill operations and the proposed Eastern Expansion. For 2007, nearly 34,000 tons of MSW were recovered for recycling from residential and commercial sources. Assuming that this recycled tonnage can be progressively increased to 50,000 tons per year by the end of 2012 (about 4 ½ years from now), a total reduction of land disposal requirement through the projected life of the proposed Eastern Expansion (approximately 6.5 years or by year 2016) would be about 98,000 tons, which is equivalent to 4.25 months of landfill capacity. Based on this analysis and the goals of the SWMP Modification, the recycling efforts alone will not have a significant impact on landfill life. It should be further noted that the

existing landfill (P-4) is still projected to close in 2009. The potential increase in recycling by 2009 is only about 6,000 tons, which will have a negligible effect on landfill life.

5.2 INCINERATE

Incineration is a waste disposal method to reduce the volume of waste and increase landfill capacity. It involves the combustion of waste at high temperatures and can be used to convert waste into energy. The NYS Office of General Services discontinued its use of incineration in 1994 due to its inefficiencies and potential environmental concerns associated with air emissions.

5.3 COMPOST

Several communities within the ANSWERS consortium dispose of waste in remote dumping areas or at composting sites. In 1990 the City of Albany developed a Compost Facility to receive grass clippings, leaves, brush, and branches. It is still in operation and located at the Department of General Services offices located at One Connors Boulevard in the City of Albany.

6.0 OFF-SITE DISPOSAL ALTERNATIVES

Another alternative to the proposed Eastern Expansion is to instead transfer and transport solid waste to another permitted disposal site. This section of the report will address this alternative by identifying potential transport and disposal options and constraints, estimating the cost, and the environmental and economic impacts associated with this alternative.

In particular, this alternative is defined to include the redirection of all the waste currently permitted for disposal at the Rapp Road Landfill (1,050 TPD at 264 days per year, or 277,200 TPY). This waste acceptance rate is not proposed to increase in connection with the Eastern Expansion.

6.1 ALTERNATIVE DISPOSAL LOCATIONS

There are 28 permitted MSW landfills in New York, including the Saratoga County Landfill, which is built but not operating. Of the 27 operating sites, 6 are privately owned and operated, 17 are publicly owned and operated, and 4 are publicly owned but leased to private operators. Privately owned and/or operated landfills are typically not restricted with respect to the origin of the waste that is accepted, but all landfills in New York have defined tonnage limits above which they are not permitted to accept. This is often referred to as the design capacity.

There are also 10 permitted and operating waste-to-energy (WTE) facilities that process MSW while recovering materials and energy. Most of these WTE facilities are operated by private companies on behalf of a municipal entity which in some cases may own the facility. Facilities that are operated by or on behalf of a municipality typically must service the waste from the sponsoring agency before it can consider accepting additional waste from other areas. For purposes of this analysis, the term “commercially available disposal capacity” was used to define that capacity that is not restricted with respect to waste origin or long-term commitment to a particular community.

Most landfills or WTE facilities that provide commercially available disposal capacity in New York are already operating at or near their design capacity. On a statewide basis, there is an overall shortage of MSW landfill capacity. According to the NYSDEC Solid Waste Information management System (SWIMS) database, approximately 10.4 million tons of waste generated in New York was disposed of at MSW landfills and WTE facilities that are located in New York.

In order to assess potential alternative disposal facilities to the proposed Eastern Expansion, information was compiled on other permitted MSW landfills and WTE facilities with a minimum annual tonnage limit of 250,000 TPY. This threshold for WTE facilities was established to represent a reasonably conservative approximation of the capacity required to be able to potentially accept a significant quantity of the up to 277,200 TPY of waste that would require export under this alternative to the Eastern Expansion. Table 5 presents a summary of all the other currently permitted MSW landfills in New York State. Table 6 presents a summary of the 6 currently permitted WTE facilities which meet the above-noted size criteria.

**Table 5
Other Permitted Municipal Solid Waste Landfills in New York**

Facility Name	Location (County)	Annual Tonnage Limit (1)	Actual Waste Acceptance(2) 2006 (tons)	Estimated Capacity Available (TPY)	Reported Tipping Fee(2) 2006 (\$/ton)
Landfills					
Allegany County	Allegany	56,680	47,113	9,567	\$ 30.00
Allied/BFI Niagara Falls Landfill (3)	Niagara	660,000	518,767	141,233	NA/ Not Reported in 2005
Auburn Landfill No. 2	Cayuga	76,000	83,400	-	\$72.00
Ava Landfill	Oneida	255,000	54,097	NA (6)	Not reported
Bath Sanitary Landfill	Steuben	152,500	107,080	45,420	\$38.00
Bristol Hill SLF	Oswego	100,000	53,568	46,432	\$ 45.00
Broome County Landfill	Broome	232,000	214,475	17,525	\$ 40.00
Chaffee Landfill (3)(4)	Erie	600,000	277,918	None (3)	\$40.00
Chautauqua Landfill	Chautauqua	408,000	382,050	25,950	\$24.00
Chemung County Sanitary Landfill	Chemung	120,000	135,913	-	\$40.00
Chenango County Landfill	Chenango	45,750	34,550	11,200	Not reported
Clinton County Landfill	Clinton	175,000	172,879	2,121	\$54.75
Colonie Sanitary Landfill (8)	Albany	167,750	159,212	8,538	\$57.00
Cortland County Landfill	Cortland	44,500	24,570	19,930	\$60.00
Delaware County SWMF	Delaware	76,250	35,077	41,173	\$ -
DANC Landfill	Jefferson	346,320	349,083	-	\$41.00
Franklin County Regional Landfill	Franklin	43,500	42,197	1,303	Not reported
Fulton County Landfill (8)	Fulton	134,000	113,231	20,769	\$46.00
High Acres West. Exp. LF	Monroe	1,074,500	987,270	87,230	\$40.00
Hyland Landfill	Allegany	232,440	231,868	572	\$35.00
Madison County LF	Madison	61,000	53,063	7,937	\$62.00
Mill Seat SLF	Monroe	593,225	596,179	-	\$45.00
Modern Landfill (3)	Niagara	815,000	804,966	10,034	NA/ Not reported in 2005
Ontario County SLF	Ontario	624,000	619,510	4,490	\$28.98
Saratoga County Landfill (5)	Saratoga	106,000		None (5)	NA
Seneca Meadows LF	Seneca	1,842,000	1,853,251	-	Not reported
Sullivan County Landfill	Sullivan	226,000	69,974	NA (7)	\$75.00

Notes:

- (1) Based on Facility Permit, annualized based on operational days if applicable.
- (2) Based on the Facility's annual report to NYSDEC, unless otherwise noted.
- (3) waste acceptance is for 2005 based on annual report
- (4) 2005 annual report noted that only 1 yr and 2 mo. of capacity remained as of 12/31/05
- (5) The Saratoga County Landfill has never been operated and is not presently available for operation
- (6) Oneida Herkimer SWA's Ava LF commenced operation in October 2006 and is only available for waste from these counties.
- (7) Sullivan County Landfill is not currently accepting out-of-county waste.
- (8) Tipping fee is based on telephone communication between CHA and facility operator.

Table 6
WTE w/ Disposal Capacity in Excess of 250,000 TPY

Facility Name(3)	Location (County)	Annual Tonnage Limit (1)	Actual Waste Acceptance(2) 2006 (tons)	Estimated Capacity Available (TPY)
Hempstead	Nassau	914,325	948,853	-
Babylon	Suffolk	273,750	225,689	48,061
Huntington	Suffolk	350,400	324,413	25,987
Charles Point	Westchester	686,250	675,990	10,260
Onondaga County	Onondaga	361,350	345,235	16,115
American Ref-Fuel Niagara	Niagara	696,675	753,142	-

Notes:

- (1) Based on Facility Permit, annualized based on operational days if applicable.
- (2) Based on the Facility's annual report to NYSDEC, unless otherwise noted.
- (3) waste acceptance is for 2005 based on annual report

The data compiled in these tables is from the most recent annual report (2005 or 2006) for each respective facility that is available from the NYSDEC Division of Solid and Hazardous Materials (DSHM). As can be seen in the tables, most of the facilities are operating at or near their respective annual limits. When tipping fee data was reported by the landfills, it is included in Table 5.

In addition to the disposal facility data, information available from the DSHM was used to identify currently permitted transfer stations in the Albany region that might have the capability of accepting a significant quantity of the up to 277,200 TPY of waste that would require export under this alternative to the Eastern Expansion. Table 7 presents a summary of information from the 3 existing transfer stations in the region that have the capacity to accept in excess of 100,000 TPY in waste deliveries.

**Table 7
Large Transfer Station Capacity in Capital District**

Facility Name	Location	Annual Tonnage Limit (1)	Actual Waste Acceptance(2) 2006 (tons)	Reported Tipping Fee(2) 2006 (\$/ton)
WMNY Port of Albany (3)	Albany	227,696	108,905	\$ 75.00
ECO B3 (4)	Canaan	158,080	105,766	Not Reported
City of Schenectady (5)	Schenectady	272,080	167,706	\$ 90.00

Notes:

- (1) Based on Facility Permit, annualized based on operational days if applicable.
- (2) Based on the Facility's annual report to NYSDEC, unless otherwise noted.
- (3) Facility tonnage limit is 749 TPD, but is limited to C&D and non-putrescible commercial waste
- (4) Facility tonnage limit is 520 TPD, but is limited to 345 TPD of MSW and 175 of C&D.
- (5) Facility tonnage limit is 895 TPD based on maximum monthly average.

None of these three facilities has the capacity to accept all the waste that would require export under this alternative. The WMNY Port of Albany transfer station is only permitted to accept non-putrescible commercial MSW and C&D. The ECO-B3 facility has annual permitted capacity of approximately 158,000 TPY, but is limited to accepting no more than 345 TPD of MSW, which would correspond to about 105,000 TPY. Finally, the City of Schenectady Transfer Station is permitted to accept up to 895 TPD on a monthly average, or approximately 272,000 TPY. This facility is already reportedly operating close to its monthly capacity limit (Carl Olsen, Personal communication on July 10, 2007).

Tables 5 and 6 clearly show that no one landfill or WTE facility has sufficient additional capacity to be able to accept an additional 327,000 TPY that would be required to replace the capacity of the proposed Eastern Expansion. To accommodate such an alternative, an existing permitted site would need to displace one or more of its existing customers to release that capacity for utilization by the Rapp Road Landfill waste stream. This would likely cause economic hardship on the displaced community waste streams, as well as additional environmental impacts associated with transfer to another more distant disposal site. Alternatively, the capacity needed could be split among several existing disposal sites. However, given the overall shortage of additional disposal capacity in New York, the net effect of waste displacement would likely be the same. Nevertheless, in the following sections of this alternatives analysis, we will assume that disposal capacity will be available at a single site.

Based on the transfer station information presented in Table 7, it is clear that there is no existing local transfer station capacity that is available to accept any significant portion of the 327,000

TPY of waste that will require export under this alternative. Therefore, this alternative would require that a new transfer station be developed to accommodate this waste stream, and the following sections of this analysis will reflect that assumption.

6.2 UNIT COSTS FOR SHIPPING AND DISPOSAL

Tipping fees from other permitted MSW landfills in New York are shown in Table 5-3, and range from \$24/ton to \$75/ton. However, as noted previously, most of the permitted disposal facilities in New York are operating at or near their approved design capacity, and none have sufficient excess capacity to accept all of the 1,050 TPD of waste that will be managed at the proposed Eastern Expansion.

With the exception of the Colonie Landfill, all of the other permitted disposal facilities are outside of Albany County and would require transfer and long distance transport.

Clough Harbour recently sought to obtain general tipping fee and transport cost data from several private upstate facilities. The results are summarized below:

- High Acres Landfill – Fairport, NY - \$46.50/ton (tipping and transport based on information gathered from a recently awarded contract with another municipality located closer to the landfill)
- Ontario County Landfill – Seneca, NY - \$45.00/ton (tipping and transport based on information gathered from a recently awarded contract with another municipality located closer to the landfill)

These tipping fee and transport costs are not directly applicable to this alternative because the quotations were not for a site in the Albany region and are for sites closer to those respective landfills. In addition, since these data were gathered in 2007, the transport cost element does not incorporate the effect of the significant increase in diesel fuel costs that have occurred since then.

CHA has also estimated the costs associated with the construction and operation of a new transfer station with sufficient capacity to handle approximately 1,050 tons per day, including transport. The estimate assumed the modification of the tipping floor at the Rapp Road site to create a bi-level facility for efficient waste transfer and the transport of waste to the High Acres Landfill, a round trip of 415 miles. The cost of acquiring and operating the tractor-trailers required to accomplish this alternative is estimated at approximately \$45/ton. Applying the \$40 per ton tipping fee reported by High Acres, total cost of transport and disposal (T&D) would be \$85/ton. Based on the assumption that a volume based discount can be applied at the disposal

site, and based upon the range of tipping fees reported at the existing facilities noted above, for purposes of this analysis CHA estimates the cost of T&D to be \$83/ton (not including the cost of transfer station construction and operation). The cost of tipping floor modifications and non-transport related transfer station operations would add approximately \$7 per ton to the cost, bringing the total cost of transfer, transport and disposal (TT&D) to approximately \$90/ton.

This estimate is generally confirmed by the tipping fee of \$90/ton, reported by the City of Schenectady transfer station in its Annual Report to DEC for 2006, which noted at that time its waste delivery was primarily to the Seneca Meadows Landfill. Because of the significant increase in the price of diesel fuel that has occurred since 2007, when these cost estimates were prepared, the estimated TD&D cost of \$90/ton may represent an underestimate of actual costs that would be incurred during the summer of 2008”.

6.3 SOLID WASTE DELIVERY RATES TO RAPP ROAD LANDFILL

The Rapp Road Landfill derives its solid waste or re-usable materials from a variety of sources including:

- Residential municipal solid waste collected (MSW) by the City of Albany
- MSW from other ANSWERS communities delivered directly by those communities
- MSW & C&D Debris collected by commercial haulers from generators in the City or other ANSWERS communities.
- MSW & C&D Debris collected by haulers from generators in the City or other local communities that are not part of ANSWERS.
- Sewage treatment plant sludge from the Albany County WWTP and the towns of Bethlehem and Guilderland WWTP plants.
- Petroleum Contaminated Soil (PCS) brokered by the City of Albany Department of General Services.
- Alternative Daily Cover Materials (ADCM).

Based upon information reported in the Landfill’s 2005 Annual Report and from the information presented in Appendix C, deliveries from calendar year 2005 are presented below:

- Residential MSW collected by the City of Albany – 32,119 tons
- MSW delivered directly by other ANSWERS communities – 38,522 tons
- Other MSW delivered from ANSWERS or other local sources – 157,518 tons
- C&D delivered from local sources – 6,107 tons
- Sewage treatment plant sludge – 1,866 tons
- PCS – 68,444 tons (used as an ADCM and not counted against approved design capacity)
- ADCM – 56,185 tons (not counted against approved design capacity)

Total waste deliveries to the Rapp Road Landfill in 2005, not including PCS and ADCM, was 236,157 tons.

6.4 ESTIMATED SHIPPING AND OFF –SITE DISPOSAL COST

Currently, City of Albany waste disposal costs are subsidized by tipping fees paid for by other users. Based on the 2005 waste delivery rates and the \$83 per ton estimated TTD cost noted earlier, if the Eastern Expansion is not approved and future waste must be exported for disposal at a commercially available site, the estimated cost for the City of Albany to transfer and dispose of its own residential collected MSW would be **\$2,666,000** per year.

If the proposed Eastern Expansion is not approved, other members of the ANSWERS community and other local users of the landfill will also need to utilize an alternative disposal site and will incur additional costs to do so. Based on the 2005 waste delivery rates and a \$90 per ton cost for TT&D (compared to the existing \$52/ton tipping fee at the landfill for the ANSWERS communities), the estimated increase in cost to transfer and dispose this MSW and C&D would be **\$7,450,000**.

There will also be cost increases associated with the disposal of PCS, currently at \$25/ton, and ADCM. These anticipated cost increases are not quantified here.

There could also be negative economic impacts on communities or waste generators who are displaced from disposal sites in order to accommodate the disposal from the Albany waste shed. These displaced communities will likely need to utilize a more distant disposal site, perhaps outside of New York, along with the attendant increases in cost.

6.5 SOLID WASTE RELATED SERVICES

The City of Albany provides its residents with a number of solid waste related services, including separate curbside collection of MSW and recyclables, compost facility, special material collection (scrap metal/appliance, yard waste), and household hazardous waste collection days. These services are funded through revenue derived from the operation of the Rapp Road Landfill and would continue to be funded through revenue derived from the operation of the proposed Eastern Expansion. Costs associated with running these programs include the capital cost, labor, tipping fees, and equipment required to run the programs. Based

on an estimate prepared by the City, the projected annual cost for fiscal year 2007 to run the recycling program, excluding management costs, is:

- Curbside Recycling Collection \$738,900
- Compost Facility and operations \$109,600
- Special Collection \$338,200
- Household Hazardous Waste \$140,000
- Other Recycling Program Costs \$55,000

Total Recycling Services Cost is thus \$1,381,700.

Based on an estimate prepared by the City, the projected annual cost for fiscal year 2007 for curbside collection of MSW, excluding management costs, is:

- Curbside MSW Collection \$1,687,300

In addition, this alternative would require the City to construct and operate a transfer station to process waste for off-site shipping and disposal. CHA has also estimated the costs associated with the construction and operation of a new transfer station with sufficient capacity to handle 1,050 tons per day, including transport. The modification of the tipping floor at the Rapp Road site to create a bi-level facility for efficient waste transfer is estimated to cost approximately \$2.9 million. In addition, the City would need to invest in new operating equipment for the transfer station. Total initial capital cost, including the new operating equipment will be approximately \$4,825,400. These capital expenses when amortized will represent an annual expense of approximately \$520,500.

Annual operating cost for the transfer station is estimated at approximately \$2,039,000 including debt service on initial capital cost.

This amount to approximately \$7/ton, and when added to the previously noted shipping and disposal cost estimate of \$83/ton, would yield a total TT&D cost of approximately \$90/ton.

6.6 LONG TERM DEBT SERVICE

Long term debt service from the existing operation of the Rapp Road Landfill and other solid waste related projects is funded through revenue derived from the operation of the Rapp Road Landfill and would continue to be funded through revenue derived from the operation of the proposed Eastern Expansion. If the Eastern Expansion Project is not permitted, it would be

necessary to pay this debt service using an alternative revenue source or the City of Albany's General Fund. The approximate cost of the debt service for these bonds in fiscal year 2007 is:

- Annual Debt Service **\$2,376,100**

6.7 TOTAL ESTIMATED ANNUAL COSTS

The total estimated annual cost which would be incurred by the City of Albany for Solid Waste Management activities (including transfer, transport and off-site disposal, recycling, composting, curbside collection, transfer station operation, and long term debt service) are summarized below. It would be necessary to pay this cost using an alternative revenue source or the City of Albany's General Fund.

- Offsite transport and Disposal - **\$2,666,000**
- Recycling Related Services – **\$1,381,700**
- Curbside Collection of MSW - **\$1,687,300**
- Transfer Station Operating Cost - **\$2,039,000**
- Long Term Debt Service - **\$2,376,100**

Total Estimated Annual Cost - **\$10,150,100**

This does not include the future costs of landfill closure and post closure care that could have been funded out of tipping fee revenues derived from the Eastern Expansion. A portion of this cost could be funded by tipping fees generated from a transfer station operated by the City of Albany. However, without the City's landfill, the revenue generated from tipping fees would be dependent upon the costs at other disposal facilities and the costs of transportation. Therefore, a fixed revenue stream would not be guaranteed to the City of Albany. Furthermore, in the event other revenue streams are not available to the City to offset these substantial increased costs, the City could be forced to curtail or eliminate recycling services in order to save money.

Put a slightly different way, the operation of the landfill provides revenues sufficient to pay for the City's solid waste and recyclables collection services (\$3,069,000) and annual debt service for bonds issued for solid waste related projects (\$2,376,100), for a total of \$5,445,100. To the extent revenues from the operation of the landfill exceed this amount, those revenues are paid into the general fund to reduce the total tax burden on the residents of the City of Albany. In the event the Eastern Expansion were not approved, the City would not only have to find an alternative source of revenues for these costs, it would incur an additional \$4,705,000 per year in transfer and hauling costs and the operation of a transfer station.

In addition, if the proposed Eastern Expansion is not approved, the Albany Pine Bush Preserve Commission will not receive revenue that it would have anticipated to otherwise receive. Also, the habitat enhancement proposed for the Pine Bush as part of the Eastern Expansion will not be undertaken.

This alternative of waste exportation instead of the Eastern Expansion would also likely result in the loss of several jobs at the landfill site which would no longer be necessary upon its closure. There will be additional negative economic multiplier effects, such as the local contractors and subcontractors typically utilized by the City in connection with the construction and operation of the landfill who will experience a business downturn when the landfill stops operating.

Additional adverse environmental impacts can also be anticipated as a result of waste exportation due to increased air emissions associated with increase long distance transport of Albany area waste that is no longer able to be managed locally. It is estimated that nearly 925,000 gallons of diesel fuel will be consumed annually in connection with the long distance waste transport if the Eastern Expansion is not approved.

From every aspect analyzed, the Eastern Expansion is preferable to this alternative. The Eastern Expansion will allow for uninterrupted waste management of waste in an environmentally sound and cost effective manner for the City, the other ANSWERS communities, and other local waste generators who have come to rely on the facility. Without the expansion, residents of the region could expect the annual cost of transport and disposal of MSW and C&D to increase by over \$7 million. Moreover, the Eastern Expansion will provide much needed disposal capacity for New York communities, and in this way is consistent with both the most current policy of the New York State Solid Waste Management Board, which recommends that New York State take steps to become more self sufficient for landfill capacity.

6.8 ADDITIONAL GHG EMISSIONS

In addition to the financial implications of a long haul scenario, there are environmental costs to consider. Specifically, adding the long haul would result in another source of GHG emissions from trucking. Assuming the total solid waste to be hauled remains at 1050 tons per day and that each tractor trailer could carry approximately 25 tons, approximately 42 trucks would be required to haul the solid waste produced each day from the City and region. Using an average of 6 MPG for a diesel tractor trailer, approximately 7,338 tons per year of CO₂ would be

generated. This is in addition to the CO₂ and methane produced by the solid waste that is placed in the regional landfill.

In the long term, the ANSWERS communities will likely develop the methods and means by which the total waste is reduced. Fiscal implications alone will drive this. However, in the short term, there would be little choice as there is no quick solution to the reduction of solid waste produced.

7.0 NO-ACTION ALTERNATIVE

Under the no action alternative the landfill will reach capacity by November, 2009. Without an expansion option, the City would no longer be able to accept waste from ANSWERS at the Rapp Road facility. This will not be enough time to receive approvals for the Coeymans site, leaving the City with no options for landfilling in the region. Therefore, the only viable alternative remaining is the transport of waste to a long-haul facility, as discussed in Section 6.0.

The adverse fiscal implications to the City of Albany are too significant to consider the no-action alternative a feasible option.

The environmental benefits of this alternative are the elimination of impacts to the ecology of the expansion area, including approximately 5.05 acres of wetland. Additionally, it would eliminate the general land use issues associated with landfill expansion adjacent to the Albany Pine Bush Preserve.

This alternative would also eliminate the need and the financial ability to implement the Habitat Plan by the City. As a result, many degraded systems will not be addressed and the conversion of the mobile home park to pine barrens habitat would not occur without an initiative from the APBPC through other funding sources.

8.0 CONCLUSIONS

8.1 SUMMARY

The alternative sites analysis reveals that the proposed Rapp Road Landfill Eastern Expansion ranks the highest due to the fact that this alternative avoids the need to retrofit a new landfill operation on a new site. Selection of a new site would be a far more costly proposition for the

City that would yield limited capacity (an interim solution) and would result in greater land use, traffic and infrastructure impacts than what is anticipated for the Eastern Expansion.

The Coeymans site remains a potential long term solution but the extent of impact to federal and State wetland far exceeds that of the proposed Eastern Expansion with the habitat avoidance scenario and therefore is not presented as a viable alternative.

Several expansion or on-site alternatives were considered to avoid or minimize the proposed wetland impacts. Options that avoid wetland impact are either not technically feasible or provide too little capacity to meet the project purpose and need. The overfill alternative for the old landfill area (GAL) is not feasible since the high potential for differential settling would compromise the leachate collection and liner systems that would be costly to repair and could result in environmental damage. Likewise, any alternative that would result in a deeper cell, intersecting the groundwater table would result in a high potential for groundwater contamination. The potential to avoid wetland impacts by utilizing the overfill portion of the proposed Eastern Expansion would provide minimal capacity and landfill life that would have significant impacts on the City's budget and insufficient time to plan for and implement a long term solution through the New SWMP process.

The proposed Eastern Expansion with the habitat avoidance scenario minimizes wetland and other habitat impacts to the greatest extent practicable. This alternative resulted from consideration of western and northern expansions that would have provided greater landfill capacity but would have also resulted in impacts to sensitive ecological communities. Additionally, the full footprint of the Eastern Expansion was reduced to reduce wetland impacts and protect high quality upland, wetland and vernal pool habitat to the east.

Continued efforts to increase the diversion rate through reduce/reuse/recycle are an important component of the long term solutions for the ANSWERS communities. However, significant reductions in the short term are not realistic.

Fortunately for the State, there are some larger operating landfills that can accept wastes on a State-wide or regional basis. For some, this option is reasonable. For the ANSWERS communities, this option is too costly for the short term due to the long haul, conversion to a transfer station in Albany, lack of funding and the immediate impact on the City's budget. Given the lack of foreseeable local landfilling options, the long haul remains a potential long term solution coupled with other measures to reduce the amount of waste transported, such as the composting of food wastes.

8.2 EVALUATION OF STANDARDS FOR PERMIT ISSUANCE

In order to obtain wetlands permits from both NYSDEC and USACE, it is necessary to meet the standards for permit issuance. For the State, these standards are set forth in 6NYCRR 663 Freshwater Wetlands Permit Requirements. The first step in evaluating these standards is to identify whether or not the project is compatible with the accepted uses in Freshwater Wetlands and their 100 foot Adjacent Areas. The regulations indicate that the filling of Freshwater Wetlands is not considered a compatible use thus requiring an evaluation of “weighing standards” identified in 6 NYCRR 663.5(e). For Class II wetlands there are two standards that must be met:

- The proposed activity must be compatible with the public health and welfare, be the only practicable alternative that could accomplish the applicant's objectives and have no practicable alternative on a site that is not a freshwater wetland or adjacent area.
- The proposed activity must minimize degradation to, or loss of, any part of the wetland or its adjacent area and must minimize any adverse impacts on the functions and benefits that the wetland provides.

In addition, as specified in 6 NYCRR 663.5(e) for Class II wetlands, “A permit shall be issued only if it is determined that the proposed activity satisfies a pressing economic or social need that clearly outweighs the loss of or detriment to the benefit(s) of the Class II wetland.”

These standards contain several parts that are addressed separately as follows:

Public health and welfare - The SDEIS fully demonstrates the public need and benefits of the Eastern Expansion. The wetland impacts will not pose any public health, safety and welfare risks. Although located adjacent to public lands, the expansion area is not adjacent to any public trails. Expansion of the landfill is essential to maintain solid waste disposal to the City of Albany and ANSWERS communities and provide sufficient time to identify and implement and alternative waste disposal option for the future that will not involve disposal of wastes at the Rapp Road facility. The primary issue of public concern with the landfill and proposed expansion is the potential for odors. The odor problem has been addressed through several measures as discussed in SDEIS Section 3.8 and there have been significant, measureable improvements. With the technology in place to capture and destroy the methane from the

existing landfill and the proposed expansion coupled with other measures to eliminate significant sources of odor causing materials, no significant odor impacts are anticipated from the proposed expansion.

Only practicable alternative to accomplish applicant's objectives – The alternatives analysis provided in SDEIS Section 5.0 along with the discussion of public need provided in Section 2.0 clearly shows that the Eastern Expansion is the only practicable alternative that will provide the capacity and lifetime sufficient to allow the City to evaluate and implement other solid waste disposal alternatives. There are other larger alternatives that would better meet the City's goal of 7-10 years of capacity. They included the northern and western expansions. However, the City recognizes that these alternatives are contrary to the Albany Pine Bush Preserve Commission goals for the preserve and could possibly impact some significant habitat.

No other practicable alternatives that do not involve impact to Freshwater Wetlands or their Adjacent Areas – As discussed in SDEIS Section 5.0 and Appendix L, the only alternatives that avoid wetland impacts and do not impact other important ecological resources are the overfill portion of the Eastern Expansion, referred to as the Wetland Avoidance Scenario, and the GAL Overfill (vertical expansion). The latter alternative is not technically feasible. Although it could be engineered, the existing steep side slopes prevent the provision of any significant landfill capacity (only about 1.2 years) without a lateral expansion and present a high potential for settlement and subsequent failure of both the liner and leachate collection systems. The Wetland Avoidance Scenario provides very little capacity (2.8 years) with a significant cost associated with moving existing infrastructure. Combination of the two scenarios is not feasible, as previously discussed for the GAL overfill and even if they were, would only provide 4 years of capacity which would not meet the City's stated goals nor would provide sufficient time to prepare a new SWMP, identify a suitable alternative, and implement it.

Minimization of Impacts to Wetlands – The City has gone to great lengths to avoid impacts to wetlands and other important ecological communities. The proposed Eastern Expansion will partly involve an expansion on upland areas that are currently developed with landfill infrastructure and buildings. In order to accommodate this expansion, infrastructure will be relocated and new buildings constructed on adjacent private lands that will be purchased. The remaining expansion has been limited to City land that has not been dedicated to the Preserve. This area has been fully investigated through wetland delineation and detailed assessment of vegetation, soils, hydrology, and habitat characteristics. The analysis shows past degradation to this area which is documented in the SDEIS Section 3.3 and Appendix D. As originally planned,

the Eastern Expansion would result in grading to all property limits, resulting in approximately 5.60 acres of impact. The habitat assessments for the surrounding area suggest that the habitat to the east of the expansion area is of higher quality and should be protected. The result is the proposed layout that pulls the slopes in on the east side, protecting the habitat to the east and reducing the wetland impacts to 5.05 acre. Concern was also raised by NYSDEC regarding the grading activity along the eastern side of the landfill to the south of the expansion area. This area is adjacent to NYSDEC lands and a large wetland occurs at the toe of slope which could be impacted by grading and sedimentation. The grading in this area involves slope stabilization. The slope is existing and the grades will not change significantly. However, in recognition of NYSDEC concerns, this area will be treated as part of the habitat restoration work and will be stabilized with plantings shortly after the landfill grading is complete. Additionally, the wetland at the toe of slope will be protected from sedimentation with silt fence and an orange snow fence construction barrier will be erected to prevent any unintentional incursions.

Economic or Social Need - Currently, the operation of the landfill provides approximately \$13 million in revenues. This money is used to pay for the City's solid waste and recyclables collection services (\$3,069,000) and annual debt service for bonds issued for solid waste related projects (\$2,376,100), for a total of \$5,445,100. The remaining revenue is paid into the general fund to reduce the total tax burden on the residents of the City of Albany, paying for many City services. In the event the Eastern Expansion were not approved, the City would not only have to find an alternative source of revenues for these costs, including the costs associated with various other City services, it would incur an additional \$4,705,000 per year in transfer and hauling costs and the operation of a transfer station (see SDEIS Section 5.5.7 - p. 5-32) since transport to an off-site regional landfill would be required.

Other beneficiaries would also suffer. The portion of the tipping fee that currently goes to the Albany Pine Bush Preserve would be eliminated and funding would not be available for the Habitat Plan discussed in SDEIS Section 2.8. The other ANSWERS communities would also likely be faced with higher costs. The Albany landfill provides a consistent, reasonably priced solution for solid waste management. Although it is understood that the long term alternative may well be a long haul transport of solid waste to a regional landfill, the time provided by the Eastern Expansion provides the communities with ample time to plan for the fiscal implications and participate in the process of selecting an appropriate solution.

Other expansion alternatives that avoid wetland impact (SDEIS Section 5.2) are either not feasible or result in too little time to properly plan for and implement a long term solution.

Based on the detailed field assessment of the wetlands within the expansion area, it has been determined that the wetlands are disturbed (see p. 3-61 for a definition of “disturbed”) and in their current state do not provide significant functions and benefits. One of the major elements of the Habitat Plan (Section 3.3.2.2) is to restore the historic drainage patterns across the mobile home park and eliminate the ditching and drain tiles that have dewatered the wetlands and promoted the degradation of these communities. These efforts are designed to improve water quality and enhance existing and proposed wetland communities.

The elimination of the wetlands in the expansion area will allow for the expansion of the landfill to address current needs for the ANSWERS communities and help them prepare for a long term solution for solid waste management. The economic and social needs for the expansion significantly outweigh the costs for the loss of these wetlands. Furthermore, the expansion provides the means to implement a comprehensive habitat plan that will address both mitigation, restoration and re-establishment of Pine Bush communities through a critical east-west link, and enhance existing upland and wetland ecology.

The federal standards are provided in the Section 404(b)(1) guidelines found in 40 CFR Part 230. Like the above State standards, the federal standards focus on the least damaging practicable alternatives and require that projects evaluate alternatives that avoid and minimize the impacts to aquatic resources. The guidelines also recognize that the alternatives should not result in other non-aquatic impacts that would be damaging to the environment. The avoidance and minimization of impacts to sensitive ecological communities, including wetlands, have been a key component throughout the process of siting and designing the proposed expansion and have been thoroughly explored in SDEIS Sections 2.0 and 5.1 and Appendix K (Alternative Sites Analysis).

Based on the exhaustive analysis of alternatives that has occurred over a period of several years documented in SDEIS Section 5.0 and in this report, coupled with the detailed analysis of site conditions documented throughout the SDEIS and specifically in Section 3.3 and Appendix D for ecological resources, there are no other practicable alternatives that meet the City’s needs to continue uninterrupted solid waste management services until a suitable alternative is identified and implemented through the new SWMP. Other alternatives with sufficient capacity that would result in less wetland impact were evaluated and presented in this SDEIS, however they would potentially result in significant impact to high quality and unique ecological communities

(western expansion) or would create barriers that would significantly limit the Pine Bush Preserve Commission's goal to link habitat (Preserve lands) from east to west.


Since the expansion is occurring adjacent to the existing landfill operations, it will not cause significant fragmentation of wetlands and other ecological systems. The expansion area contains no habitat for rare, threatened and endangered species and no rare communities. It has not been identified by the Pine Bush Management plan as containing any significant Pine Bush characteristics. There are no cultural resources within this area and the land is not dedicated to the Preserve.



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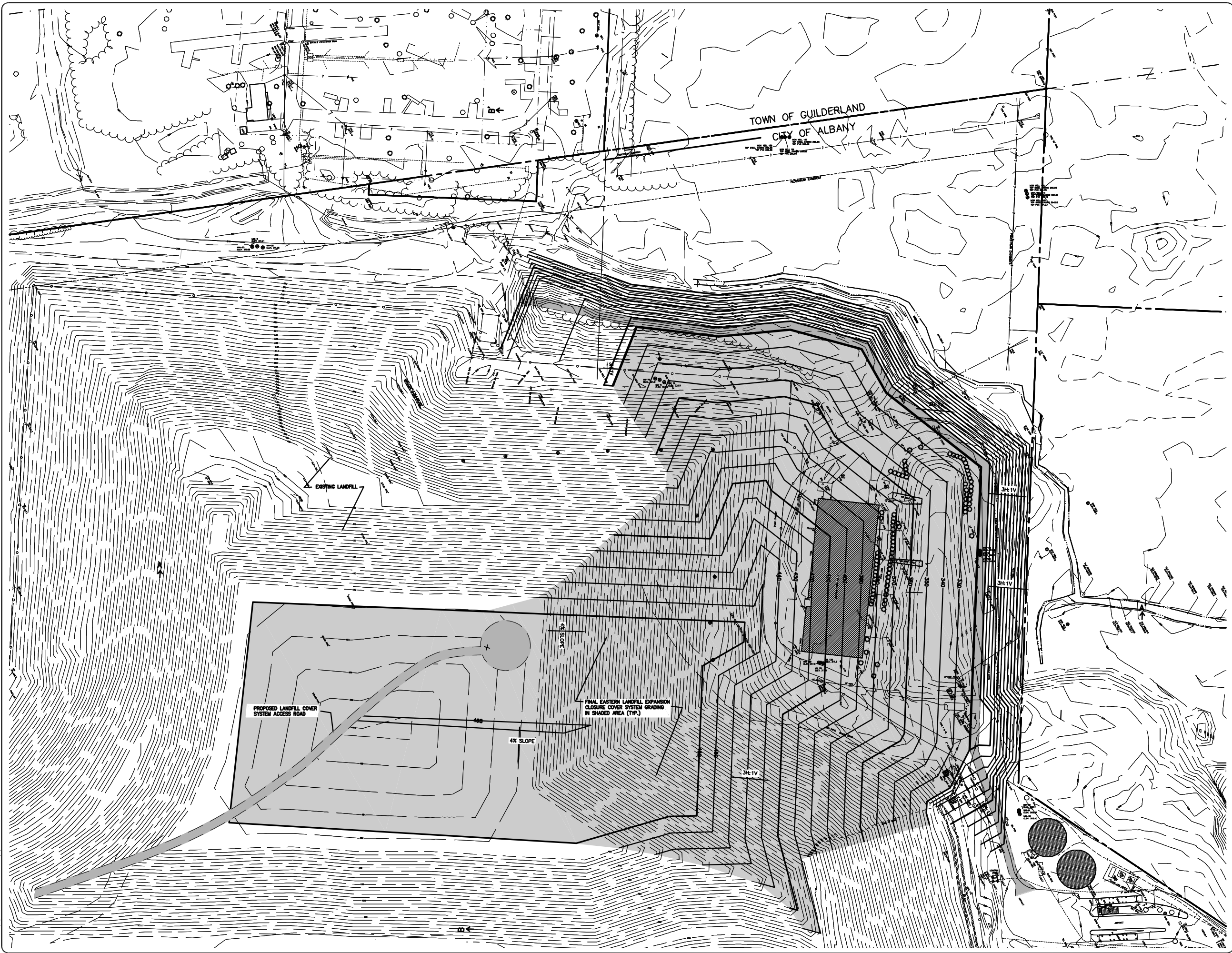
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RAPP ROAD LANDFILL
 EASTERN EXPANSION
 EXPANSION ALTERNATIVES

Issue Date: 7/07 / Project No.: 12206 / Scale: AS SHOWN

Figure
 1

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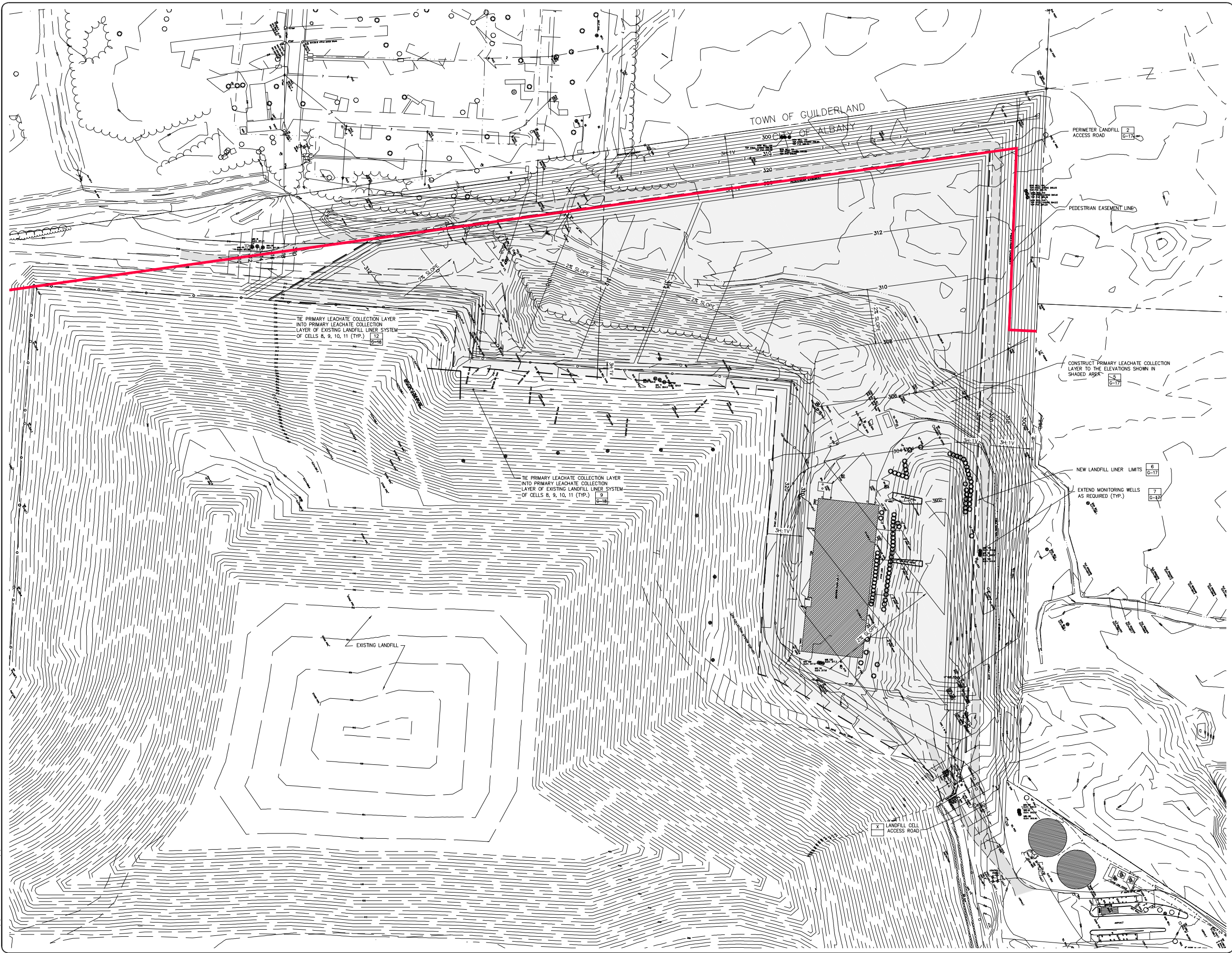
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**RAPP ROAD LANDFILL
 EASTERN EXPANSION**
 WETLAND AVOIDANCE SCENARIO
 Project No. 12206
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FIG. 3

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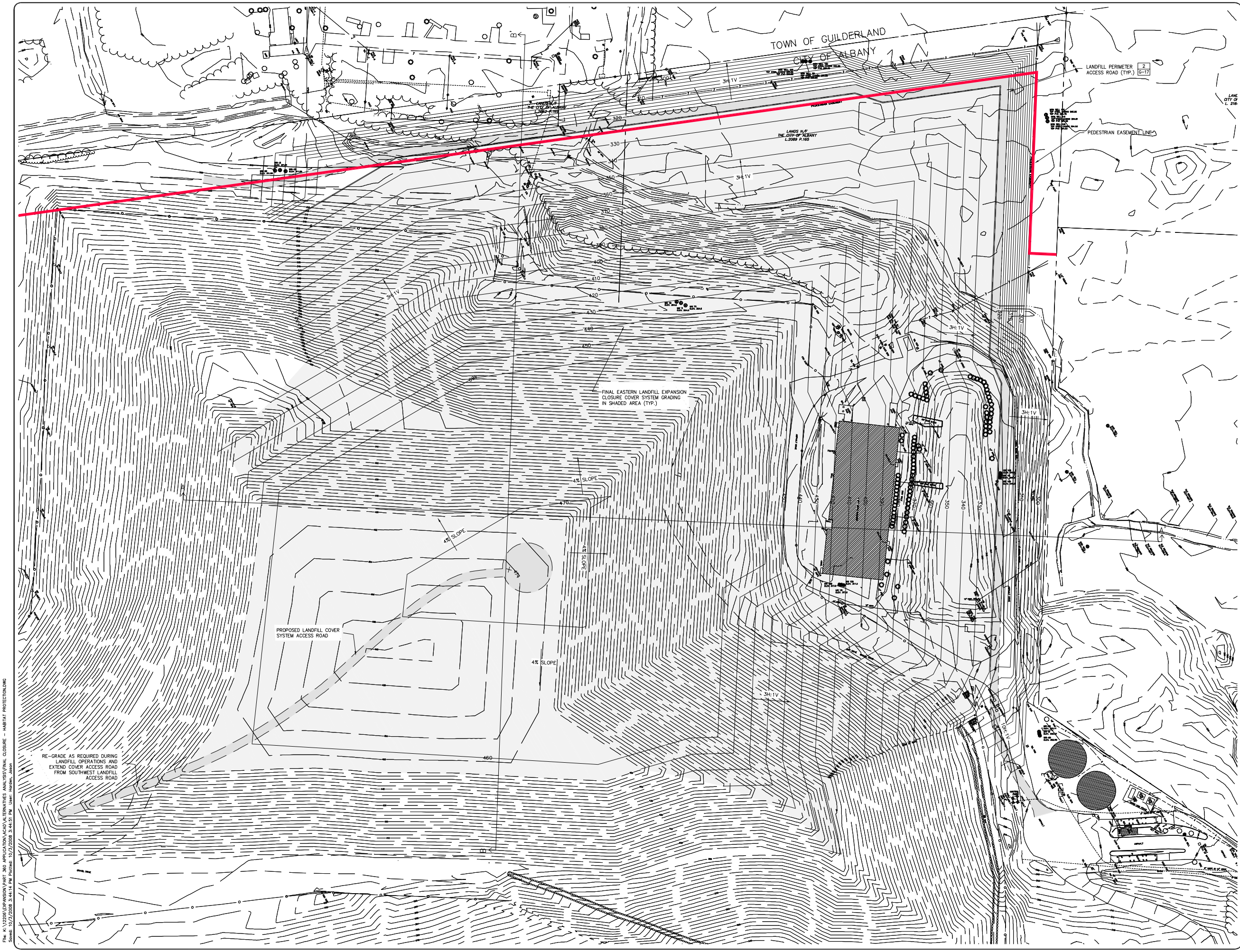
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RAPP ROAD LANDFILL
 EASTERN EXPANSION
 TOP OF LINER/LANDSCAPE/
 STORMWATER CONTROL PLAN

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FIG. 4



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RAPP ROAD LANDFILL
 EASTERN EXPANSION
 HABITAT PROTECTION SCENARIO

Sheet No: 7107 Project No: 12206 Scale: 1"=40'

FIG. 5