

**ENTERPRISE ROAD CLASS III RECYCLING AND DISPOSAL FACILITY  
CELL 17 AND VERTICAL EXPANSION CONSTRUCTION PERMIT APPLICATION  
ENGINEERING REPORT**

*Prepared for:*

**ANGELO'S AGGREGATE MATERIALS, LTD**

855 28<sup>th</sup> Street South  
St. Petersburg, Florida 33712

*Prepared by:*

**LOCKLEAR & ASSOCIATES, INC.**

4140 NW 37<sup>th</sup> Place, Suite A  
Gainesville, Florida 32606

JANUARY 2019

Performed Under the  
Supervision of

---

Lisa J. Baker, P.E.  
Florida PE #74652

**ENTERPRISE RECYCLING AND DISPOSAL FACILITY  
ENGINEERING REPORT  
TABLE OF CONTENTS**

3.1	GENERAL .....	1
3.2	SITE LOCATION AND DESCRIPTION .....	1
3.2.1	Prohibition Compliance .....	2
3.3	SURROUNDING LAND USES AND ZONING.....	2
3.4	TOPOGRAPHY .....	3
3.4.1	100-Year Flood Prone Areas.....	3
3.5	SOILS .....	3
3.6	LANDFILL SITE IMPROVEMENTS.....	4
3.6.1	Entrance Facilities .....	4
3.6.2	Roads.....	4
3.6.3	Effective Barrier.....	4
3.6.4	Weighing or Measuring Incoming Waste.....	5
3.6.5	Vehicle Traffic Control and Unloading .....	5
3.7	EXCAVATION OPERATIONS AND CELL CONSTRUCTION .....	5
3.8	METHOD OF CELL SEQUENCE .....	8
3.8.1	Vertical Expansion / Conceptual Closure.....	8
3.8.2	Erosion Control .....	10
3.8.3	Life Expectancy .....	11
3.9	WASTE COMPACTION AND APPLICATION OF COVER .....	10
3.10	DESIGN OF GAS, LEACHATE AND STORMWATER CONTROLS.....	12
3.10.1	Gas Monitoring and Control.....	12
3.10.2	Leachate Control.....	15

3.10.3	Stormwater Controls.....	16
3.11	EROSION CONTROL .....	16
3.12	FINAL GRADE PLAN.....	16
3.13	SETBACKS AND VISUAL BUFFERS.....	17
3.14	FOUNDATION ANALYSIS.....	17
3.15	CERTIFICATION .....	17
3.16	OPERATIONS PLAN .....	18
3.17	CONTINGENCY PLAN.....	18

**APPENDICES**

APPENDIX 3-A	OPERATIONS PLAN
APPENDIX 3-B	CONTINGENCY PLAN
APPENDIX 3-C	FIGURES
APPENDIX 3-D	WELL ABANDONMENT DOCUMENTATION (N/A)

## **SECTION 3 ENGINEERING REPORT**

### **3.1 GENERAL**

This Engineering Report is part of a comprehensive Florida Department of Environmental Protection (FDEP or Department) permit renewal application for the Enterprise Road Class III Recycling and Disposal Facility (Facility). The Engineering Report is designed to meet the requirements of Rule 62-701, F.A.C. and Pasco County's Land Development Code (LDC) and includes the following major components (and their respective location within this Engineering Report):

- Plan Set, titled Cell 17 and Vertical Expansion Construction Permit Plan Set, by Locklear & Associates, Inc. (Section 4);
- Figures (Appendix 3-C);
- An evaluation of the applicability of bottom liner and leachate collection system requirements (Section 2, Part G, G-1);
- Updated report evaluating geotechnical site conditions (Section 2, Part I, I-1);
- Updated Groundwater Monitoring Plan (Section 5);
- An analysis of slope stability (Section 2, Part I, I-2);
- Updated Closure and Reclamation Plan (Section 7);
- Updated financial assurance cost estimates (Section 7 Appendix 7-A);
- Updated Operations Plan (Section 3 Appendix 3-A);
- Updated Contingency Plan (Section 3 Appendix 3-B).

### **3.2 SITE LOCATION AND DESCRIPTION**

The facility receives approximately 1500 tons per day of Class III waste, which includes Construction and Demolition debris, from Pasco County and other surrounding Counties (including Pinellas, Hernando, Hillsborough and Polk). The Facility was originally permitted by the Department on October 5, 2001.

The subject site is located in Sections 5 and 8, Township 25 South, Range 22 East, in Pasco County, Florida, as shown on the United States Geological Survey (USGS) quadrangle map presented in Figure 3-1 in Appendix 3-C. More specifically, the Facility is located at the northwest corner of the intersection of Enterprise Road and Auton Road, southeast of Dade City, Florida (Figure 3-1 in Appendix 3-C). The site occupies approximately 160 acres of land on the north side of Enterprise Road. The square property is approximately 2,640 feet on a side and is located in the southwest quarter of Section 5 and the northwest quarter of Section 8.

There are no airports within 5 miles of the site, see Figure S-4 (Appendix 3-C).

### 3.2.1 Prohibition Compliance

In order to comply with Rule 62-701.300, F.A.C., the Facility will abide by the following:

- The Facility will not dispose of solid waste at the proposed site until proper permitting is obtained.
- Disposal of solid waste will not occur in areas that are: unable to provide support for the waste; geological formation or subsurface features that would allow unimpeded discharge to surface water or groundwater; are within 500 feet of an existing potable water well (Figure S-1 in Appendix 3-C); are within a dewatered pit; are in a frequently flooded area; are in a body of water; are within 200 feet of a surface water body that discharges offsite (Figure S-2 in Appendix 3-C); are on a right of way; are within 1,000 feet of an existing community potable water; or are within 3,000 ft. of Class I surface waters (Figure S-3 in Appendix 3-C).
- Open burning will not occur on the site unless the burning takes place in a permitted air curtain incinerator.
- Hazardous wastes, PCB's, biohazardous wastes, special wastes, liquids, and oily wastes will not be disposed of at the Facility. Random load checks and the use of spotters at the working face will ensure that these wastes are not placed for disposal at the Facility.

### 3.3 SURROUNDING LAND USES AND ZONING

Figure 3-2 in Appendix 3-C presents an aerial photograph map depicting the surrounding land uses and designated FDOT FLUCCS codes in the site vicinity. Open land, pastureland, row crop, tree crop, and upland hardwood forest land uses surround the site. A few scattered residences also surround the site. All adjoining properties are zoned AC. Parcel 05-25-22-0000-00500-0000 to the northwest of the facility has a mining permit and is not part of the landfill operations. To the north is the East Pasco County Class I Sanitary Landfill, which is closed. To the east is an old borrow pit and agricultural land. South of the site is agricultural land and orange groves, and to the west are orange groves. Figure 3-2B in Appendix 3-C presents an aerial photograph map with future land use classifications.

Current site zoning designation, AC with a conditional use, is consistent with the Class III Landfill use. Revised Figure S-1 depicts the locations of five (5) water wells proximate to the landfill limit. The well north of future cell 17 has been abandoned. The on-site non-potable Supply Well is operated and maintained by the facility and only utilized to flush on-site toilets. The well approximately 1000' south of the southeast corner of the facility is identified as "irrigation" by SWFWMD. The 500-foot setback from the approved landfill footprint to potable wells complies with the setback requirements of Rule 62-701.300(2)(C), F.A.C.

### 3.4 TOPOGRAPHY

The USGS 7.5-minute quadrangle map shown in Figure 3-3 in Appendix 3-C shows the land surface of the subject site has elevations ranging from 85 feet to 175 feet National Geodetic Vertical Datum (NGVD). Natural land surface generally slopes to the northeast on the northern half of the property and southeast on the southern half of the site. A 2018 site-specific topographic survey is shown on Sheets 1 and 2 of the Cell 17 and Vertical Expansion Construction Permit Plan Set provided in Section 4.

#### 3.4.1 100-Year Flood Prone Areas

Figure S-5 depicts a 100-year flood prone area map from the U.S. Federal Emergency Management Administration for the subject vicinity. As shown, the site is not within and would not be impacted by an estimated 100-year storm flood.

### 3.5 SOILS

According to the Soil Survey of Pasco County, Florida, published by the U.S. Department of Agriculture Soil Conservation Services (USDA-SCS), the majority of the subject site and surrounding areas are covered by fine sands. A copy of the USDA-SCS Soils Survey Map showing the mapped areas of the major soil types at the subject site and its vicinity is presented in Figure 3-5 Soil Survey Map.

USDA-SCS soil type 12- Astatula fine sands encompass a small portion in the northeast portion of the site. Astatula sands are nearly level to gently sloping, and excessively drained mainly in the sandhills. Seasonal high-water table (SHWT) is typically at a depth of 72 inches in Astatula soil. The permeability is very rapid throughout the soil. Both the available water capacity and natural fertility of the Astatula soil are low.

USDA soil type 32 - Lake fine sands comprise the majority of the soils found on the property. These soils are nearly level to gently sloping and excessively well drained. They occur along ridgetops and on low hillsides in the uplands. Permeability is rapid throughout the soil and the

water table is below a depth of 120 inches. The available water capacity is very low in all layers and the natural fertility and organic matter content are both low.

USDA soil type 72 - Orlando fine sands are found in a small area in the northeast portion of the property. These soils are nearly level to gently sloping and well drained. The water table is typically at a depth greater than 72 inches with permeability of the soil rapid throughout. The available water capacity is low in the surface layer and very low in the other layers.

### 3.6 LANDFILL SITE IMPROVEMENTS

Portions of the 160-acre landfill site are also currently being operated as orange groves. The following site improvements have been installed to meet landfill operational requirements.

#### 3.6.1 Entrance Facilities

An office trailer (gatehouse) is located onsite for the gate attendant. This trailer has hand washing and toilet facilities. Potable bottled water is supplied to the trailer. Electric and telephone services are available to the trailer office. Site entrance improvements also include an all-weather entrance roadway, scales and perimeter road as shown in Cell 17 and Vertical Expansion Construction Permit Plan Set provided in Section 4.

#### 3.6.2 Roads

The primary haul route servicing the Facility is Enterprise Road. Enterprise Road is serviced by Clinton Avenue and C.R. 35A.

Enterprise Road has been improved to an all-weather access roadway from C.R. 35A to the entrance of the Facility. All on-site roads are maintained by the Applicant to allow for all weather access. Access roads to the working face are constructed from on-site soils and/or recovered materials such as concrete and asphalt. This is done on an as needed basis

#### 3.6.3 Effective Barrier

A 6-foot high security fence has been constructed along the south and east boundaries. The security fence consists of a 6-foot high-galvanized chain link fence, hereafter referred to as the "security fence." A five-foot wire fence runs along the north and west property boundaries. The chain link fence has been installed in accordance with the permit issued October 2001. Three (3) foot square "NO TRESPASSING" signs with 5-inch letters have been installed at no less than 500-foot spacing and at all corners to notice unauthorized access. The only point of access into the facility will be through the gate at the entrance. This gate will be locked during closed hours.

An 8-foot high landscape berm has been constructed along the site's frontage to Enterprise and Auton Roads, see Cell 17 and Vertical Expansion Construction Permit Plan Set provided in Section 4.

#### 3.6.4 Weighing or Measuring Incoming Waste

A scale system is used to keep records of materials received at the Facility. The scales are calibrated every six (6) months. Vehicles are weighed when they enter the Facility, and based upon the tare weight of the vehicle, the waste tonnage will be determined. Prior to unloading debris, the tonnage or volume of waste materials received will be determined and the appropriate fee assessed.

#### 3.6.5 Vehicle Traffic Control and Unloading

Generally, truck traffic will be controlled on a first-in, first-out basis, as directed by the spotter at the working face. There is adequate space for truck staging at the site's entrance gate (7-8 trucks) to mitigate any queuing onto Enterprise Road. The Facility will discourage any truck staging prior to landfill opening. Signs will be posted at the entrance gate and on interior roads to guide truck traffic.

### 3.7 EXCAVATION OPERATIONS AND CELL CONSTRUCTION

On-site soils will be excavated according to the Pasco County Class I Mining Permit. The soils will be excavated and removed for various uses, including construction, roadways, and in landfilling operations. The County permit allows an excavation up to within a 200-foot setback from the property boundary and an excavation slope of 6H:1V. The Class I Mine will be "reclaimed" as a Class III landfill. The 6H:1V excavation slopes are associated with the mining of the existing soil. Once the landfill is ready to accept waste, the mine side slopes will be excavated to 2H:1V side slopes (cell slopes). Waste will be placed against this excavated slope and then built above existing grade. The Cell 17 and Vertical Expansion Construction Permit Plan Set (Section 4) show the phasing of the cell construction and filling operation at the Facility.

Excavation slopes will not exceed 6H:1V pursuant to the Pasco County permit; however, once an excavation phase is complete and construction commences on a new cell, the slopes will be excavated to 2H:1V. A portion of the excavated soils from the mining operation will be used as landfill construction material. Excavated soils will be reserved to provide adequate cover material for the landfill operation. Cell construction will follow the sequence described in Section 3.8.



As new cells are excavated and constructed, the cells will be over excavated to approximately three-feet below the approved excavation base grade to allow for the construction of a 3' clay layer. If limerock is encountered during construction, the following actions will be taken:

**Where limerock is encountered at or below the elevation of the cell clay layer:**

- In the event that limerock is encountered during clay layer excavation or construction activities, the excavation / construction activities shall cease and the Department shall be notified by email within 24 hours of discovery.
- Excavation / construction activities related to determining location, elevation, and extent of limestone or to remediation in accordance with these procedures will resume no sooner than 24 hours after notice, unless otherwise directed by the Department
- Written notification will be submitted within 7 days of discovery.
- The written notification shall include the location, elevation, and extent of limestone noted on a plan sheet, a description of the materials encountered, and a description of the completion of excavation / clay backfill in the identified area or the anticipated timeframe for completion of these activities.
- The limerock will be over-excavated (5-feet laterally beyond limerock boundary and 3-feet vertically below the bottom of the compacted clay layer) and the area backfilled with clay meeting the specifications in the FDEP Operation/Construction permit and Engineering Report.
- Excavation / construction activities will resume no sooner than 24 hours after notice, unless otherwise directed by the Department

**Where limerock is encountered during mining operations at elevations above the elevation of the cell clay layer and do not extend into the clay layer:**

- Document on the limerock observation log the location, elevation, and extent of limestone noted on a plan sheet, and a description of the materials encountered
- Submit limerock observation log to FDEP within 7 days of discovery
- Where limerock is encountered within 10-feet of the design elevation of the top of compacted clay layer, in addition to the procedures noted above, over excavate 1-foot vertically and laterally around the exposed limerock and backfill with compacted clay to temporarily prevent infiltration during mining operations.

If limerock encountered during mining operations at elevations above the cell clay layer extends to or below the elevation of the cell clay layer, the procedures identified above under the heading "*Where limerock is encountered at or below the elevation of the cell clay layer*" shall

be followed.

Stockpiled clay, obtained from on-site excavation, will be sampled for laboratory proctor testing for use as cell floor and cell side slope material to construct a three-foot thick clay barrier layer. Material with acceptable permeability and proctor test results will be placed onto the constructed cell floor in lifts, and compacted by multiple passes with a 40,000 lb., D-6 Dozer, or equivalent.

A three-foot thick clay layer will also be placed on the 2H:1V side slopes of the exterior excavation side slopes of each cell to complete the continuous clay barrier layer. Due to the steepness of the slope, clay placement and compaction will require an iterative process consisting of several horizontal lifts, stepped up progressively until the base elevation of the landfill is reached. In order to achieve the required compaction and hydraulic conductivity, as well as to achieve a constant three feet of clay along the slope, each lift along the cell wall will need to exceed three feet wide and be wide enough for the compacting equipment. Soil in excess of three feet wide on the slopes may be removed after compaction and compliance testing have been approved. Acceptable test results means the results of the laboratory proctor and permeability tests indicate that the permeability of the material meets the requirements of the construction permit ( $1 \times 10^{-8}$  cm/s), and the optimum moisture content is not too high for the equipment to manage. Optimum moisture content for the on-site stockpiles has been approximately 13 to 20 percent.

The dozer will compact the material in the bottom of the excavation and up the side slopes into the dozer track marks. After each lift is compacted with the dozer, a 12-ton, 84-inch vibratory sheeps-foot roller, or equivalent, will be used to roll the material. The daily activities will be recorded, including any tie-in locations, thickness of each compacted lift, verification of the compaction and moisture content testing, verification of equipment used for compaction, and verification of dozer tracks at the tie-in surfaces (no smooth surfaces). Field logs and photographs documenting the field work will be provided to the Department. A topographic survey will confirm the top of excavation and top of clay grades.

Excavation will be such that 2H:1V slopes will only be encountered on the outer edge boundaries of each cell. A 3H:1V working face slope, beginning at the 2H:1V slope face, will be used for landfilling the waste.

Leachate generated in existing cells 1-7 and 15 and 16 currently flows to a toe drain extending east to west along the northern perimeter of Cell 16. Leachate generated from proposed Cell 17 will flow north to the proposed toe drain extension. The existing toe drain will be extended along the northern perimeter to the northwest corner of Cell 17. The toe drain flows west to east and terminates in a manhole located between Cell 16 and Pond 3. The toe drain will “daylight” approximately 3 feet above the bottom of the manhole. A dedicated pump with float control

system will be used to transfer leachate from the manhole to Pond 3 as needed.

### 3.8 METHOD OF CELL SEQUENCE

Angelo's Aggregate Materials is currently (as of January 2019) filling in Cells 1 – 7, 15 and 16 of the Class III Landfill. The cell construction and filling sequence operations will be as follows:

Phasing Sequence 1            As shown in Cell 17 and Vertical Expansion Construction Permit Plan Set  
Continue filling Cells 1-7, 15 and 16 in 10 – 12-foot lifts to waste elevation of 172'  
Maximum slope is 3H:1V from base grade to waste elevation 167'; 1% to 2% grade from waste elevation 167' to 172'  
Sideslope berms and stormwater appurtenances are to be constructed at final closure.  
Construct Cell 17 in accordance with permitted design.

Phasing Sequence 2            As shown in Cell 17 and Vertical Expansion Construction Permit Plan Set  
Continue filling Cells 1-7, 15 and 16 in 10 – 12-foot lifts to waste elevation of 172'  
Begin filling Cell 17 with 4 – 6 feet lift north of the temporary stormwater and leachate diversion swale until cell is floored out. Remove temporary swale and fill with 4 – 6 feet lift.  
Continue filling Cell 17 in 10 – 12 feet lifts from base grade to waste elevation 147'. Maximum slope is 3H:1V from base grade to waste elevation 147'.  
A 10-ft wide stormwater bench is to be constructed at elevation 137'.  
Sideslope berms and stormwater appurtenances are to be constructed at final closure.

Phasing Sequence 3            As shown in Cell 17 and Vertical Expansion Construction Permit Plan Set  
Construct overall landfill vertical expansion to include maximum sideslope of 3H:1V from base grade to waste elevation 137', 187' and 212'; 1% to 2% grade from waste elevation 217' to 212'  
10-ft wide stormwater benches to be constructed at waste

elevations 137' and 187'.

#### Phasing Sequence 4

As shown in Cell 17 and Vertical Expansion Construction Permit Plan Set

Construct final closure cover system over Cells 1, 2, 3, 4, 5, 6, 6B, 7, 15, 16 and 17 in accordance with the revised overall landfill vertical expansion closure design.

Construct sideslope berms and stormwater appurtenances.

Construct landfill gas vents.

Lift height includes cover material. Due to the landfill bottom elevation, some lifts may not be a full 10 feet in height.

Operators will follow the fill sequencing plan and create uniform lifts no greater than 10 feet. When beginning operations in a new portion of the landfill containing a leachate collection system, select waste will be used to construct the first layer of compacted waste fill. The compacted select waste layer will be a minimum 10 feet thick. This layer is to be placed in all operating areas of the landfill that receive waste prior to vehicles driving on collection areas of the landfill.

As each sequence is active, the following procedures will be followed.

- The access road to the working face will be constructed and graded as necessary.
- Waste will be compacted as it is placed. General lift height will be 10 feet and will come within three (3) feet of the final elevation to provide for final cover.
- The working face will remain approximately 100 feet in length.
- Avoid channelizing stormwater flows
- Use mulch, grass, and maintain intermediate covers
- Weekly cover of six (6) inches of soil will be placed on the working face.
- Intermediate cover of 12 inches of soil will be placed in areas that will not receive waste within 180 days. The cover may be removed immediately prior to placement of new waste.

#### 3.8.1 Vertical Expansion / Conceptual Closure

The landfill is permitted to be completed to a maximum height of 220 feet, NGVD. The final

grading plan is shown on Drawing C2.00 of the Cell 17 and Vertical Expansion Construction Permit Plan Set provided in Section 4. The Conceptual Closure Plan includes permitted Cells 1-7 and 15, 16 and 17.

The Conceptual Closure Plan includes construction of berms on the stormwater benches that will direct stormwater to drop inlets and downcomer pipes spaced approximately every 400 – 500 feet along the benches. The downcomer pipes will discharge through an energy dissipater to the existing stormwater system. The facility's overall stormwater management system is governed by the mining operations and ERP Permits. Grades and elevation vary based on ongoing mining operations and topography. A detailed design that will tie the conceptual closure plan into the facility's stormwater management system will be submitted at the time of closure.

The top (1% to 2% grade) and side slope (4H:1V and 3H:1V) designs provide for proper drainage and minimize rainfall infiltration into the landfill surface.

### 3.8.2 Erosion Control

The following engineering controls will be used to minimize erosion at the working face:

- Regrade a maximum of 100 linear feet of the outer edge slopes at a time to 2H:1V. The purpose of this recommendation is that a relatively small area will be subjected to surface erosion at any given time.
- Construct a berm along the top of the slope during the regrading to redirect any rainfall runoff away from the face of the slope. The area along the berm should be graded so as to allow rapid runoff along the top of the slope. Ponding of water near the top of the slope should not be allowed, since seepage through the slope may initiate slope erosion.
- As soon as possible following the construction of the clay layer, begin to fill against the Cell 7 2H:1V slope with the landfill material.
- Avoid channelizing stormwater flows
- Vegetative cover will be placed on top of the intermediate cover for erosion control purposes. All or part of the intermediate cover may be removed before placing additional waste or installing final cover.

### 3.8.3 Life Expectancy

The cell capacity and lifespan estimates for Cells 1 – 7, 15, 16 and 17 and vertical expansion have been estimated using the October 2018 topographic survey performed by Pickett and Associates (Sheets 1 and 2 of Section 4 in the Cell 17 and Vertical Expansion Construction Plan Set); and recent and projected tonnages.

Using the October 2018 topographic survey as a base, a three-dimensional AutoCAD model of Cells 1 – 7, 15, 16 and 17 with vertical expansion at closure was generated, using the following assumptions:

- For all cells except Cell 16 and Cell 17, 3H:1V side slopes from base grade to waste elevation 122'; 4H:1V from waste elevation 122' to 167'; 1% to 2% grade from waste elevation 167' to 172'
- For Cell 16 and Cell 17, 3H:1V from base grade to waste elevation 122'; 4H:1V from waste elevation 122' to 147'.
- 10-foot inset for benches at waste elevations 122-ft and 147-ft NGVD
- 36 inches of cover over the 67.0-acre 2D surface was subtracted from the maximum volume

The airspace volume remaining as of October 2018 was calculated to be approximately 259,312 yd<sup>3</sup> after accounting for the final cover volume of 322,829 yd<sup>3</sup>.

The following design parameters were used to compute landfill design life remaining:

- **Density:** An in-place density of 1,350 lb/yd<sup>3</sup> (0.675 tons/ yd<sup>3</sup>) was used for the design life estimate and is a typical density for Class III waste.
- **Waste acceptance rate:** A waste acceptance rate of 1500 tons per day was used based on facility records.
- **Population to be served:** Population estimated currently to be 515,077 as of 2018 for Pasco County and projected to be 554,625 by 2023.

The remaining life in Cells 1 – 7, 15, 16 and 17 and vertical expansion was calculated to be 11 year from the survey date, or 2029.

### 3.9 WASTE COMPACTION AND APPLICATION OF COVER

Waste received will be segregated based on compactability. Bulky, incompressible items, such as concrete, asphalt, and tree debris, will be separated and stockpiled for future processing. Tree debris may be separated from the waste and periodically mulched on-site. The remaining debris is disposed of in designated cells using onsite equipment to place the debris and a Caterpillar 826 Compactor, or equivalent, to weekly compact the waste. Initial cover material is planned to be excavated from onsite areas and placed weekly in approximately 6-inch layers on the compacted lifts to control vectors, reduce rain infiltration and provide a more stable working face area. An intermediate cover of one (1) foot of compacted soil will be applied if final cover or an additional lift is not to be applied within 180 days of cell completion. Cell closure will occur when all permitted cells are filled. For final buildout grade and closure detail, see Cell 17 and Vertical Expansion Construction Permit Plan Set provided in Section 4, respectively. The Conceptual Closure Plan includes permitted Cells 1-7, 15, 16, 17 and vertical expansion. Fill grades shall be such that final cover elevations are not exceeded on all slopes.

Final cover consisting of 18 inches of compacted soil barrier layer and 18 inches of soil that will sustain vegetative growth, as specified in the Closure and Reclamation Plan provided in Section 7. Cell closure shall generally conform to the lines and maximum grades specified on the Plan Set (Cell 17 and Vertical Expansion Construction Permit Plan Set provided in Section 4 and the requirements of Rule 62-701.600 F.A.C., Rule 62-701.400 (7), F.A.C., and Rule 62-701.400(8), F.A.C.). Pesticides when deemed necessary to control rodents, insects and other vectors shall be used as specified by the Florida Department of Agriculture and Consumer Services. Uncontrolled and unauthorized scavenging shall not be permitted at the landfill site. Controlled recycling may be permitted by the Landfill Manager. Temporary storage of soil fill or recycling materials may occur within the inactive, or closed cell areas.

### 3.10 DESIGN OF GAS, LEACHATE AND STORMWATER CONTROLS

#### 3.10.1 Gas Monitoring and Control

The type of materials to be disposed of in the Class III Landfill are not expected to generate significant amounts of methane or other gases since the landfill's design prevents groundwater contact. Therefore, no active gas control systems or venting is proposed. However, because some biodegradable waste may be accepted, a passive gas control system is proposed, see Section 3.10.1.5. The Landfill Manager will conduct daily and weekly inspections of the landfill and will check for objectionable odors or gas around the perimeter of the site. The Manager will notify the FDEP of any exceedances and immediately take corrective actions. Corrective actions will include placement of additional cover material or mulch, or lime containing materials such as crushed concrete that is documented to abate the odors. Quarterly gas point monitoring is

currently conducted. The facility only accepts Class III debris for disposal and accepts no putrescible household wastes. Surface water and groundwater contact with the Class III wastes will be prevented by the approved facility design. Other best management practices to prevent odors include: 1) closure of each cell as it is completed; 2) weekly soil cover application; and, 3) immediate corrective actions to abate any detected onsite odors.

### 3.10.1.1 Gas Probe Locations

Gas monitoring points are spaced approximately 600 linear feet apart surrounding the landfill. Cell 17 and Vertical Expansion Construction Permit Plan Set provided in Section 4 presents these locations of the gas probes surrounding the landfill. Gas Probes (GP) 6 through 15 are existing, GP 1 through 5 and 16 are proposed and will be installed as part of future cell construction completion certification at closure. The remaining gas probes are to be installed in accordance with the following schedule in Table 3.10:

Table 3.10 Gas Probe Installation Schedule	
Gas Probe	Cell Construction Completion
GP-1	Future Cell 10 or closure
GP-2	Future Cell 11 or closure
GP-3	Future Cell 12 or closure
GP-4	Future Cell 17 or closure
GP-5	Future Cell 17 or closure
GP-16	Future Cell 9 or closure

One remaining gas probe on the eastern portion of the property is currently located immediately adjacent to the disposal area rather than at the property boundary as required by Rule. Probe GP -14 has been relocated to the property boundary. Probes GP-6, -7, -8, -11, -12 and -13 were abandoned and replaced with GP-6R, -7R, -8R, -11R, -12R and -13R along the property boundary in 2013 and 2017.

### 3.10.1.2 Gas Probe Design

Figure 3-14 presents the gas probe design for the subject landfill site. These gas probes are designed to be surface sealed and to provide a greater permeability than the surrounding sediments to act as collector points for any methane gas, if present. Based on the landfill design, all of the gas probes are designed to be approximately 20-foot in depth with an 18-foot open screen for the monitoring point, or to depth of adjacent waste. Table 3.10.1.2 presents supplemental information related to the total depths of gas monitoring probes GP-4, GP-5 and GP-14R. These depths will allow the screened interval to intercept the full cross-section of the landfilled waste that could potentially generate methane.



Table 3.10.1.2

Well	Elevation of the Bottom of Waste in the Adjacent Disposal Cell (ft., NGVD)	Elevation at Surface (ft., NGVD)	Total Depth (ft.)	Top of Perforated Section (ft., NGVD)	Bottom of Perforated Section (ft., NGVD)
GP-14R	86	125.04	45	120.04	80.04
GP-4	80	96.50	22	89.5	74.5
GP-5	80	94.73	20	89.73	74.73

The groundwater table may be encountered at depths of approximately 50-foot, or more below land surface (bls) across most of the site. Accordingly, gas probes are not designed to intercept the groundwater table. The gas probes are constructed of Schedule-40 polyvinyl chloride plastic pipe (PVC). The PVC casing and screen will be flush-threaded and have a screen slot size large enough to accommodate easy methane extraction from the monitoring point. The sand/bentonite slurry proposed for a surface seal will be a blend of 4 parts of sand to one part of granular bentonite. The sand and the bentonite will be mixed dry and hydrated immediately prior to placing it in the annular space of the borehole. The gas probe points are proposed to be installed by hollow-stem auger to construct an eight-inch borehole to be filled with pea gravel. The pea gravel will meet the requirements of FDOT standard size No. 10 aggregate washed pea gravel. Each gas probe will be protected by a surface mounted well protector and locked for security purposes. Each gas probe will terminate at the surface with a PVC ball valve to accommodate easy monitoring of methane levels, with a portable meter. The ball valve will remain closed between monitoring events and pre-purge measurements will be recorded. In the event of a positive gas measurement, the post-purge measurement will also be recorded.

### 3.10.1.3 Methane Gas Measurement

In accordance with the requirements of the current FDEP permits, methane gas levels are monitored at each of the active gas monitoring points quarterly, with results submitted to the FDEP. A lower explosive limit (LEL) meter will be used to measure methane levels from each of the gas probes. LEL meters, such as the MSA Model 260 or GEM 500 or equivalent, will be used to conduct this monitoring. These meters are capable of measuring percent volume of methane in air and the percent LEL level of the methane by volume. The meter will be calibrated in accordance with manufacturer’s specifications prior to each methane monitoring event. Attachment 4 of the Operations Plan provided in Appendix 3-A presents the proposed gas monitoring probe survey form to be used to conduct the quarterly monitoring at the subject site. This form will document at the time of each gas probe reading, air temperature in degrees Fahrenheit, methane levels in percent volume in air and percent LEL. The reporting action level for methane in air will be considered 5 percent by volume in air as measured by the lower

explosive limit. The reporting action limit for methane in structures is 25% of the LEL, or 1.25% methane by volume. The results of each quarterly gas probe survey will be submitted to the Department on the presented form within two weeks of each monitoring event. These events are planned to be coordinated with the semi-annual groundwater monitoring at the subject site.

#### 3.10.1.4 Gas Contingency Plan

The following Contingency Plan will be implemented if any of the measured gas monitoring points methane levels are detected above the 100% LEL of greater than 5 percent methane in air, or if 25% of the LEL or higher is measured in a structure. If this level of methane or greater is detected in any of the probes, the Facility operator will institute measurement of methane in nearby, at, or below grade structures, i.e., stormwater collection points, or any maintenance or office buildings within 100 feet of the subject gas probe on a weekly basis until these levels go below the 100% LEL at the subject probe. If methane levels measured in any on-site building exceed 25% of the LEL, building windows and/or doors will be opened for ventilation and all personnel evacuated until methane readings are maintained below 25% of the LEL for methane. The monitoring report for any event that detects methane above the LEL will also report methane levels from nearby structures, as indicated above, until the levels go below the methane LEL level or until corrective actions are conducted to reduce methane levels. The FDEP will be notified within seven days of any gas monitoring levels that exceed the reporting action levels.

#### 3.10.1.5 Passive Gas Vents

Within 90 days of closure of each landfill cell, a passive landfill gas vent will be installed at the highest point of the cell to prevent explosions, fires and damages to vegetation from methane gas buildup. Sheet C3.00 in Section 4 shows the location of the 12 gas vents and Figure 3-16 presents the design of a typical vent. The facility's gas emissions are expected to be far below the threshold of a Title V or an NSPS permit.

#### 3.10.2 Leachate Control

Any leachate that may be produced at the landfill will be controlled with the use of a continuous 3-foot thick clay layer ( $1 \times 10^{-8}$  cm/s) that will be placed on the bottom of the cells. The clay layer beneath each individual cell will form a continuous barrier layer that will be graded to direct leachate to the toe drain extending east to west along the northern perimeter of Cell 16 and Cell 17. The toe drain will slope from west to east and terminate in a manhole between Cell 16 and Pond 3. The toe drain will "daylight" approximately 3 feet above the bottom of the manhole. A dedicated pump with float control system will be used to transfer leachate from the manhole to Pond 3 as needed.

The controlled method of screening waste also supplements the leachate control. Because the Applicant privately owns the Enterprise Class III Landfill facility, most of the haulers, waste generators, and sources of waste are known to Angelo's and the scale house attendants. For those haulers that are unfamiliar to the Applicant, the scale house attendants question the haulers more intensely to determine the contents of their loads. The spotters and operators add additional monitoring at the active disposal location. The addition of video surveillance to the monitoring process of incoming wastes helps to identify fires or smoking loads. Combined methods of screening waste is an effective method to reduce any possible threat to public health or the environment.

### 3.10.3 Stormwater Controls

The approved Stormwater Management Plan for the landfill consists of berms, swales, and ponds constructed within the 200-foot landscape buffer zone to divert, collect and contain stormwater runoff from the completed site. These stormwater facilities are designated to retain the 100-year, 24-hour storm volume as required by Pasco County and the FDEP. During excavation, construction and waste disposal a 6-foot berm adjacent to active and filled cells retains stormwater from the filling area and diverts stormwater from the excavation area and pumped to stormwater Pond 3. The remaining portion of the temporary stormwater pond will be filled as part of the construction of Cell 17. Pond 3 has been permitted through the Industrial Wastewater division of FDEP. Additional details concerning the stormwater management system are provided in Drawing Sheet C3.00.

### 3.11 EROSION CONTROL

The perimeter swales and ponds surrounding the landfill prevent stormwater from leaving the property. The series of berms described in Section 3.10.3 above will help prevent erosion.

Additionally, landfill side slopes will be constructed at 3H:1V from base grade to elevation 137' and 187' NGVD and will receive intermediate cover to be maintained until final landfill closure that will occur when all existing and proposed cells are filled. See the Reclamation and Closure Plan provided in Section 7 for further details.

### 3.12 FINAL GRADE PLAN

The filling sequence of the landfill is shown on Sheets C1.00 through C3.10 of the Cell 17 and Vertical Expansion Construction Permit Plan Set provided in Section 4. The excavated areas will be certified to the approved bottom grades prior to accepting any waste material. The finished elevation after all fill material has been placed and final cover provided is designed to

reclaim excavated areas.

### 3.13 SETBACKS AND VISUAL BUFFERS

The following setbacks (buffers) shall be used:

1. Minimum of 200 feet from the property boundary to landfill footprint.
2. Minimum of 500 feet setback from surrounding potable residential wells to landfill footprint.

Buffer areas maintain visual screening of the landfill by the following methods.

1. 8-foot high berms along the frontage of Enterprise and Auton roads.
2. Landscaping and trees to provide visual buffers within setback areas
3. Existing trees within the setbacks will be maintained.

### 3.14 FOUNDATION ANALYSIS

A Geotechnical analysis was conducted on the landfill site to evaluate if the base and geologic setting are capable of providing structural support. Universal Engineering Sciences, Inc. completed the Geotechnical Report revised December 12, 2018. Slope stability and settlement analysis provided in Section 2, Appendix I-2 was completed by Civil Design Services, Inc. and revised December 21, 2018. These revisions included the Cell 17 and Cells 1-7, 15 and 16 vertical expansion. The report concludes that the landfill base will adequately support the Class III landfill wastes without excessive settlement. It also states that the potential for sinkhole development on the site is low. In the event a sinkhole is discovered on-site, or within 500-feet of the site, the Department will be notified within 24 hours. A reclamation plan of action will be submitted to the Department within seven days.

### 3.15 CERTIFICATION

Laboratory testing and observation of cell floor conditions during cell construction completion shall consist of the following:

- In-place density testing for each 12-inch thick soil lift, based on laboratory proctor test results for the construction material, will be recorded by a properly trained technician. These are to be conducted at the location of each permeability test.

- Thickness testing of each lift will be recorded at a minimum frequency of two tests per acre, per lift.
- Confirmation hydraulic conductivity testing of Shelby tube or drive cylinder samples of the compacted cell floor material will be performed at a minimum frequency of one test per lift, per acre.
- Observance for unstable areas such as limestone, sink holes and soft ground will be performed for each cell.

If the test data from a cell floor section does not meet the requirements of the anticipated conditions of the hydrogeological and geotechnical reports and the requirements of the facility construction permit, additional random samples may be tested from that cell section. If the additional testing demonstrates that the hydraulic conductivity meets the requirements, the cell will be considered acceptable. If not, that cell will be reworked or reconstructed so that it will meet these requirements.

Upon completion of construction of any cell within the disposal facility, the certification of construction completion will be provided to the FDEP on form 62-701.900(2), F.A.C. The applicant will provide the completed form to the FDEP, along with the quality assurance test results described above, and arrange for an inspection prior to acceptance of Class III wastes into the constructed disposal area.

### 3.16 OPERATIONS PLAN

The Landfill's Operations Plan is included as Appendix 3-A.

### 3.17 CONTINGENCY PLAN

The Landfill's Contingency Plan is included as Appendix 3-B.