Prepared for

Omni Waste

Omni Waste of Osceola County, LLC
100 Church Street
Kissimmee, Florida 34741

APPLICATION FOR A PERMIT TO CONSTRUCT AND OPERATE A CLASS I LANDFILL

OAK HAMMOCK DISPOSAL FACILITY

Prepared by

GeoSyntec Consultants
14055 Riveredge Drive, Suite 300
Tampa, Florida 33637

Project Number FW0400

May 2002

GEOSYNTEC CONSULTANTS

14055 Riveredge Drive, Suite 300
Tampa, Florida 33637 • USA
Telephone (813) 558-0990 • Fax (813) 558-9726

24 May 2002

Mr. James N. Bradner, P.E.
Program Manager, Solid/Hazardous Waste
Florida Department of Environmental Protection, Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Subject: Class I Landfill Construct and Operate Permit Application
Oak Hammock Disposal Facility
Omni Waste of Osceola County, LLC

Dear Mr. Bradner:

Transmitted herewith are five copies of the subject permit application package, which was prepared by GeoSyntec Consultants on behalf of Omni Waste of Osceola County, LLC. This submittal includes information and data responding to the requirements of Chapter 62-701, FAC and consists of:

- Volume I: Through Appendix D;
- Volume II: Appendix E through J;
- Volume III: Appendix K through R; and
- Permit Drawings: Sheets 1 through 50

A check in the amount of $20,000 is also enclosed with this permit application. An application for an Environmental Resources Permit is being submitted separately. If you, or your staff, have any questions or need additional information, please feel free to contact the undersigned.

Sincerely,

Kenneth W. Cargill, P.E.
Principal

Enclosures

copy: Timothy J. Salopek, Omni Waste

EXECUTIVE SUMMARY

This application for a permit to construct and operate a Class I landfill, known as Oak Hammock Disposal, was prepared by GeoSyntec Consultants on behalf of Omni Waste of Osceola County, LLC. The proposed landfill is located in eastern Osceola County, west of highway U.S. 441, approximately 6.5 miles south of Holopaw. The application is intended to support both a five-year construct and operate permit and a conceptual plan of development for build-out of the facility. The five-year construct and operate permit will be Phase 1 and will include four landfill cells with a footprint of approximately 53 acres and ancillary facilities supporting the operation of the landfill and providing storm-water management. The complete build-out of the facility will include 21 landfill cells with a footprint of approximately 264 acres. The proposed 264-acre landfill will provide available airspace for a period of approximately 30 years, based on an average waste disposal rate of 1700 tons per day. Phase 1 will provide airspace for a period greater than five years based on the waste disposal rate of 1700 tons per day.

An Environmental Resource Permit application has been submitted concurrently to FDEP with this application for a Class I landfill permit. The ERP application addresses environmental considerations and storm-water management aspects of the project.

This permit application provides information and calculations addressing all applicable parts of the FDEP Form 62-701.900(1). Fifty sheets of permit drawings provide facility layout and details of construction for all aspects of the proposed project. The permit drawings are based on the complete built-out facility in order to assure that all features of the project mutually support the future expansion. The portion of the built-out facility, which is to be constructed and operated under this permit is clearly delineated and a sequence of construction is provided.

The written documentation includes:

- hydrogeological investigation and geotechnical investigation reports;
- water quality and leachate monitoring requirements;
- Operation Plan, to include contingency planning;
- technical specifications; and
- construction quality assurance plan.

This permit application also provides calculations in support of landfill stability, leachate management, landfill gas management, and final cover performance.

Calculations indicate that landfill slope stability factors of safety exceed 1.50 and that the bearing capacity factor of safety exceeds 8.0. These factors of safety indicate a very structurally safe facility. Predicted settlements of the landfill liner system after waste reaches final heights range from 0.2 feet near the perimeter to 2.1 feet in the center of the landfill. These settlements are very small relative to the size of the landfill and will not cause any degradation of landfill performance. Evaluation of the double-composite liner system, consisting of two geosynthetic drainage layer/geomembrane/geosynthetic clay liner layers, show that leachate leakage from the landfill is basically too small to measure. The maximum rate of leakage was found to equate to spilling an 8-ounce cup of leachate over an acre every 400 days. A plan for effective landfill gas control is provided for when final waste elevations are achieved. The final cover system, which includes a geomembrane component, is effective in preventing infiltration into the waste mass after closure. Air emissions and closure permitting will be completed in accordance with FDEP rules at the appropriate time.

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SECTION 1. INTRODUCTION

1.1 Terms of Reference

GeoSyntec Consultants (GeoSyntec) has prepared this permit application to construct and operate a Class I landfill known as Oak Hammock Disposal (OHD). The permit application is submitted to the Florida Department of Environmental Protection, Central Division (FDEP) on behalf of Omni Waste of Osceola County, LLC (Omni). The permit application has been prepared to comply with the requirements of Chapter 62-701 of the Florida Administrative Code (FAC). FDEP Form 62-701.900(1), Application for a Permit to Construct, Operate, Modify or Close a Solid Waste Management Facility has been used to verify the completeness of this permit application and is included as Appendix A to this permit application.

In June 2001, Omni's request for approval of a Conditional Use/Site Development Plan to construct and operate the OHD facility was approved by the Osceola Board of County Commissioners. On 25 March 2002, Osceola County signed a 10-year contract with Omni, which requires Omni to transport the County solid waste from the County's transfer station to the OHD facility for disposal. Thus, the development of the OHD facility will serve the municipal solid waste (MSW) needs of Osceola County and will be available for use by surrounding counties.

An application for an Environmental Resources Permit (ERP) has also been prepared by GeoSyntec as a separate document and is submitted to FDEP concurrently with this Class I landfill permit application. The ERP application provides information related to environmental issues and surface water management design. The narrative portion of the ERP application is included as Appendix B to this permit application for reference.

It should be noted that this Class I landfill permit application and the ERP application are intended to support both a five-year construct and operate permit and a conceptual plan of development for build-out of the facility. FDEP approval is sought for the permit and the conceptual plan. The five-year construct and operate permit is referenced as Phase 1 and includes the layout and design of four landfill cells covering approximately 53 acres. Other principal features of Phase 1 include a leachate management system, an interim storm water management system, operations area, waste haul road, and access road. The concept plan includes layout and design of 21 landfill cells covering approximately 264 acres and includes the same principal features mentioned above, as they are planned for the final configuration of the site.

Permit drawings entitled "Oak Hammock Disposal, a Solid Waste Facility, Permit Application" are an integral part of this permit application. The permit drawings show plans, sections, and details of the proposed Class I landfill and ancillary features and are comprised of 50 sheets. These permit drawings are intended to provide sufficient detail for permit approval. Additional detail will be provided in construction drawings prepared for individual cells and other features. The construction drawings will be issued later for the purpose of bidding and will be used for construction.

The permit application was prepared under the responsible charge of Mr. Kenneth W. Cargill, P.E., of GeoSyntec. The hydrogeological investigation was performed by Kubal-Furr & Associates (KFA) under a separate contract to Omni and is presented in the report entitled "*Hydrogeologic Investigation Report and Water Quality Monitoring Plan,*" which is attached as Appendix E to this permit application. The ERP reports related to environmental considerations entitled *"Wetland Resource Impact and Mitigation Plan"* and *"Conceptual Wildlife and Habitat Management Plan"*, were prepared by Biological Research Associates (BRA) under a separate contract with Omni. These reports are attached to the ERP application as Appendices E3 and E4.

1.2 Location

The OHD site is located in eastern Osceola County, Florida, west of highway U.S. 441, approximately 6.5 miles south of Holopaw. The OHD site is located in Sections 11, 13, and 14 of Township 28 South, Range 32 East, and Sections 17 and 18 of Township 28 South, Range 33 East, Osceola County, Florida. The site location is shown in Figure 1. The main entrance of the facility is located at latitude 28° 02' 57", longitude 81° 03' 10", on highway U.S. 441. Coordinates of the main entrance are a Northing of 1350637 and an Easting of 639127 in the Florida State Plane Coordinate System. The center of the landfill footprint is located at latitude 28° 03' 32" and longitude 81° 05' 46" or a Northing of 1354222 and an Easting of 625229.

1.3 Site Description

The OHD site is currently utilized for cattle grazing and hunting. The area proposed for the development of the landfill and a part of the borrow area is an inactive sod farm. The property is generally bounded by the Gannarelli Property to the north, Bronson's, Inc. Property to the west, Clay Whaley Property to the south, and highway U.S. 441 to the east. The surrounding areas are also primarily utilized for cattle grazing and hunting.

The OHD site comprises a total of 2178.8 acres. The landfill footprint is 263.8 acres. The supporting facilities such as storm water features, leachate storage facility, buildings, and access road encompass 108.2 acres. Approximately 166 acres will be used for borrow areas. Significant portions of the remaining property will be preserved for agricultural use through a conservation easement. The proposed landfill facility will be connected to highway U.S. 441 through a 2.86-mile access road.

1.4 Purpose and Scope

This permit application has been prepared for the purpose of obtaining FDEP approval to construct and operate a Class I landfill over a five-year period and to obtain FDEP conceptual approval for a Class I landfill having a projected 30-year life. The proposed footprint of the Class I landfill is shown in Figure 2, which indicates the sequence of phases throughout the projected build-out period. The Phase 1 area will be constructed and operated under the first five-year permit, the objective of this application.

As presented in this permit application, the proposed 264-acre Class I landfill will provide available waste capacity for a period of approximately 30 years, based on an estimated average incoming waste rate of approximately 1,700 tons per day. Phase 1 will provide available waste capacity for a period greater than five years based on the incoming waste rate of 1,700 tons per day.

This permit application discusses the methodology and approach for the design, construction, operation, closure, and post-closure care of the facility. It is the intent of this permit application to address all applicable parts of the FDEP Form 62-701.900(1). Specifically, and in addition to all general requirements, this permit application provides:

- engineering report;
- hydrogeological investigation and site reports;
- geotechnical site investigation report;
- water quality and leachate monitoring plan;
- Operation Plan;
- Contingency Plan (as a part of the Operation Plan);
- technical specifications;
- Construction Quality Assurance (CQA) Plan
- landfill closure information.

Although a final cover system design is included in the permit drawings, this permit application is for construction and operation and not for closure. A separate permit application for closure will be submitted to FDEP in accordance with applicable sections of Chapter 62-701, FAC, prior to final closure construction activities being performed. A closure plan and closure report required by Section 62-701.600(3) and (4), FAC, are not submitted at this time. Details of the final cover system design to include erosion control and storm water management features are submitted with this permit application for the purpose of obtaining a permit for the conceptual design for facility build-out. It should be noted that Omni intends to construct final cover in sections of the landfill as areas are brought to final waste elevations.

1.5 Organization of the Permit Application

To address the requirements of Chapter 62-701 of the FAC, this permit application is organized as follows:

- *Section 1: Introduction*: This section provides terms of reference and site description and discusses the scope and organization of the permit application.

- *Section 2: General Information*: This section addresses applicable parts of FDEP Form 62-701.900(1) not otherwise addressed in the narrative portion of this document or in the attached appendixes.

- *Section 3: Geotechnical Design*: This section discusses site physiography and lithostratigraphy, addresses fault/seismic/unstable areas, and reports the results of analyses for bearing capacity, slope stability, and foundation settlement.

- *Section 4: Leachate Management System*: This section describes the landfill double-composite liner, leachate collection, leachate transmission, and leachate storage systems.

- *Section 5: Landfill Gas Management*: This section describes the gas collection, gas conveyance, and gas control and disposal systems.

- *Section 6: Landfill Closure*: This section discusses the closure design, closure procedures, closure schedule, closure operations, long-term care, and financial responsibilities.

The following appendices are attached to this permit application.

- *Appendix A: FDEP Form 62.701.900(1)*
- *Appendix B: Application for an Environmental Resources Permit* (narrative only)
- *Appendix C: Site Ownership*
- *Appendix D: Public Notification*
- *Appendix E: Hydrogeologic Investigation Report and Water Quality Monitoring Plan*
- *Appendix F: Geotechnical Investigation Report*
- *Appendix G: Bearing Capacity Analysis*
- *Appendix H: Slope Stability Analysis*
- *Appendix I: Settlement Analysis*
- *Appendix J: Stability of Final Cover System*
- *Appendix K: Leachate Management System*
- *Appendix L: Gas Management System*
- *Appendix M: Final Cover System Performance Evaluation*
- *Appendix N: Water Quality and Leachate Monitoring Plan*
- *Appendix O: Operation Plan*
- *Appendix P: Technical Specifications*
- *Appendix Q: Construction Quality Assurance (CQA) Plan*
- *Appendix R: FDEP Form 62-701.900(28)*

SECTION 2. GENERAL INFORMATION

2.1 Purpose

The purpose of this section is to present and address landfill permit general requirements of Chapter 62-701, FAC, not specifically addressed in other sections or appendices of this permit application. This section is specifically organized to provide information keyed to applicable parts of FDEP Form 62-701.900(1) for the Oak Hammock Disposal (OHD) facility

2.2 Prohibitions

Information required by Section 62-701.300, FAC is presented below. This information responds to Parts D-1 through D-11 of Form 62-701.900(1).

The OHD facility satisfies siting criteria requirements. No solid waste will be placed:

- in an area where geological formations or other subsurface features will not provide adequate support (stability of the landfill is discussed in detail in Section 3 of this permit application);
- within 1,000 feet of any existing or approved potable water well;
- in dewatered pits;
- in a natural or artificial body of water;
- in an area subject to frequent and periodic flooding except where flood protection measures are in place;
- within 200 feet of a wetland (or body of water) except where the facility is designed with permanent leachate control methods, which will result in compliance with water quality standards and criteria (the leachate management system is described in detail in Section 4 of this permit application); or
- on the right of way of any public highway, road, or alley.

The exemptions stated in Sections 62-701.300(12) through (16), FAC, are not applicable to the OHD facility because:

- yard trash storage areas will meet all siting criteria;

- no indoor or vehicle storage of waste will be allowed; and
- there are no existing facilities at the site.

Other Class 1 landfill prohibitions will be enforced at the OHD facility. Specifically:

- no open burning of solid waste will be allowed;
- no hazardous waste will be accepted for disposal;
- no liquids or non-liquids containing polychlorinated biphenyls (PCBs) will be accepted for disposal;
- no biomedical waste will be accepted for disposal unless the biomedical waste has been properly incinerated;
- no lead-acid batteries, used oil, yard trash, white goods, or whole tires will be accepted for disposal in the landfill (however, yard trash, white goods, and whole tires will be accepted for processing, reuse, or recycling);
- no prohibited liquid waste will be accepted for disposal; and
- no prohibited commingled used oil will be accepted for disposal.

The OHD facility is not located within 3,000 feet of Class I surface waters. The nearest surface water to the landfill is the intermittent stream, Bull Creek, which is rated as a Class III surface water by FDEP.

2.3 Ownership

Documents related to ownership of the proposed landfill site are included in Appendix C of this permit application. As indicated by these documents, the property is owned by Gannarelli and Bronsons, but Omni has a legal agreement with the property owners to purchase and use the site for the purpose of permitting, constructing, and operating the OHD facility. These documents respond to Part E-10 of Form 62-701.900(1).

2.4 Public Notification

A public notice of this permit application has been published in the Osceola Sentinel. This is a newspaper of general circulation in Osceola County. A copy of this notice is included in Appendix D of this permit application. The publication of this notice responds to part E-13 of Form 62-701.900(1) and Section 62-701.320(8)(a), FAC. Notice also was sent to the Chair of the Osceola County Commission, and the state Senator and Representative serving the area where the project is located. Copies of these letters are also included in Appendix D. These notices satisfy the requirements of Rule 62-701,320(8)(b), FAC and Section 403.707(14), Florida Statutes.

2.5 Airport Safety

Information as required by Section 62-701.320(13), FAC is presented below. This information responds to Parts E-14 and F-2 of Form 62-701.900(1).

The OHD facility satisfies the siting requirements for airport safety and notification. The closest licensed and operating airport runway is Kissimmee Airport, which is approximately 26 miles from the landfill, which exceeds the minimum 10,000-foot separation requirement. It is not necessary to notify any airport, the Federal Aviation Administration, or the Florida Department of Transportation because the proposed landfill facility is not located within a six-mile radius of any licensed and operating airport runway. A vicinity map showing the location of all airports in Osceola County and the proposed landfill facility is included as Figure 1 in this permit application.

2.6 Siting

2.6.1 Overview

General criteria restrictions as described in Section 62-701.340, FAC are discussed below. This information responds to Part G of Form 62-701.900(1).

2.6.2 Floodplain

As shown in the permit drawings, the landfill is partially located within the 100-year flood plain, which has been identified on Osceola County maps received from the Osceola County GIS Department. However, as documented in the ERP application submitted concurrently with this permit application, the proposed landfill footprint and stormwater management system (including swales, dry retention basins, and wet retention basins) are a net contributor to the 100-year flood waters rather than a receptor of flood waters. Since the landfill stormwater management system has been designed to retain all runoff from the 100-year storm event, more water is taken out of the 100-year floodplain than the infringed floodplain is able to store. Therefore, compensating water storage capacity is provided and the storage capacity of the floodplain outside of the OHD facility is increased. Calculations verifying the capability of the landfill storm water management system to contain the 100-year storm event are submitted as part of the ERP application. In summary, the OHD facility will not restrict the flow of the 100-year storm event and will provide excess compensating storage.

The landfill is designed to prevent washout of solid waste in an extreme storm event. In their final configuration, the storm water management system berms defining the retention basins at the perimeter of the landfill will be constructed to an elevation more than four feet higher than the 100-year flood elevation indicated by the Osceola County maps. Additionally, the landfill cells will be constructed within a perimeter berm that is approximately 16 feet above existing site grades. The landfill liner system perimeter anchor trench will be approximately 15 feet higher than the 100-year flood elevation.

2.6.3 Horizontal Separation

The permit drawings submitted with this permit application include dimensions between the landfill liner system perimeter anchor trench, which corresponds to the toe of the proposed final cover system slope, and the property boundary. As shown on these drawings, the minimum horizontal separation between waste placed in the proposed landfill and the landfill property boundary is 130 feet, which exceeds the 100-foot setback requirement of Section 62-701.340(4)(c), FAC.

2.6.4 Screening of Landfill from Public View

Additional measures will not be needed to screen the landfill from public view. The proposed landfill facility is located approximately 1.7 miles west of highway U.S. 441, which is the closest public area. The area between the facility and highway U.S. 441 consists of the natural vegetation of central Florida, including extensive stands of trees, which screen the site activities from public view.

2.7 Landfill Information

Landfill information as required by Section 62-701.330(3)(e), FAC, is presented below. This information responds to Part F-5 of Form 62-701.900(1).

2.7.1 Estimated Population for the Service Area

The area serviced by the facility is primarily Osceola County. According to population figures available from the Osceola County Planning Department, this service area had a population of 172,493 in 2001 and the projected population for this service area in the year 2010 is about 231,500.

The OHD facility also will be available to serve surrounding counties. According to population figures available from Florida Association of Counties, the population of

surrounding counties (Brevard, Indian River, Okeechobee, Orange, and Polk) was 2,062,673 in 2001.

2.7.2 Type, Source of Solid Waste , and Annual Quantity

Household trash, commercial waste, construction and demolition debris, and other waste classified as Class I waste may be disposed in the OHD landfill. The waste will be from residential communities and commercial sources.

The landfill will generally be open from Monday through Saturday (half-day on Saturday), and closed on Sundays. As such, the landfill will operate approximately 286 equivalent full days per year. The estimated average waste disposal rate for the OHD landfill is expected to be 1,700 tons/day. Therefore, the annual quantity of solid waste to be disposed in the OHD landfill is expected to be approximately 486,200 tons.

30 year life

2.7.3 Anticipated Life

Based on the permit drawings presented with this permit application, the estimated volume of waste and initial cover soils that can be disposed in the OHD landfill is approximately 23.7 million cubic yards. The life of the OHD landfill is approximately 30 years, based on an average annual waste disposal rate of 474,000 tons/year, an average in-place unit weight of 1,500 pounds/cubic yard, and 20 percent of the available volume dedicated to initial cover.

20% vol. for initial cover

2.7.4 Cover Material

On-site borrow soils will be used for initial, intermediate, and final cover applications. Available on-site borrow soils consist of materials considered suitable for all cover applications. Soils stripped from the inactive sod farm may be stockpiled for use as the final cover vegetative layer. If adequate quantities of stripped soils are not available for the final cover vegetative layer, appropriate soil will be imported from off site, or soil may be mixed with composted organic matter to meet specification requirements.

2.8 Land Use Information

2.8.1 Conformance with Local Zoning

The facility is in compliance with Osceola County's comprehensive plan and local zoning ordinances. In June 2001, Omni's request for approval of a Conditional Use / Site

Development Plan to construct and operate the OHD facility was approved by the Osceola Board of County Commissioners.

2.8.2 Neighboring Land Use

The site is bounded by the Gannarelli property to the north, Bronson Inc.'s property to the west, Clay Whaley's property to the south, and highway U.S. 441 to the east as shown in the permit drawings, Sheet 3 of 50. According to Osceola County zoning maps, areas adjacent to the proposed OHD landfill are zoned as Agricultural Development and Conservation District, AC District. Review of the Osceola County Future Land Use Maps indicates that the future land use for areas with a one-mile radius of the proposed landfill are also zoned as AC. Thus, the neighboring land uses are compatible with Omni's proposed project. Further, Omni has worked closely with these property owners to ensure that the project's impacts are minimized. Consequently, these property owners do not object to Omni's project.

SECTION 3. GEOTECHNICAL DESIGN

3.1 Overview

Information and analyses presented in this section are based on findings from both the hydrogeological and geotechnical investigations required by Section 62-701.410, FAC. As previously stated, the hydrogeological investigation was performed by KFA under a separate contract with Omni and is included as Appendix E to this permit application. The geotechnical investigation was performed by GeoSyntec and is reported in Appendix F to this permit application. The geotechnical investigation was conducted to characterize the underlying soils and to define the engineering properties of the soils, and to conduct the foundation analyses for the landfill. Information provided by both the hydrogeological investigation and the geotechnical investigation was used in performing the geotechnical design for the Oak Hammock Disposal (OHD) landfill.

The remainder of this section presents:

- the general physiography and lithostratigraphy at the site;
- a site evaluation of fault areas, seismic impact zones, and unstable areas;
- a discussion of the bearing capacity and slope stability analyses; and
- a discussion of the settlement analysis of the subgrade.

3.2 Physiography and Lithostratigraphy

The OHD site is located in relatively flat terrain, which is gently sloping to the east and south at approximately one to two feet per mile. The OHD site is within the Osceola Low, which is east of the Ocala Platform, west of the Brevard Platform, and north of the Okeechobee Basin. The Osceola Low is part of the Osceola Plain, which is a physiographic feature in the central to mid-peninsular physiographic zone of Florida. Within the area of the landfill footprint, existing ground elevations range between approximately 80 feet and 82 feet above the National Geodetic Vertical Datum of 1929 (NGVD29).

A generalized lithostratigraphy of the site from the ground surface to basement rock consists of:

- Undifferentiated Pleistocene to Recent deposits consisting of :
  - silty sand/sand sublayers (approximately 55 to 65 feet thick);
  - clayey sand/sandy clay/sandy, shelly clay sublayers (approximately 10 to 20 feet thick);
  - shell hash/shelly sand (approximately 5 to 20 feet thick); and
  - interbedded silty sand/clayey sand/shelly, silty sand sublayers (approximately 50 to 75-ft thick);
- Miocene deposits of the Hawthorn Group (approximately 145 feet thick) consisting of:
  - Peace River formation; and
  - Arcadia formation; and
- Ocala Group (basement rock).

A surface-water feature near the landfill footprint is Bull Creek, which passes north and east of the proposed landfill and crosses the OHD property southeast of the landfill. A minimum setback of 490 feet between the edge of waste and the centerline of Bull Creek has been maintained in the landfill design. Existing surface drainage on and in the vicinity of the landfill footprint is generally sheetflow or through shallow man-made ditches. Sheetflow is controlled by the surficial silty sand layer. Based on an evaluation of information presented by the hydrogeological investigation, the average wet season groundwater table has been assumed at elevation 79 feet NGVD or about 1 foot below the existing ground surface, whichever is higher for the purposes of storm-water management system design. The low seasonal groundwater is estimated to be up to approximately 36 inches below ground surface.

3.3 Site Evaluation

The site has been evaluated with respect to fault areas, seismic impact zones, and unstable areas as described in 40 Code of Federal Regulations (CFR) §258.13, §258.14, and §258.15, respectively, in accordance with Section 62-701.410(2)(c), FAC. Based on the hydrogeological investigation performed by KFA (Appendix E), there are no Holocene faults within 200 feet of the proposed OHD landfill, and the proposed OHD landfill is not within a seismic impact zone.

Unstable areas, as defined by 40 CFR §258.15, include areas with poor foundation conditions, areas susceptible to mass movements, and karst terrains. The proposed facility is not located in an unstable area. As documented by the geotechnical investigation, the foundation conditions at the facility are good, primarily consisting of medium density sands underlain by soils of the Hawthorn Group. This conclusion is supported by the bearing capacity analysis presented later in this section, which indicates a

factor of safety greater than 9.5 with respect to the bearing capacity failure. Areas susceptible to mass movement are areas of landslides, avalanches, debris slides and flows, block sliding, and rock fall. The site of the proposed OHD landfill is relatively flat, providing virtually no opportunity for mass movement. The results of the slope stability analyses presented later in this section indicate that construction of the proposed landfill would not cause instability at the site. Therefore, the facility is not in an area susceptible to mass movements. Based on borings from the hydrogeological and geotechnical investigations (Appendices E and F), the facility is not located in an area of karst terrain. Therefore, the site is located in an area that is not susceptible to sinkholes.

The area of the proposed landfill footprint is generally located on an inactive sod farm. The top layer of soil at the site contains some organic matter, which will be removed prior to construction of the landfill. There are limited wetland areas present in the footprint of the proposed landfill. In these areas, the excavation of soft organic soils will be performed to deeper competent ground, as required. No other indications of the presence of muck, previously filled areas, or soft ground were noted during the geotechnical investigation.

3.4 Stability Parameters

3.4.1 Landfill Description

The maximum height of the proposed landfill is approximately 98 feet above the existing ground elevation. The side slopes and top slopes will be 4H:1V and 5 percent, respectively. The components of the proposed landfill include, from top to bottom, final cover system, compacted waste, double-composite liner system, select subgrade, and subgrade. The proposed landfill is encompassed by a 16-foot high perimeter berm constructed of general fill.

The components of the liner system include, from top to bottom, 2 feet of the liner protective layer, primary drainage geocomposite, primary 60-mil high-density polyethylene (HDPE) geomembrane, primary geosynthetic clay liner (GCL), secondary drainage geocomposite, secondary 60-mil HDPE geomembrane, and secondary GCL.

3.4.2 Geotechnical Material Properties

A discussion of the geotechnical material properties used in the geotechnical evaluation of the proposed landfill is presented in Appendix F, (*Geotechnical Investigation Report*). A summary of the principal geotechnical material properties is presented in the paragraphs below.

The soil components of the final cover system have a unit weight of approximately 120 lb/ft^3. The shear strength properties of the final cover system is characterized with an effective friction angle of 35° and an effective adhesion influence of zero. The properties of individual components of the final cover system do not influence the bearing capacity, global slope stability, and settlement analyses discussed in this section of the permit application. The geotechnical evaluation of the final cover system is presented in Section 6.

Disposed waste will be compacted municipal solid waste (MSW). The unit weight of MSW varies linearly with depth from 41 lb/ft^3 (at the surface) to 67 lb/ft^3 (at 115 ft deep). The unit weight of MSW varies asymptotically with depth from 67 lb/ft^3 (at 115 ft deep) to 83 lb/ft^3 (at great depth). The average unit weight of MSW is 55 lb/ft^3. The shear strength properties of MSW are characterized by a bi-linear Mohr-Coulomb envelope. The shear strength has a constant value of 500 lb/ft^2 in the normal stress range between 0 and 625 lb/ft^2. An effective friction angle of 33° characterizes the shear strength for normal stresses greater than 625 lb/ft^2.

Waste density variation

The unit weight of the soil components of the double-composite liner system is between 110 lb/ft^3 and 120 lb/ft^3. The shear strength property of the double-composite liner system is best characterized by the weakest effective interface shear strength between the layers of the liner system. The double-composite liner system has the following interfaces:

- liner protective layer and geocomposite drainage layer;
- geocomposite drainage layer and 60-mil textured HDPE geomembrane;
- 60-mil textured HDPE geomembrane and GCL;
- GCL and geocomposite drainage layer; and
- GCL and select subgrade.

As required by the *Technical Specifications* presented as Appendix P, the average effective interface shear strength envelope of the interfaces between differing materials will exceed that characterized by an effective friction angle of 10° and an effective adhesion of zero when tested according to ASTM D 5321 or D 6243 at confining stresses of 50, 125, and 200 pounds per square inch.

interface shear strength testing

The unit weight of subgrade and subsurface soils is approximately 115 lb/ft^3. Based on geotechnical evaluation of subgrade and subsurface soils, the shear strength is characterized by an effective friction angle, which varies between 25° and 35°.

The magnitude of landfill foundation settlement depends on the deformational characteristics of the subgrade and subsurface soils. The deformational property of coarse-grained soils is characterized by the elastic modulus. Elastic modulus of coarse-grained soils was estimated using empirical relationship available in the literature and results of the geotechnical investigation. A detailed description of the elastic modulus relationship used in this permit application is presented in Appendix F. The deformational property of fine-grained soils is characterized by their compression index. A modified compression index equal to 0.1 is used in this permit application.

3.5 Bearing Capacity and Slope Stability Analyses

3.5.1 General

The landfill slopes and overall waste mass of the proposed OHD landfill are stable both during the active life of the landfill and following closure of the landfill as required by Section 62-701.410(2)(3), FAC. The landfill perimeter berm will be constructed with side slopes inclined at 3 horizontal to 1 vertical (3H:1V) on the exterior of the perimeter berm and 4H:1V on the interior of the perimeter berm. Interior berms between cells will be constructed at maximum 3H:1V slopes. During active waste filling operations, a maximum waste slope of 3H:1V will be maintained on all interior waste slopes. All exterior (i.e., at the landfill perimeter) waste slopes and the final cover side slopes of the landfill cells will be inclined at 4H:1V. The results of bearing capacity and slope stability analyses for both the active life of the landfill and the post-closure condition are presented in this section.

3.5.2 Bearing Capacity

The capacity of the landfill foundation is related to the magnitude of load and the size of the loaded area. Generally, bearing capacity is not an issue for structures such as landfills where the size of the loaded area relative to magnitude of loads is large. A detailed bearing capacity analysis is presented in the calculation package entitled "*Bearing Capacity Analysis*" attached as Appendix G to this permit application. As shown in the calculation package, the foundation will not fail in a bearing capacity failure mode and has a bearing capacity factor of safety greater than 8.0. For bearing capacity, a factor of safety of 2.0 to 2.5 normally is considered adequate. This factor of safety was calculated using very conservative assumptions as discussed in Appendix G.

3.5.3 Slope Stability

The following potential mechanisms of instability were analyzed for the proposed OHD landfill. These cases are considered to encompass all potential deep-seated failure surfaces involving the landfill waste mass or the perimeter berm. Surficial failure surfaces in the waste mass or perimeter berm are not considered likely. The veneer stability of the final cover system is discussed in Section 6 of this permit application.

- *Case 1:* Final Configuration, Circular Shear Surfaces: In this case, circular shear surfaces that pass through the final cover system, the disposed MSW, the double-composite liner system, and the foundation soils of the proposed landfill were analyzed. A minimum acceptable factor of safety of 1.50 was established for this case.

- *Case 2*: Final Configuration, Non-Circular Shear Surfaces: In this case, non-circular shear surfaces that pass through the final cover system, the disposed MSW, and along the double-composite liner system of the proposed landfill were analyzed. A minimum acceptable factor of safety of 1.50 was established for this case.

- *Case 3*: Perimeter Berm Stability: In this case, circular shear surfaces that pass through the slope of the perimeter berm were analyzed. A minimum acceptable factor of safety of 1.50 was established for this case.

- *Case 4:* Interim Configuration: In this case, circular and non-circular shear surfaces that pass through the disposed MSW, the double-composite liner system, and the foundation soils were analyzed. This case differs from Cases 1 and 2 in that interim waste slopes of 3H:1V were considered in lieu of the final configuration. A minimum acceptable factor of safety of 1.30 was established for this case.

The detailed slope stability analyses are presented in the calculation package entitled "*Slope Stability Analyses*" attached as Appendix H to this permit application. The calculation package discusses the assumed material properties, problem geometry, and the computer-generated results for each analysis. As shown in this calculation package, the calculated factors of safety for the potential failure mechanisms described above exceed the minimum factor of safety established for each case. Specifically, a factor of safety of 1.5 was exceeded for the final configuration of the landfill and a factor of safety of 1.3 was exceeded for the interim waste slopes.

3.6 Subgrade Settlement Analysis

Both total and differential subgrade settlements have been evaluated as part of the foundation analysis in accordance with Section 62-701.410(2)(3), FAC. The results of the settlement analysis are used to evaluate the impact of anticipated settlements on the performance of the leachate collection system and the proposed liner system. The settlements are calculated using the conventional elastic deformation and consolidation theories. Detailed settlement calculations are presented in the calculation package entitled "*Settlement Analysis*" attached as Appendix I to this permit application

The calculated total settlements of the landfill liner system range from 0.2 to 2.1 feet for areas near the landfill perimeter and areas near the landfill center, respectively. Based on the calculated total settlements, final grades for components of the leachate collection system were calculated. The final grade of the:

- geonet drainage layer in the leachate collection system is between 1.5 percent and 2.0 percent (grade prior to settlement is 2.0 percent); and

- leachate collection system piping is between 0.4 percent and 1.4 percent (grade prior to settlement is between 0.5 percent and 1.5 percent).

The design calculations for the leachate management components presented in Section 4 of this permit application were performed considering the initial grades and the final grades of the landfill liner system after settlement. These design calculations confirm that the calculated settlement of the landfill liner system will have no significant effect on the performance of the leachate collection system.

In addition, the maximum tensile strain in the geomembrane component of the liner system is calculated using the estimated settlements. As discussed in the calculation package entitled "*Settlement Analysis*", the maximum tensile strain in the geomembrane is less than 2 percent. HDPE geomembranes have a maximum allowable tensile strain of about 5 percent [Berg and Bonaparte, 1992], which is significantly greater than the calculated maximum tensile strain due to settlement. Therefore, the calculated settlements should have no significant impact on the integrity of the geomembrane liner.

Based on the results of the subgrade settlement analysis, it is concluded that settlement of the subgrade should have no significant effect on the performance of the leachate collection system or on the integrity of the liner system.

SECTION 4. LEACHATE MANAGEMENT SYSTEM

4.1 Overview

4.1.1 Purpose and Scope

This section describes the leachate management system for the Oak Hammock Disposal (OHD) facility including the landfill liner and leachate control systems. The section also describes the procedures for collecting and storing the leachate from the landfill as well as maintenance and operation of the leachate management facilities as required by Chapters 62-701.400 and 62-701.500(8), FAC.

4.1.2 Organization

The remainder of this section is organized to:

- provide a description of the liner and leachate control system;
- summarize the leachate production rate analysis;
- discuss the design of the liner system;
- discuss the design of the leachate collection system;
- summarize the evaluation of liner system leakage;
- discuss the design of the leachate removal, transfer and storage systems; and
- present the leachate sampling and analysis program.

4.2 Description of the Liner and Leachate Control Systems

4.2.1 General Description

The OHD landfill is comprised of 21 cells and the footprint occupies approximately 264 acres in total plan area. The landfill will be lined with a double-composite liner system, and then capped with a geomembrane as a part of the final closure system. As shown by the descriptions and calculations provided in this section, the liner system proposed for the facility exceeds the minimum design standards in Section 62-701.400, FAC for Class I landfills.

In each cell, the liner system is sloped toward a low point located in one corner of the cell along the perimeter of the landfill. The elevation of the liner subgrade is above the seasonal high ground water level except in the sump areas. Sump construction will place the bottom of the sumps 2 to 3 feet below the upper reach of the seasonal high water level. The primary difficulty with regard to this situation is related to construction. The landfill operator will attempt to schedule construction in the sump area during periods of low groundwater. Otherwise, the sump area will be dewatered during construction. After construction, the liner system will be held in place by the weight of the liner system (2 feet of low-permeability soil), sump gravel (2-feet thick minimum), and general fill and liner protective layer above the liner system, which varies in thickness from 2 feet to 16 feet. This configuration provides a factor of safety greater than 3.5 against uplift assuming 6 feet of 100-pounds per cubic foot soil/gravel resisting a buoyant force of 3 feet of water.

Pre-settlement grading will provide a minimum 2 percent grade sloping toward the leachate collection system piping. Based on the results of the settlement analyses presented in Section 3, the post settlement grade is expected to be greater than 1.5 percent. All design calculations for the design of the primary and secondary drainage layers were based on an initial two percent gradient and a final minimum gradient of one percent in order to be conservative.

Due to the grading configuration, the majority of the cells are roughly rectangular shaped areas sloping toward one corner. This configuration results in two sides of the cell that are lower than the other sides. The liner system will be placed over the prepared subgrade to intercept leachate percolating downward through the landfill. The primary drainage layer of the liner system will collect and remove leachate that is intercepted. Leachate from the primary drainage layer enters a perforated high density polyethylene (HDPE) pipe located along the two lower sides of the cells. The purpose of these pipes is to collect leachate from the drainage layer and convey it to the leachate collection sumps. Each leachate collection pipe will be embedded in two feet of drainage gravel and will have a minimum post-settlement slope of 0.4 percent toward the sump area in each cell. It is expected that the drainage gravel will actually convey the majority of leachate collected and that the pipe will be available for any excess in the most critical situations. The primary drainage layer has been designed to satisfy the maximum 1-foot head criteria set forth in Section 62-701.400(3)(c)1, FAC.

A secondary drainage layer is installed between the primary and secondary liners. The intent of the secondary drainage layer is to collect any leachate that may possibly leak past the primary liner through manufacturing or installation defects. The secondary drainage

layer is designed to limit the head on the secondary liner to less than the thickness of the drainage layer, which is a geocomposite for the OHD facility.

The sump area is divided into two hydraulically isolated areas, primary and secondary, separated by the primary composite liner. The primary sump area receives the leachate that is collected in the primary leachate collection system. The secondary sump area collects any leachate that may leak through the primary liner and is collected by the secondary drainage layer. Each sump area is initially equipped with two primary sump manholes and one secondary sump manhole. As operation experience is gained, one of the primary manholes may be removed in cells constructed later in Phase 1. No manholes will be eliminated without the concurrence of FDEP. Each sump manhole has a dedicated level-controlled sump pump to remove collected leachate from the sump.

Collected leachate is pumped from the sump into the leachate transmission line where it is conveyed to the on-site leachate storage containers. Storage containers will be either a steel tank or a flexible container system. From the on-site storage containers, leachate will be transported by truck to a wastewater treatment plant.

4.2.2 Liner System

The liner system consists of a double-composite liner. The liner system, from top to bottom, consists of:

- 2-foot thick liner protective layer;
- primary geocomposite drainage layer;
- 60-mil thick primary HDPE textured geomembrane;
- primary geosynthetic clay liner (GCL);
- secondary geocomposite drainage layer;
- 60-mil thick HDPE secondary textured geomembrane; and
- secondary GCL.

In the sump areas, the liner system is further supplemented with a 2-foot thick layer of low-permeability soil having a hydraulic conductivity less than or equal to 10^{-7}

centimeters per second underlying the secondary GCL. The limits of the extent of the low-permeability soil layer are indicated on the permit drawings.

4.2.3 Leachate Collection

Leachate collected in the sumps will be pumped out using submersible leachate pumps. The pumps will be connected to a 6-inch diameter HDPE header pipe located at the top of the sump manholes. Each cell will have a dedicated header pipe. The header pipe will convey leachate pumped from both the primary and secondary sumps to the main leachate transmission pipeline. The leachate transmission pipeline will then convey leachate pumped from all of the sumps around the landfill to the leachate storage containers. The leachate transmission line will be an 8-in diameter HDPE pipe.

Each leachate sump pump will be hung from the top of the sump riser on a pump guide bar and be attached to a 3-inch HDPE or flex hose riser pipe. The riser pipes will be equipped at the top with a quick release mechanism to provide easy access to the pumps for maintenance purposes. At the top of the sump manhole, the pipe leading from each sump pump will be fitted with an isolation valve for maintenance and a check valve to prevent the backflow of leachate from other pumps. The primary and secondary sides of the header will be equipped with separate flow totalizers to record the quantity of leachate being pumped from the cell. A mechanical flow diagram detailing the piping configuration is included in the permit drawings.

An air release valve will be installed on the header pipe near the first primary sump riser on each cell. The air release valve is intended to release any air or gas that may enter into the pipeline thereby reducing the flow capacity of the pipeline.

Each cell will be equipped with three sump pumps. Two sump pumps will be dedicated to handling the primary leachate sump and the third pump will handle secondary leachate sump. Each cell will have a motor control station to control the operation of the sump pumps. These motor control stations will communicate with the main control panel. Sump pumps will be controlled by level switches located in the sump risers.

The primary sumps will be equipped with three level switches set at different elevations within the sump manhole. Under normal operation, only the lower level switch will be activated. This will send a signal to the motor control station to start one of the primary sump pumps. The motor control station will operate the primary sump pumps so that both are used in an alternating fashion. The sumps will be equipped with low-level switches that will stop the pump when the sump has been evacuated.

During periods of high leachate generation, one pump may not be sufficient to keep up with the inflow of leachate. At this point, the higher level switch will be activated. This will notify the motor control station to start the second primary leachate pump. The primary leachate pumps have been sized to handle the maximum leachate flow rate of 350 gallons per minute expected in the early operation of Cell No. 1. Cell No. 1 was chosen for pump sizing because it is the largest cell in the landfill and all pumps are to be identically sized for interchangeability. Pump sizes may be modified during the operational life of the landfill to account for operational experience.

A third level switch will also be installed in the sumps. This switch will be connected to an alarm to notify the operator in the event leachate levels in the sump reach this level. The intent of this alarm is to notify the operator of potential problems with pumps or piping.

The secondary sump will also be equipped with level switches. The first switch will start the secondary pump motor in the event leachate is detected in the secondary sump. The second switch is an alarm switch similar to the alarm switch in the primary sump. As previously discussed with FDEP, the secondary sump will be connected to the primary sump by a 3 inch HDPE pipe between the primary and secondary manholes installed at a height of 4 feet above the bottom of the sump. This pipe is intended to provide an emergency overflow from the primary sump to the secondary sump in the event of unusually high leachate flows or primary sump pump failure. If the primary sump pumps are unable to keep up with the flow of leachate into the primary sump, the overflow will allow the primary sump to overflow into the secondary sump so that the secondary sump pump can help remove leachate from the system. The operating restrictions and required records for this method of operation are discussed in the "*Operations Plan*" attached as Appendix O to this permit application.

The main control panel will monitor the number of sump pumps operating at any one time. The maximum number of pumps operating will be limited to four pumps in order to maximize pump efficiency.

Flow totalizers will be installed on the leachate collection headers at each cell. These totalizers will provide measurements of leachate volumes pumped from the leachate sumps. Separate totalizers will be installed for the primary and secondary sides of the system to monitor the quantity of leachate pumped. The volumes of leachate pumped from each cell will be recorded. At the end of each month, the monthly leachate production rate will be compared to the monthly precipitation measures in the rain gauges

Measuring flow volumes

installed at the landfill in accordance with Section 62-701.400(8)(g), FAC. In addition, the monthly leachate production rate will also be recorded as a percentage of the monthly precipitation.

Design calculations for the piping system are included in the calculation package entitled "*Leachate Management System*" attached as Appendix K. Results of these design calculations are discussed later in this section of the permit application.

4.2.4 Leachate Storage and Transfer

Leachate from the landfill will be stored temporarily on-site in the leachate storage area. The on-site storage area was sized to contain leachate generated during an average seven-day period occurring during the maximum rainfall year as discussed in the calculation package entitled "*Leachate Management System*". Four storage containers with individual capacities of approximately 250,000 gallons will be used yielding a total on-site storage capacity of 1,000,000 gallons. Four containers were used to allow for inspection maintenance or repair of individual containers without any interruption of service. As shown in the permit drawings, these containers may be constructed of 60-mil HDPE geomembrane sheets welded together at the edges to create a large, flexible storage container. These flexible containers will provide covered storage for the collected leachate and will effectively control vector, which may be attracted to the leachate. Alternatively, a conventional steel tank, or equivalent may be used. During the initial phases of landfill construction, all leachate will be stored in flexible leachate storage containers in the interim leachate storage facility as indicated in the permit drawings. If a steel tank is used, the bottom of the steel tank will be cathodically protected using sacrificial anodes, the exterior surfaces of the tanks will be protected by a surface coating designed to prevent corrosion and deterioration, and the interior of the tank will be coated with epoxy or similar material resistant to the leachate in accordance with Section 62-701.400(6)(c)(4), FAC.

All of the leachate storage containers will be placed within a bermed area to provide secondary containment of more than 110 percent of the container's volume. The maximum fill elevation of the storage containers will be two feet below the top of the primary liner. The maximum elevation of leachate within the storage containers will be electronically monitored and alarmed to prevent overfilling. The bottom and sides of each bermed area will be lined. In the case of a steel tank, a single 60-mil HDPE geomembrane will be installed in the bermed area. In the case of the flexible storage containers, the bermed areas will be lined with two 60-mil HDPE geomembranes separated by a leak detection zone. In both cases the bottom HDPE geomembrane will be installed over a

GCL. Each bermed area will be graded to drain to a sump area where rainwater can be collected and discharged or spilled leachate can be pumped back into the storage containers. Each sump will be equipped with a riser into which a submersible pump can be lowered. The leak detection zone below the flexible containers will also have a sump connected to a riser pipe for monitoring and removing leachate, as required.

Within each bermed area the liner system is sloped toward a low point located at the innermost corner of all the storage containers. The elevation of the finished grade within the bermed area is above the seasonal high ground water level, however the liner system will be at or below the seasonal high water level. The landfill operator will attempt to schedule construction of the leachate storage area during periods of low groundwater. Otherwise, the sump area will be dewatered during construction. After construction, the liner system will be held in place b the weight of the liner system, 2 to 3 feet of liner protective drainage layer. This configuration provides a factor of safety greater than 2.4 against uplift assuming 3 feet of 100 pounds per cubic foot soil/gravel resisting a buoyant force of 2 feet of water.

All of the pipelines into and out of the storage containers will be equipped with manually and automatically actuated valves. Each container will be equipped with level sensors to monitor the level of leachate contained within that container to prevent overfilling. As a container fills, when the high level switch is activated, the inlet valve will automatically close to prevent additional leachate from being pumped into that container. If the valve fails to close and leachate continues to fill the container, a high level switch will be activated that will set off an alarm and shut down all leachate sump pumps to prevent overfilling of the containers. Manual valves are provided for maintenance and emergency shut off.

Leachate container inspection requirements are discussed in the *Operations Plan* presented in Appendix O of this permit application. The exposed exterior of the containers will be inspected weekly for leaks, corrosion, maintenance deficiencies, and in the case of a steel tank adequacy of the cathodic protection system. Inspections of steel tank interiors will be performed whenever a tank is drained or at least once every three years. The overfill protection equipment will be inspected weekly to ensure it is in good working order.

If inspections reveal a leak, or any other deficiency that could result in a release of leachate, remedial measures will be taken to eliminate the leak or deficiency. Inspection records will be maintained and made available to FDEP upon request for the lifetime of the facility.

During transport truck loading, the operator will select which container(s) to empty from a main control panel at the truck-load station. All tanks will be emptied using centrifugal pumps located near the truck-load station. Two pumps are provided at this location so that a backup pump is available in the event one pump is down for maintenance or one pump fails.

Low-level switches will monitor the level of leachate in the containers and will close the pump out valve associated with that container in the event the container is drawn down below a preset level. If all pump out valves are closed, the truck loading pumps will also be shutdown.

4.2.5 Leachate Collection System Maintenance

The leachate collection system (LCS) includes 6-inch diameter perforated leachate collection pipes and cleanouts. The collection pipes will be cleaned and maintained, as necessary, through the side slope cleanout pipes. The leachate collection pipe cleanouts can be accessed at the top of the perimeter berms as shown in the permit drawings. Leachate collection pipes can be cleaned by flushing with high-pressure water from a hose or by snaking in the case of severe blockages.

4.3 Leachate Production Rates

4.3.1 General

Leachate production rates for the proposed landfill were estimated using an analytical model. Modeling of leachate production was carried out using the Hydrologic Evaluation of Landfill Performance (HELP) model, Version 3.07, developed for the U.S. Environmental Protection Agency (Schroeder et. al., EPA/600/R-94/168a and EPA/600/R-94/168b, 1994). The HELP model is a water balance calculator commonly used to estimate leachate production rates for landfills. A detailed description of the analyses and subsequent validations is included in the calculation package entitled "*Leachate Management System*", attached as Appendix K to this permit application.

4.3.2 Estimated Production Rates

The HELP model was used to calculate leachate production rates for three basic cases, each representative of a different stage in the development of a cell. A brief description of the results for the three basic cases is as follows:

ie 1 lift of waste

- Case 1: This case simulates the initial stages of waste deposition. The cell is covered with 10 feet of waste and 6-inches of initial cover.

- Case 2: This case was designed to simulate the intermediate stages of deposition. The cell is covered with 30, 60 and 95 feet of waste and 6 inches of initial cover. Because of the varying depths of waste, this case was broken into three sub-cases representative of the waste thickness, 2a, 2b and 2c for 30, 60 and 95 feet, respectively.

- Case 3: This case simulated a closed cell with the full thickness of 95 feet of waste and installation of the final cover over the waste.

Each case was also analyzed for different surface slopes, 5 percent and 25 percent, corresponding to the slope of the final cover. A summary of the results of the HELP model for these cases is included in Appendix K to this permit application.

Various combinations of Cases 1 through 3 were used to simulate the landfill filling sequence. For example, during waste deposition, some cells may be closed, others waiting to be closed but with 95 feet of waste, and portions of others at intermediate points with varying depths of waste. Based on the proposed landfill filling sequence developed, the HELP model was run to estimate the most critical combination of waste depths and open area for the selected precipitation record. Selection of the precipitation record used for design is discussed in Appendix K. The combination of waste deposition identified by the HELP model predictions as the worst-case scenario for leachate generation is presented in Appendix K.

The results of the HELP model prediction were used to design the various components of the leachate collection system. The primary drainage layer is capable of handling a peak day leachate production rate of 29,000 gallons per acre. This value represents the worst-case scenario for leachate production. The design of the primary drainage layer accounted for several factors that could reduce the flow transmission capacity of the geocomposite. These factors included: weight of the surcharge above the drainage layer, a reduction in the base slope as a result of settlement of the landfill subgrade, biological fouling of the geotextile, creep deformation and chemical clogging of the geonet. A detailed description of these factors is included in Appendix K.

The leachate collection pipes, leachate sump pumps and the leachate transmission line were designed to carry the maximum average daily leachate generation for the

worst-case scenario. Detailed descriptions of the calculations are presented in Appendix K and results are discussed later in this section. The leachate storage containers were sized to store all the leachate generated in one week under a worst-case scenario presented in Appendix K without any off-site transfer of the leachate.

4.4 Liner System

4.4.1 Properties of Materials

The components of the liner system include, from top to bottom, the liner protective layer; primary drainage geocomposite, primary geomembrane, primary GCL, secondary drainage geocomposite, secondary geomembrane, and secondary GCL. A summary of the liner system material properties follows.

4.4.2 Liner Protective Layer

The liner protective layer is a 2-foot thick layer of soil having the physical and performance properties as specified in Section 02240 of the Technical Specifications attached as Appendix P to this permit application. In accordance with Section 62-701.400(3)(d)(3), FAC, the upper one-foot of the liner protective layer may consist of shredded tires in lieu of soil. The OHD facility intends to use tire chips, as available, having a size of approximately 1 inch to 2 inches.

4.4.3 Geotextile Filter Fabric

Separate geotextile filter fabrics are used primarily in the leachate collection sump areas to provide a separation between the protective cover and sump gravel and between the gravel installed around the leachate collection pipe and the liner protective layer. The specified geotextile filter fabric is a needle punched non-woven material having physical and performance properties as specified in Section 02720 of the Technical Specifications attached as Appendix P to this permit application.

4.4.4 Geocomposite Drainage Layers

4.4.4.1 Primary Drainage Layer

The material specified for the primary drainage layer consists of a geocomposite material consisting of a two or more strand polyethylene geonet core with needle punched non-woven geotextile heat laminated to each side. The geonet core is to be manufactured of HDPE and is, therefore, chemically resistant to Class I landfill leachate in accordance

with Section 62-701.400(4)(a)(1), FAC. The primary geocomposite was designed to meet specific requirements for hydraulic transmissivity under a specific hydraulic gradient and compressive strength. A geocomposite will be used having physical and performance properties as specified in Section 02720 of the Technical Specifications attached as Appendix P to this permit application. The parameters specified are designed to limit the accumulated head on the liner to less than 1 foot.

Design calculations to support the selection of the specified geocomposite properties are presented in Appendix K. The specifications require appropriate laboratory testing to confirm that the selected geocomposite has the specified properties. This testing includes hydraulic transmissivity tests conducted at the design compressive stress and gradient and using the appropriate boundary conditions. (i.e. the geocomposite is tested with the adjacent materials corresponding to those used in the field). Testing the geocomposite at the design compressive stress not only provides appropriate hydraulic properties, it also confirms that the geonet has sufficient compressive strength to prevent collapse (Section 62-701.400 (4)(a)(2), FAC).

4.4.4.2 Secondary Drainage Layer

The basic physical requirements for the secondary drainage layer are the same as those for the primary drainage layer with the exception of the required transmissivity. Because the quantity of leachate expected to be carried by the secondary drainage layer is significantly less than that carried by the primary drainage layer, a lower transmissivity value is allowed for the secondary drainage layer. Design calculations to support the selection of the specified transmissivity are presented in Appendix K. A secondary drainage layer having the physical and performance properties as specified in Section 02720 of the Technical Specifications attached as Appendix Q to this permit application will be used. Testing requirements for the secondary geocomposite are the same as for the primary geocomposite

4.4.5 Primary and Secondary Liner Geomembranes

The specified geomembrane liner is a 60-mil thick HDPE geomembrane as required by Section 62-701.400(3)(b)(1), FAC. An HDPE geomembrane has the appropriate physical, chemical, and mechanical properties to be resistant to leachate in accordance with Section 62-701.400(3)(a)(1), FAC, as indicated in the following discussion.

Geomembranes used in containment facilities such as landfills are subjected to tensile stresses resulting from a variety of causes including: gravity stresses, settlement, thermal

contraction, etc. Geomembranes must therefore have adequate tensile behavior. Several aspects of tensile behavior should be considered, including tensile strength and elongation. A more detailed discussion of these parameters is included in the calculation package entitled *"Settlement Analysis"* discussion attached as Appendix I to this permit application.

The design calculations presented in Appendix I of this permit application indicate that the maximum strain induced in the geomembrane due to settlement is less than 2 percent. This value is less than the typical 12 percent yield strain of HDPE geomembranes. Therefore, from the standpoint of tensile behavior, HDPE geomembranes are appropriate for use in this landfill liner system.

Since the late 1970s, extensive laboratory testing has been conducted to evaluate the chemical compatibility of several types of geomembranes with a variety of chemicals typically encountered in waste. Most of this work was sponsored by the U.S. Environmental Protection Agency (USEPA). A summary of these studies can be found in reports by Haxo et al. [1982] and Schwope et al. [1985].

This extensive chemical compatibility testing program has shown that, among all materials tested, HDPE geomembranes have the highest known degree of compatibility with almost all chemicals encountered in waste. As a result, in the past few years, there has been a tendency to automatically select HDPE geomembranes (or any of the other closely related polyethylene geomembranes) for all liner systems used with municipal solid waste. The use of HDPE geomembranes at this landfill is in agreement with the state-of-practice.

An important consideration regarding geomembrane installation is the susceptibility to low temperatures. HDPE geomembranes are not very susceptible to low temperatures. They become brittle only at temperatures below -40°F. Therefore, the use of HDPE geomembranes at this site is considered appropriate.

In selecting the thickness of an HDPE geomembrane, two installation aspects are generally considered: flexibility and seaming. These can be summarized as follows:

- Flexibility: This is a major consideration to facilitate installation and alleviate concentrated stresses. From this viewpoint, a thickness of 80 mil or less is typically recommended.

- Seaming: Because they are easily overheated, thin HDPE geomembranes can be difficult to weld. A thickness of 40 mil is the minimum typically recommended.

The 60-mil thick HDPE geomembrane provides a good balance between flexibility and seamability and is therefore appropriate for the viewpoint of installation considerations. The requirements for the geomembrane specified for this design are included as Section 02770 of the Technical Specifications, attached as Appendix P to this permit application.

4.4.6 Primary and Secondary Geosynthetic Clay Liners (GCL)

The GCL acts as the low-permeability soil component of the composite liner. The GCL is approximately 0.2 in. thick and its hydraulic conductivity is normally less than 1 x 10^{-9} cm/s, based on laboratory permeability tests. The GCL is used to provide a plugging action in the event of a liner penetration. The low permeability clay contained in the GCL is dry when installed. If a penetration occurs, the clay will absorb some of the leachate passing through the HDPE liner and will swell to seal off the penetration. The requirements for the GCL specified in this design are included as Section 02780 of the Technical Specifications attached as Appendix P to this permit application.

4.5 Leachate Collection System

4.5.1 General

This section presents a brief discussion of the results of calculations for the design of the leachate collection system. The components of the leachate collection system include the geocomposite drainage layers and the collection pipes. Each of these components must be properly designed and constructed to perform its intended function. A detailed discussion of the design calculations are provided in Appendix K.

4.5.2 Drainage Layer Design

The head of leachate directly above and in contact with the composite liner affects the rate of leakage through the composite liner. In order to minimize leakage through the composite liner, the leachate drainage layer must minimize the leachate head. Section 62-701.400 (3)(c)(1), FAC, requires that the head generated by leachate accumulation on the primary liner must be less than 1 foot. Section 62-701.400 (3)(c)(2) requires that the head on the secondary liner not exceed 1-inch or the thickness of the drainage layer. Appendix K provides the calculations prepared for design of the primary and secondary drainage layers. As shown in these calculations, the maximum head on the primary liner during the

peak daily leachate production is 2.87 inches, which is less than the 12-inch regulatory maximum. The maximum head on the secondary liner under the same peak daily conditions is 0.061 inches, which is less than the 0.3-inch thickness of the secondary geocomposite drainage layer. These heads comply with regulatory requirements.

The calculated geocomposite hydraulic transmissivities of the primary and secondary drainage layers as specified in Section 02740 of Appendix O provide a greater flow capacity than the minimum hydraulic conductivity requirements for soil components described in Section 62-701.400(1)(c) and (4)(b). Since the flow capacity of the geocomposites are greater, the drainage layers proposed for the landfill cells exceed FDEP's minimum requirements.

4.5.3 Leachate Collection Pipe Design

4.5.3.1 General

The function of the leachate collection pipes is to assist the conveyance of the leachate collected by the primary drainage layer to the leachate sumps. Collection pipes must have adequate flow capacity to convey the leachate and adequate structural resistance to withstand the applied loads. In addition, since the collection pipes are perforated to permit the flow of leachate into the pipes, the size of the perforations must be large enough to accept the flow of leachate into the pipe without head buildup, and small enough to prevent pipe bedding material from entering the pipe. This section presents an evaluation of the flow capacity and structural stability of the leachate collection pipes.

4.5.3.2 Pipe Design Parameters

Stresses on the Pipe

Pipe stresses were evaluated for two conditions: (i) the initial condition and (ii) the post-closure condition. The initial condition assumes the stresses imparted on the pipe during construction of the landfill. This condition assumes 1 foot of soil cover and traffic loads from a truck weighing 35 tons and a wheel load of 20,000 lbs. This loading combination approximates the maximum loads expected from standard construction equipment. The final condition is the load condition present after waste has reached the maximum permit elevation and the landfill is closed. Detailed descriptions of these conditions are presented in Appendix K.

Bedding Material

The drainage gravel around the drainage pipes is a rounded silica gravel meeting the gradation requirements of ASTM D 428. Section 02235 of the Technical Specifications calls for No. 57 aggregate for the cells and No. 4 aggregate in the sump areas.

4.5.3.3 Pipe Perforation Sizing

The pipe perforations in the leachate collection pipe were sized to prevent the infiltration of the drainage gravel into the pipe. Perforation sizing is dependant upon the gradation of the gravel bedding used. The calculation package attached as Appendix K, provides a detailed description of the sizing evaluation performed for the leachate collection pipes and the sump pipes. Calculations indicate that a 1/2–inch diameter perforations are appropriate for the leachate collection pipes and 5/8-inch diameter perforations appropriate for the sump leachate pipes. Perforations at the base of the sump manholes will be 5/8-inch diameter, the same as sump pipes.

4.5.3.4 Pipe Flow Capacity

The flow capacity of the leachate collection pipes was evaluated for the average peak daily leachate flow. This flow rate was generated by the HELP Model and is based on the worst-case conditions for precipitation and waste deposition. A detailed description of the methods used and the calculations performed are included in Appendix K. The calculations indicate that 6-inch HDPE pipes will have sufficient flow capacity to handle these flows.

4.5.3.5 Pipe Structural Stability

The leachate collection pipe must be able to withstand the loads applied to it. Four pipe failure mechanisms should be considered when designing a buried plastic pipe to be structurally stable under loads including:

- wall crushing;
- wall buckling;
- excessive ring deflection; and
- bending strain.

Wall crushing can occur when the stress in the pipe wall, due to external vertical pressure, exceeds the compressive strength of the pipe material. Wall buckling, a longitudinal wrinkling in the pipe wall, can occur when the external vertical pressure exceeds the critical buckling pressure of the pipe/bedding aggregate system. Ring deflection is the change in vertical diameter of the pipe as the pipe/bedding aggregate

system deforms under the external vertical pressure. The actual ring deflection of the pipe must be less than the allowable ring deflection of the pipe. When a pipe deflects under load, bending strains are induced in the pipe wall. Bending strain occurs in the pipe wall as external pressures are applied to the pipe/bedding aggregate system. HDPE pipe can be designed to resist failure by the above mechanisms using design methods presented in the technical literature (for example, see Uni-Bell [1991] and plastic pipe manufacturers' literature, such as Phillips 66 [1988 and 1991]). A detailed discussion of the conditions and design calculations are presented in the design package in Appendix K.

The potential for these pipe structural failure mechanisms have been calculated using the methods recommended by the pipe manufacturer. Based on the results of these calculations, the pipes specified meet or exceed the minimum acceptable values recommended by the pipe manufacturer. Pipe requirements are specified in Section 02715 in Appendix Q.

4.6 Leakage Evaluation

4.6.1 Purpose

The purpose of this section is to evaluate the rate of leakage through the composite liner of the landfill cells during the active life of the landfill. It is necessary to calculate the rate of leakage through the composite liner in order to verify the adequacy of the design of the liner and leachate collection system. This section presents a brief description of the methods used. Design calculations are included in Appendix K.

4.6.2 Evaluation of Leakage through the Composite Liner

The composite liner consists of a HDPE geomembrane placed on top of a GCL. Leakage through composite liners is primarily due to leakage through defects (e.g., holes) in the geomembrane [Giroud and Bonaparte, 1989]. As shown by Giroud and Bonaparte, leakage due to permeation through intact geomembranes are known to be negligible for landfills that receive MSW.

Leakage rates through composite liners are a function of many parameters, including hydraulic head, size and quantity of the holes, thickness and hydraulic conductivity of the GCL layer underlying the geomembrane, and quality of contact between the geomembrane and the underlying GCL. The evaluation for leakage through the liner was performed using the HELP model. The HELP model allows the assumption of manufacturing defects (pinholes) and installation defects during analysis.

For purposes of this evaluation the following assumptions regarding geomembrane quality control and assurance were used:

- manufacturing defects: The evaluation used two pinholes per acre with diameters of 1-mm each.

- installation defects: The evaluation used two defects per acre with areas of 1-cm^2 each.

It is assumed that the landfill cells will be constructed with high quality materials, that good construction practices will be followed, and that a very good construction quality assurance (CQA) program will be implemented. The technical specifications are presented in Appendix P and the CQA Plan is presented in Appendix Q. The assumed geomembrane defects are conservative in consideration of the required manufacturing quality control required by the technical specifications and planned CQA program

4.6.3 Conclusions

Rates of leakage through the composite liner of the landfill cells were calculated using the methods and assumptions generally accepted in liner system design practice. The calculated rate of peak leakage through the secondary liner is on the order of 0.15 x 10^{-3} to 0.07 x 10^{-3} gallons per acre per day (gpad). This leakage rate is considered negligible for all practical purposes. The maximum leakage is equivalent to spilling a few drops per acre per day or an 8-ounce cup of leachate over an acre every 400 days.

4.7 Leachate Removal and Transmission Systems

4.7.1 Introduction

The purpose of this section is to present a brief discussion of the calculations performed for the design of the leachate removal and transmissions systems. The components of the leachate removal system include the leachate sump pumps, and the associated piping. The transmission system consists of piping to convey the leachate from the sumps to the leachate storage facility.

4.7.2 Leachate Removal Pumps

Each cell is equipped with three leachate removal pumps. Two pumps are dedicated to the removal of leachate collected by the primary drainage layer system and one pump is dedicated to removing leachate collected by the secondary drainage layer. The selected

sump pumps will be stainless steel submersible pumps of the type commonly used for leachate handling. The sump pumps were sized to remove the maximum average leachate generation from the worst-case cell when both primary pumps are operating. During normal leachate generation scenarios only one pump at a time will operate. Pump operation will be programmed to alternate between the two pumps so that the moving parts of both pumps will remain lubricated.

Pump selection is based on a review of pump curves provided by the pump manufacturer. Pump curves provide a graphical representation of an individual pump performance under various pumping heads. For the leachate sump pumps, a pumping capacity of at least 175 gpm per pump was necessary. Based on a review of the expected pumping head and pump capacity requirements, a 7.5 hp pump was selected. This pump will be capable of pumping at approximately 200 gpm at the expected pumping head.

4.7.3 Leachate Transmission Pipeline

The leachate transmission pipeline conveys leachate removed from the leachate sumps to the leachate storage facility. HDPE pipe was selected for the leachate transmission pipeline because of its resistance to the chemicals and compounds contained in MSW leachate. HDPE pipe also provides the additional benefits of ease of construction and maintenance, low coefficient of friction, and resistance to ultraviolet radiation. Sizing the pipeline considered the following parameters.

- Flow rate: The design flow rate was selected based on an assumption that during the construction phase of the landfill, up to four leachate collection pumps may operate simultaneously resulting in a flow rate of 800 gpm. This flow rate exceeds the calculated peak average daily leachate generation of 615 gpm and is considered appropriate based on pump sizing. The selection of four pumps operating simultaneously was based on the assumption that the active cell will require two pumps to meet the leachate generation capacity and two additional cells will require one pump each to keep up with leachate generation. The majority of cells are not expected to produce leachate at rates that will require continuous operation of the sump pumps even during worst case scenarios. Therefore, the selection of four as the number of pumps operating is considered appropriate for this design.

- Maximum sump pump pressure head (deadhead pressure): Deadhead pressure is the pressure that a pump will generate if pumping against a closed valve. Pipelines must be designed to withstand the maximum deadhead pressure. For the

pumps selected, the maximum deadhead pressure was 130 ft of water column (56 psi).

- Pipe length: Friction losses in pipes are a factor of flow rate, pipe material and pipe length. In a large system such as the leachate transmission pipeline, pipe length provides the majority of friction losses generated by the system. The maximum friction losses in the pipeline were calculated to be approximately 90 ft of water column (39 psi) by the Darcy-Weisbach formula.

4.7.4 Pumps and Piping

The sizing of pumps and piping must be performed as a unit. As pipe pressure increases in an open-ended pipe, so does the velocity of the fluid in the pipe. This increase in velocity translates directly to increases in the pumping head necessary to push the fluid through the pipe. Therefore, selection of the appropriate sized pumps and pipes becomes an iterative process to develop the appropriate combination. During the initial phases of the landfill, the leachate storage facility will be located within the footprint of the future phases of the landfill as indicated in the permit drawings. During the future phases, the leachate storage area will be moved to a permanent location on the south east side of the landfill. This phased approach was originally conceived to congregate the active landfill operations in a smaller area. This approach has the added benefit that areas where the majority of leachate will be produced are closer to the leachate storage area than closed sections of the landfill where less leachate will be produced. The end result of this approach is that the pipe lengths necessary to convey leachate to the storage facility from the active cells will be shorter than if the storage area were located at the final location. This will result in lower pumping head requirements for the active cells, where the majority of leachate is greater. When the leachate storage area is moved to its permanent location, the cells in the first phases of landfill construction will have significantly reduced pumping requirements because the majority of the cells will be under final cover.

Based on a review of the leachate generation scenarios evaluated, it was estimated that up to four sump pumps may need to operate simultaneously in order to keep up with leachate production. The pumps selected are capable of pumping 200 gpm at the heads calculated in an 8-in HDPE pipeline. Therefore, the pipeline was sized for 800 gpm.

The sump pumps will all be controlled by electronic level switches. These switches will be monitored by a main motor control system located at the site. This system will monitor the number of pumps operating at anyone time and limit the maximum number to four as previously described.

Design calculations performed for the leachate pumping and transmission systems are included in the calculation package attached as Appendix K.

4.8 Leachate Sampling and Analysis

A detailed description of the leachate sampling and analysis to be carried out is provided in Appendix N. In accordance with Section 62-701.510(6)(c), leachate sampling and analysis will be performed on an annual basis. The leachate will be sampled from the primary leachate collection riser. The results will be submitted to the FDEP in accordance with Sections 62-701.500(8)(a), and 62-701.510(9).

SECTION 5. LANDFILL GAS MANAGEMENT

5.1 Introduction

This section describes the procedure and approach for gas management (extraction and monitoring) at the Oak Hammock Disposal (OHD) facility. This section also describes the design and operation of the gas extraction system and the gas monitoring plan in compliance with the Section 62-701.530, FAC. It should be noted that the landfill gas management system will be modified at the time of the air emissions permitting to account for the most current landfill configuration and waste placement status. Application for Air Permit – Title V Source (DEP form no. 62-210-900(1)) will be submitted within 180 days of issuance of the solid waste permit in accordance with the requirements of Section 62-20.800(7)(b)72. This section is intended to provide a minimum level of design suitable for the issuance of a five-year construction and operation permit and a 30-year conceptual plan for the OHD facility.

5.2 Organization

The remainder of this section is organized to:

- describe the gas extraction system; and
- describe the gas monitoring plan.

5.3 Landfill Gas Extraction System

5.3.1 Layout

The gas extraction system (GES) is designed to reduce gas pressure in the interior of the landfill; to prevent lateral migration of gases, explosions, and fires; and to effectively eliminate off-site odors. The GES consists of the vertical gas extraction wells, gas transmission pipes, and flare stations. The layout of the GES is presented in the permit drawings and in Figure 1 of the calculation package entitled "*Gas Management System*", attached as Appendix L to this permit application. As noted in Figure 1 in Appendix L, the GES consists of 105 vertical gas extraction wells, 2 transmission header pipes, and 4 flare stations.

The installation of vertical gas extraction wells at a spacing of approximately 300 feet will begin when the total quantity of waste disposed reaches approximately 2.75 million tons, in compliance with USEPA AP-42 (1998). The gas extraction wells will be installed

at the indicated locations in conjunction with the construction of the final cover system. The 3-ft diameter gas extraction wells, consisting of porous backfill and 8-inch diameter perforated pipe, will penetrate the top liner as indicated on the permit drawings. The porous backfill in the gas extraction wells will extend from within 9 feet of the final cover system to a minimum of 20 feet from the liner system. A minimum distance of 20 ft will be maintained to avoid drawing air from the leachate collection system and to protect the liner system.

The top of each gas extraction well will be connected to a 4-inch diameter solid pipe through a short length of 2-inch diameter flexible pipe. Each vertical gas extraction well will be connected to an 8-inch diameter gas transmission header pipe using the 4-inch diameter solid pipe. A 12-inch diameter main pipe will be used to connect the 8-inch diameter transmission header pipe to each flare station. The top of each gas extraction well will contain a control valve and a gas monitoring port. The valve will be used to control suction pressure (corresponding to 6 inches of water column) at each extraction well. The gas monitoring port will be a quick connect type port for gas monitoring and sampling. The transmission header pipes will be sloped to include multiple low points along the header pipes to collect and dispose of gas condensate in the header pipe. A condensate trap will be provided at each low point to collect the gas condensate and dispose it back to the landfill as indicated on the permit drawings.

Four flare stations will be constructed on reinforced concrete slabs along the perimeter berm as indicated on the permit drawings. Each flare station will consist of a vapor/water separator, a condensate pump, a blower, and a flare. Flare stations will be constructed after installation of the gas extraction wells as needed to actively manage the landfill gases.

5.3.2 Gas Generation Rate

The maximum landfill gas generation rate computed using USEPA AP-42 (1998) guidelines was about 4,500 scfm (standard cubic feet per minute). The computations assume an annual waste placement rate of 480,000 tons/year and a 30-year expected life of the OHD facility. The methodology, assumptions, and detailed computations are discussed in the calculation package attached as Appendix L. The gas collection rate for the OHD facility was evaluated assuming 100% collection efficiency i.e., assuming all gas generated will be collected and extracted. Each of the four flare stations will be designed to have a minimum flow capacity of 1,125 scfm (i.e., ¼ the maximum total landfill gas generation rate).

5.3.3 Radius of Influence

The horizontal radius of influence for the vertical gas extraction wells was computed to be 156 feet, using the guidelines in USEPA AP-42 (1998). As a result, the vertical gas extraction wells will be installed at a spacing of about 300 feet. The methodology, assumptions, and detailed computations are discussed in the calculation package in Appendix L.

5.3.4 Head Loss in System

The head loss in the gas transmission system was computed by identifying the longest flow paths between the vertical gas extraction wells and the flare stations. The flow paths were approximated by dividing the number of gas extraction wells along a transmission header pipe equally between the two flare stations at either end of the header pipe. The head loss in the gas transmission system was computed from the furthest gas extraction well to the flare station along a flow path. A suction pressure corresponding to 6 inches of water column will be applied at each vertical gas extraction well. The head loss computations include this suction pressure corresponding to 6 inches of water column at the vertical gas extraction wells. The methodology, assumptions, and detailed computations are discussed in the calculation package attached as Appendix L.

The gas transmission pipes were sized such that the maximum head loss in the gas transmission system was limited to 12 inches of water column. As a result, the blowers will be designed to generate a suction pressure greater than 12 inches to account for the head losses in the fittings and additional pressure that may be needed for proper operation of the flare.

5.4 Landfill Gas Monitoring Plan

The landfill gas monitoring plan proposed for the OHD facility will allow early detection of the lateral migration of landfill gas and verification of the landfill gas management system performance in accordance with the requirements of Section 62-701.530(1) FAC. The following types of landfill gas monitoring will be performed at the site: (i) monitoring for landfill gas in on-site buildings; (ii) monitoring for landfill gas migration along the perimeter berm; and (iii) monitoring at the property boundary for objectionable odors. The following subsections provide a description of the gas monitoring that will be performed at the facility.

5.4.1 Monitoring of On-Site Buildings

The on-site buildings will be located in the entrance area of the landfill. All buildings located within 500 feet of the waste limits on the property will be routinely monitored for methane. Continuous monitoring devices used within on-site buildings will be located in work areas, near any penetrations or cracks in building foundation, or at points where methane might enter the building.

If methane is detected at a concentration greater than 25 percent of the lower explosive limit (LEL) in any on-site building, Omni will perform the activities described in Section 5.4.4.

5.4.2 Monitoring for Landfill Gas Along Perimeter Berm

Gas monitoring probes along the perimeter berm will be used to detect lateral migration of landfill gases. The perimeter gas monitoring probes will be placed at approximately 500-foot intervals along the perimeter berm. The proposed locations of the gas monitoring probes are indicated in Figure 1 in Appendix L and the permit drawings.

The perimeter gas monitoring probes will be constructed using 2-in. (51-mm) nominal diameter polyvinyl chloride (PVC) pipe. The slotted section of the perimeter gas monitoring probes will extend to a depth at least 3 feet below the seasonal low groundwater surface. The top of the probes will include gas-monitoring ports that allow for collecting representative gas samples.

The gas monitoring probes located around the perimeter of the site will be monitored quarterly for methane. Should the results of the quarterly monitoring indicate lateral migration of landfill gases, Omni will install additional gas monitoring probes at the property boundary in the area(s) of concern and perform additional monitoring. If methane is detected at a concentration greater than the LEL in the gas monitoring probes at the property boundary, Omni will perform the activities described in Section 5.4.4 below.

5.4.3 Monitoring for Objectionable Odors at the Property Boundary

Omni's on-site personnel will perform monitoring for objectionable odors at the property boundary on a regular basis. If objectionable odors are detected at the property boundary, Omni will perform the activities described in Section 5.4.4 below. It should be noted that no off-site occupied structures currently exist near the property boundary.

5.4.4 Detecting Exceedances of the Regulations

Should the results of the gas monitoring indicate that the requirements of Section 62-70.530(1) have been exceeded at the facility, Omni will:

- immediately take all necessary steps to ensure protection of human health and notify the FDEP;
- within 7 days of an observed exceedance, Omni will submit to the FDEP for approval, a plan to remediate the landfill gas migration; and
- within 60 days of an observed exceedance, Omni will complete the remediation, unless otherwise directed by FDEP.

SECTION 6. LANDFILL CLOSURE

6.1 Introduction

This section describes the methodology and approach for closure of the Oak Hammock Disposal (OHD) facility. The purpose of this section is to describe how the closure requirements of Chapter 62-701, FAC, will be met.

The remainder of this section is organized to:

- describe the closure schedule;
- describe the closure report;
- present the final cover system design;
- describe the closure operation;
- describe the closure procedures;
- present the long-term care procedures; and
- demonstrate financial responsibility.

6.2 Closure Schedule

6.2.1 Introduction

The footprint of the proposed OHD landfill will cover approximately 264 acres, with a top elevation at closure of approximately 98 ft, NGVD. The proposed landfill has a design capacity of approximately 23.7 million cubic yards. Each portion of the proposed landfill will be closed as it reaches the maximum design height on a close-as-you-go basis. The estimated life of the OHD facility is approximately 30 years, assuming an initial daily waste acceptance rate of 1,700 tons/day, waste density of 1,500 pounds/cubic yard, and 20 percent of the available volume dedicated to initial cover.

6.2.2 Notice to Appropriate Agencies

In accordance with Section 62-701.600(2)(a), FAC, at least one year prior to the projected date when waste will no longer be accepted, Omni will provide to the FDEP and the local pollution control agency (if any) a written notice with a schedule for cessation of waste acceptance and closure of the OHD facility. However, if unforeseen circumstances do not allow the one-year notification, notice will be provided as soon as the need to close the facility becomes apparent.

6.2.3 Notice to Users

In accordance with Section 62-701.600(2)(b), FAC, at least 120 days prior to the date when wastes will no longer be accepted at the landfill, Omni will advise users of the intent to close the OHD facility by posting signs at the entrance of the facility giving the date of closing, the location of alternative disposal facilities, and the name of the person responsible for closing the landfill. These signs will be maintained throughout the closing period. However, if unforeseen circumstances do not allow the 120 day notice, notice will be provided as soon as the need to close the facility becomes apparent.

6.2.4 Notice to the Public

In accordance with Section 62-701.600(2)(c), FAC, within 10 days prior to the date when wastes will no longer be accepted at the OHD facility, a notice of the intent to close the facility will be published in the legal advertising section of a newspaper of general circulation in Osceola County. Proof of publication in the newspaper will then be provided to FDEP within seven days of the publication.

6.2.5 Placement of Final Cover

The ongoing, partial closure of the landfill (i.e., close as you go) is proposed to minimize leachate generation in the landfill. Partial closure will be accomplished concurrent with waste placement in the landfill. Areas that have reached final elevations will receive the final cover system within 180 days of reaching the final elevation, or a 12-inch thick intermediate cover will be placed over the area. Based on the proposed waste fill sequence, the final cover installation on the side slopes of Cells 1 and 2 is expected to begin during waste fill sequence IV, as indicated in the permit drawings.

6.3 Closure Report

This permit application requests authorization for construction and operation of the OHD facility. A closure report will be prepared at the time a closure permit from FDEP is requested. A closure permit application will be submitted to FDEP a minimum of 180 days prior to the initiation of closure construction.

6.4 Final Cover System Design

6.4.1 Introduction

The final cover system of the OHD facility will be constructed after final waste elevations are achieved (i.e., close-as-you-go). The landfill will have side slopes graded at 4 horizontal to 1 vertical (4H:1V), and top slopes graded at 5.0 percent to maximize runoff and minimize erosion. Drainage swales will be constructed on the final cover system to collect and divert surface runoff via downdrains to the storm water dry retention basins at the toe of the landfill. This will help to minimize erosion at the surface of the final cover system. The maximum final elevation of the landfill before settlement will be 178 ft NGVD. The plans and details for the proposed final cover system are provided in the permit drawings. The various components of the final cover system are discussed in the remainder of this section.

6.4.2 Final Cover System Components

The final cover system on the top (5 percent) slopes of the landfill is indicated on the permit drawings and consists of, from top to bottom:

- a 0.5-ft thick vegetative layer;
- a 1.5-ft thick cap protective layer;
- a 40-mil thick smooth polyethylene (PE) geomembrane; and
- a 1-ft thick (minimum) intermediate cover layer over the compacted waste.

The final cover system on the 4H:1V side slopes of the landfill as indicated on the permit drawings consists of, from top to bottom:

- a 0.5-ft thick vegetative layer;
- a 1.5-ft thick cap protective layer;

- a geocomposite drainage layer;
- a 40-mil thick textured PE geomembrane; and
- a 1-ft thick (minimum) intermediate cover layer over the compacted waste.

6.4.3 Final Cover System Materials

6.4.3.1 Vegetation

The surface of the final cover system will be vegetated either by seeding or sodding. The grass seed will be Bahia, which has a high tolerance to drought. The contractor may use alternate grass seed contingent upon proof that the grass is drought-resistance. The sod will be Bahia of firm texture, having a compacted growth and good root development. The minimum requirements of the grass seed and sod are presented in the Technical Specifications attached as Appendix P.

6.4.3.2 Vegetative and Cap Protective Layers

The upper 6 inches of the final cover system will consist of loosely placed vegetative layer and will be vegetated to minimize erosion. The cap protective layer below the vegetative layer will consist of 18 inches of on-site soil (or approved equal). The cap protective layer will be compacted in the upper 6 inches during construction to inhibit root penetration into the drainage layer underlying the cap protective layer on the side slopes.

6.4.3.3 Geocomposite Drainage Layer

A geocomposite drainage layer consisting of a geotextile filter, a geonet drainage layer, and a geotextile friction layer will be placed beneath the cap protective layer on the 4H:1V side slopes. The geotextile filter, the geonet drainage layer, and the geotextile friction layer are bonded together to form the geocomposite drainage layer. The function of the proposed geotextile filter is to prevent soil particles of the overlying cap protective layer from penetrating and clogging the underlying geonet drainage layer. The purpose of the drainage layer is to remove the storm water reaching the geonet and to minimize the potential of pore water pressure build-up in the overlying cap protective layer. The purpose of the geotextile friction layer is to increase the interface friction between the geomembrane and the geonet and thereby increase the stability of the final cover system.

6.4.3.4 Geomembrane

A geomembrane is proposed as a component of the final cover system to reduce infiltration of the storm water through the final cover system into the waste. The specified geomembrane is a 40-mil thick textured polyethylene geomembrane on the 4H:1V side slopes and a smooth polyethylene geomembrane on the 5 percent top surfaces. The texturing is necessary to increase the stability of the final cover system. Specified property values for the final cover geomembrane are provided in the Technical Specifications attached as Appendix P. The specified geomembrane meets the requirements of Section 62-701.600(5)(g)(4), FAC.

6.4.4 Final Cover System Construction Procedure

The surface of the intermediate cover will be graded and compacted to prepare a smooth base for the final cover geomembrane. The geomembrane and the geocomposite drainage layer will be terminated on the perimeter berm. At the termination point, the final cover geomembrane will be welded to the primary geomembrane in the bottom liner system to seal the landfill. The geocomposite drainage layer will be terminated in the drainage gravel in the 10-ft wide drainage corridor. The details of the final cover geomembrane and the geocomposite drainage layer termination are presented in the permit drawings.

6.4.5 Final Cover System Stability

6.4.5.1 Mechanisms Analyzed

Two potential final cover system failure modes were considered: (i) sliding along a shear surface within the components of final cover system both above and below the geomembrane and (ii) global slope failure through the final cover system and a portion of the underlying waste.

6.4.5.2 Sliding Along a Failure Plane Within the Final Cover System

A potential failure surface within the final cover system on the top and the side slopes of the landfill was evaluated using the method of analysis discussed in the calculation package entitled "*Stability of Final Cover System*" in Appendix J. Based on the results of the analyses, the final cover system has a minimum factor of safety greater than 1.50. This calculated factor of safety is considered acceptable and in accordance with the state-of-practice for landfill cover systems.

6.4.5.3 Global Stability of Final Cover System

The global stability of the final cover system is discussed in calculation package entitled "*Slope Stability Analyses*". The global stability of the final cover system was evaluated using the computer program, UTEXAS, and appropriate strength parameters of the waste, cover soil, structural fill, and foundation soils. The computer program was used to calculate the minimum factor of safety against sliding along a large number of potential failure surfaces.

The results of the computer analyses indicate that the critical deep-seated failure mechanism is a sliding block-type failure involving sliding along an interface within the double-composite liner system. The minimum factor of safety calculated for this critical mechanism was 1.89. This calculated factor of safety is considered acceptable.

6.4.6 Final Cover System Settlement Analysis

The side slopes of the final cover will be graded to 4H:1V (25 percent). The top slopes will be sloped at 5.0 percent. The soil components of the final cover system act as a surcharge for the underlying waste. Under this surcharge, the waste compresses and settles. Uneven total and differential settlements of the waste may adversely affect the drainage of storm water from the 5.0 percent top slopes of the final cover system. Based on GeoSyntec's experience with similar projects, the total and differential settlements of the waste under the final cover system are not expected to be significant and adequate top slopes will maintained post-settlement to provide effective drainage of storm water from the top slopes. A detailed analysis of potential waste settlements affecting the final cover system will be prepared for submittal with the closure permit application.

6.4.7 Final Cover Drainage System Design

The final cover drainage system collects the water that percolates through the vegetative and cap protective layers overlying the final cover drainage layer and conveys the water to the drainage gravel in the 10-ft wide drainage corridor along the perimeter of the landfill footprint. The water eventually discharges to the storm water dry retention basins through the downdrain junction boxes (i.e., energy dissipaters at the downdrains from the top of the landfill). The geocomposite drainage layer consists of a geotextile filter, a geonet drainage layer, and a geotextile friction layer with the geotextiles heatbonded to the geonet. Details of the final cover drainage system are presented in the permit drawings. The of geonet drainage layer, computations for maximum hydraulic head in the geocomposite drainage layer, and the geotextile filter design are discussed in the calculation package entitled "*Final Cover System Performance Evaluation*" attached as Appendix M to this permit application.

6.4.8 Surface-Water Drainage System

Drainage swales will be incorporated in the final cover system on the top and on the side slopes of the landfill as indicated in the permit drawings. The grass-lined drainage swales on the top of the landfill will be 1.25-ft deep and will have a slope of 1 percent. These drainage swales will convey water to the drainage swale along the crest of the side slopes, which will transfer the water to the downdrains. The downdrains will convey the storm water runoff to the storm water detention basin at the toe of the landfill. The downdrains consist of 24-inch diameter corrugated HDPE pipe and an energy dissipater/junction box.

Drainage swales on the side slopes of the landfill will be incorporated in the final cover system at approximately 40 ft intervals in elevation to intercept surface-water runoff. The drainage swales will also convey the surface-water runoff to the downdrains, which will transfer the water to the storm water detention basin at the toe of the landfill. The grass-lined drainage swales on the side slopes will be 12-feet wide and 2-feet deep.

Design calculations confirming the adequacy of the drainage swales and the downdrains to convey the storm water runoff are presented in the ERP application (Appendix B) submitted concurrently with this permit application.

6.5 Financial Responsibilities

Omni will execute a financial funding mechanism for the current estimate of closure and long-term care of Phase 1 of the OHD facility prior to the acceptance of waste. A construction and operation permit for Phase 1 is requested by this permit application. To comply with the requirements of Section 62-701.630(4), FAC, Omni will submit annual adjustments to the FDEP of the cost estimates for the closure and long-term care of the landfill. Omni will also revise the cost estimate for closure and long-term-care of the landfill prior to the construction of each phase of the OHD facility. A Financial Assurance Cost Estimate Form (DEP Form #62-701.900(28)) is included with this permit application as Appendix R. A financial assurance document for these estimated costs will be provided to FDEP prior to issuance of the permit to construct and operate Phase 1.

REFERENCES

Berg, R.R. and Bonaparte, R., 1992, "Long-Term Allowable Tensile Stresses for Polyethylene Geomembranes", *Geotextiles and Geomembranes*, Vol 12, No. 4, pp. 287-306.

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Schroeder, P.R., Dozier, T.S., Zappi, P.A., McEnroe, B.M., Sjostrom, J.W., and Peyton, R.L., (1994), "The Hydrologic Evaluation of Landfill Performance (HELP) Model: Engineering Documentation for Version 3," EPA/600/R-94.168b, September 1994, U.S. Environmental Protection Agency Office of Research and Development, Washington, DC.

Haxo, H.E., White, R.M., Haxo, P.D., and Fong, M.A.,, 1982, *"Liner Materials Exposed to Municipal Solid Waste Leachate"*, U.S. Environmental Protection Agency, 169 p.

Schwope, A.D., Costas, P.F., and Lyman, W.J., 1985, *"Resistance of Flexible Membrane Liners to Chemicals and Wastes"*, U.S. Environmental Protection Agency, 217 p.

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Phillips 66, 1988, "Driscopipe System Design", Manufacturer's literature, No. 1160-88 A17, Phillips 66.

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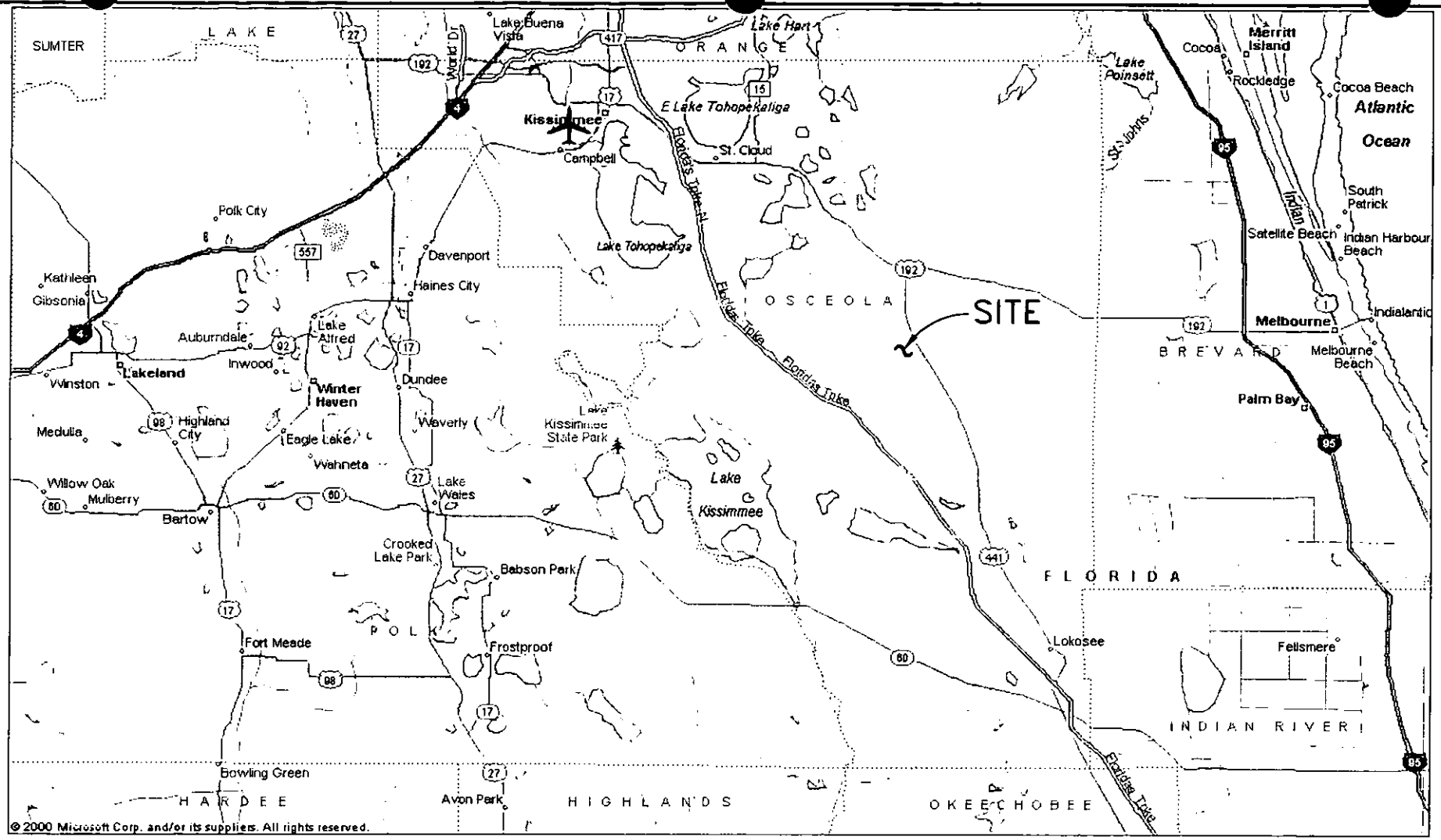
Giroud, J.P., and Bonaparte, R., 1989, "Leakage Through Liners Constructed with Geomembranes, Part I: Geomembrane Liners", *Geotextiles and Geomembranes*, Vol. 8, No. 1, pp. 27-67.



Project: OAK HAMMOCK SOLID WASTE DISPOSAL FACILITY PERMIT APPLICATION			
Figure Title: **LOCATION OF OHD SITE**			
Project Number: FW0400	Date: MAY 2002	File No.: 0400FA050	Figure No.: 1
Consultant / Engineer: GeoSyntec Consultants			

14055 RIVERCDGE DRIVE, SUITE 300 · TAMPA, FLORIDA 33637 USA
TEL: (813) 558-0990 · FAX: (813) 558-9726

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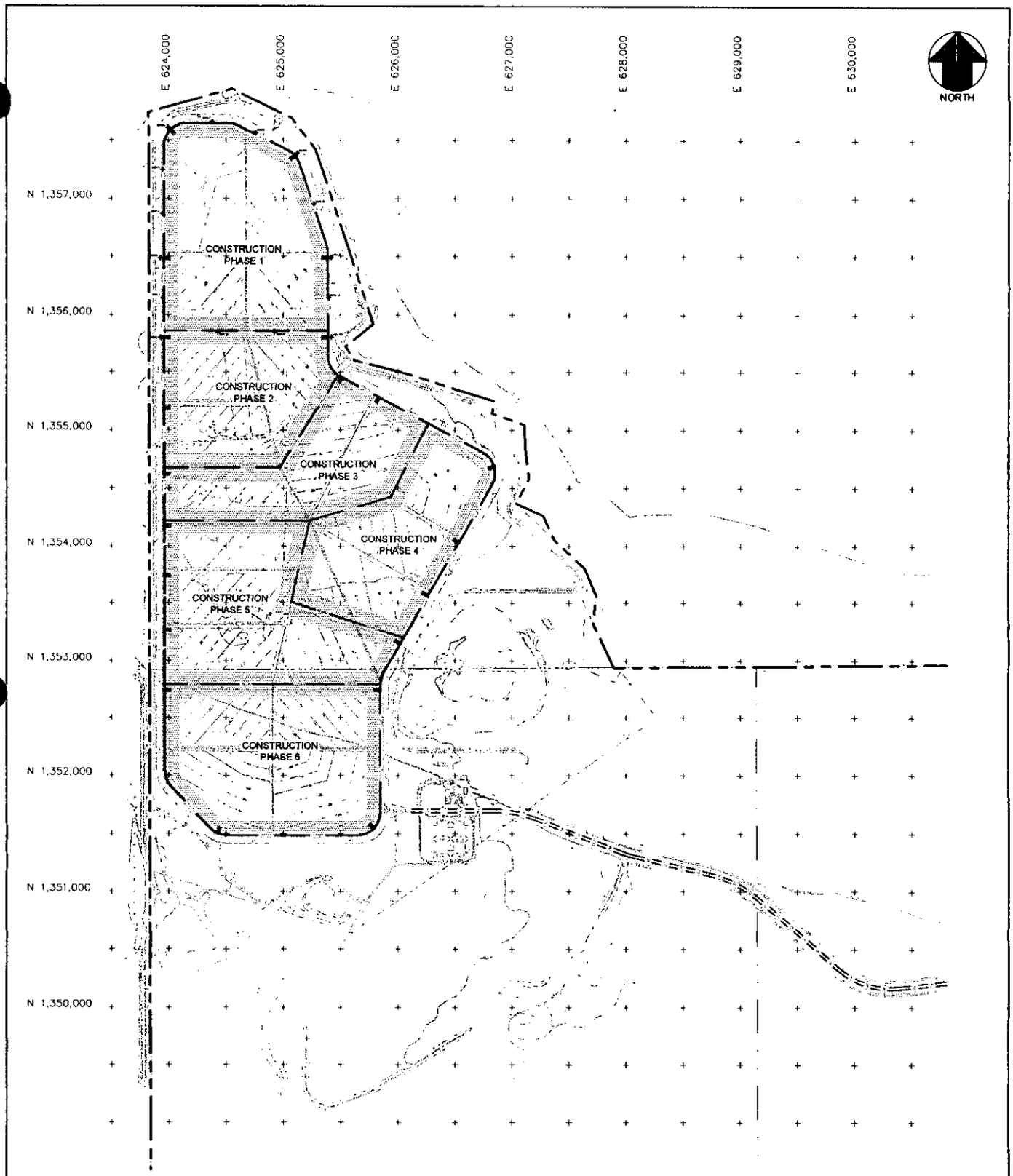

Project: OAK HAMMOCK SOLID WASTE DISPOSAL FACILITY PERMIT APPLICATION			
Figure Title: **LANDFILL FOOTPRINT AND PHASES**			
Project Number: FW0400	Date: MAY 2002	File No.: 0400FA048	Figure No.: **2**

Consultant / Engineer: GeoSyntec Consultants
14055 RIVEREDGE DRIVE, SUITE 300 · TAMPA, FLORIDA 33637 USA
TEL: (813) 558-0990 · FAX: (813) 558-9726

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Florida Department of Environmental Protection
Twin Towers Office Bldg. 2600 Blair Stone Road Tallahassee, FL 32399-2400

DEP Form # 62-701.900(1)
Form Title Solid Waste Management Facility Permit
Effective Date 05-27-01

DEP Application No. _____
(Filled by DEP)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

APPLICATION FOR A PERMIT TO CONSTRUCT, OPERATE, MODIFY OR CLOSE A SOLID WASTE MANAGEMENT FACILITY

APPLICATION INSTRUCTIONS AND FORMS

Northwest District
160 Governmental Center
Pensacola, FL 32501-5794
850-595-8360

Northeast District
7825 Baymeadows Way, Ste. B200
Jacksonville, FL 32256-7590
904-448-4300

Central District
3319 Maguire Blvd., Ste. 232
Orlando, FL 32803-3767
407-894-7555

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619
813-744-6100

South District
2295 Victoria Ave., Ste. 364
Fort Myers, FL 33901-3881
941-332-6975

Southeast District
400 North Congress Ave.
West Palm Beach, FL 33401
561-681-6600

INSTRUCTIONS TO APPLY FOR A SOLID WASTE MANAGEMENT FACILITY PERMIT

I. General

Solid Waste Management Facilities shall be permitted pursuant to Section 403.707, Florida Statutes, (FS) and in accordance with Florida Administrative Code (FAC) Chapter 62-701. A minimum of four copies of the application shall be submitted to the Department's District Office having jurisdiction over the facility. The appropriate fee in accordance with Rule 62-701.315, FAC, shall be submitted with the application by check made payable to the Department of Environmental Protection (DEP).

Complete appropriate sections for the type of facility for which application is made. Entries shall be typed or printed in ink. All blanks shall be filled in or marked "not applicable" or "no substantial change". Information provided in support of the application shall be marked "submitted" and the location of this information in the application package indicated. The application shall include all information, drawings, and reports necessary to evaluate the facility. Information required to complete the application is listed on the attached pages of this form.

II. Application Parts Required for Construction and Operation Permits

A. Landfills and Ash Monofills - Submit parts A,B, D through T
B. Asbestos Monofills - Submit parts A,B,D,E,F,G,J,L,N, P through S, and T
C. Industrial Solid Waste Facilities - Submit parts A,B, D through T
D. Non-Disposal Facilities - Submit parts A,C,D,E,J,N,S and T

NOTE: Portions of some parts may not be applicable.

NOTE: For facilities that have been satisfactorily constructed in accordance with their construction permit, the information required for A,B,C and D type facilities does not have to be resubmitted for an operation permit if the information has not substantially changed during the construction period. The appropriate portion of the form should be marked "no substantial change".

III. Application Parts Required for Closure Permits

A. Landfills and Ash Monofills - Submit parts A,B,M, O through T
B. Asbestos Monofills - Submit parts A,B,N, P through T
C. Industrial Solid Waste Facilities - Submit parts A,B, M through T
D. Non-Disposal Facilities - Submit parts A,C,N,S and T

NOTE: Portions of some parts may not be applicable.

IV. Permit Renewals

The above information shall be submitted at time of permit renewal in support of the new permit. However, facility information that was submitted to the Department to support the expiring permit, and which is still valid, does not need to be re-submitted for permit renewal. Portions of the application not re-submitted shall be marked "no substantial change" on the application form.

V. Application Codes

S	-	Submitted
LOCATION	-	Physical location of information in application
N/A	-	Not Applicable
N/C	-	No Substantial Change

VI. LISTING OF APPLICATION PARTS

PART A: GENERAL INFORMATION

PART B: DISPOSAL FACILITY GENERAL INFORMATION

PART C: NON-DISPOSAL FACILITY GENERAL INFORMATION

PART D: PROHIBITIONS

PART E: SOLID WASTE MANAGEMENT FACILITY PERMIT REQUIREMENTS, GENERAL

PART F: LANDFILL PERMIT REQUIREMENTS

PART G: GENERAL CRITERIA FOR LANDFILLS

PART H: LANDFILL CONSTRUCTION REQUIREMENTS

PART I: HYDROGEOLOGICAL INVESTIGATION REQUIREMENTS

PART J: GEOTECHNICAL INVESTIGATION REQUIREMENTS

PART K: VERTICAL EXPANSION OF LANDFILLS

PART L: LANDFILL OPERATION REQUIREMENTS

PART M: WATER QUALITY AND LEACHATE MONITORING REQUIREMENTS

PART N: SPECIAL WASTE HANDLING REQUIREMENTS

PART O: GAS MANAGEMENT SYSTEM REQUIREMENTS

PART P: LANDFILL CLOSURE REQUIREMENTS

PART Q: CLOSURE PROCEDURES

PART R: LONG TERM CARE REQUIREMENTS

PART S: FINANCIAL RESPONSIBILITY REQUIREMENTS

PART T: CERTIFICATION BY APPLICANT AND ENGINEER OR PUBLIC OFFICER

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
APPLICATION FOR A PERMIT TO CONSTRUCT, OPERATE, MODIFY OR CLOSE
A SOLID WASTE MANAGEMENT FACILITY

Please Type or Print

A. GENERAL INFORMATION

1. Type of facility (check all that apply):

[X] Disposal
- [X] Class I Landfill
- [ ] Class II Landfill
- [ ] Class III Landfill
- [ ] Other Describe: _____
- [ ] Ash Monofill
- [ ] Asbestos Monofill
- [ ] Industrial Solid Waste

[ ] Non-Disposal
- [ ] Incinerator For Non-biomedical Waste
- [ ] Waste to Energy Without Power Plant Certification
- [ ] Other Describe: _____

NOTE: Waste Processing Facilities should apply on Form 62-701.900(4), FAC; Land Clearing Disposal Facilities should notify on Form 62-701.900(3), FAC; Compost Facilities should apply on Form 62-701.900(10), FAC; and C&D Disposal Facilities should apply on Form 62-701.900(6), FAC

2. Type of application:
- [ ] Construction
- [ ] Operation
- [X] Construction/Operation
- [ ] Closure

3. Classification of application:
- [X] New
- [ ] Renewal
- [ ] Substantial Modification
- [ ] Intermediate Modification
- [ ] Minor Modification

4. Facility name: OAK HAMMOCK DISPOSAL

5. DEP ID number: _____ County: OSCEOLA

6. Facility location (main entrance): APPROXIMATELY 5 MILES SOUTH OF HOLOPAW, FLORIDA ON HIGHWAY U.S. 441

7. Location coordinates:

Section: 11 & 14 Township: 28S Range: 33E

Latitude: 28 ° 03 ' 32 " Longitude: 81 ° 05 ' 46 "

8. Applicant name (operating authority): OMNI WASTE OF OSCEOLA COUNTY, LLC

Mailing address: 100 CHURCH STREET KISSIMMEE FL 34741
Street or P.O. Box City State Zip

Contact person: TIMOTHY J. SALOPEK Telephone: (407) 957-7284

Title: PRESIDENT

tjsomni@aol.com
E-Mail address (if available)

9. Authorized agent/Consultant: GEOSYNTEC CONSULTANTS

Mailing address: 14055 RIVEREDGE DRIVE STE 300 TAMPA, FL 33637
Street or P.O. Box City State Zip

Contact person: KENNETH W. CARGILL, P.E. Telephone: (813) 558-0990

Title: PRINCIPAL AND BRANCH MANAGER

KCargill@geosyntec.com
E-Mail address (if available)

10. Landowner (if different than applicant): _____

Mailing address: _____
Street or P.O. Box City State Zip

Contact person: _____ Telephone: (___) _____

_____
E-Mail address (if available)

11. Cities, towns and areas to be served: OSCEOLA COUNTY AND SURROUNDING COUNTIES

12. Population to be served:

Current: _____ Five-Year Projection: _____

13. Date site will be ready to be inspected for completion: _____

14. Expected life of the facility: 30 years

15. Estimated costs:

Total Construction: $ 15,376,577 Closing Costs: $ 4,317,562

$4,317,562 = $82,333/acre

16. Anticipated construction starting and completion dates:

From: NOVEMBER 2002 To: JANUARY 2007

17. Expected volume or weight of waste to be received:

_____ yds³/day 1,700 tons/day _____ gallons/day

$15,376,577 / 2.64 acres = $58275/acre ??

wrong area?

This is for 52.44 acres not 264 (from closure cost estimate.)

$15,376,577 / 52.44 = $293,722/acre ← This seems reasonable.

B. DISPOSAL FACILITY GENERAL INFORMATION

1. Provide brief description of disposal facility design and operations planned under this application:

THIS PERMIT APPLICATION IS FOR CONSTRUCTION AND OPERATION OF A CLASS I LANDFILL KNOWN AS THE OAK HAMMOCK DISPOSAL FACILITY. UNDER THIS PERMIT, THE INITIAL LANDFILL CELLS, NO.S 1 THROUGH 4, WILL BE CONSTRUCTED AND OPERATED. A CONCEPTUAL DESIGN FOR A TOTAL OF 21 CELLS TOTALING 264 ACRES IS SUBMITTED. THE ANTICIPATED LIFE OF THE COMPLETE FACILITY IS 30 YEARS.

2. Facility site supervisor: _____

Title: _____ Telephone: (___) _____

_____
E-Mail address (if available)

3. Disposal area: Total 264 acres; Used N/A acres; Available 264 acres.

4. Weighing scales used: [X] Yes [ ] No

5. Security to prevent unauthorized use: [X] Yes [ ] No

6. Charge for waste received: _____ $/yds^3 _____ $/ton

7. Surrounding land use, zoning:

[ ] Residential
[X] Agricultural
[ ] Commercial
[ ] Industrial
[ ] None
[ ] Other Describe: _____

8. Types of waste received:

[X] Residential
[X] Commercial
[ ] Incinerator/WTE ash
[ ] Treated biomedical
[ ] Water treatment sludge
[ ] Air treatment sludge
[ ] Agricultural
[ ] Asbestos
[ ] Other Describe: _____
[X] C & D debris
[ ] Shredded/cut tires
[ ] Yard trash
[ ] Septic tank
[ ] Industrial
[ ] Industrial sludge
[ ] Domestic sludge

9. Salvaging permitted: [ ] Yes [X] No UNLESS VOLUME OF RECYCLABLE GOODS IS SUFFICIENT FOR SEPARATION

10. Attendant: [ ] Yes [ ] No Trained operator: [X] Yes [ ] No

11. Spotters: Yes [X] No [ ] Number of spotters used: MINIMUM OF 1 PER WORKFACE

12. Site located in: [X] Floodplain [X] Wetlands [ ] Other _____

13. Property recorded as a Disposal Site in County Land Records: [X] Yes [ ] No

14. Days of operation: MONDAY THROUGH FRIDAY, HALF DAY ON SATURDAY

15. Hours of operation: TYPICAL HOURS : 7:00a.m. - 6:00p.m. M-F; 8:00a.m. - NOON SAT.

16. Days Working Face covered: _____

17. Elevation of water table: 79.0 Ft. (NGVD 1929)

18. Number of monitoring wells: 45

19. Number of surface monitoring points: 4

20. Gas controls used: [X] Yes [ ] No Type controls: [X] Active [ ] Passive

Gas flaring: [X] Yes [ ] No Gas recovery: [ ] Yes [X] No

21. Landfill unit liner type:

[ ] Natural soils
[ ] Single clay liner
[ ] Single geomembrane
[ ] Single composite
[ ] Slurry wall
[ ] Other Describe: ADDITIONAL LOW-PERMEABILITY SOIL LAYER TO BE USED BENEATH SUMP AREAS.
[ ] Double geomembrane
[ ] Geomembrane & composite
[X] Double composite
[ ] None

22. Leachate collection method:

[X] Collection pipes
[X] Geonets (GEOCOMPOSITES)
[ ] Well points
[ ] Perimeter ditch
[ ] Other Describe: _____
[X] Sand layer
[ ] Gravel layer
[ ] Interceptor trench
[ ] None

23. Leachate storage method:

[ ] Tanks
[X] Surface impoundments WITH FLEXIBLE STORAGE CONTAINERS
[ ] Other Describe: _____

24. Leachate treatment method:

[ ] Oxidation
[ ] Secondary
[ ] Advanced
[X] None
[ ] Other _____
[ ] Chemical treatment
[ ] Settling

25. Leachate disposal method:

[ ] Recirculated
[X] Transported to WWTP
[ ] Injection well
[ ] Evaporation
[ ] Other _____
[ ] Pumped to WWTP
[ ] Discharged to surface water
[ ] Percolation ponds

26. For leachate discharged to surface waters:

Name and Class of receiving water: N/A

27. Storm Water:

Collected: [X] Yes [ ] No

Type of treatment: DRY AND WET RETENTION FOR LANDFILL AND DRY RETENTION FOR ACCESS ROAD

Name and Class of receiving water: BULL CREEK, CLASS III

28. Environmental Resources Permit (ERP) number or status: ERP APPLICATION SUBMITTED CONCURRENTLY WITH THIS APPLICATION.

C. NON-DISPOSAL FACILITY GENERAL INFORMATION

1. Provide brief description of the non-disposal facility design and operations planned under this application:

_____

_____

_____

_____

2. Facility site supervisor: _____

Title: _____ Telephone: (___) _____

_____
E-Mail address (if available)

3. Site area: Facility _____ acres; Property _____ acres

4. Security to prevent unauthorized use: [ ] Yes [ ] No

5. Site located in: [ ] Floodplain [ ] Wetlands [ ] Other _____

6. Days of operation: _____

7. Hours of operation: _____

8. Number of operating staff: _____

9. Expected useful life: _____ Years

10. Weighing scales used: [ ] Yes [ ] No

11. Normal processing rate: _____ yd^3/day _____ tons/day _____ gal/day

12. Maximum processing rate: _____ yd^3/day _____ tons/day _____ gal/day

13. Charge for waste received: _____

14. Storm Water Collected: [ ] Yes [ ] No

Type of treatment: _____

Name and Class of receiving water: _____

15. Environmental Resources Permit (ERP) number or status: _____

_____

16. Final residue produced:

_____ % of normal processing rate _____ % of maximum processing rate

_____ Tons/day _____ Tons/day

Disposed of at:

Facility name: _____ County: _____

17. Estimated operating costs: $ _____

Total cost/ton: $ _____ Net cost/ton: $ _____

18. Provide a site plan, at a scale not greater than 200 feet to the inch, which shows the facility location and identifies the proposed waste and final residue storage areas, total acreage of the site, and any other features which are relevant to the prohibitions or location restrictions in Rule 62-701.300, FAC, such as water bodies or wetlands on or within 200 feet of the site, and potable water wells on or within 500 feet of the site.

19. Provide a description of how the waste and final residue will be managed to not be expected to cause violations of the Department's ground water, surface water or air standards or criteria

20. Provide an estimate of the maximum amount of waste and final residue that will be store on-site.

21. Provide a detailed description of the technology use at the facility and the functions of all processing equipment that will be utilized. The descriptions shall explain the flow of waste and residue through all the proposed unit operations and shall include: (1) regular facility operations as they are expected to occur; (2) procedures for start up operations, and scheduled and unscheduled shut down operations; (3) potential safety hazards and control methods, including fire detection and control; (4) a description of any expected air emissions and wastewater discharges from the facility which may be potential pollution sources; (5) a description and usage rate of any chemical or biological additives that will be used in the process; and (6) process flow diagrams for the facility operations.

22. Provide a description of the loading, unloading and processing areas.

23. Provide a description of the leachate control system that will be used to prevent discharge of leachate to the environment and mixing of leachate with stormwater. Note: Ground water monitoring may be required for the facility depending on the method of leachate control used.

24. Provide an operation plan for the facility which includes: (1) a description of general facility operations, the number of personnel responsible for the operations including their respective job descriptions, and the types of equipment that will be used at the facility; (2) procedures to ensure any unauthorized wastes received at the site will be properly managed; (3) a contingency plan to cover operation interruptions and emergencies such as fires, explosions, or natural disasters; (4) procedures to ensure operational records needed for the facility will be adequately prepared and maintained; and (5) procedures to ensure that the wastes and final residue will be managed to not be expected to cause pollution.

25. Provide a closure plan that describes the procedures that will be implemented when the facility closes including: (1) estimated time to complete closure; (2) procedures for removing and properly managing or disposing of all wastes and final residues; (3) notification of the Department upon ceasing operations and completion of final closure.

D. **PROHIBITIONS** (62-701.300, FAC)

S	LOCATION	N/A	N/C		
X	SEC. 2.2	___	___	1.	Provide documentation that each of the siting criteria will be satisfied for the facility; (62-701.300(2), FAC)
X	SEC. 2.2	___	___	2.	If the facility qualifies for any of the exemptions contained in Rules 62-701.300(12) through (16), FAC, then document this qualification(s).
X	SEC. 2.2	___	___	3.	Provide documentation that the facility will be in compliance with the burning restrictions; (62-701.300(3), FAC)
X	SEC. 2.2	___	___	4.	Provide documentation that the facility will be in compliance with the hazardous waste restrictions; (62-701.300(4), FAC)
X	SEC. 2.2	___	___	5.	Provide documentation that the facility will be in compliance with the PCB disposal restrictions; (62-701.300(5), FAC)
X	SEC. 2.2	___	___	6.	Provide documentation that the facility will be in compliance with the biomedical waste restrictions; (62-701.300(6), FAC)
X	SEC. 2.2	___	___	7.	Provide documentation that the facility will be in compliance with the Class I surface water restrictions; (62-701.300(7), FAC)
X	SEC. 2.2	___	___	8.	Provide documentation that the facility will be in compliance with the special waste for landfills restrictions; (62-701.300(8), FAC)
___	_____	X	___	9.	Provide documentation that the facility will be in compliance with the special waste for waste-to-energy facilities restrictions; (62-701.300(9), FAC)
X	SEC. 2.2	___	___	10.	Provide documentation that the facility will be in compliance with the liquid restrictions; (62-701.300(10), FAC)
X	SEC. 2.2	___	___	11.	Provide documentation that the facility will be in compliance with the used oil restrictions; (62-701.300(11), FAC)

E. SOLID WASTE MANAGEMENT FACILITY PERMIT REQUIREMENTS, GENERAL (62-701.320, FAC)

S	LOCATION	N/A	N/C		
X	ATTACHED	___	___	1.	Four copies, at minimum, of the completed application form, all supporting data and reports; (62-701.320(5)(a),FAC)
X	ATTACHED	___	___	2.	Engineering and/or professional certification (signature, date and seal) provided on the applications and all engineering plans, reports and supporting information for the application; (62-701.320(6),FAC)
X	ATTACHED	___	___	3.	A letter of transmittal to the Department; (62-701.320(7)(a),FAC)
X	ATTACHED	___	___	4.	A completed application form dated and signed by the applicant; (62-701.320(7)(b),FAC)
X	ATTACHED	___	___	5.	Permit fee specified in Rule 62-701.315, FAC in check or money order, payable to the Department; (62-701.320(7)(c),FAC)
X	ATTACHED	___	___	6.	An engineering report addressing the requirements of this rule and with the following format: a cover sheet, text printed on 8 1/2 inch by 11 inch consecutively numbered pages, a table of contents or index, the body of the report and all appendices including an operation plan, contingency plan, illustrative charts and graphs, records or logs of tests and investigations, engineering calculations; (62-701.320(7)(d),FAC)
X	APPX. O	___	___	7.	Operation Plan and Closure Plan; (62-701.320(7)(e)1,FAC)
X	APPX. O	___	___	8.	Contingency Plan; (62-701.320(7)(e)2,FAC)
				9.	Plans or drawings for the solid waste management facilities in appropriate format (including sheet size restrictions, cover sheet, legends, north arrow, horizontal and vertical scales, elevations referenced to NGVD 1929) showing; (62-702.320(7)(f),FAC)
X	PD SHT. 1	___	___	a.	A regional map or plan with the project location;
X	PD SHT. 1	___	___	b.	A vicinity map or aerial photograph no more than 1 year old;
X	PD SHT. 1	___	___	c.	A site plan showing all property boundaries certified by a registered Florida land surveyor;

S	LOCATION	N/A	N/C		PART E CONTINUED
X	PD SHTS.				d. Other necessary details to support the engineering report.
X	SEC. 2.3 & APX. C			10.	Documentation that the applicant either owns the property or has legal authority from the property owner to use the site; (62-701.320(7)(g),FAC)
		X		11.	For facilities owned or operated by a county, provide a description of how, if any, the facilities covered in this application will contribute to the county's achievement of the waste reduction and recycling goals contained in Section 403.706,FS; (62-701.320(7)(h),FAC)
		X		12.	Provide a history and description of any enforcement actions taken by the Department against the applicant for violations of applicable statutes, rules, orders or permit conditions relating to the operation of any solid waste management facility in this state; (62-701.320(7)(i),FAC)
X	SEC. 2.4 & APX. D			13.	Proof of publication in a newspaper of general circulation of notice of application for a permit to construct or substantially modify a solid waste management facility; (62-702.320(8),FAC)
X	SEC. 2.5 & FIG. 1			14.	Provide a description of how the requirements for airport safety will be achieved including proof of required notices if applicable. If exempt, explain how the exemption applies; (62-701.320(13),FAC)
X	APPX. O			15.	Explain how the operator training requirements will be satisfied for the facility; (62-701.320(15), FAC)

F. **LANDFILL PERMIT REQUIREMENTS** (62-701.330, FAC)

S	LOCATION	N/A	N/C		
X	PD SHT. 3			1.	Vicinity map or aerial photograph no more than 1 year old and of appropriate scale showing land use and local zoning within one mile of the landfill and of sufficient scale to show all homes or other structures, water bodies, and roads other significant features of the vicinity. All significant features shall be labeled; (62-701.330(3)(a),FAC)
X	SEC. 2.5 & FIG. 1			2.	Vicinity map or aerial photograph no more than 1 year old showing all airports that are located within five miles of the proposed landfill; (62-701.330(3)(b),FAC)
				3.	Plot plan with a scale not greater than 200 feet to the inch showing; (62-701.330(3)(c),FAC)
X	PD SHT. 8,9			a.	Dimensions;
X	PD SHT. 3,24			b.	Locations of proposed and existing water quality monitoring wells;
X	PD SHT. 5,6			c.	Locations of soil borings;
X	PD SHT. 7			d.	Proposed plan of trenching or disposal areas;
X	PD SHT. 4,33,34			e.	Cross sections showing original elevations and proposed final contours which shall be included either on the plot plan or on separate sheets;
		X		f.	Any previously filled waste disposal areas;
X	PD SHT. 4,42			g.	Fencing or other measures to restrict access.
				4.	Topographic maps with a scale not greater than 200 feet to the inch with 5-foot contour intervals showing; (62-701.330(3)(d),FAC):
X	PD SHT. 8,9			a.	Proposed fill areas;
X	PD SHT. 8,9			b.	Borrow areas;
X	PD SHT. 43-47			c.	Access roads;
X	PD SHT. 33,34,36,37			d.	Grades required for proper drainage;
X	PD SHT. 27,28			e.	Cross sections of lifts;

S	LOCATION	N/A	N/C		PART F CONTINUED
___	_____	X	___		f. Special drainage devices if necessary;
X	PD SHT. 8,9,47	___	___		g. Fencing;
X	PD SHT. 9	___	___		h. Equipment facilities.
				5.	A report on the landfill describing the following; (62-701.330(3)(e),FAC)
X	SEC. 2.7.1	___	___		a. The current and projected population and area to be served by the proposed site;
X	SEC. 2.7.2	___	___		b. The anticipated type, annual quantity, and source of solid waste, expressed in tons;
X	SEC. 2.7.3	___	___		c. The anticipated facility life;
X	SEC. 2.7.4	___	___		d. The source and type of cover material used for the landfill.
X	APPX. N	___	___	6.	Provide evidence that an approved laboratory shall conduct water quality monitoring for the facility in accordance with Chapter 62-160,FAC; (62-701.330(3)(h),FAC)
X	SEC. 6.5	___	___	7.	Provide a statement of how the applicant will demonstrate financial responsibility for the closing and long-term care of the landfill; (62-701.330(3)(i),FAC)

G. GENERAL CRITERIA FOR LANDFILLS (62-701.340,FAC)

X	SEC. 2.6.2	___	___	1.	Describe (and show on a Federal Insurance Administration flood map, if available) how the landfill or solid waste disposal unit shall not be located in the 100-year floodplain where it will restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain unless compensating storage is provided, or result in a washout of solid waste; (62-701.340(4)(b),FAC)
X	SEC. 2.6.3	___	___	2.	Describe how the minimum horizontal separation between waste deposits in the landfill and the landfill property boundary shall be 100 feet, measured from the toe of the proposed final cover slope; (62-701.340(4)(c),FAC)
X	SEC. 2.6.4	___	___	3.	Describe what methods shall be taken to screen the landfill from public view where such screening can practically be provided; (62-701.340(4)(d),FAC)

H. LANDFILL CONSTRUCTION REQUIREMENTS (62-701.400,FAC)

S	LOCATION	N/A	N/C		
X	SEC. 6.2			1.	Describe how the landfill shall be designed so that solid waste disposal units will be constructed and closed at planned intervals throughout the design period of the landfill; (62-701.400(2),FAC)
				2.	Landfill liner requirements; (62-701.400(3),FAC)
				a.	General construction requirements; (62-701.400(3)(a),FAC):
X	APPX. P,Q			(1)	Provide test information and documentation to ensure the liner will be constructed of materials that have appropriate physical, chemical, and mechanical properties to prevent failure;
X	APPX. F,G,I			(2)	Document foundation is adequate to prevent liner failure;
X	SEC. 4.2.1			(3)	Constructed so bottom liner will not be adversely impacted by fluctuations of the ground water;
X	SEC. 4.2.1			(4)	Designed to resist hydrostatic uplift if bottom liner located below seasonal high ground water table;
X	SEC. 4.2.1			(5)	Installed to cover all surrounding earth which could come into contact with the waste or leachate.
				b.	Composite liners; (62-701.400(3)(b),FAC)
X	SEC. 4.4.5, APPX. P			(1)	Upper geomembrane thickness and properties;
X	SEC. 4.5.2, APPX. K			(2)	Design leachate head for primary LCRS including leachate recirculation if appropriate;
		X		(3)	Design thickness in accordance with Table A and number of lifts planned for lower soil component.

S	LOCATION	N/A	N/C	PART H CONTINUED
				c. Double liners; (62-701.400(3)(c),FAC)
X	SEC. 4.5, APPX. P	___	___	(1) Upper and lower geomembrane thicknesses and properties;
X	SEC. 4.5.2, APPX. K	___	___	(2) Design leachate head for primary LCRS to limit the head to one foot above the liner;
X	APPX. P	___	___	(3) Lower geomembrane sub-base design;
X	SEC. 4.5.2	___	___	(4) Leak detection and secondary leachate collection system minimum design criteria ($k \geq 10$ cm/sec, head on lower liner ≤ 1 inch, head not to exceed thickness of drainage layer);
				d. Standards for geosynthetic components; (62-701.400(3)(d),FAC)
X	APPX. P, Q	___	___	(1) Field seam test methods to ensure all field seams are at least 90 percent of the yield strength for the lining material;
X	APPX. P, Q	___	___	(2) Geomembranes to be used shall pass a continuous spark test by the manufacturer;
X	APPX. P, Q	___	___	(3) Design of 24-inch-thick protective layer above upper geomembrane liner;
X	APPX. P, Q	___	___	(4) Describe operational plans to protect the liner and leachate collection system when placing the first layer of waste above 24-inch-thick protective layer.
X	APPX. P, Q	___	___	(5) HDPE geomembranes, if used, meet the specifications in GRI GM13;
___	_____	X	___	(6) PVC geomembranes, if used, meet the specifications in PGI 1197;
X	APPX. P, Q	___	___	(7) Interface shear strength testing results of the actual components which will be used in the liner system;
X	APPX. P, Q	___	___	(8) Transmissivity testing results of geonets if they are used in the liner system;
X	APPX. P, Q	___	___	(9) Hydraulic conductivity testing results of geosynthetic clay liners if they are used in the liner system;

S	LOCATION	N/A	N/C	PART H CONTINUED
				e. Geosynthetic specification requirements; (62-701.400(3)(e),FAC)
X	APPX. P,Q.	___	___	(1) Definition and qualifications of the designer, manufacturer, installer, QA consultant and laboratory, and QA program;
X	APPX. P,Q.	___	___	(2) Material specifications for geomembranes, geocomposites, geotextiles, geogrids, and geonets;
X	APPX. P,Q	___	___	(3) Manufacturing and fabrication specifications including geomembrane raw material and roll QA, fabrication personnel qualifications, seaming equipment and procedures, overlaps, trial seams, destructive and nondestructive seam testing, seam testing location, frequency, procedure, sample size and geomembrane repairs;
X	APPX. P,Q	___	___	(4) Geomembrane installation specifications including earthwork, conformance testing, geomembrane placement, installation personnel qualifications, field seaming and testing, overlapping and repairs, materials in contact with geomembrane and procedures for lining system acceptance;
X	APPX. P,Q	___	___	(5) Geotextile and geogrid specifications including handling and placement, conformance testing, seams and overlaps, repair, and placement of soil materials and any overlying materials;
X	APPX. P,Q	___	___	(6) Geonet and geocomposite specifications including handling and placement, conformance testing, stacking and joining, repair, and placement of soil materials and any overlying materials;
X	APPX. P,Q	___	___	(7) Geosynthetic clay liner specifications including handling and placement, conformance testing, seams and overlaps, repair, and placement of soil material and any overlying materials;
				f. Standards for soil components (62-710.400(3)(f),FAC):
X	APPX. P,Q	___	___	(1) Description of construction procedures including overexcavation and backfilling to preclude structural inconsistencies and procedures for placing and compacting soil component in layers;

S	LOCATION	N/A	N/C
___	_____	X	___
X	APPX. P,Q	___	___
X	APPX. P,Q	___	___
X	APPX. P,Q	___	___
___	_____	X	___
X	APPX. P,Q	___	___
X	APPX. P,Q	___	___
X	APPX. P,Q	___	___
X	APPX. P,Q	___	___
X	APPX. P,Q	___	___

PART H CONTINUED

(2) Demonstration of compatibility of the soil component with actual or simulated leachate in accordance with EPA Test Method 9100 or an equivalent test method;

(3) Procedures for testing in-situ soils to demonstrate they meet the specifications for soil liners;

(4) Specifications for soil component of liner including at a minimum:

(a) Allowable particle size distribution, Atterberg limits, shrinkage limit;

(b) Placement moisture and dry density criteria;

(c) Maximum laboratory-determined saturated hydraulic conductivity using simulated leachate;

(d) Minimum thickness of soil liner;

(e) Lift thickness;

(f) Surface preparation (scarification);

(g) Type and percentage of clay mineral within the soil component;

(5) Procedures for constructing and using a field test section to document the desired saturated hydraulic conductivity and thickness can be achieved in the field.

3. Leachate collection and removal system (LCRS); (62-701.400(4),FAC)

a. The primary and secondary LCRS requirements; (62-701.400(4)(a),FAC)

X	SEC. 4.4.4 APPX. P	___	___
X	SEC. 4.4.4 APPX. P	___	___
X	SEC. 4.4.3 APPX. P	___	___
X	SEC. 4.2.5 APPX. O	___	___

(1) Constructed of materials chemically resistant to the waste and leachate;

(2) Have sufficient mechanical properties to prevent collapse under pressure;

(3) Have granular material or synthetic geotextile to prevent clogging;

(4) Have method for testing and cleaning clogged pipes or contingent designs for rerouting leachate around failed areas;

S	LOCATION	N/A	N/C	
				PART H CONTINUED
				b. Primary LCRS requirements; (62-701.400(4)(b),FAC)
X	SEC. 4.4.2 APPX. P	___	___	(1) Bottom 12 inches having hydraulic conductivity $\geq 1 \times 10^{-3}$ cm/sec;
X	SEC. 4.4.2 APPX. P	___	___	(2) Total thickness of 24 inches of material chemically resistant to the waste and leachate;
X	SEC. 4.2.1 APPX. K	___	___	(3) Bottom slope design to accomodate for predicted settlement;
X	SEC. 4.4.4 APPX. K	___	___	(4) Demonstration that synthetic drainage material, if used, is equivalent or better than granular material in chemical compatibility, flow under load and protection of geomembrane liner.
				4. Leachate recirculation; (62-701.400(5),FAC)
___	_____	X	___	a. Describe general procedures for recirculating leachate;
___	_____	X	___	b. Describe procedures for controlling leachate runoff and minimizing mixing of leachate runoff with storm water;
___	_____	X	___	c. Describe procedures for preventing perched water conditions and gas buildup;
___	_____	X	___	d. Describe alternate methods for leachate management when it cannot be recirculated due to weather or runoff conditions, surface seeps, wind-blown spray, or elevated levels of leachate head on the liner;
X	SEC. 5	___	___	e. Describe methods of gas management in accordance with Rule 62-701.530, FAC;
___	_____	X	___	f. If leachate irrigation is proposed, describe treatment methods and standards for leachate treatment prior to irrigation over final cover and provide documentation that irrigation does not contribute significantly to leachate generation.

S	LOCATION	N/A	N/C	PART H CONTINUED
				5. Leachate storage tanks and leachate surface impoundments; (62-701.400(6),FAC)
				a. Surface impoundment requirements; (62-701.400(6)(b),FAC)
X	SEC. 4.2.4	___	___	(1) Documentation that the design of the bottom liner will not be adversely impacted by fluctuations of the ground water;
X	SEC. 4.2.4	___	___	(2) Designed in segments to allow for inspection and repair as needed without interruption of service;
				(3) General design requirements;
X	PD, APPX. P	___	___	(a) Double liner system consisting of an upper and lower 60-mil minimum thickness geomembrane;
X	_____	___	___	(b) Leak detection and collection system with hydraulic conductivity $\geq$ 1 cm/sec;
X	PD, APPX. P	___	___	(c) Lower geomembrane placed on subbase $\geq$ 6 inches thick with k $\leq$ $1x10^{-5}$ cm/sec or on an approved geosynthetic clay liner with k $\leq$ $1x10^{-7}$ cm/sec;
X	APPX. K	___	___	(d) Design calculation to predict potential leakage through the upper liner;
X	APPX. O	___	___	(e) Daily inspection requirements and notification and corrective action requirements if leakage rates exceed that predicted by design calculations;
___	_____	X	___	(4) Description of procedures to prevent uplift, if applicable;
X	SEC. 4.2.4	___	___	(5) Design calculations to demonstrate minimum two feet of freeboard will be maintained;
X	SEC. 4.2.4	___	___	(6) Procedures for controlling disease vectors and off-site odors.

S	LOCATION	N/A	N/C	PART H CONTINUED
				b. Above-ground leachate storage tanks; (62-701.400(6)(c),FAC)
X	SEC. 4.2.4	___	___	(1) Describe tank materials of construction and ensure foundation is sufficient to support tank;
X	SEC. 4.2.4	___	___	(2) Describe procedures for cathodic protection if needed for the tank;
X	SEC. 4.2.4	___	___	(3) Describe exterior painting and interior lining of the tank to protect it from the weather and the leachate stored;
X	SEC. 4.2.4	___	___	(4) Describe secondary containment design to ensure adequate capacity will be provided and compatibility of materials of construction;
X	SEC. 4.2.4	___	___	(5) Describe design to remove and dispose of stormwater from the secondary containment system;
X	SEC. 4.2.4	___	___	(6) Describe an overfill prevention system such as level sensors, gauges, alarms and shutoff controls to prevent overfilling;
				(7) Inspections, corrective action and reporting requirements;
X	SEC. 4.2.4 APPX. O	___	___	(a) Overfill prevention system weekly;
X	SEC. 4.2.4 APPX. O	___	___	(b) Exposed tank exteriors weekly;
X	SEC. 4.2.4 APPX. O	___	___	(c) Tank interiors when tank is drained or at least every three years;
X	SEC. 4.2.4 APPX. O	___	___	(d) Procedures for immediate corrective action if failures detected;
X	SEC. 4.2.4 APPX. O	___	___	(e) Inspection reports available for department review.
				c. Underground leachate storage tanks; (62-701.400(6)(d),FAC)
___	_____	X	___	(1) Describe materials of construction;
___	_____	X	___	(2) A double-walled tank design system to be used with the following requirements;

S	LOCATION	N/A	N/C	
___	_____	X	___	(a) Interstitial space monitoring at least weekly;
___	_____	X	___	(b) Corrosion protection provided for primary tank interior and external surface of outer shell;
___	_____	X	___	(c) Interior tank coatings compatible with stored leachate;
___	_____	X	___	(d) Cathodic protection inspected weekly and repaired as needed;
X	SEC. 4.2.4 APPX. O	___	___	(3) Describe an overfill prevention system such as level sensors, gauges, alarms and shutoff controls to prevent overfilling and provide for weekly inspections;
X	APPX. O	___	___	(4) Inspection reports available for department review.
X	APPX. O	___	___	d. Schedule provided for routine maintenance of LCRS; (62-701.400(6)(e),FAC)
				6. Liner systems construction quality assurance (CQA); (62-701.400(7),FAC)
X	APPX. Q	___	___	a. Provide CQA Plan including:
X	APPX. Q	___	___	(1) Specifications and construction requirements for liner system;
X	APPX. Q	___	___	(2) Detailed description of quality control testing procedures and frequencies;
X	APPX. Q	___	___	(3) Identification of supervising professional engineer;
X	APPX. Q	___	___	(4) Identify responsibility and authority of all appropriate organizations and key personnel involved in the construction project;
X	APPX. Q	___	___	(5) State qualifications of CQA professional engineer and support personnel;
X	APPX. Q	___	___	(6) Description of CQA reporting forms and documents;

S	LOCATION	N/A	N/C	PART H CONTINUED
X	APPX. Q	___	___	b. An independent laboratory experienced in the testing of geosynthetics to perform required testing;
				7. Soil Liner CQA (62-701.400(8)FAC)
X	APPX. P	___	___	a. Documentation that an adequate borrow source has been located with test results or description of the field exploration and laboratory testing program to define a suitable borrow source;
X	APPX. P	___	___	b. Description of field test section construction and test methods to be implemented prior to liner installation;
X	APPX. P	___	___	c. Description of field test methods including rejection criteria and corrective measures to insure proper liner installation.
				8. Surface water management systems; (62-701.400(9),FAC)
X	APPX. B (ERP)	___	___	a. Provide a copy of a Department permit for stormwater control or documentation that no such permit is required;
X	PD 36,37	___	___	b. Design of surface water management system to isolate surface water from waste filled areas and to control stormwater run-off;
X	PD 38-41	___	___	c. Details of stormwater control design including retention ponds, detention ponds, and drainage ways;
				9. Gas control systems; (62-701.400(10),FAC)
X	SEC. 5	___	___	a. Provide documentation that if the landfill is receiving degradable wastes, it will have a gas control system complying with the requirements of Rule 62-701.530, FAC;
X	SEC. 4	___	___	10. For landfills designed in ground water, provide documentation that the landfill will provide a degree of protection equivalent to landfills designed with bottom liners not in contact with ground water; (62-701.400(11),FAC)

I. **HYDROGEOLOGICAL INVESTIGATION REQUIREMENTS** (62-701.410(1), FAC)

S	LOCATION	N/A	N/C		
				1.	Submit a hydrogeological investigation and site report including at least the following information:
X	APPX. E			a.	Regional and site specific geology and hydrogeology;
X	APPX. E			b.	Direction and rate of ground water and surface water flow including seasonal variations;
X	APPX. E			c.	Background quality of ground water and surface water;
X	APPX. E			d.	Any on-site hydraulic connections between aquifers;
X	APPX. E			e.	Site stratigraphy and aquifer characteristics for confining layers, semi-confining layers, and all aquifers below the landfill site that may be affected by the landfill;
X	APPX. E			f.	Description of topography, soil types and surface water drainage systems;
X	APPX. E PD SHT 3			g.	Inventory of all public and private water wells within a one-mile radius of the landfill including, where available, well top of casing and bottom elevations, name of owner, age and usage of each well, stratigraphic unit screened, well construction technique and static water level;
		X		h.	Identify and locate any existing contaminated areas on the site;
X	PD SHT. 3			i.	Include a map showing the locations of all potable wells within 500 feet, and all community water suupply wells within 1000 feet, of the waste storage and disposal areas;
X	APPX. E			2.	Report signed, sealed and dated by PE or PG.

J. **GEOTECHNICAL INVESTIGATION REQUIREMENTS** (62-701.410(2),FAC)

S	LOCATION	N/A	N/C		
				1.	Submit a geotechnical site investigation report defining the engineering properties of the site including at least the following:
X	Sec. 3.3 Appx. E,F	___	___	a.	Description of subsurface conditions including soil stratigraphy and ground water table conditions;
X	Sec. 3.3	___	___	b.	Investigate for the presence of muck, previously filled areas, soft ground, lineaments and sink holes;
X	Sec. 3.2 Appx. E	___	___	c.	Estimates of average and maximum high water table across the site;
				d.	Foundation analysis including:
X	Appx. G	___	___		(1) Foundation bearing capacity analysis;
X	Appx. I	___	___		(2) Total and differential subgrade settlement analysis;
X	Appx. H	___	___		(3) Slope stability analysis;
X	Appx. F	___	___	e.	Description of methods used in the investigation and includes soil boring logs, laboratory results, analytical calculations, cross sections, interpretations and conclusions;
X	Sec. 3.3	___	___	f.	An evaluation of fault areas, seismic impact zones, and unstable areas as described in 40 CFR 258.13, 40 CFR 258.14 and 40 CFR 258.15.
X	Appx. F	___	___	2.	Report signed, sealed and dated by PE or PG.

K. VERTICAL EXPANSION OF LANDFILLS (62-701.430,FAC)

S	LOCATION	N/A	N/C		
___	_____	X	___	1.	Describe how the vertical expansion shall not cause or contribute to leachate leakage from the existing landfill or adversely affect the closure design of the existing landfill;
___	_____	X	___	2.	Describe how the vertical expansion over unlined landfills will meet the requirements of Rule 62-701.400, FAC with the exceptions of Rule 62-701.430(1)(c),FAC;
___	_____	X	___	3.	Provide foundation and settlement analysis for the vertical expansion;
___	_____	X	___	4.	Provide total settlement calculations demonstrating that the final elevations of the lining system, that gravity drainage, and that no other component of the design will be adversely affected;
___	_____	X	___	5.	Minimum stability safety factor of 1.5 for the lining system component interface stability and deep stability;
___	_____	X	___	6.	Provide documentation to show the surface water management system will not be adversely affected by the vertical expansion;
___	_____	X	___	7.	Provide gas control designs to prevent accumulation of gas under the new liner for the vertical expansion.

L. **LANDFILL OPERATION REQUIREMENTS** (62-701.500,FAC)

X	APPX. O	___	___	1.	Provide documentation that landfill will have at least one trained operator during operation and at least one trained spotter at each working face; (62-701.500(1),FAC)
				2.	Provide a landfill operation plan including procedures for: (62-701.500(2), FAC)
X	APPX. O	___	___	a.	Designating responsible operating and maintenance personnel;
X	APPX. O	___	___	b.	Contingency operations for emergencies;
X	APPX. O	___	___	c.	Controlling types of waste received at the landfill;
X	APPX. O	___	___	d.	Weighing incoming waste;
X	APPX. O	___	___	e.	Vehicle traffic control and unloading;
X	APPX. O	___	___	f.	Method and sequence of filling waste;
X	APPX. O	___	___	g.	Waste compaction and application of cover;
X	APPX. O	___	___	h.	Operations of gas, leachate, and stormwater controls;
X	APPX. E,N	___	___	i.	Water quality monitoring.
X	APPX. O	___	___	j.	Maintaining and cleaning the leachate collection system;
X	APPX. O	___	___	3.	Provide a description of the landfill operation record to be used at the landfill; details as to location of where various operational records will be kept (i.e. FDEP permit, engineering drawings, water quality records, etc.) (62-701.500(3),FAC)
X	APPX. O	___	___	4.	Describe the waste records that will be compiled monthly and provided to the Department quarterly; (62-701.500(4),FAC)
X	APPX. O	___	___	5.	Describe methods of access control; (62-701.500(5),FAC)
X	APPX. O	___	___	6.	Describe load checking program to be implemented at the landfill to discourage disposal of unauthorized wastes at the landfill; (62-701.500(6),FAC)
				7.	Describe procedures for spreading and compacting waste at the landfill that include: (62-701.500(7),FAC)
X	APPX. O	___	___	a.	Waste layer thickness and compaction frequencies;

S	LOCATION	N/A	N/C	PART L CONTINUED
X	APPX. O	___	___	b. Special considerations for first layer of waste placed above liner and leachate collection system;
X	APPX. O	___	___	c. Slopes of cell working face and side grades above land surface, planned lift depths during operation;
X	APPX. O	___	___	d. Maximum width of working face;
				e. Description of type of initial cover to be used at the facility that controls:
X	APPX. O	___	___	(1) Disease vector breeding/animal attraction
X	APPX. O	___	___	(2) Fires
X	APPX. O	___	___	(3) Odors
X	APPX. O	___	___	(4) Blowing litter
X	APPX. O	___	___	(5) Moisture infiltration
X	APPX. O	___	___	f. Procedures for applying initial cover including minimum cover frequencies;
X	APPX. O	___	___	g. Procedures for applying intermediate cover;
X	APPX. O	___	___	h. Time frames for applying final cover;
X	APPX. O	___	___	i. Procedures for controlling scavenging and salvaging.
X	APPX. O	___	___	j. Description of litter policing methods;
X	APPX. O	___	___	k. Erosion control procedures.
				8. Describe operational procedures for leachate management including; (62-701.500(8),FAC)
X	APPX. N	___	___	a. Leachate level monitoring, sampling, analysis and data results submitted to the Department;
X	SEC. 4.2 APPX. O,N	___	___	b. Operation and maintenance of leachate collection and removal system, and treatment as required;
X	APPX. O	___	___	c. Procedures for managing leachate if it becomes regulated as a hazardous waste;
X	SEC. 4.2	___	___	d. Agreements for off-site discharge and treatment of leachate;
X	APPX. O	___	___	e. Contingency plan for managing leachate during emergencies or equipment problems;

S	LOCATION	N/A	N/C		PART L CONTINUED
X	APPX. O	___	___		f. Procedures for recording quantities of leachate generated in gal/day and including this in the operating record;
X	APPX. O	___	___		g. Procedures for comparing precipitation experienced at the landfill with leachate generation rates and including this information in the operating record;
X	APPX. O	___	___		h. Procedures for water pressure cleaning or video inspecting leachate collection systems.
X	SEC. 5	___	___	9.	Describe how the landfill receiving degradable wastes shall implement a gas management system meeting the requirements of Rule 62-701.530, FAC; (62-701.500(9),FAC)
X	APPX. B (ERP)	___		10.	Describe procedures for operating and maintaining the landfill stormwater management system to comply with the requirements of Rule 62-701.400(9); (62-701.500(10),FAC)
				11.	Equipment and operation feature requirements; (62-701.500(11),FAC)
X	APPX. O	___	___		a. Sufficient equipment for excavating, spreading, compacting and covering waste;
X	APPX. O	___	___		b. Reserve equipment or arrangements to obtain additional equipment within 24 hours of breakdown;
X	APPX. O	___	___		c. Communications equipment;
X	APPX. O	___	___		d. Dust control methods;
X	APPX. O	___	___		e. Fire protection capabilities and procedures for notifying local fire department authorities in emergencies;
X	APPX. O	___	___		f. Litter control devices;
X	APPX. O	___	___		g. Signs indicating operating authority, traffic flow, hours of operation, disposal restrictions.
X	PD SHT 42-50	___	___	12.	Provide a description of all-weather access road, inside perimeter road and other roads necessary for access which shall be provided at the landfill; (62-701.500(12),FAC)
X	APPX. O	___	___	13.	Additional record keeping and reporting requirements; (62-701.500(13),FAC)

S	LOCATION	N/A	N/C		PART L CONTINUED
X	ATTACHED			a.	Records used for developing permit applications and supplemental information maintained for the design period of the landfill;
		X		b.	Monitoring information, calibration and maintenance records, copies of reports required by permit maintained for at least 10 years;
		X		c.	Maintain annual estimates of the remaining life of constructed landfills and of other permitted areas not yet constructed and submit this estimate annually to the Department;
X	APPX. O			d.	Procedures for archiving and retrieving records which are more than five year old.

M. **WATER QUALITY AND LEACHATE MONITORING REQUIREMENTS** (62-701.510, FAC)

S	LOCATION	N/A	N/C		
X	APPX. E,N			1.	Water quality and leachate monitoring plan shall be submitted describing the proposed ground water, surface water and leachate monitoring systems and shall meet at least the following requirements;
X	APPX. E,N			a.	Based on the information obtained in the hydrogeological investigation and signed, dated and sealed by the PG or PE who prepared it; (62-701.510(2)(a),FAC)
X	APPX. E,N			b.	All sampling and analysis preformed in accordance with Chapter 62-160, FAC; (62-701.510(2)(b),FAC)
				c.	Ground water monitoring requirements; (62-701.510(3),FAC)
X	APPX. E PD SHT. 24			(1)	Detection wells located downgradient from and within 50 feet of disposal units;
X	APPX. E PD SHT. 24			(2)	Downgradient compliance wells as required;
X	APPX. E PD SHT. 5,6			(3)	Background wells screened in all aquifers below the landfill that may be affected by the landfill;
X	PD SHT. 24			(4)	Location information for each monitoring well;
X	PD SHT. 24			(5)	Well spacing no greater than 500 feet apart for downgradient wells and no greater than 1500 feet apart for upgradient wells unless site specific conditions justify alternate well spacings;
X	APPX. E PD SHT. 24			(6)	Well screen locations properly selected;
X	APPX. E			(7)	Procedures for properly abandoning monitoring wells;
		X		(8)	Detailed description of detection sensors if proposed.

S	LOCATION	N/A	N/C		PART M CONTINUED
				d.	Surface water monitoring requirements; (62-701.510(4),FAC)
X	APPX. E PD SHT. 3	___	___		(1) Location of and justification for all proposed surface water monitoring points;
X	PD SHT. 3	___	___		(2) Each monitoring location to be marked and its position determined by a registered Florida land surveyor;
X	APPX. N	___	___	e.	Leachate sampling locations proposed; (62-701.510(5),FAC)
				f.	Initial and routine sampling frequency and requirements; (62-701.510(6),FAC)
X	APPX. E	___	___		(1) Initial background ground water and surface water sampling and analysis requirements;
X	APPX. N	___	___		(2) Routine leachate sampling and analysis requirements;
X	APPX. E	___	___		(3) Routine monitoring well sampling and analysis requirements;
X	APPX. E	___	___		(4) Routine surface water sampling and analysis requirements.
X	APPX. O	___	___	g.	Describe procedures for implementing evaluation monitoring, prevention measures and corrective action as required; (62-701.510(7),FAC)
X	APPX. N	___	___	h.	Water quality monitoring report requirements; (62-701.510(9),FAC)
X	APPX. N	___	___		(1) Semi-annual report requirements;
X	APPX. N	___	___		(2) Bi-annual report requirements signed, dated and sealed by PG or PE.

N. **SPECIAL WASTE HANDLING REQUIREMENTS** (62-701.520, FAC)

S	LOCATION	N/A	N/C		
X	APPX. O	___	___	1.	Describe procedures for managing motor vehicles; (62-701.520(1),FAC)
X	APPX. O	___	___	2.	Describe procedures for landfilling shredded waste; (62-701.520(2),FAC)
X	APPX. O	___	___	3.	Describe procedures for asbestos waste disposal; (62-701.520(3),FAC)
X	APPX. O	___	___	4.	Describe procedures for disposal or management of contaminated soil; (62-701.520(4), FAC)
X	SEC. 2	___	___	5.	Describe procedures for disposal of biological wastes; (62-701.520(5), FAC)

O. **GAS MANAGEMENT SYSTEM REQUIREMENTS** (62-701.530,FAC)

				1.	Provide the design for a gas management systems that will (62-701.530(1), FAC):
X	SEC. 5.3	___	___	a.	Be designed to prevent concentrations of combustible gases from exceeding 25% the LEL in structures and 100% the LEL at the property boundary;
X	SEC. 5.3	___	___	b.	Be designed for site-specific conditions;
X	SEC. 5.3	___	___	c.	Be designed to reduce gas pressure in the interior of the landfill;
X	SEC. 5.3.1	___	___	d.	Be designed to not interfere with the liner, leachate control system or final cover.
X	SEC. 5.4	___	___	2.	Provide documentation that will describe locations, construction details and procedures for monitoring gas at ambient monitoring points and with soil monitoring probes; (62-701.530(2), FAC):
X	SEC. 5.4.4	___	___	3.	Provide documentation describing how the gas remediation plan and odor remediation plan will be implemented; (62-701.530(3), FAC):
				4.	Landfill gas recovery facilities; (62-701.530(5), FAC):
___	_____	X	___	a.	Information required in Rules 62-701.320(7) and 62-701.330(3), FAC supplied;
___	_____	X	___	b.	Information required in Rule 62-701.600(4), FAC supplied where relevant and practical;
___	_____	X	___	c.	Estimate of current and expected gas generation rates and description of condensate disposal methods provided;
___	_____	X	___	d.	Description of procedures for condensate sampling, analyzing and data reporting provided;

___	_____	X	___	e. Closure plan provided describing methods to control gas after recovery facility ceases operation and any other requirements contained in Rule 62-701.400(10), FAC;
___	_____	X	___	f. Performance bond provided to cover closure costs if not already included in other landfill closure costs.

P. LANDFILL FINAL CLOSURE REQUIREMENTS (62-701.600,FAC)

1. Closure schedule requirements; (62-701.600(2),FAC)

X	SEC. 6.2	___	___	a. Documentation that a written notice including a schedule for closure will be provided to the Department at least one year prior to final receipt of wastes;
X	SEC. 6.2	___	___	b. Notice to user requirements within 120 days of final receipt of wastes;
X	SEC. 6.2	___	___	c. Notice to public requirements within 10 days of final receipt of wastes.

2. Closure permit general requirements; (62-701.600(3),FAC)

___	_____	X	___	a. Application submitted to Department at least 90 days prior to final receipt of wastes;
				b. Closure plan shall include the following:
___	_____	X	___	(1) Closure report;
___	_____	X	___	(2) Closure design plan;
___	_____	X	___	(3) Closure operation plan;
___	_____	X	___	(4) Closure procedures;
___	_____	X	___	(5) Plan for long term care;
___	_____	X	___	(6) A demonstration that proof of financial responsibility for long term care will be provided.

3. Closure report requirements; (62-701.600(4),FAC)

				a. General information requirements;
___	_____	X	___	(1) Identification of landfill;

S	LOCATION	N/A	N/C	PART P CONTINUED
___	_____	X	___	(2) Location, description and vicinity map;
___	_____	X	___	(3) Total acres of disposal areas and landfill property;
___	_____	X	___	(4) Legal property description;
___	_____	X	___	(5) History of landfill;
___	_____	X	___	(6) Identification of types of waste disposed of at the landfill.
___	_____	X	___	b. Geotechnical investigation report and water quality monitoring plan required by Rule 62-701.330(3),FAC;
___	_____	X	___	c. Land use information report indicating: identification of adjacent landowners; zoning; present land uses; and roads, highways right-of-way, or easements.
___	_____	X	___	d. Report on actual or potential gas migration at landfills containing degradable wastes which would allow migration of gas off the landfill property;
___	_____	X	___	e. Report assessing the effectiveness of the landfill design and operation including results of geotechnical investigations, surface water and storm water management, gas migration and concentrations, condition of existing cover, and nature of waste disposed of at the landfill;
				4. Closure design requirements to be included in the closure design plan: (62-701.600(5),FAC)
___	_____	X	___	a. Plan sheet showing phases of site closing;
___	_____	X	___	b. Drawings showing existing topography and proposed final grades;
___	_____	X	___	c. Provisions to close units when they reach approved design dimensions;
___	_____	X	___	d. Final elevations before settlement;
___	_____	X	___	e. Side slope design including benches, terraces, down slope drainage ways, energy dissipators and discussion of expected precipitation effects;
				f. Final cover installation plans including:
___	_____	X	___	(1) CQA plan for installing and testing final cover;

S	LOCATION	N/A	N/C		PART P CONTINUED
___	_____	X	___	(2)	Schedule for installing final cover after final receipt of waste;
___	_____	X	___	(3)	Description of drought-resistant species to be used in the vegetative cover;
___	_____	X	___	(4)	Top gradient design to maximize runoff and minimize erosion;
___	_____	X	___	(5)	Provisions for cover material to be used for final cover maintenance.
				g.	Final cover design requirements:
X	Sec. 6.4.3	___	___	(1)	Protective soil layer design;
___	_____	X	___	(2)	Barrier soil layer design;
X	Sec. 6.4.3	___	___	(3)	Erosion control vegetation;
X	Sec. 6.4.3	___	___	(4)	Geomembrane barrier layer design;
___	_____	X	___	(5)	Geosynthetic clay liner design if used;
X	Sec. 6.4.4	___	___	(6)	Stability analysis of the cover system and the disposed waste.
X	Sec. 6.4.6 Sec. 6.4.7	___	___	h.	Proposed method of stormwater control;
X	Sec. 6.4	___	___	i.	Proposed method of access control;
___	_____	X	___	j.	Description of proposed final use of the closed landfill, if any;
X	Sec. 5.3	___	___	k.	Description of the proposed or existing gas management system which complies with Rule 62-701.530, FAC.
				5.	Closure operation plan shall include: (62-701.600(6),FAC)
___	_____	X	___	a.	Detailed description of actions which will be taken to close the landfill;
___	_____	X	___	b.	Time schedule for completion of closing and long term care;
___	_____	X	___	c.	Describe proposed method for demonstrating financial responsibility;
___	_____	X	___	d.	Indicate any additional equipment and personnel needed to complete closure.

S	LOCATION	N/A	N/C	PART P CONTINUED
___	_____	X	___	e. Development and implementation of the water quality monitoring plan required in Rule 62-701.510, FAC.
___	_____	X	___	f. Development and implementation of gas management system required in Rule 62-701.530, FAC.
___	_____	X	___	6. Justification for and detailed description of procedures to be followed for temporary closure of the landfill, if desired; (62-701.600(7),FAC)

Q. **CLOSURE PROCEDURES** (62-701.610,FAC)

S	LOCATION	N/A	N/C		
___	_____	X	___	1.	Survey monuments; (62-701.610(2),FAC)
___	_____	X	___	2.	Final survey report; (62-701.610(3),FAC)
___	_____	X	___	3.	Certification of closure construction completion; (62-701.610(4),FAC)
___	_____	X	___	4.	Declaration to the public; (62-701.610(5),FAC)
___	_____	X	___	5.	Official date of closing; (62-701.610(6),FAC)
___	_____	X	___	6.	Use of closed landfill areas; (62-701.610(7),FAC)
__	_____	X	___	7.	Relocation of wastes; (62-701.610(8), FAC)

R. **LONG TERM CARE REQUIREMENTS** (62-701.620,FAC)

__	_____	X	___	1.	Maintaining the gas collection and monitoring system; (62-701.620(5), FAC)
___	_____	X	___	2.	Right of property access requirements; (62-701.620(6),FAC)
___	_____	X	___	3.	Successors of interest requirements; (62-701.620(7),FAC)
___	_____	X	___	4.	Requirements for replacement of monitoring devices; (62-701.620(9),FAC)
___	_____	X	___	5.	Completion of long term care signed and sealed by professional engineer (62-701.620(10), FAC).

S. **FINANCIAL RESPONSIBILITY REQUIREMENTS** (62-701.630,FAC)

X	SEC. 6.5 APPX. R	___	___	1.	Provide cost estimates for closing, long term care, and corrective action costs estimated by a PE for a third party performing the work, on a per unit basis, with the source of estimates indicated; (62-701.630(3)&(7), FAC).
X	SEC. 6.5	___	___	2.	Describe procedures for providing annual cost adjustments to the Department based on inflation and changes in the closing, long-term care, and corrective action plans; (62-701.630(4)&(8), FAC).
X	SEC. 6.5	___	___	3.	Describe funding mechanisms for providing proof of financial assurance and include appropriate financial assurance forms; (62-701.630(5),(6),&(9), FAC).

T. CERTIFICATION BY APPLICANT AND ENGINEER OR PUBLIC OFFICER

1. Applicant:

The undersigned applicant or authorized representative of OMNI WASTE OF OSCEOLA COUNTY, LLC is aware that statements made in this form and attached information are an application for a CONSTRUCTION/OPERATION Permit from the Florida Department of Environmental Protection and certifies that the information in this application is true, correct and complete to the best of his/her knowledge and belief. Further, the undersigned agrees to comply with the provisions of Chapter 403, Florida Statutes, and all rules and regulations of the Department. It is understood that the Permit is not transferable, and the Department will be notified prior to the sale or legal transfer of the permitted facility.

Signature of Applicant or Agent

TIMOTHY J. SALOPEK
Name and Title (please type)

tjsomni@aol.com
E-Mail address (if available)

100 CHURCH STREET
Mailing Address

KISSIMMEE, FLORIDA 34741
City, State, Zip Code

(407) 957-7284
Telephone Number

Date: 24 May 2002

Attach letter of authorization if agent is not a governmental official, owner, or corporate officer.

2. Professional Engineer registered in Florida (or Public Officer if authorized under Sections 403.707 and 403.7075, Florida Statutes):

This is to certify that the engineering features of this solid waste management facility have been designed/examined by me and found to conform to engineering principles applicable to such facilities. In my professional judgment, this facility, when properly maintained and operated, will comply with all applicable statutes of the State of Florida and rules of the Department. It is agreed that the undersigned will provide the applicant with a set of instructions of proper maintenance and operation of the facility.

Signature

KENNETH W. CARGILL, P.E.
Name and Title (please type)
PRINCIPAL AND BRANCH MANAGER

54435
Florida Registration Number
(please affix seal)

GEOSYNTEC CONSULTANTS
14055 RIVEREDGE DR. SUITE 300
Mailing Address

TAMPA, FLORIDA 33637
City, State, Zip Code

KCargill@geosyntec.com
E-Mail address (if available)

(813) 558-0990
Telephone Number

Date: 24 May 2002

Prepared for

Omni Waste of Osceola County, LLC
100 Church Street
Kissimmee, Florida 34741

APPLICATION FOR AN ENVIRONMENTAL RESOURCES PERMIT OAK HAMMOCK DISPOSAL FACILITY

Prepared by

GeoSyntec Consultants
14055 Riveredge Drive, Suite 300
Tampa, FL 33637

Project Number FW0400

May 2002

Insert in Appendix B
OMNI WASTE Vol I

Item II (E)

Impact Summary Tables:

1. *For all projects, complete Tables 1, 2 and 3 as applicable.*

2. *For docking facilities or other structures constructed over wetlands or other surface waters, provide the information requested in Table 4.*

3. *For shoreline stabilization projects, provide the information requested in Table 5.*

Tables 1 and 2 are applicable to this project and are presented on seven separate pages between page E-6 (Rev 1) and E-7 of this ERP application. Tables 1 and 2 are summarized in the *Wetland Resource Impact and Mitigation Plan*, prepared by BRA and presented as Appendix E3. Tables 3, 4, and 5 are not applicable.

TABLE ONE:

PROJECT WETLAND AND OTHER SURFACE WATER SUMMARY

(This information is summarized in table 4-1 and Figure 6 of the Wetland Resource Impact and Mitigation Plan report)

WL & SW ID	WL & SW TYPE	WL & SW SIZE	WL & SW NOT IMPACTED	TEMPORARY WL & SW IMPACTS			PERMANENT WL & SW IMPACTS			MITIGATION AREA ID
				WL & SW TYPE	IMPACT SIZE	IMPACT TYPE	WL & SW TYPE	IMPACT SIZE	IMPACT TYPE	
1	Forested/ herbaceous	0.02	0.02							
2	Cattle Pond	** 0.17	0.0				Cattle Pond	0.17	Road	
3	Forested/ herbaceous	1.79	0.0				Forested/ herbaceous	1.79	landfill	
4	Herbaceous	1.10	0.0				Herbaceous	1.10	landfill	
5	Forested/ herbaceous	3.87	0.0				Forested/ herbaceous	3.87	landfill	
6	Herbaceous	3.36	0.0				Herbaceous	3.36	landfill	
7	Herbaceous	2.11	0.0				Herbaceous	2.11	landfill	
8	Herbaceous	0.71	0.0				Herbaceous	0.71	landfill	
9	Forested/ Herbaceous	26.26	26.25				Forested/ Herbaceous	0.01	Road	
PROJECT TOTALS										

COMMENTS: ** cattle pond extends offsite

Note:
WL = Wetland SW = Other Surface Water ID = Identification Number, letter, etc.
Wetland Type: from an established wetland classification system
Impact Type: D = Dredge; F = Fill; H = Change Hydrology; S = Shading; C = Clearing; O = Other
Multiple entries per cell not allowed, except in the "Mitigation ID" column. If more than one impact is proposed in a given area, indicate the final impact.

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WL & SW ID	WL & SW TYPE	WL & SW SIZE	WL & SW NOT IMPACTED	TEMPORARY WL & SW IMPACTS			PERMANENT WL & SW IMPACTS			MITIGATION AREA ID
				WL & SW TYPE	IMPACT SIZE	IMPACT TYPE	WL & SW TYPE	IMPACT SIZE	IMPACT TYPE	
10	Forested/ Herbaceous	0.21	0.21							
11	Herbaceous	5.64	5.64							
12	Forested/ Herbaceous	3.84	3.84							
13	Herbaceous	197.20	197.09				Herbaceous	0.11	Road	
14	Herbaceous	1.48	1.48							
15	Herbaceous	0.53	0.53							
16	Forested/ Herbaceous	69.02	69.02							
17	Cattle pond	0.11	0.0							
18	Forested/ herbaceous	26.96	26.96							
PROJECT TOTALS										

COMMENTS: * wetland extends offsite

Note:
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				WL & SW TYPE	IMPACT SIZE	IMPACT TYPE	WL & SW TYPE	IMPACT SIZE	IMPACT TYPE	
19	Forested/ Herbaceous	109.74	109.14				Forested/ Herbaceous	0.60	Road	
20	Cattle pond	0.31	0.31							
21	Forested/ Herbaceous	8.90	8.90							
22	Forested/ Herbaceous	56.62	56.49				Forested/ Herbaceous	0.13	Road	
23	Forested/ Herbaceous	68.86	68.71				Forested/ Herbaceous	0.15	Road	
24	Herbaceous	2.83	2.83							
25	Herbaceous	0.71	0.71							
26	Herbaceous	1.57	1.57							
27	Herbaceous	2.50	2.50							
PROJECT TOTALS										

COMMENTS: * wetland extends offsite

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Multiple entries per cell not allowed, except in the "Mitigation ID" column. If more than one impact is proposed in a given area, indicate the final impact.

TABLE ONE:

PROJECT WETLAND AND OTHER SURFACE WATER SUMMARY

(This information is summarized in table 4-1 and Figure 6 of the Wetland Resource Impact and Mitigation Plan report)

WL & SW ID	WL & SW TYPE	WL & SW SIZE	WL & SW NOT IMPACTED	TEMPORARY WL & SW IMPACTS			PERMANENT WL & SW IMPACTS			MITIGATION AREA ID
				WL & SW TYPE	IMPACT SIZE	IMPACT TYPE	WL & SW TYPE	IMPACT SIZE	IMPACT TYPE	
28	Forested/ herbaceous	4.29	4.29							
29	Herbaceous	4.30	4.30							
30	Forested/ herbaceous	33.90	33.90							
31	Herbaceous	0.15	0.04							
32	Forested/ herbaceous	0.83	0.83							
33	Forested/ Herbaceous	27.07	26.84				Forested/ Herbaceous	0.23	Road	
34	Cattle pond	0.11	0.11							
35	Forested/ Herbaceous	58.37	58.09				Forested/ Herbaceous	0.28	Road	
36	Herbaceous	0.46	0.46							
PROJECT TOTALS										

COMMENTS: * wetland extends offsite

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WL = Wetland SW = Other Surface Water ID = Identification Number, letter, etc.
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Impact Type: D = Dredge; F = Fill; H = Change Hydrology; S = Shading; C = Clearing; O = Other
Multiple entries per cell not allowed, except in the "Mitigation ID" column. If more than one impact is proposed in a given area, indicate the final impact.

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WL & SW ID	WL & SW TYPE	WL & SW SIZE	WL & SW NOT IMPACTED	TEMPORARY WL & SW IMPACTS			PERMANENT WL & SW IMPACTS			MITIGATION AREA ID
				WL & SW TYPE	IMPACT SIZE	IMPACT TYPE	WL & SW TYPE	IMPACT SIZE	IMPACT TYPE	
37	Forested/ herbaceous	13.56	13.56							
38	Forested/ herbaceous	7.27	7.27							
39	Herbaceous	0.61	0.61							
40	Herbaceous	2.28	2.17							
41	Forested/ herbaceous	0.04	0.00				Forested/ Herbaceous	0.04	Road	
D1	Upland-cut ditch	0.21	0.21							
D2	Upland-cut ditch	0.02	0.02							
D3	Upland-cut ditch	0.02	0.0				Upland-cut ditch	0.02	Landfill	
D4	Upland-cut ditch	0.03	0.00				Upland-cut ditch	0.03	Landfill	
PROJECT TOTALS										

COMMENTS: * wetland extends offsite

Note:
WL = Wetland SW = Other Surface Water ID = Identification Number, letter, etc.
Wetland Type: from an established wetland classification system
Impact Type: D = Dredge; F = Fill; H = Change Hydrology; S = Shading; C = Clearing; O = Other
Multiple entries per cell not allowed, except in the "Mitigation ID" column. If more than one impact is proposed in a given area, indicate the final impact.

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PROJECT WETLAND AND OTHER SURFACE WATER SUMMARY

(This information is summarized in table 4-1 and Figure 6 of the Wetland Resource Impact and Mitigation Plan report)

WL & SW ID	WL & SW TYPE	WL & SW SIZE	WL & SW NOT IMPACTED	TEMPORARY WL & SW IMPACTS			PERMANENT WL & SW IMPACTS			MITIGATION AREA ID
				WL & SW TYPE	IMPACT SIZE	IMPACT TYPE	WL & SW TYPE	IMPACT SIZE	IMPACT TYPE	
D5	Upland-cut ditch	0.04	0.00				Upland-cut ditch	0.04	Landfill	
D6	Upland-cut ditch	0.56	0.00				Upland-cut ditch 1	0.56	Landfill	
D7	Upland-cut ditch	0.09	0.00				Upland-cut ditch	0.09	Landfill	
D8	Upland-cut ditch	0.14	0.14							
D9	Upland-cut ditch	0.33	0.33							
D10	Upland-cut ditch	0.11	0.0				Upland-cut ditch	0.11	Landfill	
PROJECT TOTALS		751.21	735.37					15.51		

COMMENTS: * wetland extends offsite

Note:
WL = Wetland SW = Other Surface Water ID = Identification Number, letter, etc.
Wetland Type: from an established wetland classification system
Impact Type: D = Dredge; F = Fill; H = Change Hydrology; S = Shading; C = Clearing; O = Other
Multiple entries per cell not allowed, except in the "Mitigation ID" column. If more than one impact is proposed in a given area, indicate the final impact.

TABLE TWO:

PROJECT ON-SITE MITIGATION SUMMARY

MITIGATION AREA ID	CREATION		RESTORATION		ENHANCEMENT		WETLAND PRESERVE		UPLAND PRESERVE		OTHER	
	AREA	TARGET TYPE	AREA	TARGET TYPE	AREA	TARGET TYPE	AREA	TYPE	AREA	TYPE	AREA	TARGET TYPE
R-1			0.14	Herb								
R-2			0.12	Herb								
Wetland Preservation							483	Mixed				
Upland Preservation									596	Mixed		
Wetland Enhancement					113	Mixed						
PROJECT TOTALS												

COMMENTS:

Target Type = target or existing habitat from an established wetland classification system or land use classification for non-wetland mitigation.
Note: Multiple entries per cell not allowed.

TRANSMITTAL LETTER

ENGINEER'S CERTIFICATION

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INTRODUCTION

INTRODUCTION

1. TERMS OF REFERENCE

On behalf of Omni Waste of Osceola County LLC (Omni), GeoSyntec Consultants (GeoSyntec) has prepared this Environmental Resources Permit (ERP) application for a proposed Class I landfill in Osceola County, which will be known as the Oak Hammock Disposal (OHD) landfill. The ERP application specifically addresses the storm-water management system design and environmental considerations relevant to the proposed Class I landfill and ancillary features. The ERP application has been prepared to meet the requirements of the Florida Department of Environmental Protection (FDEP) Form No. 62-343.900(1) entitled "*Joint Environmental Resource Permit Application*" (dated 3 October 1995). This ERP application addresses only Sections A, C, and E of the form, which are the sections applicable to this project.

The ERP application preparation was a joint effort by GeoSyntec (landfill and storm-water management system designs) and Biological Research Associates (BRA) (wildlife and wetland impact and mitigation). Mr. Kenneth W. Cargill, P.E. of GeoSyntec is the engineer-of-record for this project.

2. SITE LOCATION

The OHD site is located in eastern Osceola County, Florida, west of highway U.S. 441, approximately 5 miles south of Holopaw. The OHD site is located in Sections 11, 13, and 14 of Township 28 South, Range 32 East, and Sections 17 and 18 of Township 28 South, Range 33 East, Osceola County, Florida. The site location is shown in Figure 1. The main entrance of the facility is located at latitude 28° 02' 57", longitude 81° 03' 10", on highway U.S. 441. Coordinates of the main entrance are a Northing of 1350637 and an Easting of 639127 in the Florida State Plane Coordinate System. The center of the landfill footprint is located at latitude 28° 03' 32" and longitude 81° 05' 46" or a Northing of 1354222 and an Easting of 625229.

3. PROJECT BACKGROUND

In June 2001, Omni's request for approval of a Conditional Use/Site Development Plan to construct and operate the OHD facility was approved by the Osceola Board of County Commissioners. On 25 March 2002, Osceola County signed a 10-year contract with Omni,

which requires Omni to transport the County solid waste from the County's transfer station to the OHD facility for disposal. Thus, the development of the OHD facility will serve the municipal solid waste (MSW) needs of Osceola County and will be available for use by surrounding counties.

An application to construct and operate a Class I landfill has also been prepared by GeoSyntec as a separate document and is submitted to FDEP concurrently with this ERP application. The Class I landfill permit application provides information related to design and construction of the landfill and ancillary features.

It should be noted that the Class I landfill permit application and this ERP application are intended to support both a five-year construct and operate permit and a conceptual plan of development at final build-out. FDEP approval is sought for the ERP and the conceptual plan. The five-year construct and operate permit is referenced as Phase 1 and includes the layout and design of four landfill cells covering approximately 53 acres. Other principal features of Phase 1 include a leachate management system, an interim storm water management system, operations area, waste haul road, and access road. The concept plan of development at final build-out includes layout and design of 21 landfill cells covering approximately 264 acres and includes the same principal features mentioned above.

4. ERP SUMMARY

This ERP application describes the proposed design of the storm-water management system for the OHD facility. The system is based the design criteria of the FDEP, the South Florida Water Management District, and Omni. All drainage culverts, swales, and other conveyances are designed to carry, or pass, the 25-year storm event. All landfill and roadway retention basins are designed to retain and infiltrate the required treatment volumes. The landfill storm-water retention basins are designed to retain runoff from the 100-year storm event. The OHD landfill footprint does encroach on the 100-year floodplain of the adjacent Bull Creek. However, calculations are presented to show that the development of the landfill will not exacerbate conditions during the 100-year flood. The area to be developed as part of the landfill area is a net contributor to the 100-year floodwaters in the pre-development state; but the storm-water management system for the landfill has been designed to retain all of the 100-year floodwaters that fall on the developed portions of the landfill in the post-development state. Therefore, the developed landfill storm-water management basins provide flood storage greater than the storage lost from the pre-developed condition. The landfill footprint does not hinder the flow of floodwaters in the Bull Creek basin.

The ERP application also describes the impacts of the landfill development on wetlands and presents the plan for mitigation of these impacts. Wetland impacts will be required in order to construct both the access road and the landfill. Omni has chosen a roadway alignment that avoids wetlands to the greatest extent possible, and thus has minimized wetland impacts for the access road. However, it is not possible to traverse the nearly three-mile distance to the landfill footprint without crossing wetlands. Where wetland crossings are needed, the design of the access roadway has been modified to reduce the cross-section from 130 feet to 52 feet to minimize the impacted areas. This minimum width is required in order to provide two lanes of traffic for large trucks, plus shoulders and side slopes. Impacts to wetlands within the 264-acre footprint of the landfill itself were needed in order to efficiently use the land and meet the solid waste disposal needs of Osceola County. The report entitled "*Facility Wetland Resource Impact and Mitigation Plan*" prepared by BRA and presented in Appendix E3, provides a discussion of wetland impact areas and the mitigation plan.

The ERP application also provides a discussion of wildlife impacts and presents a plan for impact mitigation. The report entitled "*Conceptual Wildlife and Habitat Management Plan*" by BRA and presented in Appendix E4 provides a plan for mitigation and habitat improvements, which offer additional opportunity for the native species to thrive.

5. ORGANIZATION

The organization of this permit application generally follows FDEP Form No. 62-343.900(1). Based on the type of proposed development, Omni is required to submit Sections A, C, and E of the form. Sections B, D, F and G of the form are not required for the development and are not addressed in this ERP application. The remainder of this document presents the information required by Sections A, C, and E of the form. Section A provides a description of the project and general information regarding the facility. Section C provides brief descriptions of the proposed construction, the existing surface-water and wetlands that will be impacted by the project, the quantity of wetlands to be filled, and the proposed wetland mitigation plan. Section E provides detailed information regarding the proposed construction, wetland impacts, mitigation plans, and storm-water management systems, and design calculations. In Section E, each statement of required information is quoted from the FDEP form in italics and is followed immediately by a response in normal font.

APPLICATION FORM

SECTION A

BASIC APPLICATION FORM

SECTION A

FOR AGENCY USE ONLY	
ACOE Application #	DEP/WMD Application #
Date Application Received	Date Application Received
Proposed Project Lat.	Fee Received $
Proposed Project Long.	Fee Receipt #

PART 1:

Are any of the activities described in this application proposed to occur in, on, or over wetlands or other surface waters?
☒ yes ☐ no

Is this application being filed by or on behalf of a government entity or drainage district? ☐ yes ☒ no

PART 2:

A. Type of Environmental Resource Permit Requested (check at least one). See Attachment 2 for thresholds and descriptions.

- ☐ Noticed General - include information requested in Section B.
- ☐ Standard General (Single Family Dwelling) - include information requested in Sections C and D.
- ☐ Standard General (all other Standard General projects) - include information requested in Sections C and E.
- ☐ Individual (Single Family Dwelling) - include information requested in Sections C and D.
- ☒ Individual (all other Individual projects) - include information requested in Sections C and E.
- ☐ Conceptual - include information requested in Sections C and E.
- ☐ Mitigation Bank Permit (construction) - include information requested in Sections C and F. (If the proposed mitigation bank involves the construction of a surface water management system requiring another permit defined above, check the appropriate box and submit the information requested by the applicable section.)
- ☐ Mitigation Bank (conceptual) - include information requested in Sections C and F.

B. Type of activity for which you are applying (check at least one)

- ☐ Construction or operation of a new system, other than a solid waste facility, including dredging or filling in, on or over wetlands and other surface waters.
- ☒ Construction, expansion or modification of a solid waste facility.
- ☐ Alteration or operation of an existing system which was not previously permitted by a WMD or DEP.
- ☐ Modification of a system previously permitted by a WMD or DEP.

Provide previous permit numbers:___

☐	Alteration of a system	☐	Extension of permit duration
☐	Abandonment of a system	☐	Construction of additional phases of a system
☐	Removal of a system		

C. Are you requesting authorization to use Sovereign Submerged Lands?
☐ yes ☒ no
(See Section G and Attachment 5 for more information before answering this question.)

D. For activities in, on,or over wetlands or other surface waters, check type of federal dredge and fill permit requested:

☒ Individual	☐ Programmatic General	☐ General
☐ Nationwide	☐ Not Applicable	

E. Are you claiming to qualify for an exemption? ☐ yes ☒ no
If yes, provide rule number if known. ___

PART 3: **A. OWNER(S) OF LAND**		**B. ENTITY TO RECEIVE PERMIT (IF OTHER THAN OWNER)**
Name Evadne Gannerelli	Bronsons, A FL GP	Name Timothy J. Salopek
Title and Company		Title and Company President, Omni Waste of Osceola County, LLC
Address 1401 Coaches Lane	1415 W. Vine St.	Address 100 Church Street
City, State, Zip St. Cloud, FL 34773	Kissimmee, FL 34741	City, State, Zip Kissimmee, FL 34741
Telephone and Fax 407-892-8539	407-847-2847	Telephone and Fax 407-957-7284 Fax: 407-957-7202
C. AGENT AUTHORIZED TO SECURE PERMIT		**D. CONSULTANT (IF DIFFERENT FROM AGENT)**
Name Kenneth W. Cargill, P.E.		Name N/A
Title and Company Principal, GeoSyntec Consultants		Title and Company
Address 14055 Riveredge Drive, Suite 300		Address
City, State, Zip Tampa, FL 33637		City, State, Zip
Telephone and Fax 813-558-0990 Fax: 813-558-9726		Telephone and Fax

PART 4: (Please provide metric equivalent for federally funded projects):

A. Name of Project, including phase if applicable: Oak Hammock Disposal Facility - Phase 1

B. Is this application for part of a multi-phase project?
☒yes ☐no

C. Total applicant-owned area contiguous to the project?
2,179 ac.; N/A ha.

D. Total area served by the system: 473 ac.; N/A ha.

E. Impervious area for which a permit is sought: 12 ac.; N/A ha.

F. Volume of water that the system is capable of impounding:
600 ac. ft.; N/A m

G. What is the total area of work in, on, or over wetlands or other surface waters?
14.28 ac.; N/A ha. 622,037 sq. ft.; N/A sq. m.

H. Total volume of material to be dredged: 0 yd; N/A m

I. Number of new boat slips proposed: 0 wet slips; 0 dry slips

PART 5:

Project location (use additional sheets if needed):
County(ies) Osceola

Section(s) 11, 13, 14	Township 28 South	Range 32 East
Section(s) 17, 18	Township 28 South	Range 33 East
Section(s)	Township	Range

Land Grant name, if applicable: N/A

Tax Parcel Identification Number: N/A

Street AddressRoador other location:N/A

City, Zip Code, if applicable: N/A

PART 6: Describe in general terms the proposed project, system, or activity.

Construct a Class I landfill, access road, ancillary facilities, and stormwater management system. Approximately 53 acres of Class I landfill will be constructed during the first five-year construction period. An ultimate buildout of approximately 264 acres of landfill footprint is planned.

PART 7:

A. If there have been any pre-application meetings, including on-site meetings, with regulatory staff, please list the date(s), location(s), and names of key staff and project representatives.

Design Review Mtgs: Jim Bradner, Scott Wesson, George Cheryan, Saadia Qureshi, Richard Tedder, Lee Martin

01 Nov. 01, 18 Dec. 01, 12 Feb. 02, 27 Feb. 02, 08 Mar. 02

On-Site Mtgs: Jim Carr, John Poulton, Dave Adams

10 Jan. 02, 07 May 02, 08 Jay 02, 09 May 02

B. Please identify by number any MSSW/Wetland Resource/ERP/ACOE Permits pending, issued or denied for projects at the location, and any related enforcement actions.

Agency	Date	No.\Type of Application	Action Taken
ACOE	—	404	To be Submitted
—	—	—	—
—	—	—	—

C. Note: The following information is required for projects proposed to occur in, on or over wetlands that need a federal dredge and fill permit or an authorization to use state owned submerged lands. Please provide the names, addresses and zip codes of property owners whose property directly adjoins the project (excluding application) and/or (for proprietary authorizations) is located within a 500 ft. radius of the applicant's land. Please attach a plan view showing the owner's names and adjoining property lines. Attach additional sheets if necessary.

1.
E. Gannarelli
1401 Coaches Lane
St. Cloud,FL 34773
407-892-8539

2.
Bronson Ranch LTD
1415 W.Vine Street
Kissimmee, FL 34741
407-847-2847

3.
Clay Whaley
4550 N. Kenansville Road
St.Cloud, FL 34773
407-892-4512

4.
Dr. William Broussard
Forever Florida
4755 N. KanansvilleRoad
St. Cooud, FL 34773
407-956-9694

5.
Don Vanosdol
D&M Trucking & Timer
102 Sawmill Road
St. Coud, FL 34773
407-956-9015

6.
N/A

7.
N/A

8.
N/A

PART 8:

A. By signing this application form, I am applying, or I am applying on behalf of the applicant, for the permit and any proprietary authorizations identified above, according to the supporting data and other incidental information filed with this application. I am familiar with the information contained in this application and represent that such information is true, complete and accurate. I understand this is an application and not a permit, and that work prior to approval is a violation. I understand that this application and any permit issued or proprietary authorization issued pursuant thereto, does not relive me of any obligation for obtaining any other required federal, state, water management district or local permit prior to commencement of construction. I agree, or I agree on behalf of the applicant, to operate and maintain the permitted system unless the permitting agency authorizes transfer of the permit to a responsible operation entity. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S. and 18 U.S.C. Section 1001.

Kenneth W. Cargill, P.E.
Typed/Printed Name of Applicant (If no Agent is used) or Agent (If one is so authorized below)

Signature of Applicant/Agent — Date: 24 May 02

Principal
(Corporate Title if applicable)

AN AGENT MAY SIGN ABOVE ONLY IF THE APPLICANT COMPLETES THE FOLLOWING:

B. I hereby designate and authorize the agent listed above to act on my behalf, or on behalf of my corporation, as the agent in the processing of this application for the permit and/or proprietary authorization indicated above; and to furnish, on request, supplemental information in support of the application. In addition, I authorize the above-listed agent to bind me, or my corporation, to perform any requirements which may be necessary to procure the permit or authorization indicated above. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S. and 18 U.S.C. Section 1001.

Timothy J. Salopek | Signature of Applicant | 5/21/02
Typed/Printed Name of Applicant | Date

President
(Corporate Title if applicable)

Please note: The applicant's original signature (not a copy) is required above.

PERSON AUTHORIZING ACCESS TO THE PROPERTY MUST COMPLETE THE FOLLOWING:

C. I either own the property described in this application or I have legal authority to allow access to the property, and I consent, after receiving prior notification, to any site visit on the property by agents or personnel from the Department of Environmental Protection, the Water Management District and the U.S. Army Corps of Engineers necessary for the review and inspection of the proposed project specified in this application. I authorize these agents or personnel to enter the property as many times as may be necessary to make such review and inspection. Further, I agree to provide entry to the project site for such agents or personnel to monitor permitted work if a permit is granted.

Timothy J. Salopek | Signature of Applicant | 5/21/02
Typed/Printed Name of Applicant | Date

President
(Corporate Title if applicable)

SECTION C

NOTICE OF RECEIPT OF APPLICATION

SECTION C

Environmental Resource Permit Notice of Receipt of Application

Note: this form does not need to be submitted for noticed general permits.
This information is required in addition to that required in other sections of the application. Please submit five copies of this notice of receipt of application and all attachments with the other required information. Please submit all information on 8 1/2" x 11" paper.

Project Name	Oak Hammock Disposal Facility
County	Osceola County, Florida
Owner	Omni Waste of Osceola County, LLC*
Applicant:	Omni Waste of Osceola County, LLC
Applicant's Address:	100 Church Street, Kissimmee, Florida 34741

*Property under option for purchase.

1. Indicate the project boundaries on a USGS quadrangle map. Attach a location map showing the boundary of the proposed activity. The map should also contain a north arrow and a graphic scale; show Section(s), Township(s), and Range(s); and must be of sufficient detail to allow a person unfamiliar with the site to find it.

2. Provide the names of all wetlands, or other surface waters that would be dredged, filled, impounded, diverted, drained, or would receive discharge (either directly or indirectly), or would otherwise be impacted by the proposed activity, and specify if they are in an Outstanding Florida Water or Aquatic Preserve:

Approximately 14 acres of isolated, freshwater wetlands in the watershead of Bull Creek will be filled. Outstanding Florida waters or aquatic preserves are not associated with this project.

3. Attach a depiction (plan and section views), which clearly shows the works or other facilities proposed to be constructed. Use multiple sheets, if necessary. Use a scale sufficient to show the location and type of works.

4. Briefly describe the proposed project (such as "construct dock with boat shelter", "replace two existing culverts", "construct surface water management system to serve 150 acre residential development"):

Construct Class I landfill to serve Osceola County.

5. Specify the acreage of wetlands or other surface waters, if any, that are proposed to be filled, excavated, or otherwise disturbed or impacted by the proposed activity:

filled 14.28 ac.; 0 excavated ac.;

other impacts 0 ac.

6. Provide a brief statement describing any proposed mitigation for impacts to wetlands and other surface waters (attach additional sheets if necessary):

Proposed mitigation for filling of 14.28 acres of isolated wetlands includes conservation and management in perpetuity of a 1,089 acre parcel of land (988 acres of wetlands and 601 acres of uplands) and hydrologic enhancement of wetlands by a stream restoration project in the southern section of Bull Creek within the Oak Hammock Disposal property. In this area, Bull Creek has been transformed into a man-made, excavated channel, which has increased drainage and decresed the hydroperiod of adjacent wetlands. Historic hydrologic conditions will be restored to the maximum extent practical by constructing a series of check dams in the excavated channel.

FOR AGENCY USE ONLY

Application Name:
Application Number:
Office where the application can be inspected:

Note to Notice recipient: The information in this notice has been submitted by the applicant, and has not been verified by the agency. It may be incorrect, incomplete or may be subject to change.

SECTION E

INFORMATION REQUESTED FOR STANDARD GENERAL, INDIVIDUAL AND CONCEPTUAL ENVIRONMENTAL RESOURCE PERMIT APPLICATIONS NOT RELATED TO A SINGLE FAMILY DWELLING UNIT

TABLE OF CONTENTS

I. SITE INFORMATION

Item I (A)

Provide a map(s) of the project area and vicinity delineating USDA/SCS soil types.

The USDA/SCS soil type map is presented as Figure 4 of Appendix E3.

Item I (B)

Provide recent aerials, legible for photo interpretation with a scale of 1" = 400 ft, or more detailed, with project boundaries delineated on the aerial.

A recent aerial photograph including the project boundary is presented as Map E1 (I-III) in Appendix E1.

Item I (C)

Identify the seasonal high water or mean high tide elevation and normal pool or mean low tide elevation for each on-site wetland or surface water, including receiving waters into which runoff will be discharged. Include dates, datum, and methods used to determine these elevations.

The storm-water management system for the 435-acre portion of the site proposed for landfill development, which includes the landfill footprint and the dry and wet retention basins, has been designed to hold all runoff from a 100-year, 72-hour rainfall event. All storm water will be retained on the site. There will be no direct discharge from the areas to wetlands. The only exception to the no direct discharge condition is that the 435-acre portion of the site has been designed so that if two 25-year storm events occur within a 7-day period, the storm-water management system would overflow through four discharge points to Bull Creek and its associated wetland system.

The 37-acre area of the site proposed for construction of the access road will discharge to upland areas and to wetlands. Discharge from treatment areas parallel to the access road into wetlands will occur in five locations. The season high water (SHW) elevation at each of these locations is listed below and is also presented in the environmental report by BRA entitled *"Wetland Resource Impact and Mitigation Plan"* included as Appendix E3. The

wetland ID numbers are shown in Figure 6 of the BRA report. Normal pool elevations were not set for these wetlands because it is not intended to use the wetlands for treatment, and thus a treatment volume does not need to be calculated.

Wetland ID	Approximate Station	SHW elevation (feet NGVD)
13	123+00	77.2
19	97+00	73.9
19/22	85+00	73.7
22/23	66+00	73.0
33	30+00	70.8

Item I (D)

Identify the wet season high water tables at the locations representative of the entire project site. Include dates, datum, and methods used to determine these elevations.

A total of 27 piezometers (Figure E1) were installed around the landfill footprint to obtain water-level data and hydraulic characteristics of the uppermost aquifer system beneath the site. All piezometers were constructed of 2-in, Schedule 40 PVC with 5-ft long, number 10-slot well screens. Thirteen (13) of the piezometers were installed in the upper surficial aquifer (A-Zone piezometers) to depths of 15-ft (i.e., screened from 10-15 ft bls.); 11 piezometers were installed in the upper surficial aquifer (C-Zone piezometers) to depths of 55-ft (screened from 45-50 ft bls); and 3 piezometers were installed to depths of 72-78 ft bls in the "shell zone" beneath the first lower permeability layer encountered at the site.

All piezometers were surveyed in and each measuring point (MP) elevation was referenced to NGVD of 1929. A complete round of water-level measurements from all piezometers were collected on two occasions: 3 December 2001 and 9 February 2002. These water level measurements were used to construct potentiometric surface maps for the A-Zone, C-Zone and the "shell zone" as shown in Figures E2 through E7, respectively.

In order to obtain information on long-term water-level fluctuations beneath the site, one of the piezometers cluster locations (DP-7, DP-8, SZ-1) consisting of an A-Zone (DP-7) and a C-Zone (DP-8) surficial and a shell zone (SZ-1) piezometers were instrumented with pressure transducers. The transducers were installed on 3 December 2001 and they

have been recording water levels in this three-well cluster four times per day. On 8 February 2002, a "data dump" was performed and the transducer data was used to construct the hydrographs shown on Figure E8. Water levels in the 15-ft A-Zone (DP-7) and 50-ft C-Zone(DP-8) piezometers are very similar; they fluctuate in tandem in response very rapidly to precipitation events. The deeper "shell zone" piezometer also responds in a similar fashion, but with a longer lag time.

During the two month period between 3 December 2001 and 8 February 2002, water levels in the uppermost aquifer fluctuated from about 0.5-ft to 2.5-ft bls. Although the period of record at this point represents a portion of the classical dry season in Florida, water levels in the uppermost aquifer respond quickly to precipitation events and were noted to rise as much as 2 ft in just over a 24-hour period in mid-January 2002. The water levels receded about 1 foot during the following week, and another foot in the next two weeks. These measurements were used as a basis of estimating the wet season average ground-water table used for storm-water management calculations presented in Appendix E2.

II. ENVIRONMENTAL CONSIDERATIONS

Item II (A)

Provide results of any wildlife surveys that have been conducted on the site, and provide any comments pertaining to the project from the Florida Game and Fresh Water Fish Commission and the U.S. Fish and Wildlife Service.

A report entitled "*Conceptual Wildlife and Habitat Management Plan*" has been prepared by BRA and is presented in Appendix E4. The plan covers the landfill, borrow areas, haul road, and lands proposed for future conservation. Brief descriptions are given for ecological habitats and the results of wildlife surveys conducted at the site.

Item II (B)

Provide a description of how water quantity, quality, hydroperiod, and habitat will be maintained in on-site wetlands and other surface waters that will be preserved or will remain undisturbed.

Water quantity and hydroperiod of wetlands are largely groundwater controlled on this property and thus will remain largely unaffected. Water quality and wildlife habitat will be maintained in the undisturbed on-site wetlands by not discharging directly to the wetlands except for short sections of the access roadway where wetland encroachment is minimized. For the landfill, borrow areas, and storm-water management basins, an upland buffer around wetlands of at least the typical 15-foot minimum, 25-foot average setback has been provided. As an added measure, excavation of the borrow area/wet retention basin will provide storage capacity for the 100-year, 72-hour storm event, thus providing additional groundwater recharge not available from the predevelopment area.

As mitigation for wetland impacts, Omni will preserve, through a conservation easement, approximately 1,089 acres of the site and will restore a portion of Bull Creek where it transects the property through creek modifications. These wetlands were previously dewatered as a result of the excavation of a large ditch system through the network of wetlands. The ditch system is currently referred to as Bull Creek. Providing checkdams in strategic locations along the creek will mitigate the previous dewatering. The report, prepared by BRA and presented in Appendix E3, and the storm-water management system calculations, prepared by GeoSyntec and presented in Appendix E2, discuss the benefits to be derived from installing the checkdams.

Item II (C)

Provide a narrative description of any proposed mitigation plans, including purpose, maintenance, monitoring, and construction sequence and techniques, and estimated costs.

The *Wetland Resource Impact and Mitigation Plan* prepared by BRA and presented in Appendix E3 discusses mitigation plans. The principal features of the mitigation plan are the minimization of new impacts, restoration of wetlands associated with abandoned roadway, enhancement of the Bull Creek slough through hydroperiod increases, and the establishment of conservation areas on the property. Costs of restoration and Bull Creek enhancements are estimated at $23,750. Costs to establish the conservation area have not been estimated.

Item II (D)

Describe how boundaries of wetlands or other surface waters were determined. If there has ever been a jurisdictional declaratory statement, a formal wetland determination, a formal determination, a validated informal determination, or a revalidated jurisdictional determination, provide the identifying number.

Wetland boundaries have been flagged and surveyed in the proposed development area. Outside the proposed development area, wetland boundaries have been delineated through aerial photography interpretation. A request for a Jurisdictional Declaratory Statement (JDS) has been submitted to FDEP and a letter acknowledging that the submittal is complete has been issued. The project has been assigned the JDS file No. FD-49-0196971-4. The field review was conducted on 7 May through 9 May 2002.

The wetland boundaries at the site were originally field verified by Mr. Jim Carr of the Central District of the FDEP. However, a final survey was never submitted to Mr. Carr as it was subsequently decided to pursue a JDS for the project.

Item II (E)

Impact Summary Tables:

1. For all projects, complete Tables 1, 2 and 3 as applicable.

2. For docking facilities or other structures constructed over wetlands or other surface waters, provide the information requested in Table 4.

3. For shoreline stabilization projects, provide the information requested in Table 5.

Tables 1 and 2 are applicable to this project and are presented in the *Wetland Resource Impact and Mitigation Plan*, prepared by BRA and presented as Appendix E3. Tables 3, 4, and 5 are not applicable.

III. Plans

Item III

Provide clear, detailed plans for the system including specifications, plan (overhead) views, cross sections (with the locations of the cross sections shown on the corresponding plan view), and profile (longitudinal) views of the proposed project. The plans must be signed and sealed by an appropriate registered professional as required by law. Plans must include a scale and a north arrow. These plans should show the following:

Clear, detailed project plans, which are signed and sealed by a professional engineer registered in Florida, are presented in Appendix E1. Compliance of the plans with specific ERP requirements is demonstrated in the following items.

Item III (A)

Project area boundary and total land area, including distances and orientation from roads or other landmarks;

The requested information is shown on permit drawing Sheets 2 and 3 of 50 presented in Appendix E1.

Item III (B)

Existing land use and land cover (acreage and percentages), and on-site natural communities, including wetlands and other surface waters, aquatic communities, and uplands. Use the Florida Land Use Cover & Classification System (FLUCCS)(Level 3) for projects proposed in the South Florida Water Management District, the St. Johns River Water Management District, and the Suwannee River Water Management District and use the National Wetlands Inventory (NWI) for projects proposed in the Southwest Florida Water Management District. Also identify each community with a unique identification number, which must be consistent in all exhibits.

This information is shown in Figure E9 (Pre-Development Land Use) presented at the end of this section.

Item III (C)

The existing topography extending at least 100 feet off the project area, and including adjacent wetlands and other surface waters. All topography shall include the location and a description of known benchmarks, referenced to NGVD. For systems waterward of the mean high water (MHW) or seasonal high water lines, show water depths, referenced to mean low water (MLW) in tidal areas or seasonal low water in non-tidal areas, and list the range between MHW and MLW. For docking facilities, indicate the distance to, location of, and depths of the nearest navigational channel and access routes to the channel.

Existing topography referenced to NGVD is shown on permit drawing Sheet 4 of 50 presented in Appendix E1. There are no known benchmarks on the site. Other requested information is not applicable.

Item III (D)

If the project is in the known flood plain of a stream or other water course, identify the following: 1) the flood plain boundary and approximate flooding elevations; and 2) the 100-year flood elevation and floodplain boundary of any lake, stream or other watercourse located on or adjacent to the site;

Portions of the OHD facility are located in the known flood plain of Bull Creek. Flood plain boundaries are shown on permit drawing Sheet 4 of 50 presented in Appendix E1. There is no specific elevation associated with the floodplain boundary.

Item III (E)

The boundaries of wetlands and other surface waters within the project area. Distinguish those wetlands and other surface waters that have been delineated by any binding jurisdictional determination;

Boundaries of wetlands and surface waters are shown on permit drawing Sheet 4 of 50 presented in Appendix E1. A description of the wetland boundary delineation methods and binding jurisdictional determination status is discussed in the *Wetland Resource Impact and Mitigation Plan,* prepared by BRA and presented in Appendix E3.

Item III (F)

Proposed land use, land cover and natural communities (acreage and percentages), including wetlands and other surface waters, undisturbed uplands, aquatic communities, impervious surfaces, and water management areas. Use the same classification system and community identification number used in III (B) above.

The proposed land use cover is shown in Figure E10 (Post-Development Land Use) presented at the end of this section.

Item III (G)

Proposed impacts to wetlands and other surface waters, and any proposed connections/outfalls to other surface waters or wetlands;

Proposed impacts to wetlands are depicted on permit drawing Sheets 7, 8, 9, 25, 26, 43, 44, 45, and 46. Details of proposed outfalls are shown in permit drawing Sheets 39 and 50. All wetland impacts and the associated mitigation plan are discussed in the *Wetland Resource Impact and Mitigation Plan,* prepared by BRA and presented in Appendix E3. There will be no storm-water discharge to wetlands or surface water from the landfill area for the 100-year, 72-hour storm event. Discharge to wetlands and uplands from the access road is through a riser structure after treatment.

Item III (H)

Proposed buffer zones;

Setbacks of the landfill footprint are indicated on permit drawing Sheets 7, 8, 9, 13 and 39 of 50 presented in Appendix E1. The landfill limit (toe of final cover) is located a minimum of 130 ft from the property line and, on average, over 500 ft from the centerline of Bull Creek (surface water). The storm-water retention system berms for the landfill and wet retention basin are offset a minimum of 15 ft from any adjacent wetlands.

Item III (I)

Pre- and post-development drainage patterns and basin boundaries showing the direction of flows, including any off-site runoff being routed through or around the system; and connections between wetlands and other surface waters;

Pre-development drainage patterns are indicated on permit drawing Sheet 4 of 50 presented in Appendix E1. Post-development drainage patterns are indicated on permit drawing Sheets 36, 37, and 43 through 47 of 50 presented in Appendix E1. Basin boundaries are generally not discernable in the area of development. Available data indicate that except for a portion in the southwest corner of the property and a narrow strip near highway U.S. 441, the project site is in the Bull Creek Sub-Basin, which is a tributary to the Jane Creek Surface Water Basin.

Item III (J)

Location of all water management areas with details of size, side slopes, and designed water depths;

The proposed storm-water management system plan and details are shown on permit drawing Sheets 36 through 50 of 50 presented in Appendix E1. Expected water depth for the 100-year, 72-hour design flood is presented in the calculation package included as Appendix E2.

Item III (K)

Location and details of all water control structures, control elevations, any seasonal water level regulation schedules; and the location and description of benchmarks (minimum of one benchmark per structure);

The storm-water management system for the 435-acre landfill development area has been designed for total retention (i.e., no discharge) of the design storm (100-year, 72-hour storm). Since the system has been designed for total retention, there are no proposed control structures. Emergency overflows are indicated on permit drawing Sheets 36, 37, and 39, presented in Appendix E1.

The access road storm-water management system is designed for the 25-year, 72-hour storm event consists of dry detention basins. Locations and details of the perforated riser structures used to drain these basins are presented on permit drawing Sheets 43 through 50

of 50 presented in Appendix E1. Benchmarks will be established at the site during construction of Phase 1.

Item III (L)

Location, dimensions and elevations of all proposed structures, including docks, seawalls, utility lines, roads, and buildings;

The location, dimensions and elevations of the proposed structures are shown on permit drawing sheets presented in Appendix E1. Utility lines will be established either parallel to the access road or from properties to the north of the landfill at a later time. Temporary generator power and cellular telephones will be used at the site initially.

Item III (M)

Location, size, and design capacity of the internal water management facilities;

The location and size of the internal water management facilities are shown on permit drawing Sheets 36 through 50 of 50 presented in Appendix E1. The design capacities of the hydraulic structures are presented in the calculation package included in Appendix E2.

Item III (N)

Rights-of-way and easements for the system, including all on-site and off-site areas to be reserved for water management purposes, and rights-of-way and easements for the existing drainage system, if any;

There are no rights-of-way or easements for the storm-water management system proposed for this project.

Item III(O)

Receiving waters or surface water management systems into which runoff from the developed site will be discharged;

The storm-water management system for the landfill area has been designed for total retention (i.e., no discharge) of the design storm (100-year 72-hour storm). Runoff from the developed site will not be discharged off-site except under emergency situations (i.e. situations where the water levels on site exceed the design maximum level). Emergency spillways that would discharge to the east from retention basins on the east side of the landfill area and to the north (across the access road) from the wet retention basin are proposed for emergency situations. Emergency spillways are indicated on permit drawing Sheets 36, 37, and 39 of 50 presented in Appendix E1.

The dry detention basins of the access road discharge at the edge of wetlands and in upland areas as indicated on permit drawing Sheets 43 through 47 of 50 presented in Appendix E1.

Item III (P)

Location and details of the erosion, sediment and turbidity control measures to be implemented during each phase of construction and all permanent control measures to be implemented in post-development conditions;

Temporary erosion and sediment control measures required for construction will consist of sodded soil berms and/or silt fences to be constructed at the perimeter of the landfill and access road construction areas. These sodded berms and/or silt fences are shown on permit drawing Sheets 8, 9, 25, 26 and 43 through 47 of 50 presented in Appendix E1 for the landfill and access road areas. These measures are discussed in the Technical Specifications of the Class I landfill permit application.

Item III (Q)

Location, grading, design water levels, and planting details of all mitigation areas;

Wetlands to be restored are indicated on permit drawing Sheets 44 and 45 presented in Appendix E1. Mitigation for the proposed wetland impacts includes approximately 1,089 acres to be placed into a conservation easement as presented in the *Wetland Resource Impact and Mitigation Plan* prepared by BRA and included in Appendix E3. Of this total, approximately 488 acres will be wetlands and approximately 601 acres will be uplands. The existing wetlands along Bull Creek will be enhanced by selectively filling portions of the ditch system currently cut through the network of wetlands. The environmental

narrative report prepared by BRA presented in Appendix E3 provides a discussion of the mitigation plans.

Item III (R)

Site grading details, including perimeter site grading;

Site grading details are shown on permit drawings presented in Appendix E1.

Item III (S)

Disposal site for any excavated material, including temporary and permanent disposal sites;

Temporary stockpiles of excavated materials will be placed within the landfill area for use in future development of the landfill. Temporary stockpile areas are designated in permit drawing Sheets 25 and 26 of 50 presented in Appendix E1.

Item III (T)

Dewatering plan details;

There is no permanent dewatering planned for the site. Temporary dewatering required for construction of the leachate sumps at landfill cells, the leachate storage area, and access road culverts is expected to encompass very localized areas for not more than 2 days in each area. If borrow area dewatering is used, plans will be submitted with any water-use permit application, which may be required.

Item III (U)

For marina facilities, locations of any sewage pumpout facilities, fueling facilities, boat repair and maintenance facilities, and fish cleaning stations;

The project does not include marina facilities.

Item III (V)

Location and description of any nearby existing offsite features which might be affected by the proposed construction or development such as stormwater management ponds, buildings or other structures, wetlands or other surface waters.

The facilities proposed to be constructed as part of this project will not impact any off-site features. Modifications to Bull Creek are proposed, however the analyses presented in Section 8 of Appendix E2 indicates that the proposed modifications to Bull Creek do not impact surface waters or wetland of adjacent property upstream or downstream of the site.

Item III (W)

For phased projects, provide a master development plan.

The master development plan is illustrated in permit drawing Sheet 24 of 50 presented in Appendix E1. The staged development of Phase 1 is illustrated on Sheets 25 and 26 of 50 presented in Appendix E1.

IV. CONSTRUCTION SCHEDULE AND TECHNIQUES

Item IV

Provide a construction schedule, and a description of construction techniques, sequencing and equipment. This information should specifically include the following:

The proposed sequence for construction is presented in permit drawings 24, 25, and 26 of 50 presented in Appendix E1. Construction of both permanent and interim features of the surface-water management system is scheduled to be completed in the first 5 years. The current Class I permit application will be followed by subsequent 5-year applications until the landfill is completely built. The landfill final closure will be performed as landfill surfaces reach final elevations and should be completed in 31 years.

Standard construction techniques and earthmoving equipment will be used for the following landfill construction operations:

- clearing and grubbing;
- excavation and soil fill placement;
- grading and compaction;
- vegetative soil placement; and
- seeding and sodding.

Specialized construction techniques will include procedures for installation of geosynthetic materials in the landfill liner and final cover system.

Item IV (A)

Method for installing any pilings or seawalls slabs;

Pilings or seawall slabs are not proposed in this project.

Item IV (B)

Schedule of implementation of temporary or permanent erosion and turbidity control measures;

The schedule of implementation of temporary and permanent erosion control measures is indicated on permit drawing Sheets 25 and 26 of 50 presented in Appendix E1..

Item IV (C)

For projects that involve dredging or excavation in wetlands or other surface waters, describe the method of excavation, and the type of material to be excavated;

A minimal amount of construction of culverts in Bull Creek and other wetlands will be required. The following construction process will be employed:

- construction involving excavation will be planned for a period with a favorable weather forecast;
- silt fences will be installed between construction area and wetland area;
- a diversion ditch will be excavated adjacent to the culvert placement area to divert stream flow around the construction area, if required;
- a temporary soil coffer dam will be placed around the culvert construction area, if required;
- a temporary discharge area will be located in upland pasture at least 100 ft from any wetland and will be surrounded by hay bales to control sediment;
- a temporary sump will be excavated within the culvert construction area and a pump will be installed to dewater the area with discharge to the temporary discharge area;
- the culvert bedding will be placed, compacted, and graded;
- the culverts and a portion of embankment fill will be placed;
- the precast concrete headwalls will be placed;

- the sump and diversion ditch (if used) will be removed; and
- the embankment fill will be completed.

Item IV (D)

For projects that involve fill in wetlands or other surface waters, describe the source and type of fill material to be used. For shoreline stabilization projects that involve the installation of riprap, state how these materials are to be placed, (i.e., individually or with heavy equipment) and whether the rocks will be underlain with filter cloth;

Fill to be placed in wetlands for construction of storm-water management berms will consist of a mixture of stripped soil and, fine sand. Fill to be placed in wetlands for construction of landfill cells, perimeter berm, or roadway embankments will consist of fine-to-medium sand with silt. All fill will be clean, uncontaminated, native soil obtained from on-site borrow sources.

Item IV (E)

If dewatering is required, detail the dewatering proposal including the methods that are proposed to contain the discharge, methods of isolating dewatering areas, and indicate the period dewatering structures will be in place (Note: a consumptive use or water use permit may be required);

Temporary dewatering for roadway culvert construction is discussed in the response to item IV (C) above. Temporary dewatering for the construction of landfill sump and leachate storage areas is discussed in Section 5.11 of the calculation package presented in Appendix E2. Dewatering of the borrow area, if used, will be described in any water-use permit application, which may be required. Based on discussions with FDEP personnel, a water-use permit application will not be submitted until the need is evident.

Item IV (F)

Methods for transporting equipment and materials to and from the work site. If barges are required for access, provide the low water depths and draft of the fully loaded barge;

Equipment and materials will be transferred to and from the work site by truck using existing roads and eventually using improved roadways.

Item IV (G)

Demolition plan for any existing structures to be removed; and

There are no existing structures to be demolished for this project.

Item IV (H)

Identify the schedule and party responsible for completing monitoring, record drawings, and as-built certifications for the project when completed.

The owner is the party responsible for completing monitoring, record drawings and as-built certifications for the project when completed. The owner will contract with a qualified engineering firm to provide third-party construction quality assurance in accordance with the CQA Plan submitted with the Class I landfill permit application. For each phase of construction, monitoring will be carried out throughout the construction period, record drawings and as-built certifications for the project will be completed and submitted to FDEP for each major feature of construction.

V. DRAINAGE INFORMATION

Item V (A)

Provide pre-development and post-development drainage calculations, signed and sealed by an appropriate registered professional, as follows:

Pre-development and post-development drainage calculations signed and sealed by a professional engineer registered in Florida are provided in Appendix E2 and are described in the remainder of this item.

Item V (A)(1)

Runoff characteristics, including area, runoff curve number or runoff coefficient, and time of concentration for each drainage basin;

Runoff characteristics are evaluated in Section 4 and summarized in Tables 1, 2, and 3 of the calculation package presented in Appendix E2.

Item V (A)(2)

Water table elevations (normal and seasonal high) including aerial extent and magnitude of any proposed water table draw down;

Water table elevations are discussed in Section 2.4 of the calculation package presented in Appendix E2 and have been previously discussed in Item I (D).

Item V (A)(3)

Receiving water elevations (normal, wet season, design storm);

Receiving water elevations are not applicable for the landfill storm-water management systems because the system is designed for total retention (i.e., no discharge) of the design storm. The access road dry detention basins discharge to wetland areas and receiving water elevations for these wetland areas are discussed in the report entitled *"Wetland Resource Impact and Mitigation Plan"* prepared by BRA and presented in Appendix E3.

Item V (A)(4)

Design storms used including rainfall depth, duration, frequency, and distribution.

Design storms are presented in Section 2.3 of the calculation package presented in Appendix E2.

Item V (A)(5)

Runoff hydrograph(s) for each drainage basin, for all required design storm event(s);

Runoff hydrograph summary reports are provided in the attachments to the calculation package presented in Appendix E2. The organization of the attachments is explained in the calculation package text.

Item V (A)(6)

Stage-storage computations for any area such as a reservoir, close basin, detention area, or channel, used in storage routing;

Stage-storage computations are provided as appropriate and summarized in Tables 4 and 12 of the calculation package presented in Appendix E2.

Item V (A)(7)

Stage-discharge computations for any storage areas at a selected control point, such as control structure or natural restriction;

Stage-discharge computations were performed using the adICPR surface-water modeling software as a part of storm routing. The calculations and storm routing simulation are discussed in Sections 4, 5, and 7, and computer outputs are summarized in Attachments 5, 6, 7, 12, and 13, of the calculation package presented in Appendix E2.

Item V (A)(8)

Flood routings through on-site conveyance and storage areas;

Results of flood routings through on-site conveyance and storage areas are provided in the calculation package presented in Appendix E2.

Item V (A)(9)

Water surface profiles in the primary drainage system for each required design storm event(s);

Maximum water surface elevations for the landfill perimeter drainage system are summarized in Table 7 and calculation input and output details are provided in the attachments of Appendix E2.

Item V (A)(10)

Runoff peak rates and volumes discharged from the system for each required design storm event(s);

The peak runoff rates and volumes for the landfill and access areas were calculated using the adICPR computer program. Results are discussed in Sections 4, 5, and 7, and computer outputs are provided in Attachments 5, 6, 7, 12, and 13 of the calculation presented in Appendix E2.

Item V (A)(11)

Tail water history and justification (time and elevation); and

Tail water history and justification is not required since the storm-water management system serving the landfill is designed for total retention (i.e., no discharge) of the design storm. The storm-water management system serving the access road discharges to wetland and upland areas, but a tail water history is not required for the design since the seasonal high water level was considered.

Item V (A)(12)

Pump specifications and operating curves for range of possibilities operating conditions (if used in system).

There are no storm-water management system pumps proposed for the system.

Item V (B)

Provide the results of any percolation tests, where appropriate, and soil borings that are representative of the actual site conditions;

Hydraulic conductivity testing and soil borings are discussed in Section 2.6 of the calculation package presented in Appendix E2.

Item V (C)

Provide the acreage, and percentages of the total project, of the following:

1. *Impervious surfaces, excluding wetlands;*
2. *Pervious surfaces (green areas, not including wetlands);*
3. *Lakes, canals, retention areas, other open water areas; and*
4. *Wetlands.*

The requested acreages and percentages are provided below. These areas are relevant to storm-water management system design only.

Type of Area	Acreage (Acres)	Percentage of Total Area (Percent)
Total Site Area	2,179	100
Impervious surfaces	12	0.5
Pervious surfaces	1250	57.4
Open water	166	7.6
Wetlands	751	34.5

Item V (D)

Provide an engineering analysis of floodplain storage and conveyance (if applicable), including:

1. *Hydraulic calculations for all proposed traversing works;*

2. *Backwater water surface profiles showing upstream impact of traversing works;*

3. *Location and volume of encroachment within regulated floodplain(s); and*

4. *Plan for compensating floodplain storage, if necessary, and calculations required for determining minimum building and road flood elevations.*

Items 1 and 2 are addressed in Section 8 of the calculation package presented in Appendix E2. Items 3 and 4 are addressed in Sections 5.2, 5.3, 7.4, and 7.6.3 of the calculation package presented in Appendix E2.

Item V (E)

Provide an analysis of the water quality treatment system including:

1. A description of the proposed stormwater treatment methodology that addresses the type of treatment, pollution abatement volumes, and recovery analysis; and

2. Construction plans and calculations that address stage-storage and design elevations, which demonstrate compliance with the appropriate water quality treatment criteria.

A discussion of the storm water treatment methodology is discussed in Sections 5 and 7 of the calculation package presented in Appendix E2. Construction plans are presented in the permit drawing Sheets 8, 9, 25, and 26, presented in Appendix E1 and calculations demonstrating compliance are presented in Sections 5 and 7 of the calculation package presented in Appendix E2.

Item V (F)

Provide a description of the engineering methodology, assumptions and references for the parameters listed above, and a copy of all such computations, engineering plans, and specifications used to analyze the system. If a computer program is used for the analysis, provide the name of the program, a description of the program, input and output data, two diskette copies, if available, and justification for model selection.

The engineering methodology, assumptions, and references for the various parameters are provided in the calculation package presented in Appendix E2. The engineering plans and specifications are provided in Appendix E1. The computer programs adICPR and HEC RAS were used for analysis of the surface water management system. A description of these models, including a justification for their selection of this model, is provided in Sections 4 and 8 of the calculation package presented in Appendix E2. Input and output data on CD are included in Attachment 15 of Appendix E2.

VI. OPERATION AND MAINTENANCE AND LEGAL DOCUMENTATION

Item VI (A)

Describe the overall maintenance and operation schedule for the proposed system.

Operation and maintenance activities for the storm-water management systems for the landfill and roadways are described in the Operations Plan, an appendix to the Class I landfill permit application.

Item VI (B)

Identify the entity that will be responsible for operating and maintaining the system in perpetuity if different than the permittee a draft document enumerating the enforceable affirmative obligations on the entity to properly operate and maintain the system for its expected life, and documentation of the entity's financial responsibility for long-term maintenance. If the proposed operation and maintenance entity is not a property owner's association, provide proof of the existence of an entity, or the future acceptance of the system by an entity, which will operate and maintain the system. If a property owner's association is the proposed operation and maintenance entity, provide copies of the articles of incorporation for the association and copies of the declaration, restrictive covenants, deed restrictions, or other operational documents that assign responsibility for the operation and maintenance of the system. Provide information ensuring the continued adequate access to the system for maintenance purposes. Before transfer of the system to the operating entity will be approved, the permittee must document that the transferee will be bound by all terms and conditions of the permit.

The owner is responsible for maintenance and operation activities at the OHD facility. As a part of the landfill construction and operation permit, FDEP requires submission of operation and maintenance closure cost estimates and financial assurance that the activities will be continued through the post-closure care period. After the post-closure care period, routine maintenance of the storm-water management system will continue to be the responsibility of the owner.

Item VI (C)

Provide copies of all proposed conservation easements, storm-water management system easements, property owner's association documents, and plats for the property containing the proposed system.

The proposed conservation easement at the site is identified in the *Wetland Resource Impact and Mitigation Plan* prepared by BRA and presented in Appendix E3. No storm-water management system easements are proposed.

Item VI (D)

Provide indication of how water and wastewater service will be supplied. Letters of commitment from off-site suppliers must be included.

The owner intends to provide wastewater service through a septic system to be permitted by the county. Non-potable water for cleaning and incidental use will be supplied by a well to be permitted. Potable water will be supplied by one of several local vendors of bottled water.

Item VI (E)

Provide a copy of the boundary survey and/or legal description and acreage of the total land area of contiguous property owner/controlled by the applicant.

The boundary survey with legal description is presented in permit drawing Sheet 2 of 50 in Appendix E1.

VII. WATER USE

Item VII (A)

Will the surface water system be used for water supply, including landscape irrigation, or recreation.

Currently there are no plans to use the storm-water management system for water supply, landscape irrigation, or recreation. However, the storm-water system may be used for irrigation and dust control at some future phase of construction and the wet retention basin may be used for recreation after all borrow activities are complete. Application for appropriate permits or permit modifications will be made at the time the need for the use is identified.

Item VII (B)

If a Consumptive Use or Water Use permit has been issued for the project, state the permit number.

Application for a consumptive use or water use permit has not been made at this time. Application will be made in the future, if required.

Item VII (C)

If no Consumptive Use or Water Use permit has been issued for the project, indicate if such a permit will be required and when the application for a permit will be submitted.

Appropriate permits will be obtained prior to conducting the consumptive use or water use activity. The owner anticipates that an application for a water use permit for dewatering in the borrow areas may be required during future operation of the borrow areas.

Item VII (D)

Indicate how any existing wells located within the project site will be utilized or abandoned.

There are no existing water supply wells within the project site.

July 16, 1999

Osceola County Board of County Commissioners
17 S. Vernon Avenue
Kissimmee, Florida 34741

Gentlemen:

This letter will authorize R. Stephen Miles, Jr. and the law firm of Overstreet, Miles, Ritch & Cumbie, P.A., to apply for CU/SDP approval by Osceola County, Florida for the construction of a landfill and related appurtenances by Omni Waste LLC upon lands owned by Bronsons, a Florida General Partnership, in Sections 13 and 14, Township 28 South, Range 32 East, and Section 18, Township 28 South, Range 33 East, Osceola County, Florida.

Sincerely,

Bronsons, a Florida General Partnership

By: _____
Dan Lackey – General Manager

IRLO "BUD" BRONSON, JR.
MANAGING PARTNER

COMMERCIAL CATTLE AND CITRUS
1415 West Vine St. • P.O. Box 420879 • Kissimmee, Florida 34742-0879 • Phone (407) 847-2847 • Fax (407) 847-6074

MAY 13, 1999

TO WHOM IT MAY CONCERN:

WITH THIS LETTER, I HEREBY AUTHORIZE OMNI WASTE LLC TO PROCEED WITH PLANS TO APPLY FOR ANY AND ALL PERMITS AT THEIR EXPENSE NECESSARY TO OPERATE A LAND FILL ON MY PROPERTY.

EVADNE J. GANNARELLI
159 RED GAP ROAD
PERKINSTON, MS 39573

OMNI WASTE LLC
P. O. BOX 2116
DAYTON, OHIO 45401

GEOSYNTEC CONSULTANTS

14055 Riveredge Drive, Suite 300
Tampa, Florida 33637 • USA
Telephone (813) 558-0990 • Fax (813) 558-9726

22 May 2002

Honorable Paul Owen, Chairman
Osceola County Board of County Commissioners
1 Courthouse Square, Suite 5700
Kissimmee, Florida 34741

Certified Mail No. 7002 0510 0003 0581 6022

Dear Chairman Owen:

On behalf of Omni Waste of Osceola County, LLC, I am sending you this letter to formally notify you that Omni has filed an application with the Florida Department of Environmental Protection (FDEP) for a permit to construct and operate a new "Class I" landfill (i.e., a landfill that will receive typical household garbage and similar materials). The landfill will be located in unincorporated Osceola County, approximately five miles south of Holopaw, on the west side of U.S. 441.

To comply with the requirements of Section 62-701.320(8), F.A.C., this notice is being provided to you, State Senator Howard E. Futch and State Representative Frank Attkisson. In addition, the attached notice will be published in the Orlando Sentinel.

This firm has been hired to design the landfill and provide other engineering services for Omni. Please call me at 813-558-0990 if you have any questions about this project.

Sincerely,

Kenneth W. Cargill, P.E.
Principal

KWC:vds
Attachment: Notice of Application

cc: Mr. Lenny Marion, Osceola County
Mr. Ray Tobey, City of St. Cloud
Mr. Timothy J. Salopek, Omni Waste
Mr. James Bradner, P.E., FDEP

GEOSYNTEC CONSULTANTS

14055 Riveredge Drive, Suite 300
Tampa, Florida 33637 • USA
Telephone (813) 558-0990 • Fax (813) 558-9726

22 May 2002

Honorable Frank Attkisson
State Representative
District 79
323 Pleasant Street
Kissimmee, Florida 34741-5763

Certified Mail No. 7002 0510 0003 0581 6039

Dear Representative Attkisson:

On behalf of Omni Waste of Osceola County, LLC, I am sending you this letter to formally notify you that Omni has filed an application with the Florida Department of Environmental Protection (FDEP) for a permit to construct and operate a new "Class I" landfill (i.e., a landfill that will receive typical household garbage and similar materials). The landfill will be located in unincorporated Osceola County, approximately five miles south of Holopaw, on the west side of U.S. 441.

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Sincerely,

Kenneth W. Cargill, P.E.
Principal

KWC:vds
Attachment: Notice of Application

cc: Mr. Lenny Marion, Osceola County
Mr. Ray Tobey, City of St. Cloud
Mr. Timothy J. Salopek, Omni Waste
Mr. James Bradner, P.E., FDEP

GEOSYNTEC CONSULTANTS

14055 Riveredge Drive, Suite 300
Tampa, Florida 33637 • USA
Telephone (813) 558-0990 • Fax (813) 558-9726

22 May 2002

Honorable Howard E. Futch
State Senator
District 18
134 Fifth Avenue, Suite 103
Indialantic, Florida 32903

Certified Mail No. 7002 0510 0003 0581 6046

Dear Senator Futch:

On behalf of Omni Waste of Osceola County, LLC, I am sending you this letter to formally notify you that Omni has filed an application with the Florida Department of Environmental Protection (FDEP) for a permit to construct and operate a new "Class I" landfill (i.e., a landfill that will receive typical household garbage and similar materials). The landfill will be located in unincorporated Osceola County, approximately five miles south of Holopaw, on the west side of U.S. 441.

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Mr. Ray Tobey, City of St. Cloud
Mr. Timothy J. Salopek, Omni Waste
Mr. James Bradner, P.E., FDEP

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WEDNESDAY

MAY 22, 2002

Osceola

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WEDNESDAY, MAY 22, 2002
SECTION H

STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL PROTECTION
NOTICE OF APPLICATION

The Department of Environmental Protection announces receipt of an application for permit from Omni Waste of Osceola County, LLC to construct and operate a Class I landfill to be known as **Oak Hammock Disposal**. This project is located approximately five miles south of Holopaw, Osceola County, Florida on the west side of highway U.S. 441.

This application is being processed and is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays at the Department of Environmental Protection, 3319 Maguire Boulevard, Suite 232, Orlando, Florida 32803-3767, telephone (407) 893-3328. Any comments or objections should be filed in writing with the Department at this address. Comments or objections should be submitted as soon as possible to ensure that there is adequate time for them to be considered in the Department decision on the application.

OSCL4474868 May 22, 2002