

# CONSTRUCTION PERMIT APPLICATION

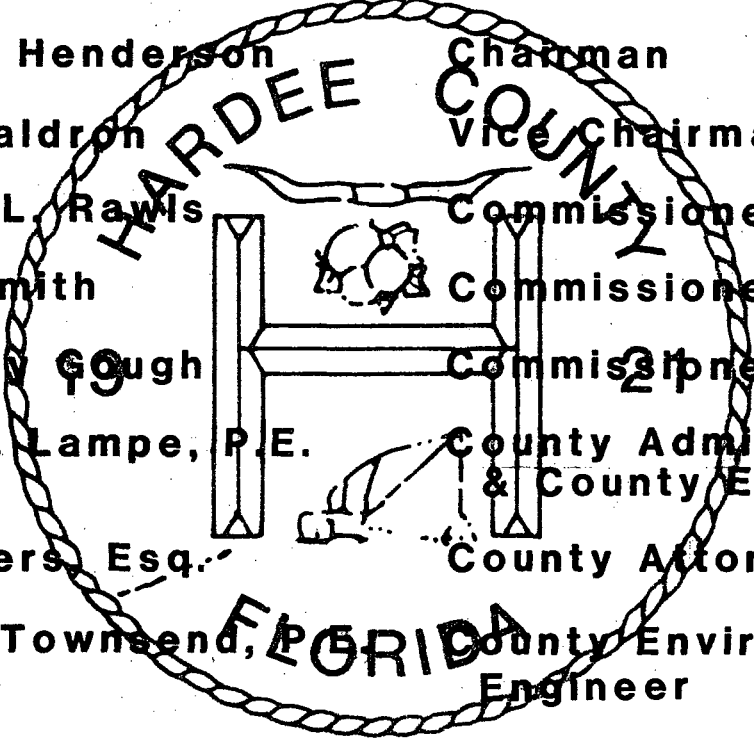
## FOR THE

### REGIONAL SANITARY LANDFILL

Prepared for

## HARDEE COUNTY

### BOARD OF COUNTY COMMISSIONERS



The seal of Hardee County, Florida, is a circular emblem with a rope-like border. Inside the circle, the words "HARDEE COUNTY" are arched across the top, and "FLORIDA" is arched across the bottom. The center of the seal features a shield with a palm tree and a sun. The names and titles of the county officials are listed on either side of the seal.

Maurice Henderson	Chairman
Luke Waldron	Vice Chairman
Samuel L. Rawls	Commissioner
Ralph Smith	Commissioner
John Roy Gough	Commissioner
Harry E. Lampe, P.E.	County Administrator & County Engineer
Joel Evers, Esq.	County Attorney
Gordon Townsend, P.E.	County Environmental Engineer

Prepared by

**EVI**

**ENVISORS, INC.**

Consulting Civil & Environmental Engineers, Economists & Planners  
Tampa, Margate, & Winter Haven, Florida

**MAY 1982**

# HARDEE COUNTY

## BOARD OF COUNTY COMMISSIONERS

Rm. A-204, Courthouse Annex  
412 West Orange Street  
Wauchula, Florida 33873

Commissioners' Office (813) 773-6952  
Bookkeeping & Payroll (813) 773-6932

County Attorney, Joel Evers  
Environmental Attorney, Judith S. Kavanaugh



## COMMISSIONERS

Samuel L. Rawls  
Ralph Smith  
John Roy Gough  
Luke Waldron  
Maurice Henderson

District I  
District II  
District III  
District IV  
District V

County Administrator, Harry E. Lampe  
Clerk, Coleman W. Best

May 13, 1982

5025-56095

40612

4025C30001

Mr. William K. Hennessey  
District Manager  
Florida Department of Environmental  
Regulation  
Southwest District  
7601 Highway 301 North  
Tampa, Florida 33610

Re: Construction Permit - Hardee County  
Regional Sanitary Landfill

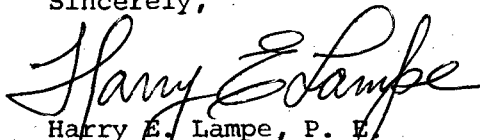
Dear Mr. Hennessey:

Transmitted herewith are four (4) copies of an Application for Construction Permit with supporting documentation for establishing a new Regional Sanitary Landfill to serve all of the residents of Hardee County. The proposed landfill is located approximately one mile north of S. R. 64A on Kings Road and will replace the existing landfill upon completion.

Your expeditious review and consideration of our permit request is sincerely appreciated.

Please contact this office if additional information is desired.

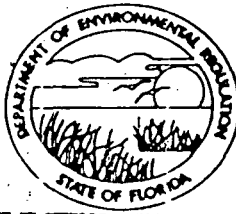
Sincerely,

  
Harry E. Lampe, P. E.  
County Administrator

HEL/vt

Attachments

State of Florida  
DEPARTMENT OF ENVIRONMENTAL REGULATION



PAID MAY 26 1982  
SO 25-56095

APPLICATION FOR PERMIT TO CONSTRUCT ☐  
OPERATE ☐  
A SOLID WASTE RESOURCE RECOVERY AND MANAGEMENT FACILITY

GENERAL REQUIREMENTS

Resource Recovery and Management Facilities must be permitted pursuant to Section 403.707, Florida Statutes. Separate applications for each permit, four copies each, should be submitted to the District office of the Department of Environmental Regulation. Complete appropriate sections of the application for the type of facility proposed.

Each application shall be accompanied by an application (check) fee of \$20.00 payable to "State of Florida, Department of Environmental Regulation."

Applicant has the responsibility to provide copies of the application to appropriate city, county and/or regional pollution control agencies, established pursuant to Section 403.182, Florida Statutes. Applicant shall also clear the application through appropriate local planning agencies. Comments from any of these agencies shall be forwarded with the application to the Department.

Information contained in the application shall conform to requirements of Chapter 17-7, Florida Administrative Code. All entries should be typed or printed in ink. If additional space is needed, separate, properly identified sheets of paper may be attached. All blanks shall be filled or marked as not applicable.

Applicant Name (operating authority): Board of County Commissioners, Hardee County, Florida

Street Address: 413 West Orange Street  
Wauchula, Florida 33873

Authorized Agent: Maurice Henderson, Chairman, Board of County Commissioners

Mailing Address (if different from above): SAME

City \_\_\_\_\_ County \_\_\_\_\_ Zip \_\_\_\_\_  
Telephone Number: (813) 773-3236

Facility Location: Kings Road Approximately 1 Mile North of S.R. 64A  
(Name of Access Road and Crossroad)

S 35 section, T 33S township, R 25E range / Latitude 81 ° 47 ' 1 " Longitude 27 ° 34 ' 10 "

Towns and Areas to be Served: Facility to serve entire County, including the municipalities of  
Bowling Green, Wauchula, and Zolfo Springs.

Population to be Served: 16,240 (1982)

Acres within Waste Site Boundary: 53.5

Acres within Property Boundary: 97.5

Volume of Solid Waste to be received: 47 (1982) to 73 (2000) ~~tons/day~~ ~~gallons~~

Date Site Ready to Receive Solid Waste: August 1982

Landowner (if different than applicant): Mobil Chemical Company

Address of Landowner: Phosphate Division, P.O. Box 311, Nichols, Florida 33863

Facility Type:

Sanitary Landfill:

- ☒ Class I, more than 50 cy or 20 tons waste/day
- ☐ Class II, less than 50 cy or 20 tons waste/day
- ☐ Class III:
  - ☐ trash/yard trash
  - ☐ yard trash composting
- ☐ Landspreading
  - ☐ Grade III
  - ☐ Grade IV
- ☐ Other Facility not shown \_\_\_\_\_

Volume Reduction:

- ☐ Composting
- ☐ Transfer Station
- ☐ Shredder
- ☐ Incinerator
- ☐ Resource Recovery:
  - ☐ Energy
  - ☐ Materials

REQUIRED ATTACHMENTS FOR  
RESOURCE RECOVERY AND MANAGEMENT FACILITY PERMITS

Construction Permits:

- A. Class I and Class II Landfills; Submit items 1 (if appropriate), 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11.
- B. Class III Landfills; 1 (if appropriate), 3, 4, 5, 7, 8 (a, b, c, h, j, k), 9, and 11.
- C. Volume Reduction; 4, 5, 6 (a, e), 7 (a, d, e, g, h, j), 8 (a, b, c, g, h, j, k), 9, and 12.

Operation Permits:

NOTE: For facilities that have been satisfactorily constructed, in accordance with their construction permit, the information in A, B, and C, above does not have to be resubmitted for an operation permit if the information has not changed during the construction period.

- D. Class I and II Landfills; all of the items in A above, plus item 13.
- E. Class III Landfills; all items in B above plus item 13.
- F. Volume Reduction; all items in C above plus item 13.

ATTACHMENT ITEMS

- 1. Bonds (17-7.03(1), Florida Administrative Code) and/or other assurances.
  - a. Copy of bond, or
  - b. Copy of waiver of bond requirement.

NOTE: This requirement only applies to privately owned and operated disposal sites. It does not apply to sites operated by counties, municipalities, other governmental agencies, or persons operating a county or municipally owned facility under contract.

- c. Agreement between landowner and applicant, if not the same. Identify and explain the terms of lease or contract; duration, and who will be responsible for site closure and continued monitoring until released by the department.

- 2. Soil Survey (17-7.05(2)(a), Florida Administrative Code)

NOTE: This information is not required if the information is included in the hydrogeological report in item #3.

- a. Degree of limitation of soil
- b. Soil series
- c. Soil drainage class
- d. Permeability

- e. Slope
- f. Soil texture
- g. Depth to bedrock

3. Hydrogeological Survey (17-7.05(2)(b), Florida Administrative Code)

NOTE: For Class II and Class III landfills these requirements may be satisfied by providing the best available information from Water Management Districts, the U.S. Geological Survey, the Florida Bureau of Geology, or other acceptable sources. For Class I site this information shall be obtained from on-site soil borings.

- a. Thickness and character of overburden (soil)
- b. Character of bedrock
- c. Depth of water table and potentiometric surfaces
- d. Depth to shallow ground water aquifer and artesian aquifer
- e. Local and regional ground water flow systems indicating direction of ground water flow
- f. Frequency and extent of flooding of the area (17-7.04(3)(a), Florida Administrative Code)

4. Evidence that the Facility is in conformance with local zoning (17-7.05(2)(c)4., Florida Administrative Code)

5. Map or Aerial Photograph taken within one year of permit application (17-7.05(3)(a), Florida Administrative Code), showing land use and zoning within ¼ mile of the proposed facility, using the Florida Land Use Cover and Forms Classification System (available from the Department). Map shall be of sufficient scale to show all homes, industrial buildings, wells, water courses, dry runs, rock out-croppings, roads and other significant details.

6. Plot Plan (17-7.05(3)(b), Florida Administrative Code)

NOTE: The plot plan should be drawn on a scale not greater than 200 feet to the inch showing the following:

- a. Dimensions and legal description of the site
- b. Location and depth corrected to MSL of soil borings
- c. Proposed trenching plan
- d. Cover stock piles
- e. Fencing or other measures to restrict access
- f. Cross sections showing both original and proposed fill elevations
- g. Location, depth corrected to MSL and construction details of monitoring wells

7. Design Drawings and Maps (17-7.05(3)(c), Florida Administrative Code)

NOTE: The design drawings and maps, which may be combined with the plot plan (item #6), should be drawn on a scale not greater than 200 feet to the inch showing the following:

- a. Topographic map with five foot contour intervals
- b. Proposed fill area
- c. Borrow area
- d. Access roads
- e. Grades required for proper drainage
- f. Typical cross sections of disposal site including lifts, borrow areas and drainage controls
- g. Special drainage devices

- h. Fencing
  - i. Equipment facilities
  - j. Other pertinent information based on intended use of facility
8. Report (17-7.05(3)(d), Florida Administrative Code)
- a. Estimated population and area served by the proposed site with basis for the estimate.
  - b. Anticipated type, annual quantity, and source of solid waste with rationale for estimate, expressed in tons or cubic yards of compacted material. Specify the type and amounts of solid wastes to be received from industrial and commercial sources.
  - c. Anticipated life of site
  - d. Geological formations and ground water elevations corrected to MSL to a depth of at least ten feet below proposed excavations and lowest elevation of the site. Such data shall be obtained by soil borings or other appropriate means. **This information is not required for Class III sites.** This information may be submitted in the hydrogeological survey (Item #3).
  - e. Soil map, interpretive guide sheets, and a report giving the suitability of the site for such an operation. This information may be submitted in the soil survey (Item #2).
  - f. Source and characteristics of cover material
  - g. Contingency plan, including waste handling and disposal methods, in case of an emergency such as equipment failure, natural disaster or fire.
  - h. Persons responsible for actual operation and maintenance of the site and intended operating procedures.
  - i. A plan for gas control if gas generation from the site is expected.
  - j. Operational plans to direct and control the use of the site.
  - k. Plans for controlling the type of waste received at the site; plans shall specify inspection procedures to be followed if prohibited types of waste are discovered.
9. Water Quality Standards (17-7.05(3)(e), 17-7.05(4)(f), and 17-7.05(4)(g), Florida Administrative Code)
- Indicate by discussion or drawings or both how the site is designed to meet water quality standards of 17-3 and 17-4, Florida Administrative Code, at the waste site boundary.
10. Background Water Quality (17-7.05(4)(a)3, Florida Administrative Code) — Ground water and any on-site water shall be tested for the following parameters:
- a. Conductivity
  - b. Nitrates
  - c. Iron
  - d. Chemical Oxygen Demand
  - e. Others as determined necessary
11. Solid Waste Disposal Facility Data Form.
12. Solid Waste Volume Reduction and Resource Recovery Facility Data Form.
13. Certification of Construction Completion

**STATEMENTS BY APPLICANT AND ENGINEER OR PUBLIC OFFICER**

**A. Applicant**

The undersigned owner or authorized representative of The Board of County Commissioners, Hardee County,  
Florida  
 is aware that statements made in this form and attached exhibits are an application for a Sanitary Landfill

Construction Permit from the Florida Department of Environmental Regulation and certifies that the information in this application is true, correct and complete to the best of his 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 establishment.

Maurice Henderson  
 Signature of Owner or Agent

Maurice Henderson, Chairman  
 Name and Title

Date: \_\_\_\_\_

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

**B. Professional Engineer Registered in Florida or Public Officer as Required in Chapter 403.707 and 403.707(5), Florida Statutes**

This is to certify that the engineering features of this resource recovery and management facility have been designed/examined by me and found to conform to engineering principals applicable to such facilities. In my professional judgement, 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 for proper maintenance and operation of the facility.

[Signature]  
 Signature

Dale D. Ernsberger, Project Manager  
 Name and Title (Please Type)

13768  
 Florida Registration No.

(please affix seal)

Envisors, Inc., P.O. Box 9309  
 Mailing Address

Winter Haven, Florida 33880  
 City, State, Zip Code

813-324-1112  
 Telephone No.

Date: May 13, 1982

Construction Cost Estimate: \_\_\_\_\_

Permit Number: \_\_\_\_\_ Issue Date: \_\_\_\_\_

Review Date: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

ATTACHMENT ITEMS

Item  
No.

1. "Bonds (17-7.03(1), Florida Administrative Code) and/or other assurances.
  - a. Copy of bond, or
  - b. Copy of waiver of bond requirement.
  - c. Agreement between landowner and applicant, if not the same. Identify and explain the terms of lease or contract; duration, and who will be responsible for site closure and continued monitoring until released by the department."

Response No. 1:

- a. Not Applicable.
  - b. Not Applicable.
  - c. Agreement between Landowners and Applicant. Attachment 1 is a copy of the executed lease between the Mobil Chemical Corporation and Hardee County for the proposed 97.5 acre site.
2. "Soil Survey (17-7.05(2)(a), Florida Administrative Code)
    - a. Degree of limitation of soil
    - b. Soil series
    - c. Soil drainage Class
    - d. Permeability
    - e. Slope
    - f. Soil texture
    - g. Depth to bedrock"

Response No. 2:

- a. Attachment 2 is a report entitled "Feasibility Study on Use of the Mobil Site as a Class I Sanitary Landfill" prepared by Envisors, Inc. and dated February 1982. A copy of this report was submitted to the FDER on 12 March 1982.

The section entitled "Surface Soils" on page IV-2 of the report presents the requested information.



ATTACHMENT ITEMS - (Continued)

Item  
No.

- b. Table IV-2 and Figure IV-4 of Attachment 2 present the requested information.
  - c. The section entitled "Surface Soils" on page IV-2 of Attachment 2 presents the requested information.
  - d. The section entitled "Soil Permeability" on Page IV-4 of Attachment 2 presents the requested information.
  - e. The section entitled "Surface Soils" on page IV-2 of Attachment 2 presents the requested information.
  - f. The section entitled "Surface Soils" on page IV-2 of Attachment 2 presents the requested information.
  - g. Figure IV-5 of Attachment 2 presents the requested information.
3. "Hydrogeological Survey (17-7.05(2)(b), Florida Administrative Code)
- a. Thickness and character of overburden (soil)
  - b. Character of bedrock
  - c. Depth of water table and potentiometric surfaces
  - d. Depth to shallow ground water aquifer and artesian aquifer
  - e. Local and regional ground water flow systems indicating direction of ground water flow
  - f. Frequency and extent of flooding of the area (17-7.04(3)(a), Florida Administrative Code)"

Response No. 3:

- a. The section entitled "Lithology-Stratigraphy" on page IV-3 of Attachment 2 presents the requested information.
- b. The section entitled "Lithology-Stratigraphy" on page IV-3 of Attachment 2 presents the requested information.
- c. The section entitled "Surface Drainage and Shallow Groundwater Aquifer" on page IV-3 of Attachment 2 present the requested information.
- d. The section entitled "Surface Drainage and Shallow Groundwater Aquifer" on page IV-3, and the section entitled "Potentiometric Surface" on page IV-5 of Attachment 2 present the requested information.

ATTACHMENT ITEMS - (Continued)

Item  
No.

- e. The section entitled "Surface Drainage and Shallow Groundwater Aquifer" on page IV-3 of Attachment 2 presents the requested information.
  - f. Attachment 3 shows the site located on the Federal Flood Hazard Zone map. As shown, the site is not subject to flooding in a 100-year storm.
4. "Evidence that the Facility is in conformance with local zoning (17-7.05(2)(c)4., Florida Administrative Code)"

Response No. 4:

Attachment 4 is a statement from the Hardee County Zoning Administrator that the proposed landfill site is properly zoned for the intended use.

5. "Map or Aerial Photograph taken within one year of permit application (17-7.05(3)(a), Florida Administrative Code), showing land use and zoning within 1/4 mile of the proposed facility, using the Florida Land Use Cover and Forms Classification System (available from the Department). Map shall be of sufficient scale to show all homes, industrial buildings, wells, water courses, dry runs, rock out-croppings, roads and oather significant details."

Response No. 5:

Attachment 5 is an aerial photograph taken in April 1982 presenting the requested information.

6. "Plot Plan (17-7.05(3)(b), Florida Administrative Code)
- a. Dimensions and legal description of the site
  - b. Location and depth corrected to MSL of soil borings
  - c. Proposed trenching plan
  - d. Cover stock piles
  - e. Fencing or other measures to restrict access
  - f. Cross sections showing both original and proposed fill elevations
  - g. Location, depth corrected to MSL and construction details of monitoring wells"

Response No. 6:

This information included in the Response to Item 7.

ATTACHMENT ITEMS - (Continued)

Item  
No.

7. "Design Drawings and Maps (17-7.05(3)(c), Florida Administrative Code)
  - a. Topographic map with five foot contour intervals
  - b. Proposed fill area
  - c. Borrow area
  - d. Access roads
  - e. Grades required for proper drainage
  - f. Typical cross sections of disposal site including lifts, borrow areas and drainage controls
  - g. Special drainage devices
  - h. Fencing
  - i. Equipment facilities
  - j. Other pertinent information based on intended use of facility"

Response No. 7:

Attachment 6 is a set of design drawings of the proposed facility, including:

- a. Dimensions and legal description of the site;
- b. Location and depth corrected to msl of soil borings;
- c. Proposed trenching plan;
- d. Cover stock piles;
- e. Fencing to restrict access;
- f. Cross-sections showing both original and fill elevations;
- g. Location, depth, and construction details of monitoring wells;
- h. Site contours at one-foot intervals;
- i. Proposed fill area;
- j. Borrow areas;
- k. Access roads;
- l. Grades required for drainage;
- m. Typical cross-sections;
- n. Special drainage devices;
- o. Fencing details; and
- p. Equipment storage and maintenance facilities.

ATTACHMENT ITEMS - (Continued)

Item  
No.

8. "Report (17-7.05(3)(d), Florida Administrative Code)

- a. Estimated population and area served by the proposed site with basis for the estimate.
- b. Anticipated type, annual quantity, and source of solid waste with rationale for estimate, expressed in tons or cubic yards of compacted material. Specify the type and amounts of solid wastes to be received from industrial and commercial sources.
- c. Anticipated life of the site
- d. Geological formations and ground water elevations corrected to MSL to a depth of at least ten feet below proposed excavations and lowest elevations of the site. Such data shall be obtained by soil borings or other appropriate means. **This information is not required for Class III sites.** This information may be submitted in the hydrogeological survey (Item #3).
- e. Soil map, interpretive guide sheets, and a report giving the suitability of the site for such an operation. This information may be submitted in the soil survey (Item #2).
- f. Source and characteristics of cover material
- g. Contingency plan, including waste handling and disposal methods, in case of an emergency such as equipment failure, natural disaster or fire.
- h. Persons responsible for actual operation and maintenance of the site and intended operating procedures.
- i. A plan for gas control if gas generation from the site is expected.
- j. Operational plans to direct and control the use of the site.
- k. Plans for controlling the type of waste received at the site; plans shall specify inspection procedures to be followed if prohibited types of waste are discovered."

Response No. 8:

- a. The information is presented as on page III-1 of Attachment 2 in the section entitled "Projected Future Population Values".
- b. The existing landfill at Wauchula has been operated on an occasional basis with no records kept of type, quantity, or source of solid waste.

ATTACHMENT ITEMS - (Continued)

Item  
No.

The landfill is anticipated to serve residential and commercial customers in the unincorporated areas of the County and the municipalities of Bowling Green, Wauchula, and Zolfo Springs.

Chapter III of Attachment 2 presents the best projections available of solid waste parameters.

- c. The anticipated life of the site is 20 years.
- d. This information was provided in Item 3.
- e. This information was provided in Item 2.
- f. Cover material will consist primarily of sand and clayey sand excavated from the cells. Clays mined from the bottom of the cells will be mixed with the material used for final cover in order to render it more impermeable. Clay can easily be mined on the south portion of the site where it is within five to six feet of the ground surface. The characteristics of the on-site soils were set forth in Item 2.
- g. A D-6 size bulldozer will be the primary machine in hauling, compacting, and covering the solid waste. The landfill will also have a three cubic yard front end loader (weight - 30,000 pounds) which can handle the relatively small amount of solid waste coming into the landfill (50 tons/day) until the primary machine is back in operation. The purchase agreement for the equipment provides that the vendor will supply an equivalent machine if downtime exceeds 72 hours.

In case of natural disaster, trees and demolished structures will be burned on vacant portions of the site under controlled conditions, with proper permits, and the reduced material buried in the landfill.

Fire in the landfill cells will be controlled by isolating the burning material with the bulldozer and smothering the combustible material with earth. Water will also be available from the on-site water mains for direct application to the fire. The Wauchula Fire Department will render assistance in the event the landfill operating personnel cannot bring the fire under control.

- h. The landfill operation will be the responsibility of the Hardee County Public Works Department. George Taylor, Operations Manager, will be directly responsible for managing the landfill and supervising the landfill personnel. The landfill will have one full-time gate attendant and two heavy equipment operators.

ATTACHMENT ITEMS - (Continued)

Item  
No.

The landfill attendant will be responsible for directing vehicles to the dumping area and for inspecting vehicles to be sure that they are not carrying prohibited items.

The heavy equipment operators will be responsible for moving, compacting, and covering the solid waste and for excavation of the cells.

- i. Gas generation is not anticipated to be a problem due to semi-pervious cover material and the impermeable barrier wall around the cell area. If the gas question becomes a problem, it can easily be vented by installing vents.
- j. Groundwater Control - Groundwater will be controlled by first constructing an impervious barrier around three sides of the site utilizing a 30 mil PVC membrane or a bentonite slurry wall keyed into the clay base underlying the site. A dewatering trench will be excavated in the location of a future cell and a semi-permanent pumping facility will be installed. Water will be pumped from the trench over the impermeable barrier and into the stormwater drainage system of ditches and detention ponds. The dewatering operation will be moved as shown to remain well ahead of cell construction.

7 Cell Construction - Cells will be excavated to the depths and slopes shown. The bottom will be excavated into the clay layer with a six-inch layer of clay pushed up the sides of the cell to a height of five feet above the clay layer. The bottom of the cell will be sloped toward the leachate collection sump as shown. Intermediate water control berms will be constructed along the cell to separate water which contacts the refuse from that which doesn't. Water which does not contact the garbage will be pumped into stormwater control swales. Water coming into contact with refuse will be pumped back over the completed cell area for evaporation and absorption. The cells will be excavated in 250 to 350 feet of length at a time, staying ahead of the refuse requirements. A standby cell will always be kept open near the access road for use in wet weather or emergencies.

Disposal - Solid waste will be placed in two six-foot lifts with one-foot of intermediate cover to bring the cell approximately level with existing grade and then two more lifts four to six feet in thickness with a minimum of two feet of final cover over the completed cell. Final cover will be sloped as shown to divert rainfall runoff from the disposal area.

Leachate Control - If leachate ever forms in sufficient quantity to present a potential problem, it will be pumped from the leachate collection sumps into an aerobic treatment system. The treated effluent will then be sprayed over the site for evaporation.

ATTACHMENT ITEMS - (Continued)

Item  
No.

- k. A sign will be posted at the gate stating "No Hazardous Wastes Accepted, including Industrial Chemicals, Petroleum Solvents, or Pesticides".

The gate attendant will be trained to inspect incoming trucks for suspected hazardous wastes. No drums or containers will be allowed in the landfill without approval of the operations manager.

The equipment operators will be instructed to watch for drums, sacks, or containers that could contain hazardous wastes and isolate them until their contents can be determined.

If hazardous wastes are discovered on-site, the appropriate regulatory agencies, including FDER, will be notified in order to determine the proper method of disposal.

Septic tank wastes will not be allowed at the landfill.

9. "Water Quality Standards (17-7.05(3)(e), 17-7.05(4)(f), and 17-7.05(4)(g), Florida Administrative Code)

Indicate by discussion or drawings or both how the site is designed to meet water quality standards of 17-3 and 17-4, Florida Administrative Code, at the waste site boundary."

Response No. 9:

Stormwater will be diverted from the waste disposal area by site grading into a system of ditches and detention areas, including the natural bay head on site. Water pumped from the dewatering ditch will be diverted into this same site drainage system.

Groundwater in the unconfined aquifer above the confining clay layer will be held within the site boundaries by the continuous impervious barrier around the site.

10. "Background Water Quality (17-7.05(4)(a)3, Florida Administrative Code) - Ground water and any on-site water shall be tested for the following parameters:

- a. Conductivity
- b. Nitrates
- c. Iron
- d. Chemical Oxygen Demand
- e. Others as determined necessary"

ATTACHMENT ITEMS - (Continued)

Item  
No.

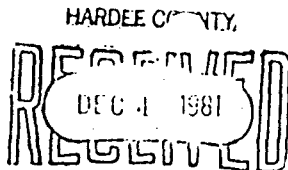
Response No. 10:

The section entitled "Water Quality" on page IV-5 of Attachment 2 presents the requested information.

11. "Solid Waste Disposal Facility Data Form."

Attachment 7 presents the requested information.





COMMISSIONERS

LEASE

This is a Lease given by MOBIL CHEMICAL COMPANY 150 East 42nd Street, New York, New York, 10017, a New York corporation authorized to transact business in Florida, herein called "Lessor" to HARDEE COUNTY, a political subdivision of the State of Florida, herein called "Lessee".

1. PROPERTY. This Lease pertains to the real property in Hardee County, Florida, containing 97.5 acres, more or less, described below and herein called the "Property", which Property is owned by Lessor.

Begin at the SE corner of the NE $\frac{1}{4}$  of Section 35, Township 33 South, Range 25 East and go West 660 feet to the point of beginning, thence run North 2,640 feet, thence West 1650 feet, thence South 2310 feet, thence East 330 feet, thence South 330 feet, thence East 1,320 feet to the point of beginning, Hardee County, Florida, together with a 60 foot easement for ingress and egress to the above site from King Road at a place to be jointly selected and agreed upon by the Lessor and Lessee.

2. LEASE. In consideration of the mutual agreements and undertakings of the parties as contained herein, Lessor hereby leases the property to Lessee upon the terms and conditions set forth herein.

3. LEASE RENTAL. The rental payment for the Property shall be the annual ad valorem taxes on the Property. The rent shall be paid annually, by Lessee to Lessor at Mobil Chemical Company, Phosphate Division, P. O. Box 311, Nichols, Florida, 33863, within fifteen (15) days after the tax bills are mailed by the Tax Collector, except that the rent for the period of time from the beginning of this Lease until January 1 of the next calendar year shall be prorated for the portion of the year which it represents and shall be payable not later than fifteen (15) days after the Tax Collector's notice of taxes due.

4. TERM. This Lease is for a term of twenty (20) years

beginning on the date hereof and ending on October 1, 2001.

5. EXTENSION. Lessee is hereby granted and shall, if not at the time in default under this Lease, have an option to extend the term of this Lease in eight (8) successive periods of two (2) years on the same terms, covenants and conditions herein contained. This option shall be exercised only by Lessee's delivering in person or by United States registered or certified mail on or before August 1, 2001, written notice of their elections to extend this Lease as herein provided.

6. LESSEE'S ANNUAL RATIFICATION OF LEASE. Not less than thirty (30) days prior to the expiration of each Lease year during the term hereof, including any extension thereof pursuant to Paragraph 5 above, Lessee shall cause to be placed on the agenda of the next succeeding meeting of the County Commission of Lessee a resolution pursuant to which the Commission shall ratify and confirm on Lessee's behalf this Lease for the following lease year under the same terms and conditions. In the event said Commission declines or otherwise fails to adopt such resolution at such meeting with respect to any lease year, Lessor shall have the option of terminating this Lease on not less than ninety (90) days prior written notice to Lessee.

7. LESSOR'S OPTION TO CONVEY. Upon the expiration or termination of this Lease, Lessor shall have the option, exercisable upon written notice to Lessee given not later than thirty (30) days after such termination or expiration, to donate and to convey to Lessee the fee simple title to the Property. Such conveyance shall be by special warranty deed in the usual form.

8. USE BY LESSEE. Lessee shall use the Property only as a Sanitary Land Fill Facility for the public, including the citizens of Hardee County. Lessee may place upon the Property whatever improvements Lessee desires. Upon expiration or termination of this Lease, or any earlier time, Lessee may remove from the Property any improvements placed thereon by Lessee. Lessee will not allow any liens to arise or remain against the Property

on account of Lessee's use and occupancy thereof. Lessee will at all times maintain the Property in a clean, sightly, neat and sanitary condition, and will meet the requirements of the Department of Environmental Regulations and other related agencies of the State of Florida, and of the federal government under the Resource Recovery and Conservation Act and any other pertinent rules or regulations. Maximum digging depths in the supplemental area as noted in letter of September 24, 1981 shall be observed in development of the site.

9. RESPONSIBILITY FOR PERSONAL INJURY, PROPERTY DAMAGE OR OTHER VIOLATIONS. Lessee agrees to defend, indemnify and hold harmless Lessor, its agents, employees and assigns, from any and all lossess, liabilities, penalties, expenses, damages, demands and claims (including costs of defense and reasonable attorneys' fees) in connection with or arising out of any injury or alleged injury (including death) to any person, or damage or alleged damage to property, or contamination of or adverse effects on the environment, or any violation of governmental laws, regulations or orders, caused or sustained or alleged to have been caused or sustained in connection with, or to have arisen out of, the use or occupancy of the Property by Lessee or persons (except persons who are upon the Property as employees, agents or invitees of Lessor) upon the Property with the permission of Lessee.

10. SUITABILITY OF PROPERTY. Lessor does not represent that the Property is suitable or safe for the purposes provided by this Lease, and Lessee accepts the Property without reliance upon any representations by Lessor as to suitability or safety.

11. NOTICES. All notices, requests, demands and other communications required or permitted to be given hereunder shall be in writing and shall be deemed to have been duly given if delivered personally, given by prepaid telegram or mailed first class, postage prepaid, certified or registered mail when required, to the following addresses:

HIGHTON, EVERS &  
EZZELLE, P. A.  
ATTORNEYS AT LAW  
P. O. DRAWER 1228  
NICHOLS, FLORIDA 33873  
PHONE 813 773-3241

If to Lessor:

MOBIL CHEMICAL COMPANY  
Phosphate Division  
Post Office Box 311  
Nichols, Florida 33863

ATTENTION: Manager

If to Lessee:

BOARD OF COUNTY COMMISSIONERS OF  
HARDEE COUNTY  
Room A-204, Second Floor  
Courthouse Annex  
412 West Orange Street  
Wauchula, Florida 33873

Either party may change its address for the purposes of this paragraph by giving written notice to the other as provided in this paragraph.

12. ASSIGNABILITY. Lessee may not assign this Lease or sublease all or any part of the Property, without the written consent of the Lessor. Lessor may assign any or all of Lessor's rights hereunder.

13. LESSEE'S RIGHT OF TERMINATION OF NOTICE. Lessee may terminate this Lease, at any time during the lease term or extension thereof, if the site should become untenable for use as a land fill site, or unusable under the rules and regulations of the Department of Environmental Regulation or other changes required by state regulatory agencies by giving the Lessor one (1) year prior written notice of Lessee's intention to do so.

DATED this 12th day of NOVEMBER, 1981.

Signed in the presence of:

MOBIL CHEMICAL COMPANY

John E. Alfried

By K. L. Egan

M. L. Tomkins  
Witnesses

Signed in the presence of:

BOARD OF COUNTY COMMISSIONERS,  
HARDEE COUNTY, FLORIDA

Jack Evers

By Maurice Henderson  
Maurice Henderson, Chairman

Vida L. Tomkins  
Witnesses

Attest: Coleman W. Best  
Coleman W. Best, Clerk

FEASIBILITY STUDY  
ON  
USE OF THE MOBIL SITE AS A CLASS I SANITARY LANDFILL

PREPARED FOR  
  
HARDEE COUNTY, FLORIDA  
BOARD OF COUNTY COMMISSIONERS

PREPARED BY  
  
ENVISORS, INC.  
CONSULTING CIVIL & ENVIRONMENTAL ENGINEERS, PLANNERS, & ECONOMISTS  
TAMPA, MARGATE, & WINTER HAVEN, FLORIDA  
EVI JOB NO. 81014

FEBRUARY 1982

## PREFACE

### NOTES ON REPORT ARRANGEMENT

The chapters in this Report are numbered with Roman numerals. Pages within each chapter are numbered with the Roman numeral of the subject chapter followed by the sequential Arabic number of the page (e.g., I-1, I-2, etc. for Chapter I).

Tables appear at the end of each chapter and are numbered with Roman numerals which designate the chapter and with Arabic numerals which designate the sequence within the chapter (e.g., II-1 for the first Table of Chapter II). The Table of Contents contains a complete listing of tables.

Figures are assembled at the end of each respective chapter and are numbered with Roman numerals which designate the chapter and with Arabic numerals which designate the sequence within the chapter. The Table of Contents contains a complete listing of figures.

Technical appendices are assembled at the end of this Report.

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CHAPTER I

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

## CHAPTER I

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### SUMMARY

##### Chapter II - Introduction

On 5 November 1981, the Hardee County Board of County Commissioners authorized Envisors, Inc. to evaluate the feasibility of using a 97.5 acre site leased from Mobil Chemical Company as a Class I Sanitary Landfill and prepare a preliminary engineering report setting forth the results of the evaluation.

This action was the culmination of a joint effort by the governing bodies of Wauchula, Bowling Green, Zolfo Springs, and Hardee County to find an acceptable long range solution for the disposal of solid waste generated within the County.

##### Chapter III - Solid Waste Parameters

The 1980 Census determined the population of Hardee County to be 19,379. According to information provided by the University of Florida, Bureau of Economic Research (the State agency responsible for making population projections), the population for Hardee County in 1982 is estimated at 20,300 and it is projected to be 28,400 in the year 2000. Table III-1 presents projected population values for Hardee County.

It is anticipated that the total County population will not utilize the proposed landfill facility. Only that portion of the population living in the U.S. 17 corridor is expected to use the facility. This corridor (encompassing the area lying about six miles to the east and west of U.S. 17) is expected to continue to be the more developed and higher density area of the County. It has been projected that 90 percent of the solid waste generated in Hardee County, including the incorporated areas, will be deposited in the landfill through the year 2000.

Using an average per capita solid waste generation rate of 4.5 lbs/person/day and a 5.5 day operating week at the landfill, the landfill should receive 13,400 tons in 1982 (47 tons/day) and 21,000 tons in the year 2000 (73 tons/day). Assuming a compaction rate of 1,000 lbs/cubic yard, 26,700 cubic yards should arrive at the landfill in 1982 and 42,000 cubic yards in the year 2000. The total amount of accumulated solid waste in the landfill through the year 2000 is projected to be 650,700 cubic yards. Tables III-2 and III-3 presented projected solid waste values for Hardee County.

##### Chapter IV -- Evaluation of the Mobil Site

The Mobil Site encompasses 97.5 acres and is located northeast of the City of Wauchula in the vicinity of the Wauchula Airport (Figure II-1). It is approximately one-half mile north of the existing landfill and 660 feet west of Airport Road. The land in the vicinity of the site is predominantly agricultural and open space and there are an estimated ten residential type structures within one-half mile of the site (Figure IV-2).

Permanent access to the site will be via an extension of Kings Road. Temporary access will be from Airport Road, providing an easement can be acquired (Figure IV-3).

The site's surface elevations range from a high of 87 feet msl in the northwest area to a low of 76 feet msl in the outfall ditch in the southwest corner of the site (Figure IV-1). The majority of the site is pastureland which slopes downward to a large bayhead in the east-central portion of the site. The Florida Department of Environmental Regulation has determined that the bayhead is not jurisdictional waters of the State.

The site has six to 17 feet of moderately to poorly drained sands overlying an impermeable and continuous clay layer averaging 25 feet in thickness (Figures IV-5, IV-6, IV-7, IV-8, and IV-9). The clay layer effectively separates the groundwater in the upper unconfined aquifer from the water in the confined/deep Floridan Aquifer. Samples of water taken from both aquifer systems have been analyzed to establish background water quality prior to development of the landfill (Table IV-2).

Based on the results of our work, the site appears to be hydrologically and geologically suitable for development as a sanitary landfill, providing the site design, construction, and the operating procedures are properly structured to adequately control groundwater and leachate. Considering the site's location and proposed access route, proper operation of this site should create minimal adverse impact on the surrounding area.

#### Chapter V - Site Development Concepts and Preliminary Estimated Cost and Tipping Charge

Permanent access to the site will be via an extension of Kings Road (Figure IV-3). This proposed extension of Kings Road to the southwest corner of the site will consist of a 24 foot stabilized road within a sixty foot wide easement along an alignment mutually acceptable to Hardee County and Mobil Chemical Company. A bridge will be required to cross Max Branch. If required, temporary access will be from Airport Road and will require an easement.

The site will be developed by constructing a perimeter ditch and water detention areas to lower the water table within the disposal area. Lowering the groundwater is one of the key parameters to successfully developing the site. All on-site roadways will consist of in-situ earth stabilized with clay mined on-site. A conceptual design of the proposed landfill (Figure V-1) and conceptual cross-sections of the solid waste disposal cells (Figure V-2) are included in Chapter V.

Equipment required for operation of the landfill includes excavating equipment (front end loader and dragline), solid waste handling and compaction equipment (bulldozer), dewatering pumps, fueling and maintenance equipment, and communication and office equipment. The dragline, bulldozer, and loader can be utilized by the County's Road Department on a cost-sharing basis. An equipment storage and maintenance building with fueling facilities and a gate house with office equipment are also proposed.

Operation of the landfill can be divided into three areas of responsibility: solid waste handling, site maintenance, and accounting. Each of these are explained in Chapter V and must be specifically addressed in the landfill management plan.

Although the land at the proposed site is leased on an annual basis, all other costs associated with the development of the site must be provided at the outset. The County has secured a loan commitment from the Farmers Home Administration to cover the required capital costs. Detailed preliminary capital cost estimates for the various required components are given in Table V-1.

The total preliminary capital cost of implementing the landfill is estimated at \$1,091,600. This includes equipment, on-site improvements, off-site improvements, legal, engineering, and fiscal services, and interest during construction; however, it excludes cell and perimeter ditch excavation costs which are considered as operating costs.

Total estimated annual revenue requirements are given in Table V-2 and they range from \$216,900 in 1983 to \$223,200 in 1986. Because the heavy equipment is expected to be partially used by the County's Road and Bridge Department, capital and renewal and replacement (R & R) costs have been apportioned between the landfill account and the County's general fund. Table V-3 presents the estimated apportioned costs.

Based on the aforementioned revenue needs (Table V-2), shared costs (Table V-3), and solid waste values (Table III-2), estimated landfill tipping charges are given in Table V-4 and they range from \$6.26/yd<sup>3</sup> in 1983 to \$5.88/yd<sup>3</sup> in 1986.

#### CONCLUSIONS AND RECOMMENDATIONS

Based on the analyses conducted in preparing this report, the following courses of action are suggested:

- 1) Accept this report and proceed with the Project in accordance with the concepts presented herein.
- 2) Authorize the consultant to: conduct any required additional field work; prepare the final landfill design; prepare the construction documents (drawings and specifications), equipment specifications, and final cost estimates; and prepare and process the FDER permit.
- 3) Retain a fiscal consultant and secure interim financing for the Project.
- 4) Secure an easement for the temporary access road from Airport Road.
- 5) Agree on the alignment of Kings Road with Mobil Chemical Company and secure the necessary easement.

- 6) Authorize the consultant to conduct a brief study and prepare a report to establish an initial schedule of rates and charges for users of the landfill which will make the facility financially self-supporting.
- 7) Authorize the consultant to prepare, and aid the County in implementing, an accounting procedure and record keeping system for the sanitary landfill facility.

CHAPTER II

INTRODUCTION



## CHAPTER II

### INTRODUCTION

#### GENERAL

Realizing the importance of providing environmentally sound and cost-effective solid waste disposal facilities, the cities of Wauchula and Bowling Green and the town of Zolfo Springs joined together with Hardee County to seek a common long range solution to their solid waste disposal problem. Accordingly, on 20 October 1978, the four governments entered into an "Inter-Local Agreement for Solid Waste Disposal".

This Agreement designated Hardee County as the agency responsible for financing, constructing, operating, and maintaining a Resource Recovery and Management Facility of sufficient capacity to handle and dispose of all solid waste generated within the County. After extensive investigation of the cost and feasibility of resource recovery and solid waste incineration by the four governing bodies, they determined that a sanitary landfill would be the most cost-effective method of solid waste disposal. The municipalities and County appointed a Hardee County Solid Waste Committee and it was charged with the responsibility of locating and evaluating alternate disposal sites. The Committee evaluated several potential sites before negotiating a low cost, long term lease with Mobil Chemical Company for the use of a 97.5 acre parcel situated north of the Wauchula Municipal Landing Field and west of Airport Road (Figure II-1).

#### AUTHORIZATION

On 5 November 1981, the Board of County Commissioners, Hardee County, Florida entered into a contract with Envisors, Inc., Consulting Civil and Environmental Engineers, Planners, and Economists to provide the requisite professional engineering services to evaluate the Mobil Chemical Company site for use as a Class I Sanitary Landfill to serve Hardee County. If the site evaluation work shows that the Mobil Site is suitable for use as a Class I Sanitary Landfill, additional engineering, and perhaps field and laboratory, work must be conducted to design, permit, equip, and implement the sanitary landfill.

It should be noted that award of the contract was accomplished in full accordance with the State of Florida's Competitive Negotiation Act for Engineering, Architectural, and Surveying Services, Florida Statute 287.055.

#### PURPOSE, SCOPE, AND METHODOLOGY

The purpose of this study is to evaluate the proposed 97.5 acre Mobil Chemical Company site for use as a Class I Sanitary Landfill in compliance with Chapter 17.7 of the Florida Administrative Code.

This report summarizes the findings of this investigation and is the culmination of the major work tasks listed on the following page.

- (1) Collect, collate, and evaluate existing and readily available data relative to the Project;
- (2) Perform a boundary survey of the property to establish and monument the limits of the site and to provide horizontal and vertical data for photogrammetric work;
- (3) Provide a photogrammetric contour survey of the site;
- (4) Perform preliminary subsurface soils investigations to ascertain geologic and hydrologic features of the site;
- (5) Perform chemical analyses of on-site shallow and deep groundwater to preliminarily establish background water quality data;
- (6) Estimate the future population of Hardee County, solid waste generation rates, and corresponding landfill volume/area requirements;
- (7) Meet with regulatory agency personnel to secure their comments regarding use of the site as a sanitary landfill;
- (8) Prepare a conceptual design and preliminary cost estimate for utilization of the site;
- (9) Prepare a report summarizing the results of the work and offering recommendations as to the suitability of the site;
- (10) Review the report with County personnel and revise the report to reflect their comments; and
- (11) Present the final report to the Board of County Commissioners.

#### PROJECT TEAM

This Report was prepared in the offices of Envisors, Inc., Consulting Civil and Environmental Engineers, Planners, and Economists, Winter Haven, Tampa, and Margate, Florida. Douglas M. Darden, P.E., served as Project Director and Dale D. Ernsberger, P.E., served as Project Manager.

Envisors retained the services of Armac Engineering for the necessary geotechnical investigations. Kucera & Associates and Chastain-Skillman performed the aerial and field survey work, respectively.

Throughout the conduct of this Project, the work was coordinated with the County Administrator, County Environmental Engineer, and the County's Consultant, Alton Robertson, P.E., of Seaburn and Robertson, Inc. These people were periodically apprised of the status of the Project and Project milestones were reported to the Board of County Commissioners.

## ACKNOWLEDGMENTS

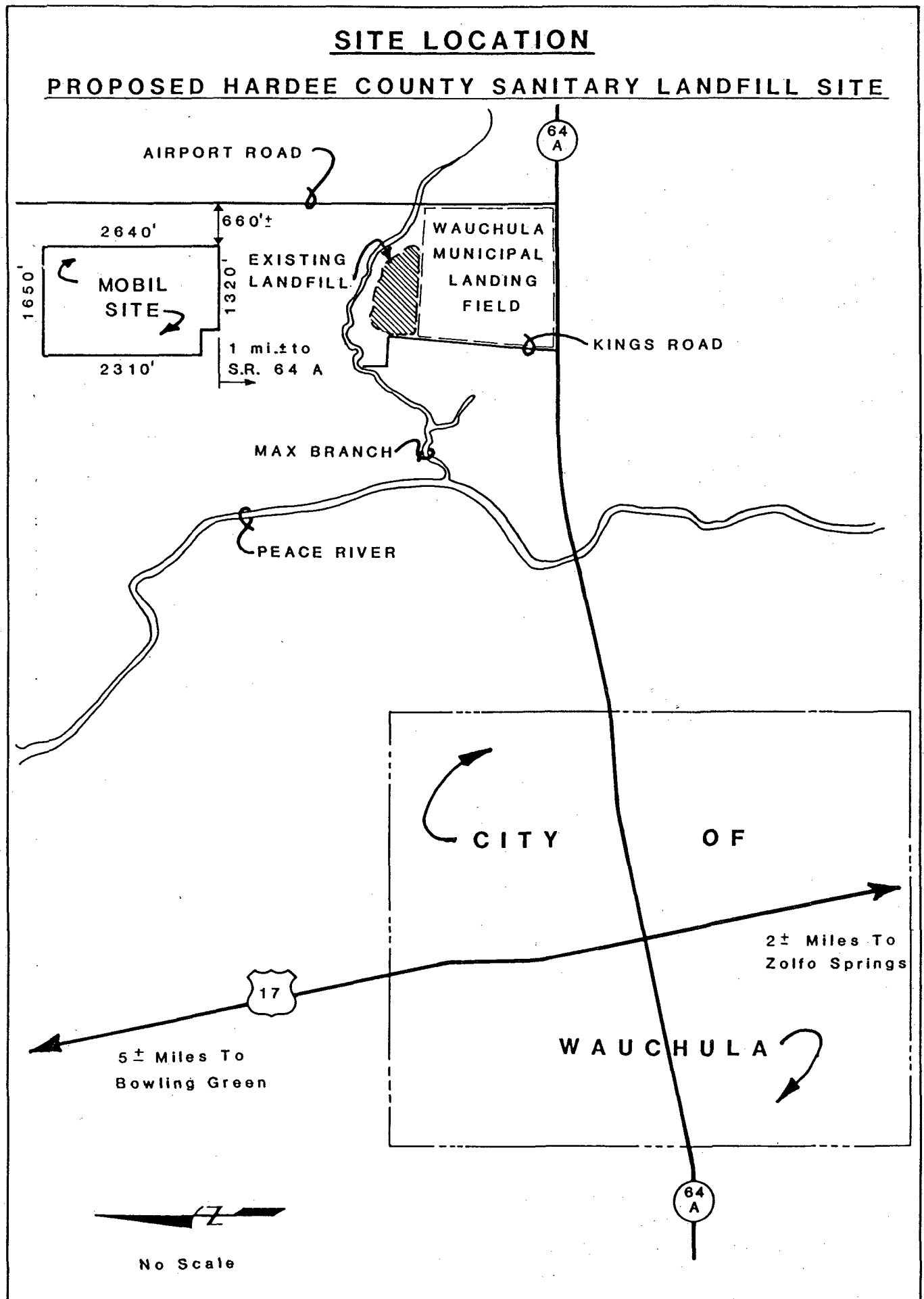
During the development of this Report, many individuals gave unselfishly of their time and energy. Envisors, Inc. is especially grateful for the assistance rendered by the Hardee County Board of County Commissioners and its staff. In this regard, sincere appreciation is extended to:

Chairman, Vice Chairman, and Commissioners,  
Board of County Commissioners

Harry E. Lampe, P.E.	County Administrator and County Engineer
Gordon G. Townsend, P.E.	County Environmental Engineer
Joel Evers, Esquire	County Attorney
Vita Tomlinson	Secretary to the Board and Administrator
Alton Robertson, P.E.	County Consultant

Appreciation is also extended to the following individuals for their assistance on this Project.

William K. Hennessey	Florida Department of Environmental Regulation
Edward J. Snipes, Jr., P.E.	Florida Department of Environmental Regulation
Patrick W. Lewis	Florida Department of Environmental Regulation
Allen G. Burdett, Jr.	Florida Department of Environmental Regulation
Jack Miller	U.S.D.A., Soil Conservation Service
Louis Frost	U.S.D.A., FmHA District Director
Members of the Hardee County Solid Waste Committee	
Mobil Chemical Company	



CHAPTER III

SOLID WASTE PARAMETERS

## CHAPTER III

### SOLID WASTE PARAMETERS

#### INTRODUCTION

This Chapter presents projected future solid waste values for Hardee County. These solid waste values are based on the University of Florida's population projections for Hardee County and specifically that portion of the County's population which is expected to utilize the proposed sanitary landfill.

#### PROJECTED FUTURE POPULATION VALUES

Between 1970 and 1980, Hardee County experienced a moderate 30 percent increase in population. According to the U.S. Census, the 1 April 1980 population count was 19,379. The University of Florida's high and medium projections for the next 18 years (through year 2000) are listed in Table III-1 and illustrated on Figure III-1. As shown therein, the differences between the high and medium projections are relatively small. Using the high values, the County's total population is projected to reach 28,400 persons by the year 2000, a 40 percent increase over the next 18 years (Table III-1 and Figure III-1).

It is anticipated that the total County population will not utilize the proposed landfill facility. Only that portion of the population living in the U.S. 17 corridor is expected to use the facility because the U.S. 17 corridor is expected to continue to be the more developed and higher density area of the County and this area has economical access to the proposed sanitary landfill. This corridor encompasses the area lying about six miles to the east and west of U.S. 17. As set forth in Table III-1, between approximately 24,000 and 26,000 residents, or 90 percent of the County's total population, is expected to be served by the proposed landfill facility in the year 2000. Figure III-1 illustrates the projected population values expected to be served by the sanitary landfill.

#### PROJECTED SOLID WASTE VALUES

Future solid waste values were computed for both the high and medium population values. Table III-2 presents the projected future solid waste values in tons per year, tons per day, and cubic yards per year. Figure III-2 illustrates projected future solid waste values (tons/year and cubic yards/year).

The yearly tonnage values are based on a generation average of 4.5 lbs/person/day, 365 days/year. To compute the per day tonnage values, it is assumed that the landfill will operate eight hours per day Monday through Friday and four hours on Saturday. Maximum expected solid waste values range from 47 tons/day in 1982 to 73 tons/day in year 2000.

Table III-3 presents accumulated solid waste volumes for the high and medium population values. As tabulated therein and illustrated on Figure III-3, by the year 2000 there is expected to be between 623,000 and 651,000 cubic yards of accumulated solid waste at the proposed landfill.

TABLE III-1

HARDEE COUNTY PROJECTED FUTURE POPULATION VALUES

Year	Total Population (a)		Estimated Population Served (b)	
	High	Medium	High	Medium
1982	20,300	20,100	16,240	16,080
1985	21,900	21,400	17,739	17,334
1990	24,200	23,200	20,328	19,488
1995	26,300	25,000	22,881	21,750
2000	28,400	26,600	25,560	23,940

Notes: (a) University of Florida population projections.

(b) Estimated population served is the population living within six miles of U.S. 17 as based on County estimates and the Future Land Use Plan Element of the Hardee County Comprehensive Plan.

TABLE III-2

## PROJECTED FUTURE SOLID WASTE TONNAGE AND VOLUME VALUES

## PROPOSED HARDEE COUNTY SANITARY LANDFILL

YEAR	SOLID WASTE VALUES					
	High Values			Medium Values		
	Tonnage		Volume	Tonnage		Volume
	Per Year (a)	Per Day (b)	Yd <sup>3</sup> per Year (c)	Per Year (a)	Per Day (b)	Yd <sup>3</sup> per Year (c)
1982	13,337	47	26,674	13,206	46	26,412
1985	14,568	51	29,136	14,236	50	28,472
1990	16,694	58	33,388	16,005	56	32,010
1995	18,791	66	37,582	17,862	62	35,724
2000	20,991	73	41,982	19,661	69	39,322

Notes: (a) Based on Table III-1 population values and a generation rate of 4.5 lbs/person/day, 365 days/year.

(b) Based on the sanitary landfill operating 5.5 days per week, or 286 days/year.

(c) Based on an in-situ compacted density of 1,000 lbs/yd<sup>3</sup>.



TABLE III-3

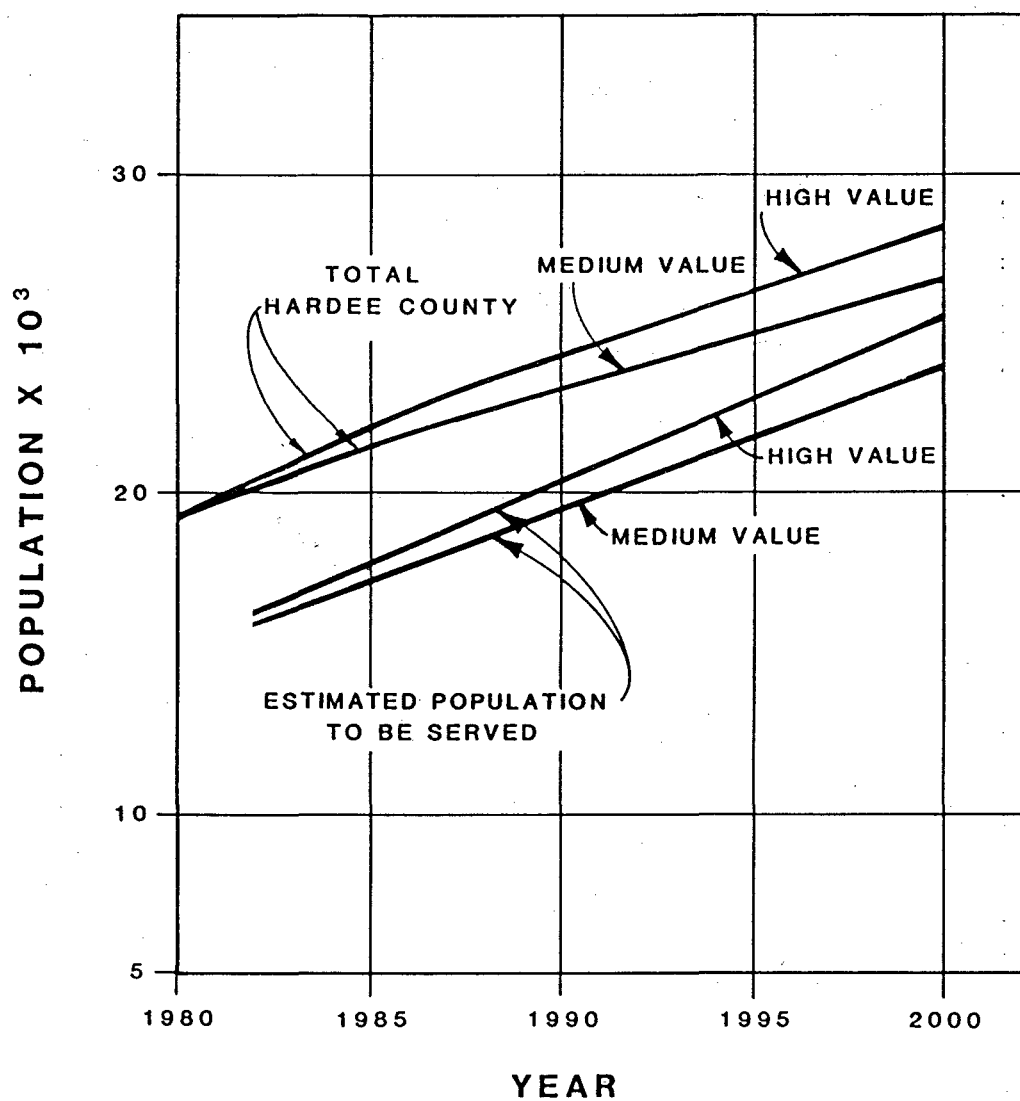
PROJECTED FUTURE ANNUAL AND ACCUMULATED SOLID WASTE VOLUME VALUES

PROPOSED HARDEE COUNTY SANITARY LANDFILL

Year	Annual Volume - Yd <sup>3</sup> /Yr. (a)		Accumulated Volume - Yd <sup>3</sup>	
	High Value	Medium Value	High Value	Medium Value
1982	26,674	26,412	26,674	26,412
1983	27,495	27,099	54,169	53,511
1984	28,315	27,785	82,484	81,296
1985	29,136	28,472	111,620	109,768
1986	29,986	29,180	141,606	138,948
1987	30,837	29,887	172,443	168,835
1988	31,687	30,595	204,130	199,430
1989	32,538	31,302	236,668	230,732
1990	33,388	32,010	270,056	262,742
1991	34,227	32,753	304,283	295,495
1992	35,066	33,496	339,349	328,991
1993	35,904	34,238	375,253	363,229
1994	36,743	34,981	411,996	398,210
1995	37,582	35,724	449,578	433,934
1996	38,462	36,444	488,040	470,378
1997	39,342	37,163	527,382	507,541
1998	40,222	37,883	567,604	545,424
1999	41,102	38,602	608,706	584,026
2000	41,982	39,322	650,688	623,348

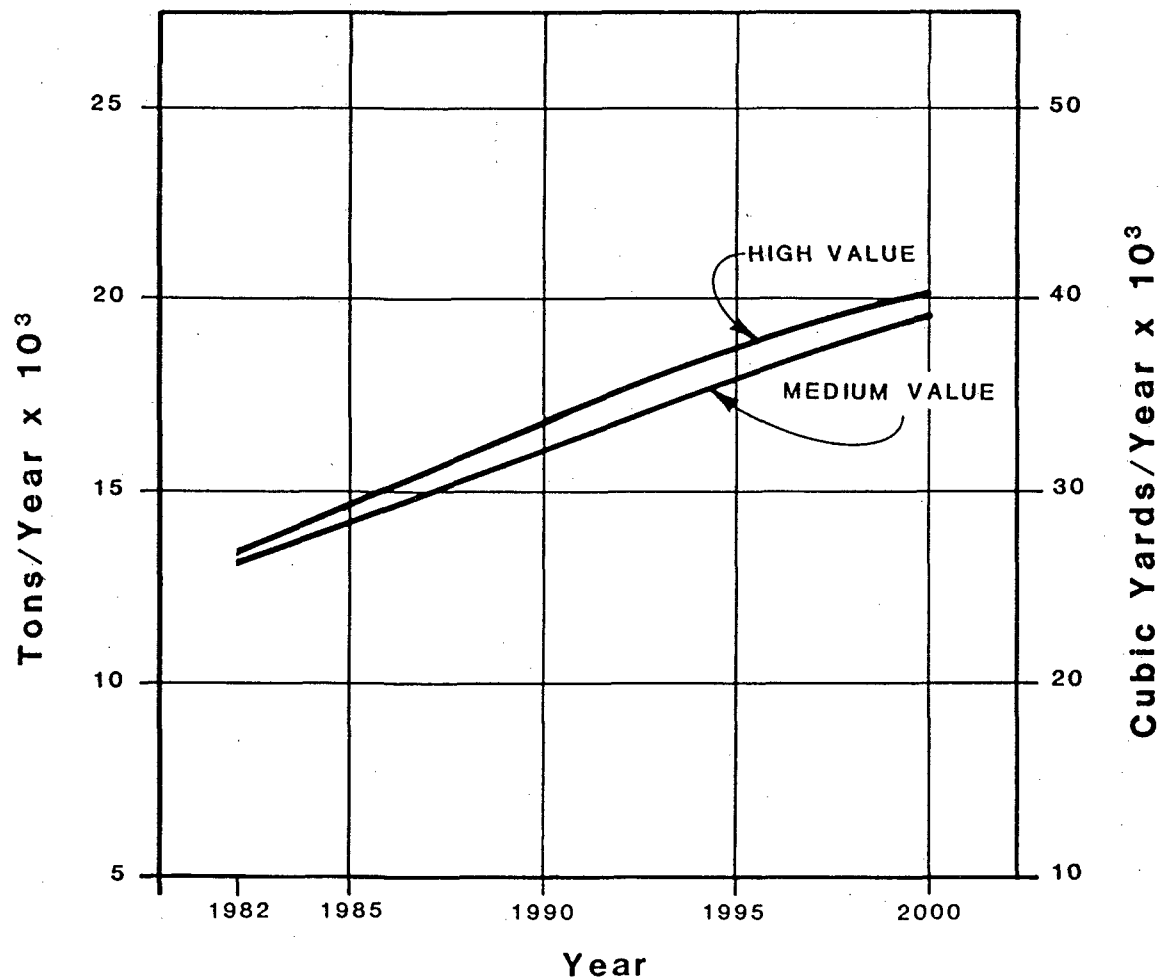
Note: (a) Based on Table III-2 volume values and assumed level annual growth between the population values projected for 1982, 1985, 1990, 1995, and 2000 (Table III-1).

## PROJECTED HARDEE COUNTY POPULATION VALUES



References: Tables III-1 and III-2.

**PROJECTED SOLID WASTE TONNAGE AND VOLUME**  
**HARDEE COUNTY SANITARY LANDFILL**

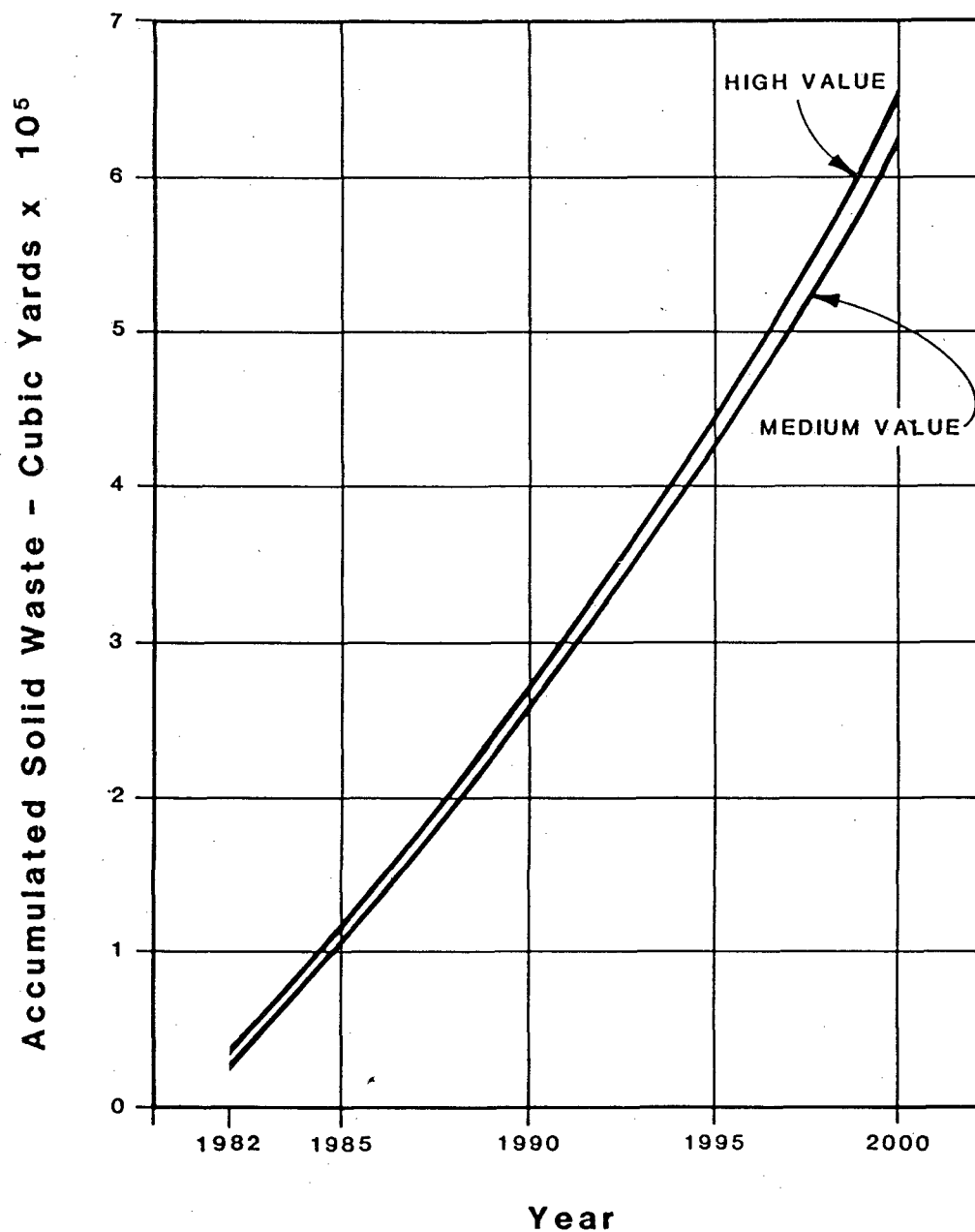


References: Table III-2 and III-3.

Note: Generation value is based on a generation rate of 4.5 lbs/person/day.

Volume is based on an in-situ compacted density of 1,000 lbs/yd<sup>3</sup>.

**ACCUMULATED SOLID WASTE VOLUME**  
**HARDEE COUNTY SANITARY LANDFILL**



Reference: Table III-3.

Note: Volume is based on a compacted in-situ density of 1,000 lbs/yd<sup>3</sup>.

CHAPTER IV

EVALUATION OF THE MOBIL SITE

## CHAPTER IV

### EVALUATION OF THE MOBIL SITE

#### INTRODUCTION

This Chapter presents a summary of the results of the preliminary evaluation of the Mobil Site for use as a Class I Sanitary Landfill.

#### LOCATION

Figure II-1 illustrates the location of the proposed Mobil sanitary landfill site. The Mobil Site is situated northeast of the City of Wauchula approximately one mile east of the Peace River and one-half mile north of the existing landfill. Specifically, the site encompasses 97.5 acres and is situated in the northeast quadrant of Section 35, Township 33 South, Range 25 East. As shown on Figure II-1, the site is generally rectangular and measures approximately one-half mile on the east and west sides and three-tenths mile on the north and south sides, less a 2.5 acre square parcel in the southwest corner. The south boundary of the site is approximately one-half mile north of the Airport situated north of S.R. 64A and east of Wauchula. The east boundary of the site is 660 feet west of Airport Road.

#### GENERAL DESCRIPTION

The Mobil Site encompasses approximately 97.5 acres. Figure IV-1 shows that approximately 25 acres in the east-center of the site is covered by a low, swamp-filled, heavily wooded depression (bay head). The remainder of the site is presently being used as improved pasture. The site generally slopes toward the large bay head in the east-central portion. In wet weather, this bay head drains through a ditch to the southwest corner of the property toward the Peace River. The ditch, however, does not connect directly to the River or to any of its tributaries (Figure IV-2) and both the bay head and the ditch have been found not to be "Waters of the State" by the Florida Department of Environmental Regulation. Surface elevations on the site range from a high of 87 feet in the northwest portion to a low of 76 feet in the ditch passing through the southwest corner of the site (Figure IV-1).

#### LAND USE COMPATIBILITY

The land use in the vicinity of the site is predominantly agricultural and open space. Ten scattered residential type structures have been located within about one-half mile of the site's boundaries. Figure IV-1 illustrates land use characteristics in the vicinity of the site.

#### ACCESS

One of the conditions of the site lease with the Mobil Chemical Company is that permanent access to the site will be from the south by constructing an extension of Kings Road from the vicinity of the existing landfill gate northward across Max Branch to the southwest corner of the site (Figure IV-3). Temporary access to the site from Airport Road may be needed while

the Kings Road extension is being constructed. This temporary access will require an easement across the 660 feet of intervening land between the site and Airport Road (Figure IV-3).

#### SURFACE SOILS

Figure IV-4 illustrates the surface soils associations on the Mobil Site as mapped by the Soil Conservation Service. Surface soils are those soils at or near (within six feet of) the ground surface. Approximately 65 percent of the site consists of moderately to poorly drained, nearly level surface soils found in the Flatwood areas of the coastal plains. The remaining 35 percent of the site is covered with very poorly drained sands overlain with muck. A description of the major soils associations on the site is given in Table IV-1.

The Soil Conservation Service's Interim Soil Survey Report lists all of these soils as having severe problems when constructing sanitary landfill trenches and when using these soils for daily and final cover because of their wetness and high permeability. It should be noted, however, that a review of all of the soil associations listed for Hardee County show the same comments. This leads to the conclusion that the soils on the proposed site are generally as good as can be found anywhere in the County. Therefore, the problems associated with the soils must be overcome by proper site design and operational techniques.

The site's surface sand series are poorly drained because of several factors, including: The area's general topography is flat (average slope across the site from northeast to southwest is 0.2 percent); The impervious subsurface soils prevent downward percolation; and The shallow groundwater table has a very slight hydraulic gradient. All of the soils on the site have laboratory permeabilities ranging from 6-20 inches per hour except for thin beds of weakly cemented sands with permeabilities of 0.6-2.0 inches per hour. If drainage channels are constructed around the landfill cells, these soils should become well drained and the site will be dewatered.

#### GEOLOGY

##### General

The proposed Mobil Landfill Site is geologically contained within the mid-Peninsular Physiographic zone as defined by White (1970). This zone is further subdivided into three (3) distinct physiographic regions: the Polk Upland, the Desota Plain, and the Gulf Coastal Lowlands. The delineation of each physiographic province or region is roughly approximated by a series of marine cut terraces which are the result of successive regressional stands of the sea during the Pleistocene epoch.

The Polk Upland, in which the city of Wauchula and the proposed landfill site are contained, lies generally at elevations greater than 100.0+ feet msl, with the resulting marine cut terrace corresponding to the Wicomico Shoreline. However, numerous streams traverse the region which results in the formation of broad river valleys lying below elevation 100+ feet msl. The proposed landfill site, lying at an average elevation of approximately 80+ feet msl, is located along the limits of the broad Peace River valley thus formed.

The Desota Plain, located to the south of the Polk Upland, lies at about elevation 40+ feet msl. This plain is the result of a lower marine cut terrace which appears to correspond to the Pamlico Shoreline. The much lower Gulf Coastal Lowlands, located to the southwest of the Desota Plain, is a result of successive regressional stages of the Gulf of Mexico during later Pleistocene time.

### Lithology - Stratigraphy

As part of the preliminary soils investigation work conducted at the Mobil Site, seven (7) Standard Penetration Test (SPT) borings were made and four (4) shallow groundwater observation wells were installed. The soil boring logs are included in Appendix A. The location of the SPT borings and groundwater observation wells are shown on Figure IV-1. The boring location plan and stratigraphy summary for the site are illustrated on Figure IV-5. The boring location plan and stratigraphy summary for borings 1, 2, 4, and 6 are illustrated on Figure IV-6. Figures IV-7, IV-8, and IV-9 illustrate soil cross sections through the various borings.

The generalized soil stratigraphy, as determined from the soil test borings, consists of a thin surficial stratum of brown to gray sands to depth 6.0 to 17.0 feet below ground surface and averages approximately ten (10) feet in thickness. This surficial Pleistocene sand unit is underlain by interbedded lenses of gray to gray-green clayey sand and sandy clay grading to a phosphatic calcareous and non-calcareous sandy clay at between 12.5 and 19.0 feet below ground surface. Based on the data available, it appears that this cohesive clay soil stratum constitutes a continuous confining bed. The phosphatic sandy clay corresponds geologically to the Hawthorne formation of the Miocene age. This cohesive clay layer, which is underlain by calcareous sandy clay and limestone, varies in thickness between 14 and 35 feet and averages approximately 25 feet in thickness. The calcareous sandy clay and limestone unit corresponds to the upper limits of the Tampa formation of early Miocene age. All of the soil borings performed at the site (except Boring B-5) were terminated within this geologic unit. Soil Boring B-5, located in the southeast corner of the site (Figure IV-1), contains a great thickness of phosphatic sandy clay from depth 13.0 to 50.0 feet and its existence is most likely the result of an in-filled relict or paleo sink of preHawthorne age origin. The results of the soil boring indicate the in-filled soils to be stable under present conditions.

The Tampa Limestone formation is underlain by a series of limestone formations which are comprised of the Suwannee Limestone of Oligocene age with an average thickness of 200 feet, and the Ocala Group and Avon Park Group of Eocene age. The Ocala Group consists of the Crystal River, Williston, and Inglis formations which range in thickness from 250 to 400 feet. The Avon Park Limestone ranges in thickness from 200 to 470 feet. Except for their major contribution to the Floridan aquifer hydrostatigraphic unit, these pre-miocene age formations do not influence the surficial geology of the Mobil Site.

### HYDROLOGY

#### Surface Drainage and Shallow Groundwater Aquifer

The surficial sand and clay soils contain a shallow water table or unconfined aquifer system. The interface of the lower limits of these surficial sandy soils with the top of the clay stratum constitutes a well-defined



and continuous confining bed which is seen to separate the unconfined aquifer system from the deeper Floridan aquifer. Measurement of the groundwater levels recorded in the observation wells installed within the area indicate a groundwater flow direction generally to the west and southwest towards the Peace River. However, it should be noted that drainage within the site generates base flow direction reversal into the lowland depression which is located in the east-center of the site (Figure IV-1). This depression is seen to then drain, due to ditching, by surface flow to the southwest.

The measured heads within the groundwater aquifer ranged from elevation 75.6+ feet msl in the northwest corner of the site to 80.1+ feet msl in the northeast corner of the site. The resulting flow gradient (i) based on the observation well measurements ranged from  $1.0 \times 10^{-3}$  to  $1.5 \times 10^{-3}$ .

#### Soil Permeability

Soil permeability tests performed in each of the installed observation wells generated an average surface sands soil permeability (kh) of  $4.88 \times 10^{-4}$  cm/sec. With the in-situ soil permeability and flow gradient determined, the flow velocity of groundwater flow across the site is calculated by use of the following formula:

$$V = ki/n$$

where: V is the horizontal flow velocity in cm/sec  
k is the coefficient of permeability in cm/sec  
n is the estimated soil porosity (25%)  
i is the flow gradient (dimensionless)

The resulting flow velocity ranged from  $1.38 \times 10^{-7}$  cm/second (1.71 in/year) to  $5.48 \times 10^{-6}$  cm/second (68.02 in/year) with an average value of  $2.81 \times 10^{-6}$  cm/second (34.89 in/year) or 2.91 ft/year.

In addition to the in-situ permeability values determined from the installation of the observation wells, laboratory permeability tests were performed on two (2) clay samples. These samples were representative of the cohesive soils comprising the confining layer which separates the shallow groundwater aquifer from the upper Floridan Aquifer. The results of these tests indicate permeability values of  $2.0 \times 10^{-8}$  cm/second in Boring B-2 at depth 25.0 feet and  $9.5 \times 10^{-8}$  cm/second in Boring B-1 at depth 25.0 feet. The results of these tests show that the clay stratum is essentially impervious.

In addition to the laboratory permeability tests performed, grain size analyses were performed on the soil samples tested as well as representative soil samples obtained from the soils comprising the confining bed. The grain size analyses indicate that the permeability values obtained are representative of the soils comprising the confining layer. The percentage of soil which was found to pass the No. 200 sieve indicates the percentage, by weight, of the clay fraction of the soil tested. These values ranged from 21.40 to 63.81 percent, with an average of 47.05 percent passing the No. 200 sieve. The percent passing the No. 200 sieve of the soils tested in the laboratory permeameter was 21.40 percent with the coefficient of permeability (k) measured at  $9.5 \times 10^{-8}$  cm/second and 61.19 percent with a measured (k) of  $2.0 \times 10^{-8}$  cm/second.

### Potentiometric Surface

The potentiometric surface of the confined Floridan Aquifer, based on USGS Floridan Aquifer data, indicates a head of approximately 55.0+ feet msl. Groundwater flow direction based on this 1980 Floridan aquifer mapping indicated groundwater movement to be to the southwest. It should be noted that actual flow directions within any limestone aquifer may be different than that implied by externally measured gradients due to linear discontinuities such as joints, cracks, or fissures within the limestone which would control the actual flow directions.

### Unconfined and Confined Aquifer Relationship

Knowing the head differential between the unconfined/shallow and confined/deep aquifer systems, it is possible to determine the theoretical rate of downward vertical flow into the underlying confined aquifer. This rate can be calculated by using the previously referenced formula:

$$V = ki/n$$

where: V is vertical seepage rate in cm/second  
k is the coefficient of permeability in cm/second  
n is the estimated soil porosity (35 percent)  
i is the seepage gradient (dimensionless)

The seepage gradient (i) is determined from the aquifer head differential per unit thickness of the confining bed separating the two systems. Based on the average clay confining layer thickness of 25 feet and a head difference of 25 feet, a seepage gradient (i) of unity or 1.0 is obtained. Using the average coefficient of permeability (k) of the confining clay layer of  $5.75 \times 10^{-8}$  cm/second or  $5.94 \times 10^{-2}$  feet/year and a soil porosity of 35 percent, an estimated theoretical vertical seepage rate of 0.17 feet/year is obtained.

It is very important to recognize the practical effect of the thick clay layer illustrated on Figures IV-5, IV-6, IV-7, IV-8, and IV-9. The practical effect is that its small pore size (as evidenced by its low coefficient of permeability,  $6 \times 10^{-8}$  cm/second) and its natural ion exchange capacity should prevent the migration of any pollutants through the clay layer and into the confined/deep Floridan Aquifer.

### WATER QUALITY

As previously mentioned, there are two aquifer systems involved when discussing groundwater, unconfined/shallow and confined/deep. The unconfined/shallow aquifer exists in the surface sands and extends down to the top of the clay layer which overlays the limestone bedrock. The confined/deep Floridan Aquifer exists in solution channels and fractures in the limestone. These two aquifer systems are separated by the thick, impermeable clay layer overlaying the limestone.

The water in the unconfined/shallow aquifer is usually used only for irrigation. The confined/deep Floridan Aquifer is the primary source of drinking water, not only in Hardee County, but throughout much of the State of Florida. Protection of the groundwater in both aquifers is the most important parameter in designing and operating a sanitary landfill.

In order to establish the water quality in both aquifers prior to development of the landfill and to monitor water quality after development, four shallow groundwater monitoring wells have been constructed on-site. One deep water quality monitoring well into the Floridan Aquifer and, if required, additional shallow wells will be constructed during site development.

Samples have been withdrawn from each of the on-site shallow monitoring wells and also from one off-site private deep well (Floridan Aquifer) upgradient from the site and from one private deep well downgradient from the site. The laboratory analyses of water from each of the wells are presented in Table IV-2. The column on the right hand side of the table indicates the maximum contaminant level (MCL) allowed under the Federal Safe Drinking Water Act and the Florida Department of Environmental Regulation Rules, Chapter 17-22.

The results of the chemical analyses of the water in each of the two aquifers are summarized as follows:

- 1) Shallow Aquifer: The analyses of four on-site sampling wells indicate that, although the aquifer is not suitable for potable use, there are no major contamination problems (Samples No. 1 - 4 in Table IV-2). Turbidity is the only primary standard which is exceeded, but it does not present a public health hazard.
- 2) Deep Aquifer (Floridan): As anticipated, the water in the Floridan Aquifer shows no contamination and is suitable for potable use. The turbidity (1.6 NTU) in Sample No. 5 exceeds the recommended limit of 1.0 but that is allowed for a single sample. The total dissolved solids and sulfate in Sample No. 5 exceed the recommended limits, but they do not present a public health hazard.

Prior to commencing site operations, additional samples should be collected and analyzed to provide better and more valid water quality base data.

#### SUMMARY

The proposed Mobil Landfill Site, currently used for improved pasture, is located in a sparsely populated area of the County. Ten residential type units have been located within one-half mile of the site's boundaries. Permanent site access will require construction of a new four-span timber bridge and approximately 3,200 feet of new road from the end of existing Kings Road to the southwest corner of the property. If temporary site access is required, about 660 feet of off-site road and 1,350 feet of on-site road improvements will be needed.

The site's surface soils consist of six to 17 feet of moderately to poorly drained sand which overlay a continuous clay layer. This continuous clay layer is essentially impervious, having a Darcy's coefficient of  $K = 6 \times 10^{-8}$  and a thickness ranging from 14 to 35 feet. The clay layer is close enough to the surface in some areas of the site to allow mining it for use in construction of the proposed access road and temporary roads and for use in cell construction on site. Groundwater and leachate control will be the governing factors in the final design of the landfill and in establishing operating procedures for the facility.

The site is probably as well suited, hydrologically and geologically, as any site in Hardee County. Considering the location, the natural screening formed by the on-site bay head, the proposed access route, and the distance from the nearest dwelling, proper operation of this site should create minimal adverse impact on the surrounding area. In summary, initial work indicates that the Mobil Site is suitable for the construction and operation of a Class I Sanitary Landfill.

TABLE IV-1

DESCRIPTION OF MAJOR SOILS ASSOCIATIONS

PROPOSED HARDEE COUNTY SANITARY LANDFILL SITE

<u>Classification No.</u>	<u>Soil Type</u>	<u>Description</u>
10	Pomona Fine Sand	The Pomona Series consists of poorly drained, nearly level soils of the Flatwoods in the hyperthermic region of the coastal plains. Typically, these soils have a very dark gray sand surface horizon underlain to a depth of about 26 inches by layers of gray or light gray sand. Below this to 36 inches are layers of very dark gray sand that are weakly cemented. Between depths of 36 to 51 inches are layers of brownish sand. Below 51 inches to 72 inches or deeper are layers of gray sandy clay loam or light sandy clay.
13	Floridana Mucky Fine Sand Depressional	These are very poorly drained soils that occur on broad low flats. A representative profile has a black sand surface soil about 12 inches thick and a grayish brown sand subsurface layer over a dark gray sandy clay loam subsoil that begins within a depth of 20 to 40 inches below the soil surface. These soils formed in sandy and loamy marine sediments.
15	Immokalee Fine Sand	The Immokalee Series consists of poorly drained sandy soils with a weakly cemented BH horizon below a depth of 30 inches. They occur on the lower atlantic and gulf coastal Flatwoods and formed in sandy marine sediments. In a representative profile, the surface layer is very dark gray fine sand six inches thick. Next is six inches of light gray fine sand and then 23 inches of white fine sand. Between 35 and 54 inches is weakly cemented black and dark reddish brown fine sand, brown fine sand extended to below 80 inches.

TABLE IV-1

DESCRIPTION OF MAJOR SOILS ASSOCIATIONS - (Continued)

<u>Clarification No.</u>	<u>Soil Type</u>	<u>Description</u>
35	Oldsmar Fine Sand	The Oldsmar Series consists of nearly level, poorly drained soils in Flatwoods areas in central and southern Florida. In a representative profile, the surface layer is black fine sand about five inches thick. The subsurface layer is gray and light gray fine sand that extends to about 34 inches deep. Next is about ten inches of black and dark reddish brown fine sand that is coated with organic matter. Mottled fine sandy loam is next and extends to below a depth of 65 inches.
36	Tomoka Muck	The Tomoka Series consists of very poorly drained, nearly level soils that occur in south and central Florida. In a representative profile, the soil is muck to a depth of 27 inches. The upper five inches is very dark brown. The next six inches is dark reddish brown and between depths of 13 to 27 inches it is black. Below this is a layer of very dark gray sand about four inches thick, and then a layer of gray sand about four inches thick. Between depths of 35 to 46 inches is dark gray sandy clay loam underlain by gray sandy loam.

TABLE IV-2

ANALYSIS OF GROUNDWATER FROM THE SURFICIAL AQUIFER AND THE FLORIDAN AQUIFER  
PROPOSED HARDEE COUNTY SANITARY LANDFILL SITE

SAMPLE NUMBER/LOCATION (FIGURE IV-1)	SW 1 (a)	SW 2	SW 3	SW 4 (a)	5 (b)	6 (c)	Safe Drinking Water Act MCL (d)
ESTIMATED APPROXIMATE DEPTH OF WELL	16'	14'	7'	13'	172'	185'	
Primary Standards	VALUES/CONCENTRATIONS						
Units							
<b>Inorganics</b>							
Arsenic as As	mg/l	<0.005	<0.005		<0.005	<0.005	0.05
Barium as Ba	mg/l	<0.005	<0.03		<0.03	<0.005	1.0
Cadmium as Cd	mg/l	<0.002	<0.002		<0.002	<0.002	0.01
Chromium as Cr	mg/l	<0.005	0.017		0.044	0.015	0.05
Lead as Pb	mg/l	<0.01	<0.01		<0.01	<0.01	0.05
Mercury as Hg	mg/l	<0.0005	<0.0005		<0.0005	<0.0005	0.002
Selenium as Se	mg/l	<0.005	<0.005		<0.005	<0.005	0.01
Silver as Ag	mg/l	<0.005	<0.005		<0.005	<0.005	0.05
Nitrate as N	mg/l	0.25	0.03	0.05	<0.02	0.04	10.0
Fluoride as F	mg/l		0.13	0.27	1.0	1.7	(e)
Turbidity	NTU		44 *	31 *	0.49	1.6 *	1.0
<b>Organics</b>							
Endrin	mg/l	<0.0001	<0.0001		<0.0001	<0.0001	0.002
Lindane	mg/l	<0.0002	<0.0002		<0.0002	<0.0002	0.004
Methoxychlor	mg/l	<0.005	<0.005		<0.005	<0.005	0.1
Toxaphene	mg/l	<0.001	<0.001		<0.001	<0.001	0.005
2,4-D	mg/l	<0.02	<0.02		<0.02	<0.02	0.1
2,4,5-TP, Silvex	mg/l	<0.002	<0.002		<0.002	<0.002	0.01
<b>Secondary Standards</b>							
Chloride as Cl	mg/l	80	32	49	11	12	250
Color		15	100	15	70	5	15
Copper as Cu	mg/l	0.006	<0.005	0.037	<0.005	0.008	1
Foaming Agents	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	0.5
Iron as Fe	mg/l	4.6	5.5	3.2	3.4	<0.02	0.3
Manganese as Mn	mg/l	0.01	0.006	0.008	0.013	<0.005	0.05
Odor		1	2	1	1	- 0 -	3
pH		6.3	5.7	5.8	6.1	7.6	6.5
Sulfate as SO <sub>4</sub>	mg/l	7.8	19	14	1.5	275 *	250
TDS	mg/l	238	140	170	68	576 *	500
Zinc as Zn	mg/l	0.034	0.090	0.052	0.019	0.014	5
COD	mg/l	17	28	12	24	9.9	----
Specific Conductance	mg/l	39	145	208	14	670	----
BOD <sub>5</sub>	mg/l		1.3	4.5		2.4	----
Total Phosphorus as P	mg/l		.15	.37		.06	----
<b>General</b>							
Total Hardness as CaCO <sub>3</sub>	mg/l	79	45	33	47	402	----
Total Alkalinity as CaCO <sub>3</sub>	mg/l	87	21	29	50	132	----
N.C.H. as CaCO <sub>3</sub> (C)	mg/l	0	24	4	0	270	----
Bicarbonate as HCO <sub>3</sub> (C)	mg/l	106	26	35	61	161	----
Calcium as Ca	mg/l	20	9.7	8.1	11	90	----
Magnesium as Mg	mg/l	7.1	5.1	2.6	4.6	43	----
Carbon Dioxide as CO <sub>2</sub> (C)	mg/l	80	too low	too low	75	6.0	----
Bicarbonate as CaCO <sub>3</sub> (C)	mg/l	87	21	29	50	132	----
Carbonate as CaCO <sub>3</sub> (C)	mg/l	0	0	0	0	0	----
Hydroxide as CaCO <sub>3</sub> (C)	mg/l	0	0	0	0	0	----
Sodium as Na	mg/l	55	15	32	5.1	16	----
pHs (C)		8.2	9.1	9.0	8.6	7.4	----
Stability Index 2pHs-pH (C)		10	12	12	11	7.2	----
Saturation Index pH-pHs (C)		-1.9	-3.4	-3.2	-2.5	0.2	----
Interpretation		Corro- sive	Corro- sive	Corro- sive	Corro- sive	Stable	----

Notes: (a) Only partial analysis performed on these samples.

(b) Private deep well downgradient from site.

(c) Private deep well upgradient from site.

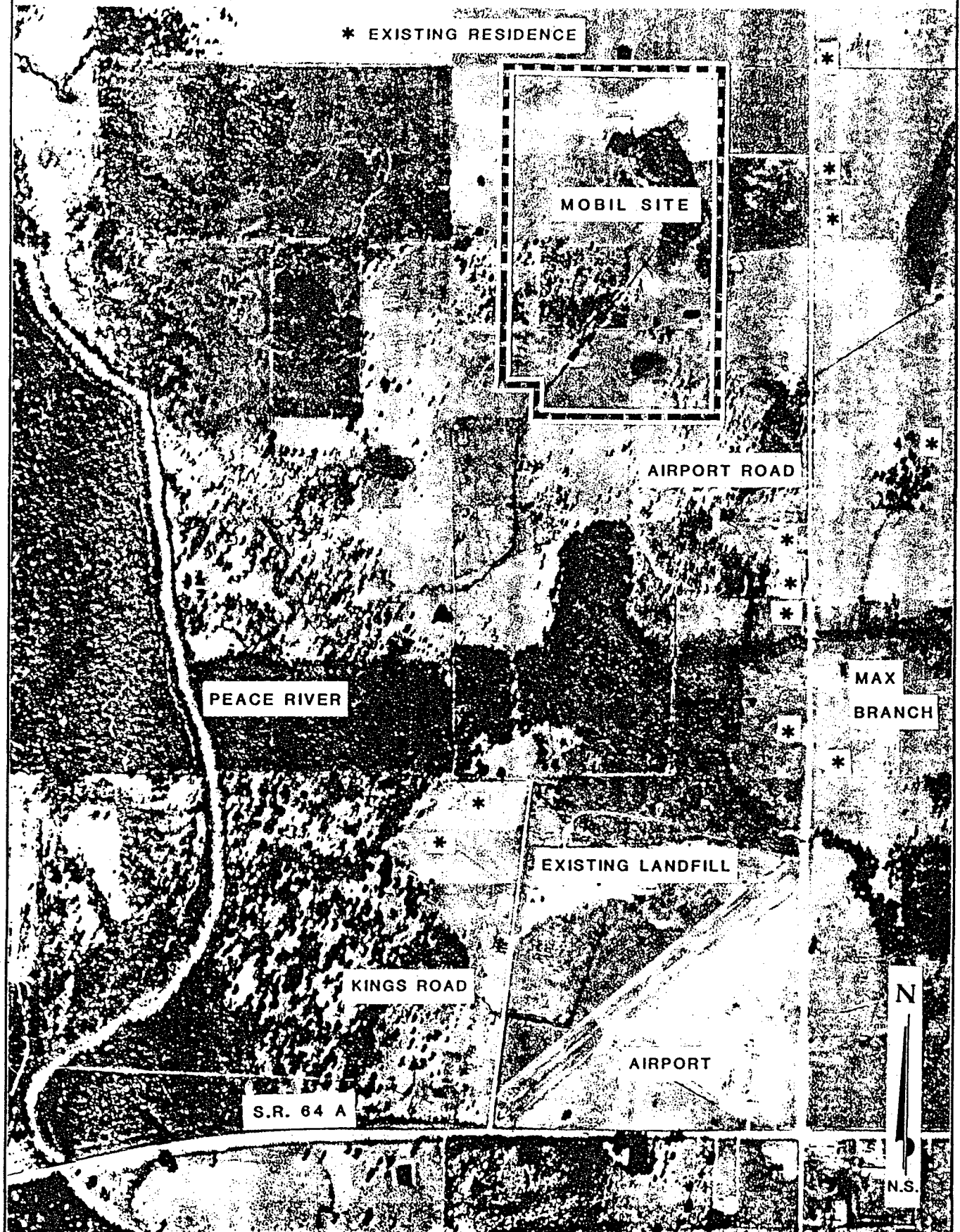
(d) MCL, Maximum Contaminant Level, Federal Safe Drinking Water Act and FDER Rules, Chapter 17-22.

(e) Varies with temperature, between 1.4 and 2.4 mg/l.

\* Exceeds MCL.

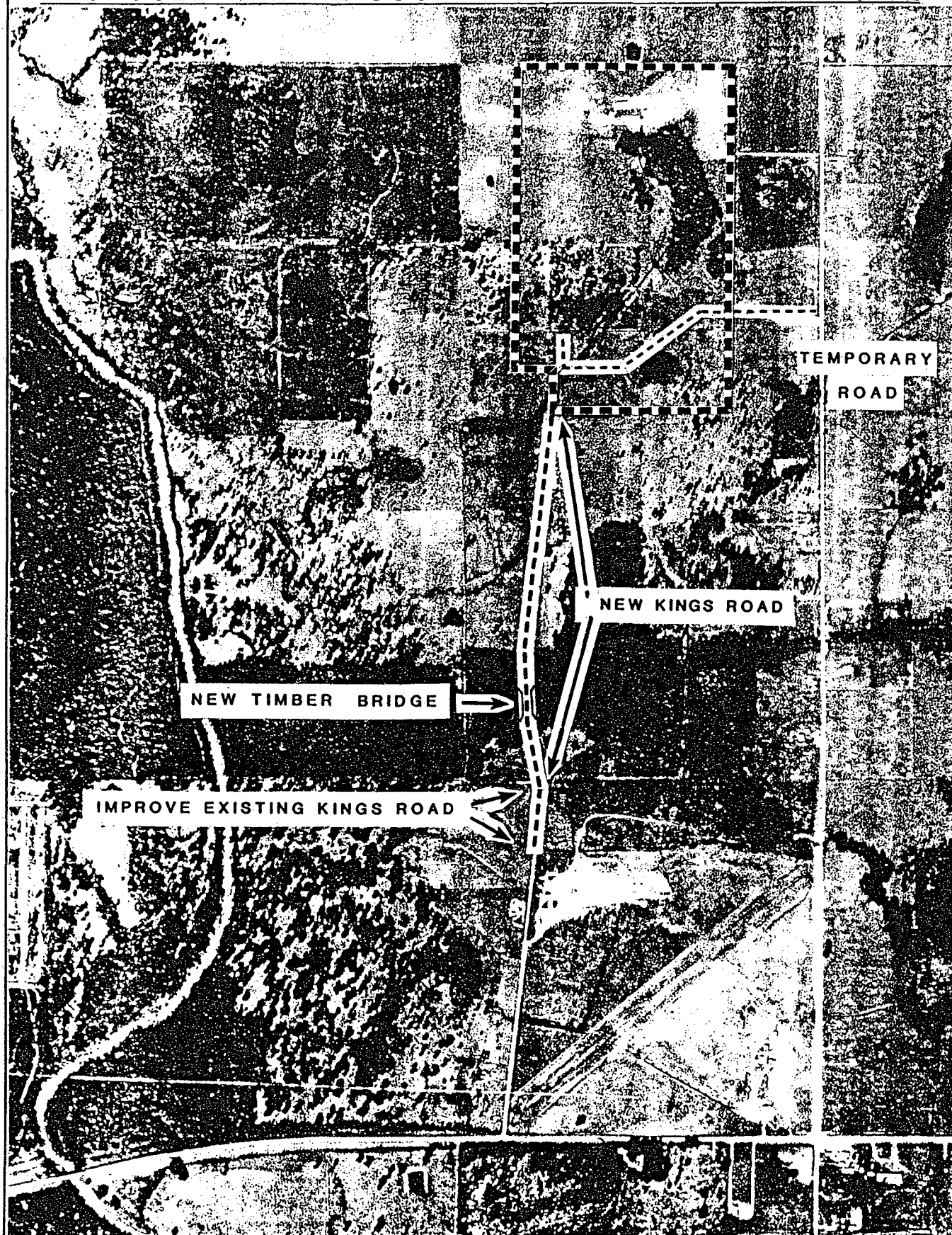
--- Not Applicable.

**SITE VICINITY & SURROUNDING LAND USE**  
**PROPOSED HARDEE COUNTY SANITARY LANDFILL SITE**



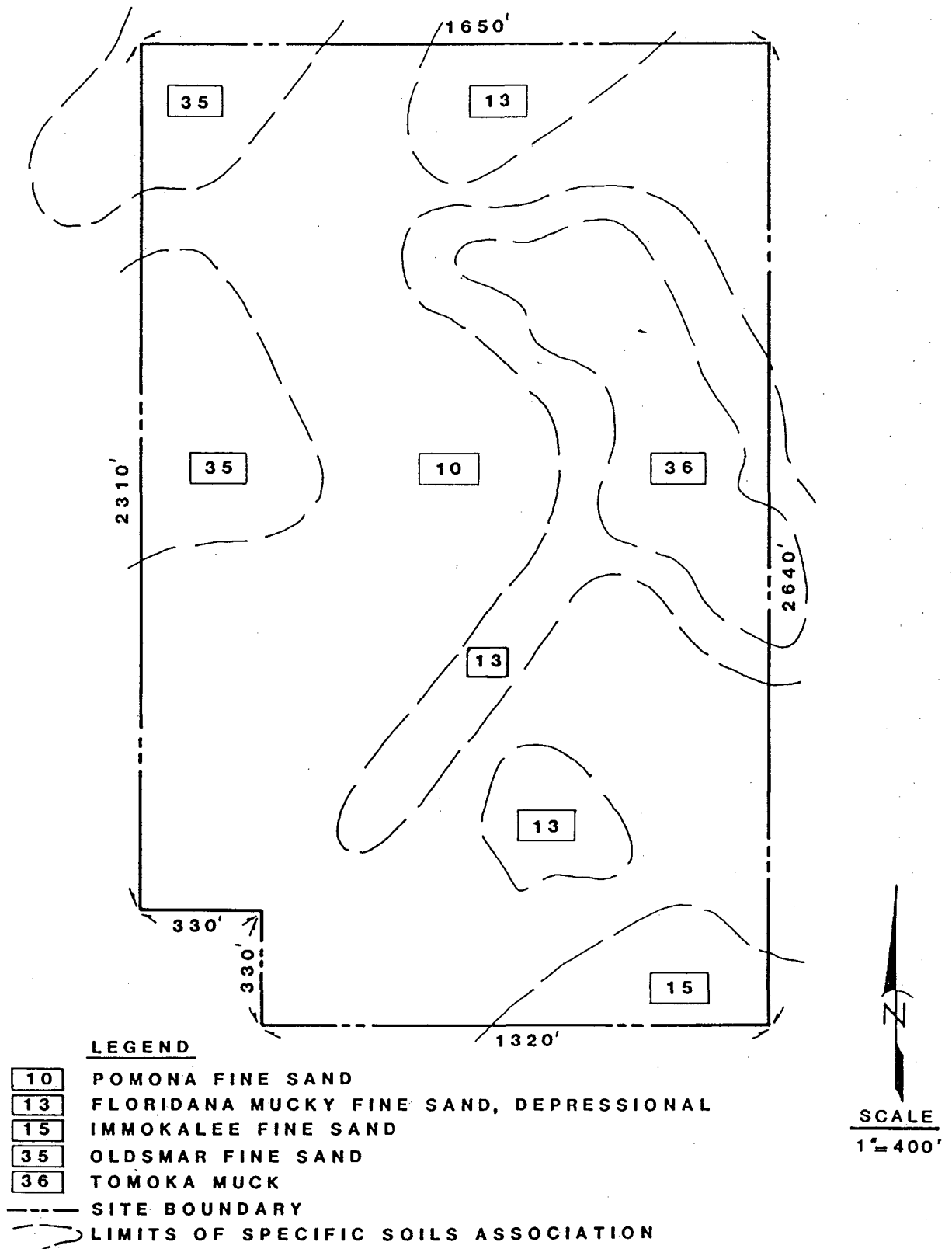


PROPOSED OFF-SITE ROAD IMPROVEMENTS  
AND TEMPORARY ACCESS ROAD  
PROPOSED HARDEE COUNTY SANITARY LANDFILL SITE

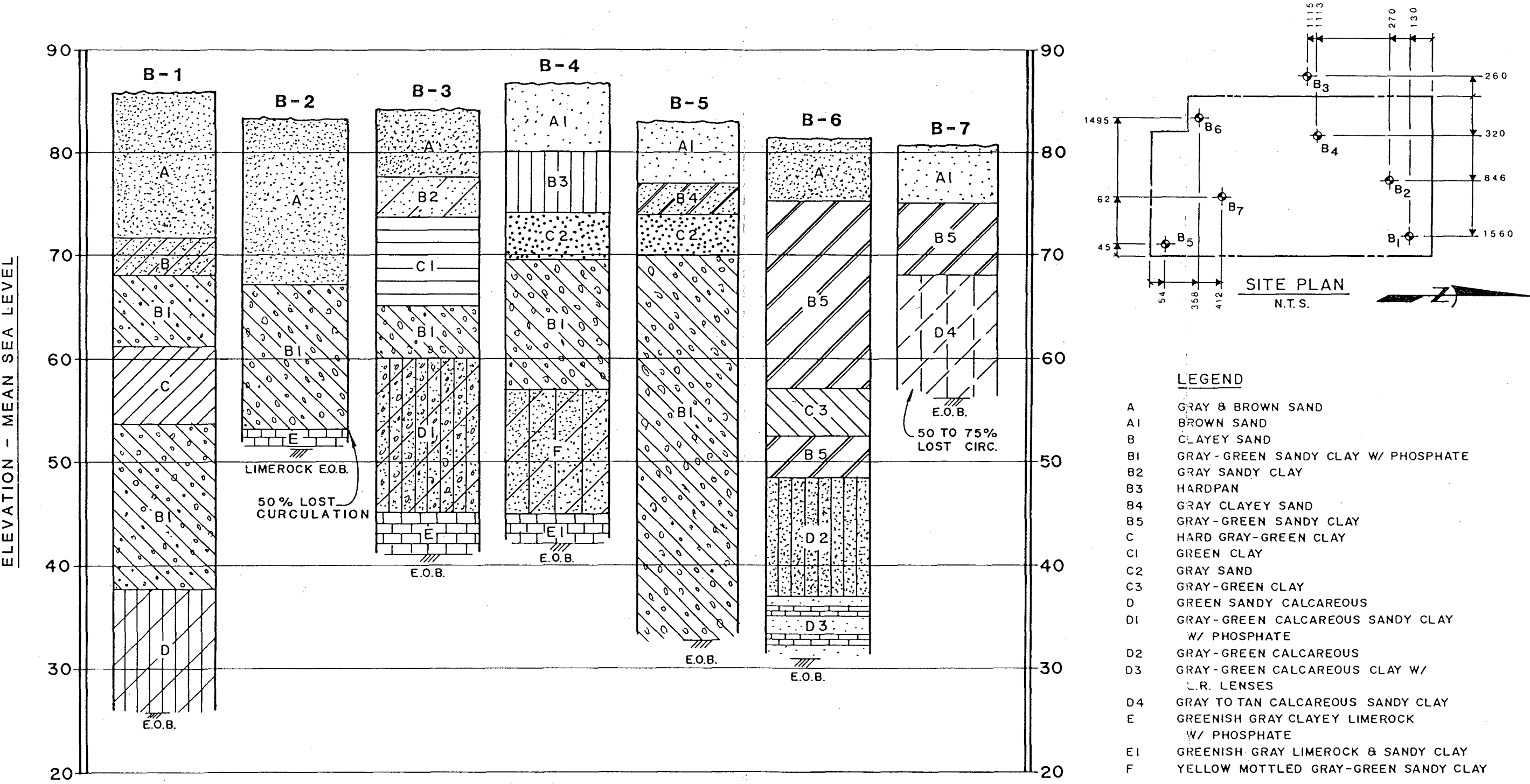


# SURFACE SOILS ASSOCIATIONS

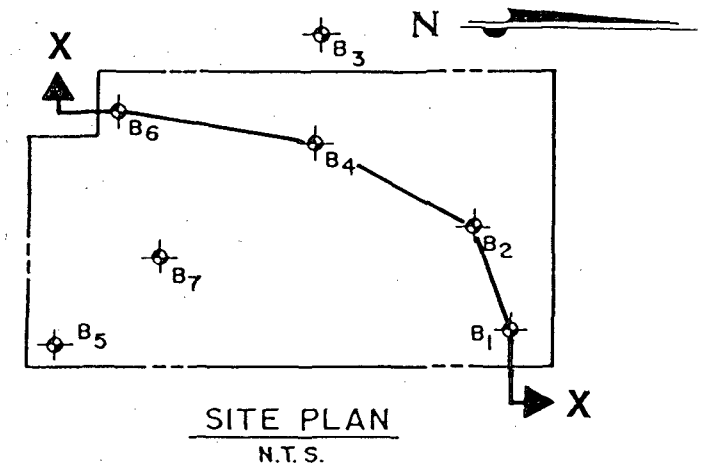
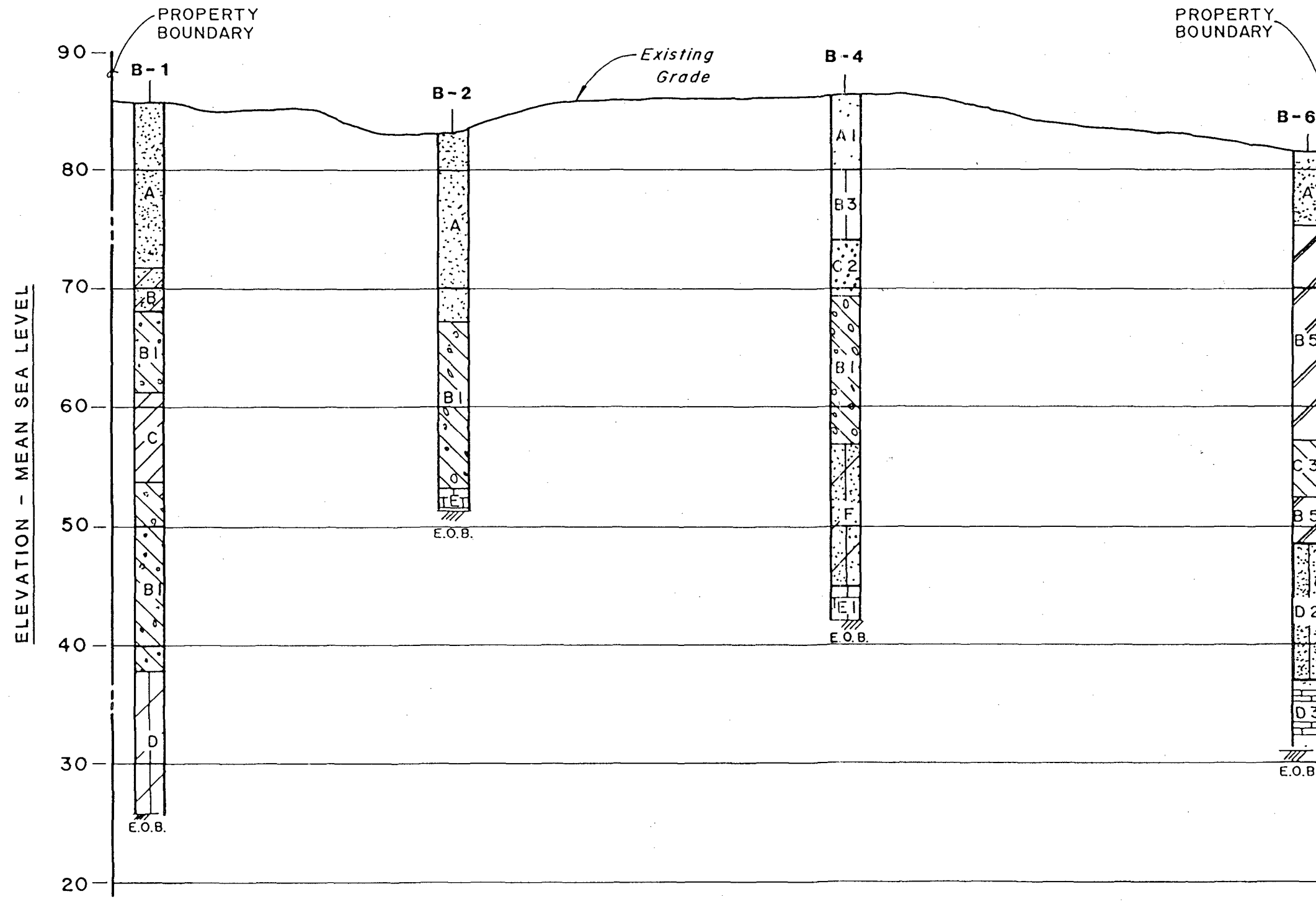
## PROPOSED HARDEE COUNTY SANITARY LANDFILL SITE



**BORING LOCATION PLAN AND  
STRATIGRAPHY SUMMARY  
PROPOSED HARDEE COUNTY SANITARY LANDFILL SITE**



# **BORING LOCATION PLAN AND SOIL STRATIGRAPHY - BORINGS 1, 2, 4, & 6 PROPOSED HARDEE COUNTY SANITARY LANDFILL SITE**



- LEGEND**
- A GRAY & BROWN SAND
  - A1 BROWN SAND
  - B CLAYEY SAND
  - B1 GRAY-GREEN SANDY CLAY W/ PHOSPHATE
  - B2 GRAY SANDY CLAY
  - B3 HARDPAN
  - B4 GRAY CLAYEY SAND
  - B5 GRAY-GREEN SANDY CLAY
  - C HARD GRAY-GREEN CLAY
  - C1 GREEN CLAY
  - C2 GRAY SAND
  - C3 GRAY-GREEN CLAY
  - D GREEN SANDY CALCAREOUS
  - D1 GRAY-GREEN CALCAREOUS SANDY CLAY W/ PHOSPHATE
  - D2 GRAY-GREEN CALCAREOUS
  - D3 GRAY-GREEN CALCAREOUS CLAY W/ L.R. LENSES
  - D4 GRAY TO TAN CALCAREOUS SANDY CLAY
  - E GREENISH GRAY CLAYEY LIMEROCK W/ PHOSPHATE
  - E1 GREENISH GRAY LIMEROCK & SANDY CLAY
  - F YELLOW MOTTLED GRAY-GREEN SANDY CLAY

**SECTION X-X**







CHAPTER V

SITE DEVELOPMENT CONCEPTS AND PRELIMINARY ESTIMATED COST AND TIPPING CHARGE



## CHAPTER V

### SITE DEVELOPMENT CONCEPTS AND PRELIMINARY ESTIMATED COST AND TIPPING CHARGE

#### INTRODUCTION

This Chapter presents: general site development concepts and techniques; operating procedures; preliminary cost estimates; estimated apportioned costs; and an estimated initial tipping charge. The data presented herein will serve as the basis for: the final design and permitting of the sanitary landfill; equipment selection; the first phase construction; the fiscal program; and the initial operations program.

#### DEVELOPMENT CONCEPTS

A conceptual design of the first phase of the proposed Mobil Sanitary Landfill is shown on Figure V-1. As shown thereon, initial operations are scheduled for the northwest corner of this site because this location takes advantage of the natural site buffering offered by the bayhead. Surface water runoff is handled by contouring the site so that runoff flows to a swale system which discharges to the proposed perimeter ditch. The perimeter ditch also intercepts groundwater that would usually traverse the site and lowers the groundwater elevation in the solid waste disposal area. Therefore, the perimeter ditch will minimize the horizontal movement of any leachate which might escape from the disposal cells and also make the cell area dry. As the sanitary landfill expands, the perimeter ditch is extended. Groundwater and surface water runoff accumulating in the perimeter ditch is pumped into the detention pond which overflows a control structure and discharges into the bayhead which discharges into the existing ditch.

All on-site roadways will consist of in-situ earth, stabilized with clay mined on site. The equipment storage and maintenance facilities shown on Figure V-1 include fuel storage and equipment maintenance facilities. The gate house is equipped with office equipment necessary for revenue collection and record keeping, communications equipment, and restroom facilities for the gatekeeper and operating personnel.

Figure V-2 shows conceptual development cross sections of the solid waste disposal cells. The cells are constructed in two major lifts, one below existing grade and the other above existing grade. This procedure accomplishes two goals: (1) it minimizes the area required for solid waste disposal with a corresponding reduction in excavation and roadway construction; and (2) it facilitates the collection and treatment of leachate if it should prove necessary. The top of completed cell families are covered with relatively impervious material, grassed, and sloped to control surface runoff, hence minimizing downward percolation of runoff into cells (Figure V-2).

#### OPERATING PROCEDURES

There are three basic components of sanitary landfill operation: solid waste handling; site and equipment maintenance; and accounting procedures. Each of these areas must be specifically addressed in developing a long range sanitary landfill management plan.

Solid waste handling covers all operations related to receiving, compacting, and burying the solid waste. It includes maintaining traffic flow in and out of the landfill, constructing and maintaining the groundwater control system, and operating the disposal cells.

Site and equipment maintenance encompasses all other aspects of the operation except for accounting procedures. It includes maintenance of all equipment and structures and general groundskeeping. All scheduled maintenance should be performed in accordance with equipment manufacturers' recommendations and established time schedules. Groundskeeping should be carried out on a routine basis to maintain the facility as a 'Good Neighbor'.

Accounting procedures address the establishment and implementation of a system of rates and charges and record keeping for all financial transactions. The system should be established such that actual unit cost information can be generated on an annual basis for each piece of equipment assigned to the landfill operation. This can be done by establishing an equipment service and maintenance recording procedure which is consistent with the County's financial accounting system.

#### SITE ACCESS

Although the least cost access to the Mobil Site would be a new road west from Airport Road to the site, specific sections of the lease with Mobil Chemical Company require that access be from the south via an extension of Kings Road (Figure IV-3). Mobil Chemical Company has granted a 60 foot easement for construction of this road, with the provision that they and the County mutually agree on the final road alignment. If temporary access from Airport Road is required, an easement must be obtained.

At present, the improved portion of Kings Road ends immediately north of the entrance to the existing landfill site. By curving slightly to the west to pass through a previously cleared section of the swamp bounding Max Branch, the road can be extended in a nearly straight line north to the south boundary of the site (Figure IV-3). The proposed roadway will be a 24 foot wide stabilized road with swale drainage on both sides. It is anticipated that the clay required for stabilization can be mined on the new landfill site. A new four-span timber bridge will be required across Max Branch (Figure IV-3).

#### SITE DEVELOPMENT COMPONENTS AND ESTIMATED COSTS

##### General

Following preliminary site investigations (this Report), development of a sanitary landfill site involves four basic areas of endeavor:

- 1) Final design and permitting;
- 2) Construction;
- 3) Equipment selection; and
- 4) Establishing Landfill Operating Procedures.

Table V-1 presents a detailed capital cost estimate for permitting, developing, implementing, and financing a Class I Sanitary Landfill at the Mobil Site.

The estimated equipment costs are principally based on quotes received from vendors and they total \$617,205.

#### On-Site Improvements

This item includes the costs associated with the various on-site construction items required to commence operations. They include the potable water supply system, a maintenance and storage shed for the heavy equipment, the gatekeeper's office, fencing, and roadways. The cost of initial cell construction and excavating the perimeter ditch is considered as an operating cost and is not included therein. The specific items are shown in Table V-1 together with their estimated costs. The total estimated cost for these items is \$120,290 (Table V-1).

#### Off-Site Improvements

This item includes the cost of: improving the existing portion of Kings Road from S.R. 64A to the existing landfill entrance; the complete construction of Kings Road north to the Mobil Site; construction of a bridge at Max Branch; and constructing a temporary access road from Airport Road to the site and across the site to the main road. The costs shown are derived from conversations with road contractors and bid prices on file from similar work. The total estimated cost of these items is \$178,848 (Table V-1).

#### Engineering, Legal, and Fiscal Services

This item includes the cost of: (1) preparing the Preliminary Feasibility Report; (2) any additional field work (soil borings, field surveys, sampling well construction, water sampling and analyses, etc.); (3) developing the final design; (4) preparing the final construction drawings and specifications; (5) preparing and processing the required FDER construction permit; (6) establishing operating and accounting procedures; (7) obtaining legal and fiscal services; (8) obtaining interim financing; and (9) processing, administering, and managing the Farmers Home Administration (FmHA) loan. The estimated costs are given on Table V-1 and they total \$137,451.

#### Summary

The preliminary estimated total capital cost required to develop an operational Class I Sanitary Landfill at the Mobil Site, including an allowance for contingencies, but excluding all cell and ditch construction, is itemized in Table V-1 and totals \$1,053,794.

#### ESTIMATED ANNUAL REVENUE REQUIREMENTS AND POTENTIAL REVENUE SOURCES

##### Revenue Requirements

Assuming an FmHA loan of \$1,053,800 and level annual debt service for 20 years at 5.5 percent interest, the debt service is \$88,181 per year (CRF = 0.08368).

In addition to repaying the FmHA loan, monies are required for: personnel; funding the renewal and replacement (R & R) account; maintenance; and operations. The major cost item will be funding the R & R account. Assuming

## Final Design and Permitting

Final design and permitting encompasses: All required additional field work (soil borings, surveys, well construction, water sampling and analyses, etc.); Preparation of the final construction documents (drawings and specifications); Preparation of and processing the FDER permit; Preparation of equipment and materials specifications; and Assisting the County with purchasing equipment, constructing the landfill and its appurtenances, and initial start-up and debugging of the landfill. The estimated cost for these services is included in the cost of engineering, fiscal, and legal services, interim financing, etc.

## Equipment

Conferences were held with Hardee County staff to solicit their opinions and specific requirements regarding equipment. Equipment vendors were then contacted to refine equipment needs. Table V-1 provides a complete list of all equipment items. The following major equipment inventory has been established as being the minimum required for satisfactory operation of the proposed sanitary landfill.

- 1) Bulldozer - Equivalent to Caterpillar D-6 for minor excavation, solid waste moving, crushing, compaction, and applying daily and final cover. This item of equipment may also be used by the County Road Department on a cost-sharing basis.
- 2) Front End Loader - Equivalent to Caterpillar Model 950 with 3 cubic yard bucket for minor excavation, moving cover dirt on-site, and for towing stuck garbage trucks. This item of equipment may also be used by the County Road Department on a cost-sharing basis.
- 3) Dragline w/1 Cubic Yard Bucket and Extra Long (70') Boom - Equivalent to American 500 series for excavation of cells, groundwater control ditches, and ponds. This item of equipment may also be used by the County Road Department on a cost-sharing basis.
- 4) Pick-up Truck, Compact Series - For transportation of maintenance equipment and general use.
- 5) Maintenance Equipment - Shop tools, an arc welder, and a steam jenny for maintaining equipment; fuel storage and transfer equipment; and fire control equipment.
- 6) Office Equipment - Includes a copy machine, cash register, time clock, and office furniture for cash handling, accounting, and record keeping.
- 7) Communication Equipment - Includes a mobile unit for the pick-up truck and two portable units for the operators.
- 8) Groundwater Pumps - Low head, high volume electric pumps for control of groundwater.

a useful life of ten (10) years for major equipment and a 25 percent escalation cost, the R & R account must be funded at \$60,000/year  $((\$130,000 + \$225,000 + \$125,000) \times 1.25)/\text{ten years}$ ). All other operating costs are estimated at \$2.50/yd<sup>3</sup> of solid waste handled. Estimated annual revenue requirements through 1986 are set forth in Table V-2 and are summarized below.

#### ESTIMATED ANNUAL REVENUE REQUIREMENTS THROUGH 1986

<u>Year</u>	<u>Total Required Revenue</u>
1982	214,900
1983	216,900
1984	219,000
1985	221,080
1986	223,200

#### Potential Revenue Sources

There are two potential sources of revenue: landfill tipping charges; and the County's general fund. The County's general fund is included because it is expected that the heavy equipment (dragline, bulldozer, and front end loader) will be used by the Road and Bridge Department for other County activities. The estimated apportionment of use and cost is given in Table V-3 and is summarized below. This apportionment estimate should be revised to reflect actual conditions.

#### ESTIMATED APPORTIONED COST OF SHARED ITEMS

ITEM	SHARED COST - \$/Yr							
	Landfill Account				General Fund			
	% Used	Capital Cost	R & R Fund	Total	% Used	Capital Cost	R & R Fund	Total
Dragline	40	7,532	11,250	18,782	60	11,298	16,875	28,173
Bulldozer	60	6,528	9,750	16,278	40	4,352	6,500	10,852
Loader	60	6,276	9,375	15,651	40	4,184	6,250	10,434
Totals	N/A	20,336	30,375	50,711	N/A	19,834	29,625	49,084

All other required revenue must be generated from landfill charges.

#### Estimated Tipping Charge

Based on: the aforementioned revenue needs (Table V-2); shared costs (Table V-3); and medium range solid waste values (Table III-2); estimated landfill tipping charges are given in Table V-4 and are summarized on the following page.

ESTIMATED LANDFILL TIPPING CHARGES

<u>Year</u>	<u>Estimated Tipping Charge (\$/Yd<sup>3</sup>)</u>
1982	6.26
1983	6.18
1984	6.10
1985	5.95
1986	5.88

Once costs are finalized, the tipping charge should be recomputed to reflect more valid cost data.

TABLE V-1

PRELIMINARY CAPITAL COST ESTIMATE  
PROPOSED HARDEE COUNTY SANITARY LANDFILL SITE

<u>No.</u>	<u>Item</u>	<u>No. Required</u>	<u>Unit Cost (\$)</u>	<u>Estimated Cost 1st Quarter - 1982\$</u>	<u>Notes</u>
I)	<u>Land</u>	97.5 Ac.	- 0 -	- 0 -	(k)
II)	<u>Equipment</u>				
	A) Cat D-6 Bulldozer	1	130,000	130,000	(a)
	B) 1 Cy. Yd. Dragline w/Extra Long Boom, 70' min.	1	225,000	225,000	(b)
	C) Cat 950 3 cu. yd. Rubber Tire Front End Loader	1	125,000	125,000	(a)
	D) Compact Pick-up Truck w/ A/C	1	7,000	7,000	
	E) 1,000 gal. Buried Fuel Tank w/Elec. Pump	1	2,000	2,000	(c)
	F) Office Equipment Inventory including Xerox, Cash Register, Time Clock, Furniture, etc.	LS	4,000	4,000	
	G) Air Compressor	1	1,500	1,500	
	H) Groundwater Transfer Pumps w/Electric Motor Drives	2	15,000	30,000	(h)
	I) 250 Amp Arc Welder	1	1,000	1,000	
	J) Shop Maintenance Tool Inventory	LS	4,000	4,000	
	K) Fire Extinguishers (25 lb. min.)	4	175	700	(e)
	L) Steam Jenny	1	1,500	1,500	
	M) Radio Communications				
	1) Mobile	1	1,500	1,500	(d)
	2) Hand	2	1,000	2,000	(d)
	N) Fire Hose (1-1/2" w/Nozzle)	1,000 lf	1.50	1,500	(e)
	O) Subtotal	N/A	N/A	536,700	
	P) Contingencies @ 15%	N/A	N/A	80,505	
	Q) Equipment Subtotal	N/A	N/A	617,205	

-- (Continued) --

TABLE V-1

PRELIMINARY CAPITAL COST ESTIMATE - (Continued)  
PROPOSED HARDEE COUNTY SANITARY LANDFILL SITE

<u>No.</u>	<u>Item</u>	<u>No. Required</u>	<u>Unit Cost (\$)</u>	<u>Estimated Cost 1st Quarter - 1982\$</u>	<u>Notes</u>
III)	<u>On-site Improvements</u>				
	A) Rework Existing Barbed Wire Perimeter Fence and Gates	LS	2,000	2,000	
	B) Road w/Ditch Culvert	2,550 lf	22	56,100	(f)
	C) Operating/Gate House w/Sanitary Facilities	600 sf	20	12,000	
	D) New Groundwater Monitoring Wells	5	500	2,500	
	E) Water Well w/Pump, Appurtenances, and Piping	LS	10,000	10,000	
	F) Fire Hydrants	3	1,000	3,000	
	G) Enclosed 20' x 40' Pole Shed Maintenance/Equipment Structure w/Concrete Floor Slab	800 sf	10	8,000	
	H) 12' Chain Link Fence w/Barbed Wire Around Items II-E, III-C, and III-G	400 lf	10	4,000	
	I) Entrance Beautification and Signage	LS	1,000	1,000	
	J) Septic Tank, Drainfield, and Outside Piping	1	1,000	1,000	
	K) Site Lighting	LS	3,000	3,000	
	L) Leachate Control				
	1) PVC Liner	- 0 -	- 0 -	- 0 -	
	2) Clay Liner	- 0 -	- 0 -	- 0 -	
	3) Collection System	LS	2,000	2,000	
	4) Treatment and Disposal Facilities	1	25,000	- 0 -	(i)
	M) Gas Venting and Control	N/A	N/A	N/A	(j)
	N) Subtotal	N/A	N/A	104,600	
	O) Contingencies @ 15%	N/A	N/A	15,690	
	P) On-Site Improvements Subtotal	N/A	N/A	120,290	

-- (Continued) --



TABLE V-1

PRELIMINARY CAPITAL COST ESTIMATE - (Continued)  
PROPOSED HARDEE COUNTY SANITARY LANDFILL SITE

<u>No.</u>	<u>Item</u>	<u>No. Required</u>	<u>Unit Cost (\$)</u>	<u>Estimated Cost 1st Quarter - 1982\$</u>	<u>Notes</u>
IV)	<u>Off-site Road Improvement Costs</u>				
	A) Airport Road to Site and to Main On-Site Road (Temporary)	2,160 lf	22	47,520	
	B) Extension of Kings Road (Clearing, Grubbing, and Stabilized 24' Road)	3,200 lf	27	86,400	
	C) Kings Road 4 Span Timber Bridge	1	15,000	15,000	(g)
	D) Rework Existing Kings Road From Existing Landfill Entrance to its Termination	550 lf	12	6,600	
	E) Subtotal	N/A	N/A	155,520	
	F) Contingencies @ 15%	N/A	N/A	23,328	
	G) Off-site Road Improvements Subtotal	N/A	N/A	178,848	
V)	Subtotal, Items I through IV	N/A	N/A	916,343	(e)
VI)	Engineering, Legal, Fiscal Services, and Interest During Construction. Estimated at 15 percent of Item V (Includes Preliminary Feasibility Report, Surveys, Existing Monitoring Wells, Water Quality Testing, Permitting, etc.)	N/A	N/A	137,451	(e)
VII)	TOTAL ESTIMATED COST			1,053,794	(e)

Notes: (a) By Rozier Equipment Company; (b) By M.D. Moody & Sons, Inc.; (c) By Robert H. Hart & Sons; (d) By Motorola; (e) By Polk County Fire Department; (f) By Ed McElroy, Macasphalt Corporation, and assumes provision of fill and clay by County from landfill site and excavated by Contractor; (g) By Hardee County; (h) By M & W Pump Company; (i) Not expected to be required due to impervious clay base and dewatering; (j) Not required at present, future operating cost; (k) Leased from Mobil Chemical Company for annual property taxes; and (l) These costs are rounded to the nearest \$100.

TABLE V-2

## ESTIMATED ANNUAL REVENUE REQUIREMENTS THROUGH 1986

Year	Heavy Equipment R & R Fund (a)	Debt Service	Operating Expense (b)	Required Revenue
	(\$)	(\$)	(\$)	(\$)
1982	60,000	88,200	66,700	214,900
1983	60,000	88,200	68,700	216,900
1984	60,000	88,200	70,800	219,000
1985	60,000	88,200	72,800	221,000
1986	60,000	88,200	75,000	223,200

Notes: (a) Based on ten year life and 25 percent cost increase.

(b) Based on \$2.50/yd<sup>3</sup> of solid waste handled; maximum solid waste volume values used.

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TABLE V-3

## ESTIMATED APPORTIONED COST OF SHARED ITEMS

ITEM	CAPITAL COST		R & R FUNDING (b)	SHARED COST - \$/Yr							
	Total	Amortized (a)		Landfill Account				General Fund			
	\$	\$/Yr		% Used	Amortized Capital Cost	R & R Fund	Total	% Used	Amortized Capital Cost	R & R Fund	Total
Dragline	225,000	18,830	28,125	40	7,532	11,250	18,782	60	11,298	16,875	28,173
Bulldozer	130,000	10,880	16,250	60	6,528	9,750	16,278	40	4,352	6,500	10,852
Loader	125,000	10,460	15,625	60	6,276	9,375	15,651	40	4,184	6,250	10,434
Totals	480,000	40,170	60,000	N/A	20,336	30,375	50,711	N/A	19,834	29,625	49,459

Notes: (a) Based on 20 year term, 5.5 percent interest rate, and level debt service; CRF = 0.08368.

(b) Reference: Table V-2.

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TABLE V-4

## ESTIMATED EXPENSES AND TIPPING CHARGE

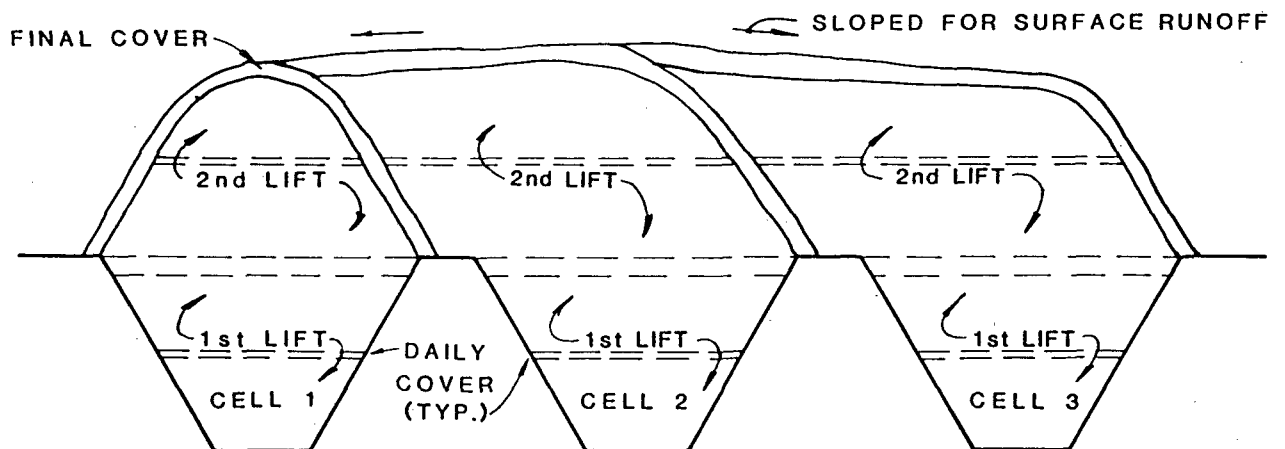
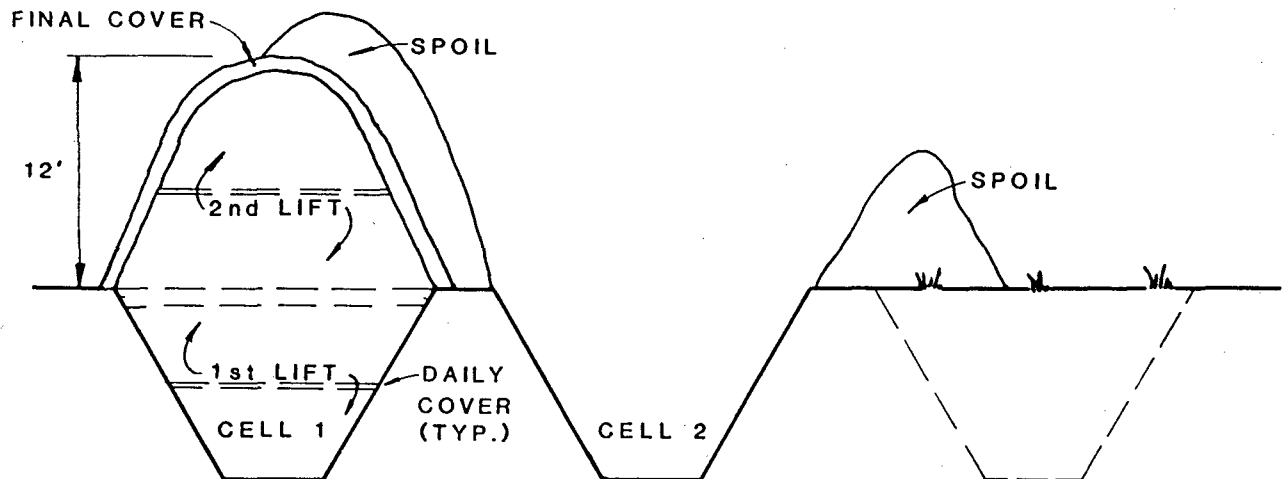
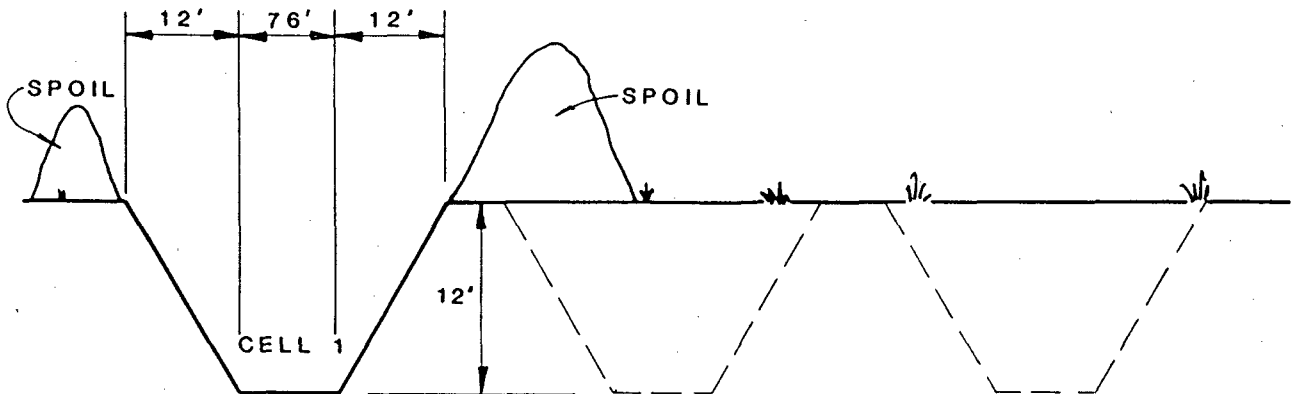
YEAR	EXPECTED MEDIUM SOLID WASTE VOLUME (Yd <sup>3</sup> )	ESTIMATED EXPENSES				ESTIMATED LANDFILL TIPPING CHARGE (\$/Yd <sup>3</sup> )
		Debt Service	R & R Fund	Operating Expense	Total	
		\$ (a)	\$ (b)	\$ (c)	\$	
1982	26,412	68,366	30,375	66,700	165,441	6.26
1983	27,099	68,366	30,375	68,700	167,441	6.18
1984	27,785	68,366	30,375	70,800	169,541	6.10
1985	28,472	68,366	30,375	72,800	171,541	5.95
1986	29,180	68,366	30,375	75,000	173,741	5.88

Notes: (a) Total debt service, less County share (Table V-3).

(b) Total R & R Fund Expense, less County share (Table V-3).

(c) Reference: Table V-2.

# CONCEPTUAL CELL DEVELOPMENT CROSS SECTIONS MOBIL SANITARY LANDFILL SITE



APPENDIX A

SOIL BORING LOGS

**LOG OF BORING**

Ref: 8150

Boring No. B-1

Project: Mobil Landfill-Hardee County  
Client: Envisors, Inc.  
Location: See Drawing  
Elevation: Approx. 86.0' MSL

Date Drilled: 11-23-81  
Type of Boring: SPT  
Rig: Buddy Systems, Inc.  
Depth to Ground Water: NA feet

Depth of Boring	(1) Blows per 6 inches	Sample Number	Depth in feet	Description	Depth in feet
2.5	4- 7- 7	1		Medium dense light gray fine sand	
5.0	4- 9- 9	2	5	Medium dense brown fine sand	5
7.5	6-10-9	3		Medium dense light gray fine sand	
10.0	6- 8- 9	4	10	Medium dense light gray to white fine to medium sand	10
12.5	6-12-21	5		Dense same	
15.0	11-17-25	6	15	Dense gray fine to medium sand (very slightly silty)	15
19.5	5- 4- 2	7	20	Firm gray green sandy clay w/trace of P04 pebble and feed	20
25.0	6-12-21	8	25	Hard mottled gray to orange-tan slightly sandy clay w/trace of P04 feed and pebble	25
30.0	12-14-26	9	30	Hard mottled gray/green clay	30
35.0	6-10-28	10	35	Hard gray green sandy clay and black P04 feed	35
40.0	15-34-67	11	40	Hard light gray green fine sandy clay and fine black P04 feed	40

(1) 2 inch diameter sampler, 140 lb. weight dropped 30 inches  
Remarks:

Boring No. B-1  
Sheet 1 of 2



# LOG OF BORING

Project: Mobil Landfill-Hardee County  
Envisors, Inc.

Boring No. 8150

Depth of Boring	(1) Blows per 6 inches	Sample Number	Depth in	Description	Depth in
45.0	14-18-28	12	45	Same	45
50.0	60-53-81	13	50	Hard gray green calcareous fine sandy clay w/some fine black P04 feed w/trace of limestone gravel	50
55.0	16-20-31	14	55	Same	55
58.0	23-68-51	15	60	Same w/lense of gray limestone and fine black P04 feed	60
65.0	20-23-23	16	65	Hard light gray green calcareous fine slightly sandy clay w/trace of limestone gravel and trace of fine P04 feed	65
69.8	<sup>100</sup> 45-28-2.5"	17	70	Refusal-Hard dark gray green fine slightly sandy clay w/trace of black P04 feed	70
			75	E.O.B. 69.8'	75
			80	Borehole backgrouted with cement-bentonite grout (approx. 30 gals.)	80
			85		85

Remarks:

Boring No. B-1

**LOG OF BORING**

Ref: 8150  
Boring No. B-2

Project: Mobil Landfill-Hardee County  
Client: Envisors, Inc.  
Location: See Drawing  
Elevation: Approx. 85.5' MSL

Date Drilled: 11-23-81  
Type of Boring: SPT  
Rig: Buddy Systems, Inc.  
Depth to Ground Water: 3.0 feet (11-24-81)

Depth of Boring	(1) Blows per 6 inches	Sample Number	Depth in feet	Description	Depth in feet
5.0	6- 6- 5	1	5	Medium dense fine brown sand	5
10.0	9-14-18	2	10	Hard gray green fine to medium sandy clay	10
15.0	10-23-34	3	15	Very dense gray medium sand	15
20.0	10- 8- 4	4	20	Medium dense gray to brown fine to medium slightly clayey sand,	20
25.0	1- 2- 1	5	25	Soft gray green fine to medium sandy clay w/ trace of fine black PO4 feed	25
30.0	9- 8- 8	6	30	Very stiff gray, green calcareous sandy clay w/ lenses of limestone & trace-some PO4 feed & pebble-50% loss of drill fl.circ. @ 30.0'	30
31.6	50/<1"	7	30	Refusal- Hard gray limestone w/ PO4 pebble & feed intrusions	30
			35	E.O.B. 31.6'	35
			40	Borehole backgrouted with cement-bentonite grout.	40
				Approx. 50% loss of drill fluid circulation at depth 30.0'	40

Remarks: (1) 2 inch diameter sampler, 140 lb. weight dropped 30 inches

Boring No. B-2  
Sheet 1 of 1

# LOG OF BORING

Ref: 8150  
Boring No. B-3

Project: Mobil Landfill-Hardee County  
Client: Envisors, Inc.  
Location: See Drawing  
Elevation: Approx. 84.0' MSL

Date Drilled: 11-25-81  
Type of Boring: SPT  
Rig: Buddy Systems, Inc.  
Depth to Ground Water: NA feet

Depth of Boring	(1) Blows per 6 inches	Sample Number	Depth in feet	Description	Depth in feet
5.0	7-10- 9	1	5	Gray fine sand	5
10.0	18-29-30	2	10	Medium dense mottled gray to brown fine clayey sand	10
15.0	3- 5- 6	3	15	Hard light gray fine sandy clay	15
20.0	3- 3- 5	4	20	Stiff green clay	20
25.0	18-52-73	5	25	Firm green sandy clay w/some gray to brown medium PO4 feed	25
30.0	12-23-28	6	30	Hard light gray green slightly calcareous sandy clay w/ some gray to brown fine to medium PO4 feed	30
35.0	18-27-59	7	35	Hard gray green to tan slightly calcareous sandy clay and gray to brown to black PO4 pebble and feed	35
39.8	32-37-4" 100	8	40	Hard mottled light gray green to tan slightly calcareous fine sandy clay w/trace to some fine black PO4 feed	40
42.5	27-28-50	9		Refusal - Hard green sandy clay & slightly churty limestone w/fine black PO4 feed	
				Hard gray green slightly churty limestone w/ fine black PO4 feed	

E.O.B. 42.5'

(1) 2 inch diameter sampler, 140 lb. weight dropped 30 inches  
Remarks: Borehole backgrouted with cement-bentonite grout

Boring No. B-3  
Sheet 1 of 1



# LOG OF BORING

Ref: 8150  
Boring No. B-4

Project: Mobil Landfill-Hardee County  
Client: Envisors, Inc.  
Location: See Drawing  
Elevation: Approx. 85' MSL

Date Drilled: 11-24-81  
Type of Boring: SPT  
Rig: Buddy Systems, Inc.  
Depth to Ground Water: NA feet

Depth of Boring	(1) Blows per 6 inches	Sample Number	Depth in feet	Description	Depth in feet
5.0	8-11-11	1	5	Medium dense mottled brown to light brown fine slightly clayey sand	5
10.0	18-17-14	2	10	Dense dark brown slightly cemented fine organic sand (hardpan)	10
15.0	16-18-10	3	15	Medium dense gray fine to medium sand w/trace to some black P04 feed	15
20.0	2- 4- 6	4	20	Stiff mottled gray green to tan very slightly fine sandy clay	20
25.0	7- 8-11	5	25	Very stiff same w/lenses of gray phosphatic sand	25
30.0	8-18-42	6	30	Hard yellow tan calcareous fine slightly sandy clay w/trace to some fine black P04 feed	30
35.0	12-18-29	7	35	Hard mottled yellow-tan to gray green Same	35
40.0	7- 8-16	8	40	Very stiff mottled yellow tan to gray green sandy clay & P04 feed and pebble (abundant to rich)	40

Remarks: (1) 2 inch diameter sampler, 140 lb. weight dropped 30 inches

Boring No. B-4  
Sheet 1 of 2



# LOG OF BORING

Project: Mobil Landfill-Hardee County  
Envisors, Inc.

Boring No. B-4

Depth of Boring	(1) Blows per 6 inches	Sample Number	Depth in	Description	Depth in
45.0	15-35-42	9	45	Hard gray green very sandy clay and fine black PO4 feed (abundant to rich)	45
48.8	100/3"	10		Refusal-Hard gray-green limestone w/fine blk. PO4 feed & gray-green sandy clay	
			50	E.O.B. 48.8'	50
			55	Borehole backgrouted with cement-bentonite grout	55
			60		60
			65		65
			70		70
			75		75
			80		80
			85		85

Remarks:

Boring No. B-4

**LOG OF BORING**

Ref: 8150  
Boring No. B-5

Project: Mobil Landfill-Hardee County  
Client: Envisors, Inc.  
Location: See Drawing  
Elevation: Approx. 80' MSL

Date Drilled: 11-25-81  
Type of Boring: SPT  
Rig: Buddy Systems, Inc.  
Depth to Ground Water: NA feet

Depth of Boring	(1) Blows per 6 inches	Sample Number	Depth in feet	Description	Depth in feet
5.0	4- 2- 2	1	5	Loose brown to light brown fine sand	5
				Gray clayey sand	
10.0	7-13-19	2	10	Dense lt.gray-gray fine-medium sand w/trace of fine blk.P04 feed (grading to clayey sand)	10
		3A		Gr-grn sl. calcareous clay w/gr.clayey sand & P04 pebble and feed	
15.0	9-12-13	3	15	Medium dense dark gray clayey sand and black P04 feed and pebble	15
20.0	16-38-17	4	20	Hard tan grav. calc. clay w/limestone lenses	20
				Hard brown churty limestone (wash classification)	
24.0		5A		Hard tan gravelly calcareous clay w/limestone lenses	
25.0	33-24-59	5	25	Hard gray green calcareous sandy clay w/some black P04 feed and pebble	25
30.0	11-18-26	6	30	Hard light gray green calcareous sandy clay w/ some black P04 feed and pebble	30
35.0	11-16-24	7	35	Same	35
40.0	14-25-36	8	40	Same	40

Remarks: (1) 2 inch diameter sampler, 140 lb. weight dropped 30 inches

Boring No. B-5  
Sheet 1 of 2



# LOG OF BORING

Project: Mobil Landfill-Hardee County  
Envisors, Inc.

Boring No. B-5

Depth of Boring	(1) Blows per 6 inches	Sample Number	Depth in	Description	Depth in
45.0	8-17-27	9	45	Same with interbedded lenses of gray green clay	45
50.0	8-10-26	10	50	Same	50
				E.O.B. 50.0'	
			55	Borehole backgrouted with cement-bentonite grout	55
			60		60
			65		65
			70		70
			75		75
			80		80
			85		85

Remarks:

Boring No. B-5



# LOG OF BORING

Ref: 8150  
Boring No. B-6

Project: Mobil Landfill-Hardee County  
Client: Envisors, Inc.  
Location: See Drawing  
Elevation: Approx. 80' MSL

Date Drilled: 11-24-81  
Type of Boring: SPT  
Rig: Buddy Systems, Inc.  
Depth to Ground Water: NA feet

Depth of Boring	(1) Blows per 6 inches	Sample Number	Depth in feet	Description	Depth in feet
5.0	9- 9- 6	1	5	Gray to brown fine sand w/trace of iron stain	5
10.0	7-10-14	2	10	Medium dense gray to light brown fine sand	10
15.0	5- 5- 5	3	15	Very stiff gray green fine sandy clay	15
20.0	4- 5- 6	4	20	Stiff mottled gray to blue-green very slightly fine sandy clay	20
25.0	3- 4- 6	5	25	Same (very slightly calcareous)	25
30.0	4- 6- 7	6	30	Stiff gray green clay-very slightly sandy in lenses	30
35.0	26-40-33	7	35	Stiff gray green very sandy clay w/some P04 feed	35
40.0	12-17-30	8	40	Hard light gray green calcareous clay w/inter-bedded lenses of orange-tan P04 feed	40
				Hard light gray green calcareous fine slightly sandy clay w/some fine black P04 feed	40

(1) 2 inch diameter sampler, 140 lb. weight dropped 30 inches  
Remarks:

Boring No. B-6  
Sheet 1 of 2



# LOG OF BORING

Project: Mobil Landfill-Hardee County  
Envisors, Inc.

Boring No. B-6

Depth of Boring	(1) Blows per 6 inches	Sample Number	Depth in	Description	Depth in
45.0	19-22-31	9	45	Hard light gray green calcareous clay w/lenses of light gray green limestone w/trace of black fine P04 feed	45
			50	Hard dark gray green sandy clay w/lenses of fine black P04 feed	50
			55	E.O.B. 50.0'	55
			60	Borehole backgrouted with cement-bentonite grout	60
			65		65
			70		70
			75		75
			80		80
			85		85

Remarks:

Boring No. B-6



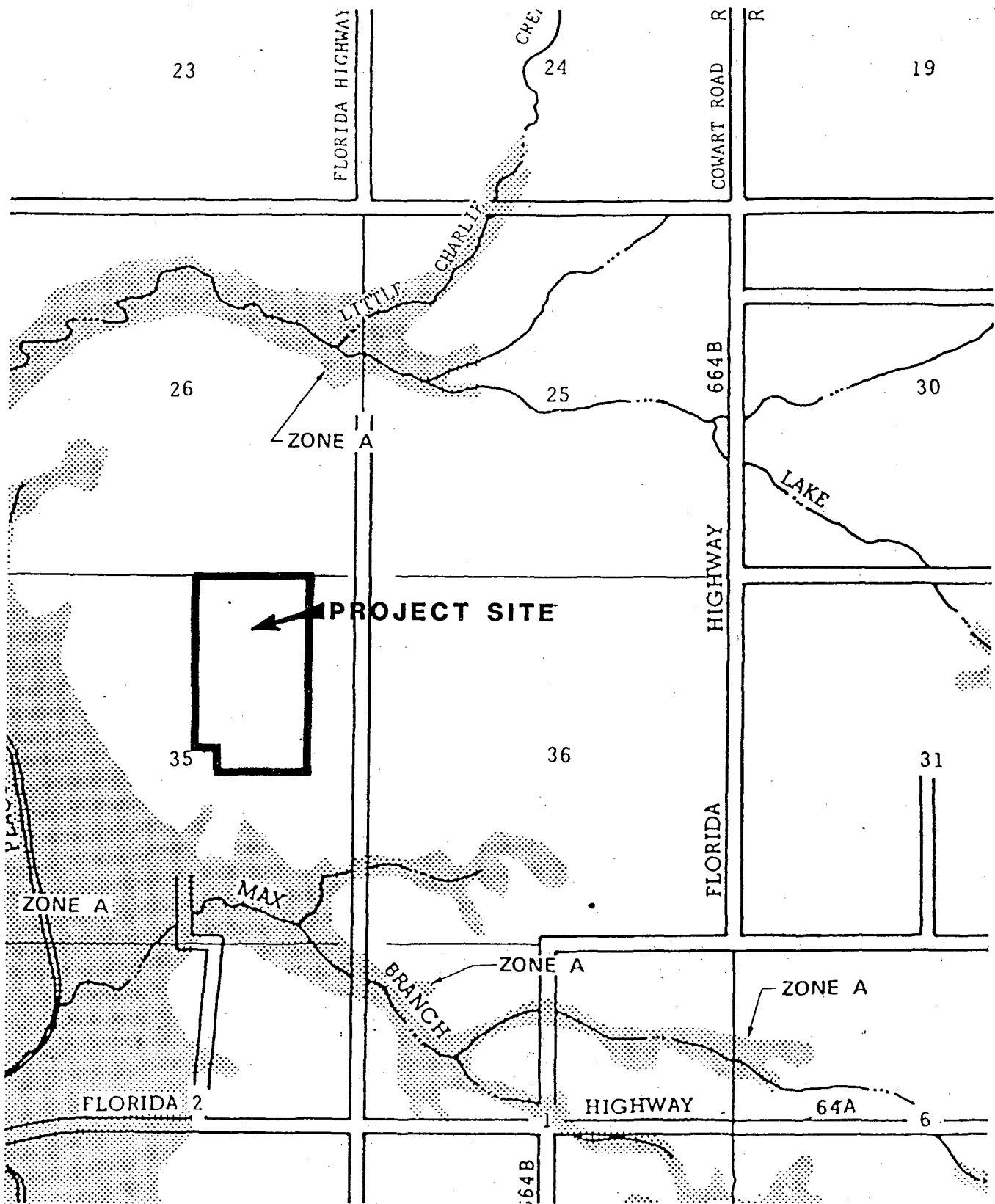
## LOG OF BORING

Ref: 8150  
Boring No. B-7Project: Mobil Landfill-Hardee County  
Client: Envisors, Inc.  
Location: See Drawing  
Elevation: Approx. 78' MSLDate Drilled: 11-25-81  
Type of Boring: SPT  
Rig: Buddy Systems, Inc.  
Depth to Ground Water: NA feet

Depth of Boring	(1) Blows per 6 inches	Sample Number	Depth in feet	Description	Depth in feet
5.0	4- 3- 1	1	5	Loose brown fine sand	5
10.0	7-11-15	2	10	Very stiff gray green sandy clay	10
15.0	4- 4- 4	3	15	Firm light gray to tan gravelly calcareous sandy clay w/trace of PO4 pebble and feed 50%-75% drill fluid circ. loss at 18.0'	15
20.0	0- 1-16	4	20	Stiff gray green calcareous sand w/limestone gravel & PO4 pebble and feed (abundant)	20
24.3	$\frac{100}{31- 4''}$	5	25	Refusal-Hard light gray to tan gravelly calcareous sandy clay & PO4 pebble and feed	25
			25	E.O.B. 24.3'	25
			30	Borehole backgrouted with cement-bentonite grout	30
			35		35
			40		40

Remarks: (1) 2 inch diameter sampler, 140 lb. weight dropped 30 inches

Boring No. B-7  
Sheet 1 of 1



**EVI** ENGINEERING  
ADVISORS, INC.  
CONSULTING ENGINEERS  
TAMPA • MARGATE • WINTER HAVEN, FLORIDA

HARDEE COUNTY, FLORIDA  
REGIONAL SANITARY LANDFILL  
FLOOD HAZARD BOUNDARY MAP  
FLA. REG. PROF. ENG. NO. 13768

JOB NO. 81014  
DATE 5/82  
DRAWN BY C.S.L.  
CHECKED BY D.D.E.

SHEET

01



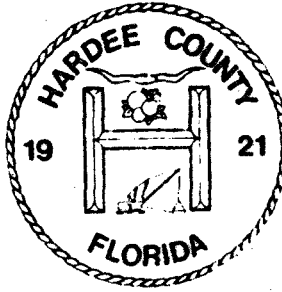
# HARDEE COUNTY

## BOARD OF COUNTY COMMISSIONERS

Rm. A-204, Courthouse Annex  
412 West Orange Street  
Wauchula, Florida 33873

Commissioners' Office (813) 773-6952  
Bookkeeping & Payroll (813) 773-6932

County Attorney, Joel Evers  
Environmental Attorney, Judith S. Kavanaugh



## COMMISSIONERS

Samuel L. Rawls  
Ralph Smith  
John Roy Gough  
Luke Waldron  
Maurice Henderson

District I  
District II  
District III  
District IV  
District V

County Administrator, Harry E. Lampe  
Clerk, Coleman W. Best

May 13, 1982

Mr. William K. Hennessey  
District Manager  
Florida Department of Environmental  
Regulation  
7601 Highway 301 North  
Tampa, Florida 33610

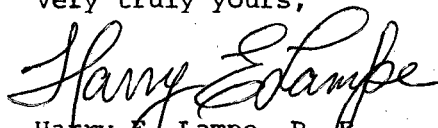
Subject: Zoning

Project: Hardee County Regional Sanitary  
Landfill

Dear Mr. Hennessey:

This letter is to advise you that the site under consideration for the Hardee County Regional Sanitary Landfill (the Mobil site) located in Section 35, Township 33 South, Range 25 East, is presently zoned A-1 according to the Hardee County zoning maps. A sanitary landfill is a permitted use under this zoning classification. The adjacent land is also zoned A-1.

Very truly yours,

  
Harry E. Lampe, P. E.  
Zoning Administrator

HEL/vt



**AERIAL OVERVIEW WITH SALIENT FEATURES**  
**REGIONAL SANITARY LANDFILL**

**HARDEE COUNTY, FLORIDA**

4-21-82

30417 2-1





PLANS ARE INCLUDED IN THIS PACKAGE  
AND ARE APPENDED HERETO.

## SOLID WASTE DISPOSAL FACILITY DATA FORM

Permit No.: \_\_\_\_\_ Issue Date: \_\_\_\_\_ Expires: \_\_\_\_\_

Facility No. (DER Identification): \_\_\_\_\_

DER ACTION: ☐ Add ☐ Delete ☐ Change ☐ Deactivate Site ☐ Other

1. County Hardee		2. Site Name Hardee County Regional Sanitary Landfill	
3. Date Form Completed 13 May 1982		4. Facility Address Kings Road	
4a. Facility Phone No. Not installed		4b. Facility Site Supervisor George Taylor	
5a. 84° 47' 1" 27° 34' 10"	5b. 33 South 25 East 35		
Latitude	Longitude	Township	Range Section
6. Operating Authority Name Hardee County Board of County Commissioners		8. Operating Authority Address 413 West Orange Street Wauchula, Florida 33873	
7. Phone Number (813) 773-3236			
9. Owner of Site Property (if different from operator) Mobil Chemical Company		11. Address of Owner Phosphate Division, P.O. Box 311 Nichols, Florida 33863	
10. Phone Number of Owner (813) 425-3011			
12. Facility Type <input checked="" type="checkbox"/> Class I, Sanitary Landfill <input type="checkbox"/> Class III <input type="checkbox"/> Class II, Sanitary Landfill <input type="checkbox"/> Trash/Yard Trash <input type="checkbox"/> Sludge disposal facility <input type="checkbox"/> Trash & Trash Composting <input type="checkbox"/> Other Facility Not Shown (Lagoon, Pit, etc.)			
13. Month/Year Begun August 1982	14. Disposal Area 53.5 Acres	15. Population Served 16,240 (1982)	
16. Expected Useful Lifetime 20 Years	17. Weighing Scales <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	18. Security to Prevent Unauthorized Use <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
19. Depth of Water Table MSL 77 Ft.	20. Quantity of Waste/Day 47 Tons or 94 Yd <sup>3</sup> (1982)	21. Charge Ad Valorem Taxes \$ N/A yd/ton	
22. Surrounding Land Use Zoning <input type="checkbox"/> Residential <input type="checkbox"/> None <input checked="" type="checkbox"/> Agricultural <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Other			
23. Types of Waste Received <input checked="" type="checkbox"/> Residential <input checked="" type="checkbox"/> Agricultural <input type="checkbox"/> Hazardous <input type="checkbox"/> Industrial Sludge <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Septic Tank <input type="checkbox"/> Yard Trash/Trash <input type="checkbox"/> Hospital <input type="checkbox"/> Incinerator Residue <input type="checkbox"/> Industrial <input type="checkbox"/> Sewage Sludge <input type="checkbox"/> Other: <input type="checkbox"/> Pathological/Infectious <input type="checkbox"/> Water/Air Treat Sludge			
24. Number of Monitoring Wells 8		25. Number of Surface Monitoring Points Ditch, Cell, Holding Pond, Outfall Ditch	
26. Gas Control System <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	27. Salvaging Permitted <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	28. Attendant <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
29. Leachate Control Method Liner Type: <input checked="" type="checkbox"/> Natural <input checked="" type="checkbox"/> Emplaced Clay <input checked="" type="checkbox"/> Plastic <input type="checkbox"/> None <input type="checkbox"/> Other Collection Method: <input type="checkbox"/> Well Point <input type="checkbox"/> Permitter Ditch <input type="checkbox"/> None <input type="checkbox"/> Under Site Drains <input checked="" type="checkbox"/> Other Treatment Method: <input type="checkbox"/> Oxidation <input type="checkbox"/> Recirculated <input type="checkbox"/> Chemical <input type="checkbox"/> Advanced <input type="checkbox"/> None <input checked="" type="checkbox"/> Other TBD			
30. Leachate Discharge <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Class of Receiving Water N/A	
31. Site Located in <input type="checkbox"/> Floodplain <input type="checkbox"/> Wetlands <input checked="" type="checkbox"/> Other: Pasture Land			
32. Surface Runoff Collected <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Type of Runoff Treatment None	Class of Receiving Waters None	
33. Property Recorded as a Solid Waste Disposal Site in County Land Records <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
34. Days of Operation 6 per week	Days of Cover Daily	Hours of Operation 7:30 AM - 5:30 PM	
35. Name and Title of Person Completing Form Dale D. Ernsberger, P.E., Project Manager			

Note: All blanks must be filled or marked as not applicable.