

**Site Exploration  
Proposed Slurry Wall Leachate Control System  
Lena Road Landfill, Stage II  
Manatee County, Florida**

Oct. 31, 1988

FLORIDA DEPARTMENT OF  
ENVIRONMENTAL PROTECTION

MAY 18 2010

SOUTHWEST DISTRICT  
TAMPA

Ardaman & Associates, Inc.

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**Ardaman & Associates, Inc.**

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Professional Engineers in Private Practice



Ardaman & Associates, Inc.

October 31, 1988  
File Number 87-7326

Consultants in Soils, Hydrogeology,  
Foundations and Materials Testing

Manatee County Department of Public Works  
4501 - 66th Street West  
Bradenton, Florida 34210

Attention: Mr. Terry J. Ried  
Solid Waste Division Manager

Subject: Site Exploration for the Proposed Slurry Wall Leachate Control  
System, Lena Road Landfill, Stage II, Manatee County, Florida

Gentlemen:

As requested and authorized by Manatee County Department of Public Works, we have completed a field exploratory and laboratory program at the Lena Road Landfill site (Stage II) in accordance with our original proposal dated February 24, 1988 and our modified proposal dated October 21, 1988. Please note that the Site Exploration Study for the Gun Club site (Stage III), as included in our proposals, was covered in our previous report dated October 17, 1988.

This report has been prepared for the exclusive use of Manatee County for specific application to the construction of the slurry wall/leachate control system for the Lena Road Landfill area in accordance with generally accepted geotechnical and hydrogeological engineering practice. No other warranty, expressed or implied, is made.

We appreciate the opportunity to be of service to you on this phase of the project. If you have any questions or need further assistance, please do not hesitate to contact the undersigned or Mr. Herb Stangland, P.E.

Very truly yours,  
ARDAMAN & ASSOCIATES, INC.

*Lakshmi N. Reddi*

Lakshmi N. Reddi  
Project Engineer

*John E. Garlanger*

John E. Garlanger, Ph.D., P.E.  
Principal  
Florida Registration No. 19782

LNR:cc  
cc: Bob Hall  
Gary Schmidt

## TABLE OF CONTENTS

| <u>Section</u>        | <u>Title</u>                         | <u>Page</u> |
|-----------------------|--------------------------------------|-------------|
| 1.0                   | INTRODUCTION                         | 1           |
|                       | 1.1 Project Description              | 1           |
|                       | 1.2 Scope of Work                    | 1           |
| 2.0                   | FIELD EXPLORATORY PROGRAM            | 2           |
|                       | 2.1 Test Borings                     | 2           |
|                       | 2.2 Sampling Program                 | 2           |
| 3.0                   | LABORATORY TESTING PROGRAM           | 3           |
|                       | 3.1 General                          | 3           |
|                       | 3.2 Classification Tests             | 3           |
| 4.0                   | GENERAL SUBSURFACE CONDITIONS        | 3           |
|                       | 4.1 Soil Boring Profiles             | 3           |
|                       | 4.2 Hydrogeology                     | 3           |
|                       | 4.3 Stratigraphy                     | 4           |
| <br><u>Appendices</u> |                                      |             |
| 1                     | Standard Penetration Test Procedures |             |
| 2                     | Boring Logs                          |             |
| 3                     | Grain Size Distribution Curves       |             |

## LIST OF TABLES

| <u>Table</u> | <u>Title</u>                    |
|--------------|---------------------------------|
| 1            | Percent Fines of Various Strata |

## LIST OF FIGURES

| <u>Figure</u> | <u>Title</u>                            |
|---------------|---|
| 1             | Site Location                           |
| 2             | Aerial Map of the Site                  |
| 3             | Boring Location Plan                    |
| 4             | East and West Wall Soil Boring Profiles |
| 5             | North Wall Soil Boring Profiles         |

## **1.0 INTRODUCTION**

### **1.1 Project Description**

The objective of this report is to provide soil boring data and laboratory test results for the construction of the proposed slurry wall/leachate control system for the Stage II Lena Road Landfill in Manatee County, Florida.

The landfill site, consisting of approximately 200 acres, is located north of and adjacent to the existing landfill in Section 6, T35S, R19E and Section 31, T34S, R19E. A location map is presented in Figure 1. A 1982 aerial photograph of the site is provided in Figure 2. The Stage II landfill is an expansion of the existing landfill. Hydrogeological conditions at and near the site were discussed in detail in the following reports submitted by Ardaman & Associates, Inc. (A&A):

- "Compilation of Hydrogeological and Groundwater Data for Lena Road Landfill, Stage I and Stage II Areas, Volumes I and II", dated April 16, 1987.
- "Site Exploration for Proposed Slurry Wall Leachate Control System at Gun Club Landfill", October 17, 1988.

Based upon the information gathered in these studies and the data from this exploration, a slurry wall/leachate control system will provide a viable alternative to isolate the groundwater within the landfill area from adjacent properties.

### **1.2 Scope of Work**

The following tasks were completed by A&A for the subject study:

- Reviewed the data collected from our previous studies.
- Conducted site visits by Messrs. Bill Ryan, P.E., and Lakshmi Reddi, Ph.D., of A&A.
- Planned and conducted a field exploratory program consisting of 30 Standard Penetration Test (SPT) borings and 10 helical power auger borings to assess the subsurface conditions along the proposed route of the slurry wall and to recover soil samples for laboratory testing.
- Planned and conducted a laboratory testing program to characterize the engineering properties of representative soil samples retrieved from the site.
- Prepared this report to document the results of our field and laboratory studies, and to provide information on the required depths for the proposed slurry wall.

The analyses and recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated. The

information contained in this report does not reflect any variations which may occur at other locations where borings are not available. The nature and extent of such variations between the borings may not become evident until construction. If variations then appear evident, it will be necessary for a reevaluation of the recommendations presented herein after performing on-site observations during the construction period and noting the characteristics of the variations.

## **2.0 FIELD EXPLORATORY PROGRAM**

### **2.1 Test Borings**

A field program was conducted by A&A at the site between June 1, 1988 and October 21, 1988. The field exploratory program consisted of performing 30 Standard Penetration Test (SPT) borings and 10 helical power auger borings at the approximate locations illustrated on the boring location plan shown in Figure 3. The locations of these borings were selected along the proposed route of the slurry wall. The borings were spaced approximately 200 feet apart along the north, east and west walls of the site. Even-numbered stations were staked; and the ground surface elevations at these stations were provided by Manatee County. Odd-numbered stations were located using tape measurements from the adjacent stations; and the ground surface elevations were estimated from a topographic map provided by Manatee County. Therefore, the locations and elevations of the borings at odd-numbered stations should be considered only approximate, as implied by the methods of measurement used. The SPT borings were advanced using procedures similar to those outlined in ASTM D-1586. A summary of this field procedure is included in Appendix 1. All the test borings were grouted upon completion of drilling with neat cement using the tremie pipe grouting method. The SPT boring logs are provided in Appendix 2.

### **2.2 Sampling Program**

Split-spoon soil samples were recovered during performance of the SPT. Typically, continuous samples at 1.5-foot intervals were recovered for the top 10 feet of the borings and the bottom 15 feet of the borings. In between, split-spoon soil samples were obtained at 5-foot intervals, or whenever there was a major change in soil strata. These samples were visually classified in the field and representative portions of the soil samples were sealed in airtight jars and later transported to our laboratory for additional classification and testing.

Soil samples were also recovered from auger borings conducted at the site. Auger borings were conducted using a 4-inch diameter, continuous flight, helical auger with a cutting head at its end. The auger was screwed into the ground in 5-foot sections. It was powered by the rotating action of the kelly bar of a rotary drill rig. Samples were recovered by withdrawing the auger out of the ground without rotating it. The soil samples so obtained, were classified and representative samples put in jars and brought back to the laboratory for classification and testing.

### **3.0 LABORATORY TESTING PROGRAM**

#### **3.1 General**

All recovered split-spoon samples were returned to our laboratory for visual examination and for determination of engineering properties. The laboratory testing program was performed to better define the subsurface soil stratification, and to determine the index properties and engineering characteristics of the subsurface soils with respect to the proposed construction. All tests, where applicable, were performed in accordance with current ASTM standards.

#### **3.2 Classification Tests**

The split-spoon jar samples were visually classified in the laboratory using the procedures outlined in the Unified Soil Classification System (USCS). Tests were performed on representative samples and included natural moisture content determinations, Atterberg limits, grain size analysis, and percent fines determinations, i.e., percent by dry weight of materials passing the U.S. No. 200 standard sieve. The results of these tests, which are presented on the boring logs in Appendix 2, were used to aid in classifying and stratifying the soils. The full grain size sieve analyses are presented in Appendix 3.

### **4.0 GENERAL SUBSURFACE CONDITIONS**

#### **4.1 Soil Boring Profiles**

The results of the field exploratory and laboratory testing programs are documented in the boring logs in Appendix 2. Generalized subsurface profiles at the SPT boring locations are presented in Figures 4 and 5.

The stratification shown on the boring logs and profiles represent our interpretation of the field logs and the results of laboratory examinations on recovered samples from the borings. The stratification lines represent the approximate boundary between soil types and the transitions may be more gradual than shown.

The soil boring profiles are representative of subsurface conditions only at their respective locations and for their vertical reaches. Local variations of the subsurface materials in the area are anticipated and may be encountered. The relative density of cohesionless soils and the consistency of cohesive soils may be inferred from the engineering classification table presented with the boring logs based on empirical correlations with the SPT blow count values (N values).

#### **4.2 Hydrogeology**

Hydrogeological conditions at the site were discussed in detail elsewhere (Ardaman, 1987) and therefore will not be repeated herein. To summarize, a surficial unconfined aquifer system is found in the beds of sand and slightly silty to silty sand found on site at depths between the surface and 10 to 15 feet. This zone is recharged directly by local rainfall. Water levels encountered in this system for the most part range between 0.5-5.0 feet below ground surface. These



levels can fluctuate widely with variations in rainfall and evapotranspiration. Movement of the shallow groundwater is very limited due to the lack of topographic relief but some radial movement away from the landfill occurs. Vertical movement of water downward is restricted due to the presence of clays and clayey sands first encountered at depths of 15 to 20 feet. Recharge through the approximately 100-foot thick confining beds above the underlying aquifer systems has been estimated at less than 2 inches/year by Stewart (1980). Wells for domestic supply are from the deeper artesian aquifers and not from the surficial aquifer.

### 4.3 Stratigraphy

Based upon a review of the test borings performed along the perimeter of the proposed landfill, the shallow subsurface profile generally consists of two main strata, a surficial fine sand to clayey fine sand layer overlying a stratum of sandy clays and clays.

The surficial soils (0 to 20 feet) generally consist of a brown fine sand to slightly silty fine sand with increasing clay contents at greater depths. Traces of phosphate were frequently encountered below depths of 15 to 20 feet. The typical SPT blow count value in this relatively pervious surficial sandy stratum is between 2 and 23 blows per foot, indicative of very loose to medium dense sand.

The top of the sandy clay to clay stratum, which underlies the surficial sandy soils, is typically encountered at depths of 25 to 30 feet below ground surface. The soils that make up this stratum (Stratum 4) are primarily gray to brown clay and sandy clay. In many boreholes, Stratum 4 is underlain and/or overlain by a gray to green clayey fine sand stratum (Stratum 5). Boreholes along the west wall, however, encountered a gray clayey silt stratum (Stratum 6) underlying Stratum 4. The clayey silt stratum was found to be very dense with blow count values close to 50. Table 1 shows the variations in fines content of various strata encountered at the site. With average fines contents of 68 and 72, Strata 4 and 6 can generally be considered impervious relative to the surficial sandy soils.

According to the Unified Soil Classification System (USCS) based on the plasticity of the soils, the soils in Stratum 4 are primarily composed of low to medium plasticity sandy clay with a USCS designation of CL, and clays of high plasticity, with a USCS designation of CH. The clayey materials within the explored depths can generally be described as medium stiff to hard with a typical blow count value of 5 to over 50. We recommend that the slurry cut-off wall be keyed a minimum of 3 feet into the top of this clayey stratum.

The depths to the top of the natural clayey liner at the boring locations, based upon our interpretation of the field and laboratory data (which include visual examination of soil samples, fines content determinations, and Atterberg limits) are included on the generalized boring profiles presented in Figures 4 and 5. The slurry cut-off wall should be keyed a minimum of 3 feet into the top of the confining unit identified on Figures 4 and 5. In general, the SPT borings did not encounter significant difficulty in drilling requiring boring relocation. However, the blow count values at some locations in Strata 4 and 5 are significantly greater

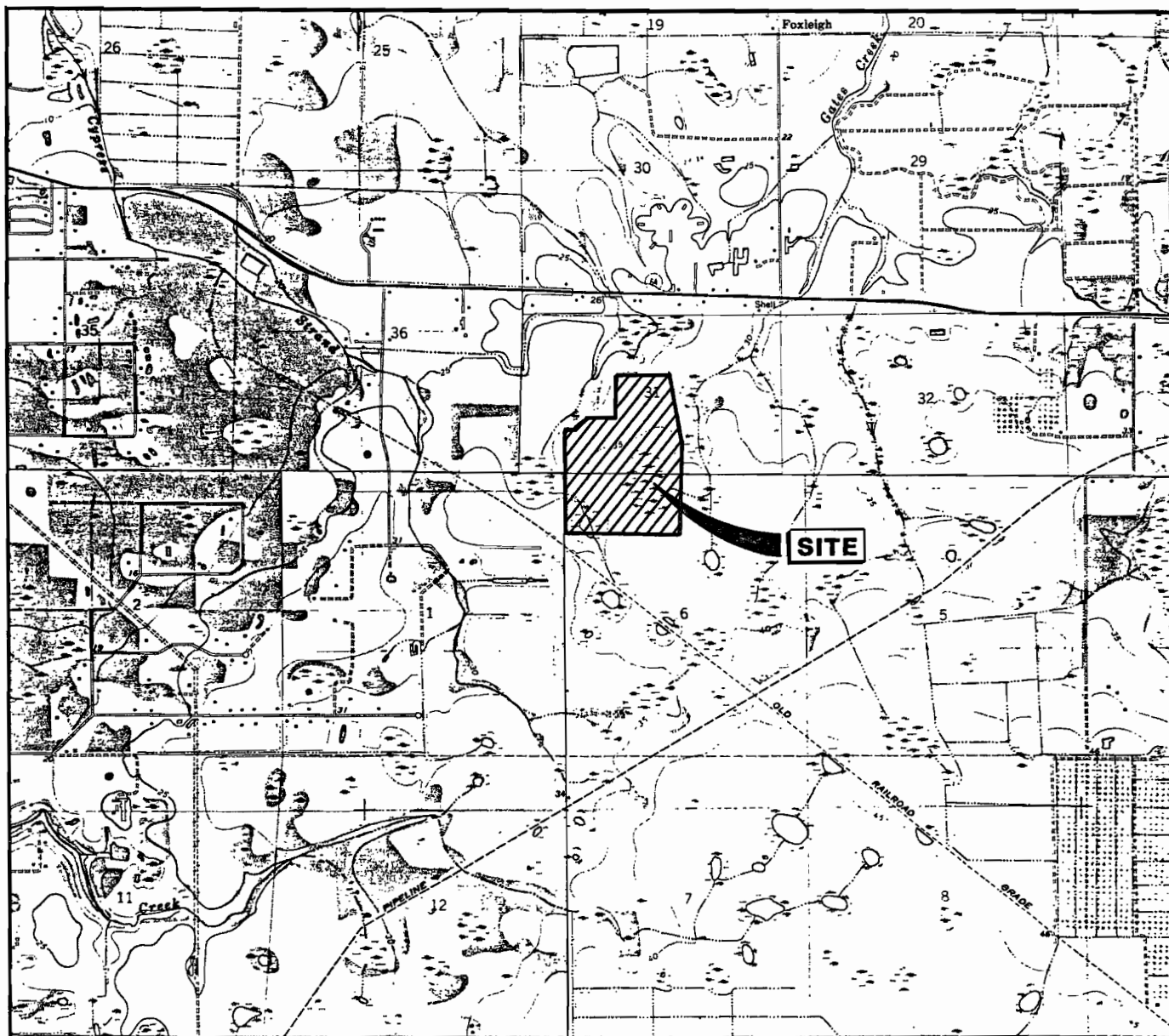
than 50. Slurry trenching activities may encounter difficulty at these locations. We recommend that the top of the clay layer be verified by a qualified geotechnical engineer or his representative during construction so that the slurry wall will be keyed into the proper layer.

Table 1

**PERCENT FINES OF VARIOUS STRATA**

|   | <u>No. of<br/>Measurements</u> | <u>Range of<br/>Variation</u> | <u>Average</u> | <u>Standard<br/>Deviation</u> |
|---|--------------------------------|-------------------------------|----------------|-------------------------------|
| Light gray to brown<br>medium to fine sand to<br>slightly silty fine sand<br>(Strata 1 and 3) | 3                              | 3-11                          | 7.7            | 4.2*                          |
| Gray to brown slightly<br>silty to silty fine sand<br>(Stratum 2)                             | 6                              | 6-31                          | 14             | 10.0                          |
| Gray to green clay and<br>sandy clay (Stratum 4)  | 10                             | 49-79                         | 68             | 11.4                          |
| Gray and green slightly<br>clayey to clayey fine sand<br>(Stratum 5)                          | 23                             | 5-57                          | 27             | 13.2                          |
| Gray silt (Stratum 6)   | 2                              | 68-75                         | 72             | 4.9*                          |

\*Standard deviation may not be a true representation since the number of measurements is too small.


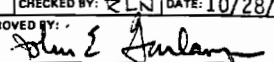


## SITE LOCATION

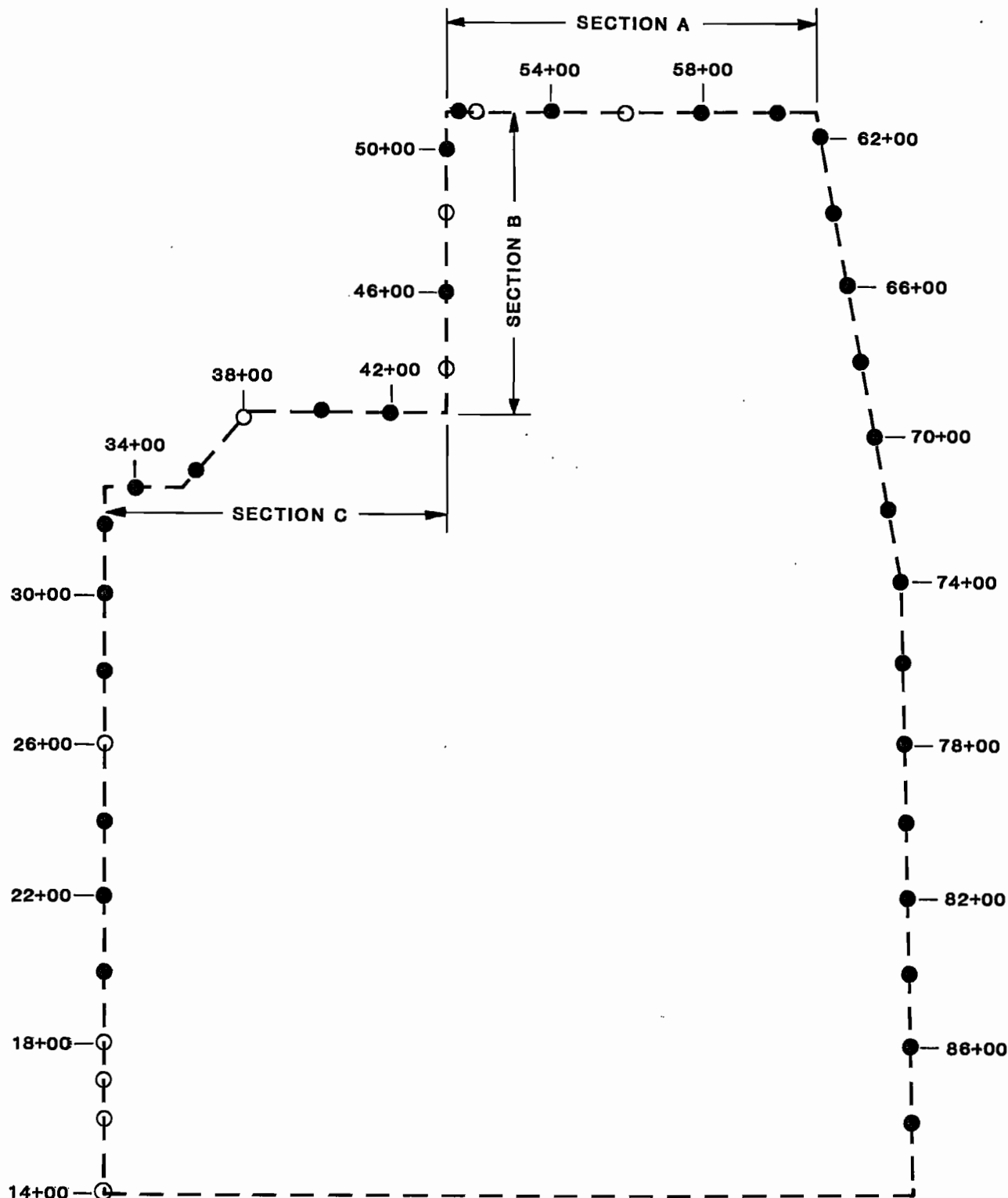
**TOWNSHIPS 34 AND 35, SOUTH  
RANGE 19, EAST  
SECTIONS 6 AND 31**



SOURCE: USGS QUAD MAP, LORRAINE (1973)

|  |   |                |
|--|---|----------------|
|  <b>Ardaman &amp; Associates, Inc.</b><br>Consulting Engineers in Soil Mechanics,<br>Foundations, and Materials Testing |   |                |
| SITE EXPLORATION<br>PROPOSED SLURRY WALL LEACHATE CONTROL SYSTEM<br>LENA ROAD LANDFILL, STAGE II<br>MANATEE COUNTY, FLORIDA  |   |                |
| DRAWN BY: SEF  | CHECKED BY: ZLN   | DATE: 10/28/88 |
| FILE NO.<br>87-7326  | APPROVED BY:<br> |                |


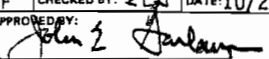




## BORING LOCATION PLAN



- LEGEND**
- SPT BORINGS
  - AUGER BORINGS

|  |   |                |
|--|---|----------------|
|  <b>Ardaman &amp; Associates, Inc.</b><br>Consulting Engineers in Soil Mechanics,<br>Foundations, and Materials Testing |   |                |
| SITE EXPLORATION<br>PROPOSED SLURRY WALL LEACHATE CONTROL SYSTEM<br>LENA ROAD LANDFILL, STAGE II<br>MANATEE COUNTY, FLORIDA  |   |                |
| DRAWN BY: SEF  | CHECKED BY: ZLN   | DATE: 10/28/88 |
| FILE NO.<br>87-7326  | APPROVED BY:<br> |                |

Appendix 1

**STANDARD PENETRATION TEST PROCEDURES**

## STANDARD PENETRATION TEST

The standard penetration test is a widely accepted method of *in situ* testing of foundation soils (ASTM D-1586). A 2-foot long, 2-inch O.D. split-barrel sampler attached to the end of a string of drilling rods is driven 18 inches into the ground by successive blows of a 140-pound hammer freely dropping 30 inches. The number of blows needed for each 6 inches of penetration is recorded. The sum of the blows required for penetration of the second and third 6-inch increments of penetration constitutes the test result or N-value. After the test, the sampler is extracted from the ground and opened to allow visual examination and classification of the retained soil sample. The N-value has been empirically correlated with various soil properties allowing a conservative estimate of the behavior of soils under load.

The tests are usually performed at 5-foot intervals. However, more frequent or continuous testing is done by our firm through depths where a more accurate definition of the soils is required. The test holes are advanced to the test elevations by rotary drilling with a cutting bit, using circulating fluid to remove the cuttings and hold the fine grains in suspension. The circulating fluid, which is a bentonitic drilling mud, is also used to keep the hole open below the water table by maintaining an excess hydrostatic pressure inside the hole. In some soil deposits, particularly highly pervious ones, NX-size flush-coupled casing must be driven to just above the testing depth to keep the hole open and/or to prevent the loss of circulating fluid.

Representative split-spoon samples from soils at every 5 feet of drilled depth and from every different stratum are brought to our laboratory in air-tight jars for further evaluation and testing, if necessary. Samples not used in testing are stored for at least six months prior to being discarded. After completion of a test boring, the hole is kept open until a steady state groundwater level is recorded. The hole is then sealed, if necessary, and backfilled.



Appendix 2

**BORING LOGS**

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 14+00  
 TOTAL DEPTH 25.0 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure No. 3.  
 COUNTY Manatee STATE Florida ELEVATION 36.95 ft NGVD  
 DATE STARTED 9-19-88 DATE COMPLETED 9-19-88 BORING TYPE 4" Auger  
 DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING \_\_\_\_\_  
 WATER TABLE DEPTH: 1st 3.0' DATE 9-19-88 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
|        |      |  |            | 1             |           |             |           |           | Mixed brown fine sand and gray fine sand (SP)            |                        |
| 1      |      |  |            |               |           |             |           |           | Gray fine sand (SP)                                      |                        |
|        | 5    |  |            | 2             |           |             |           |           | Brown fine sand (SP)                                     |                        |
| 2      |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            | 3             |           |             |           |           | Light brown fine sand (SP)                               |                        |
| 3      | 10   |  |            |               |           |             |           |           |  |                        |
|        |      |  |            | 4             |           |             |           |           | Brown fine sand (SP)                                     |                        |
| 4      |      |  |            |               |           |             |           |           |  |                        |
|        | 15   |  |            | 5             |           |             |           |           | Gray silty fine sand with phosphate (SM)                 |                        |
| 5      |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            | 6             |           |             |           |           | Gray clay (CH)   |                        |
| 6      | 20   |  |            |               |           |             |           |           |  |                        |
|        |      |  |            | 7             |           |             |           |           |  |                        |
| 7      |      |  |            |               |           |             |           |           |  |                        |
|        | 25   |  |            |               |           |             |           |           |  |                        |
| 8      |      |  |            |               |           |             |           |           | Termination of boring at 25.0 feet                       |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 9      | 30   |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 10     |      |  |            |               |           |             |           |           |  |                        |
|        | 35   |  |            |               |           |             |           |           |  |                        |
| 11     |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 12     | 40   |  |            |               |           |             |           |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 16+00  
 TOTAL DEPTH 30.0 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 35.76 ft NGVD (approximately)  
 DATE STARTED 9-19-1988 DATE COMPLETED 9-19-1988 BORING TYPE Auger  
 DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING \_\_\_\_\_  
 WATER TABLE DEPTH: 1st 1.5' DATE 9-19-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)            | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
|        |      |  |            | 1             |           |             |           |           | Dark gray slightly fine sand (SP-SM)                                |                        |
|        |      |  |            | 2             |           |             |           |           | Brown fine sand (SP)  |                        |
| 1      |      |  |            | 3             |           |             |           |           |   |                        |
|        | 5    |  |            |               |           |             |           |           |   |                        |
| 2      |      |  |            | 4             |           |             |           |           | Gray silty fine sand (SM)   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 3      | 10   |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 4      |      |  |            |               |           |             |           |           |   |                        |
|        | 15   |  |            | 5             |           |             |           |           | Gray silty fine sand with phosphate (SM)                            |                        |
| 5      |      |  |            |               |           |             |           |           |   |                        |
|        |      |  |            | 6             |           |             |           |           | Gray silty fine sand with lenses of gray clay and phosphate (SM-CH) |                        |
| 6      | 20   |  |            |               |           |             |           |           |   |                        |
|        |      |  |            | 7             |           |             |           |           | Light gray clay (CH)  |                        |
| 7      |      |  |            |               |           |             |           |           |   |                        |
|        |      |  |            | 8             |           |             |           |           | Gray clay (CH)  |                        |
| 8      | 25   |  |            |               |           |             |           |           |   |                        |
|        |      |  |            | 9             |           |             |           |           | Gray silt with occasional traces of clay (ML)                       |                        |
| 9      | 30   |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 10     |      |  |            |               |           |             |           |           | Termination of boring at 30.0 feet.                                 |                        |
|        | 35   |  |            |               |           |             |           |           |   |                        |
| 11     |      |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 12     |      |  |            |               |           |             |           |           |   |                        |
|        | 40   |  |            |               |           |             |           |           |   |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 17+00  
 TOTAL DEPTH 35.0 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 35.17 ft NGVD (approximately)  
 DATE STARTED 9-19-1988 DATE COMPLETED 9-19-1988 BORING TYPE Auger  
 DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING \_\_\_\_\_  
 WATER TABLE DEPTH: 1st 0.5' DATE 9-19-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            | Lab Data      |           |             |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) |  |                        |
| 1      |      |  |            | 1             |           |             |           | Gray fine sand (SP)                                      |                        |
|        |      |  |            |               |           |             |           | Brown fine sand (SP)                                     |                        |
|        | 5    |  |            | 2             |           |             |           | Gray silty fine sand (SM)                                |                        |
| 2      |      |  |            |               |           |             |           |  |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 3      | 10   |  |            | 3             |           |             |           | Gray silty fine sand with phosphate (SM)                 |                        |
|        |      |  |            |               |           |             |           |  |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 4      |      |  |            |               |           |             |           |  |                        |
|        | 15   |  |            | 4             |           |             |           | Grayish green clay (CH)                                  |                        |
| 5      |      |  |            |               |           |             |           |  |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 6      | 20   |  |            | 5             |           |             |           | Gray sandy clay (CL)                                     |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 7      |      |  |            |               |           |             |           |  |                        |
|        | 25   |  |            |               |           |             |           |  |                        |
| 8      |      |  |            | 6             |           |             |           | Gray silt (ML)   |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 9      | 30   |  |            |               |           |             |           |  |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 10     |      |  |            | 7             |           |             |           | Gray fine sand with phosphate (SP)                       |                        |
|        | 35   |  |            |               |           |             |           |  |                        |
| 11     |      |  |            |               |           |             |           | Termination of boring at 35.0 feet.                      |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 12     | 40   |  |            |               |           |             |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 18+00  
 TOTAL DEPTH 40.0 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 34.57 ft NGVD  
 DATE STARTED 7-5-1988 DATE COMPLETED 7-5-1988 BORING TYPE SPT  
 DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING Used driller's mud.  
 WATER TABLE DEPTH: 1st 2.75' DATE 7-5-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            | Lab Data      |           |             |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) |  |                        |
|        |      |  |            | 1             |           |             |           | Gray fine sand with roots (SP)                           |                        |
|        |      |  |            | 2             |           |             |           | Brown fine sand (SP)                                     |                        |
| 1      |      |  |            |               |           |             |           |  |                        |
|        | 5    |  |            | 3             |           |             |           | Grayish brown slightly silty fine sand (SP-SM)           |                        |
| 2      |      |  |            |               |           |             |           |  |                        |
|        | 10   |  |            | 4             |           |             |           | Gray clayey fine sand with phosphate (SM)                |                        |
| 4      |      |  |            |               |           |             |           |  |                        |
|        | 15   |  |            | 5             |           |             |           | Grayish yellow clayey fine sand, trace phosphate (SC)    |                        |
| 5      |      |  |            |               |           |             |           |  |                        |
|        | 20   |  |            | 6             |           |             |           |  |                        |
| 6      |      |  |            |               |           |             |           |  |                        |
|        | 25   |  |            | 7             |           |             |           | Gray silty fine sand, trace phosphate (SM)               |                        |
| 7      |      |  |            |               |           |             |           |  |                        |
|        | 30   |  |            | 8             | 29        | 31          |           |  |                        |
| 8      |      |  |            |               |           |             |           |  |                        |
|        | 35   |  |            | 9             |           |             |           | Gray sandy clay (CL)                                     |                        |
| 9      |      |  |            |               |           |             |           |  |                        |
|        | 40   |  |            | 10            | 33        | 75          | 43        | Gray silt, trace rock (ML)                               |                        |
| 10     |      |  |            |               |           |             |           |  |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 11     |      |  |            |               |           |             |           |  |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 12     |      |  |            |               |           |             |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 20+00  
 TOTAL DEPTH 31.5 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 34.53 ft NGVD (approximately)  
 DATE STARTED 10-19-1988 DATE COMPLETED 10-19-1988 BORING TYPE SPT  
 DRILLER/RIG David/David LENGTH/TYPE CASING Used driller's mud.  
 WATER TABLE DEPTH: 1st 3.5' DATE 10-19-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
|        |      |  |            | 1             |           |             |           |           | Gray fine sand (SP)                                      |                        |
|        |      |  |            | 2             |           |             |           |           | Brown fine sand (SP)                                     |                        |
| 1      |      |  |            | 3             |           |             |           |           | Gray clayey fine sand (SC)                               |                        |
|        | 5    |  |            | 4             |           |             |           |           |  |                        |
| 2      |      |  |            | 5             |           |             |           |           | Gray fine sand (SP)                                      |                        |
|        |      |  |            | 6             |           |             |           |           |  |                        |
| 3      | 10   |  |            | 7             |           |             |           |           |  |                        |
|        |      |  |            | 8             |           |             |           |           | Dark brown fine sand (SP)                                |                        |
| 4      | 15   |  |            | 9             |           |             |           |           |  |                        |
|        |      | 2-4-4                                    | 8          | 10            |           |             |           |           | Brown clayey fine sand (SC)                              |                        |
| 5      |      | 4-7-2                                    | 9          | 11            |           |             |           |           |  |                        |
|        |      | 2-12-17                                  | 29         | 12            | 19        | 9           |           |           | Gray slightly silty fine sand with phosphate (SP-SM)     |                        |
| 6      | 20   | 12-17-21                                 | 38         | 13            |           |             |           |           |  |                        |
|        |      | 12-15-14                                 | 29         | 14            |           |             |           |           | Gray clayey fine sand with phosphate (SC)                |                        |
| 7      |      | 9-10-10                                  | 20         | 15            |           |             |           |           |  |                        |
|        | 25   | 8-9-9                                    | 18         | 16            |           |             |           |           |  |                        |
| 8      |      | 11-9-8                                   | 17         | 17            | 20        | 23          |           |           |  |                        |
|        |      | 8-8-11                                   | 19         | 18            |           |             |           |           | Gray sandy clay with phosphate (CL)                      |                        |
| 9      | 30   | 8-12-21                                  | 33         | 19            |           |             |           |           |  |                        |
|        |      | 21-19-21                                 | 40         |               |           |             |           |           |  |                        |
| 10     |      |  |            |               |           |             |           |           | Termination of boring at 31.5 feet.                      |                        |
|        | 35   |  |            |               |           |             |           |           |  |                        |
| 11     |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 12     | 40   |  |            |               |           |             |           |           |  |                        |

# BORING LOG

## ARDAMAN & ASSOCIATES, INC.

BORING NO. STA 22+00  
TOTAL DEPTH 34.5 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 34.50 ft NGVD  
DATE STARTED 9-19-1988 DATE COMPLETED 9-19-1988 BORING TYPE SPT  
DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 0.75' DATE 9-19-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/ft                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
|        |      |  |            |               |           |             |           |           | Brown slightly silty fine sand (SP-SM)                   |                        |
| 1      |      |  |            |               |           |             |           |           | Brown silty fine sand (SM)                               |                        |
|        | 5    | -4-7                                     | 11         | 1             |           |             |           |           |  |                        |
| 2      |      | 7--                                      |            | 2             |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 3      | 10   | 7-9-10                                   | 19         | 3             |           |             |           |           | Brown fine sand (SP)                                     |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 4      |      |  |            |               |           |             |           |           |  |                        |
|        | 15   | 4-2-2                                    | 4          | 4             |           |             |           |           |  |                        |
| 5      |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 6      | 20   | 4-6-7                                    | 13         | 5             |           |             |           |           | Gray silty fine sand, trace phosphate (SM)               |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 7      |      | 5-5-7                                    | 12         | 6             |           |             |           |           | Gray to green clayey fine sand (SC)                      |                        |
|        | 25   | 6-6-7                                    | 13         | 7             |           |             |           |           |  |                        |
| 8      |      | 6-11-9                                   | 20         | 8             |           |             |           |           |  |                        |
|        |      | 10-17-17                                 | 34         | 9             |           |             |           |           | Gray silty fine sand with lenses of green clay (SM-CH)   |                        |
| 9      | 30   | 13-17-21                                 | 38         | 10            |           |             |           |           |  |                        |
|        |      | 17-50/4                                  | 50/4       | 11            |           |             |           |           | Light gray clay, trace rock (CL)                         |                        |
| 10     |      | 24-50/3                                  | 50/3       | 12            |           |             |           |           |  |                        |
|        |      | 37-17-21                                 | 38         | 13            | 54        |             | 86        | 39        | Light gray silt (MH)                                     |                        |
|        | 35   |  |            |               |           |             |           |           |  |                        |
| 11     |      |  |            |               |           |             |           |           | Termination of boring at 34.5 feet.                      |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 12     |      |  |            |               |           |             |           |           |  |                        |
|        | 40   |  |            |               |           |             |           |           |  |                        |

# BORING LOG

## ARDAMAN & ASSOCIATES, INC.

BORING NO. STA 24+00  
TOTAL DEPTH 31.5 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 34.33 ft NGVD (approximately)  
DATE STARTED 10-20-1988 DATE COMPLETED 10-20-1988 BORING TYPE SPT  
DRILLER/RIG David/David LENGTH/TYP CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 4.0' DATE 10-20-1988 TIME  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)     | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
| 1      |      |  |            | 1             |           |             |           |           | Gray fine sand (SP)  |                        |
|        |      |  |            | 2             |           |             |           |           | Brown fine sand (SP)   |                        |
|        | 5    |  |            | 3             |           |             |           |           | Gray silty fine sand (SM)                                    |                        |
| 2      |      |  |            | 4             |           |             |           |           |  |                        |
|        |      |  |            | 5             |           |             |           |           |  |                        |
| 3      | 10   |  |            | 6             |           |             |           |           | Grayish brown fine sand (SP)                                 |                        |
|        |      |  |            | 7             |           |             |           |           |  |                        |
| 4      |      |  |            | 8             |           |             |           |           | Gray clayey fine sand with phosphate and rock fragments (SC) |                        |
|        | 15   |  |            | 9             | 29        | 15          |           |           | Light brown clayey fine sand with phosphate (SC)             |                        |
| 5      |      | 5-1-1                                    | 2          | 10            |           |             |           |           | Gray clayey fine sand with phosphate (SC)                    |                        |
|        |      | 0-3-4                                    | 7          | 11            |           |             |           |           |  |                        |
| 6      | 20   | 3-2-4                                    | 6          | 12            |           |             |           |           | Gray silty fine sand, trace phosphate (SM)                   |                        |
|        |      | 3-3-7                                    | 10         | 13            | 29        | 8           |           |           |  |                        |
| 7      |      | 7-6-6                                    | 12         | 14            |           |             |           |           | Gray clayey fine sand with phosphate (SC)                    |                        |
|        |      | 6-12-17                                  | 29         | 15            |           |             |           |           | Dark green sandy clay with phosphate (CL)                    |                        |
|        | 25   | 6-12-12                                  | 24         | 16            |           |             |           |           |  |                        |
| 8      |      | 20-12-17                                 | 29         | 17            |           |             |           |           | Light gray clayey silt with rock fragments (ML)              |                        |
|        |      | 10-50/6-                                 | 50/6       | 18            |           |             |           |           |  |                        |
| 9      | 30   | - - 50/4                                 | 50/4       | 19            |           |             |           |           | Termination of boring at 31.5 foot.                          |                        |
|        |      | - - 50/8                                 | 50/3       |               |           |             |           |           |  |                        |
| 10     |      |  |            |               |           |             |           |           |  |                        |
|        | 35   |  |            |               |           |             |           |           |  |                        |
| 11     |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 12     | 40   |  |            |               |           |             |           |           |  |                        |



# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 26+00  
 TOTAL DEPTH 40.0 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 34.16 ft NGVD (approximately)  
 DATE STARTED 7-5-1988 DATE COMPLETED 7-5-1988 BORING TYPE Auger  
 DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING \_\_\_\_\_  
 WATER TABLE DEPTH: 1st 3.5' DATE 7-5-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            | Lab Data      |           |             |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%)  |                        |
| 1      | 5    |  |            | 1             |           |             |           |  |                        |
| 2      | 10   |  |            | 2             |           |             |           |  |                        |
| 3      | 15   |  |            | 3             |           |             |           |  |                        |
| 4      | 20   |  |            | 4             |           |             |           |  |                        |
| 5      | 25   |  |            | 5             |           |             |           |  |                        |
| 6      | 30   |  |            | 6             |           |             |           |  |                        |
| 7      | 35   |  |            | 7             |           |             |           |  |                        |
| 8      | 40   |  |            | 8             |           |             |           |  |                        |
| 9      |      |  |            | 9             | 29        | 77          | 40        | 13   |                        |
| 10     |      |  |            | 10            |           |             |           |  |                        |
| 11     |      |  |            | 11            | 43        | 68          |           |  |                        |
| 12     |      |  |            |               |           |             |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 28+00  
 TOTAL DEPTH 34.5 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 33.99 ft NGVD (approximately)  
 DATE STARTED 9-20-1988 DATE COMPLETED 9-20-1988 BORING TYPE SPT  
 DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING Used driller's mud.  
 WATER TABLE DEPTH: 1st \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)                    | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
| 1      | 5    | 2-2-4                                    | 6          | 1             |           |             |           |           | Light brown fine sand (SP)  |                        |
| 2      | 10   | 5-5-5                                    | 10         | 2             |           |             |           |           | Grayish brown slightly silty fine sand (SP-SM)                              |                        |
| 3      | 15   | 3-2-3                                    | 5          | 3             |           |             |           |           |   |                        |
| 4      | 20   | 6-8-11                                   | 19         | 4             |           |             |           |           | Gray clayey fine sand with phosphate and thin lenses of gray fine sand (SC) |                        |
| 5      | 25   | 5-10-13                                  | 23         | 5             |           |             |           |           | Gray clayey fine sand (SC)  |                        |
| 6      | 30   | 14-16-15                                 | 31         | 6             |           |             |           |           |   |                        |
| 7      | 35   | 11-10-8                                  | 18         | 7             |           |             |           |           |   |                        |
| 8      | 40   | 10-12-50/3                               | 73/9       | 8             |           |             |           |           | Gray to green clayey fine sand with rock fragments (SC)                     |                        |
| 9      |      | 38-29-25                                 | 54         | 9             |           |             |           |           |   |                        |
| 10     |      | 19-12-9                                  | 21         | 10            |           |             |           |           |   |                        |
| 11     |      | 8-9-11                                   | 20         | 11            |           |             |           |           | Gray sandy clay (CL)  |                        |
| 12     |      | 19-30-50                                 | 80         | 12            |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           | Termination of boring at 34.5 feet.   |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 30+00  
TOTAL DEPTH 34.5 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 33.82 ft NGVD  
DATE STARTED 9-20-1988 DATE COMPLETED 9-20-1988 BORING TYPE SPT  
DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 1.0' DATE 9-20-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
| 1      |      |  |            |               |           |             |           |           | Brown fine sand (SP)                                     |                        |
|        | 5    | 4-7-8                                    | 15         | 1             |           |             |           |           |  |                        |
| 2      |      |  |            |               |           |             |           |           |  |                        |
| 3      | 10   | 4-6-6                                    | 12         | 2             | 19        | 7           |           |           | Gray slightly silty fine sand (SP-SM)                    |                        |
| 4      |      |  |            |               |           |             |           |           |  |                        |
|        | 15   | 3-4-2                                    | 6          | 3             |           |             |           |           | Gray slightly silty fine sand with phosphate (SP-SM)     |                        |
| 5      |      |  |            |               |           |             |           |           |  |                        |
| 6      | 20   | 3-5-6                                    | 11         | 4             |           |             |           |           | Gray clayey fine sand with phosphate (SC)                |                        |
| 7      |      |  |            |               |           |             |           |           |  |                        |
|        | 25   | 3-5-7                                    | 12         | 5             |           |             |           |           | Gray sandy clay, trace phosphate (CL)                    |                        |
| 8      |      | 6-7-7                                    | 14         | 6             | 37        | 75          |           |           |  |                        |
|        |      | 6-7-6                                    | 13         | 7             |           |             |           |           |  |                        |
|        |      | 12-31-50                                 | 81         | 8             |           |             |           |           |  |                        |
| 9      | 30   | 37-50/2                                  | 50/2       | 9             |           |             |           |           | Gray sandy silt with rock fragments (ML)                 |                        |
|        |      | 28-17-14                                 | 31         | 10            |           |             |           |           |  |                        |
| 10     |      | 13-18-21                                 | 39         | 11            |           |             |           |           | Light gray silt (ML)                                     |                        |
|        |      | 24-30-21                                 | 51         | 12            |           |             |           |           |  |                        |
|        | 35   |  |            |               |           |             |           |           |  |                        |
| 11     |      |  |            |               |           |             |           |           | Termination of boring at 34.5 feet.                      |                        |
| 12     | 40   |  |            |               |           |             |           |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 32+00  
 TOTAL DEPTH 30.0 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 34.20 ft NGVD (approximately)  
 DATE STARTED 6-2-1988 DATE COMPLETED 6-2-1988 BORING TYPE SPT  
 DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING Used driller's mud.  
 WATER TABLE DEPTH: 1st 3.5' DATE 6-2-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
| 1      |      | 1-1-2                                    | 3          | 1             |           |             |           |           | Gray fine sand with roots (SP)                           |                        |
|        |      | 1-2-2                                    | 4          | 3             |           |             |           |           | Light brown fine sand (SP)                               |                        |
|        |      | 1-2-3                                    | 5          |               |           |             |           |           |  |                        |
| 2      | 5    | 2-5-6                                    | 11         |               |           |             |           |           |  |                        |
|        |      | 4-7-7                                    | 14         | 4             |           |             |           |           | Brown slightly silty fine sand (SP-SM)                   |                        |
|        |      | 5-7-7                                    | 14         |               |           |             |           |           |  |                        |
| 3      | 10   | 4-5-6                                    | 11         |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 4      | 15   |  |            |               |           |             |           |           | Gray fine sand, trace phosphate (SP)                     |                        |
|        |      | 3-3-2                                    | 5          | 5             |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 6      | 20   | 2-2-3                                    | 5          | 6             |           | 14          |           |           | Light brown clayey fine sand with phosphate (SC)         |                        |
|        |      | 4-6-7                                    | 13         | 7             |           |             |           |           |  |                        |
|        |      | 4-6-7                                    | 13         | 8             |           | 28          |           |           | Gray clayey fine sand (SC)                               |                        |
| 7      | 25   | 5-7-7                                    | 14         | 9             |           | 62          |           |           | Gray sandy clay (CL)                                     |                        |
|        |      | 4-5-7                                    | 12         | 10            |           |             |           |           |  |                        |
|        |      | 6-50/6                                   | 50/6       | 11            |           |             |           |           |  |                        |
| 8      | 30   | 50/4                                     | 50/4       | 12            | 21        |             | 22        | 5         | Light gray silt with rock fragments (ML)                 |                        |
|        |      | 50/5                                     | 50/5       | 13            |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 10     | 35   |  |            |               |           |             |           |           | Termination of boring at 30.0 feet.                      |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 12     | 40   |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |

# BORING LOG

## ARDAMAN & ASSOCIATES, INC.

BORING NO. STA 34+00  
TOTAL DEPTH 31.5 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 34.0 ft NGVD (approximately)  
DATE STARTED 10-20-1988 DATE COMPLETED 10-20-1988 BORING TYPE SPT  
DRILLER/RIG David/David LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 4.5' DATE 10-20-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
|        |      |  |            | 1             |           |             |           |           | Gray fine sand (SP)                                      |                        |
|        |      |  |            | 2             |           |             |           |           | Brown fine sand (SP)                                     |                        |
| 1      |      |  |            | 3             |           |             |           |           | Gray silty fine sand (SM)                                |                        |
|        | 5    |  |            | 4             |           |             |           |           | Brown silty fine sand (SM)                               |                        |
| 2      |      |  |            | 5             |           |             |           |           | Gray silty fine sand (SM)                                |                        |
|        | 10   |  |            |               |           |             |           |           |  |                        |
| 3      |      |  |            |               |           |             |           |           |  |                        |
|        | 15   |  |            |               |           |             |           |           |  |                        |
| 4      |      |  |            |               |           |             |           |           |  |                        |
|        | 20   |  |            |               |           |             |           |           |  |                        |
| 5      |      | 3-4-7                                    | 11         | 6             |           |             |           |           | Light brown fine sand (SP)                               |                        |
|        |      | 3-4-3                                    | 7          | 7             |           |             |           |           | Light brown fine sand with phosphate (SP)                |                        |
| 6      |      | 1-1-5                                    | 6          | 8             |           |             |           |           | Grayish brown clayey fine sand with phosphate (SC)       |                        |
|        |      | 5-5-5                                    | 10         | 9             | 26        | 23          |           |           |  |                        |
| 7      |      | 4-6-10                                   | 16         | 10            |           |             |           |           | Gray sandy clay with phosphate (CL)                      |                        |
|        |      | 6-8-9                                    | 17         | 11            |           |             |           |           | Gray clay with phosphate (CH)                            |                        |
|        | 25   |  |            |               |           |             |           |           | Gray clayey fine sand (SC)                               |                        |
| 8      |      | 6-1-5                                    | 6          | 12            |           |             |           |           |  |                        |
|        |      | 6-50/6                                   | 50/6       | 13            |           |             |           |           | Light brown clayey fine sand with phosphate (SC)         |                        |
|        |      | 50/6 - -                                 | 50/6       | 14            |           |             |           |           |  |                        |
| 9      |      | 50/6 - -                                 | 50/6       | 15            |           |             |           |           | Light brown clay with cemented sand and phosphate (CH)   |                        |
|        | 30   | 50/6 - -                                 | 50/6       | 16            |           |             |           |           |  |                        |
| 10     |      |  |            |               |           |             |           |           | Termination of boring at 31.5 feet.                      |                        |
|        | 35   |  |            |               |           |             |           |           |  |                        |
| 11     |      |  |            |               |           |             |           |           |  |                        |
|        | 40   |  |            |               |           |             |           |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 36+00  
TOTAL DEPTH 30.5 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 33.8 ft NGVD (approximately)  
DATE STARTED 10-21-1988 DATE COMPLETED 10-21-1988 BORING TYPE SPT  
DRILLER/RIG David/David LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 4.5' DATE 10-21-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            | Lab Data      |           |             |           | Soil Description and Remarks<br>(Unified Classification)       | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) |  |                        |
| 1      |      |  |            |               |           |             |           | Washed   |                        |
|        | 5    |  |            |               |           |             |           |  |                        |
| 2      |      |  |            |               |           |             |           |  |                        |
|        | 10   |  |            |               |           |             |           |  |                        |
| 3      |      |  |            |               |           |             |           | Brown clayey fine sand (SC)                                    |                        |
|        | 15   |  |            |               |           |             |           |  |                        |
| 4      |      |  |            |               |           |             |           |  |                        |
|        | 20   |  |            |               |           |             |           |  |                        |
| 5      |      | 6-5-5                                    | 10         | 1             |           |             |           | Gray slightly silty fine sand with traces of phosphate (SP-SM) |                        |
|        |      | 1-1-1                                    | 2          | 2             |           |             |           |  |                        |
| 6      |      | 1-1-3                                    | 4          | 3             |           |             |           |  |                        |
|        |      | 3-4-6                                    | 10         | 4             |           |             |           |  |                        |
| 7      |      | 6-12-14                                  | 26         | 5             |           |             |           | Gray clayey fine sand with phosphate (SC)                      |                        |
|        |      | 6-8-7                                    | 15         | 6             |           |             |           |  |                        |
| 8      |      | 8-8-13                                   | 21         | 7             |           |             |           |  |                        |
|        |      | 50 - -                                   |            | 8             |           |             |           |  |                        |
| 9      |      | 10-18-50                                 | 68         | 9             |           |             |           | Light gray sandy clay (CL)                                     |                        |
|        |      | 15-50-                                   |            | 10            |           |             |           |  |                        |
|        |      |  |            | 11            |           |             |           |  |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 10     |      |  |            |               |           |             |           | Termination of boring at 30.5 feet                             |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 11     |      |  |            |               |           |             |           |  |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 12     |      |  |            |               |           |             |           | Termination of boring at 30.5 feet                             |                        |
|        |      |  |            |               |           |             |           |  |                        |
|        | 40   |  |            |               |           |             |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 38+00  
 TOTAL DEPTH 30.0 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 33.70 ft NGVD (approximately)  
 DATE STARTED 10-7-1988 DATE COMPLETED 10-7-1988 BORING TYPE Auger  
 DRILLER/RIG David/David LENGTH/TYPE CASING \_\_\_\_\_  
 WATER TABLE DEPTH: 1st 3.5' DATE 10-7-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/ft                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
|        |      |  |            | 1             |           |             |           |           | Brown slightly silty fine sand (SP-SM)                   |                        |
| 1      |      |  |            | 2             |           |             |           |           | Brown silty fine sand (SM)                               |                        |
|        | 5    |  |            | 3             |           |             |           |           |  |                        |
| 2      |      |  |            | 4             |           |             |           |           | Light brown slightly silty fine sand (SP-SM)             |                        |
|        |      |  |            | 5             |           |             |           |           |  |                        |
| 3      | 10   |  |            | 6             |           |             |           |           |  |                        |
|        |      |  |            | 7             |           |             |           |           |  |                        |
| 4      |      |  |            | 8             |           |             |           |           |  |                        |
|        | 15   |  |            | 9             |           |             |           |           | Gray slightly silty fine sand with phosphate (SP-SM)     |                        |
| 5      |      |  |            | 10            |           |             |           |           |  |                        |
|        |      |  |            | 11            |           |             |           |           | Gray clayey fine sand with phosphate and shell (SC)      |                        |
| 6      | 20   |  |            | 12            |           |             |           |           | Gray sandy clay with phosphate (CL)                      |                        |
|        |      |  |            | 13            |           |             |           |           |  |                        |
| 7      |      |  |            | 14            |           |             |           |           | Gray sandy clay with rock (CL)                           |                        |
|        | 25   |  |            | 15            |           |             |           |           |  |                        |
| 8      |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 9      | 30   |  |            |               |           |             |           |           | Termination of boring at 30.0 feet.                      |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 10     |      |  |            |               |           |             |           |           |  |                        |
|        | 35   |  |            |               |           |             |           |           |  |                        |
| 11     |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 12     | 40   |  |            |               |           |             |           |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 40+00  
TOTAL DEPTH 29.0 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 33.5 ft NGVD (approximately)  
DATE STARTED 10-22-1988 DATE COMPLETED 10-22-1988 BORING TYPE SPT  
DRILLER/RIG David/David LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 4.0' DATE 10-22-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)                | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
| 1      |      | 2-3-3                                    | 6          | 1             |           |             |           |           | Brown fine sand with roots (SP)   |                        |
|        |      | 4-5-5                                    | 10         | 2             |           |             |           |           |   |                        |
| 2      | 5    | 7-5-6                                    | 11         | 3             |           |             |           |           | Light brown slightly silty fine sand with roots (SP-SM)                 |                        |
|        |      | 8-10-12                                  | 22         | 4             |           |             |           |           |   |                        |
| 3      | 10   | 4-5-6                                    | 11         | 5             |           |             |           |           | Light brown slightly silty fine sand (SP-SM)                            |                        |
|        |      | 7-10-9                                   | 19         | 6             |           |             |           |           |   |                        |
| 4      |      | 6-6-6                                    | 12         | 7             |           |             |           |           |   |                        |
|        |      | 3-1-3                                    | 4          | 8             |           |             |           |           |   |                        |
| 5      | 15   | 3-4-5                                    | 9          | 9             |           |             |           |           |   |                        |
|        |      | 3-6-5                                    | 11         | 10            |           |             |           |           |   |                        |
| 6      | 20   | 5-20-20                                  | 40         | 11            |           |             |           |           | Gray clayey fine sand with phosphate and traces of shell fragments (SC) |                        |
|        |      | 3-5-7                                    | 12         | 12            |           |             |           |           |   |                        |
| 7      |      | 2-2-5                                    | 7          | 13            |           |             |           |           |   |                        |
|        |      | 2-2-2                                    | 4          | 14            |           |             |           |           |   |                        |
| 8      | 25   | 2-2-7                                    | 9          | 15            |           |             |           |           | Gray sandy clay with seams of gray clay (CL)                            |                        |
|        |      | 3-3-6                                    | 9          | 16            |           |             |           |           |   |                        |
| 9      | 30   | 7-6-9                                    | 15         | 17            |           |             |           |           |   |                        |
|        |      | 5-5-11                                   | 16         | 18            |           |             |           |           |   |                        |
| 10     |      | 10-50/3                                  | 50/3       | 19            |           |             |           |           | Gray clayey fine sand with phosphate (SC)                               |                        |
|        |      | 50/6                                     | 50/6       | 20            |           |             |           |           |   |                        |
| 11     | 35   |  |            | 21            |           |             |           |           | Termination of boring at 29.0 feet.                                     |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 12     | 40   |  |            |               |           |             |           |           |   |                        |



# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 42+00  
TOTAL DEPTH 30.0 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 33.35 ft NGVD  
DATE STARTED 6-2-1988 DATE COMPLETED 6-2-1988 BORING TYPE SPT  
DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 3.5' DATE 6-2-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
| 1      |      | 1-1-2                                    | 3          | 1             |           |             |           |           | Gray fine sand with fine roots (SP)                      |                        |
|        |      | 1-2-2                                    | 4          | 2             |           |             |           |           | Dark brown slightly silty fine sand (SP-SM)              |                        |
|        |      | 1-2-3                                    | 5          | 3             |           |             |           |           |  |                        |
| 2      | 5    | 2-4-5                                    | 9          |               |           |             |           |           | Gray silty fine sand (SM)                                |                        |
|        |      | 3-5-8                                    | 13         |               |           |             |           |           |  |                        |
|        |      | 7-9-7                                    | 16         |               |           |             |           |           |  |                        |
| 3      | 10   | 5-7-6                                    | 13         |               |           |             |           |           | Gray slightly silty fine sand (SP-SM)                    |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 4      | 15   | 2-2-3                                    | 5          | 6             |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 5      | 20   | 1-1-1                                    | 2          | 7             |           |             |           |           | Gray clayey fine sand with shell and phosphate (SC)      |                        |
|        |      | 1-1-2                                    | 3          | 8             |           |             |           |           |  |                        |
|        |      | 4-6-5                                    | 11         | 9             |           | 23          |           |           |  |                        |
| 7      | 25   | 3-7-5                                    | 12         | 10            |           |             |           |           | Gray clayey fine sand (SC)                               |                        |
|        |      | 3-2-4                                    | 6          | 11            |           |             |           |           |  |                        |
|        |      | 2-50/3                                   | 50/3       | 12            |           |             |           |           | Light gray sandy clay with rock fragments (CL)           |                        |
| 8      | 30   | 27-50/4                                  | 50/4       | 13            |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 10     | 35   |  |            |               |           |             |           |           | Termination of boring at 30.0 feet.                      |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 11     | 40   |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 12     |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 44+00  
 TOTAL DEPTH 30.0 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 33.30 ft NGVD (approximately)  
 DATE STARTED 10-7-1988 DATE COMPLETED 10-7-1988 BORING TYPE Auger  
 DRILLER/RIG David/David LENGTH/TYPE CASING \_\_\_\_\_  
 WATER TABLE DEPTH: 1st 3.0' DATE 10-7-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)                       | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/ft                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
|        |      |  |            | 1             |           |             |           |           | Brown slightly silty fine sand (SP-SM)   |                        |
| 1      |      |  |            | 2             |           |             |           |           | Light brown slightly silty fine sand (SP-SM)                                   |                        |
|        | 5    |  |            | 3             |           |             |           |           |  |                        |
| 2      |      |  |            | 4             |           |             |           |           |  |                        |
|        | 10   |  |            | 5             | 20        | 6           |           |           |  |                        |
|        |      |  |            | 6             |           |             |           |           |  |                        |
| 4      |      |  |            | 7             |           |             |           |           | Grayish brown slightly silty fine sand with phosphate and rock fragments       |                        |
|        | 15   |  |            | 8             |           |             |           |           |  |                        |
| 5      |      |  |            | 9             |           |             |           |           |  |                        |
|        | 20   |  |            | 10            |           |             |           |           | Gray clayey fine sand with phosphate and rock fragments (SC)                   |                        |
|        |      |  |            | 11            |           |             |           |           | Gray slightly clayey fine sand with phosphate and trace of rock fragments (SC) |                        |
| 7      |      |  |            | 12            |           |             |           |           |  |                        |
|        | 25   |  |            | 13            |           |             |           |           |  |                        |
| 8      |      |  |            | 14            | 41        |             | 52        | 22        | Gray sandy clay with phosphate (CL)  |                        |
|        |      |  |            | 15            |           |             |           |           | Gray clay (CH)   |                        |
| 9      | 30   |  |            |               |           |             |           |           |  |                        |
| 10     |      |  |            |               |           |             |           |           | Termination of boring at 30.0 feet.  |                        |
|        | 35   |  |            |               |           |             |           |           |  |                        |
| 11     |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 12     | 40   |  |            |               |           |             |           |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 46+00  
TOTAL DEPTH 30.0 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida  
DATE STARTED 10-22-1988 DATE COMPLETED 10-22-1988 ELEVATION 32.2 ft NGVD (approximately)  
DRILLER/RIG David/David BORING TYPE SPT  
WATER TABLE DEPTH: 1st 4.0' DATE 10-22-1988 LENGTH/TYPE CASING Used driller's mud.  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)                | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
| 1      |      | 1-2-5                                    | 7          | 1             |           |             |           |           | Gray fine sand with traces of roots (SP)                                |                        |
|        |      | 4-4-4                                    | 8          | 2             |           |             |           |           | Brown fine sand (SP)  |                        |
| 2      | 5    | 3-1-2                                    | 3          | 3             |           |             |           |           |   |                        |
|        |      | 2-4-6                                    | 10         | 4             |           |             |           |           |   |                        |
| 3      | 10   | 5-5-5                                    | 10         | 5             |           |             |           |           | Light brown slightly silty fine sand (SP-SM)                            |                        |
|        |      | 5-6-6                                    | 12         | 6             |           |             |           |           |   |                        |
| 4      |      | 8-7-8                                    | 15         | 7             |           |             |           |           |   |                        |
|        |      | 3-3-6                                    | 9          | 8             |           |             |           |           |   |                        |
| 5      | 15   | 7-8-9                                    | 17         | 9             |           |             |           |           |   |                        |
|        |      | 5-5-11                                   | 16         | 10            |           |             |           |           |   |                        |
| 6      | 20   | 8-8-11                                   | 19         | 11            |           |             |           |           |   |                        |
|        |      | 6-8-10                                   | 18         | 12            |           |             |           |           | Brown fine sand with traces of phosphate (SP)                           |                        |
| 7      |      | 5-5-4                                    | 9          | 13            |           |             |           |           |   |                        |
|        |      | 2-1-1                                    | 2          | 14            |           |             |           |           | Gray clayey fine sand with shell fragments and traces of phosphate (SC) |                        |
| 8      | 25   | 1-1-2                                    | 3          | 15            |           |             |           |           |   |                        |
|        |      | 7-10-50/3                                | 50/3       | 16            |           |             |           |           |   |                        |
| 9      | 30   | - - 50/3                                 | 50/3       | 17            |           |             |           |           | Gray clayey fine sand with phosphate and cemented sand (SC)             |                        |
|        |      | 50-50-50/3                               | 50/3       | 18            |           |             |           |           |   |                        |
| 10     |      | - - 50/3                                 | 50/3       | 19            |           |             |           |           | Gray slightly sandy clay with phosphate (CL)                            |                        |
|        |      | - - 50/3                                 | 50/3       | 20            |           |             |           |           |   |                        |
| 11     | 35   |  |            |               |           |             |           |           | Termination of boring at 30.0 feet.                                     |                        |
| 12     | 40   |  |            |               |           |             |           |           |   |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 48+00  
 TOTAL DEPTH 30.0 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 32.0 ft NGVD (approximately)  
 DATE STARTED 10-7-1988 DATE COMPLETED 10-7-1988 BORING TYPE Auger  
 DRILLER/RIG David/David LENGTH/TYPE CASING \_\_\_\_\_  
 WATER TABLE DEPTH: 1st 2.5' DATE 10-7-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)     | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
| 1      |      |  |            | 1             |           |             |           |           | Light brown slightly silty fine sand (SP-SM)                 |                        |
|        |      |  |            | 2             |           |             |           |           |  |                        |
|        | 5    |  |            | 3             |           |             |           |           |  |                        |
| 2      |      |  |            | 4             |           |             |           |           |  |                        |
|        |      |  |            | 5             |           |             |           |           |  |                        |
| 3      | 10   |  |            | 6             |           |             |           |           |  |                        |
|        |      |  |            | 7             |           |             |           |           |  |                        |
| 4      |      |  |            | 8             |           |             |           |           | Brown silty fine sand (SM)                                   |                        |
|        | 15   |  |            | 9             |           |             |           |           |  |                        |
| 5      |      |  |            | 10            |           |             |           |           | Gray silty fine sand with phosphate (SM)                     |                        |
|        |      |  |            | 11            | 17        | 20          |           |           | Gray silty fine sand with phosphate, trace of rock (SM)      |                        |
| 6      | 20   |  |            | 12            |           |             |           |           | Gray clayey fine sand with phosphate and rock fragments (SC) |                        |
|        |      |  |            | 13            |           |             |           |           | Gray sandy clay with phosphate and traces of rock (CL)       |                        |
| 7      |      |  |            | 14            |           |             |           |           |  |                        |
|        | 25   |  |            | 15            |           |             |           |           | Gray clay with phosphate (CH)                                |                        |
| 8      |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 9      | 30   |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           | Termination of boring at 30.0 feet.                          |                        |
| 10     |      |  |            |               |           |             |           |           |  |                        |
|        | 35   |  |            |               |           |             |           |           |  |                        |
| 11     |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 12     | 40   |  |            |               |           |             |           |           |  |                        |

# BORING LOG

## ARDAMAN & ASSOCIATES, INC.

BORING NO. STA 50+00  
TOTAL DEPTH 30.0 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 31.3 ft NGVD (approximately)  
DATE STARTED 10-25-1988 DATE COMPLETED 10-25-1988 BORING TYPE SPT  
DRILLER/RIG David/David LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 5.5' DATE 10-25-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
| 1      |      | 1-3-3                                    | 6          | 1             |           |             |           |           | Brown fine sand with roots (SP)                          |                        |
|        |      | 4-4-5                                    | 9          | 2             |           |             |           |           |  |                        |
| 2      | 5    | 6-4-4                                    | 8          | 3             |           |             |           |           | Light brown fine sand (SP)                               |                        |
|        |      | 3-2-2                                    | 4          | 4             |           |             |           |           |  |                        |
| 3      | 10   |  |            | 5             |           |             |           |           |  |                        |
|        |      | 2-1-3                                    | 4          |               |           |             |           |           |  |                        |
| 4      |      | 3-4-5                                    | 9          | 6             |           |             |           |           |  |                        |
|        |      |  |            | 7             |           |             |           |           |  |                        |
| 5      | 15   | 6-7-9                                    | 16         |               |           |             |           |           |  |                        |
|        |      | 6-6-8                                    | 14         | 8             |           |             |           |           |  |                        |
| 6      | 20   | 4-4-5                                    | 9          | 9             |           |             |           |           | Gray slightly silty fine sand with phosphate (SP-SM)     |                        |
|        |      | 6-6-8                                    | 14         | 10            |           |             |           |           |  |                        |
| 7      | 25   | 7-7-9                                    | 16         |               |           |             |           |           |  |                        |
|        |      | 6-6-9                                    | 15         | 11            |           |             |           |           |  |                        |
| 8      |      | 6-11-18                                  | 29         | 12            |           |             |           |           | Gray clayey fine sand with phosphate (SC)                |                        |
|        |      | 6-6-7                                    | 13         | 13            |           |             |           |           |  |                        |
| 9      | 30   | 7-9-11                                   | 20         | 14            |           |             |           |           | Light brown sandy clay with phosphate (CL)               |                        |
|        |      | 9-11-15                                  | 26         | 15            |           |             |           |           |  |                        |
| 10     | 35   | 10-50/6                                  | 50/6       | 16            |           |             |           |           |  |                        |
|        |      | 50 - -                                   | 50/6       | 17            |           |             |           |           |  |                        |
| 11     |      | 50 - -                                   | 50/6       | 18            |           |             |           |           | Termination of boring at 30.0 feet                       |                        |
|        |      | 35-50/6                                  | 50/6       |               |           |             |           |           |  |                        |
| 12     | 40   |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 51+50  
TOTAL DEPTH 31.0 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida  
DATE STARTED 6-3-1988 DATE COMPLETED 6-3-1988 ELEVATION 31.17 ft NGVD  
DRILLER/RIG Fisher/Nick BORING TYPE SPT  
WATER TABLE DEPTH: 1st 4.5' DATE 6-3-1988 LENGTH/TYPE CASING Used driller's mud.  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)                  | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
|        |      | 1-2-4                                    | 6          | 1             |           |             |           |           | Light gray fine sand with roots (SP)                                      |                        |
|        |      | 4-5-5                                    | 10         | 3             |           |             |           |           | Light brown slightly silty fine sand with roots (SP-SM)                   |                        |
| 1      |      | 4-2-2                                    | 4          | 4             |           |             |           |           | Gray silty fine sand (SM)   |                        |
|        | 5    | 1-1-1                                    | 2          |               |           |             |           |           |   |                        |
| 2      |      | 1-1-0                                    | 1          |               |           |             |           |           |   |                        |
|        |      | 1-1-2                                    | 3          |               |           |             |           |           |   |                        |
| 3      | 10   | 3-3-4                                    | 7          | 5             |           |             |           |           | Gray slightly silty fine sand (SP-SM)                                     |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 4      |      |  |            |               |           |             |           |           | Brown clayey fine sand (SC)   |                        |
|        | 15   | 1-2-1                                    | 3          | 6             |           |             |           |           |   |                        |
| 5      |      |  |            |               |           |             |           |           |   |                        |
|        |      | 4-5-6                                    | 11         | 7             |           |             |           |           | Dark gray slightly silty fine sand (SP-SM)                                |                        |
| 6      | 20   | 4-2-1                                    | 3          | 8             |           |             |           |           |   |                        |
|        |      | 1-1-2                                    | 3          | 9             |           | 10          |           |           | Dark gray slightly clayey fine sand (SM-SC)                               |                        |
| 7      |      | 3-5-5                                    | 10         | 10            |           |             |           |           | Gray silty fine sand with rock fragments, trace of phosphate (SM)         |                        |
|        | 25   | 11-21-27                                 | 48         | 11            |           |             |           |           | Light brown to gray clayey fine sand with a trace of phosphatic rock (SC) |                        |
| 8      |      | 28-17-42                                 | 59         | 12            |           |             |           |           |   |                        |
|        |      | 18-6-9                                   | 15         | 13            | 61        | 64          | 64        | 27        | Gray clay, trace silt (CH)  |                        |
| 9      | 30   | 10-16-21                                 | 37         | 14            |           |             |           |           | Gray sandy clay with rock fragments (CL)                                  |                        |
|        |      | 24-50/5                                  | 50/5       | 15            |           |             |           |           |   |                        |
| 10     |      |  |            |               |           |             |           |           | Termination of boring at 31.0 feet.                                       |                        |
|        | 35   |  |            |               |           |             |           |           |   |                        |
| 11     |      |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 12     | 40   |  |            |               |           |             |           |           |   |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 52+00  
 TOTAL DEPTH 30.0 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 31.50 ft NGVD (approximately)  
 DATE STARTED 10-7-1988 DATE COMPLETED 10-7-1988 BORING TYPE Auger  
 DRILLER/RIG David/David LENGTH/TYPE CASING \_\_\_\_\_  
 WATER TABLE DEPTH: 1st 3.5' DATE 10-7-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)        | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
|        |      |  |            | 1             |           |             |           |           | Light brown silty fine sand (SM)                                |                        |
| 1      |      |  |            | 2             |           |             |           |           |   |                        |
|        | 5    |  |            | 3             |           |             |           |           |   |                        |
| 2      |      |  |            | 4             |           |             |           |           |   |                        |
|        | 10   |  |            | 5             |           |             |           |           |   |                        |
| 3      |      |  |            | 6             |           |             |           |           |   |                        |
|        |      |  |            | 7             |           |             |           |           | Gray silty fine sand (SM)                                       |                        |
| 4      |      |  |            | 8             | 19        | 11          |           |           | Brown slightly silty fine sand with traces of phosphate (SP-SM) |                        |
|        | 15   |  |            | 9             |           |             |           |           |   |                        |
| 5      |      |  |            | 10            |           |             |           |           | Gray silty fine sand with phosphate, trace rock fragments (SM)  |                        |
|        | 20   |  |            | 11            |           |             |           |           | Gray clayey fine sand with phosphate (SC)                       |                        |
| 6      |      |  |            | 12            |           |             |           |           |   |                        |
|        | 25   |  |            | 13            |           |             |           |           |   |                        |
| 7      |      |  |            | 14            |           |             |           |           | Gray clay (CH)  |                        |
|        |      |  |            | 15            |           |             |           |           |   |                        |
| 8      |      |  |            |               |           |             |           |           |   |                        |
|        | 30   |  |            |               |           |             |           |           | Termination of boring at 30.0 feet.                             |                        |
| 9      |      |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 10     |      |  |            |               |           |             |           |           |   |                        |
|        | 35   |  |            |               |           |             |           |           |   |                        |
| 11     |      |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 12     |      |  |            |               |           |             |           |           |   |                        |
|        | 40   |  |            |               |           |             |           |           |   |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 54+00  
TOTAL DEPTH 31.5 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 32.09 ft NGVD (approximately)  
DATE STARTED 10-25-1988 DATE COMPLETED 10-25-1988 BORING TYPE SPT  
DRILLER/RIG David/David LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 5.0' DATE 10-25-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
| 1      |      | 1-1-2                                    | 3          | 1             |           |             |           |           | Brown fine sand with roots (SP)                          |                        |
|        |      | 2-2-2                                    | 4          | 2             |           |             |           |           |  |                        |
|        |      | 3-3-5                                    | 8          | 3             |           |             |           |           | Brown slightly silty fine sand with roots (SP-SM)        |                        |
| 2      | 5    |  |            | 4             |           |             |           |           |  |                        |
|        |      | 6-5-5                                    | 10         | 5             |           |             |           |           | Light brown slightly silty fine sand (SP-SM)             |                        |
|        |      | 5-5-6                                    | 11         | 6             |           |             |           |           |  |                        |
| 3      | 10   | 6-6-6                                    | 12         | 7             |           |             |           |           |  |                        |
|        |      | 6-6-8                                    | 14         | 8             |           |             |           |           |  |                        |
|        |      | 1-2-2                                    | 4          | 9             |           |             |           |           |  |                        |
| 4      |      | 5-6-8                                    | 14         | 10            |           |             |           |           |  |                        |
|        |      | 5-6-5                                    | 11         | 11            |           |             |           |           |  |                        |
|        |      | 2-1-2                                    | 3          | 12            |           |             |           |           |  |                        |
| 5      | 15   | 6-6-7                                    | 13         | 13            |           |             |           |           | Brown slightly silty fine sand with phosphate (SP-SM)    |                        |
|        |      | 6-6-4                                    | 10         | 14            |           |             |           |           |  |                        |
|        |      | 5-6-10                                   | 16         | 15            |           |             |           |           | Gray clayey fine sand with cemented sand (SC)            |                        |
| 6      | 20   | 7-6-7                                    | 13         | 16            |           |             |           |           |  |                        |
|        |      | 10-9-11                                  | 20         | 17            |           |             |           |           | Light gray sandy clay with phosphate (CL)                |                        |
|        |      | 15-17-33                                 | 50         | 18            |           |             |           |           |  |                        |
| 7      | 25   | 23-50/3                                  | 50/3       | 19            |           |             |           |           |  |                        |
|        |      | 30-41-50/3                               | 50/3       | 20            |           |             |           |           |  |                        |
|        |      | 50/3 - -                                 | 50/3       | 21            |           |             |           |           |  |                        |
| 8      | 30   | 50/3 - -                                 | 50/3       | 22            |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 9      | 35   |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 10     | 40   |  |            |               |           |             |           |           | Termination of boring at 31.5 feet.                      |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |



# BORING LOG

## ARDAMAN & ASSOCIATES, INC.

BORING NO. STA 56+00  
 TOTAL DEPTH 30.0 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 32.5 ft NGVD (approximately)  
 DATE STARTED 10-7-1988 DATE COMPLETED 10-7-1988 BORING TYPE Auger  
 DRILLER/RIG David/David LENGTH/TYPE CASING \_\_\_\_\_  
 WATER TABLE DEPTH: 1st 4.0' DATE 10-7-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            | Lab Data      |           |             |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%)  |                        |
| 1      |      |  |            | 1             |           |             |           |  |                        |
|        |      |  |            | 2             |           |             |           |  |                        |
|        | 5    |  |            | 3             |           |             |           |  |                        |
| 2      |      |  |            | 4             |           |             |           |  |                        |
|        |      |  |            | 5             |           |             |           |  |                        |
| 3      | 10   |  |            | 6             |           |             |           |  |                        |
|        |      |  |            | 7             |           |             |           |  |                        |
|        | 15   |  |            | 8             |           |             |           |  |                        |
| 5      |      |  |            | 9             | 20        | 21          |           |  |                        |
|        |      |  |            | 10            |           |             |           |  |                        |
| 6      | 20   |  |            | 11            |           |             |           |  |                        |
|        |      |  |            | 12            |           |             |           |  |                        |
| 7      |      |  |            | 13            |           |             |           |  |                        |
|        | 25   |  |            | 14            |           |             |           |  |                        |
| 8      |      |  |            | 15            | 30        |             | 54        | 25   |                        |
|        | 30   |  |            |               |           |             |           |  |                        |
| 10     |      |  |            |               |           |             |           |  |                        |
|        | 35   |  |            |               |           |             |           |  |                        |
| 11     |      |  |            |               |           |             |           |  |                        |
|        |      |  |            |               |           |             |           |  |                        |
| 12     | 40   |  |            |               |           |             |           |  |                        |
|        |      |  |            |               |           |             |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 58+00  
TOTAL DEPTH 35.0 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 33.0 ft NGVD (approximately)  
DATE STARTED 10-10-1988 DATE COMPLETED 10-10-1988 BORING TYPE SPT  
DRILLER/RIG David/David LENGTH/TYPER CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 3.0' DATE 10-10-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            | Lab Data      |           |             |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) |  |                        |
| 1      |      |  |            |               |           |             |           | Washed   |                        |
|        | 5    |  |            |               |           |             |           |  |                        |
| 2      |      |  |            |               |           |             |           |  |                        |
|        | 10   |  |            |               |           |             |           |  |                        |
| 3      |      |  |            |               |           |             |           | Brown fine sand with traces of rock and phosphate (SP)   |                        |
|        | 15   | 2-4-6                                    | 10         | 1             |           |             |           |  |                        |
|        |      |  |            | 2             |           |             |           |  |                        |
| 4      |      | 4-3-2                                    | 5          | 3             |           |             |           |  |                        |
|        |      |  |            | 4             |           |             |           | Light brown clayey fine sand with phosphate (SC)         |                        |
|        |      | 1-1-4                                    | 5          | 5             |           |             |           |  |                        |
|        |      |  |            | 6             |           |             |           |  |                        |
| 5      |      | 17-59-13                                 | 72         | 7             |           |             |           |  |                        |
|        | 20   | 50-20-20                                 | 40         | 8             |           | 12          |           | Gray sandy clay with traces of phosphate (CL)            |                        |
|        |      |  |            | 9             |           |             |           |  |                        |
| 6      |      | 28-29-50                                 | 79         | 10            |           |             |           |  |                        |
|        |      | 50-18-18                                 | 36         | 11            |           |             |           |  |                        |
|        | 25   | 10-5-8                                   | 13         | 12            |           |             |           | Gray clay with phosphate, traces of rock fragments (CH)  |                        |
|        |      |  |            | 13            |           |             |           |  |                        |
| 7      |      | 16-20-27                                 | 47         | 14            |           |             |           |  |                        |
|        |      | 50-16-9                                  | 25         | 15            |           |             |           |  |                        |
|        | 30   | 8-6-6                                    | 12         | 16            |           |             |           | Brown clayey fine sand (SC)                              |                        |
|        |      | 15-8-8                                   | 16         | 17            |           | 42          |           |  |                        |
| 8      |      | 14-5-6                                   | 11         | 18            |           |             |           |  |                        |
|        |      | 30-50-17                                 | 67         | 19            |           |             |           |  |                        |
|        | 35   | 50/8                                     | 50/8       | 20            |           |             |           | Termination of boring at 35.0 feet.                      |                        |
| 9      |      |  |            |               |           |             |           |  |                        |
| 10     |      |  |            |               |           |             |           |  |                        |
|        | 40   |  |            |               |           |             |           |  |                        |

# BORING LOG

## ARDAMAN & ASSOCIATES, INC.

BORING NO. STA 60+00  
 TOTAL DEPTH 31.0 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 33.13 ft NGVD (approximately)  
 DATE STARTED 6-3-1988 DATE COMPLETED 6-3-1988 BORING TYPE SPT  
 DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING Used driller's mud.  
 WATER TABLE DEPTH: 1st 4.75' DATE 6-3-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            | Lab Data      |           |             |           | Soil Description and Remarks<br>(Unified Classification)              | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) |   |                        |
| 1      | 5    | 1-2-2                                    | 4          | 1             |           |             |           | Gray slightly silty fine sand (SP-SM)                                 |                        |
|        |      |  |            | 2             |           |             |           | Dark brown slightly silty fine sand (SP-SM)                           |                        |
|        |      | 1-1-2                                    | 3          | 3             |           |             |           | Light brown slightly silty fine sand (SP-SM)                          |                        |
|        |      | 1-1-1                                    | 2          |               |           |             |           |   |                        |
| 2      | 10   | 1-1-3                                    | 4          | 4             |           |             |           | Light brown silty fine sand (SM)                                      |                        |
|        |      | 4-6-7                                    | 13         | 5             |           |             |           |   |                        |
|        |      | 5-7-7                                    | 14         |               |           |             |           | Light gray fine sand (SP)   |                        |
| 3      | 10   | 6-5-4                                    | 9          |               |           |             |           |   |                        |
| 4      |      |  |            |               |           |             |           |   |                        |
| 5      | 15   | 1-1-2                                    | 3          | 6             |           |             |           | Dark brown silty fine sand (SM)                                       |                        |
|        |      |  |            |               |           |             |           |   |                        |
| 6      | 20   | 6-9-9                                    | 18         | 7             |           |             |           | Light gray clayey fine sand with rock fragments, trace phosphate (SC) |                        |
| 7      | 25   | 37-24-31                                 | 55         | 8             |           |             |           |   |                        |
|        |      | 18-4-10                                  | 14         | 9             |           | 79          |           | Gray sandy clay (CL)  |                        |
| 8      | 30   | 21-13-27                                 | 40         | 10            | 35        | 74          |           |   |                        |
|        |      | 21-28-19                                 | 47         | 11            |           |             |           |   |                        |
|        |      | 8-4-6                                    | 10         | 12            |           | 77          |           |   |                        |
| 9      | 35   | 7-9-7                                    | 16         | 13            |           |             |           |   |                        |
|        |      | 6-6-5                                    | 11         | 14            |           |             |           | Gray clay (CH)  |                        |
| 10     |      |  |            |               |           |             |           |   |                        |
| 11     | 40   |  |            |               |           |             |           | Termination of boring at 31.0 feet.                                   |                        |
|        |      |  |            |               |           |             |           |   |                        |
| 12     | 40   |  |            |               |           |             |           |   |                        |

# BORING LOG

## ARDAMAN & ASSOCIATES, INC.

BORING NO. STA 62+00  
TOTAL DEPTH 30.0 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 33.2 ft NGVD (approximately)  
DATE STARTED 10-12-1988 DATE COMPLETED 10-12-1988 BORING TYPE SPT  
DRILLER/RIG David/David LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 3.5' DATE 10-12-1988 TIME  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)               | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
| 1      | 5    |  |            |               |           |             |           |           | Light brown slightly silty fine sand (SP-SM)                           |                        |
| 2      |      |  |            |               |           |             |           |           |  |                        |
| 3      | 10   |  |            |               |           |             |           |           |  |                        |
| 4      |      |  |            |               |           |             |           |           |  |                        |
|        | 15   | 3-3-4                                    | 7          | 1             |           |             |           |           | Brown slightly silty fine sand (SP-SM)                                 |                        |
| 5      |      | 3-6-4                                    | 10         | 2             |           |             |           |           | Brown slightly silty fine sand with traces of phosphate (SP-SM)        |                        |
|        |      | 7-21-38                                  | 59         | 3             |           |             |           |           | Gray clayey fine sand with phosphate and traces of rock fragments (SC) |                        |
| 6      | 20   | 27-50-29                                 | 79         | 4             |           |             |           |           | Light brown clayey fine sand with phosphate (SC)                       |                        |
|        |      | 70-25-29                                 | 54         | 5             | 39        | 56          |           |           |  |                        |
| 7      |      | 16-20-50/3                               | 70         | 6             |           |             |           |           | Gray sandy clay (CL)   |                        |
|        |      | 10-21-29                                 | 50         | 7             |           |             |           |           | Gray sandy clay with phosphate (CL)                                    |                        |
|        | 25   | 26-30-34                                 | 64         | 8             |           |             |           |           | Gray sandy clay with phosphate (CL)                                    |                        |
| 8      |      | 25-31-35                                 | 66         | 9             |           |             |           |           | Gray sandy clay (CL)   |                        |
|        |      | 16-9-25                                  | 34         | 10            |           |             |           |           | Gray sandy clay with phosphate (CL)                                    |                        |
| 9      | 30   | 20-28-31                                 | 59         | 11            |           |             |           |           | Gray clay with phosphate (CH)  |                        |
| 10     |      |  |            |               |           |             |           |           | Termination of boring at 30.0 feet.                                    |                        |
|        | 35   |  |            |               |           |             |           |           |  |                        |
| 11     |      |  |            |               |           |             |           |           |  |                        |
| 12     | 40   |  |            |               |           |             |           |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 64+00  
TOTAL DEPTH 31.5 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 33.3 ft NGVD (approximately)  
DATE STARTED 10-13-1988 DATE COMPLETED 10-13-1988 BORING TYPE SPT  
DRILLER/RIG Fletch/David LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 3.5' DATE 10-13-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)                          | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
|        |      |  |            | 1             |           |             |           |           | Gray fine sand (SP)   |                        |
|        |      |  |            |               |           |             |           |           | Brown fine sand (SP)  |                        |
| 1      |      |  |            | 2             |           |             |           |           |   |                        |
|        | 5    |  |            | 3             |           |             |           |           | Dark gray slightly silty fine sand (SP-SM)  |                        |
| 2      |      |  |            | 4             |           |             |           |           |   |                        |
| 3      | 10   |  |            |               |           |             |           |           |   |                        |
|        |      |  |            | 5             |           |             |           |           |   |                        |
| 4      |      |  |            |               |           |             |           |           |   |                        |
|        | 15   | 3-3-3                                    | 6          | 6             |           |             |           |           |   |                        |
| 5      |      | 2-3-5                                    | 8          | 7             |           |             |           |           |   |                        |
|        |      | 5-5-5                                    | 10         | 8             |           |             |           |           |   |                        |
| 6      | 20   | 2-4-6                                    | 10         | 9             |           |             |           |           | Brown slightly silty fine sand (SP-SM)  |                        |
|        |      | 4-3-8                                    | 11         | 10            |           |             |           |           | Gray silty fine sand with phosphate and trace of rock fragments (SM)              |                        |
| 7      |      | 8-8-8                                    | 16         | 11            |           |             |           |           | Gray slightly silty fine sand with phosphate and traces of rock fragments (SP-SM) |                        |
|        |      | 5-8-12                                   | 20         | 12            | 30        | 57          |           |           | Gray clayey fine sand with phosphate (SC)   |                        |
| 8      | 25   | 8-12-28                                  | 40         | 13            |           |             |           |           |   |                        |
|        |      | 50-50-50                                 | 50         | 14            |           |             |           |           |   |                        |
|        |      |  | 50         | 15            |           |             |           |           |   |                        |
|        |      |  | 50         | 16            |           |             |           |           | Gray sandy clay with phosphate (CL)   |                        |
| 9      |      | 10-16-17                                 | 33         | 17            |           |             |           |           |   |                        |
|        | 30   | 10-26-34                                 | 60         | 18            |           |             |           |           |   |                        |
|        |      | 18-22-26                                 | 48         | 19            |           |             |           |           |   |                        |
| 10     |      |  |            |               |           |             |           |           |   |                        |
|        | 35   |  |            |               |           |             |           |           | Termination of boring at 31.5 feet.   |                        |
| 11     |      |  |            |               |           |             |           |           |   |                        |
| 12     | 40   |  |            |               |           |             |           |           |   |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 66+00  
TOTAL DEPTH 35.0 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 33.5 ft NGVD (approximately)  
DATE STARTED 10-13-1988 DATE COMPLETED 10-13-1988 BORING TYPE SPT  
DRILLER/RIG Fletch/David LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 3.5' DATE 10-13-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)              | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
|        |      |  |            | 1             |           |             |           |           | Gray fine sand (SP)   |                        |
|        |      |  |            | 2             |           |             |           |           | Brown fine sand (SP)  |                        |
| 1      |      |  |            | 3             |           |             |           |           | Dark gray slightly silty fine sand (SP-SM)                            |                        |
|        | 5    |  |            | 4             |           |             |           |           |   |                        |
| 2      |      |  |            | 5             |           |             |           |           |   |                        |
|        | 10   |  |            | 6             |           |             |           |           |   |                        |
|        |      |  |            | 7             |           |             |           |           | Gray silty fine sand with traces of phosphate and rock fragments (SM) |                        |
|        | 15   |  |            | 8             |           |             |           |           |   |                        |
| 5      |      | 4-4-5                                    | 9          | 9             |           |             |           |           |   |                        |
|        | 20   | 5-8-12                                   | 20         | 10            |           |             |           |           |   |                        |
|        |      | 9-6-3                                    | 9          | 11            |           |             |           |           | Gray clayey fine sand with phosphate (SC)                             |                        |
|        |      | 4-4-8                                    | 12         | 12            |           |             |           |           |   |                        |
| 7      |      | 8-18-29                                  | 47         | 13            | 19        | 15          |           |           |   |                        |
|        | 25   | 50                                       | 50         | 14            |           |             |           |           |   |                        |
| 8      |      | 28-20-47                                 | 67         | 15            |           |             |           |           | Gray sandy clay with phosphate (CL)                                   |                        |
|        |      | 15-21-37                                 | 58         | 16            |           |             |           |           |   |                        |
|        |      | 9-12-16                                  | 28         | 17            |           |             |           |           |   |                        |
| 9      | 30   | 12-16-21                                 | 37         | 18            |           |             |           |           |   |                        |
|        |      | 8-9-24                                   | 33         | 19            |           |             |           |           | Termination of boring at 35.0 feet.                                   |                        |
| 10     |      | 9-12-22                                  | 34         | 20            |           |             |           |           |   |                        |
|        | 35   | 11-12-24                                 | 36         | 21            |           |             |           |           |   |                        |
| 11     |      |  |            |               |           |             |           |           |   |                        |
| 12     | 40   |  |            |               |           |             |           |           |   |                        |

# BORING LOG

## ARDAMAN & ASSOCIATES, INC.

BORING NO. STA 68+00  
TOTAL DEPTH 31.0 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 33.79 ft NGVD  
DATE STARTED 6-6-1988 DATE COMPLETED 6-6-1988 BORING TYPE SPT  
DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 3.75' DATE 6-6-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)          | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
| 1      | 5    | 2-1-3                                    | 4          | 1             |           |             |           |           | Gray fine sand (SP)   |                        |
|        |      | 3-3-4                                    | 7          | 2             |           |             |           |           | Dark brown silty fine sand (SM)                                   |                        |
|        |      | 3-4-4                                    | 8          | 3             |           |             |           |           | Brown fine sand (SP)  |                        |
| 2      | 10   | 4-7-6                                    | 13         | 4             |           |             |           |           |   |                        |
|        |      | 5-5-8                                    | 13         |               |           |             |           |           | Gray fine sand (SP)   |                        |
| 3      | 15   | 9-12-11                                  | 23         |               |           |             |           |           |   |                        |
| 4      | 20   | 7-8-7                                    | 15         |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 5      | 25   |  |            |               |           |             |           |           | Gray slightly silty fine sand with phosphate (SP-SM)              |                        |
|        |      | 2-2-2                                    | 4          | 5             |           |             |           |           |   |                        |
| 6      | 30   | 3-4-9                                    | 13         | 6             | 21        | 65          |           |           |   |                        |
| 7      | 35   | 4-3-4                                    | 7          | 7             | 35        | 76          |           |           | Gray sandy clay with phosphate (CL)                               |                        |
|        |      | 3-5-7                                    | 12         | 8             |           |             |           |           |   |                        |
| 8      | 40   | 5-6-9                                    | 15         | 9             |           |             |           |           |   |                        |
|        |      | 14-18-19                                 | 37         | 10            |           |             |           |           | Gray clayey fine sand with thin lenses of fine sand and phosphate |                        |
| 9      | 45   | 11-15-16                                 | 31         | 11            |           |             |           |           |   |                        |
|        |      | 12-16-14                                 | 30         | 12            |           |             |           |           |   |                        |
| 10     | 50   | 10-10-12                                 | 22         | 13            | 30        | 42          |           |           |   |                        |
| 11     | 55   |  |            |               |           |             |           |           | Termination of boring at 31.0 feet.                               |                        |
| 12     | 60   |  |            |               |           |             |           |           |   |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 70+00  
TOTAL DEPTH 31.5 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida  
DATE STARTED 10-14-1988 DATE COMPLETED 10-14-1988 ELEVATION 33.5 ft NGVD (approximately)  
DRILLER/RIG David/David BORING TYPE SPT  
WATER TABLE DEPTH: 1st 3.0' DATE 10-14-1988 LENGTH/TYPE CASING Used driller's mud.  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)      | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/ft                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
|        |      |  |            | 1             |           |             |           |           | Gray fine sand (SP)   |                        |
|        |      |  |            | 2             |           |             |           |           | Brown fine sand (SP)  |                        |
| 1      |      |  |            | 3             |           |             |           |           |   |                        |
|        | 5    |  |            | 4             |           |             |           |           |   |                        |
| 2      |      |  |            | 5             |           |             |           |           | Dark gray slightly silty fine sand (SP-SM)                    |                        |
|        |      |  |            | 6             |           |             |           |           |   |                        |
| 3      | 10   |  |            | 7             |           |             |           |           |   |                        |
|        |      |  |            | 8             |           |             |           |           |   |                        |
| 4      |      |  |            | 9             |           |             |           |           | Brown slightly silty fine sand (SP-SM)                        |                        |
|        | 15   |  |            | 10            |           |             |           |           | Gray silty fine sand with phosphate (SM)                      |                        |
| 5      |      | 3-1-0                                    | 1          | 11            |           |             |           |           |   |                        |
|        |      | 0-2-1                                    | 3          | 12            |           |             |           |           |   |                        |
| 6      | 20   |  |            | 13            |           |             |           |           | Gray clayey fine sand with phosphate and rock fragments (SC)  |                        |
|        |      | 4-5-4                                    | 9          | 14            |           |             |           |           |   |                        |
| 7      |      | 5-9-11                                   | 20         | 15            |           |             |           |           |   |                        |
|        |      | 9-8-6                                    | 14         | 16            |           |             |           |           |   |                        |
| 8      | 25   | 5-5-8                                    | 13         | 17            | 40        |             | 59        | 38        | Green clay with thin seams of fine sand, trace phosphate (CH) |                        |
|        |      | 7-11-14                                  | 25         | 18            |           |             |           |           |   |                        |
| 9      |      | 9-9-11                                   | 20         |               |           |             |           |           |   |                        |
|        | 30   | 15-18-21                                 | 39         |               |           |             |           |           | Gray clayey fine sand with phosphate (SC)                     |                        |
|        |      | 15-20-28                                 | 48         |               |           |             |           |           |   |                        |
| 10     |      |  |            |               |           |             |           |           |   |                        |
|        | 35   |  |            |               |           |             |           |           | Termination of boring at 31.5 feet.                           |                        |
| 11     |      |  |            |               |           |             |           |           |   |                        |
|        | 40   |  |            |               |           |             |           |           |   |                        |



# BORING LOG

## ARDAMAN & ASSOCIATES, INC.

BORING NO. STA 72+00  
 TOTAL DEPTH 31.5 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 33.75 ft NGVD (approximately)  
 DATE STARTED 10-14-1988 DATE COMPLETED 10-14-1988 BORING TYPE SPT  
 DRILLER/RIG Fletch/David LENGTH/TYPE CASING Used driller's mud.  
 WATER TABLE DEPTH: 1st 3.5' DATE 10-14-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)      | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
|        |      |  |            | 1             |           |             |           |           | Dark gray fine sand (SP)                                      |                        |
| 1      |      |  |            | 2             |           |             |           |           |   |                        |
|        |      |  |            | 3             |           |             |           |           | Gray clayey fine sand (SC)                                    |                        |
|        | 5    |  |            | 4             |           |             |           |           |   |                        |
| 2      |      |  |            | 5             |           |             |           |           | Gray slightly silty fine sand (SP-SM)                         |                        |
|        |      |  |            | 6             |           |             |           |           |   |                        |
| 3      | 10   |  |            | 7             |           |             |           |           |   |                        |
|        |      |  |            | 8             |           |             |           |           | Brown fine sand (SP)  |                        |
| 4      |      |  |            | 9             |           |             |           |           |   |                        |
|        | 15   |  |            | 10            |           |             |           |           | Gray silty fine sand with phosphate and rock fragments (SM)   |                        |
| 5      |      | 5-6-9                                    | 15         | 11            |           |             |           |           |   |                        |
|        |      | 5-5-6                                    | 11         | 12            |           |             |           |           | Green clay with thin seams of fine sand, trace phosphate (CH) |                        |
| 6      | 20   | 5-5-6                                    | 11         | 13            |           |             |           |           |   |                        |
|        |      | 7-8-11                                   | 19         | 14            | 22        |             | 42        | 26        | Green clay with clayey fine sand, trace phosphate (CL)        |                        |
| 7      |      | 13-15-11                                 | 26         | 15            |           |             |           |           |   |                        |
|        | 25   | 9-11-11                                  | 22         | 16            |           |             |           |           |   |                        |
| 8      |      | 6-9-10                                   | 19         | 17            |           |             |           |           | Gray very clayey fine sand, trace phosphate (CH-SC)           |                        |
|        |      | 7-8-8                                    | 16         | 18            |           |             |           |           |   |                        |
| 9      |      | 5-6-6                                    | 12         |               |           |             |           |           |   |                        |
|        | 30   | 7-6-6                                    | 12         |               |           |             |           |           |   |                        |
|        |      | 1-7-11                                   | 18         |               |           |             |           |           |   |                        |
| 10     |      |  |            |               |           |             |           |           | Termination of boring at 31.5 feet.                           |                        |
|        | 35   |  |            |               |           |             |           |           |   |                        |
| 11     |      |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 12     | 40   |  |            |               |           |             |           |           |   |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 74+00  
TOTAL DEPTH 31.5 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 34.0 ft NGVD (approximately)  
DATE STARTED 10-17-1988 DATE COMPLETED 10-17-1988 BORING TYPE SPT  
DRILLER/RIG David/David LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 3.5' DATE 10-17-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)          | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
| 1      |      |  |            | 1             |           |             |           |           | Gray fine sand (SP)   |                        |
|        |      |  |            | 2             |           |             |           |           | Brown fine sand (SP)  |                        |
|        | 5    |  |            |               |           |             |           |           | Dark gray slightly silty fine sand (SP-SM)                        |                        |
| 2      |      |  |            | 3             |           |             |           |           |   |                        |
|        |      |  |            | 4             |           |             |           |           |   |                        |
| 3      | 10   |  |            | 5             |           |             |           |           |   |                        |
|        |      |  |            | 6             |           |             |           |           |   |                        |
|        | 15   |  |            | 7             |           |             |           |           | Brown fine sand (SP)  |                        |
| 5      |      | 5-2-3                                    | 5          | 8             |           |             |           |           | Gray slightly silty fine sand (SP-SM)                             |                        |
|        |      | 4-4-4                                    | 8          | 9             |           |             |           |           | Grayish green clay with seams of clayey fine sand (CH)            |                        |
|        |      | 1-1-1                                    | 2          | 10            |           |             |           |           | Gray clayey fine sand with phosphate (SC)                         |                        |
| 6      | 20   | 3-7-6                                    | 13         | 11            |           |             |           |           | Grayish green clay with lenses of fine sand, trace phosphate (CH) |                        |
|        |      | 6-7-7                                    | 14         | 12            |           |             |           |           | Gray clay with lenses of clayey fine sand (CH)                    |                        |
|        |      | 6-5-7                                    | 12         | 13            |           |             |           |           | Gray clayey fine sand with phosphate (SC)                         |                        |
|        | 25   | 6-9-9                                    | 18         | 14            | 54        | 50          |           |           |   |                        |
| 8      |      | 8-9-11                                   | 20         | 15            |           |             |           |           |   |                        |
|        |      | 3-6-8                                    | 14         | 16            |           |             |           |           |   |                        |
| 9      | 30   | 8-9-7                                    | 16         | 17            |           |             |           |           |   |                        |
|        |      | 9-9-9                                    | 18         |               |           |             |           |           |   |                        |
| 10     |      |  |            |               |           |             |           |           | Termination of boring at 31.5 feet.                               |                        |
|        | 35   |  |            |               |           |             |           |           |   |                        |
| 11     |      |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 12     | 40   |  |            |               |           |             |           |           |   |                        |



# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 76+00  
TOTAL DEPTH 31.5 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 34.40 ft NGVD (approximately)  
DATE STARTED 10-19-1988 DATE COMPLETED 10-19-1988 BORING TYPE SPT  
DRILLER/RIG David/David LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 3.0' DATE 10-19-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)          | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
|        |      |  |            | 1             |           |             |           |           | Gray fine sand (SP)   |                        |
|        |      |  |            | 2             |           |             |           |           | Brown fine sand (SP)  |                        |
| 1      |      |  |            | 3             |           |             |           |           | Dark gray slightly silty fine sand (SP-SM)                        |                        |
|        | 5    |  |            | 4             |           |             |           |           |   |                        |
| 2      |      |  |            | 5             |           |             |           |           |   |                        |
|        |      |  |            | 6             |           |             |           |           |   |                        |
| 3      | 10   |  |            | 7             |           |             |           |           |   |                        |
|        |      |  |            | 8             |           |             |           |           | Brown slightly silty fine sand, trace phosphate (SP-SM)           |                        |
| 4      |      |  |            | 9             |           |             |           |           |   |                        |
|        | 15   |  |            | 10            |           |             |           |           | Gray clayey fine sand with rock, phosphate and shell (SC)         |                        |
| 5      |      | 5-7-6                                    | 13         | 11            |           |             |           |           |   |                        |
|        |      | 4-4-4                                    | 8          | 12            |           |             |           |           | Brown clayey fine sand with phosphate (SC)                        |                        |
| 6      |      | 4-8-9                                    | 17         | 13            |           |             |           |           |   |                        |
|        | 20   | 28-16-13                                 | 29         | 14            |           |             |           |           | Gray clayey fine sand with phosphate (SC)                         |                        |
| 7      |      | 12-10-9                                  | 19         | 15            |           |             |           |           |   |                        |
|        |      | 9-7-7                                    | 14         | 16            |           |             |           |           | Grayish green clay with lenses of fine sand, trace phosphate (CL) |                        |
|        | 25   | 7-7-7                                    | 14         | 17            | 26        |             | 39        | 21        |   |                        |
| 8      |      | 6-8-6                                    | 14         | 18            |           |             |           |           |   |                        |
|        |      | 6-6-5                                    | 11         |               |           |             |           |           |   |                        |
|        |      | 1-6-5                                    | 11         |               |           |             |           |           | Clayey fine sand layer at bottom                                  |                        |
| 9      | 30   | 5-5-4                                    | 9          |               | 42        | 35          |           |           |   |                        |
|        |      |  |            |               |           |             |           |           | Termination of boring at 31.5 feet.                               |                        |
| 10     |      |  |            |               |           |             |           |           |   |                        |
|        | 35   |  |            |               |           |             |           |           |   |                        |
| 11     |      |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 12     | 40   |  |            |               |           |             |           |           |   |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 78+00  
TOTAL DEPTH 31.0 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 34.34 ft NGVD (approximately)  
DATE STARTED 6-6-1988 DATE COMPLETED 6-6-1988 BORING TYPE SPT  
DRILLER/RIG Fisher/Nick LENGTH/TYPER CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 3.5' DATE 6-6-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)         | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
| 1      | 5    | 1-2-4                                    | 6          | 1             |           |             |           |           | Gray fine sand (SP)  |                        |
|        |      |  |            | 2             |           |             |           |           | Dark brown slightly silty fine sand (SP-SM)                      |                        |
|        |      | 3-5-4                                    | 9          | 3             |           |             |           |           | Brown fine sand (SP)   |                        |
|        |      | 4-5-6                                    | 11         |               |           |             |           |           |  |                        |
| 2      | 10   | 4-7-9                                    | 16         | 4             |           |             |           |           | Light brown fine sand (SP)                                       |                        |
|        |      | 7-8-7                                    | 15         |               |           |             |           |           |  |                        |
| 3      | 15   | 6-5-6                                    | 11         |               |           |             |           |           | Gray fine sand, trace clay (SP)                                  |                        |
|        |      | 5-5-5                                    | 10         |               |           |             |           |           |  |                        |
| 4      | 20   |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 5      | 25   | 2-2-4                                    | 6          | 5             |           |             |           |           | Gray slightly silty fine sand, trace phosphate (SP-SM)           |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 6      | 30   | 4-17-10                                  | 27         | 6             | 17        | 38          |           |           | Light brown clayey fine sand, traces of rock and phosphate (SC)  |                        |
|        |      | 6-18-12                                  | 30         | 7             |           |             |           |           |  |                        |
| 7      | 35   | 14-7-9                                   | 16         | 8             |           |             |           |           | Grayish green clayey fine sand (SC)                              |                        |
|        |      | 4-5-5                                    | 10         | 9             |           | 33          |           |           |  |                        |
| 8      | 40   | 4-5-6                                    | 11         | 10            |           |             |           |           |  |                        |
|        |      | 4-7-8                                    | 15         | 11            |           |             |           |           | Grayish green sandy clay with thin lenses of gray fine sand (CL) |                        |
| 9      |      | 5-3-3                                    | 6          | 12            |           |             |           |           |  |                        |
|        |      | 2-2-3                                    | 5          | 13            |           |             |           |           |  |                        |
| 10     |      |  |            |               |           |             |           |           | Termination of boring at 31.0 feet.                              |                        |
| 11     |      |  |            |               |           |             |           |           |  |                        |
| 12     |      |  |            |               |           |             |           |           |  |                        |

# BORING LOG

## ARDAMAN & ASSOCIATES, INC.

BORING NO. STA 80+00  
 TOTAL DEPTH 31.5 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 34.50 ft NGVD (approximately)  
 DATE STARTED 10-19-1988 DATE COMPLETED 10-19-1988 BORING TYPE SPT  
 DRILLER/RIG David/David LENGTH/TYPE CASING Used driller's mud.  
 WATER TABLE DEPTH: 1st 3.0' DATE 10-19-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Meters | Feet | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|--|------------------------|
|        |      | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |  |                        |
|        |      |  |            | 1             |           |             |           |           | Gray fine sand (SP)                                      |                        |
|        |      |  |            | 2             |           |             |           |           | Brown fine sand (SP)                                     |                        |
| 1      |      |  |            | 3             |           |             |           |           |  |                        |
|        |      |  |            | 4             |           |             |           |           | Dark gray silty fine sand (SM)                           |                        |
|        | 5    |  |            |               |           |             |           |           |  |                        |
| 2      |      |  |            | 5             |           |             |           |           |  |                        |
|        |      |  |            | 6             |           |             |           |           |  |                        |
| 3      | 10   |  |            | 7             |           |             |           |           |  |                        |
|        |      |  |            | 8             |           |             |           |           |  |                        |
| 4      |      |  |            | 9             |           |             |           |           |  |                        |
|        | 15   |  |            | 10            |           |             |           |           |  |                        |
| 5      |      | 3-5-6                                    | 11         | 11            |           |             |           |           | Brown slightly silty fine sand (SP-SM)                   |                        |
|        |      | 4-4-7                                    | 11         | 12            | 39        | 5           |           |           | Gray clayey fine sand with phosphate (SC)                |                        |
| 6      | 20   | 4-3-2                                    | 5          | 13            |           |             |           |           |  |                        |
|        |      | 2-1-2                                    | 3          | 14            |           |             |           |           | Gray sandy clay, trace rock and phosphate (CL)           |                        |
| 7      |      | 7-21-25                                  | 46         | 15            |           |             |           |           |  |                        |
|        | 25   | 14-17-27                                 | 44         | 16            |           |             |           |           |  |                        |
| 8      |      | 13-25-14                                 | 39         | 17            |           |             |           |           |  |                        |
|        |      | 16-20-33                                 | 53         | 18            |           |             |           |           | Gray clayey fine sand with phosphate (SC)                |                        |
| 9      | 30   | 10-12-9                                  | 21         | 19            |           |             |           |           |  |                        |
|        |      | 11-12-13                                 | 25         | 20            |           |             |           |           |  |                        |
|        |      | 11-17-18                                 | 35         |               |           |             |           |           |  |                        |
| 10     |      |  |            |               |           |             |           |           | Termination of boring at 31.5 feet.                      |                        |
|        | 35   |  |            |               |           |             |           |           |  |                        |
| 11     |      |  |            |               |           |             |           |           |  |                        |
|        |      |  |            |               |           |             |           |           |  |                        |
| 12     | 40   |  |            |               |           |             |           |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 82+00  
TOTAL DEPTH 40.0 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 34.60 ft NGVD (approximately)  
DATE STARTED 7-15-1988 DATE COMPLETED 7-15-1988 BORING TYPE SPT  
DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 2.5' DATE 7-15-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

**REMARKS**

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)      | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
| 1      |      |  |            |               |           |             |           |           | Brown slightly silty fine sand (SP-SM)                        |                        |
|        | 5    | 4-4-6                                    | 10         | 1             |           |             |           |           |   |                        |
| 2      |      |  |            |               |           |             |           |           |   |                        |
| 3      | 10   | 4-5-7                                    | 12         | 2             |           |             |           |           | Dark grayish brown fine sand (SP)                             |                        |
| 4      |      |  |            |               |           |             |           |           |   |                        |
|        | 15   | 4-3-6                                    | 9          | 3             |           |             |           |           |   |                        |
| 5      |      |  |            |               |           |             |           |           | Gray clayey fine sand with shell fragments and phosphate (SC) |                        |
| 6      | 20   | 2-1-1                                    | 2          | 4             |           |             |           |           |   |                        |
| 7      |      |  |            |               |           |             |           |           |   |                        |
|        | 25   | 12-14-19                                 | 33         | 5             |           |             |           |           | Gray clayey fine sand (SC)                                    |                        |
| 8      |      | 14-17-13                                 | 30         | 6             |           |             |           |           |   |                        |
|        |      | 7-13-13                                  | 26         | 7             | 19        | 31          |           |           |   |                        |
| 9      | 30   | 15-16-15                                 | 31         | 8             |           |             |           |           | Gray slightly clayey fine sand (SM-SC)                        |                        |
|        |      | 16-18-19                                 | 37         | 9             |           |             |           |           |   |                        |
| 10     |      |  |            |               |           |             |           |           |   |                        |
|        | 35   | 9-4-6                                    | 10         | 10            |           |             |           |           | Gray sandy clay with thin lenses of gray fine sand (CL)       |                        |
| 11     |      | 5-5-8                                    | 13         | 11            | 28        |             | 30        | 6         |   |                        |
|        |      | 4-6-7                                    | 13         | 12            |           |             |           |           |   |                        |
| 12     | 40   | 4-7-8                                    | 15         | 13            |           |             |           |           |   |                        |

# BORING LOG

## ARDAMAN & ASSOCIATES, INC.

BORING NO. STA 84+00  
TOTAL DEPTH 39.5 ft  
SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 34.51 ft NGVD (approximately)  
DATE STARTED 7-15-1988 DATE COMPLETED 7-15-1988 BORING TYPE SPT  
DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 2.25' DATE 7-15-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            | Lab Data      |           |             |           | Soil Description and Remarks<br>(Unified Classification) | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|--|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) |  |                        |
| 1      | 5    | 4-6-7                                    | 13         | 1             |           |             |           | Brown slightly silty fine sand (SP-SM)                   |                        |
| 2      | 10   | 4-5-6                                    | 11         | 2             |           |             |           |  |                        |
| 3      | 15   | 2-3-5                                    | 8          | 3             |           |             |           | Gray slightly silty fine sand (SP-SM)                    |                        |
| 4      | 20   | 2-1-3                                    | 4          | 4             |           |             |           | Gray silty fine sand with shell and phosphate (SM)       |                        |
| 5      | 25   | 6-6-8                                    | 14         | 5             | 22        | 20          |           | Gray clayey fine sand with phosphate, trace rock (SC)    |                        |
| 6      | 30   | 23-50/4                                  | 73/10      | 6             |           |             |           |  |                        |
| 7      | 35   | 21-56/6                                  | 56/6       | 7             | 31        | 49          |           | Gray sandy clay (CL)                                     |                        |
| 8      | 40   | 5-4-9                                    | 13         | 8             |           |             |           |  |                        |
| 9      |      | 5-6-8                                    | 14         | 9             |           |             |           |  |                        |
| 10     |      | 5-5-6                                    | 11         | 10            |           |             |           |  |                        |
| 11     |      | 5-6-7                                    | 13         | 11            |           |             |           |  |                        |
| 12     | 40   | Termination of boring at 39.5 feet.      |            |               |           |             |           |  |                        |

# BORING LOG

**ARDAMAN & ASSOCIATES, INC.**

BORING NO. STA 86+00  
 TOTAL DEPTH 39.5 ft  
 SHEET 1 OF 1

PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
 CLIENT Manatee County Department of Public Works  
 BORING LOCATION See Figure 3.  
 COUNTY Manatee STATE Florida ELEVATION 35.0 ft NGVD (approximately)  
 DATE STARTED 7-14-1988 DATE COMPLETED 7-14-1988 BORING TYPE SPT  
 DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING Used driller's mud.  
 WATER TABLE DEPTH: 1st 2.5' DATE 7-14-1988 TIME \_\_\_\_\_  
 2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)      | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
| 1      |      |  |            |               |           |             |           |           | Brown slightly silty fine sand (SP-SM)                        |                        |
|        | 5    | 2-1-5                                    | 6          | 1             |           |             |           |           |   |                        |
| 2      |      |  |            |               |           |             |           |           |   |                        |
| 3      | 10   | 3-6-8                                    | 14         | 2             | 18        | 6           |           |           | Brown fine sand (SP)  |                        |
| 4      |      |  |            |               |           |             |           |           |   |                        |
|        | 15   | 8-9-5                                    | 14         | 3             |           |             |           |           |   |                        |
| 5      |      |  |            |               |           |             |           |           | Gray clayey fine sand with phosphate and shell fragments (SC) |                        |
| 6      | 20   | 1-1-1                                    | 2          | 4             |           |             |           |           |   |                        |
| 7      |      |  |            |               |           |             |           |           |   |                        |
|        | 25   | 7-6-6                                    | 12         | 5             |           |             |           |           | Dense fragmentary material                                    |                        |
| 8      |      |  |            |               |           |             |           |           |   |                        |
|        | 30   | 8-6-19                                   | 25         | 6             |           |             |           |           |   |                        |
| 9      |      |  |            |               |           |             |           |           | Gray clayey fine sand with phosphate (SC)                     |                        |
|        | 35   | 10-18-15                                 | 33         | 7             |           |             |           |           |   |                        |
| 10     |      | 8-7-10                                   | 17         | 8             |           |             |           |           |   |                        |
|        |      | 8-12-11                                  | 33         | 9             |           |             |           |           | Gray sandy clay with streaks of gray fine sand (CL)           |                        |
| 11     |      | 8-9-9                                    | 18         | 10            | 37        | 33          |           |           |   |                        |
|        |      | 5-7-10                                   | 17         | 11            | 25        | 20          |           |           |   |                        |
| 12     |      | 8-8-9                                    | 17         | 12            |           |             |           |           | Gray clayey fine sand (SC)                                    |                        |
|        | 40   |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           | Termination of boring at 39.5 feet.                           |                        |



# BORING LOG

## ARDAMAN & ASSOCIATES, INC.

BORING NO. STA 88+00  
TOTAL DEPTH 30.5 ft  
SHEET 1 OF 1

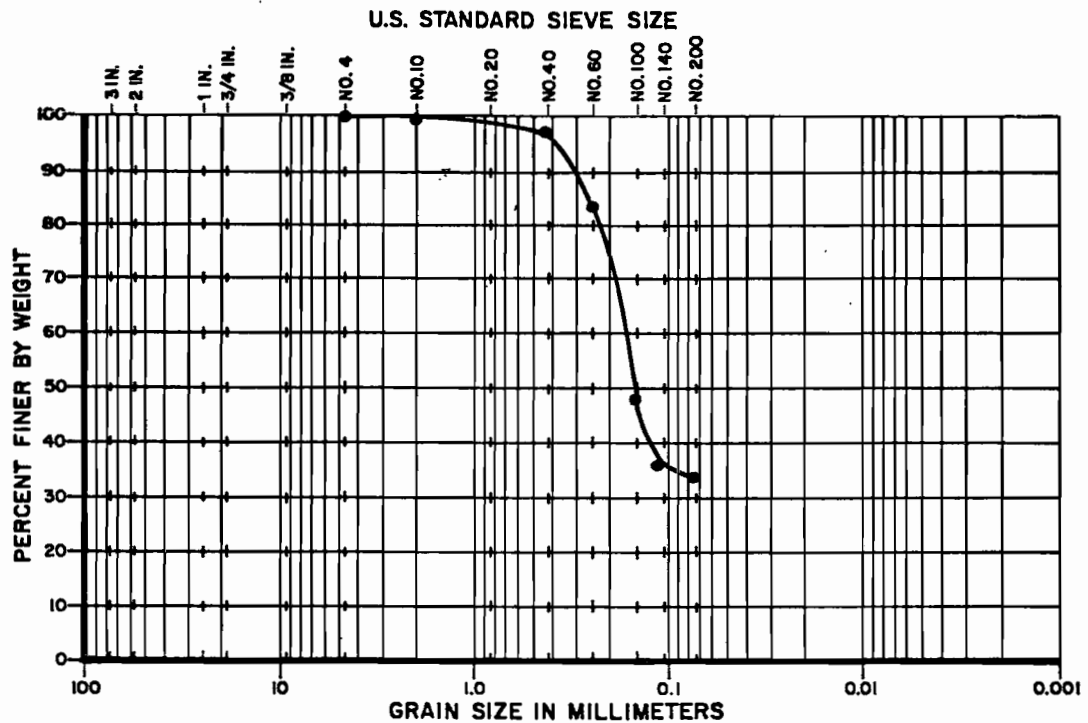
PROJECT Lena Road Landfill, Phase II FILE NO. 87-7326  
CLIENT Manatee County Department of Public Works  
BORING LOCATION See Figure 3.  
COUNTY Manatee STATE Florida ELEVATION 36.0 ft NGVD (approximately)  
DATE STARTED 6-7-1988 DATE COMPLETED 6-7-1988 BORING TYPE SPT  
DRILLER/RIG Fisher/Nick LENGTH/TYPE CASING Used driller's mud.  
WATER TABLE DEPTH: 1st 4.0' DATE 6-7-1988 TIME \_\_\_\_\_  
2nd \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

REMARKS \_\_\_\_\_

| Depth  |      | Standard Penetration Test<br>ASTM D-1586 |            |               | Lab Data  |             |           |           | Soil Description and Remarks<br>(Unified Classification)      | Undisturbed<br>Samples |
|--------|------|--|------------|---------------|-----------|-------------|-----------|-----------|---|------------------------|
| Meters | Feet | Blows/6"                                 | N<br>Value | Sample<br>No. | NM<br>(%) | -200<br>(%) | LL<br>(%) | PI<br>(%) |   |                        |
| 1      |      | 1-2-4                                    | 6          | 1             |           |             |           |           | Dark grayish brown fine sand with roots (SP)                  |                        |
|        |      | 5-5-5                                    | 10         | 2             |           |             |           |           | Light brown fine sand (SP)                                    |                        |
|        |      | 4-5-4                                    | 9          | 3             |           |             |           |           |   |                        |
| 2      | 5    | 4-9-13                                   | 22         |               |           |             |           |           |   |                        |
|        |      | 9-11-11                                  | 22         | 4             |           |             |           |           | Gray fine sand (SP)   |                        |
|        |      | 6-6-7                                    | 13         |               |           |             |           |           |   |                        |
| 3      | 10   | 5-7-8                                    | 15         |               |           |             |           |           |   |                        |
| 4      |      |  |            |               |           |             |           |           | Dark gray fine sand (SP)                                      |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 5      | 15   | 4-3-5                                    | 8          | 5             | 18        | 3           |           |           |   |                        |
| 6      | 20   | 1-0-1                                    | 1          | 6             |           |             |           |           |   |                        |
|        |      | 1-1-3                                    | 4          | 7             |           |             |           |           | Gray clayey fine sand with phosphate and shell fragments (SC) |                        |
|        |      | 50/3                                     |            |               |           |             |           |           |   |                        |
| 7      |      | 2-3-5                                    | 8          | 8             |           | 24          |           |           |   |                        |
|        |      | 3-4-6                                    | 10         | 9             |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 8      | 25   | 4-7-9                                    | 16         | 10            |           |             |           |           | Gray clay with lenses of fine sand (CH)                       |                        |
|        |      | 5-3-5                                    | 8          | 11            |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 9      | 30   | 4-7-9                                    | 16         | 12            |           |             |           |           | Gray sandy clay (CL)  |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 10     |      |  |            |               |           |             |           |           | Termination of boring at 30.5 feet.                           |                        |
| 11     | 35   |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
|        |      |  |            |               |           |             |           |           |   |                        |
| 12     | 40   |  |            |               |           |             |           |           |   |                        |

Appendix 3

**GRAIN SIZE DISTRIBUTION CURVES**



| GRAVEL |      | SAND   |        |      | SILT | CLAY |
|--------|------|--------|--------|------|------|------|
| COARSE | FINE | COARSE | MEDIUM | FINE |      |      |

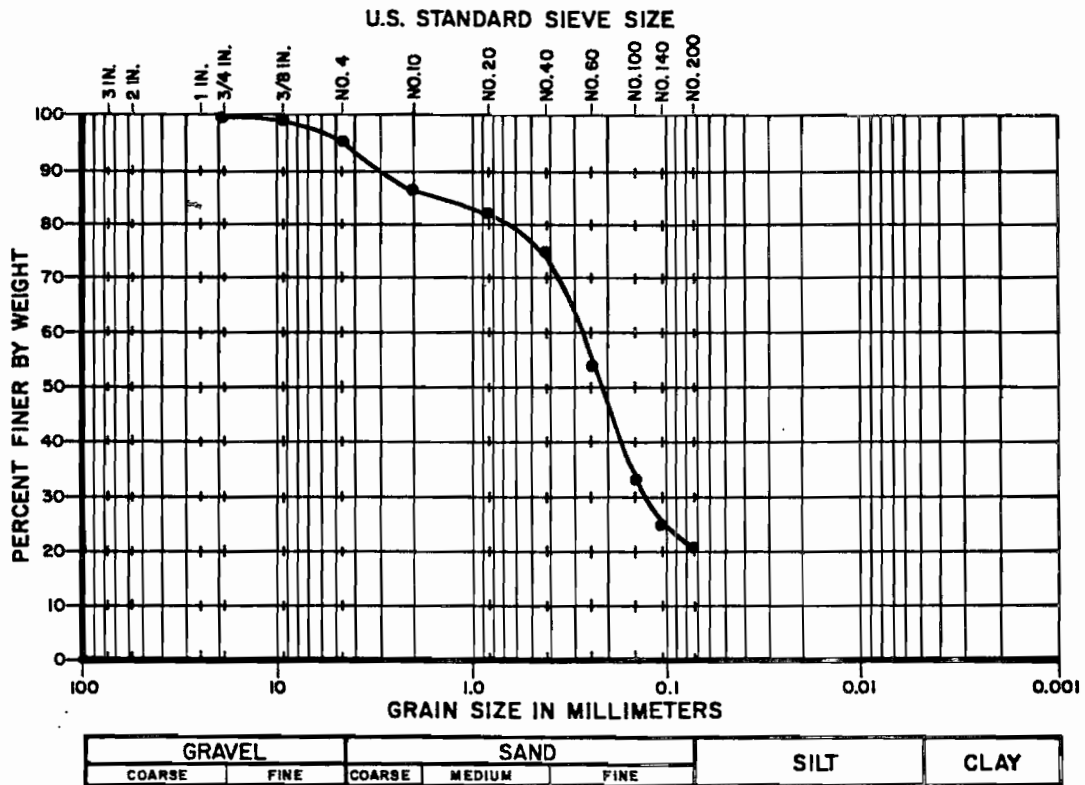
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|---------------|------------|-------|--------|-----------------------|----------------|
| 86+00         | 9          | 34.0' | ●      | GRAY CLAYEY FINE SAND | SC             |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |

**Ardaman & Associates, Inc.**  
 Consulting Engineers in Soil Mechanics,  
 Foundations, and Materials Testing

SITE EXPLORATION  
 PROPOSED SLURRY WALL LEACHATE CONTROL SYSTEM  
 LENA ROAD LANDFILL, STAGE II  
 MANATEE COUNTY, FLORIDA

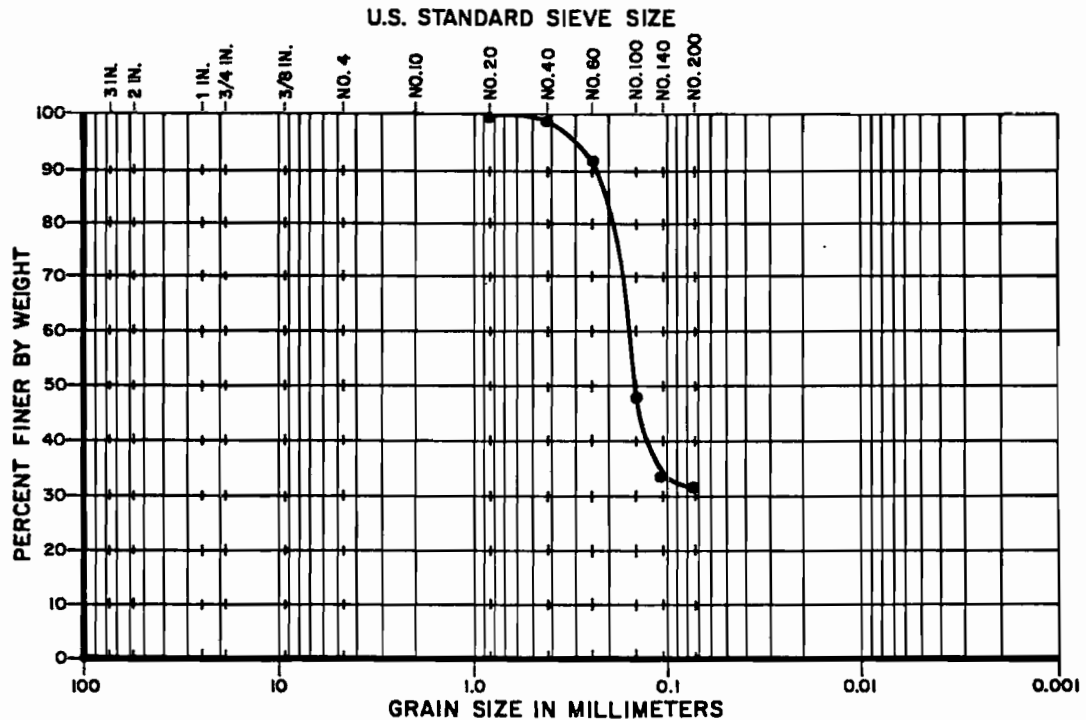
DRAWN BY: SEF
CHECKED BY: RAN
DATE: 10/28/88

FILE NO. 87-7326
APPROVED BY:




| TEST HOLE NO. | SAMPLE NO. | DEPTH | SYMBOL | SAMPLE DESCRIPTION    | UNIFIED CLASS. |
|---------------|------------|-------|--------|-----------------------|----------------|
| 84+00         | 5          | 25.0' | ●      | GRAY CLAYEY FINE SAND | SC             |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |
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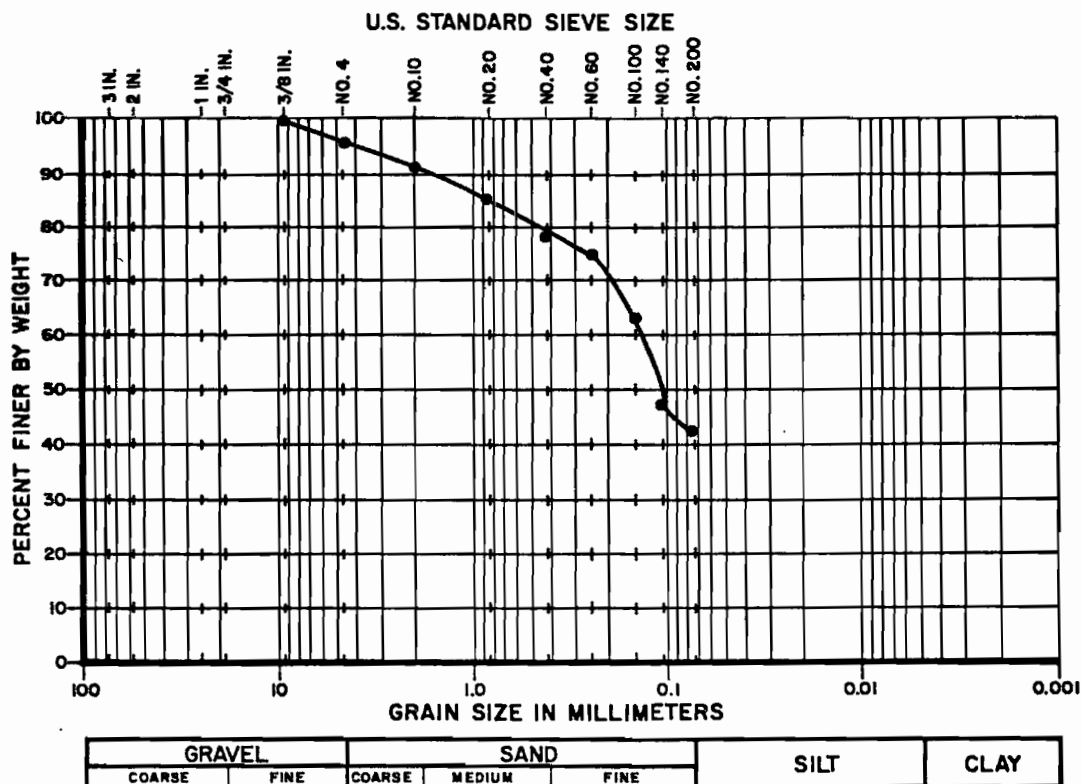
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|---|-----------------------------------|
| <b>Ardaman &amp; Associates, Inc.</b><br>Consulting Engineers in Soil Mechanics,<br>Foundations, and Materials Testing      |                                   |
| SITE EXPLORATION<br>PROPOSED SLURRY WALL LEACHATE CONTROL SYSTEM<br>LENA ROAD LANDFILL, STAGE II<br>MANATEE COUNTY, FLORIDA |                                   |
| DRAWN BY: SEF   | CHECKED BY: R.L.N. DATE: 10/28/88 |
| FILE NO. 87-7326  | APPROVED BY:                      |



| GRAVEL |      | SAND   |        |      | SILT | CLAY |
|--------|------|--------|--------|------|------|------|
| COARSE | FINE | COARSE | MEDIUM | FINE |      |      |

| TEST HOLE NO. | SAMPLE NO. | DEPTH | SYMBOL | SAMPLE DESCRIPTION    | UNIFIED CLASS. |
|---------------|------------|-------|--------|-----------------------|----------------|
| 82+00         | 7          | 28.0' | ●      | GRAY CLAYEY FINE SAND | SC             |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |

|  |                                 |                |
|--|---------------------------------|----------------|
|  <b>Ardaman &amp; Associates, Inc.</b><br>Consulting Engineers in Soil Mechanics,<br>Foundations, and Materials Testing |                                 |                |
| SITE EXPLORATION<br>PROPOSED SLURRY WALL LEACHATE CONTROL SYSTEM<br>LENA ROAD LANDFILL, STAGE II<br>MANATEE COUNTY, FLORIDA  |                                 |                |
| DRAWN BY: SEF  | CHECKED BY: <i>SLN</i>          | DATE: 10/28/88 |
| FILE NO.<br>87-7326  | APPROVED BY: <i>[Signature]</i> |                |

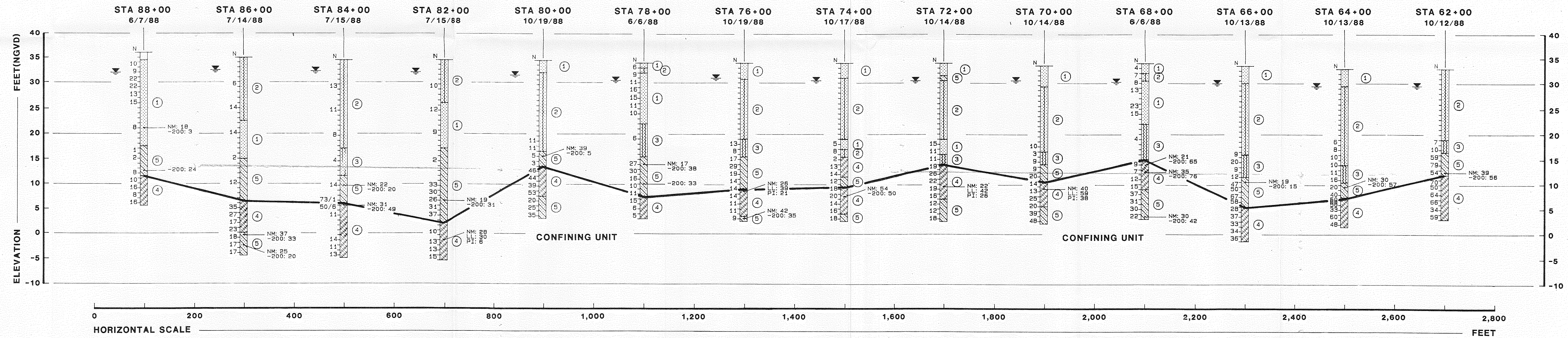


| TEST HOLE NO. | SAMPLE NO. | DEPTH | SYMBOL | SAMPLE DESCRIPTION    | UNIFIED CLASS. |
|---------------|------------|-------|--------|-----------------------|----------------|
| 68+00         | 13         | 30.5' | ●      | GRAY CLAYEY FINE SAND | SC             |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |
|               |            |       |        |                       |                |

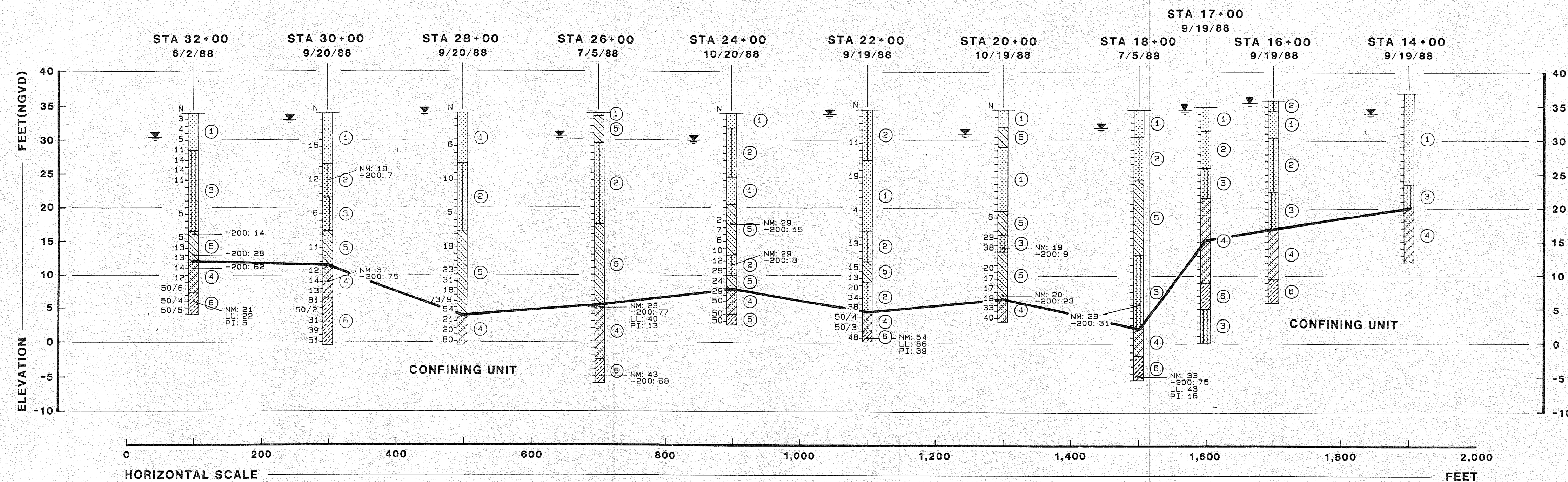
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|---|------------------|----------------|
| <b>Ardaman &amp; Associates, Inc.</b><br>Consulting Engineers in Soil Mechanics,<br>Foundations, and Materials Testing      |                  |                |
| SITE EXPLORATION<br>PROPOSED SLURRY WALL LEACHATE CONTROL SYSTEM<br>LENA ROAD LANDFILL, STAGE II<br>MANATEE COUNTY, FLORIDA |                  |                |
| DRAWN BY: SEF   | CHECKED BY: KLN  | DATE: 10/28/88 |
| FILE NO.<br>87-7326   | APPROVED BY:<br> |                |



## EAST WALL SOIL BORING PROFILES



## WEST WALL SOIL BORING PROFILES



### LEGEND

- ENGINEERING CLASSIFICATION**
- 1 COHESIONLESS SOILS**
- 2 COHESIVE SOILS**
- 3 COHESIVE SOILS**
- 4 COHESIVE SOILS**
- 5 COHESIVE SOILS**
- 6 COHESIVE SOILS**
- 7 COHESIVE SOILS**
- 8 COHESIVE SOILS**
- 9 COHESIVE SOILS**
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- 46 COHESIVE SOILS**
- 47 COHESIVE SOILS**
- 48 COHESIVE SOILS**
- 49 COHESIVE SOILS**
- 50 COHESIVE SOILS**

WHILE THE BORINGS ARE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THEIR RESPECTIVE LOCATIONS AND FOR THEIR RESPECTIVE VERTICAL REACHES, LOCAL VARIATIONS EXIST. THE BORINGS ARE NOT MEANT TO BE INTERPRETED AS A REPRESENTATION OF THE ENTIRE SITE. THE BORINGS ARE NOT MEANT TO BE INTERPRETED AS A REPRESENTATION OF THE ENTIRE SITE. THE BORINGS ARE NOT MEANT TO BE INTERPRETED AS A REPRESENTATION OF THE ENTIRE SITE.

**Ardaman & Associates, Inc.**  
Consulting Engineers in Soils, Hydrogeology, Foundations, and Materials Testing

**SITE EXPLORATION  
PROPOSED SLURRY WALL  
LEACHATE CONTROL SYSTEM  
LENA ROAD LANDFILL, STAGE II  
MANATEE COUNTY, FLORIDA**

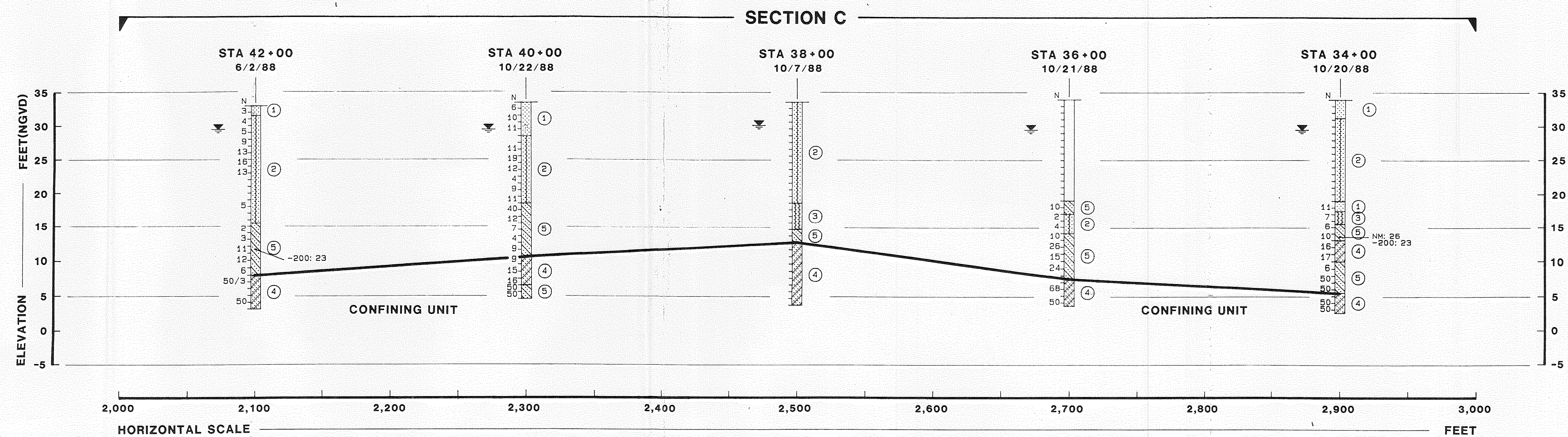
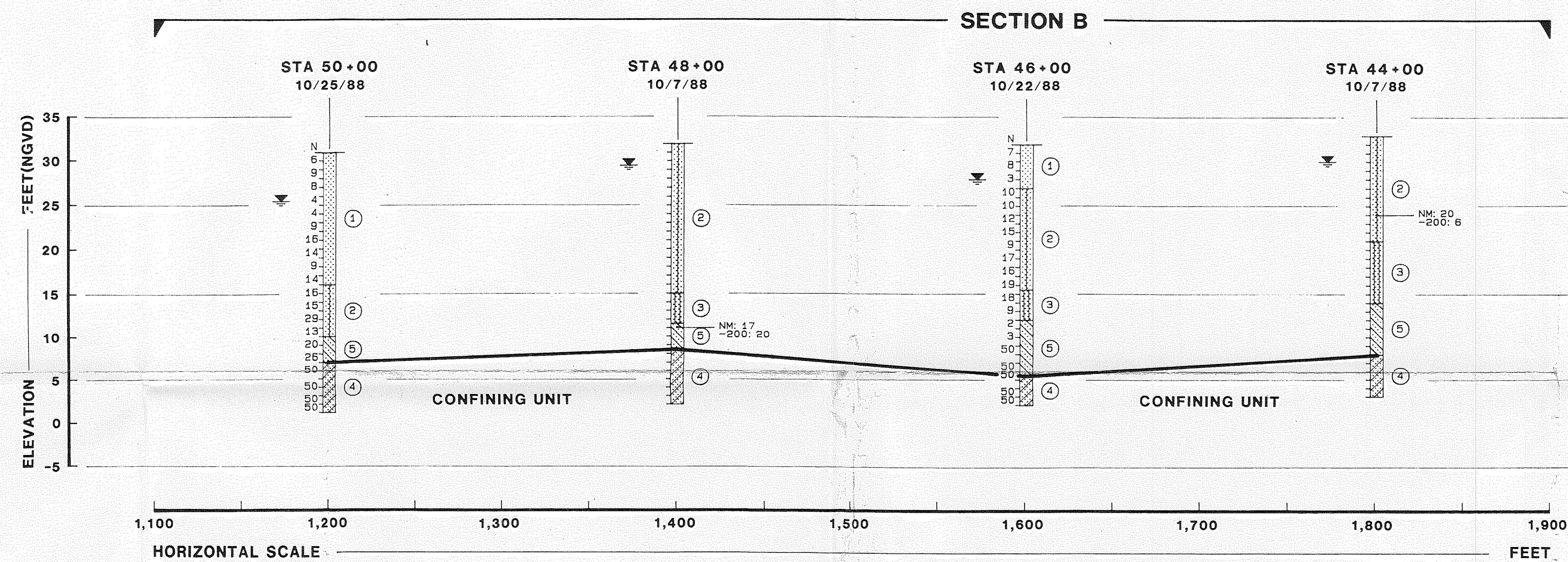
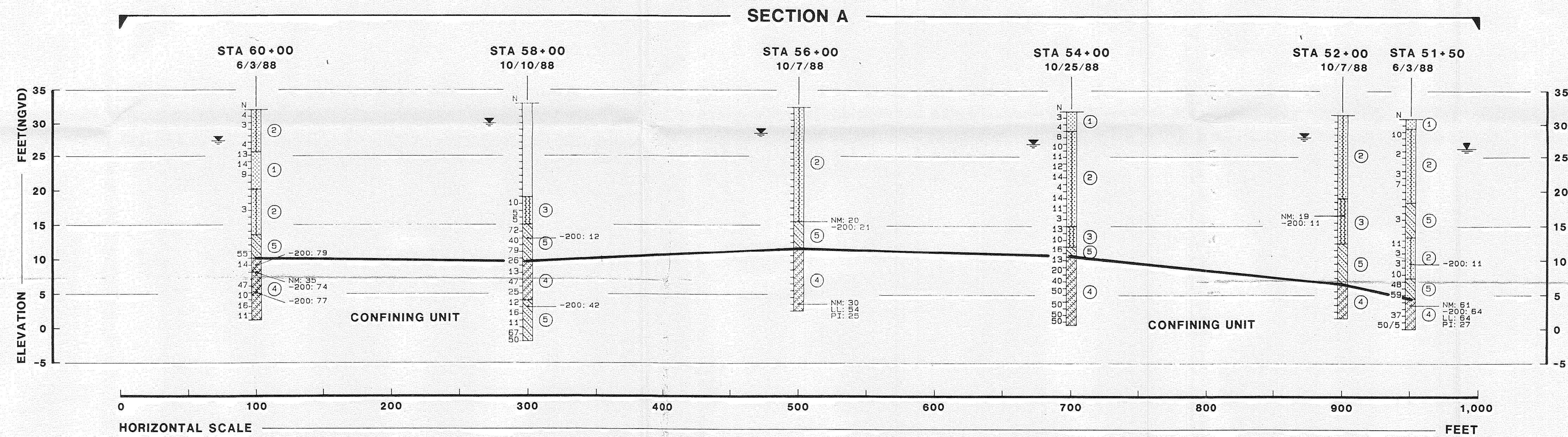
DRAWN BY: **R.B.E.** CHECKED BY: **R.L.N.** DATE: **10/28/88**

FILE NO. **87-7326** APPROVED BY: *John E. Ardaman*

FIGURE 4



# NORTH WALL SOIL BORING PROFILES



**ENGINEERING CLASSIFICATION**

**1. COHESIONLESS SOILS**

| DESCRIPTION  | BLOW COUNT "N" |
|--------------|----------------|
| VERY LOOSE   | 0 TO 4         |
| LOOSE        | 4 TO 10        |
| MEDIUM DENSE | 10 TO 30       |
| DENSE        | 30 TO 50       |
| VERY DENSE   | 50             |

**2. COHESIVE SOILS**

| DESCRIPTION  | UNCONFINED COMPRESSIVE STRENGTH, Q <sub>u</sub> , TSF | BLOW COUNT "N" |
|--------------|---|----------------|
| VERY SOFT    | 1/4   | 0 TO 2         |
| SOFT         | 1/4 TO 1/2  | 2 TO 4         |
| MEDIUM STIFF | 1/2 TO 1  | 4 TO 8         |
| STIFF        | 1 TO 2  | 8 TO 15        |
| VERY STIFF   | 2 TO 4  | 15 TO 30       |
| HARD         | 4   | 30             |

WHILE THE BORINGS ARE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THEIR RESPECTIVE LOCATIONS AND FOR THEIR RESPECTIVE VERTICAL REACHES, LOCAL VARIATIONS CHARACTERISTIC OF THE SUBSURFACE MATERIALS OF THE REGION ARE ANTICIPATED AND MAY BE ENCOUNTERED. THE BORING LOGS AND RELATED INFORMATION ARE BASED ON THE DRILLER'S LOGS AND VISUAL EXAMINATION OF SOILS AND SAMPLES IN THE LABORATORY. THE INFORMATION HEREON IS NOT TO BE USED FOR ANY OTHER PURPOSES AND THE USER ASSUMES ALL RESPONSIBILITY FOR THE USE OF THIS INFORMATION. THE INFORMATION REPRESENTS OUR INTERPRETATION OF SUBSURFACE CONDITIONS AT THE INDICATED BORING LOCATIONS ON THE PARTICULAR DATE DRILLED.

GROUNDWATER ELEVATIONS SHOWN ON THE BORING LOGS REPRESENT GROUNDWATER SURFACE ENCOUNTERED ON THE DATED BORING. FLUCTUATIONS OF WATER TABLES ARE NOT INDICATED. APPLICATIONS THROUGHOUT OF WATER TABLES ARE NOT INDICATED. APPLICATIONS THROUGHOUT OF WATER TABLES ARE NOT INDICATED. APPLICATIONS THROUGHOUT OF WATER TABLES ARE NOT INDICATED. APPLICATIONS THROUGHOUT OF WATER TABLES ARE NOT INDICATED.

**Ardaman & Associates, Inc.**  
Consulting Engineers in Soils, Hydrogeology, Foundations, and Materials Testing

**SITE EXPLORATION**  
**PROPOSED SLURRY WALL LEACHATE CONTROL SYSTEM**  
**LENA ROAD LANDFILL, STAGE II**  
**MANATEE COUNTY, FLORIDA**

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FILE NO. 87-7326 APPROVED BY: [Signature]

FIGURE 5