PUBLIC NOTICE
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY (LDEQ)
VERMILION PARISH POLICE JURY
VERMILION PARISH SOLID WASTE PLANT
TECHNICALLY COMPLETE SOLID WASTE PERMIT MODIFICATION APPLICATION

The LDEQ, Office of Environmental Services, has determined that a Type II & III solid waste permit modification application for Vermilion Parish Police Jury, P O Box 208, Abbeville, Louisiana 70511 for the Vermilion Parish Solid Waste Plant (facility) is technically complete and acceptable for public review **The facility is located on Birch Road at Highway 696, Meaux (near Abbeville), Vermilion Parish**

Vermilion Parish Police Jury requested a solid waste permit modification to construct and operate a Subtitle D disposal area within the currently permitted area of the facility, for the disposal of municipal solid waste generated from within the Vermilion Parish

Written comments, written requests for a public hearing or written requests for notification of the final decision regarding this permit action may be submitted to Ms Soumaya Ghosn at LDEQ, Public Participation Group, P O Box 4313, Baton Rouge, LA 70821 4313 **Written comments and/or written requests must be received by 12 30 p m , Wednesday, October 22, 2008** Written comments will be considered prior to a final permit decision

If LDEQ finds a significant degree of public interest, a public hearing will be held LDEQ will send notification of the final permit decision to the applicant and to each person who has submitted written comments or a written request for notification of the final decision

The technically complete solid waste permit modification is available for review at the LDEQ Public Records Center, Room 127, 602 North 5th Street, Baton Rouge, LA Viewing hours are from 8 00 a m to 4 30 p m , Monday through Friday (except holidays) **The available information can also be accessed electronically on the Electronic Document Management System (EDMS) on the DEQ public website at www deq louisiana gov**

Additional copies may be reviewed at the Vermilion Parish Library, 405 E St Victor, Abbeville, LA 70511, Acadiana Regional Office, 111 New Center Drive, Lafayette, LA 70508 and the Vermilion Parish Police Jury, 100 N State Street-Suite 200, Abbeville, LA 70510

Inquiries or requests for additional information regarding this permit action should be directed to Mr Hoa Van Nguyen, LDEQ Waste Permits Division, P O Box 4313, Baton Rouge, LA 70821-4313, phone (225) 219-3047

Persons wishing to be included on the LDEQ permit public notice mailing list or for other public participation related questions should contact the Public Participation Group in writing at LDEQ, P O Box 4313, Baton Rouge, LA 70821-4313, by email at deqmaillistrequest@la gov or contact the LDEQ Customer Service Center at (225) 219-LDEQ (219-5337)

Permit public notices including electronic access to general information from the technically complete solid waste permit application can be viewed at the LDEQ permits public notice webpage at

www deq louisiana gov/apps/pubNotice/default asp and general information related to the public participation in permitting activities can be viewed at www deq louisiana gov/portal/tabid/2198/Default aspx

Alternatively, individuals may elect to receive the permit public notices via email by subscribing to the LDEQ permits public notice List Server at www doa louisiana gov/oes/listservpage/ldeq_pn_listserv htm

All correspondence should specify AI Number 148, Permit Number P-0030, and Activity Number PER20040002

Scheduled for publication Wednesday, September 17, 2008

BOBBY JINDAL
GOVERNOR

HAROLD LEGGETT, PH D
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES

AUG 2 9 2008

CERTIFIED MAIL 7003 2260 0005 9324 0777

Mr Gerald Butaud, President
Vermilion Parish Police Jury
100 N State Street – Suite 200
Abbeville, LA 70510

RE Notice of Technical Completeness
Permit Modification Number 9
Vermilion Parish Solid Waste Plant
AI # 148 / PER20040002 / D 113 0023 / P 0030
Vermilion Parish

Dear Mr Butaud

The Waste Permits Division is in receipt of the final copies of your permit modification # 9 dated May 15 2008 and the additional information package dated August 13 2008 The additional information submitted separately has been inserted into the final copies After reviewing these documents, we have determined that your permit modification is technically complete and ready for public review

The Environmental Assistance Division will distribute copies of your modification for public review and place public notices in the appropriate newspapers in accordance with LAC 33 VII 517 B 3 Please contact Ms Soumaya Ghosn at (225) 219 3276 for the date of publication and the dates for the comment period At the conclusion of the comment period, the Waste Permits Division will consider all comments and render a permit decision regarding your modification

Please reference the Agency Interest Number AI # 148 Permit Number P-0030 and Permit Activity Number PER20040002 on all correspondence to this office pertaining to this permit modification If you have any questions concerning this matter, please contact Mr Hoa Van Nguyen at 225 219 3047

Sincerely,

Bijan Sharafkhani, P E
Administrator
Waste Permits Division

hvn

c Ms Dana M Simon, Sellers & Associated, Inc

VERMILION PARISH SOLID WASTE PLANT

Facility Number D-113-0023
Permit Number P-0030

Permit Modification Number 9 Area 2-B Expansion

(Meets Requirements of LAC 33 VII 315)

March 2008

Prepared For

Vermilion Parish Police Jury

Prepared By

Sellers & Associates, Inc.

ENGINEERS SURVEYORS PLANNERS

Lafayette – Abbeville Louisiana

Sellers & Associates, Inc.
ENGINEERS **SURVEYORS**

ELIZABETH S GIROUARD PRESIDENT
TODD A VINCENT VICE PRESIDENT

EUGENE M SELLERS PE PLS
WARREN P BEEDLE PE PLS
TODD A VINCENT M S PE PLS
ELIZABETH S GIROUARD C E
DANA MONTET SIMON M S PE
LARRY A CRAMER PE
A DAVID SUIRE PE
T J HOLLON PE
STEVE A DRONET E I
STEPHANIE M BRIGGS E I
WILBERT J GUIDRY PLS

May 15, 2008

Mr Bijan Sharafkhani P E Administrator
Waste Permits Division
Office of Environmental Services
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313

RE Vermilion Parish Police Jury
Vermilion Parish Solid Waste Plant
Facility Number D 113 0023, Permit Number P 0030
AI #148
Permit Modification #9, Area 2 B Subtitle D Expansion
File Number 5263 27

Dear Mr ~~Vince~~

On behalf of the Vermilion Parish Police Jury and as per your letter dated February 19, 2008, as well as subsequent conversations with your Department, please find attached six (6) bound ***final*** copies of Permit Modification #9 for the above referenced project

This permit modification proposes a new Subtitle D disposal area (Area 2 B) at the Vermilion Parish Solid Waste Plant, as well as increase the overall height of the landfill The document is the complete permit modification which incorporates all previously accepted revisions in their appropriate sections All requested changes to the permit is depicted in the document (new language requested is **bolded** and **underlined**, and existing language requested to be deleted is shown in ~~strikeout~~)

Additionally, all affected regulation responses have been updated in accordance with the current solid waste code (The previous regulation code is referenced in parentheses)

Should you have any questions, or require any further information, please do not hesitate to contact our office

Sincerely,

SELLERS & ASSOCIATES, INC

EUGENE M SELLERS P E , P L S

RECEIVED
MAY 20 2008
LDEQ

N \DATA\5263\5263 27\PERMITS\PM 9\FINAL DOCUMENT\dms lt01 051508 ldeq submittal wpd
Attachments (4 copies)
c Mr Gerald Butaud, President - VPPJ
Mr Chris P Theriot Secretary/Treasurer - VPPJ (w/attachment)
Ricky Leblanc, Vermilion Parish Solid Waste Plant (w/attachment)
Vermilion Parish Police Jurors
Mr Brett Leblanc LDEQ - Acadiana Regional Office (w/attachment)

(337) 232-0777
148B EASY ST LAFAYETTE LA 70506-3095

FAX (337) 232 0851
www sellersandassociates com
Please Reply To Our Lafayette Address

(337) 893 2808
100 THOMAS ST ABBEVILLE LA 70510

FINAL COPY

VERMILION PARISH SOLID WASTE PLANT

Facility Number D-113-0023
Permit Number P-0030

Permit Modification Number 9
Area 2-B Expansion

(Meets the requirements of LAC 33 VII 315)

March 2008

Prepared for
Vermilion Parish Police Jury

Prepared by

Sellers & Associates, Inc.
ENGINEERS SURVEYORS PLANNERS
Lafayette – Abbeville Louisiana

Vermilion Parish Solid Waste Plant
Permit Modification Number 9
Area 2-B Expansion

Introduction & Summary of Permit Modification

This permit modification proposes a new Subtitle D disposal area (Area 2-B) at the Vermilion Parish Solid Waste Plant, within the boundaries of the currently permitted acreage of the overall facility The overall acreage of the facility will not be increased as a result The Vermilion Parish Police Jury proposes to develop another disposal area (approximately 12 acres) within the currently permitted area for disposal of residential and commercial (Type II) waste, while still maintaining the required buffer zone As such, the disposal acreage will be increased from 39 acres to 51 acres Currently, the only disposal acreage available for the disposal of residential and commercial waste is in the existing Subtitle D Area I B This particular area is approaching its capacity, and, therefore, additional disposal acreage for the residential and commercial waste is necessary in order to continue the level of service provided to the residents of Vermilion Parish All residential waste generated in Vermilion Parish is disposed at the Vermilion Parish Solid Waste Plant, and, the proposed disposal area (Area 2 B) as well as the entire facility are dedicated strictly for the disposal of waste generated from Vermilion Parish The facility does not and will not accept waste from outside of the Parish

Originally, this modification also included a proposed overall height increase of the landfill, however, the height increase was previously approved under the separate Permit Modification #8 Additionally, this modification also proposes to exclude the wood ash area, which is located adjacent to the Air Curtain Destructor Facility from the landfill boundaries

In accordance with LAC 33 VII 517 A 1, any change in a facility or deviation from the permit is noted in the narrative of the application All new language requested in the permit narrative is shown in **bold and underlined** and, existing language requested to be deleted from the permit narrative is shown in ~~strikeout~~ An assessment of the effects of the modification on the environment and/or the operation is identified in the responses to §523 ENVIRONMENTAL ASSESSMENT STATEMENT EXPANDED IT DECISION" QUESTIONS Additionally, this document has been reformatted for conformance with the current Solid Waste Regulations

Introduction & Summary of Permit Modification ~ Continued

This document incorporates, in the appropriate sections all required plans, narratives and revisions made during the review process Below are the items which are included in this modification

- Table of Contents & List of Appendices
- Summary of Permit Modifications
- §519 Part I Permit Application Form
- §520 Compliance Information (LAC 33 I 1701 form)
- Responses to §521 Part II Supplementary Information, All Processing and Disposal Facilities (affected/revised regulations only)
- Responses to §522 General Facility Geology Subsurface Characterization and Facility Groundwater Monitoring
- Responses to §523 Part III Additional Supplementary Information
- Responses to Chapter 13 Financial Assurance
- Appendix A Drawings
  - A 6 Site Excavation Plan
  - A 7 Leachate Collection System and Force Main
  - A 7c Supplemental Sheet Leachate Collection System Details
  - A 7d Supplemental Sheet - Leachate Collection System Details
  - A 8 Site Plan Showing Final Contours
  - A 8a Supplemental Sheet Cross Section
  - A 8b Supplemental Sheet Cross Section
  - A 9 Oxidation Pond
  - A 10 Site Grid System
  - A 11 Site Plan Showing Groundwater Monitoring Well Locations and Bore Hole Locations
  - A 11a Site Plan Showing DOTD Registered Wells & Oil and/or Gas Wells
  - A 11b Site Plan Showing Known Shot Hole Lines
  - A 12 Site Plan Showing Gas Monitoring Probe Locations
- Appendix B 3 U S Army Corps of Engineers Letter
- Appendix B 5 Louisiana Pollutant Discharge Elimination System Permit
- Appendix B 12 U S Census Bureau Information
- Appendix B 13 LDOTD Letter
- Appendix C 1 Groundwater Monitoring Plan
- Appendix C 2a Gas Monitoring Probes As Builts
- Appendix D 4 Quality Assurance/Quality Control Plan for Area II B Alternate Liner System

Introduction & Summary of Permit Modification ~ Continued

- Appendix F 6 — Geoscience Investigation Performed by Soil Testing Engineers, Inc for Permit Modification 9, Area 2-B Permit Modification, 2004
- Appendix G 2 — Closure and Post Closure Care Cost Estimate
- Appendix G 3 — Financial Assurance Documentation
- Appendix H 1 — Engineering Certification
- Appendix H 2 — Engineering Calculations
  - Oxidation Pond Calculations
  - Stormwater Drainage Ditches Calculations
  - Leachate Piping Calculations
  - Area II-B Implementation Schedule
  - Area II B Soil Balance

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D 113-0023/P 0030
PERMIT MODIFICATION NUMBER 9
(Meets the Requirements of LAC 33 VII 315)

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§521 A
§521 B LOCATION CHARACTERISTICS
§521 C FACILITY CHARACTERISTICS
§521 D FACILITY SURFACE HYDROLOGY
§521 E FACILITY PLANS AND SPECIFICATIONS
§521 F FACILITY ADMINISTRATIVE PROCEDURES
§521 G FACILITY OPERATIONAL PLANS
§521 H IMPLEMENTATION PLANS
§521 I FACILITY CLOSURE
§521 K FINANCIAL RESPONSIBILITY
§521 L SOLID WASTE FEES
§521 M SPECIAL REQUIREMENTS

Responses to §522

§522 A GENERAL FACILITY GEOLOGY
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Responses to §523 PART III ADDITIONAL SUPPLEMENTARY INFORMATION

§523 A A DISCUSSION DEMONSTRATING THAT THE POTENTIAL AND REAL ADVERSE ENVIRONMENTAL EFFECTS OF THE FACILITY HAVE BEEN AVOIDED TO THE MAXIMUM EXTENT POSSIBLE
§523 B A COST BENEFIT ANALYSIS DEMONSTRATING THAT THE SOCIAL AND ECONOMIC BENEFITS OF THE FACILITY OUTWEIGH THE ENVIRONMENTAL IMPACT COSTS
§523 C A DISCUSSION AND DESCRIPTION OF POSSIBLE ALTERNATIVE PROJECTS WHICH WOULD OFFER MORE PROTECTION TO THE ENVIRONMENT WITHOUT UNDULY CURTAILING NONENVIRONMENTAL BENEFITS
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VERMILION PARISH SOLID WASTE PLANT
D 113 0023/P-0030
PERMIT MODIFICATION NUMBER 9
(Meets the Requirements of LAC 33 VII 315)

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VERMILION PARISH SOLID WASTE PLANT
D-113-0023/P-0030
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(Meets the Requirements of LAC 33 VII 315)

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A 5 Site Plan Showing Existing Topography
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A 7 Leachate Collection System and Force Main
A 7a Supplemental Sheet Leachate Collection System Details
A 7b Supplemental Sheet Leachate Collection System Details
A 7c Supplemental Sheet - Leachate Collection System Details
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A 11 Site Plan Showing Groundwater Monitoring Well Locations and Bore Hole Locations
A 11a Site Plan Showing DOTD Registered Wells & Oil and/or Gas Wells
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A 12 Site Plan Showing Gas Monitoring Probe Locations

VERMILION PARISH SOLID WASTE PLANT
D-113 0023/P-0030
PERMIT MODIFICATION NUMBER 8
(Meets the Requirements of LAC 33 VII 315)

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B 4 Letters of Notification to the FAA and Airport Operator

B 5 ~~State Water Quality Permit~~ **Louisiana Pollutant Discharge Elimination System (LPDES) Permit**

B 6 BMP Plan

B 7 ~~NPDES Permit Application~~ **Reserved**

B 8 Entrance Sign

B 9 Letter Regarding the Impact of Landfill Operations on Road Infrastructure

B 10 Letters from LDEQ Regarding Daily Cover Requirements

B 11 Letter to LDEQ Requesting an Exemption to the Boring Requirements of LAC 33 VII 709 C 1 c

B 12 U S Census Bureau Information

B 13 Letter from La Dept of Transportation and Development

VERMILION PARISH SOLID WASTE PLANT
D-113-0023/P-0030
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(Meets the Requirements of LAC 33 VII 315)

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VERMILION PARISH SOLID WASTE PLANT
D-113-0023/P 0030
PERMIT MODIFICATION NUMBER 8
(Meets the Requirements of LAC 33 VII 315)

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  F 2 Solid Waste Site Suitably Study Performed by URS Company Under Contract With the Louisiana Department of Natural Resources, Office of Environmental Affairs Solid Waste Division 1982

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  F 4 Boring Logs Performed by Louisiana Testing and Inspection, Inc , 1993

  F 5 Geoscience Investigation Performed by Soil Testing Engineers, Inc for Permit Modification 5 Mandatory Permit Modification 1994

  F 6 Geoscience Investigation Performed by Soil Testing Engineers, Inc for Permit Modification 9, Area 2-B Permit Modification, 2004

- **Appendix G - Closure and Post Closure**

  G 1 Closure Document to be Filed in the Parish Courthouse

  G 2 Closure and Post Closure Care Cost Estimate

  G 3 Financial Assurance Documentation

- **Appendix H - Engineering**

  H 1 Engineering Certification

  H 2 Engineering Calculations

Summary of Permit Modifications

VERMILION PARISH SOLID WASTE PLANT
Facility Number D-113-0023 / Permit Number P-0030

SUMMARY OF PERMIT MODIFICATIONS

Modification Number	Description	Date Submitted	Date Approved
0	Standard Permit Issued *Facility No D 113 0023* *Permit No P 0030*	-	6-1-84
1	QA/QC Plan for POTW Sludge & Gas Venting System	3-31-89	2-23-89
2	Permit Modification to Establish a Separate Disposal Area	10 4-89	7-2-90
3	Permit Modification to Separate the Air Curtain Destructor Facility from the Solid Waste Plant, revised QA/QC Plan for the Acceptance of Domestic Sewage Sludge	9-23-93	5-18-94
4	Permit Modification to Increase the Permitted Height	5-26-94	5-11-95
5	Mandatory Permit Modification	8-1-94	10-17-97
6	Tire Collection Facility and Citizen Disposal Area	7-5-95	8-15-95
7	Permit Modification to Install Liner System	1-17-96	(withdrawn)
8	Permit Modification Tie In Liner System & Height Increase	10-04	9-24-07
9	Permit Modification Area II B Subtitle D Expansion	11-04	

Responses to §519
Part I: Permit Application Form

SOLID WASTE STANDARD PERMIT APPLICATION - PART I

(The form shall be completed in accordance with the instructions found in LAC 33 VII 513 A 1)

1 Name of the Applicant (prospective permit holder)
Vermilion Parish Police Jury

2 Facility Name Vermilion Parish Solid Waste Plant

3 Facility Location/Description One Half Mile North of LA 696 - End of Birch Road

4 Location Section 2 Township 12S Range 3E

Parish Vermilion

Coordinates Lat Degrees 30 Minutes 01 Seconds 48

Long Degrees 92 Minutes 08 Seconds 50

5 Mailing Address P O Box 208
Abbeville, LA 70511

6 Contact Mr Rick Leblanc

7 Telephone (337) 898-4338

8 Type and Purpose of Operation (check each applicable line)

TYPE I	Industrial Landfill	—
	Industrial Surface Impoundment	—
	Industrial Landfarm	—
TYPE I A	Industrial Incinerator Waste Handling Facility	—
	Industrial Shredder/Compactor/Baler	—
	Industrial Transfer Station	—
TYPE II	Sanitary Landfill	X
	Residential/Commercial Surface Impoundment	—

	Residential Commercial Landfarm	___
TYPE II A	Residential/Commercial Incinerator Waste Handling Facility	___
	Residential/Commercial Shredder/Compactor/Baler	___
	Residential/Commercial Refuse derived Fuel	___
TYPE III	Construction/Demolition debris Landfill	X
	Woodwaste Landfill	X
	Compost Facility	___
	Resource Recovery/Recycling Facility	___
Other	Describe _____	

9 Site Status Owned X Leased___ Lease Term___ Years
(Note If leased provide copy of lease agreement)

10 Operation Status Existing X Proposed_____

11 Total Acres 136 Processing Acres 3 Disposal Acres ~~39~~ 51

12 Environmental Permits (List)

SW Permit Number P-0030

LPDES Permit Number LA0056031

13 Zoned Yes___ No X Zoning Requested___

Zone Classification _____

(Note If zoned, include zoning affidavit and/or other documentation stating that the proposed use does not violate existing land-use requirements)

14 Types, Quantities and Sources of Waste

	Processing		Disposal	
	On-Site	Off Site	On Site	Off Site
Residential		500		500
Industrial		0		0
Commercial		100		100
Other		0		250*

* Type III waste

15 Service Area _____

List of Parishes Vermilion Parish

Statewide ___ Unlimited ___

16 Proof of Operator's Public Notice Attach proof of publication of the notice regarding the permit application submittal as required by LAC 33 VII 513 A

17 Certification I have personally examined and am familiar with the information submitted in the attached document, and I hereby certify under penalty of law that this information is true, accurate, and complete to the best of my knowledge I am aware that there are significant penalties for submitting false information, including the possibility of fine and/or imprisonment

Signature Gerald Butaud

Date May 15, 2008

Typed Name and Title Gerald Butaud, President
Vermilion Parish Police Jury

(Note Attach proof of the legal authority of the signee to sign for the applicant)

18 Any additional information required by the Administrative Authority

EXCERPT FROM THE MINUTES
OF THE
JUNE 2, 2008
VERMILION PARISH POLICE JURY MEETING

Upon motion by Mr Wayne Touchet, duly seconded by Mr Keith Meaux, and unanimously carried, the Police Jury authorized President Gerald Butaud to execute the Department of Environmental Quality Standard Permit Application Form and any other documents to be submitted relative to Permit Modification No 9 for the Solid Waste Plant

****

CERTIFICATION

I, Chris P Theriot, Administrative/Secretary-Treasurer of the Vermilion Parish Police Jury, do hereby certify that the above is a true and exact copy of an excerpt of the minutes of the meeting of June 2, 2008, at which a quorum was present and acting

Thus done this 4th day of June, 2008 in Abbeville, Louisiana

Chris P Theriot
Administrative/Secretary Treasurer
Vermilion Parish Police Jury

Responses to §520 Compliance Information (LAC 33:I.1701 Form)

Media Type (check one)
Hazardous Waste ☐ Air ☐
Solid Waste ☒ Water ☐
Radiation Licensing ☐

Agency Interest Number 148
Is this a copy of a previously submitted form? Yes ☐ No ☒
If yes indicate the original submittal date ____
If yes indicate the original permit number ____

Department of Environmental Quality Permits Division P O Box 4313 Baton Rouge LA 70821-4313 (225) 219 3181	**Addendum to Permit Applications per LAC 33 I 1701**	

Please Type Or Print	Company Name Vermilion Parish Police Jury	☒ Own ☒ Operator	For Permits Division Use Only
	Parent Company (If Company Name given above is a division)		
	Plant name (If any) Vermilion Parish Solid Waste Plant		
	Nearest town Abbeville	Parish where located Vermilion	

1 Does the company or owner have federal or state environmental permits identical to, or of a similar nature to the permit for which you are applying in other states? (This requirement applies to all individuals partnerships corporations or other entities who own a controlling interest of 50% or more in your company or who participate in the environmental management of the facility for an entity applying for the permit or an ownership interest in the permit)

☒ Permits in Louisiana List Permit Numbers P 0030

☐ Permits in other states (list states) _____

2 Do you owe any outstanding fees or final penalties to the Department? No☒ Yes☐
If yes please explain _____

3 Is your company a corporation or limited liability company? No☒ Yes☐ If yes attach a copy of your company s Certificate of Registration and/or Certificate of Good Standing from the Secretary of State

Certification

I certify under provisions in Louisiana and United States law which provide criminal penalties for false statements that based on information and belief formed after reasonable inquiry the statements and information contained in this Addendum to the Permit Application including all attachments thereto are true accurate and complete

Responsible Official

Name Gerald Butaud	City Abbeville	State La	Zip 70510
Title President	Business phone (337) 898-4300		
Company Vermilion Parish Police Jury	Signature of responsible official(s) Gerald Butaud		
Suite mail drop or division Suite 200	Date 6/4/2008		
Street or P O Box 100 North State Street Courthouse Building			

form_7037_r03
06/30/04

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
Addendum to Permit Applications per LAC 33 I 1701

Introduction

This Addendum to Permit Applications provides information to the Permits Division which is used to comply with the requirements of LAC 33 I 1701 – Requirements for Obtaining a Permit Authority to ask for this information is contained in the Louisiana Administrative Code Title 33 Copies of this law are available from the Regulation Development Section of the Office of Environmental Assessment or on the Internet at
http //www ldeq org/planning/regs/title33/index htm

Who Should Submit an Addendum to Permit Applications?

The Addendum to Permit Applications should be submitted for any permit application submitted for a new source and for all permit actions including renewals and changes of ownership Air permit modification requests are exempt from this requirement unless they include or are limited to a change of ownership

What If I Previously Sent an Addendum to Permit Applications to DEQ?

You must submit this addendum with each permit application as stated above It is acceptable to submit a copy of a previously submitted form if the original signature date is not more than twelve months old Indicate the original submittal date and the permit number for which it was previously submitted Please review the information to ensure that it is still correct

What You Should Submit and What You Should Keep

Route the original and two photocopies to this agency For Part 70 Air Permit applications a copy should be submitted directly to EPA s Dallas office EPA Region 6 (6PD R) 1445 Ross Avenue Suite 1200 Dallas TX 75202 2733

Acceptable Answers

NA is not an acceptable answer If a particular section does not apply to you explain why Please attach additional sheets for the required information The Department may require the submission of additional information if it deems such information necessary

General

Do not write information in the top or left side margin of this form as file folder bindings may cover the information

Step-by-Step Instructions

1 Media Type

Indicate whether this is for a Solid Waste Air Water Hazardous Waste or Radiation Licensing application

2 Agency Interest Number

If blank type or print the Agency Interest Number in the space provided at the top of each page (if known) otherwise leave blank

3 Indicate if Copy of Previously Submitted Form

Indicate whether or not this is a copy of a previously submitted form If yes indicate the original submittal date and the permit number for which it was previously submitted You may not submit a copy which has an original signature date that is more than twelve months old

4 Company Name, Parent Company Plant Name and Location

If blank type or print the name of the company the name of its parent the name of the plant if any the parish where the plant is located and the closest town in the same parish as the facility Check the appropriate box to indicate if the permittee is the owner or operator of the facility

5 List of States With Similar Actions

Please provide a list of the states where you as applicant have federal or state environmental permits identical to or of a similar nature to the permit for which you are applying

6 Outstanding Fees

Do you owe any outstanding fees or final penalties to the Department? If so please explain

7 Registration with Secretary of State

If your company is a corporation or a limited liability company please provide proof of registration with the Secretary of State

8 Responsible Official

Enter the name address and phone number of the responsible company official Part 70 sources must meet the requirements of LAC 33 III 502 regarding the Responsible Official

9 Certification by Responsible Official

An authorized company agent should sign and date the form confirming its accuracy and completeness

Responses to §521
Part II: Supplementary Information, All Processing and Disposal Facilities

§521 B 2 (formerly §521 A 1 b)
ACCESS FACILITIES,
§521 B 3 (formerly §521 A 1 b)
A LETTER FROM AN APPROPRIATE AGENCY CONCERNING THE TRAFFIC FLOW FOR FACILITIES RECEIVING WASTE GENERATED OFFSITE,

Access to the landfill is provided by Birch Road (Parish Road P-3-62), which is an asphalt road capable of supporting waste disposal vehicles Exhibit A 1, "Parish Map Showing Landfill Location" depicts the proximity of the facility to an adequate network of hard surfaced roads, namely State Highways 167 and 696 The Vermilion Parish Police Jury, who is responsible for the maintenance of Birch Road, has provided a letter (refer to Appendix B 9) indicating that the road can support the weight of the solid waste department trucks transporting waste to the landfill All of the above mentioned roads (Highway 167 and 696 and Birch Road) are free from sharp turns obstructions or other hazards which might be conducive to accidents **Additionally, a letter from the Louisiana Department of Transportation and Development is included in Appendix B 13, which states that only a minimal impact to the traffic on state highways should be experienced from this facility, and, therefore DOTD "has no major objection to the issuance of a permit for the proposed modifications "**

§521 B 7 (formerly §521 A 1 e)

THE ENVIRONMENTAL CHARACTERISTICS OF THE SITE

There are no known historical sites, recreational areas, archaeological sites, designated wildlife management areas, or habitat for endangered species within 1000 feet of the site However, the strip of wooded area along the northern boundary of the landfill is considered a wetland, refer to Exhibit A 5a, "Aerial Photograph Showing Landfill Topography" and Appendix B 3a, "Letter from USDA Natural Resources Conservation Service " No landfill activities will be conducted within the wooded area as it coincides with the required 200' buffer zone Further, the letter from the USDA Natural Resources Conservation Service ~~and the U S Army Corps of Engineers (Appendix B 3 &~~ B 3a) indicates that the cleared areas shown on Exhibit A 5a are not considered wetlands **A more recent letter obtained from the U S Army Corps of Engineers (refer to Appendix B 3) states that a review of recent maps, aerial photography, and soils data indicates that there are jurisdictional wetlands within 1,000-feet of the subject site Should the deposition of redistribution of dredged or fill material in the wetland occur, a Department of the Army permit under Section 404 of the Clean Water Act shall be obtained**

The Louisiana Department of Culture Recreation and Tourism in a letter presented as Appendix B 1 indicated no recorded archaeological or historical sites within 1000 feet of the site

The Louisiana Department of Wildlife and Fisheries in a letter presented as Appendix B 2 indicated that no wildlife management areas are located within Vermilion Parish and further that no known threatened or endangered species exist within the project area

§521 B 8 (formerly §521 A 1 f)

A WETLANDS DEMONSTRATION, IF APPLICABLE, AS PROVIDED IN LAC 33 VII 709 A 8

As stated in the response to §521 B 7, the northern border of this site does contain a narrow wooded strip which is considered a wetland As shown on Exhibit A 5a, this strip lies entirely within the buffer zone and will not be impacted by the landfill Also, the Vermilion Parish Police Jury is not contemplating utilizing the tracts of property to the north ~~and east~~ (which are currently vacant) as disposal areas at this time

The Vermilion Parish Police Jury does not intend to conduct landfill operations within the wetland area Therefore, the wetlands demonstration does not apply

A more recent letter obtained from the U S Army Corps of Engineers (refer to Appendix B 3) states that a review of recent maps, aerial photography, and soils data indicates that there are jurisdictional wetlands within 1,000-feet of the subject site Should the deposition of redistribution of dredged or fill material in the wetland occur, a Department of the Army permit under Section 404 of the Clean Water Act shall be obtained

§521 B 9 (formerly §521 A 1 g)

DEMOGRAPHIC INFORMATION CONCERNING THE ESTIMATED POPULATION DENSITY, WITHIN A THREE-MILE RADIUS OF THE FACILITY BOUNDARY, BASED ON THE LATEST CENSUS FIGURES

According to figures provided by the **U S Census Bureau (Appendix B 12)**, ~~Evangeline Economic and Planning District,~~ the population **density**, based on the **2000** ~~1990~~ census, within a three mile radius of the Vermilion Parish Solid Waste Plant is **between 1-103 persons per square mile** ~~2627 people in 1041 housing units~~ Based on the census data, the population density is 92 97 people per square mile

§521 B 10 (formerly §521 A 2)

INFORMATION REGARDING WELLS, FAULTS, SEISMIC IMPACT ZONES, UNSTABLE AREAS, AND UTILITIES, WHICH IS REQUIRED FOR TYPE I AND II FACILITIES

Shotholes and Seismic Lines **Exhibit A 11b depicts the updated locations of shot hole lines in the area Previous information on shotholes and seismic lines was provided by** ~~In order to define the extent of seismic exploration at the site,~~ Seismic Exchange, Inc , of New Orleans, LA ~~, was retained to conduct a records search in the vicinity of T12S, R3W~~ The results of their findings for all known shotholes within one mile of the site are plotted on Figure 12 of the *Geoscience Report* (Appendix F 5)

Water Wells The locations of all water wells within one mile of the site which are registered with LDOTD are shown on **Exhibit A 11a** ~~Figure 11 of the *Geoscience Report*~~ ~~The source was a LDOTD printout of January, 1995 These wells are primarily for domestic use They are typically screened in the Chicot Aquifer, which is typically located between elevation -40 and -60 MSL within this area~~

Oil and/or Gas Wells All known oil and gas wells within 2,000 feet of the site are shown on Figure 11A in Appendix F 5 The source was a LDNR printout dated August 14, 1996 This figure contains the locations of all LDNR registered oil and gas wells within 1 mile of the site

Plan of Action-Oil Well In the unlikely event that an unregistered well is found, the following actions will be taken First, LDEQ will be notified Then, the upper part of the well casings will have to be cut off during landfill construction, and the well plugged and abandoned in accordance with LDNR procedures A registered engineer or geologist will supervise the plugging and abandonment of this well The following procedures will be followed to prevent seepage

1 Over excavate area within a 20 foot radius of the well by 3 feet

2 At the well bore, over excavate alongside the well for an additional 5 feet, tapering from at least 1 foot outside the well casing at 5 feet

3 Cut the casing 4 to 5 feet below base of excavation Plug and abandon the well following LDNR requirements

4 Fill back to 3 ½ feet below bottom of liner with cement/bentonite grout

5 Construct a 10 x 10 foot reinforced concrete slab 6 inches thick over the old well casing

6 Fill the remaining 3 feet with recompacted clay meeting liner specifications

Plan of Action-Shotholes Because of the nature of shothole work, attempting to recover the locations of the holes by survey is not likely to be fruitful In one instance, at a different (but geologically similar) site, a shothole was recovered in a deep excavation by an upflow of water However, the potentiometric level in Zone II is below the cut elevation

The most promising approach for recovery is visual inspection of the advancing excavations During the initial cut through Zones I and II, the equipment operators will be watchful for upwelling water, holes and/or the metal cones used in recent times to plug shotholes The cuts will also be inspected for shotholes by the Landfill Manager or his designated representative Such locations will also be marked and established accurately (to within 0 1 feet) by survey When the excavation is completed, the QC inspector will also make a thorough visual inspection of the exposed subgrade Any shotholes detected will be sounded for depth, then grouted their open depths bottom-to-top using cement/bentonite grout as described for geotechnical boreholes

No deep-seated faults are known to exist near the site, as illustrated on Figure 4 of the *Geoscience Report* (Appendix F 5)

Faults are not indicated in this area as evidenced by regional geology by Pope, 1984, see Figure 2 of Appendix F 5 of the *Geoscience Report* Faults active in Holocene time are to be taken from Howard, 1978 Therefore, this provision is not applicable to the Vermilion Parish Solid Waste Plant Howard's map is reproduced on Figure 5 of Appendix F 5 of the *Geoscience Report* No faults are indicated near the site which have been active during Holocene time

As shown on Exhibits A 6, A 7, A 8, A 10, A 11 and A 12, there is a United Gas Pipeline and LPG Pipeline which crosses the landfill site There are no other pipeline or utility crossings located on the landfill site other than electrical and phone lines, which are used in conjunction with the operation of the landfill Landfill operations do not occur within the pipeline right of way and, consequently, do not impact the pipelines in any way

§521 C (formerly §521 B 1 a)

FACILITY CHARACTERISTICS STANDARDS CONCERNING FACILITY CHARACTERISTICS ARE CONTAINED IN LAC 33 VII 709 B (TYPE I AND II FACILITIES), LAC 33 VII 717 B (TYPE I-A AND II-A FACILITIES) AND LAC 33 VII 719 B (TYPE III FACILITIES) A FACILITY PLAN, INCLUDING DRAWINGS AND A NARRATIVE, DESCRIBING THE INFORMATION REQUIRED BELOW MUST BE PROVIDED

§521 C 1

THE FOLLOWING INFORMATION IS REQUIRED FOR ALL FACILITIES

§521 C 1 a

ELEMENTS OF THE PROCESS OR DISPOSAL SYSTEM EMPLOYED,

Exhibits A 5, A 6, A 7, A 8, A 10, A 11 and A 12 are site plans of the Vermilion Parish Solid Waste Plant and indicate the location of property lines, buildings, units of the facility, drainage systems, and road infrastructure Exhibit A 5a is an aerial photograph of the landfill site which was flown in 1994 Exhibit A 5 is a topographic map of the site which was developed from the aerial photograph (A 5a) This map also features one foot contours and spot elevations present at the time that the aerial was flown

Waste loads entering the landfill are stopped at the landfill entrance and the gate attendant directs the driver to the proper location for shredding, incineration, or landfilling Loads of wood products are directed to the Vermilion Parish Air Curtain Destructor Facility (a separate facility) for incineration ~~The wood ash by-product is sent back to the Vermilion Parish Solid Waste Plant for Disposal in Area I-E (a dedicated Type III cell) or Areas I-A or I-C~~ Loads of Type III wastes are directed to Area I-A and Area I-C for disposal Municipal waste loads shall be ultimately disposed of within Area I-B **and/or Area II-B** which **are** the disposal **cells** constructed to Subtitle D Standards Normally, municipal wastes entering the facility are directed to the shredder building for shredding prior to disposal The shredder building is a covered and enclosed structure with a concrete floor Waste loads are deposited onto the floor and are then pushed into the shredder feed conveyor After shredding, the waste is compacted and placed into trailers which are used to transport the shredded waste to Area I-B **and/or Area II-B** for disposal Municipal waste loads, if the shredder is down for repairs, may also be directly landfilled and not go through the shredding process In this case, the load is sent directly to Area I-B **and/or Area II-B** where it is disposed Waste tires entering the landfill are directed to the tire collection facility where they are stored Waste tires are periodically removed from the site for processing and ultimate disposal by a third party Refer to Appendix E 6 for the Plant of Operation for the Parish Tire Collection Facility White goods are also temporarily stored at the site for a period not to exceed 180 days

As shown on the above referenced Exhibits, the Vermilion Parish Solid Waste Plant also has an oxidation pond This pond is utilized to treat leachate and runoff which falls directly within active Type II disposal areas Leachate **collected from all collection systems** and runoff collected within the active area of the cell (I-B **and/or II-B**) is pumped to the pond via ~~a 4"~~ force mains

§521 C 1 b (formerly §521 B 1 b)

THE PERIMETER BARRIER AND OTHER CONTROL MEASURES,

As shown on Exhibits A 5, A 6, A 7, A 8, A 10, A 11 and A 12, **the landfill** ~~Phase I~~ is ~~completely~~ fenced in **on the south and west sides of the facility, as well as a portion of the northeast corner,** with lockable gates at all points of ingress and egress **The facility is bordered on the north and east by Coulee Kinney, as depicted on Exhibit A 6** During operating hours, these gates are continuously monitored, and after hours, the gates are locked

In order to eliminate unacceptable waste from entering the facility, a sign measuring 4' x 8' as shown in Appendix B 8 shall be installed at the entrance gate of the facility which lists the types of waste allowed for disposal at the Vermilion Parish Solid Waste Plant

§521 C 1 g (formerly §521 B 1 g)
NPDES/LDPES DISCHARGE POINTS (EXISTING AND PROPOSED), AND

The Landfill currently has ~~three~~ **five** discharge points which serve the landfill site ~~Discharge point 001 is a stormwater discharge point located on the western border of Phase I and serves the western part of the landfill~~ Discharge point 101 is the discharge point serving the oxidation pond **Discharge point 102 is the discharge point serving the package wastewater treatment plant which treats domestic sewage generated from the office building Discharge point 001 is a stormwater discharge point located on the western border of the facility and serves the western half of Phase I** Discharge point 002 is a stormwater discharge point located on the ~~northern border of Phase I~~ **northeastern corner of the facility** and serves the **northern** ~~eastern~~ half of Phase I, **and discharge point 003 is a stormwater discharge point located on the southeastern corner of the facility and serves the southern half of Phase I and the Subtitle D cells** ~~An additional stormwater discharge point (003) is proposed on the eastern border of the site~~ The locations of the discharge points ~~is~~ **are** depicted in Exhibits A 5a, A 7 and A 9

Stormwater runoff is prohibited from entering active areas of the landfill by a system of diversion levees and ditches Rainwater which falls on active landfill areas is prevented from leaving these areas by the previously mentioned system of levees and ditches This water is then collected and pumped to the oxidation pond where it is treated prior to discharge This system of run on/runoff control and the oxidation pond ensures that discharges from the landfill are controlled and conform to applicable state and federal laws

~~The discharge points (001, 101 & 002) have been permitted by the State of Louisiana (State Permit Number WP1239) - reissued February 26, 1996 and a copy of the State Water Quality Permit is presented as Appendix B-5 An NPDES (National Pollutant Discharge Elimination System) Permit application was submitted on July 18, 1991 however, the permit has not yet been granted A copy of the NPDES Permit Application and confirmation of receipt by the EPA is presented as Appendix B-7~~ **An LDPES (Louisiana Pollutant Discharge Elimination System) permit was issued on September 15, 2004, and includes discharge points 101, 102, 001, 002 and 003 A copy of the current permit is included in Appendix B 5**

As shown on Exhibit A 9, the discharges from the pond are controlled by means of a valve located at the discharge point Also, a flow measuring device ~~shall be~~ **is** installed ~~in order to~~ **for** recording the quantity of discharges from the oxidation pond

~~Additionally, a 1000 gpd package wastewater treatment plant is proposed for treating all domestic wastewater generated at the landfill building (Currently, this domestic sewage is routed to the oxidation pond for treatment) The proposed location of this package wastewater treatment plant is along the west side of the facility boundary, as shown on Exhibit A-7 The Vermilion Parish Police Jury shall apply for a Louisiana Pollutant Discharge Elimination System (LPDES) permit and/or any other applicable permits to discharge the treated wastewater into the adjacent ditch, thence into Coulee Kinney~~

§521 C 2 (formerly §521 B 2)

THE FOLLOWING INFORMATION IS REQUIRED FOR TYPE I AND II FACILITIES

§521 C 2 a (formerly §521 B 2 a)

AREAS FOR ISOLATING NONPUTRESCIBLE WASTE OR INCINERATOR ASH, AND BORROW AREAS, AND

Municipal solid waste will be disposed of within "Subtitle D" **areas** (~~or~~ Phase I-B disposal area of Phase I **and/or Phase II-B disposal area of Phase II**) Area I-A shall be covered with a 2' thick (minimum) interim compacted cover and graded to facilitate drainage The unutilized airspace in Area I-A will then be filled with Type III wastes to the final contours shown on Exhibit A 8 At such time that Area I-A is completely filled, a final cap consisting of 2' of compacted clay and 6" top soil, or as per regulations Area I-C is a Type III cell which receives construction/demolition debris, yard trash, and woodwastes Area I-D is a tire disposal area which is capped and closed ~~Area I- E is also a Type III disposal cell, but only wood ash from the Vermilion Parish Air Curtain Destructor Facility shall be disposed in this area~~ Waste tires entering the landfill are directed to the tire collection facility where they are stored Waste tires are periodically removed from the site for processing and ultimate disposal by a third party Refer to Appendix E 6 for the Plan of Operation for the Parish Tire Collection Facility These disposal areas are depicted in Exhibits A 5, A 5a, A 6, A 7, A 8, and A 10

§521 C 2 b (formerly §521 B 2 b)

LOCATION OF LEACHATE COLLECTION/TREATMENT/REMOVAL SYSTEM

Exhibit A 7 shows the location of leachate collection lines within the Pre-Subtitle D disposal areas, as well as the leachate collection system in Subtitle D area I-B **and area II-B** There are no leachate collection lines located within the Type III disposal areas

~~The Landfill currently has one discharge point which serves the oxidation pond — This discharge point is identified as point 101 and is shown on Exhibits A-7 and A-9 An additional discharge point (102) is proposed at the package wastewater treatment plant, which treats all domestic wastewater generated at the landfill office building Stormwater discharges from the landfill via discharge points 001 and 002 which are also shown on A-7 and A-9 — (Stormwater discharge point 003 is also proposed) The discharge points (001, 101 & 002) have been permitted by the State of Louisiana (State Permit Number WP 1239) and a copy of the State Water Quality Permit is presented as Appendix B-5 A NPDES (National Pollutant Discharge Elimination System) Permit application was submitted on October 20, 1978 however, the permit has not yet been granted A copy of the NPDES Permit Application and confirmation of receipt by the EPA is presented as Appendix B-7 An LPDES (Louisiana Pollutant Discharge Elimination System) permit modification application was subsequently submitted to include outfalls 102 and 003 and is also included in Appendix B-7~~ **The Landfill was issued a Louisiana Pollutant Discharge Elimination System (LPDES) Permit (refer to Appendix B 5) for the following outfalls, which are depicted on Exhibits A 7 and A 8**

Outfall 101 — Oxidation Pond treated leachate – contaminated stormwater)
Outfall 102 — Package Wastewater Treatment Plant (treated sanitary wastewater)
Outfalls 001, 002, 003 — Uncontaminated stormwater

As shown on Exhibit A 9, discharges from the pond shall be controlled by means of a valve located at the discharge point Also, a flow measuring device shall be installed in order to record the quantity of discharges from the oxidation pond

§521 D (formerly §521 C)

FACILITY SURFACE HYDROLOGY STANDARDS GOVERNING FACILITY SURFACE HYDROLOGY ARE CONTAINED IN LAC 33 VII 711 A (TYPE I AND II LANDFILLS), LAC 33 VII 713 A (TYPE I AND II SURFACE IMPOUNDMENTS), LAC 33 VII 715 A (TYPE I AND II LANDFARMS), LAC 33 VII 717 C (TYPE I A AND II-A FACILITIES) AND LAC 33 VII 719 C (TYPE III FACILITIES), AND LAC 33 VII 723 B (COMPOSTING FACILITIES) THE FOLLOWING INFORMATION IS REQUIRED FOR ALL FACILITIES

§521 D 1 (formerly §521 C 1 a)

A DESCRIPTION OF THE METHOD TO BE USED TO PREVENT SURFACE DRAINAGE THROUGH THE OPERATING AREAS OF THE FACILITY,

Based on U S Weather Bureau Technical Paper Number 40, the 24-hour, 25-year rainfall at the Vermilion Parish Solid Waste Plant is approximately 10 5 inches (refer to H 2a) Because the site is located below 31 degrees latitude, the design standard is 12 inches Based on §711 A 3, the design storm for this site is, therefore, 12 inches

The system of diversion levees and ditches on this site have been designed based on the peak discharges for the designated drainage areas The discharges were computed using the Louisiana Department of Transportation and Development s hydraulic program, HYDR 1130 for Peak Runoff Then, a graph of depth in feet versus capacity in cubic feet per second (cfs) was formulated based on Manning's formula and a trapezoidal channel with 2 1 side slopes and a 0 002 % slope The depth of the ditches surrounding the drainage areas were interpolated based on the peak discharges as given by HYDR 1130 (Refer to the data and calculations in Appendix H 2) This system was designed to segregate and minimize runoff that has been in contact with those portions of the landfill disposal area (Area I-B and Area II-B) which have not yet received final or interim cover

Refer to Exhibits A 6, and A 8 which depict the major features of the on-site drainage system **and the route of the stormwater runoff down the slopes of the Area II-B expansion area (Exhibit A 8) This runoff which comes into contact with refuse will be collected by a perimeter ditch system, as illustrated on Exhibit A 7 and A 7c, which will then drain to a storm drain drop inlet, then into Pump Station #4 The contaminated runoff will then be pumped to the oxidation pond for treatment via an 8-inch force main Exhibits A 8a and 8b depict the final contours of the Area II-B expansion area The perimeter drainage system shall collect uncontaminated stormwater runoff and shall be routed off-site**

Runoff from the Phase II borrow area (north side) and Phase III areas will be allowed to naturally drain into the coulees to the north ~~and east~~ of the landfill site, refer to Exhibit A 5 These areas will not be used as disposal areas at this time and will be utilized only as borrow areas Therefore, no runoff/runon control system is required

Within the Phase I and Phase II-B areas, runoff shall be segregated by temporary diversion levees, berms and ditches Interim berms shall be utilized to divert surface drainage through the proposed

expansion areas of the landfill (north and east sides) Segregation of runoff shall be dependant on whether or not the runoff has come into contact with Type II wastes which have not been covered by interim compacted cover or final cover Runoff over Type II wastes having interim compacted cover or final cover shall be collected by the perimeter drainage system and allowed to drain directly into the storm water drainage ditches

Runoff which has come into contact with Type II wastes (not covered by interim compacted cover or final cover) shall be collected and pumped to the oxidation pond

Runoff through the Type III disposal areas may either be pumped from the excavation to a stormwater discharge point or allowed to runoff into stormwater drainage ditches and discharged

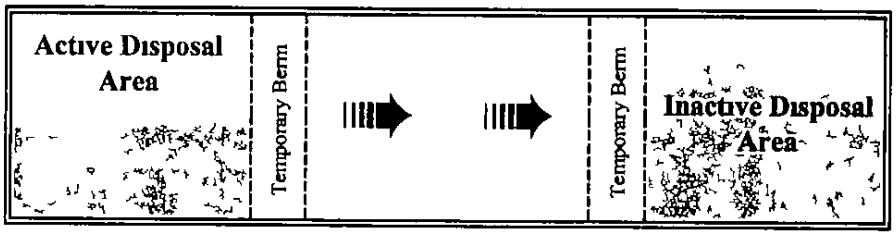
The oxidation pond is equipped with a levee system which surrounds the entire unit The levee has a top elevation of 18 0 MSL (three feet above the 100-year base flood elevation - refer to Exhibit A 4) and provides adequate freeboard Side slopes on the levee are 3 1, as indicated in Exhibit A 9, and the levee has a grass cover to minimize erosion

§521 D 2 (formerly §521 C 1 b)

A DESCRIPTION OF THE FACILITY RUNOFF/RUN-ON COLLECTION SYSTEM,

Phase I - Disposal Areas

Within the Phase I **and Phase II-B** areas, runoff shall be segregated by temporary diversion levees, berms and ditches Segregation of runoff shall be dependant on whether or not the runoff has come into contact with Type II wastes which have not been covered by interim compacted cover or final cover Interim compacted or final cover shall be sloped to allow drainage into the nearest perimeter ditch Temporary berms may be utilized to segregate contaminated and uncontaminated run-off within the active unit below natural grade The diagram illustrates typically how the temporary berms may be shifted within the unit to accomplish this task



The storm water runoff collected in the perimeter ditch system drains either to discharge point 001 or discharge point 002 (or discharge point 003, once permitted) (Refer to Appendix B 5 which contains the facility's permit to discharge at these two outfall locations and the Best Management Practices Plan in Appendix B 6)

Storm water which has come into contact with Type II wastes (not covered by interim compacted cover or final cover) shall be collected through the leachate system and pumped to the oxidation pond Any storm water that infiltrates in the waste mass is also collected by the system of leachate lines, which is also pumped to the oxidation pond

Runoff through the Type III disposal areas may either be pumped from the excavation to a stormwater discharge point or allowed to runoff into stormwater drainage ditches and discharged

Run-on is prevented from entering any disposal cell in Phase I **and Phase II-B** by the surrounding levee system, which has a crown elevation of 18' MSL As indicated in Exhibit A 4, portions of the facility are located within a 100-year flood zone, with a base flood elevation of 15' MSL Additionally, the 24-hour, 25-year design storm event for the facility is 12 inches With this levee system, run-on is not considered to be a threat to the disposal units

Phase II - Borrow Areas

Runoff from the Phase II **borrow** area will be allowed to naturally drain into the coulees to the north ~~and east~~ of the landfill site, refer to Exhibits A 5 and A 7 This ~~These~~ areas will not be used as **a** disposal **area** at this time and shall be utilized only as **a** borrow areas Therefore, no runoff/runon control system is required

Oxidation Pond

The oxidation pond is contained within a 18' MSL levee system, and the maximum water level in the pond is 17' MSL This ensures at least one foot (1') of freeboard exists at all times As discussed above, the 100-year base flood elevation is 15' MSL, and the 24-hour/25-year storm event is 12 inches This levee system serves as the run off collection system for the pond by not allowing water in the pond to overflow into other areas of the facility The natural ground elevation immediately surrounding the oxidation pond range from 13' MSL to 14 5 MSL With the minimum distance between the surrounding ground and the levee system being 3 5', run-on is not considered to be a threat to the oxidation pond

§521 D 5 (formerly §521 C 1 e)

IF THE FACILITY IS LOCATED IN A FLOOD PLAIN, A PLAN TO ENSURE THAT THE FACILITY DOES NOT RESTRICT THE FLOW OF THE 100-YEAR BASE FLOOD OR SIGNIFICANTLY REDUCE THE TEMPORARY WATER-STORAGE CAPACITY OF THE FLOOD PLAIN, AND DOCUMENTATION INDICATING THAT THE DESIGN OF THE FACILITY IS SUCH THAT THE FLOODING DOES NOT AFFECT THE INTEGRITY OF THE FACILITY OR RESULT IN THE WASHOUT OF SOLID WASTE

Appendix H 2b contains a reproduction of a portion of a USGS quadrangle map showing the landfill location This map also depicts the watershed boundary in which the landfill is located Exhibit A 4 is a reproduction of Flood Insurance Rate Map, Community-Panel Number 220221 0150D, which shows the location of the landfill This map also indicates that portions of the landfill that are located within Zone C, "Areas of minimal flooding" (outside of the 100 year flood boundary) and Zone A5, "Areas of 100-year flood, base flood elevations and flood hazard factors determined " According to this map, the 100-year Base Flood Elevation is 15 0 NGVD 1929 in the area of the landfill site

Exhibit A 5 indicates the location of the flood plain relative to the site and indicates that a portion of disposal area I-A and I-E are within the 100 year flood plain The total acreage within the 100 year flood plain is approximately 8 acres No landfilling will be performed within the Phase **II (north side)** and Phase III areas at this time, these areas will be utilized as borrow areas Based on this information, it is unlikely that the landfill will have a measurable impact on 100 year base flood elevations within the vicinity of the landfill even when the Phase II and Phase III areas are landfilled This minimal impact is anticipated for the following reasons 1) the area of the flood plain impacted is minuscule when compared to the total area of the flood plain, 2) given the flatness of the area a very small increase in base flood elevation accounts for extremely large volumes of water These two factors taken together indicate that any impact caused by the landfill will be non-measurable or insignificant

Levees having an average crown elevation of 18' surround all waste disposal areas and the oxidation pond This prevents a washout of waste by a 100 year flood since the levee crowns are at a greater elevation than the 100 year Base Flood Elevation of 15' NGVD '29

§521 E 2

GEOTECHNICAL FIELD TESTS AND LABORATORY TESTS SHALL BE CONDUCTED ACCORDING TO THE STANDARDS OF THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) OR THE EPA OR OTHER APPLICABLE STANDARDS APPROVED BY THE ADMINISTRATIVE AUTHORITY THE RESULTS OF THESE TESTS MAY BE USED FOR MODELING AND ANALYSIS PURPOSES

All geotechnical field tests and laboratory tests have been conducted according to standards approved by the administrative authority, the results of which have been used for modeling and/or analysis purposes All future geotechnical field tests and laboratory tests shall be conducted according to the standards of the American Society for Testing and Materials (ASTM) or the EPA or other applicable standards approved by the Administrative Authority, and, the results of these tests may be used for modeling and analysis purposes

§521 E 3 (formerly §521 F 2)

THE FOLLOWING INFORMATION IS REQUIRED FOR TYPE I AND II FACILITIES

§521 E 3 a (formerly §521 F 2 a)

DETAILED PLAN-VIEW DRAWING(S) SHOWING ORIGINAL CONTOURS, PROPOSED ELEVATIONS OF THE BASE OF UNITS PRIOR TO INSTALLATION OF THE LINER SYSTEM, AND PROPOSED FINAL CONTOURS (e g , MAXIMUM HEIGHT),

An ~~recent~~ aerial of the Vermilion Parish Solid Waste Plant aided in the development of a plan view of the facility showing the existing contours This contour map is presented as Exhibit A 5

As shown in Exhibit A 11, all known boring locations, groundwater monitoring well locations, and piezometer locations have been superimposed on a site excavation plan Excavation contours are shown on this drawing, however, they are not clearly visible at the half scale Thus, Exhibit A 8a should be used as a reference for excavation depths for the disposal areas, and Exhibit A 9 should be used as a reference for the excavation depth of the oxidation pond

Borings B-1 (1983), B-2 (1982), B-3 (1983), and B-4 (1983) are located in Area I C which is the disposal area for construction/demolition debris and woodwaste only Borings B-1 (1982), B-2 (1983), B-3 (1977), and B-5 (1983) are located in Pre Subtitle D Area I-A, where municipal solid waste was disposed prior to December 31, 1997 Thereafter, this area will be utilized for the disposal of Type III wastes only ~~Finally,~~ Borings B-1 (1994), B-2 (1994), B 3 (1994), B-4 (1994), and B-6 (1983) are located in the Subtitle D Area I-B which is reserved for municipal solid waste disposal after December 31, 1997 Boring B-2 (1977) was also provided within the oxidation pond area **Finally, borings B03-1, B03-2, B03-3, B03-4, B03-5, B03-6, B03-7, B03-8, and B03-9 are located in the Subtitle D Area II-B, which is also reserved for municipal solid waste disposal**

Final contours are illustrated on Exhibit A 8

§521 E 3 e (formerly §521 F 4 b)

A DESCRIPTION OF THE LINER SYSTEM, WHICH SHALL INCLUDE CALCULATIONS OF ANTICIPATED LEACHATE VOLUMES, RATIONALE FOR PARTICULAR DESIGNS OF SUCH SYSTEMS AND DRAWINGS, AND

Pursuant to the solid waste regulations, landfill bottom construction in excavated areas which have not received waste by October 9, 1993 shall be constructed in accordance with these regulations The areas indicated on the Exhibits as the "Subtitle D" area will be constructed in accordance with these regulations All and only Type II municipal wastes received after December 31, 1997 will be disposed of within ~~this~~ **these Subtitle** areas [Note that the oxidation pond is not governed by the liner standards set forth in that section]

The composite liner system to be installed along the slopes of the "Subtitle D" Area I-B and above grade along the adjoining slopes between Subtitle "D" Disposal Area **I-B** and Type III Disposal Area I-C (north side) and the adjoining slope between Subtitle "D" Disposal Area **I-B,** and Pre-Subtitle "D" Disposal Area I-A (north and east sides), as depicted on Exhibits A 7a ~~and~~ A 8, **A 8a and A 8b** consists of **a layer of earthen material over** a geocomposite drainage layer (geonet and geotextile - **on side slopes and piggyback slopes only)** over a 60 mil HDPE synthetic liner over a geosynthetic clay liner **(reinforced on side slopes and piggyback slopes)** over the existing soil material Prior to placement of waste in these areas, a layer of approximately 6-inches of earthen material shall be placed over the geocomposite The bottom of the "Subtitle D Area **I-B** consists of a 1 foot thick protective layer of sand (USCS SP) which protects the underlying 60 mil HDPE synthetic liner Beneath the synthetic liner is a 3 foot thick recompacted clay liner except for the easternmost section in the Subtitle D cell For the section that drains into the leachate collection trench at Station 15+25 of the Subtitle "D" cell I-B, the Solid Waste Division approved an alternate proposed liner system In place of the 3' recompacted clay liner, the bottom liner system shall consist of two feet (2') of clay material with the top 6" recompacted, covered by a geosynthetic clay liner (GCL) The HELP model was utilized to determine that the GCL liner system is hydraulically equivalent to the 3' recompacted clay liner Refer to Appendix H 2 for these results **For the Subtitle "D" Area II-B, an alternate liner system consisting of 1-foot recompacted clay under a 40-mil HDPE/GCL system under a 60-mil HDPE synthetic liner is proposed in the bottom The hydraulic equivalency for this proposed liner system is located in Appendix H 2 This system will be covered by a 1-foot thick protective sand layer The side slopes of this area shall be the same as for the Subtitle "D" Area I-B Additionally, the liner system shall continue up along the slope of Area Subtitle "D" Disposal Area I-A on the west side of Area II-B** All liner installation activities will be inspected and certified by a registered professional engineer as required in the QA/QC plan for liner construction The liner system described herein conforms to the regulation requirements, and as such is considered to be compatible with the leachate generated from municipal solid waste

Any leachate generated by the waste shall be prevented from migrating out of the disposal area by this liner system The potential for migration of leachate through the liner shall be minimized by the leachate collection system The leachate collection system shall consist of 6" diameter pipes having 3/8" perforations and encased in an aggregate bedding consisting of 1" washed gravel A filter cloth

will completely surround the gravel pack to prevent fines from entering and plugging the collection system The collection system will be maintained in a pumped down condition As determined from the HELP model **and design calculations** (see results in Appendix H 2), **the oxidation pond can treat the quantities of leachate and contaminated stormwater generated from the facility** ~~the quantity of leachate estimated after final cover is installed is approximately 1000 gallons per month Refer to §521 E 3 f for a description of the oxidation pond~~

NOTE The Pre-Subtitle D area was utilized for disposal of solid waste prior to October 9, 1993, and therefore does not meet nor is required to meet the "Subtitle D Liner" requirements However, ~~the~~ **all** Subtitle D Disposal Areas ~~I-B~~ must and shall comply with these regulations as described herein [The Subtitle D detail on Exhibit A 6 illustrates how the liner shall be anchored on the side slopes]

§521 E 4 (formerly §521 F 3)

THE FOLLOWING INFORMATION ON PLANS AND SPECIFICATIONS IS REQUIRED FOR TYPE I, II AND III LANDFILLS

§521 E 4 a (formerly §521 F 3 a)

APPROXIMATE DIMENSIONS OF DAILY FILL AND COVER, AND

Cover will consist of soil cover, reusable synthetic cover, and/or shredded tires Interim and compacted interim cover will consist of soil **Soil balance calculations for Area II-B are provided in Appendix H 2** ~~Volume calculations indicate that there will be an excess of excavated material available for use as cover material (Refer to Exhibit H-2 for volume calculations) Geotechnical data indicates a ready supply of clay materials suitable for use as cover materials~~

Operational procedure in effect at the landfill requires that the working face of the landfill be of a minimal size to allow for practical operation

§521 F (formerly §521 G)

FACILITY ADMINISTRATIVE PROCEDURES STANDARDS GOVERNING FACILITY ADMINISTRATIVE PROCEDURES ARE CONTAINED IN LAC 33 VII 711 C (TYPE I AND II LANDFILLS), LAC 33 VII 713 C (TYPE I AND II SURFACE IMPOUNDMENTS), LAC 33 VII 715 C (TYPE I AND II LANDFARMS), LAC 33 VII 717 F (TYPE I-A AND II-A FACILITIES), LAC 33 VII 721 B (TYPE III CONSTRUCTION AND DEMOLITION DEBRIS AND WOODWASTE LANDFILLS), LAC 33 VII 723 B (TYPE III COMPOSTING FACILITIES) AND LAC 33 VII 725 B (TYPE III SEPARATION FACILITIES)

§521 F 1 (formerly §521 G 1)

THE FOLLOWING INFORMATION ON ADMINISTRATIVE PROCEDURES IS REQUIRED FOR ALL FACILITIES

§521 F 1 a (formerly §521 G 1 a)

A DESCRIPTION OF THE RECORDKEEPING SYSTEM, INCLUDING TYPES OF RECORDS TO BE KEPT, AND THE USE OF RECORDS BY MANAGEMENT TO CONTROL OPERATIONS AS REQUIRED,

The Vermilion Parish Solid Waste Plant is permitted as a single facility and includes all areas of the site which are enclosed by the perimeter fence This includes Pre Subtitle D Disposal Area I-A, Subtitle D Disposal Areas I-B **and II-B**, Type III Disposal Area I-C E, the facility building, the oxidation pond, and all other aspects within the facility boundary

Inspection, measurement, classification and recordkeeping of wastes entering the landfill will be performed by attendants of the landfill office as required by these regulations and by Appendix E 1, "Municipal Waste Acceptance Quality Assurance/Quality Control Plan " All personnel involved in waste handling at the facility will be informed of procedures to be followed for the exclusion of hazardous or PCB waste These records will be maintained on file at the landfill office and will be used to compile annual reports

Waste tires entering the landfill are directed to the tire collection facility where they are stored Waste tires are periodically removed from the site for processing and ultimate disposal by a third party, refer to Appendix E 6 for the Plan of Operation for the Parish Tire Collection Facility Waste tires will be manifested per LAC 33 VII 10533 from the collection site to the waste tire processor This manifest will reference the facility number of the Parish Tire Collection facility

Additionally, a complete set of all landfill documents (which ~~include~~ pertaining to solid waste disposal as well as the operation of the oxidation pond) shall be maintained at the landfill office for the life of the facility and for at least three years thereafter These documents include records pertaining to landfill operations, transporters of waste for processing or disposal at the facility (only Vermilion Parish Police Jury disposal trucks are allowed to dispose of the municipal waste collected in the parish), copies of the current Louisiana Solid Waste Rules and Regulations, the permit, the permit application, permit modifications, certified field **notes** for construction, Emergency/Training

plan, daily logs, quality-assurance/quality-control records, inspections by the permit holder or operator including but not limited to inspections to detect incoming hazardous waste loads, Board of Certification and Training for Solid Waste Disposal System Operator Certificates, records demonstrating that liners, leachate-control systems, and leak-detection and cover systems are constructed or installed in accordance with appropriate **quality** assurance procedures, records on groundwater sampling results, records on the leachate volumes and results of the leachate sampling, any other relevant monitoring, testing, or analytical data, post-closure monitoring reports, and copies of all documents received from and submitted to the Solid Waste Division These records will be maintained for the life of the facility and will be kept on file for at least three years after closure

Annual reports derived from these records, indicating quantities and types of waste received from July 1 through June 30 of the preceding year, will be submitted to the administrative authority on approved forms These reports will also include the calculations used to determine the amounts of waste received, as well as the estimated remaining permitted capacity The annual report will be submitted to the Department by August 1st of each year

§521 F 1 b (formerly §521 G 1 b)

AN ESTIMATE OF THE MINIMUM PERSONNEL, LISTED BY GENERAL JOB CLASSIFICATION, REQUIRED TO OPERATE THE FACILITY, AND

The Vermilion Parish Solid Waste Plant has the following numbers and levels of certified operators employed at the facility

~~2 - Class A~~	**1 – Class A**
~~5 - Class C~~	**1 – Class B**
	3 – Class C

Operator certificates are prominently displayed at the facility If any changes in the employment status of the certified operators occurs, the Board of Certification and Training for Solid Waste Disposal System Operators and the Solid Waste Division will be notified within 30 days

Landfill personnel are trained in waste handling procedures as required by the Emergency/Training Plan which is presented as Appendix E 4 Waste acceptance/exclusion protocols for the Vermilion Parish Solid Waste Plant are covered in Appendix E 1, "Municipal Waste Acceptance Quality Assurance/Quality Control Plan "

§521 F 1 c (formerly §521 G 1 c)

MAXIMUM DAYS OF OPERATION PER WEEK AND PER FACILITY OPERATING DAY (MAXIMUM HOURS OF OPERATION WITHIN A 24-HOUR PERIOD), AND,

The maximum days and hours of operation for the Vermilion Parish Solid Waste Plant are Monday through Sunday from 6 00am thru 8 00pm (earliest opening time and latest closing time) Actual hours of operation ~~will be~~ **are** set by the Vermilion Parish Police Jury **and are currently 7 am to 5 pm**, ~~but will fall within the hours set forth above~~ These days and hours of operation will only be exceeded during extraordinary circumstances and the Administrative Authority will be informed of all such instances

§521 F 1 d

AN ANNUAL REPORT SUBMITTED TO THE ADMINISTRATIVE AUTHORITY

Annual reports derived from these records, indicating quantities and types of waste received from July 1 through June 30 of the preceding year, will be submitted to the administrative authority on approved forms These reports will also include the calculations used to determine the amounts of waste received, as well as the estimated remaining permitted capacity The annual report will be submitted to the Department by August 1st of each year

§521 F 2 (formerly§521 G 2)

ADMINISTRATIVE PROCEDURES FOR TYPE II FACILITIES SHALL INCLUDE THE NUMBER OF FACILITY OPERATORS CERTIFIED BY THE LOUISIANA SOLID WASTE OPERATOR CERTIFICATION AND TRAINING PROGRAM (R S 37 3151 ET SEQ)

~~At the present time, the number of operators with a Class A Landfill Operator Certification is two (2) Additionally, the facility also employs five (5) Class C personnel~~ **There is one (1) Class A, one (1) Class B, and three (3) Class C Landfill Operators**

§521 G (formerly §521 H)

FACILITY OPERATIONAL PLANS STANDARDS GOVERNING FACILITY OPERATIONAL PLANS ARE CONTAINED IN LAC 33 VII 711 D (TYPE I AND II LANDFILLS), LAC 33 VII 713 D (TYPE I AND II SURFACE IMPOUNDMENTS), LAC 33 VII 715 D (TYPE I AND II LANDFARMS), LAC 33 VII 717 G (TYPE I-A AND II-A FACILITIES), LAC 33 VII 721 C (TYPE III CONSTRUCTION AND DEMOLITION DEBRIS AND WOODWASTE LANDFILLS), LAC 33 VII 723 C (TYPE COMPOSTING FACILITIES) AND LAC 33 VII 725 C (TYPE III SEPARATION FACILITIES)

§521 G 1 a (formerly §521 H 1)

THE FOLLOWING INFORMATION ON OPERATIONAL PLANS IS REQUIRED FOR ALL FACILITIES

§521 G 1 a (formerly §521 H 1 a)

TYPES OF WASTE (INCLUDING CHEMICAL, PHYSICAL AND BIOLOGICAL CHARACTERISTICS OF INDUSTRIAL WASTES GENERATED ON SITE), MAXIMUM QUANTITIES OF WASTES PER YEAR AND SOURCES OF WASTE TO BE PROCESSED OR DISPOSED OF AT THE FACILITY,

The Vermilion Parish Solid Waste Plant is a Type II and III facility and does not generate any wastes on site other than an incidental amount from the landfill's administrative areas As such, it is permitted to receive and dispose of solid wastes Sanitary **(Type II)** wastes shall be **disposed** ~~within~~ the "Subtitle D" (Phase I-B area **and/or Phase II-B area**) disposal areas only Area I-A ~~shall be~~ **was** covered within 90 days of December 31, 1997 with a 2' thick interim compacted cover ~~which will~~ **was** ~~be~~ graded to drain The remaining permitted airspace will then be filled with Type III wastes to the contours shown on Exhibit A 8 Once the waste has reached the final contours, the entire Subtitle "D" area I-A **and** area **II-B** shall be covered with a final cover consisting of 6" of topsoil over a 60-mil HDPE liner under lain by a 2' recompacted clay liner Type III wastes will also be disposed of within the Phase I-C area (C&D, and yard trash) ~~Wood ash from the Vermilion Parish Air Curtain Destructor Facility will be disposed of within the Phase I-E area, Phase I-A area or Phase I-C area only~~ (Refer to A 5, A 5a, A 6, A 7, A 8 and A 10 for disposal area locations)

Waste tires entering the landfill are directed to the tire collection facility where they are stored Waste tires are periodically removed from the site for processing and ultimate disposal by a third party Refer to Appendix F 6 for the Plan of Operation for the Parish Tire Collection Facility

White goods entering the facility are directed to the 'White Goods Collection Area" where they are temporarily stored for a period not to exceed 180 days

The oxidation pond is utilized for the treatment of leachate generated from the municipal solid waste disposal areas and contaminated stormwater only

Open burning of solid waste shall not be practiced at this facility, unless authorization is first obtained from the administration authority and any other applicable federal, state, and local authorities

Wastes to be disposed of within the Vermilion Parish Solid Waste Plant will be generated within the service area which consists of Vermilion Parish, including that ~~and a~~ portion of the Town of Delcambre **which lies** in **Vermilion** ~~Iberia~~ Parish **only** (refer to A 3)

The receipt of hazardous waste and PCB waste shall be strictly prohibited and prevented at this facility To ensure that unacceptable waste is not disposed at the facility, the Solid Waste Plant performs random inspections, as outlined in Appendix E 1, "Municipal Waste Acceptance Quality Assurance/Quality Control Plan "

The landfill currently disposes of approximately **60** tons of waste per day on average The waste stream consists of roughly **88%** municipal and commercial wastes, and **12%** yard trash and construction demolition debris

§521 G 1 b (formerly §521 H 1 b)

WASTE-HANDLING PROCEDURES FROM ENTRY TO FINAL DISPOSITION, WHICH COULD INCLUDE SHIPMENT OF RECOVERED MATERIALS TO A USER,

Waste acceptance/exclusion/handling protocols for the Vermilion Parish Solid Waste Plant are covered in Appendix E 1, "Municipal Waste Acceptance Quality Assurance/Quality Control Plan " The acceptance of ~~Water~~ **Waste** Tires for temporary storage at the Tire Collection Facility is governed by the "Plan of Operation - Parish Tire Collection Facility" which is included as Appendix E 6 In addition, the Vermilion Parish Police Jury/Designee reserves the right to exclude or prohibit the disposal of any and all waste materials deemed unacceptable by the Jury/Designee White goods are also accepted for temporary storage and are stored in the area labeled "White Goods Collection Area" for a period not to exceed 180 days

The Municipal Waste Acceptance Quality Assurance/Quality Control Plan serves as the random waste inspection plan and is designed to prevent the receipt/disposal of hazardous or PCB wastes at the Vermilion Parish Solid Waste Plant These random inspections shall be documented, and the record shall be kept on file at the landfill office

Wastes entering the Vermilion Parish Solid Waste Plant Landfill shall be inspected and an entry made regarding the type and quantity of the waste The inspection shall occur on the concrete floor in the shredder facility A determination shall be made, in accordance with Appendix E 1, "Municipal Waste Acceptance Quality Assurance/Quality Control Plan" as to whether the load will be accepted for disposal If an incoming waste is determined to be hazardous, the unacceptable waste shall be immediately segregated from the rest of the waste The Vermilion Parish Solid Waste Plant will contact the LDEQ, Acadiana Regional Office to notify them of the incident and await further instruction The preliminary plan is to apply for a provisional EPA identification number, which will allow the Solid Waste Plant to make the necessary arrangements for a licensed transporter and licensed disposer to retrieve the waste and dispose of it properly A local licensed disposer is Chemical Waste Management in Carlyss, Louisiana (Phone 337-583-2169) Based on the type of waste, the Vermilion Parish Solid Waste Plant may have to do a profile of the waste, which may involve a TCLP analysis

If ~~Once~~ a waste load is accepted for disposal at the **Vermilion Parish Solid Waste Plant**, following the requirements of Appendix E 1, the driver shall be directed to the disposal area by landfill attendants The shredded municipal waste is disposed in Area I-A and shall be disposed in this area until December 31, 1997 Thereafter, this waste shall be disposed in the Subtitle D Area I-B/**Area II-B** only Trucks entering the landfill with a load of wood products will be directed to the Vermilion Parish Air Curtain Destructor Facility ~~Trucks hauling wood ash from the Vermilion Parish Air Curtain Destructor Facility (ACD) will be directed to disposal area I-E Only Vermilion Parish trucks will be allowed to haul wood ash from the ACD~~ Trucks hauling Type III wastes not destined for the ACD will be directed to disposal area I-A or I C Once the waste load is deposited, the driver shall be directed to the landfill exit

Waste tires entering the landfill are directed to the tire collection facility where they are stored Waste tires are periodically removed from the site for processing and ultimate disposal by a third party Refer to Appendix E 6 for the Plan of Operation for the Parish Tire Collection Facility

White goods entering the facility are directed to the white goods collection area where they are temporarily stored for a period not to exceed 180 days

§521 G 1 d (formerly §521 H 1 d)

PLAN TO SEGREGATE WASTES, IF APPLICABLE,

The Vermilion Parish Police Jury, owner and operator of this facility, is responsible for waste pick-up in the service area Each portion of the service area has designated collection days for Type II waste and Type III waste Thus, the waste is initially separated prior to arriving at the Vermilion Parish Solid Waste Plant

Once collection vehicles arrive at the gate of the facility, the gate attendant directs the vehicles to the proper areas as follows

- Vehicles hauling Type II waste are directed to the shredder facility for processing The shredded material waste will be disposed in Subtitle D Area I-B/**Area II-B** only In the event that the shredder is inoperable, the municipal solid waste is deposited directly in the **Subtitle D** disposal areas
- For vehicles hauling Type III waste (construction/demolition debris and yard trash), the gate attendant directs the driver to deposit this waste either in Area I-C or Area I A
- ~~Vehicles hauling wood ash from the Vermilion Parish Air Curtain Destructor Facility are directed to Area I-E~~

Waste tires entering the facility are directed to the tire collection facility where they are stored White goods entering the facility are directed to the white goods storage area, where they are stored for a period not to exceed 180 days Waste tires and white goods are periodically removed from the site for processing **by** a third party Refer to Appendix E 6 for the Plan of Operation for the Parish Tire Collection Facility

§521 G 1 e (formerly §521 H 1 e)

PROCEDURES PLANNED IN CASE OF BREAKDOWNS, INCLEMENT WEATHER AND OTHER ABNORMAL CONDITIONS (INCLUDING DETAILED PLANS FOR WET-WEATHER ACCESS AND OPERATIONS),

As shown on Exhibits A 5, A 5a, A 6, A 7, and A 8, on-site all weather roads provide access to disposal areas within the landfill Covering and grading the waste disposal area to encourage runoff also allows greater accessibility to the active areas of the landfill during wet periods

Other provisions for wet weather operation include cover material stockpiles which are accessible during wet periods

All units of the facility shall be inspected at least weekly and after storms to detect evidence of deterioration of the dikes and levees, overtopping, malfunctions, or improper operation Excessive vegetative growth that prevents proper access, inspection, or operation, or may provide a conduit for groundwater contamination shall be removed (If **a leak damage to the dikes and levees** in the oxidation pond is **are** found, the administrative authority shall be notified)

§521 G 1 g (formerly §521 H 1 g)

PROVISIONS FOR CONTROLLING VECTORS, DUST, LITTER AND ODORS

The primary method for controlling vectors, blowing litter and odors shall be through the use of cover and interim cover Cover will consist of soil cover, reusable synthetic cover, and processed tire material Interim cover will consist of soil materials Volume calculations indicate that there will be an excess of excavated material available for use as cover material Geotechnical data indicates a ready supply of clay materials suitable for use as cover or interim cover

The materials utilized as cover will minimize vector-breeding areas, animal attraction, leachate generation, inward movement of oxygen, blowing litter, and odor Cover materials will also enhance accessibility to the operating area and enhance the appearance of the landfill

Blowing litter shall also be controlled through the use of litter fences which are erected around tipping areas when necessary During windy days landfill personnel will be assigned the task of picking up litter, which has blown out of the disposal area The landfill's water truck shall be used to dampen dust during dry windy days

Shredded municipal waste and Type III wastes shall be covered on an as needed basis or at least bi-weekly in order to control vector attraction, odors, etc ~~The wood-ash disposal area will not be covered due to the nature of the waste~~ Municipal wastes which are not shredded prior to disposal shall be covered on a daily basis

§521 G 2 (formerly §521 H 2)

THE FOLLOWING INFORMATION ON OPERATIONAL PLANS IS REQUIRED FOR TYPE I AND II FACILITIES

§521 G 2 a (formerly §521 H 2 a)

A COMPREHENSIVE OPERATIONAL PLAN DESCRIBING THE TOTAL OPERATION, INCLUDING (BUT NOT LIMITED TO) INSPECTION OF INCOMING WASTE TO ENSURE THAT ONLY PERMITTED WASTES ARE ACCEPTED (TYPE II LANDFILLS SHALL PROVIDE A PLAN FOR RANDOM INSPECTION OF INCOMING WASTE LOADS TO ENSURE THAT HAZARDOUS WASTES OR TOXIC SUBSTANCES CONTROL ACT (TSCA) REGULATED PCB WASTES ARE NOT DISPOSED OF IN THE FACILITY), TRAFFIC CONTROL, SUPPORT FACILITIES, EQUIPMENT OPERATION, PERSONNEL INVOLVEMENT, AND DAY-TO-DAY ACTIVITIES A QUALITY-ASSURANCE/QUALITY-CONTROL (QA/QC) PLAN SHALL BE PROVIDED FOR FACILITIES RECEIVING INDUSTRIAL WASTE, DOMESTIC-SEWAGE SLUDGE, INCINERATOR ASH, FRIABLE ASBESTOS, NONHAZARDOUS PETROLEUM-CONTAMINATED MEDIA, AND DEBRIS GENERATED FROM UNDERGROUND STORAGE TANKS (UST), CORRECTIVE ACTION OR OTHER SPECIAL WASTES AS DETERMINED BY THE ADMINISTRATIVE AUTHORITY THE QA/QC PLAN SHALL INCLUDE (BUT SHALL NOT BE LIMITED TO) THE NECESSARY METHODOLOGIES, ANALYTICAL PERSONNEL, PREACCEPTANCE AND DELIVERY RESTRICTIONS, AND APPROPRIATE RESPONSIBILITIES OF THE GENERATOR, TRANSPORTER, PROCESSOR AND DISPOSER THE QA/QC PLAN SHALL ENSURE THAT ONLY PERMITTED, NONHAZARDOUS WASTES ARE ACCEPTED,

The Vermilion Parish Solid Waste Plant is permitted as a single facility and includes all areas of the site which are enclosed by the perimeter fence This includes Pre-Subtitle D Disposal Area I-A, Subtitle D Disposal Areas I-B **and II-B**, Type III Disposal Area I C, ~~Type III Disposal Area I-E~~, the facility building, the oxidation pond, and all other units within the facility boundary

Waste acceptance/exclusion/handling protocols for the Vermilion Parish Solid Waste Plant are covered in Appendix E 1, "Municipal Waste Acceptance Quality Assurance/Quality Control Plan " In addition, the Vermilion Parish Police Jury/Designee reserves the right to exclude or prohibit the disposal of any and all waste materials deemed unacceptable by the Jury/Designee

The Municipal Waste Acceptance Quality Assurance/Quality Control Plan serves as the random waste inspection plan and is designed to prevent the receipt/disposal of hazardous or PCB wastes at the Vermilion Parish Solid Waste Plant Records of random inspections shall be documented and maintained on file at the landfill office If the load is considered unacceptable (hazardous, PCB containing, or non-permitted), the appropriate action and management will follow in accordance with the QA/QC Plan

The Police Jury is responsible for waste pick-up in the service area Each portion of the service area

has designated collection days for Type II waste and Type III waste separately Thus, the waste is initially segregated prior to arrival at the facility Once a waste load is accepted for disposal, following the requirements of Appendix E 1, the driver shall be directed to the plant where the waste is deposited on the plant floor (All random inspections, as specified in Appendix E 1occur on the concrete floor in the shredder facility) At this point, the waste shall be again inspected for any prohibited wastes If the waste is acceptable, it will be loaded into the shredder This procedure will be followed normally, but when the shredder is inoperable due to maintenance requirements or break downs, the waste will not be shredded and will be deposited directly within the proper disposal area The municipal shredded waste shall be transported to Subtitle D Area I-B **and/or Area II-B** only Trucks entering the landfill with a load of wood products will be directed to the Vermilion Parish Air Curtain Destructor Facility (ACD) ~~**Ash from the ACD will be directed to disposal area I-E, area I-A, or area I-C Only Vermilion Parish trucks will be allowed to haul wood ash from the ACD**~~ Trucks hauling Type III Wastes not destined for the ACD will be directed to disposal area I A or I-C Once the waste load is deposited, the driver shall be directed to the landfill exit

Additionally, the following also applies to the Solid Waste Plant

- Open burning of solid waste shall not be practiced,
- Salvaging shall be prevented,
- Scavenging shall be prevented,
- Grazing of domestic livestock shall not be allowed in operating areas, and
- No solid waste shall be deposited in standing water

At least weekly, a landfill operator shall patrol the units of the facility to ensure that the levees and required freeboard are maintained For the oxidation pond, at least one foot (1') of freeboard shall exist at all times This will confirm that the oxidation pond is not overloaded (For further protocols for maintaining the drainage system, refer to the Best Management Practices Plan in Appendix B 6

The following delineates which items are acceptable and unacceptable for disposal

Acceptable Waste	Unacceptable Waste
• normal household waste/garbage	• hazardous or PCB waste
• woodwaste	• industrial waste
• construction/demolition debris	• liquid wastes or waste containing free liquids
• wood ash	• used oil, lead acid batteries
• approved domestic sewage sludge*	• paint cans with paint
• waste tires (for recycling)	• highly flammable substances
• white goods (for recycling)	• infectious waste not properly incinerated, not properly packaged, or not certified noninfectious by the Department of Health and Hospitals

White goods are accepted for temporary storage (a period not to exceed 180 days), provided all freon

and capacitors are removed prior to receipt The Vermilion Parish Police Jury, owner and operator of this facility, has contracted with a scrap metal recycling company to recycle these white goods

* The Vermilion Parish Solid Waste Plant shall only accept domestic sewage sludge based on the following, or as per the regulations

The waste shall be tested for toxicity characteristics leachate procedure (TCLP) Analysis and priority pollutants prior to the acceptance of the waste and annually for two years following acceptance Each year thereafter, the generator must certify that the waste remains unchanged

Additionally, at the time of disposal, accepted sludge waste shall contain more than 15% solids, contain no free liquids, and be bladeable by landfill equipment

§521 G 2 d (formerly §521 H 7)

A COMPREHENSIVE AIR MONITORING PLAN FOR FACILITIES RECEIVING WASTE WITH A POTENTIAL TO PRODUCE METHANE GASES

A gas monitoring plan is **presented** ~~proposed~~ in Appendix C 2 This Gas Monitoring Plan applies to the entire facility, including the oxidation pond and the disposal areas This Plan prescribes procedures for sampling and analysis, safety, and remedial measures The levels of methane gas shall be monitored in the facility's structures, above ground around the perimeter of the disposal areas and the oxidation pond, and below ground in the gas monitoring probes (proposed in Appendix A 12)

This Plan includes the following measures

- Methane gas levels must be limited to less than the lower explosive limits at the facility boundary and to 25 percent of the lower-explosive limits in facility buildings
- The minimum frequency of testing shall be quarterly
- If methane gas levels exceed the limits specified above, immediate steps shall be taken to ensure the protection of human health and the administrative authority shall be notified, a report shall be submitted to the administrative authority within 7 days of the detection with the methane gas levels detected and the steps taken to protect human health, a remediation plan for the methane gas releases shall be submitted to the administrative authority within 30 days of detection which shall describe the nature and extent of the problems and the proposed remedy and shall include an implementation schedule, and the plan shall be implemented within 60 days of detection
- If strong odors occur at the facility boundaries, the administrative authority shall be notified
- Records of the gas monitoring results shall be maintained at the facility
- Odors shall be controlled by the best means practicable
- The Vermilion Parish Solid Waste Plant shall ensure that the units do not violate any applicable requirements developed under a state implementation plans (SIP) approved or promulgated pursuant to Section 110 of the Clean Air Act, as amended

§521 H (formerly §521 I)

IMPLEMENTATION PLANS ALL FACILITIES SHALL HAVE IMPLEMENTATION PLANS IN ACCORDANCE WITH STANDARDS IN LAC 33 VII 709 D (TYPE I AND II FACILITIES), LAC 33 VII 717 H (TYPE I A AND II-A FACILITIES) AND LAC 33 VII 719 E (TYPE III FACILITIES)

At this time the Vermilion Parish Solid Waste Plant ~~essentially~~ meets the requirements of Subtitle D and the Louisiana Solid Waste Rules and Regulations with the Exception of the following

- ~~Installation of Final Cover on the Pre-Subtitle D Disposal Area~~
- ~~Installation of Gas Monitoring Probes~~
- Installation of Gas Vents on the Pre-Subtitle D Disposal Area

Following is the anticipated schedule for implementation of the Subtitle D requirements

Item	Date Started	Date Completed
~~Install Final Cover on Pre-Subtitle D Disposal Area~~	~~January 14, 1998~~	~~Within 90 days~~
~~Install Gas Monitoring Probes~~		~~Within 90 days~~
Install Gas Vent System on Pre Subtitle D Disposal Area	*	*

* Gas vents to be installed when final contours have been reached

The Subtitle "D" liner system in area **II-B** ~~I-B~~ is to be constructed in **two** phases, as necessary **The implementation schedule for this expansion is as follows**

Item	**Anticipated Start Date**	**Anticipated Completion Date**
Phase A - Subtitle "D" Liner System - Areas II-B and Associated Work (including relocating groundwater monitoring wells and new GW wells)	**early Fall 2008**	**late Fall 2008**
Commence Operations - Phase A	**2009**	**2017**
Phase B - Subtitle "D" Liner System - Area II-B and Associated Work	**Spring 2015**	**late Spring 2015**
Commence Operations - Phase B	**2016**	**Summer 2028**
Install Gas Vent System on Closed Areas	**early Summer 2028**	**late Summer 2028**

~~The transition of the current operation of the Vermilion Parish Solid Waste Plant into the requirements described in this permit application will entail the following:~~

~~Municipal Solid Waste shall be disposed of within the Phase I-A, Pre-Subtitle D disposal area until January 14, 1998. Thereafter,~~ Municipal Solid Waste shall be disposed of within ~~the Phase~~ **Area** I-B **and/or Area II-B**, Subtitle D disposal areas. ~~At this time the Area I-A area will be covered with a 2' thick interim compacted cover.~~ The remaining permitted airspace within the Phase I-A **Pre-Subtitle D** area will be utilized as a Type III disposal area. Once Area I-A has reached the final contours shown on Exhibit A 8, final cover and the gas venting system will be installed in accordance with the permit. Type III construction/demolition debris and yard trash will also be disposed of within the Phase I-C disposal area, ~~and wood ash from the Vermilion Parish ACD will be disposed of within the Phase I-E disposal area~~

A detailed Implementation Schedule is included in Appendix H 2, which includes the phased disposal schemes. (Construction activities shall be conducted in phases, based on the waste disposal requirements. Therefore, the actual dates of construction, etc., may vary)

That portion of the Phase ~~I~~ **II** disposal area to be upgraded to these regulations is indicated as the "Subtitle D Area" (Area ~~I-B~~ **II-B**) on the exhibits. No municipal waste ~~will be~~ **was** deposited within the "Pre-Subtitle D Area" (Area I-A) after January 14, 1998. ~~At this time~~ **Subsequently**, municipal wastes shall be deposited in upgraded areas (Area I-B **and/or Area II-B**) and ~~work shall begin to place interim compacted cover in the~~ Pre-Subtitle D Area which shall then be utilized as a Type III cell. Area I-A will be covered with a composite final cap once the area is filled to its permitted capacity. Municipal wastes shall be deposited in the area indicated as the "Subtitle D Area" (Area I-B **and/or II-B**) after January 14, 1998. This area shall be constructed to the standards set forth in these regulations.

Type III construction/demolition debris and yard trash will also be disposed of within the Phase I-C disposal area ~~and wood ash from the Vermilion Parish ACD will be disposed of within the Phase I-E disposal area~~

~~Interim Compacted Cover construction shall begin after January 14, 1998, on the Pre-Subtitle D Disposal Area located in Area I-A, which shall then be utilized as a Type III cell.~~ **Final cover in Subtitle "D", Area I-B shall be completed within the required time frame upon reaching final elevations.** Area I-A will be covered with a composite final cap once the area is filled to its permitted capacity.

§521 I (formerly §521 J)

FACILITY CLOSURE STANDARDS GOVERNING FACILITY CLOSURE ARE CONTAINED IN LAC 33 VII 711 E (TYPE I AND II LANDFILLS), LAC 33 VII 713 E (TYPE I AND II SURFACE IMPOUNDMENTS), LAC 33 VII 715 E (TYPE I AND II LANDFARMS), LAC 33 VII 717 I (TYPE I-A AND II-A FACILITIES), LAC 33 VII 721 D (CONSTRUCTION AND DEMOLITION DEBRIS AND WOODWASTE LANDFILLS), LAC 33 VII 723 D (TYPE III COMPOSTING FACILITIES) AND LAC 33 VII 725 D (TYPE III SEPARATION FACILITIES)

§521 I 1 (formerly §521 J 1)

THE CLOSURE PLAN FOR ALL FACILITIES SHALL INCLUDE THE FOLLOWING

§521 I 1 a (formerly §521 J 1 a)

THE DATE OF FINAL CLOSURE,

Based on current projections, the Vermilion Parish Solid Waste Plant **is estimated to** ~~shall~~ be in operation for the next 20 **years, or about the year 2028 (refer to the detailed Implementation Schedule in Appendix H 2)** The Vermilion Parish Police Jury shall inform the Administrative Authority of the intent to close units of the landfill This notification will be submitted at least 90 days before the intended closure date and shall include the date of intended closure

At the time that the Vermilion Parish Police Jury notifies the Administrative Authority of the intent to close a unit of the landfill the Vermilion Parish Police Jury with an updated closure schedule and closure cost estimate

It is anticipated that the existing Subtitle D Cell (Area I-B) will undergo final closure within a three (3) year time frame of the construction of the piggyback liner system (est mid-2009)

§521 I 1 b (formerly §521 J 1 b)

THE METHOD TO BE USED AND STEPS NECESSARY FOR CLOSING THE FACILITY, AND

The Vermilion Parish Solid Waste Plant shall submit a detailed Closure Plan to the Department for review and approval at least 90 days prior to the closure of the disposal units within the facility and/or the oxidation pond, or the intent to close, seal, or abandon any individual disposal units and/or the oxidation pond ~~within the facility~~

This closure plan to be submitted to **the** Department shall contain the date of planned closure, changes (if any) requested in the approved closure plan, and the closure schedule and estimated cost

Closure Plan For Disposal Units

After final grades are reached in each disposal unit of the facility or the date of known final receipt of solid waste in the unit, whichever comes first, the final cover installation shall be initiated no later than 30 days after and shall be completed no later than 90 days **thereafter** These deadlines may be extended by the administrative authority if necessary due to inclement weather or other circumstances to a maximum of 60 days for initiation and a maximum of 180 days for completion

~~Interim compacted cover installation within the Pre-Subtitle D disposal area (Phase I A) shall begin around January 14, 1998 as no municipal wastes shall be disposed of within this area after that date~~ Final cover installation shall be in accordance with these regulations As waste disposal areas reach final contours (refer to Exhibit A 8), final cover shall be installed along with the gas venting system

The above paragraph describes closure of individual units of the landfill At such time that the entire facility is closed, the connecting sides of the Pre Subtitle D disposal area and the Subtitle D disposal area shall be filled and capped as described, and all remaining areas will be capped The leachate collection system will remain in service during the post closure care period, as well as the gas monitoring system, groundwater monitoring system and oxidation pond The oxidation pond will be utilized to treat any leachate produced during the post closure care period

Closure Plan for the Oxidation Pond

As previously discussed, a detailed closure plan shall be submitted to the Department at least ninety (90) days prior to the intended closure of the oxidation pond This detailed plan shall include sampling and analysis procedures and parameters to be **analyzed** ~~tested~~ for the closure of the oxidation pond The oxidation pond is intended to be kept operational until such time as leachate is no longer generated or until the Police Jury can demonstrate that the leachate no longer poses a threat to human health or the environment Prior to closure, the levee system surrounding the oxidation pond shall be maintained and modified to prevent overflow of the wastewater to adjoining areas

The preliminary clean closure plan is presented below and is subject to change when the detailed closure plan is submitted ninety (90) days prior to closure

Sample the water in the pond in accordance with the discharge permit, and if acceptable, dewater the oxidation pond through the permitted discharge point Two samples of sludge will be taken and analyzed for parameters found in the leachate If the sludge is deemed non-hazardous, then the sludge from the pond will be excavated and removed to a permitted facility Once it appears all of the sludge has been removed, a soil sample in the general area of the surface impoundment of uncontaminated soils will be taken for a determination of background levels using indicator parameters described in the detailed closure plan Also, a sample of the soils in the area of the surface impoundment after sludge has been excavated will occur If the analysis does not indicate the presence of sludge, then a request for a closure inspection will be filed Then the area of the surface impoundment will be filled with clean water to achieve a clean closure The pond will provide an aesthetically pleasing appearance to the facility for closure (If the analysis revels the presence of sludges, additional soils will be excavated from the area of the surface impoundment and the process repeated) Not the 713 B 4 requires a gas collection and treatment or removal system only for surface impoundments that do not perform clean closure Since the above narrative proposes a clean closure for the surface impoundment, no gas collection and treatment or removal system is provided in the direct vicinity of the surface impoundment

Upon determination by the administrative authority that a facility has completed closure in accordance with the approved plan, the Police Jury shall request that the administrative authority release the closure fund

§521 I 1 c (formerly §521 J 1 c)

AN ITEMIZED COST OF CLOSURE OF THE FACILITY, BASED ON THE ESTIMATED COST OF HIRING A THIRD PARTY TO CLOSE THE FACILITY AT THE POINT IN THE FACILITY'S OPERATING LIFE WHEN THE EXTENT AND MANNER OF ITS OPERATION WOULD MAKE CLOSURE THE MOST EXPENSIVE

A Closure Cost Estimate is presented in Appendix G 2 **This closure cost estimate reflects closure of approximately 10-acres of pre-Subtitle D / C-D disposal cells to receive final cover and approximately 12-acres of Subtitle D disposal cells to receive final cover, as well as the other closure expenses**

§521 I 2 b (formerly §521 J 2 b)

AN ESTIMATE OF THE LARGEST AREA OF THE FACILITY EVER REQUIRING A FINAL COVER AT ANY TIME DURING THE ACTIVE LIFE,

The Pre-Subtitle D disposal area which consists of Area I-A has not yet received final cover It is anticipated that the Pre-Subtitle D disposal area will be the largest area without final cover at any given time during the life of the facility, this area covers 10 ~~19~~ acres The closure cost estimate in Appendix G is based on capping this area

§521 I 2 c (formerly §521 J 2 c)

AN ESTIMATE OF THE MAXIMUM INVENTORY OF SOLID WASTE EVER ON-SITE OVER THE ACTIVE LIFE OF THE FACILITY, AND

With the proposed expanded area and height increase, it is estimated that the **overall maximum inventory of solid waste which will ever be on-site over the active life of the facility** ~~facility's total design capacity~~ is approximately **4 2 million** ~~3,000,000~~ cubic yards **of Type II and Type III waste** Of that total, approximately **1 5 million** ~~1,000,000~~ cubic yards have been or will be utilized for the disposal of municipal solid waste (putrescible waste), which includes the slope liner system for the Subtitle D Area I-B/**Area II-B**

§521 I 3 (formerly §521 J 3)

THE CLOSURE PLAN FOR ALL TYPE I AND II FACILITIES AND TYPE III WOODWASTE AND CONSTRUCTION/DEMOLITION DEBRIS FACILITIES SHALL INCLUDE THE FOLLOWING

§521 I 3 a (formerly §521 J 3 a)

THE SEQUENCE OF FINAL CLOSURE OF EACH UNIT OF THE FACILITY, AS APPLICABLE,

~~Interim cover installation within the Pre-Subtitle D (Area I-A) disposal shall begin about January 14, 1998, as no municipal wastes shall be disposed of within this area after that date. Final cover installation within this area shall be completed once this area has reached its permitted contours and as required by these regulations.~~

Final cover installation shall be in accordance with the drawings shown in Appendix A. As waste disposal areas reach final contours (refer to Exhibit A 8), final cover shall be installed along with the gas venting system.

§521 I 3 b (formerly §521 J 3 b)

A DRAWING SHOWING FINAL CONTOURS OF THE FACILITY, AND

Exhibit A 8 depicts the final contours of the permitted waste disposal areas Exhibits A 8a **and A 8b** shows cross sectional views of these areas

§521 J 1 b (formerly §521 K 1 b)

AN ITEMIZED COST OF CONDUCTING POST-CLOSURE OF THE FACILITY, BASED ON THE ESTIMATED COST OF HIRING A THIRD PARTY TO CONDUCT POST CLOSURE ACTIVITIES IN ACCORDANCE WITH THE CLOSURE PLAN

Post-Closure care shall consist of maintaining the final cap, maintaining erosion control measures, providing annual reports to the Administrative Authority, maintaining and operating the leachate collection system and the oxidation pond until such time as either leachate is no longer generated or until the Police Jury can demonstrate that the leachate no longer poses a threat to human health or the environment, maintaining and operating the gas collection system, maintaining the groundwater monitoring system, and, monitoring the groundwater quality

The estimated cost of post-closure care during the 30 year period is **provided in Appendix G 2** ~~$1,860,000 00~~ (Note that the length of post-closure care can be decreased by the administrative authority if the permit holder demonstrates that the reduced period is sufficient to protect human health and the environment and this demonstration is approved by the administrative authority Any demonstration must provide supporting data, including adequate groundwater monitoring data)

§521 K (formerly §521 L)

FINANCIAL RESPONSIBILITY STANDARDS GOVERNING FINANCIAL RESPONSIBILITY ARE CONTAINED IN LAC 33 VII CHAPTER 13 ALL APPLICABLE SECTIONS OF LAC 33 VII CHPATER 13 MUST BE ADDRESSED AND INCORPORATED INTO THE PERMIT APPLICATION RESPONSES A SECTION DOCUMENTING FINANCIAL RESPONSIBILITY ACCORDING TO LAC 33 VII CHPATER 13 THAT CONTAINS THE FOLLOWING INFORMATION SHALL BE INCLUDED FOR ALL FACILITIES

§521 K 1 (formerly §521 L 1)

THE NAME AND ADDRESS OF THE PERSON WHO CURRENTLY OWNS THE LAND AND THE NAME AND ADDRESS OF THE PERSON WHO WILL OWN THE LAND IF THE STANDARD PERMIT IS GRANTED (IF DIFFERENT FROM THE PERMIT HOLDER, PROVIDE A COPY OF THE LEASE OR DOCUMENT WHICH EVIDENCES THE PERMIT HOLDER'S AUTHORITY TO OCCUPY THE PROPERTY), OR

The Vermilion Parish Solid Waste Plant is owned and will be owned by the Vermilion Parish Police Jury The address of the Police Jury is

Vermilion Parish Police Jury
~~P O Box 430~~
~~Abbeville, Louisiana 70511-0430~~
Courthouse Building
100 North State Street
Suite 200
Abbeville, LA 70510

§521 K 2 (formerly §521 L 2)

THE NAME OF THE AGENCY OR OTHER PUBLIC BODY THAT IS REQUESTING THE STANDARD PERMIT, OR, IF THE AGENCY IS A PUBLIC CORPORATION, ITS PUBLISHED ANNUAL REPORT, OR, IF OTHERWISE, THE NAMES OF THE PRINCIPAL OWNERS, STOCKHOLDERS, GENERAL PARTNERS, OR OFFICERS,

The Vermilion Parish Police Jury owns and operates the Vermilion Parish Solid Waste Plant

§521 K 3 (formerly §521 L 3)
EVIDENCE OF LIABILITY COVERAGE, INCLUDING

§521 K 3 a (formerly §521 L 3 a)
PERSONAL INJURY, EMPLOYEES AND THE PUBLIC (COVERAGE, CARRIERS AND ANY EXCLUSIONS OR LIMITATIONS),
§521 K 3 b (formerly §521 L 3 b)
PROPERTY DAMAGE (COVERAGE AND CARRIER),
§521 K 3 c (formerly §521 L 3 c)
ENVIRONMENTAL RISKS, AND

The Vermilion Parish Police Jury, owner and operator of the facility, provides a Letter of Credit to meet the financial responsibility during operation, which covers personal injury, employees, and the public, property damage, and environmental risks Refer to the responses to LAC 33 VII 1301 and Appendix G 3

§521 K 4 (formerly §521 L 4)

EVIDENCE OF A FINANCIAL ASSURANCE MECHANISM FOR CLOSURE AND/OR POST-CLOSURE CARE AND CORRECTIVE ACTION FOR KNOWN RELEASES WHEN NEEDED

The Vermilion Parish Police Jury, owner and operator of the facility, provides a Letter of Credit to meet the financial responsibility for closure and post-closure care Refer to the responses to LAC 33 VII 1303 and Appendix G 3

§521 L

SOLID WASTE FEES STANDARDS GOVERNING SOLID WASTE FEES ARE CONTAINED IN LAC 33 VII CHAPTER 15 A SECTION DOCUMENTING COMPLIANCE WITH APPLICABLE FEES ACCORDING TO LAC 33 VII CHAPTER 15 SHALL BE INCLUDED FOR ALL FACILITIES

The Vermilion Parish Police Jury shall comply and submit the applicable fees according to LAC 33 VII CHAPTER 15 when submitting standard permit applications and/or permit modification applications for the Vermilion Parish Solid Waste Plant, a Type II and III solid waste disposal facility

Responses to §522 General Facility Geology, Subsurface Characterization, and Facility Groundwater Monitoring

§522 GENERAL FACILITY GEOLOGY, SUBSURFACE CHARACTERIZATION, AND FACILITY GROUNDWATER MONITORING

§522 A (formerly §521 D)

FACILITY GEOLOGY STANDARDS GOVERNING FACILITY GEOLOGY ARE CONTAINED IN LAC 33 VII 801 THE FOLLOWING INFORMATION REGARDING GEOLOGY IS REQUIRED FOR TYPE I, TYPE I-A, TYPE II, TYPE II-A, AND TYPE III FACILITIES

§522 A 1 (formerly §709 C 1 c)

A DEMONSTRATION THAT THE PERSON WHO CHARACTERIZED THE SUBSURFACE SOIL AND GROUNDWATER CONDITIONS AT THE FACILITY IS QUALIFIED AT A MINIMUM, THIS INDIVIDUAL SHALL BE A GEOLOGIST, OR A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF LOUISIANA WITH EXPERTISE IN GEOTECHNICAL ENGINEERING AND HYDROGEOLOGY, AND,

The geotechnical investigation for Permit Modification No 9, Subtitle D, Area 2-B Expansion at the Vermilion Parish Solid Waste Plant was prepared under the direction and supervision of Dr Ricardo C de Abreu, P E (Registered Professional Engineer in Civil and Environmental Engineering, License No 31257, Senior Engineer) with Ardaman & Associates, Inc (formerly Soil Testing Engineers, Inc of Baton Rouge, La)

§522 A 2 (formerly §521 D 1 a, D 1 c, D 1 d, D 1 e, D 1 f, D 1 g)
A DEMONSTRATION THAT THE FACILITY HAS NATURAL SOILS OF LOW PERMEABILITY AS PROVIDED IN LAC 33 VII 801 A 2, OR,

§522 A 3 (formerly §709 C 1 b)
A DESIGN FOR SURFACING NATURAL SOILS THAT DO NOT MEET THE LOW PERMEABILITY STANDARD AS PROVIDED IN LAC 33 VII 801 A 3

The Vermilion Parish Solid Waste Plant disposes of municipal solid waste, construction/demolition debris, woodwaste, wood ash, and domestic sewage sludge ~~The depth of excavation for the disposal generally ranges from 3 3' to 5 6' MSL~~ Each unit of the facility is labeled with an "area code" as shown in Exhibits A 6 and A 7 for waste segregation Municipal solid waste ~~shall be~~ **is** disposed in Subtitle D Area I-B ~~only~~ **and shall be disposed in the expanded Subtitle D Area 2-B** Construction/demolition debris or woodwaste ~~shall be~~ **is** disposed in Pre-Subtitle D Area I-A (after December 31, 1997) and Area I-C ~~Area I-E is reserved for wood ash disposal generated by the Vermilion Parish Air Curtain Destructor Facility, which is not a unit of the Vermilion Parish Solid Waste Plant~~

~~In regards to~~ **The updated** isometric profiles and cross-sections of soils~~, the following response was~~ **were** provided by Soil Testing Engineers, Inc in a report entitled "Report of Geoscience Investigation - Vermilion Parish Solid Waste Plant, Permit Modification No 5 **9**~~, Mandatory Permit Modification~~ Vermilion Parish Louisiana dated ~~March 2, 1995~~ **November 19, 2004** A complete copy of the geotechnical and geohydrological reports are is represented in Appendix F

An Isometric Soil Profile for the proposed landfill area is illustrated as Figure ~~14~~ **2** of the **2004** *Geoscience Report* (see Appendix F 5 **6**) Geologic profiles are shown on Figures **3** ~~and 15~~ through ~~22~~ **16** of that report Well screens and excavation levels are depicted on these drawings The soil profile beneath this site can be grouped into the basic soil state presented on the following page

Stratum No	~~Depth To Top (feet)~~	Typical Depths ~~Thickness~~ (feet)	Average Vertical Permeability (cm/sec)	Average Horizontal Permeability (cm/sec)
IA	~~0~~	~~24~~	~~2x10(-8)~~	~~9x10(-9)~~
IB	~~0~~	**0 to 25** ~~5~~	**1 6x10(-8)** ~~1x10(-7)~~	**1 2x10(-8)** ~~1x10(-7)~~
~~IC~~	~~10~~	**0 to 25** ~~23~~	**9 6x10(6)** ~~1x10(-6)~~	**1 6x10(-6)** ~~1x10(-6)~~
IIA	~~24~~	~~100~~	~~1x10(-5)~~	~~1x10(-5)~~
IIB	~~37~~	**25 to >100** ~~47~~	**9 5x10(-4)** ~~1x10(-8)~~	~~3x10(-8)~~
		35 to 50	**5 5x10(-9)**	

*For further details, see Paragraph (2 4 ~~B~~) of the **2004** *Geoscience Report*

The deepest excavation planned for the **new** landfill **cell, disposal Area 2-B,** is ~~26~~ **approximately 15** feet below present grade The isometric and geologic profiles extend well beyond the 30 feet requirement The clays of Zone I form an effective barrier to vertical migration of water in the area to be utilized for service facilities This stratum begins at the ground surface and is well in excess of ~~20~~ **3** feet thick in the service area**, after excavation**

All classification, strength, and permeability test results are presented in Appendix A of the **2004** *Geoscience Report* (Appendix ~~F-5~~ **F 6**) A summary of all permeability tests performed on natural soils for this ~~1994~~ **2004** study is presented **in section 2 4 2 and** ~~as~~ Table~~s~~ A-2 ~~and A-3~~ of that report The test methodologies conformed to appropriate ASTM and/or EPA procedures as required under **LAC 33 VII 521 E 2 (formerly** LAC 33 VII 709 C 1 c iv)

§522 B (formerly §709 C)

SUBSURFACE CHARACTERIZATION STANDARDS GOVERNING SUBSURFACE CHARACTERIZATION ARE CONTAINED IN LAC 33 VII 803

§522 B 1 (formerly §709 C 1 c)

TYPE I, II, AND III FACILITIES SHALL DEMONSTRATE THAT THE FACILITY MEETS THE BORING REQUIREMENTS PROVIDED IN LAC 33 VII 803 A

The locations of all known soil borings are shown on Exhibit A 11 Soil boring logs are presented in Appendix F 1, F 2, F 3, F 4, ~~and~~ F 5 **and F 6** The ground surface elevations of each boring are listed in Appendix ~~F-5~~ **F 6,** Table A-1 Note that the elevation of all borings, except those drilled in 1994 **and 2003**, were estimated from a site topographic map made in 1992, since they were not surveyed at the time of drilling All boreholes drilled for ~~this~~ **the** 1994 **and 2003** study were grouted from the bottom to the top with a cement-bentonite grout using the tremie method For the proportions of the mix, refer to Appendix F 5, page A-4, **Grouting**

Note **Borings are required** at a maximum spacing of 450 feet and to the required depths along the perimeter of the facility, rather than drilling through the waste However, an exemption to these regulations has been requested by the Vermilion Parish Police Jury (refer to Appendix B 11 for a copy of the request) based on a thorough understanding of the geology and groundwater flow at the site

§522 B 2 (formerly §521 F 5)

TYPE I AN II FACILITIES SHALL DEMONSTRATE THAT

§522 B 2 a (formerly §521 F 5 a)

THE FACILITY MEETS THE PIEZOMETER OR MONITORING WELL REQUIREMENTS AS PROVIDED IN LAC 33 VII 803 B , AND,

Five monitoring wells were installed at the Vermilion Parish site in 1984 These wells were supplemented by one deep piezometer in 1994 At present, there are ~~six~~ **twelve** piezometers/wells **in the site** ~~to Zone II~~ Long term water level data on these wells is presented on Table ~~A-1~~ **A-4** of the **2004** *Geoscience Report* ~~These are the known continuous Zones for monitoring~~ **Recent** potentiometric mapping is provided on Figures ~~25~~ **22** through **24** ~~28~~ **of the 2004** ***Geoscience Report***

The flow direction is discussed in the Responses to **LAC 33 VII 522 B 2 b (formerly** LAC 33 VII 521 E 1 a iii) The flow of the ground water is generally to the southwest

§522 B 2 b (formerly §521 E 1 a, E 1 b, F 5 b)

THE FACILITY MEETS THE GEOLOGY AND GROUNDWATER FLOW CHARACTERIZATION REQUIREMENTS PROVIDED IN LAC 33 VII 803 C

The "water table" at the Vermilion Parish Solid Waste Plant site should be taken as the potentiometric level in the silty sand (SM) zone labeled Zone II in Paragraph ~~2 4 B~~ **2 4 2** of the **2004** *Geoscience Report* Zone II underlies the entire site

The only **continuous** permeable zone beneath the Vermilion Parish Solid Waste Plant is Zone II This silty sand begins at about Elevation 0 **feet NGVD** ~~MSL~~ and continues to about Elevation – 800 **feet NGVD** ~~MSL~~ It was found in ~~all of the 1994~~ **six of the nine 2003** borings **depths** made for this most recent investigation **All previous borings were used to compliment the 2003 boring information in preparing the soil profile for the site**

Recent Potentiometric maps for Zone II are presented as Figures ~~25~~ **20** through ~~28~~ **22** ~~including 28A through 28E~~ of the **2004** *Geoscience Report* (Appendix ~~F-5~~ **F 6**) Flow is generally to the **south, moving from the the southeast to the** southwest Water particle velocities are on the order of 15 to ~~25~~ **35** feet per year **as shown in the 1995 *Geoscience Report*** However, localized groundwater directions are influenced by irrigation pumping, municipal well pumping, and surface drainage features such as rivers, bayous and coulees The most significant effect on Zone II appears to be the presence of Coulee Kinney and its tributary which form a crescent around the east, north and west sides of the site Surface water flow in Coulee Kinney is from the northwest to the southwest Surface flow in the tributary is from southeast to the northwest, intersecting the southwesterly flow in Coulee Kinney near the northeast corner of the site The bottom depth of the coulee at this point is -3 MSL

Any change in the geohydraulic system due to previous landfill construction, although expected to be small, would be difficult to detect given the influence on Zone II water levels by the nearby Coulee Previous landfill cells bottomed in Zone I, and were constructed with leachate collection systems, thus any effects would be negligible The oxidation pond bottomed in Zone I at elevation +6 MSL, some minor localized effect on the flow regime is possible due to water levels in the pond

For the current Subtitle D cell and other future areas of development governed by the current regulations, a composite liner system (recompacted clay, **GCL** and synthetic) should result in negligible effects on the aquifer

The only recognized aquifer whose upper surface is within 200 feet of the ground surface is the Chicot Aquifer The upper surface of this aquifer is Zone II (see Response to LAC 33 VII 521 D 1 a), which was encountered in the boreholes and defined from geological publications and areas water wells (see **1995 and 2004** *Geoscience Reports*) The Chicot underlies the entire site and most of Vermilion Parish

The upper surface of the Chicot Aquifer lies about 20 feet below natural ground surface The bottom of the Chicot Aquifer lies near Elev -800' MSL, giving a typical thickness of 800 feet (Jones, 1954)

Jones (1954), indicates that the Chicot Aquifer may be in contact with the next deeper aquifer, the Evangeline Aquifer, at about Elevation -900' MSL (900 feet below ground surface)

Potentiometric mapping for the Chicot Aquifer was available in the geologic literature It is presented for 1980 on Figure 8 of the **1995** *Geoscience Report* and for 1985 on its Figure 9 of Appendix F 5 The gradient in Zone II (the Chicot Aquifer) is about 0 7 feet per mile The overall direction of groundwater flow is and has been basically westward at this site The water particle velocity is some 15 to ~~25~~ **35** feet per year (see Paragraph 2 3 A of the **1995** *Geoscience Report* in Appendix F 5)

A**n** ~~recent~~ aerial of the Vermilion Parish Solid Waste Plant aided in the development of a plan view of the facility showing the existing contours This contour map is presented as Exhibit A 5

As shown in Exhibit A 11, all known boring locations, groundwater monitoring well locations, and piezometer locations have been superimposed on a site excavation plan Excavation contours are shown on this drawing, however, they are not clearly visible at the half scale Thus, Exhibit A 8a should be used as a reference for excavation depths for the disposal areas, and Exhibit A 9 should be used as a reference for the excavation depth of the oxidation pond

Borings B-1 (1983), B-2 (1982), B-3 (1983), and B-4 (1983) are located in Area I-C which is the disposal area for construction/demolition debris and woodwaste only Borings B-1 (1982), B-2 (1983), B-3 (1977), and B 5 (1983) are located in Pre-Subtitle D Area I-A, where municipal solid waste was disposed prior to December 31, 1997 Thereafter, this area will be utilized for the disposal of Type III wastes only ~~Finally,~~ Borings B-1 (1994), B-2 (1994), B-3 (1994), B-4 (1994), and B-6 (1983) are located in the Subtitle D Area I-B which is reserved for municipal solid waste disposal after December 31, 1997 Boring B-2 (1977) was also provided within the oxidation pond area **Finally, borings B03-1, B03-2, B03-3, B03-4, B03-5, B03-6, B03-7, B03-8, and B03-9 are located in the Subtitle D Area II-B, which is also reserved for municipal solid waste disposal**

Geologic cross-sections ~~with the waste disposal areas and the oxidation pond excavation levels superimposed~~ are represented as Figures ~~15~~ **2** through ~~22~~ **16** of the **2004** *Geoscience Report* (Appendix ~~F-5~~ **F 6**) Also refer to the cross-sections of the waste disposal areas depicting the original and final grades are shown on Exhibit A 8a (cut and fill slopes and the perimeter levee and drainage system are also indicated) The location of and type of liner and leachate system is shown on Exhibits A 7a and A 7b (Note that the oxidation pond was constructed in 1978, and as such, is not required to upgrade to liner standards in accordance with §713 B 3 Liners)

Geologic Cross-sections taken from

> Nyman, D J , *The Occurrence of High Concentrations of Chloride in the Chicot Aquifer System of Southwestern Louisiana* , U S Geological Survey, 1984

are given as Figure 3 of the **1995** *Geoscience Report* (**Appendix** F 5) They illustrate the stratigraphy to a depth of at least 200 feet below the ground surface

As discussed in the response to LAC 33 VIII 521 A 2 b i, the only known faults in the area terminate at great depth No faults active in Holocene time are known to exist within many miles of the site (see Response to LAC 33 VII 709 A 5) The site stratigraphy was determined by correlation of the boreholes and is presented on the Isometric Profile, Figure ~~14~~ **2**, and **cross sections,** Figures ~~15~~ **3** through ~~22~~ **16** of the **2004** *Geoscience Report*, (Appendix ~~F-5~~ **F 6**) No consistent lithological trends indicative of a fault are present Based on the above, no mitigating measures are necessary to protect the environment from fault-related considerations

This site is not in a Seismic-impact Zone (see Figure 6 of the **1995** *Geoscience Report* in Appendix F 5) Therefore, the provisions of **LAC 33 VII 709 A 10 c** ~~(this LAC 33:VII 521 D 1 f)~~ are not applicable to the Vermilion Parish Solid Waste Plant

Both the USEPA and LDEQ use the same definition of a "Seismic-impact Zone " defined in LAC 33 VII 115 as

> *"Seismic-impact Zone - and area with a 10 percent or greater probability that the maximum horizontal acceleration in lithified earth material expressed as a percentage of the earth's gravitational pull (g) will exceed 0 10 g in 250 years "*

This is the same definition as given in 40 CFR 258 14 (USEPA "Subtitle D")

In its discussion of 40CFR258 14 justifying the 250-year period, the USEPA refers to the appropriate mapping as that contained in USGS Open-File Report No 82 1033 (see *Federal Register*, Vol 56, No 196, page 51046) The correct map for a Seismic Impact Zone is Plate 3 of that report, it is cited in Paragraph 2 6 3 of the EPA's *Draft Technical Manual for Solid Waste Disposal Facility Criteria* and given as Figure 2 5 of that publication This Plate 3 is reproduced as Figure 6 of the **1995** *Geoscience Report* in Appendix F 5, with the site marked thereon The Vermilion Parish site is not in a Seismic-Impact Zone

The Vermilion Parish site is not located in a "*unstable area*" as defined in LAC 33 VII 115 ~~and 709 C 3~~ It is not underlain by Karst Terrane, and is not subject to naturally-induced mass movements such as landslides or those due to geologic faults The site is free from "poor foundation conditions' which might tend to impair landfill structural components The foundation effects

common to even good sites as this one have been evaluated as shown below, these evaluations showed that no such impairment will occur

Liner As shown ~~in the Response to LAC 33 VII 709 C 3 a and~~ Paragraph ~~(4 4 B)~~ **3 4 4** of the **2004** *Geoscience Report* **(Appendix F 6)**,the settlements will cause neither cracking of the clay portion of the liner nor over stressing of the synthetic portion

Leachate Collection System The leachate system has been designed to accommodate these settlements and still maintain positive gradients for drainage

Run On/Run Off Settlements due to any increment of load will be substantially complete within 5 years or less after load application The majority of the settlements will occur during the active life of the facility, less than 1/3 the total settlements will take place after closure The remaining consolidation settlements have been taken into account in the final cover slopes These settlements will have virtually no effect on the levee heights and so will not affect run-on

Slope stability has been analyzed both for the excavations and for the waste mass Both have adequate safety factors (>~~2~~ **1 7**), **as presented in Paragraph 3 4 3 ii of the 2004 Geoscience Report (Appendix F 6)**

§522 C (formerly §521 F)

FACILITY GROUNDWATER MONITORING STANDARDS GOVERNING FACILITY GROUNDWATER MONITORING ARE CONTAINED IN LAC 33 VII 805 THE FOLLOWING INFORMATION IS REQUIRED FOR TYPE I AND II FACILITIES

§522 C 1 (formerly §521 F 5 c)

A DESIGNATION OF EACH ZONE THAT WILL BE MONITORED,

The locations of existing and proposed monitoring wells for the Vermilion Parish Solid Waste Plant are shown in ~~Exhibit A-11~~ **Figure 19 of the 2004 *Geoscience Report*** The point of compliance for ~~each~~ Zone II-A is indicated on Figure ~~30~~ 19 of the 2004 *Geoscience Report* (Appendix ~~F-5~~ F 6) ~~In all cases,~~ The point of compliance lies under property owned by Vermilion Parish The above information for both existing and proposed monitoring wells is presented on Tables ~~1 and 3~~ A-3 of that report As-built well diagrams are presented as Figures 31 through 35 **on the 1995 *Geoscience Report*** and **on Appendix A of the 2004 *Geoscience Report*** **The facility also monitors Zone 1B in groundwater monitoring wells MW-9 and MW-10**

The Vermilion Parish Solid Waste Plant has been sampling, analyzing, and reporting its monitoring system in accordance with Permit Number P 0030 since 1984 However new parameters are required under the 1993 regulations Presented in Appendix C 1 is the new Groundwater Monitoring Plan (GWP) It contains consistent sampling and analysis procedures to ensure that the results are reliable indicators of groundwater quality Some pertinent features of this plan are highlighted below to demonstrate compliance For details, refer to the GWP **in Appendix C 1** ~~itself~~

One Zone Each well provides for only one zone and is installed in its own borehole Any non-dedicated equipment used for sampling will be cleaned and decontaminated between wells to prevent cross-contamination The protective casing of the wells will be kept locked to prevent tampering with the wells

Preservation The proper sample preservation procedures established by EPA (Federal Register, January 1985) and provided in the GWP (see C 1) will be followed with all groundwater samples

Chain-of-Custody Sample chain of custody will be employed to create an accurate written record, which can be used to trace the possession and handling of the samples from the moment of collection until receipt by the laboratory Sample custody will be tracked by means of a chain of custody form which includes

1 The unique sample number as obtained from the sample label
2 Source of the sample,
3 Date and time of sample collection
4 Name(s) of collector(s)

5 Signature of collector,
6 Optional field data (pH, temperature, and specific conductance),
7 Signature of persons involved in the chain of custody, and
8 Inclusive dates of possession

Precision Quality assurance/quality-control of groundwater monitoring is provided by the proper use of trip blanks, equipment blanks (for non-dedicated sampling equipment), duplicates, and analysis performed in accordance with applicable testing procedures

Parameters The Vermilion Parish Solid Waste Plant accepts only Type II and Type III wastes Therefore, groundwater monitoring will be performed for the parameters listed in Appendix C 1, Table 1 This parameter list complies with the requirements of **LAC 33 VII 805 C 7 b (formerly** LAC 33 VII 709 E 3 g ii) **Some of the parameters may be requested to be omitted based on the results of the long-term history of the leachate sampling, i e , if a particular parameter is not detected in the leachate However, only after previous consultation and written approval from LDEQ may a parameter be omitted from the groundwater monitoring plan**

Analysis Methods Analytical procedures to be used in groundwater monitoring are presented in the Table 1, along with PQL's of each These procedures conform to those in Table 2, Appendix C, of the Environmental Regulatory Code, Part VII Subpart 1, dated February 1993

Frequency The Vermilion Parish Solid Waste Plant is an existing facility and has had a groundwater monitoring system since 1984 Baseline sampling and reporting for groundwater monitoring wells will be performed quarterly during the first year after the system is approved under the current regulations, thus providing four independent samples from each groundwater monitoring well as a baseline or more samples shall be collected for baseline if necessary The GWP in Appendix C 1 was implemented in October of 1996 Thereafter, groundwater sampling and analysis during the active life of the landfill will be conducted semiannually in accordance with **LAC 33 VII 805 C 3 (formerly** LAC 33 VII 709 E 3 c) Groundwater monitoring will continue semiannually through the post closure period in accordance with **LAC 33 VII 805 C 4 (formerly** LAC 33 VII 709 E 3 d) Of course if assessment monitoring becomes necessary, the schedule and parameters will be changed to reflect that status

Statistical Method Various statistical methods are recommended by the US EPA (EPA/530 R 93-017) depending on the nature of the test data The choice(s) among these methods can be made by parameter and are based on

1 Whether or not the (background) data for that parameter is normally distributed
2 The Coefficient of Variation of the (background) data for that parameter
3 The percentage of 'Non Detects ' for that parameter

~~The facility's monitoring history is based on then-approved parameters but not those currently~~

~~required Hence, there is currently insufficient data to evaluate which of the approved methods in LAC 33 VII 709 E 2 c ii would be appropriate for the various new parameters~~

~~Therefore, t~~ The Vermilion Parish Police Jury proposes to base its statistical methodology on the results of the background sampling A **separate** report **detailing the statistical analysis to be used shall be submitted to the Department for review and approval within 90-days of the completion of the background sampling events once the new relocated wells are installed** ~~on the initial sampling event along with Vermilion Parish Police Jury's recommendations will be submitted to LDEQ for review and approval within 90 days of completing background sampling~~

Quantitation Limits Practical quantitation limits (PQL's) for each monitoring parameter, corresponding to the analytical testing method, are provided in Table 1 of the GWP As methodologies approved by LDEQ change over time, different procedures and/or PQL's may be implemented with LDEQ approval

§522 C 2 (formerly §709 E)

A MAP FOR EACH GROUNDWATER MONITORING ZONE THAT DEPICTS THE LOCATIONS OF ALL MONITORING WELLS (INCLUDING PROPOSED MONITORING WELLS THAT ARE SCREENED IN A PARTICULAR ZONE AND EACH ZONE'S RELEVANT POINT OF COMPLIANCE, ALONG WITH INFORMATION THAT DEMONSTRATES THAT MONITORING WELLS MEET THE STANDARDS IN LAC 33 VII 805 A 1 AND 2 FOR PROPOSED MONITORING WELLS, THE RESPONSE TO THIS REQUIREMENT SHALL PROVIDE AN IMPLEMENTATION SCHEDULE FOR SUBMITTING A REVISED WELL LOCATION MAP SHOWING ALL EXISTING AND PROPOSED MONITORING WELLS THAT ARE SCREENED IN EACH PARTICULAR ZONE

The Vermilion Parish Solid Waste Plant is an existing facility For the Area II-B expansion, two (2) groundwater monitoring wells are proposed to be plugged and abandoned and three (3) monitoring wells are be proposed to be installed in Zone II-A

Exhibit A 11 in Appendix A depicts the locations of all monitoring wells (including existing and proposed wells) All of these wells, except for MW-9 and MW-10, are screened in Zone II-A MW-9 and MW-10 are screened in Zone IB The updated Point of Compliance is presented on Figure 19 of the 2004 Geoscience Report (Appendix F 6) Potentiometric maps for Zone II-A are presented as Figures 20 through 22 of the 2004 Geoscience Report (Appendix F 6) Flow is generally to the south, moving from the southeast to the southwest

Two (2) additional wells may be installed in Zone II-A to meet the 800-ft maximum spacing for downgradient wells near MW-9 and MW-10, should the new potentiometric maps, once MW-12, MW-13, and MW-14 are installed, suggest that the northern perimeter of the facility, where MW-9 and MW-10 are located, are shown to be downgradient

Additionally, a new monitoring well, MW-7A, is proposed to be installed adjacent to MW-7 (since MW-7 has been historically dry) with screen intervals between elevations -22 3 ft and -32 3 ft MSL, approximately, to monitor the groundwater level at that location (although it will be sampled during the drilling below the levels of the existing MW-7 for confirmation) After installing MW-7A, MW-7 shall be plugged and abandoned

A map showing the "as-built" location of the new monitoring wells will be submitted to LDEQ within 90 days of the installation date

§522 C 3 (formerly §521 D 1 a)

A GEOLOGIC CROSS SECTION ALONG THE PERIMETER OF THE FACILITY SHOWING SCREEN INTERVALS FOR EXISTING AND PROPOSED MONITORING WELLS, ALONG WITH OTHER APPLICABLE INFORMATION REQUIRED IN LAC 33 VII 803 C 2 a FOR PROPOSED MONITORING WELLS, THE RESPONSE TO THIS REQUIREMENT SHALL INCLUDE AN IMPLEMENTATION SCHEDULE FOR REVISING APPLICABLE GEOLOGIC CROSS SECTIONS TO INCLUDE THE SCREEN INTERVAL OF THE NEWLY INSTALLED MONITORING WELLS AND OTHER APPLICABLE INFORMATION REQUIRED IN LAC 33 VII 803 C 2 a,

Updated Geologic Cross-Sections, which includes the locations of the monitoring wells screen intervals, are presented on Figures 3 through 16 of the 2004 Geoscience Report (Appendix F 6) Revised Geologic Cross-Sections, which will include the "as-built" screen locations of the new monitoring wells will be submitted to the LDEQ within 90 days of the installation date

§522 C 4 (formerly §709 E 1 b)

A DESIGNATION OF EACH MONITORING WELL (INCLUDING ANY PROPOSED MONITORING WELLS) AS EITHER "BACKGROUND' OR "DOWN GRADIENT , FOR EACH ZONE THAT WILL BE MONITORED

The only zones monitored at the facility are Zone IB (with Monitoring Wells MW-9 and MW-10) and Zone II-A For Zone II-A, Monitoring Wells 3, 11, and 12 (proposed) are "Background" (Up-Gradient) wells, and, Monitoring Wells 4, 5, 6, 7, 8, 13 (proposed), and 14 (proposed) are "Down-Gradient" wells Refer to Figure 19 of the 2004 Geoscience Report (Appendix F 6) for the location of the existing and proposed wells

§522 C 5 (formerly §521 F 5 b)

A TABLE DISPLAYING PERTINENT WELL CONSTRUCTION DETAILS FOR EACH MONITORING WELL, INCLUDING THE ELEVATION OF THE REFERENCE POINT FOR MEASURING WATER LEVELS TO THE NATIONAL GEODETIC VERTICAL DATUM (NGVD), THE ELEVATION OF THE GROUND SURFACE (NGVD), THE DRILLED DEPTH (IN FEET), THE DEPTH TO WHICH THE WELL IS CASED (IN FEET), THE DEPTH TO THE TOP AND BOTTOM OF THE BENTONITE SEAL (IN FEET), THE SLOT SIZE, THE CASING SIZE, AND THE TYPE OF GROUT, AND AS-BUILT DIAGRAMS (CROSS SECTIONS) OF EACH WELL PROVIDING THE AFOREMENTIONED WELL CONSTRUCTION DETAILS FOR PROPOSED MONITORING WELLS, THE RESPONSE TO THIS REQUIREMENT SHALL PROVIDE AN IMPLEMENTATION SCHEDULE FOR SUBMITTING THE INFORMATION SPECIFIED IN THIS REQUIREMENT,

A table displaying well construction details for each monitoring well is presented as Table A-3 of the 2004 Geoscience Report (Appendix F 6) and Exhibit A 11

"As-built" diagrams for the existing monitoring wells are provided in Appendix A of the 2004 Geoscience Report (Appendix F 6) and Figures 31 through 35 of the 1995 Geoscience Report (Appendix F 5 of Permit Modification No 5, submitted to the Department in October 1997)

"As-built" construction details for the proposed monitoring wells will be submitted to LDEQ within 90 days of the installation date, in order to comply with the requirements of this regulation

§522 C 6 (formerly §521 F 5 f)

A DEMONSTRATION THAT THE MONITORING WELLS ARE CONSTRUCTED ACCORDING TO THE STANDARDS IN LAC 33 VII 805 A 3 FOR PROPOSED MONITORING WELLS, THE RESPONSE TO THIS REQUIREMENT SHALL PROVIDE AN IMPLEMENTATION FOR SUBMITTING THE INFORMATION SPECIFIED IN THIS REQUIREMENT,

Plugging and abandonment of monitoring wells will follow the LDOTD rules cited in LAC 70 XIII plus the special LDEQ provisions in **LAC 33 VII 805 A 5 (formerly** LAC 33 VII 709 E 2 e ii) In general, the casings will be pulled or reamed, and the resulting hole grouted bottom-to-top with cement-bentonite grout All surface components will be removed All resulting waste material will be disposed of at a properly permitted facility

Before any monitoring wells may be abandoned, written approval shall be obtained from LDEQ and other application regulatory agencies The Vermilion Parish Police Jury will notify LDEQ, in writing, at least 30 days before abandonment, of intent to abandon any monitor well and will supply LDEQ with the following information

(1) Name and address of the facility,
(2) Well identification and exact location,
(3) Well construction data, including well depth and intermediate stratification, screen length and material, casing size and material, sealing of the annulus, and other pertinent data,
(4) Reason for abandonment, and
(5) Proposed abandonment method including sealing method and material proposed

§522 C 7 (formerly §521 F 5 d)

FOR AN EXISTING FACILITY, ALL BACKGROUND DATA AND AT LEAST THREE YEARS OF DETECTION MONITORING DATA FROM MONITORING WELLS IN PLACE AT THE TIME OF THE PERMIT APPLICATION IF THIS DATA EXISTS IN THE DEPARTMENT RECORDS, THE ADMINISTARTIVE AUTHORITY MAY ALLOW REFERENCES TO THE DATA IN THE PERMIT APPLICATION FOR AN EXISTING FACILITY WITH NO WELLS, GROUNDWATER DATA SHALL BE SUBMITTED WITHIN 90 DAYS AFTER THE INSTALLATION OF MONITORING WELLS FOR A NEW FACILITY OR EXPANSION, GROUNDWATER DATA (ONE SAMPLING EVENT) SHALL BE SUBMITTED BEFORE WASTE IS ACCEPTED

The Vermilion Parish Solid Waste Plant is an existing facility, operating under Permit P-0030 The existing monitoring wells at the Vermilion Parish Solid Waste Plant have been sampled semiannually since ~~1984~~ **their installation** for the **required** parameters ~~listed in Permit P-0030~~ This information has been submitted regularly to LDEQ

§522 C 8 (formerly §521 F 5 c)

A SAMPLING AND ANALYSIS PLAN THAT MEETS THE STANDARDS IN LAC 33 VII 805 B AND INCLUDES A TABLE THAT SPECIFIED EACH PARAMETER, ANALYTICAL METHOD, PRACTICAL QUANTITATION LIMIT, AND CHEMICAL ABSTRACTS SERVICE REGISTRY NUMBER (CAS RN), AND

The sampling and analysis plan is presented as Section III of the Groundwater Monitoring Plan (Appendix C 1) Table 1 of Attachment 1 of the Groundwater Monitoring Plan specifies each groundwater monitoring parameter, analytical method, practical quantitation limit, and CAS RN

§522 C 9 (formerly §521 F 5 e)

A PLAN FOR DETECTING, REPORTING, AND VERIFYING CHANGES IN GROUNDWATER

Groundwater sampling and analysis during the active life of the Vermilion Parish Solid Waste Plant will be conducted semiannually in accordance with **LAC 33 CII 805 C 3 (formerly** LAC 33 VII 709 E 3) Groundwater monitoring will continue semiannually through the post-closure period The sampling parameters for groundwater monitoring are included in the Groundwater Monitoring Plan, Appendix C 1, ~~they include the~~ Table 1, ~~Appendix C parameters~~ required for Type II landfills under LAC 33 VII 709 E 2 g ii

A written report, containing groundwater sampling results, will be submitted to LDEQ within ~~45~~ **90** days **after each sampling event** ~~the sample analyses have~~ **has** been completed, **in accordance with LAC 33 VII 805 C 5**

Additional information concerning groundwater sampling analysis and reporting is provided in the Groundwater Monitoring Plan (Appendix C 1)

Due to MW-9 and MW-10 being screened in Zone I-B, intrawell comparisons will be utilized for these wells, and analytical results shall not be utilized in the statistical evaluation of Zone II-A

Responses to §523
Part III: Additional Supplementary Information

ENVIRONMENTAL ASSESSMENT STATEMENT "EXPANDED IT DECISION" QUESTIONS

§523 PART III ADDITIONAL SUPPLEMENTARY INFORMATION

THE FOLLOWING SUPPLEMENTARY INFORMATION IS REQUIRED FOR ALL SOLID WASTE PROCESSING AND DISPOSAL FACILITIES ALL RESPONSES AND EXHIBITS MUST BE IDENTIFIED IN THE FOLLOWING SEQUENCE TO FACILITATE THE EVALUATION

§523 A A DISCUSSION DEMONSTRATING THAT THE POTENTIAL AND REAL ADVERSE ENVIRONMENTAL EFFECTS OF THE FACILITY HAVE BEEN AVOIDED TO THE MAXIMUM EXTENT POSSIBLE,

The Vermilion Parish Solid Waste Plant is an existing Type II and III solid waste disposal facility which was permitted on June 4, 1986 and has been in continuous operation since that time To date, many improvements and upgrades have been incorporated into the facility in an effort to make the site safer and more environmentally friendly The permit modification under consideration is a permit modification to expand the Subtitle D disposal acreage The expansion area has been previously approved for landfill use

The following elements of the environment will be affected by the facility

AIR Minor amounts of dust and noise will be generated due to the nature of the facility However, these problems will only occur during normal working hours Landfill gas also has a potential impact on air quality Landfill gas is naturally produced by the anaerobic decomposition of organic matter disposed in the landfill cell Generally, landfill gas is a mixture of carbon dioxide and methane with traces of other gases and vapors such as hydrogen sulfide Landfill gas has the ability to travel or migrate from areas where refuse has been deposited into excavations and other confined areas that are located in or near the disposal area Methane and carbon dioxide from landfill gas can displace oxygen in confined spaces and in other locations where landfill gas is allowed to accumulate Methane is flammable Hydrogen sulfide is a poisonous gas that can be harmful in very low concentrations These potential air contaminants could potentially affect human health and animals

All-weather roads will eliminate the majority of the dust that would be generated Additionally although an increase in noise occurs during operational hours of the facility by the collection vehicles and landfill equipment the distance between the site and residences is a sufficient distance away Furthermore Highway 167, which is a highly traveled thoroughfare from Abbeville to Lafayette is also in the vicinity and poses the same, if not greater noise levels than from the landfill operations

As for the landfill gas, a gas monitoring plan is in effect at the facility, as presented in Appendix C 2 This Gas Monitoring Plan applies to the entire facility, including the oxidation pond and the disposal areas This Plan prescribes procedures for sampling and analysis, safety, and remedial measures The levels of methane gas shall be monitored in the facility's structures, above ground around the perimeter of the disposal areas and the oxidation pond, and below ground in the gas monitoring probes The methane gas levels must be limited to less than the lower-explosive limits at the facility boundary and to 25 percent of the lower-explosive limits in facility buildings

Additionally, in an effort to further prevent the down-stream spread of odors, the facility has installed a tree barrier on the south perimeter of the facility to serve as a natural buffer The facility also has tree-lines on the northern and eastern side of the facility to prevent the spread of odors Furthermore, the site is located in a rural area without a large population inhabiting the immediate surrounding area

WATER (SURFACE WATER & GROUNDWATER) Surface water is prevented from coming into contact with the waste area by the levee system surrounding the disposal areas Stormwater runoff which has come into contact with the waste areas and is considered contaminated is routed to the oxidation pond for proper treatment Stormwater runoff which has not come into contact with waste areas is considered uncontaminated water and is routed offsite without treatment Although this water may have some turbidity, it is estimated that the levels of turbidity are far less than that from the agricultural stormwater runoff in the surrounding areas The facility currently has a Louisiana Pollutant Discharge Elimination System (LPDES) permit for monitoring all surface water discharges from the facility and aims to identify potential sources of contamination

A potential source of contamination of the groundwater is the leachate which is generated from the percolation of moisture and stormwater through the waste mass This leachate is collected through the collection system at the base of the disposal cells and is then pumped to the oxidation pond for treatment In order to prevent adverse effects to the groundwater, the migration of leachate from the disposal cells to the underlying potable water source the Chicot Aquifer, is prevented by the comprehensive liner system installed in the Subtitle D cells, and the groundwater surrounding the disposal cells is monitored to detect any changes or possible contamination The facility strictly adheres to the monitoring schedule and analyzes for the same constituents as required for drinking water Appendix C 1 details the groundwater monitoring plan

SOIL The potential source of contamination of the underlying soil at the facility is from leachate Each Subtitle D disposal area has a comprehensive liner system, which consists of a 60 mil high-density polyethylene (HDPE) liner system underlain by three feet (3') of recompacted clay, or its equivalent to prevent the migration of leachate from the disposal cell and therefore contamination of the underlying soil The groundwater monitoring system also assists in detecting leachate migration as described above

Based on the factors now present it appears that the Vermilion Parish Solid Waste Plant, has, to the extent possible minimized any potential or real adverse environmental effects

§523 B A COST-BENEFIT ANALYSIS DEMONSTRATING THAT THE SOCIAL AND ECONOMIC BENEFITS OF THE FACILITY OUTWEIGH THE ENVIRONMENTAL-IMPACT COSTS,

As mentioned previously, the Vermilion Parish Solid Waste Plant is an existing Type II and III facility that was originally permitted on June 4, 1986, but was in existence since 1979 As early as 1973, the concept of one Parish-wide sanitary landfill began, and the associated engineering study had subsequently begun The study analyzed the existing solid waste collection and disposal methods in the Parish, in addition to an economic analysis of various collection and disposal methods The study indicated that at that time, all of the municipalities were providing for the collection and disposal of wastes generated within their corporate limits The communities were disposing their wastes in various open dumps with open burning occurring frequently Also, at that time, the Police Jury was not providing a collection or disposal service for those residents of the unincorporated area The study indicated that some of the residents were serviced by commercial collection, but the majority of the residents wither disposed of their waste in the various dumps or burned it in their backyards After further consideration, a special election was called for on April 27, 1976 to consider a one-half cent (½¢) sales tax for solid waste collection/disposal and other purposes The sales tax was approved by the voters of Vermilion Parish and the implementation of the program began Subsequently, in 1994, the voters of Vermilion Parish passed an additional one-half cent (½¢) sales and use tax to be dedicated for the construction, acquisition, improvements, maintenance, and operation of solid waste collection and disposal facilities There are no additional monthly charges to the residents of the Parish for collection or disposal of their residential solid waste

Without the establishment of this Parish disposal facility, the parish would not have a permitted landfill within the parish to dispose of the solid waste generated As such, the waste would have to be transported out of the parish at a permitted facility, such as the Jefferson Davis Parish Sanitary Landfill, which would result in increased hauling costs, not to mention increased tipping fees Since this proposed permit modification is for a 12 acre expansion of the municipal disposal cells, the additional fees to transport and dispose in an alternate landfill would be applied over the estimated life of the proposed expansion The proposed expansion is estimated to provide disposal of approximately 400,000-500,000 gate tons of municipal solid waste Based on the current waste disposal rates, it is estimated that the proposed expansion will provide for an additional 20-25 years of life for the facility Therefore, these additional expenses must be taken into account for the life and capacity of the proposed expansion The estimated capital cost for construction of the proposed expansion is $2 5 million

A brief cost analysis of hauling these costs to another facility is as presented below

- The Vermilion Parish Solid Waste Collection Program currently averages 32 residential collection routes per week
- 63 miles to the Jefferson Davis Parish Sanitary Landfill Commission x 2 (round trip) x $0 485/mile (US Department of the Treasury , Internal Revenue Service, 2007 Standard Mileage Rate) + $0 20/mile (US Department of the Treasury , Internal Revenue Service, 2007 moving purposes mileage rate)
- ($9 00/hour/driver + 47% benefits) * 1 25 hours * 2 (round-trip)

$$= 32 * \{[63 * 2 * (\$0\,485 + \$0\,20)] + (\$9\,00 * 1\,47 * 1\,25 * 2)\}$$
$$= \$3{,}820\,32 / week$$
$$= \$198{,}656\,64 / year$$

A brief cost analysis of the additional cost for municipal disposal costs at another facility (such as the Jefferson Davis Parish Sanitary Landfill) versus disposal in the proposed expansion at the Vermilion Parish Solid Waste Plant is as presented below

- The Vermilion Parish Solid Waste Plant averages approximately 20,000 tons (or 70,000 cubic yards) of municipal solid waste per year
- Current disposal rates at the Jefferson Davis Parish Sanitary Landfill is $12 85/cubic yard
- Current estimated cost to dispose at the Vermilion Parish Solid Waste Plant is approximately $28 00 per ton (or $8 00/cubic yard) Although this figure already takes into consideration capital costs for the construction of liner systems as well as the daily operational and maintenance costs, the unit price for disposal in the proposed expansion will also be added for a conservative account [$2 5 million – (400,000 tons x 3 5 cubic yards/ton) = $1 79/cubic yard] Therefore, estimate tipping fee in the proposed expansion at the Vermilion Parish Solid Waste Plant = $8 00/cubic yard + $1 79/cubic yard = **$9 79/cubic yard**
- Estimated annual ***additional*** cost for disposal at alternate landfill

$$= 70{,}000 cu\ yd * \{[\$12\,85 - \$9\,79 / cu\ yd\ ]$$
$$= \$214{,}200 / year$$

Over the course of the estimated life of the proposed expansion, the estimated additional cost per year is approximately$412,856 64 for hauling and disposal at an alternate facility as opposed to hauling and disposal at the Vermilion Parish Solid Waste Plant Over the course of the life of the proposed expansion (20-25 years), Vermilion Parish could potentially have a cost savings of over $8 million dollars for continuing to dispose at the Vermilion Parish Solid Waste Plant, rather than hauling and disposing at an alternate permitted landfill This "savings"is then used by Vermilion Parish to benefit the parish, either through community programs or infrastructure These benefits are gained by the 53,807 (2000 Census figures) residents of the parish Aside from these direct economic benefits, the parish provides jobs and business to the local market through the operation of the collection and disposal system

Potential negative costs may result on the surrounding property value for residential development However, the estimated land use within a three-mile radius of the facility only contains an estimated 6% for residential development The majority of the surrounding area is agricultural and undeveloped Additionally, this application is for an existing landfill, therefore, no additional negative effects on property value should result

Environmental-impact costs may potentially result from cleanup activities from the migration of leachate into the underlying groundwater However, the costs associated with cleanup and the associated environmental-impact costs would only be fully known in the event of a failure in the composite liner system and the leachate collection system, which would cause a release of leachate into the underlying soil and groundwater Based on the extent of the contamination plume, the clean-up costs could vary substantially Therefore, at this time, it is unrealistic to quantity such an environmental-impact cost However, provisions such as the composite liner system, leachate collection system, and the groundwater monitoring system are in place to prevent and detect the release of contaminants

Therefore, the residents of Vermilion Parish are well aware of landfill activities Because of the above factors, there is a healthy public interest in the operation of the landfill and there is strong public support for the facility Additionally, just as residents are aware of the relative safety of the facility, they are also aware of the positive economic impact that the facility has on Vermilion Parish At an additional$400,000+ per year for hauling and disposal cost at a permitted out-of-parish facility, the social and economic benefits of the project far outweigh the negative environmental impacts

§523 C A DISCUSSION AND DESCRIPTION OF POSSIBLE ALTERNATIVE PROJECTS WHICH WOULD OFFER MORE PROTECTION TO THE ENVIRONMENT WITHOUT UNDULY CURTAILING NONENVIRONMENTAL BENEFITS,

A site analysis study was previously prepared for the Vermilion Parish Police Jury which revealed that the Vermilion Parish Police Jury's "Poor Farm" appeared to be the most optimum site This "Poor Farm" was the same 81 646 acre tract of land owned by the Police Jury, which is known today as the Vermilion Parish Solid Waste Plant facility It was determined at that time that a shredder processing plant with a landfill proved to be the most economic disposal method over the long-term This study also analyzed two other options - direct landfilling (disposal without shredding) and incineration

Combustion/incineration with resource recovery [also referred to as a waste-to-energy (WTE) system] may also be a possible alternative project for consideration WTE is a waste treatment technology that involves the combustion of waste at high temperatures Combustion of waste materials converts the waste into heat (which can be subsequently used to generate electricity), gases and particulates of combustion and a smaller amount of solid residue (ash) which still requires landfilling Current research reveals that the cost for new combustion/incinerator projects will range in price from about $95 to $155 US dollars per ton (net cost), according to the Pembina Institute, which is a Canada-based organization which pioneers practical, multi-stakeholder solutions to energy and environmental issues This net cost accounts for management of the resultant ash, the amortized capital expenditures required for such a facility, as well as the energy revenue which would result from the sale of electricity generated by the process Furthermore, the World Bank estimates that the cost of incineration is "an order of magnitude greater than landfilling" EPA's Decision Maker's Guide to Solid Waste Management, Volume II (EPA 530-R-95-023) also states that the "cost of a WTE system will exceed current landfilling costs" frequently

Another possible alternative would be to haul the solid waste to a permitted facility out of the Parish, such as the Jefferson Davis Parish Sanitary Landfill, which may have improved site characteristics However, the costs associated with this disposal is also greater than the current disposal at the Vermilion Parish Solid Waste Plant just in additional hauling expenses, not to mention the higher disposal costs

A brief cost comparison between the existing disposal and the two options discussed herein are summarized below

	Existing Disposal at Vermilion Parish Solid Waste Plant	Alternative ① Incineration at Local Site	Alternative ② Disposal at Outside Permitted Landfill
Average Annual Solid Waste Generated in the Parish	80,000 tons (280,000 cubic yards)	80 000 tons (280,000 cubic yards)	80,000 tons (280,000 cubic yards)
Disposal Rates	$28 00/ton* ($8 00/cubic yard)	$95 00/ton**	$12 85/cubic yard
Subtotal Annual Disposal Cost	$ 2,240,000	$ 7,600 000	$ 3 598,000
Other Annual Expenses			$200,000 (Hauling Out of Parish Estimated Cost)
TOTAL ESTIMATED ANNUAL DISPOSAL COST	$ 2,240,000	$ 7 600,000	$ 3 798,000

* Estimate based on 2005 and 2006 disposal costs and quantities for the Vermilion Parish Solid Waste Plant
** Estimated Cost

§523 D A DISCUSSION OF POSSIBLE ALTERNATIVE SITES WHICH WOULD OFFER MORE PROTECTION TO THE ENVIRONMENT WITHOUT UNDULY CURTAILING NONENVIRONMENTAL BENEFITS, AND

A site analysis study was previously prepared for the Vermilion Parish Police Jury in 1975 This study not only analyzed the solid waste collection and disposal methods in the Parish at that time and recommended various collection and disposal methods, but also various sites for locating a solid waste facility This study ultimately revealed that the Vermilion Parish Police Jury's "Poor Farm" appeared to be the most optimum site This "Poor Farm" was the same 81 646 acre tract of land owned by the Police Jury, which is known today as the Vermilion Parish Solid Waste Plant facility The facility is located in a centrally-located region of Vermilion Parish which makes it accessible to the entire Parish, and is also located in a region which is not densely populated

Another possible alternative would be to haul the solid waste to a permitted facility out of the Parish, such as the Jefferson Davis Parish Sanitary Landfill, which may have improved site characteristics However, the costs associated with this disposal is also greater than the current disposal at the Vermilion Parish Solid Waste Plant just in additional hauling expenses, not to mention the higher disposal costs A cost analysis comparison of the nonenvironmental benefits are noted in the response to §523 C

Geotechnical reports previously prepared for this site reveal that the soils underlying the site are clays and silty clays extending to depths ranging from 12 to more than 30 feet, which are sufficiently impermeable to provide a natural liner to contain waste materials Furthermore, with the establishment of the Subtitle D standards, all active Type II solid waste disposal cells and proposed cells contain liner systems which have proven to be impermeable This facility has been in successful operation for a number of years These factors, taken together limit or exclude any alternate projects which would offer greater environmental protection with or without consideration of nonenvironmental benefits

§523 E A DISCUSSION AND DESCRIPTION OF THE MITIGATING MEASURES WHICH WOULD OFFER MORE PROTECTION TO THE ENVIRONMENT THAN THE FACILITY, AS PROPOSED, WITHOUT UNDULY CURTAILING NONENVIRONMENTAL BENEFITS

There are no additional mitigating measures which would offer more protection to the environment than the facility, as proposed, without unduly curtailing nonenvironmental benefits The active and proposed Type II waste disposal cells are constructed in accordance with Subtitle D standards, which afford the most reasonable measures for environmental benefits The facility has also recently planted a tree line for over seven-tenths of a mile all along the south border of the facility The tree line has intermingled live oak trees, sweet viburnum bushes, and loblolly pine trees which shall not only serve as a noise and visual barrier, but also serves as a barrier for controlling odor As the tree line matures, it will serve as a more effective barrier Tree lines also exist along the northern and eastern boundary along Coulee Kenney The property immediately to the west of the facility is uninhabited, and is border on its western edge by a tree line along Coulee Kenney Therefore, a natural tree barrier exists to prevent the spread of odors into surrounding inhabited areas Additionally the Vermilion Parish Police Jury currently has automated and dedicated leachate collection pumps on order for each of the leachate cleanout risers and anticipates installation of the units in the first quarter of 2008 The intent of this automated system is to ensure that the leachate in the disposal cells is maintained in a pumped-down condition, thereby controlling odors

Responses to Chapter 13. Financial Assurance for All Processors and Disposers of Solid Waste

(Formerly Chapter 7 Subchapter E)

CHAPTER 13 FINANCIAL ASSURANCE FOR ALL PROCESSORS AND DISPOSERS OF SOLID WASTE (Formerly Chapter 7 Subchapter E)

§1301 FINANCIAL RESPONSIBILITY DURING OPERATION (Formerly §727 A 1)

§1301 A FINANCIAL RESPONSIBILITY FOR TYPE I, I A, II, II-A, AND III FACILITIES PERMIT HOLDERS OR APPLICANTS FOR STANDARD PERMITS OF TYPE I, I-A, II, II-A, AND III FACILITIES HAVE THE FOLLOWING FINANCIAL RESPONSIBILITIES WHILE THE FACILITY IS IN OPERATION

1 TYPE I AND II FACILITIES SHALL MAINTAIN LIABILITY INSURANCE, OR ITS EQUIVALENT, FOR SUDDEN AND ACCIDENTAL OCCURRENCES IN THE AMOUNT OF $1 MILLION PER OCCURRENCE AND $1 MILLION ANNUAL AGGREGATE, PER SITE, EXCLUSIVE OF LEGAL-DEFENSE COSTS, FOR CLAIMS ARISING FROM INJURY TO PERSONS OR PROPERTY, OWING TO THE OPERATION OF THE SITE EVIDENCE OF THIS COVERAGE SHALL BE UPDATED ANNUALLY AND PROVIDED TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION

Vermilion Parish Solid Waste Plant provides an equivalent financial responsibility during operation, as defined by the regulations A copy of the Letter of Credit in the amount of $1 million assuring financial responsibility during operation is provided in Appendix G 3

§1301 A 2 PERMIT HOLDERS OR APPLICANTS FOR TYPE I-A AND II-A FACILITIES SHALL MAINTAIN LIABILITY INSURANCE, OR ITS EQUIVALENT, FOR SUDDEN AND ACCIDENTAL OCCURRENCES IN THE AMOUNT OF $500,000 PER OCCURRENCE, AND $500,000 ANNUAL AGGREGATE, PER SITE, EXCLUSIVE OF LEGAL-DEFENSE COSTS, FOR CLAIMS ARISING FROM INJURY TO PERSONS OR PROPERTY, OWING TO THE OPERATION OF THE SITE EVIDENCE OF THIS COVERAGE SHALL BE UPDATED ANNUALLY AND PROVIDED TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION

Vermilion Parish Solid Waste Plant is a Type II & III facility, therefore, the above regulation does not apply

§1301 A 3 TYPE III FACILITIES SHALL MAINTAIN LIABILITY INSURANCE, OR ITS EQUIVALENT, FOR SUDDEN AND ACCIDENTAL OCCURRENCES IN THE AMOUNT OF $250,000 PER OCCURRENCE, AND $250,000 ANNUAL AGGREGATE, PER SITE, EXCLUSIVE OF LEGAL DEFENSE COSTS, FOR CLAIMS ARISING FROM INJURY TO PERSONS OR PROPERTY, OWING TO THE OPERATION OF THE SITE EVIDENCE OF THIS COVERAGE SHALL BE UPDATED ANNUALLY AND PROVIDED TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION

Vermilion Parish Solid Waste Plant is a Type II & III facility, therefore, the above regulation does not apply

§1301 B ESTABLISHMENT OF FINANCIAL RESPONSIBILITY THE FINANCIAL RESPONSIBILITY DURING OPERATION MAY BE ESTABLISHED BY ANY ONE OR A COMBINATION OF THE FOLLOWING AN INSURANCE POLICY, A LETTER OF CREDIT, OR THE FINANCIAL TEST AND/OR CORPORATE GUARANTEE

1 INSURANCE EVIDENCE OF LIABILITY INSURANCE MAY CONSIST OF EITHER A SIGNED DUPLICATE ORIGINAL OF A SOLID WASTE LIABILITY ENDORSEMENT, OR A CERTIFICATE OF INSURANCE

Vermilion Parish Solid Waste Plant has chosen to use a Solid Waste Facility Letter of Credit as the mechanism for financial assurance during operation, therefore this section is not applicable

§1301 B 2 LETTER OF CREDIT A PERMIT HOLDER OR APPLICANT MAY SATISFY THE REQUIREMENTS OF THIS SECTION BY OBTAINING AN IRREVOCABLE STANDBY LETTER OF CREDIT THAT CONFORMS TO THE FOLLOWING REQUIREMENTS, AND BY SUBMITTING THE LETTER TO THE ADMINISTRATIVE AUTHORITY

a THE ISSUING INSTITUTION MUST BE AN ENTITY THAT HAS THE AUTHORITY TO ISSUE LETTERS OF CREDIT AND WHOSE LETTER-OF-CREDIT OPERATIONS ARE REGULATED AND EXAMINED BY A FEDERAL OR STATE AGENCY

To meet the requirements of LAC 33 VII 521 K 3 and 1301 B, the Vermilion Parish Solid Waste Plant has obtained an Irrevocable Letter of Credit, which conforms to the requirements therein A copy of the Letter is included in Appendix G 3 The Irrevocable Letter of Credit (No 2826) was issued by First Guaranty Bank, which is an entity that has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a federal or state agency

§1301 B 2 b A PERMIT HOLDER OR APPLICANT WHO USES A LETTER OF CREDIT TO SATISFY THE REQUIREMENTS OF THIS SECTION MUST ALSO PROVIDE TO THE ADMINISTRATIVE AUTHORITY EVIDENCE OF THE ESTABLISHMENT OF A STANDBY TRUST FUND UNDER THE TERMS OF THE LETTER OF CREDIT, ALL AMOUNTS PAID PURSUANT TO A DRAFT BY THE ADMINISTRATIVE AUTHORITY WILL BE DEPOSITED BY THE ISSUING INSTITUTION DIRECTLY INTO THE STANDBY TRUST FUND THE WORDING OF THE STANDBY TRUST FUND AGREEMENT SHALL BE AS SPECIFIED IN LAC 33 VII 1399 APPENDIX D, THE INSTRUCTIONS IN BRACKETS ARE TO BE REPLACED WITH THE RELEVANT INFORMATION AND THE BRACKETS DELETED

Vermilion Parish Solid Waste Plant has chosen to use an Irrevocable Letter of Credit to satisfy the requirements of financial assurance during operation In accordance with these requirements, the Vermilion Parish Solid Waste Plant also provides evidence of the establishment of a standby trust fund, also attached in Appendix G 3 Under the terms of the letter of credit, all amounts paid pursuant to a draft by the Administrative Authority will be deposited by the issuing institution directly into the standby trust fund The wording of the standby trust provided is identical to the wording specified in LAC 33 VII 727 A 2 d ix that is re-codified in the revised Solid Waste Regulations as LAC 33 VII 1399 Appendix D, except that the instructions in brackets are replaced with the relevant information Capital One Bank is the issuing institution of the standby trust fund, i e , the "Trustee"

§1301 B 2 c THE LETTER OF CREDIT SHALL BE ACCOMPANIED BY A LETTER FROM THE PERMIT HOLDER OR APPLICANT REFERRING TO THE LETTER OF CREDIT BY NUMBER, NAME OF ISSUING INSTITUTION, AND DATE, AND PROVIDING THE FOLLOWING INFORMATION

- I AGENCY INTEREST NUMBER,
- ii SOLID WASTE IDENTIFICATION NUMBER,
- iii SITE NAME,
- iv FACILITY NAME,
- v FACILITY PERMIT NUMBER, AND,
- vi THE AMOUNT OF FUNDS ASSURED FOR LIABILITY COVERAGE OF THE FACILITY BY THE LETTER OF CREDIT

The Letter of Credit is accompanied by a letter from the Vermilion Parish Police Jury (refer to Appendix G 3), which contains the following information

Letter of Credit Number ***2826***
Name of Issuing Institution ***First Guaranty Bank***
Date of Letter of Credit ***October 16, 2007***
Agency Interest Number ***148***
Solid Waste Identification Number ***D-113-0023***
Site Name ***Vermilion Parish Solid Waste Plant***
Facility Name ***Vermilion Parish Solid Waste Plant***
Facility Permit Holder ***Vermilion Parish Police Jury***
Amount of Funds Assured for Liability Coverage of the Facility by the Letter of Credit ***$1,000,000 00***

§1301 B 2 d THE LETTER OF CREDIT MUST BE IRREVOCABLE AND ISSUED FOR A PERIOD OF AT LEAST ONE YEAR UNLESS, AT LEAST 120 DAYS BEFORE THE CURRENT EXPIRATION DATE, THE ISSUING INSTITUTION NOTIFIES BOTH THE PERMIT HOLDER AND THE ADMINISTRATIVE AUTHORITY BY CERTIFIED MAIL OF A DECISION NOT TO EXTEND THE EXPIRATION DATE UNDER THE TERMS OF THE LETTER OF CREDIT, THE 120 DAYS SHALL BEGIN ON THE DATE WHEN BOTH THE PERMIT HOLDER AND THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION, RECEIVE THE NOTICE, AS EVIDENCED BY THE RETURN RECEIPTS

The wording of the Letter of Credit for liability coverage during operation of the Vermilion Parish Solid Waste Plant is identical to the wording in LAC 33 VII 727 A 1 d ii (e) that is re-codified in the revised Solid Waste Regulations as §1399 Appendix C, except that the instructions in brackets have been replaced with the relevant information and the brackets deleted As such, the Letter of Credit states that it is irrevocable and issued for a period of at least one year unless, at least 120 days before the current expiration date, the issuing institution notifies both the permit holder and the administrative authority by certified mail of a decision not to extend the expiration date Under the terms of the Letter, the 120 days shall begin on the date when both the Vermilion Parish Police Jury and the Office of Environmental Services, Waste Permits Division, receive the notice, as evidenced by the return receipts

§1301 B 2 e THE WORDING OF THE LETTER OF CREDIT SHALL BE IDENTICAL TO THE WORDING INLAC 33 VII 1399 APPENDIX C, EXCEPT THAT THE INSTRUCTIONS IN BRACKETS ARE TO BE REPLACED WITH THE RELEVANT INFORMATION AND THE BRACKETS DELETED

The wording of the Letter of Credit for liability coverage during operation of the Vermilion Parish Solid Waste Plant is identical to the wording in LAC 33 VII 727 a 1 d ii (e) that is re-codified in the revised Solid Waste Regulations as §1399 Appendix C, except that the instructions in brackets have been replaced with the relevant information and the brackets deleted

§1301 B 3 FINANCIAL TEST

a TO MEET THIS TEST, THE APPLICANT, PERMIT HOLDER, PARENT CORPORATION OF THE APPLICANT (CORPORATE GUARANTOR), OR PERMIT HOLDER MUST SUBMIT TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION, THE DOCUMENTS REQUIRED BY PARAGRAPH A 2 OF THIS SECTION DEMONSTRATING THAT THE REQUIREMENTS OF THAT SUBSECTION HAVE BEEN MET USE OF THE FINANCIAL TEST MAY BE DISALLOWED ON THE BASIS OF THE ACCESSIBILITY OF THE ASSETS OF THE PERMIT HOLDER, APPLICANT, OR PARENT CORPORATION (CORPORATE GUARANTOR) IF THE APPLICANT, PERMIT HOLDER, OR PARENT CORPORATION IS USING THE FINANCIAL TEST TO DEMONSTRATE LIABILITY COVERAGE AND CLOSURE AND POST-CLOSURE CARE, ONLY ONE LETTER FROM THE CHIEF FINANCIAL OFFICER IS REQUIRED

Vermilion Parish Solid Waste Plant has chosen to use a Letter of Credit as the mechanism for financial assurance during operation, therefore, this section is not applicable

§1301 B 4 CORPORATE GUARANTEE

(A) A PERMIT HOLDER OR APPLICANT MAY MEET THE REQUIREMENTS OF THIS SECTION FOR LIABILITY COVERAGE BY OBTAINING A WRITTEN GUARANTEE, HEREAFTER REFERRED TO AS A "CORPORATE GUARANTEE "

Vermilion Parish Solid Waste Plant has chosen to use a Letter of Credit as the mechanism for financial assurance during operation, therefore, this section is not applicable

§1301 C THE USE OF A PARTICULAR FINANCIAL RESPONSIBILITY MECHANISM IS SUBJECT TO THE APPROVAL OF THE ADMINISTRATIVE AUTHORITY

Vermilion Parish Solid Waste Plant acknowledges that the use of a particular financial responsibility mechanism is subject to the approval of the administrative authority

§1301 D PERMIT HOLDERS OF EXISTING FACILITIES MUST SUBMIT, ON OR BEFORE FEBRUARY 20, 1995, FINANCIAL RESPONSIBILITY DOCUMENTATION THAT COMPLIES WITH THE REQUIREMENTS OF THIS SECTION APPLICANTS FOR PERMITS FOR NEW FACILITIES MUST SUBMIT EVIDENCE OF FINANCIAL ASSURANCE IN ACCORDANCE WITH THIS CHAPTER AT LEAST 60 DAYS BEFORE THE DATE ON WHICH SOLID WASTE IS FIRST RECEIVED FOR PROCESSING OR DISPOSAL

Vermilion Parish Solid Waste Plant acknowledges that permit holders of existing facilities must submit, on or before February 20, 1995, financial responsibility documentation that complies with the requirements of this section

§1303 FINANCIAL RESPONSIBILITY FOR CLOSURE AND POST-CLOSURE CARE (Formerly §727 A 2)

A FINANCIAL RESPONSIBILITY FOR TYPE I, I-A, II, II-A, AND III FACILITIES PERMIT HOLDERS OR APPLICANTS OF TYPE I, I-A, II, II-A, AND III FACILITIES HAVE THE FOLLOWING FINANCIAL RESPONSIBILITIES FOR CLOSURE AND POST-CLOSURE CARE

1 PERMIT HOLDERS OR APPLICANTS FOR PROCESSING OR DISPOSAL FACILITIES SHALL ESTABLISH AND MAINTAIN FINANCIAL ASSURANCE FOR CLOSURE AND POST-CLOSURE CARE

Vermilion Parish Solid Waste Plant will establish and maintain financial assurance for closure and post-closure by means of the Letter of Credit mechanism

§1303 A 2 THE APPLICANT OR PERMIT HOLDER SHALL SUBMIT TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION, THE ESTIMATED CLOSURE DATE AND THE ESTIMATED COST OF CLOSURE AND POST-CLOSURE CARE IN ACCORDANCE WITH THE FOLLOWING PROCEDURES

a THE APPLICANT OR PERMIT HOLDER MUST HAVE A WRITTEN ESTIMATE, IN CURRENT DOLLARS, OF THE COST OF CLOSING THE FACILITY IN ACCORDANCE WITH THE REQUIREMENTS IN THESE RULES THE ESTIMATE MUST EQUAL THE COST OF CLOSURE AT THE POINT IN THE FACILITY'S OPERATING LIFE WHEN THE EXTENT AND MANNER OF ITS OPERATION WOULD MAKE CLOSURE THE MOST EXPENSIVE, AS INDICATED BY THE CLOSURE PLAN, AND SHALL BE BASED ON THE COST OF HIRING A THIRD PARTY TO CLOSE THE FACILITY IN ACCORDANCE WITH THE CLOSURE PLAN

Vermilion Parish Solid Waste Plant acknowledges this requirement The estimated closure date of the facility is estimated to be 2028 The closure cost estimate is discussed in the response to LAC 33 VII 521 J and the current cost estimate is provided in Appendix G 2 The cost estimate is provided in current dollars for the cost of closing the facility in accordance with the requirements in these rules The estimate is equal to the cost of closure at the point in the facility's operating life when the extent and manner of its operation would make closure the most expensive, as indicated by the closure plan The estimate is based on the cost of hiring a third party to close the facility in accordance with the closure plan

§1303 A 2 b THE APPLICANT OR PERMIT HOLDER OF A FACILITY SUBJECT TO POST-CLOSURE MONITORING OR MAINTENANCE REQUIREMENTS MUST HAVE A WRITTEN ESTIMATE, IN CURRENT DOLLARS, OF THE ANNUAL COST OF POST-CLOSURE MONITORING AND MAINTENANCE OF THE FACILITY IN ACCORDANCE WITH THE PROVISIONS OF THESE RULES THE ESTIMATE OF POST CLOSURE COSTS IS CALCULATED BY MULTIPLYING THE ANNUAL POST-CLOSURE COST ESTIMATE BY THE NUMBER OF YEARS OF POST-CLOSURE CARE REQUIRED AND SHALL BE BASED ON THE COST OF HIRING A THIRD PARTY TO CONDUCT POST-CLOSURE ACTIVITIES IN ACCORDANCE WITH THE CLOSURE PLAN

The Vermilion Parish Solid Waste Plant is subject to post-closure monitoring and maintenance A cost estimate for the post-closure care costs is also provided in Appendix G 2 The estimate is provided in current dollars for the annual cost of post-closure monitoring and maintenance of the facility in accordance with the provisions of these rules The estimate is calculated by multiplying the annual post-closure cost estimate by the number of years of post-closure care required and is based on the cost of hiring a third party to conduct post-closure activities in accordance with the closure plan

§1303 A 2 c THE COST ESTIMATES MUST BE ADJUSTED WITHIN 30 DAYS AFTER EACH ANNIVERSARY OF THE DATE ON WHICH THE FIRST COST ESTIMATE WAS PREPARED ON THE BASIS OF EITHER THE INFLATION FACTOR DERIVED FROM THE ANNUAL IMPLICIT PRICE DEFLATOR FOR GROSS DOMESTIC PRODUCT, AS PUBLISHED BY THE U S DEPARTMENT OF COMMERCE IN ITS *SURVEY OF CURRENT BUSINESS* OR A REESTIMATION OF THE CLOSURE AND POST-CLOSURE COSTS IN ACCORDANCE WITH CLAUSES A 2 B I AND II OF THIS SECTION THE PERMIT HOLDER OR APPLICANT MUST REVISE THE COST ESTIMATE WHENEVER A CHANGE IN THE CLOSURE/POST-CLOSURE PLANS INCREASES OR DECREASES THE COST OF THE CLOSURE PLAN THE PERMIT HOLDER OR APPLICANT MUST SUBMIT A WRITTEN NOTICE OF ANY SUCH ADJUSTMENT TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION, WITHIN 15 DAYS FOLLOWING SUCH ADJUSTMENT

The Vermilion Parish Police Jury will adjust the cost estimate within 30 days after each anniversary of the date (06/12/07) on which the first cost estimate was prepared on the basis of either the inflation factor derived from the Annual Implicit Price Deflator for Gross Domestic Product, as published by the U S Department of Commerce in its Survey of Current Business, or re-estimation of the closure and post-closure costs The Vermilion Parish Police Jury will review the cost estimate whenever a change in the closure/post-closure plans increases or decreases the cost of the closure plan The Vermilion Parish Police Jury will submit a written notice of any such adjustment to the administrative authority within 15 days following such adjustment.

§1303 A 2 d FOR TRUST FUNDS, THE FIRST PAYMENT MUST BE AT LEAST EQUAL TO THE CURRENT CLOSURE AND POST-CLOSURE COST ESTIMATE, DIVIDED BY THE NUMBER OF YEARS IN THE PAY-IN PERIOD SUBSEQUENT PAYMENTS MUST BE MADE NO LATER THAN 30 DAYS AFTER EACH ANNUAL ANNIVERSARY OF THE DATE OF THE FIRST PAYMENT THE AMOUNT OF EACH SUBSEQUENT PAYMENT MUST BE DETERMINED BY SUBTRACTING THE CURRENT VALUE OF THE TRUST FUND FROM THE CURRENT CLOSURE AND POST-CLOSURE COST ESTIMATES AND DIVIDING THE RESULT BY THE NUMBER OF YEARS REMAINING IN THE PAY-IN PERIOD THE INITIAL PAY-IN PERIOD IS BASED ON THE ESTIMATED LIFE OF THE FACILITY

The Vermilion Parish Police Jury is providing financial assurance by means of a Letter of Credit and Standby Trust Agreement. No trust funds are involved Therefore, the above regulation does not apply

§1303 B FINANCIAL ASSURANCE MECHANISMS THE FINANCIAL ASSURANCE MECHANISM MUST BE ONE OR A COMBINATION OF THE FOLLOWING A TRUST FUND, A FINANCIAL GUARANTEE BOND ENSURING CLOSURE FUNDING, A PERFORMANCE BOND, A LETTER OF CREDIT, AN INSURANCE POLICY, OR THE FINANCIAL TEST THE FINANCIAL ASSURANCE MECHANISM IS SUBJECT TO THE APPROVAL OF THE ADMINISTRATIVE AUTHORITY AND MUST FULFILL THE FOLLOWING CRITERIA

1 EXCEPT WHEN A FINANCIAL TEST, TRUST FUND, OR CERTIFICATE OF INSURANCE IS USED AS THE FINANCIAL ASSURANCE MECHANISM, A STANDBY TRUST FUND NAMING THE ADMINISTRATIVE AUTHORITY AS BENEFICIARY MUST BE ESTABLISHED AT THE TIME OF THE CREATION OF THE FINANCIAL ASSURANCE MECHANISM INTO WHICH THE PROCEEDS OF SUCH MECHANISM COULD BE TRANSFERRED SHOULD SUCH FUNDS BE NECESSARY FOR EITHER CLOSURE OR POST-CLOSURE OF THE FACILITY, AND A SIGNED COPY MUST BE FURNISHED TO THE ADMINISTRATIVE AUTHORITY WITH THE MECHANISM

Vermilion Parish Solid Waste Plant acknowledges the above regulation and has included a Stand-by Trust Agreement in Appendix G 3

§1303 B 2 A PERMIT HOLDER OR APPLICANT MAY USE A FINANCIAL ASSURANCE MECHANISM SPECIFIED IN THIS SECTION FOR MORE THAN ONE FACILITY, IF ALL SUCH FACILITIES ARE LOCATED WITHIN LOUISIANA AND ARE SPECIFICALLY IDENTIFIED IN THE MECHANISM

Vermilion Parish Solid Waste Plant shall be the only facility utilizing a financial assurnace mechanism for the Vermilion Parish Police Jury Therefore, this regulation is not applicable

§1303 B 3 THE AMOUNT COVERED BY THE FINANCIAL ASSURANCE MECHANISM(S) MUST EQUAL THE TOTAL OF THE CURRENT CLOSURE AND POST-CLOSURE ESTIMATES FOR EACH FACILITY COVERED

The amount covered by the financial assurance mechanism is at least equal to the total of the current closure and post-closure estimates for the Vermilion Parish Solid Waste Plant, which is the facility covered

§1303 B 4 WHEN ALL CLOSURE AND POST-CLOSURE REQUIREMENTS HAVE BEEN SATISFACTORILY COMPLETED, THE ADMINISTRATIVE AUTHORITY SHALL EXECUTE AN APPROVAL TO TERMINATE THE FINANCIAL ASSURANCE MECHANISM(S)

Vermilion Parish Solid Waste Plant acknowledges that when all closure and post-closure requirements have been satisfactorily completed, the administrative authority shall execute an approval to terminate the financial assurance mechanism

§1303 C TRUST FUNDS A PERMIT HOLDER OR APPLICANT MAY SATISFY THE REQUIREMENTS OF THIS SECTION BY ESTABLISHING A CLOSURE TRUST FUND THAT CONFORMS TO THE FOLLOWING REQUIREMENTS AND SUBMITTING AN ORIGINALLY SIGNED DUPLICATE OF THE TRUST AGREEMENT TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION

The Vermilion Parish Police Jury is providing financial assurance by means of a Letter of Credit. Accordingly, a Standby Trust Agreement has been submitted along with the Letter of Credit, in accordance with LAC 33 VII 1303 F 2

§1303 D SURETY BONDS A PERMIT HOLDER OR APPLICANT MAY SATISFY THE REQUIREMENTS OF THIS SECTION BY OBTAINING A SURETY BOND THAT CONFORMS TO THE FOLLOWING REQUIREMENTS AND SUBMITTING THE BOND TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION

The Vermilion Parish Police Jury is providing financial assurance by means of Letter of Credit. Therefore, the above regulation does not apply

§1303 E PERFORMANCE BONDS A PERMIT HOLDER OR APPLICANT MAY SATISFY THE REQUIREMENTS OF THIS SECTION BY OBTAINING A SURETY BOND THAT CONFORMS TO THE FOLLOWING REQUIREMENTS AND SUBMITTING THE BOND TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION

The Vermilion Parish Police Jury is providing financial assurance by means of Letter of Credit Therefore, the above regulation does not apply

§1303 F LETTER OF CREDIT A PERMIT HOLDER OR APPLICANT MAY SATISFY THE REQUIREMENTS OF THIS SECTION BY OBTAINING AN IRREVOCABLE STANDBY LETTER OF CREDIT THAT CONFORMS TO THE FOLLOWING REQUIREMENTS AND SUBMITTING THE LETTER TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION

1 THE ISSUING INSTITUTION MUST BE AN ENTITY THAT HAS THE AUTHORITY TO ISSUE LETTERS OF CREDIT AND WHOSE LETTER-OF-CREDIT OPERATIONS ARE REGULATED AND EXAMINED BY A FEDERAL OR STATE AGENCY

A copy of the Letter of Credit supplied to LDEQ and dated June 12, 2007 is included in Appendix G 3 The Letter of Credit was issued by First Guaranty Bank and is regulated and examined by a federal or state agency

§1303 F 2 A PERMIT HOLDER OR APPLICANT WHO USES A LETTER OF CREDIT TO SATISFY THE REQUIREMENTS OF THIS SECTION MUST ALSO PROVIDE TO THE ADMINISTRATIVE AUTHORITY EVIDENCE OF THE ESTABLISHMENT OF A STANDBY TRUST FUND UNDER THE TERMS OF THE LETTER OF CREDIT, ALL AMOUNTS PAID PURSUANT TO A DRAFT BY THE ADMINISTRATIVE AUTHORITY WILL BE DEPOSITED BY THE ISSUING INSTITUTION DIRECTLY INTO THE STANDBY TRUST FUND THE WORDING OF THE STANDBY TRUST FUND SHALL BE AS SPECIFIED IN LAC 33 VII 1399 APPENDIX D, THE INSTRUCTIONS IN BRACKETS ARE TO BE REPLACED WITH THE RELEVANT INFORMATION AND THE BRACKETS DELETED

A copy of the Standby Trust Agreement by and between the Vermilion Parish Police Jury and Capital One Bank is included in Appendix G 3 This standby trust fund complies with the language specified in LAC 33 VII 727 A 2 d ix that is re-codified in the revised Solid Waste Regulations as §1399 Appendix D, and states that all amounts paid pursuant to a draft by the Administrative Authority will be deposited by the issuing institution directly into the standby trust fund

§1303 F 3 THE LETTER OF CREDIT MUST BE ACCOMPANIED BY A LETTER FROM THE PERMIT HOLDER OR APPLICANT REFERRING TO THE LETTER OF CREDIT BY NUMBER, ISSUING INSTITUTION, AND DATE, AND PROVIDING THE FOLLOWING INFORMATION

a AGENCY INTEREST NUMBER,
b SOLID WASTE IDENTIFICATION NUMBER,
c SITE NAME,
d FACILITY NAME,
e FACILITY PERMIT NUMBER, AND,
f THE AMOUNT OF FUNDS ASSURED FOR CLOSURE AND/OR POST-CLOSURE OF THE FACILITY BY THE LETTER OF CREDIT

The Letter of Credit is accompanied by a letter from the Vermilion Parish Police Jury (refer to Appendix G 3), which contains the following information

Letter of Credit Number ***2798***
Name of Issuing Institution ***First Guaranty Bank***
Date of Letter of Credit ***June 12, 2007***
Agency Interest Number ***148***
Solid Waste Identification Number ***D-113-0023***
Site Name ***Vermilion Parish Solid Waste Plant***
Facility Name ***Vermilion Parish Solid Waste Plant***
Facility Permit Holder ***Vermilion Parish Police Jury***
Amount of Funds Assured for Closure and/or Post-Closure Care of the Facility by Letter of Credit
$3,079,228 00

§1303 F 4 THE LETTER OF CREDIT MUST BE IRREVOCABLE AND ISSUED FOR A PERIOD OF AT LEAST ONE YEAR, UNLESS, AT LEAST 120 DAYS BEFORE THE CURRENT EXPIRATION DATE, THE ISSUING INSTITUTION NOTIFIES THE PERMIT HOLDER AND THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION, BY CERTIFIED MAIL OF A DECISION NOT TO EXTEND THE EXPIRATION DATE UNDER THE TERMS OF THE LETTER OF CREDIT, THE 120 DAYS WILL BEGIN ON THE DATE WHEN BOTH THE PERMIT HOLDER AND THE ADMINISTRATIVE AUTHORITY RECEIVE THE NOTICE, AS EVIDENCED BY THE RETURN RECEIPTS

The wording of the Letter of Credit for the Vermilion Parish Solid Waste Plant is identical to the wording in LAC 33 VII 727 A 2 g xiii that is re-codified in the revised Solid Waste Regulations as §1399 Appendix G, except that the instructions in brackets have been replaced with the relevant information and the brackets deleted As such, the Letter of Credit states that it is irrevocable and issued for a period of at least one year unless, at least 120 days before the current expiration date, the issuing institution notifies both the permit holder and the administrative authority by certified mail of a decision not to extend the expiration date Under the terms of the Letter, the 120 days shall begin on the date when both the Vermilion Parish Police Jury and the Office of Environmental Services, Waste Permits Division, receive the notice, as evidenced by the return receipts

§1303 F 5 THE LETTER OF CREDIT MUST BE ISSUED IN AN AMOUNT AT LEAST EQUAL TO THE CURRENT CLOSURE AND POST-CLOSURE COST ESTIMATES

Vermilion Parish Solid Waste Plant acknowledges the above regulation and provides a Letter of Credit issued by First Guaranty Bank for the amount of $3,079,228 00 to cover closure and post closure costs, which is at least equal to the current closure and post closure cost estimate A copy of the Letter of Credit dated June 12, 2007 transmitted to the LDEQ is included in Appendix G 3

§1303 F 6 WHENEVER THE CURRENT COST ESTIMATES INCREASE TO AN AMOUNT GREATER THAN THE AMOUNT OF THE CREDIT, THE PERMIT HOLDER, WITHIN 60 DAYS AFTER THE INCREASE, MUST EITHER CAUSE THE AMOUNT OF THE CREDIT TO BE INCREASED SO THAT IT AT LEAST EQUALS THE CURRENT CLOSURE AND POST-CLOSURE COST ESTIMATES AND SUBMIT EVIDENCE OF SUCH INCREASE TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION, OR OBTAIN OTHER FINANCIAL ASSURANCE AS SPECIFIED IN THIS SECTION TO COVER THE INCREASE WHENEVER THE CURRENT COST ESTIMATE DECREASES, THE AMOUNT OF THE CREDIT MAY BE REDUCED TO THE AMOUNT OF THE CURRENT CLOSURE AND POST-CLOSURE COST ESTIMATES UPON WRITTEN APPROVAL OF THE ADMINISTRATIVE AUTHORITY

Vermilion Parish Solid Waste Plant acknowledges the regulation above and will increase the amount of the letter of credit accordingly within 60 days should current closure and post-closure costs increase beyond $3,079,228 00 Supporting evidence of any increase will be included with an amendment to letter of credit should it be needed

§1303 F 7 FOLLOWING A DETERMINATION BY THE ADMINISTRATIVE AUTHORITY THAT THE PERMIT HOLDER HAS FAILED TO PERFORM FINAL CLOSURE OR POST-CLOSURE IN ACCORDANCE WITH THE CLOSURE PLAN AND OTHER PERMIT REQUIREMENTS WHEN REQUIRED TO DO SO, THE ADMINISTRATIVE AUTHORITY MAY DRAW ON THE LETTER OF CREDIT

Vermilion Parish Solid Waste Plant acknowledges the regulation above and realizes that if it failed to perform final closure or post-closure in accordance with its plans and other permit requirements at the time required, the administrative authority could draw on the Letter of Credit.

§1303 F 8 THE WORDING OF THE LETTER OF CREDIT SHALL BE IDENTICAL TO THE WORDING IN LAC 33 VII 1399 APPENDIX G, EXCEPT THAT THE INSTRUCTIONS IN BRACKETS ARE TO BE REPLACED WITH THE RELEVANT INFORMATION AND THE BRACKETS DELETED

The copy of the Letter of Credit dated June 12, 2007 transmitted to the LDEQ, which is included in Appendix G 3, includes the language as required in LAC 33 VII 727 A 2 g xiii that is re-codified in the revised Solid Waste Regulations as LAC 33 VII 1399 APPENDIX G

§1303 G INSURANCE A PERMIT HOLDER OR APPLICANT MAY SATISFY THE REQUIREMENTS OF THIS SECTION BY OBTAINING INSURANCE THAT CONFORMS TO THE REQUIREMENTS OF THIS SUBPARAGRAPH AND SUBMITTING A CERTIFICATE OF SUCH INSURANCE TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION

Vermilion Parish Solid Waste Plant acknowledges the above regulation, however, the Vermilion Parish Police Jury is providing financial assurance by a Letter of Credit Therefore, the above regulation does not apply

§1303 H FINANCIAL TEST A PERMIT HOLDER, APPLICANT, OR PARENT CORPORATION OF THE PERMIT HOLDER OR APPLICANT, WHICH WILL BE RESPONSIBLE FOR THE FINANCIAL OBLIGATIONS, MAY SATISFY THE REQUIREMENTS OF THIS SECTION BY DEMONSTRATING THAT HE OR SHE PASSES A FINANCIAL TEST AS SPECIFIED IN THIS SUBPARAGRAPH THE ASSETS OF THE PARENT CORPORATION OF THE APPLICANT OR PERMIT HOLDER SHALL NOT BE USED TO DETERMINE WHETHER THE APPLICANT OR PERMIT HOLDER SATISFIES THE FINANCIAL TEST, UNLESS THE PARENT CORPORATION HAS SUPPLIED A CORPORATE GUARANTEE AS OUTLINED IN CLAUSE A 1 D IV OF THIS SECTION

Vermilion Parish Solid Waste Plant acknowledges the above regulation, however, the Vermilion Parish Police Jury is providing financial assurance by a Letter of Credit. Therefore, the above regulation does not apply

§1303 I LOCAL GOVERNMENT FINANCIAL TEST AN OWNER OR OPERATOR THAT SATISFIES THE REQUIREMENTS OF CLAUSES A 2 J I III OF THIS SECTION MAY DEMONSTRATE FINANCIAL ASSURANCE UP TO THE AMOUNT SPECIFIED IN CLAUSE A 2 J IV OF THIS SECTION

Vermilion Parish Solid Waste Plant acknowledges the above regulation, however, the Vermilion Parish Police Jury is providing financial assurance by a Letter of Credit Therefore, the above regulation does not apply

§1303 J LOCAL GOVERNMENT GUARANTEE AN OWNER OR OPERATOR MAY DEMONSTRATE FINANCIAL ASSURANCE FOR CLOSURE, POST-CLOSURE, AND CORRECTIVE ACTION, AS REQUIRED BY PARAGRAPHS A 1-2 OF THIS SECTION, BY OBTAINING A WRITTEN GUARANTEE PROVIDED BY A LOCAL GOVERNMENT THE GUARANTOR MUST MEET THE REQUIREMENTS OF THE LOCAL GOVERNMENT FINANCIAL TEST IN SUBPARAGRAPH A 2 J OF THIS SECTION, AND MUST COMPLY WITH THE TERMS OF A WRITTEN GUARANTEE

Vermilion Parish Solid Waste Plant acknowledges the above regulation, however, the Vermilion Parish Police Jury is providing financial assurance by a Letter of Credit Therefore, the above regulation does not apply

§1303 K USE OF MULTIPLE MECHANISMS AN OWNER OR OPERATOR MAY DEMONSTRATE FINANCIAL ASSURANCE FOR CLOSURE POST-CLOSURE, AND CORRECTIVE ACTION, IN ACCORDANCE WITH THIS CHAPTER, BY ESTABLISHING MORE THAN ONE FINANCIAL MECHANISM PER FACILITY, EXCEPT THAT MECHANISMS GUARANTEEING PERFORMANCE, RATHER THAN PAYMENT, MAY NOT BE COMBINED WITH OTHER INSTRUMENTS THE MECHANISMS MUST BE AS SPECIFIED IN SUBSECTIONS C-H OF THIS SECTION, EXCEPT THAT FINANCIAL ASSURANCE FOR AN AMOUNT AT LEAST EQUAL TO THE CURRENT COST ESTIMATE FOR CLOSURE, POST-CLOSURE CARE, AND/OR CORRECTIVE ACTION MAY BE PROVIDED BY A COMBINATION OF MECHANISMS, RATHER THAN A SINGLE MECHANISM

The Vermilion Parish Solid Waste Plant acknowledges the above regulation, however, the Vermilion Parish Police Jury is providing financial assurance by only one mechanism, a Letter of Credit.

§1303 L DISCOUNTING THE ADMINISTRATIVE AUTHORITY MAY ALLOW DISCOUNTING OF CLOSURE AND POST-CLOSURE COST ESTIMATES IN SUBSECTION A OF THIS SECTION, AND/OR CORRECTIVE ACTION COSTS IN LAC 33 VII 1301 A, UP TO THE RATE OF RETURN FOR ESSENTIALLY RISK-FREE INVESTMENTS, NET OF INFLATION, UNDER THE FOLLOWING CONDITIONS

1 THE ADMINISTRATIVE AUTHORITY DETERMINES THAT COST ESTIMATES ARE COMPLETE AND ACCURATE AND THE OWNER OR OPERATOR HAS SUBMITTED A STATEMENT FROM A PROFESSIONAL ENGINEER TO THE OFFICE OF ENVIRONMENTAL SERVICES, WASTE PERMITS DIVISION, SO STATING,
2 THE STATE FINDS THE FACILITY IN COMPLIANCE WITH APPLICABLE AND APPROPRIATE PERMIT CONDITIONS,
3 THE ADMINISTRATIVE AUTHORITY DETERMINES THAT THE CLOSURE DATE IS CERATIN AND THE OWNER OR OPERATOR CERTIFIES THAT THERE ARE NO FORESEEABLE FACTORS THAT WILL CHANGE THE ESTIMATE OF SITE LIFE, AND
4 DISCOUNTED COST ESTIMATES ARE ADJUSTED ANNUALLY TO REFLECT INFLATION AND YEARS OF REMAINING LIFE

Should the Vermilion Parish Police Jury propose discounting of closure and post-closure cost estimates in Subsection A of this Section up to the rate of return for essentially risk-free investments, net of inflation, the conditions listed herein shall be met. However, discounting is not proposed at this time

§1305 FINANCIAL RESPONSIBILITY FOR CORRECTIVE ACTION FOR TYPE II LANDFILLS (Formerly §727 B)

Vermilion Parish Solid Waste Plant acknowledges the above regulation, however, corrective action is not required at this time for this facility. Therefore the above regulation does not apply.

Appendix A

Drawings

EXHIBIT A:2

AERIAL PHOTOGRAPH
SHOWING THE

VERMILION PARISH SOLID WASTE PLANT

VERMILION PARISH POLICE JURY

LOCATED IN SECTION 2, T-12-S, R-3-E,
VERMILION PARISH, LOUISIANA

AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH, 4.0.2742, ON 04-03-07.

ENGINEER	DRAWN BY	BOOK NO.	PAGE NO.
DMS	DMS	XX	XX
DATE	SCALE	PROJECT NO.	
04/07	1"=1000'	5263-27	
SURVEY BOOK NO.	Pages	FILE NO.	
00-00	00-00	0-0-00	
ACAD. DWG. NO.	SHEET 00 OF 00		
\5263-27\PM-9\5263a2			

Sellers & Associates, Inc.
ENGINEERS SURVEYORS PLANNERS
Lafayette - Abbeville Louisiana

STATE OF LOUISIANA
E.M. SELLERS
Reg. No. 6457
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

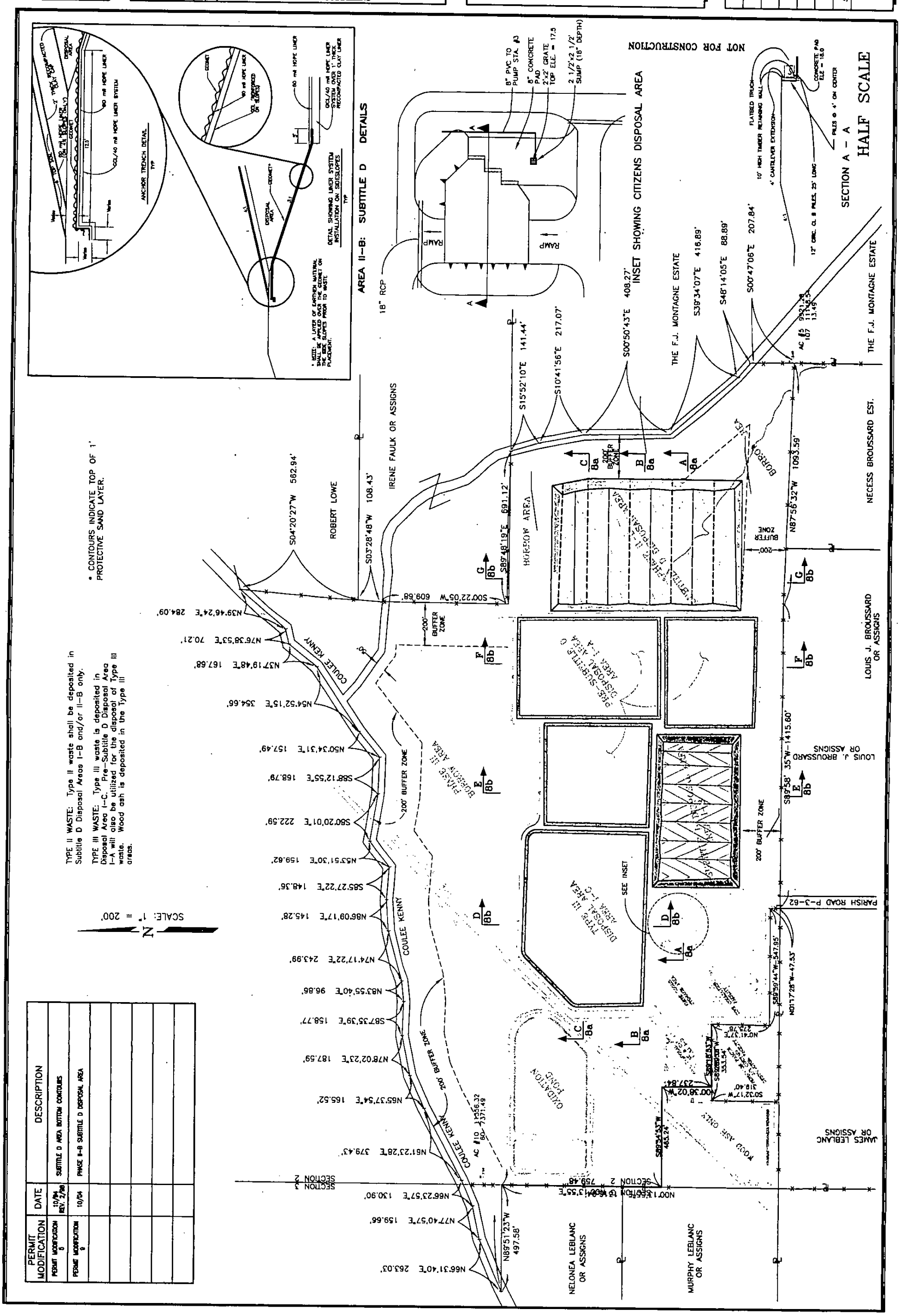
REVISIONS	
DATE	BY
11/96	DM
04/97	DM
02/98	DM
10/04	DMS
05/08	DMS

Sellers & Associates, Inc.
ENGINEERS SURVEYORS PLANNERS
Lafayette - Abbeville Louisiana

SHEET DESCRIPTION
EXHIBIT A.6

SITE EXCAVATION PLAN
VERMILION PARISH SOLID WASTE PLANT

ENGINEER WSC/DMS
DRAWN BY JFT
DATE 1994
SCALE 1" = 200'
PROJECT NO. 5263-27
FILE NO. P.M.19
ACAD. DWG. NO. 5263-27\permits\c6a



PERMIT MODIFICATION	DATE	DESCRIPTION
PERMIT MODIFICATION 5	10/94 REV. 2/98	SUBTITLE D AREA BOTTOM CONTOURS
PERMIT MODIFICATION 6	10/04	PHASE II-B SUBTITLE D DISPOSAL AREA

STATE OF LOUISIANA
E.M. SELLERS
Reg. No. 6457
REGISTERED PROFESSIONAL ENGINEER

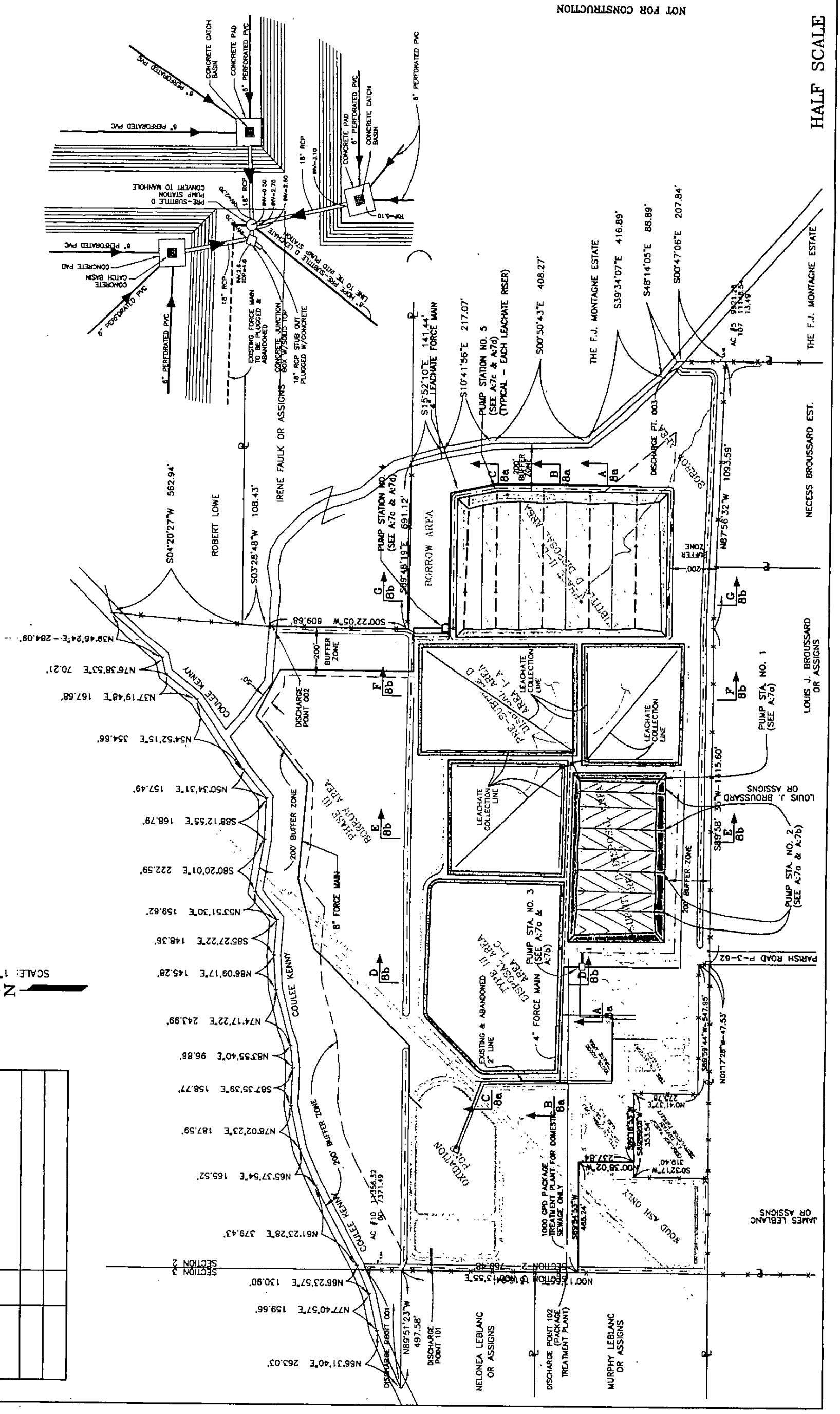
REVISIONS	
DATE	BY
11/98	DM
3/97	DM
7/97	DM
2/98	DM
10/04	DMS

Sellers & Associates, Inc.
ENGINEERS SURVEYORS PLANNERS
Lafayette - Abbeville Louisiana

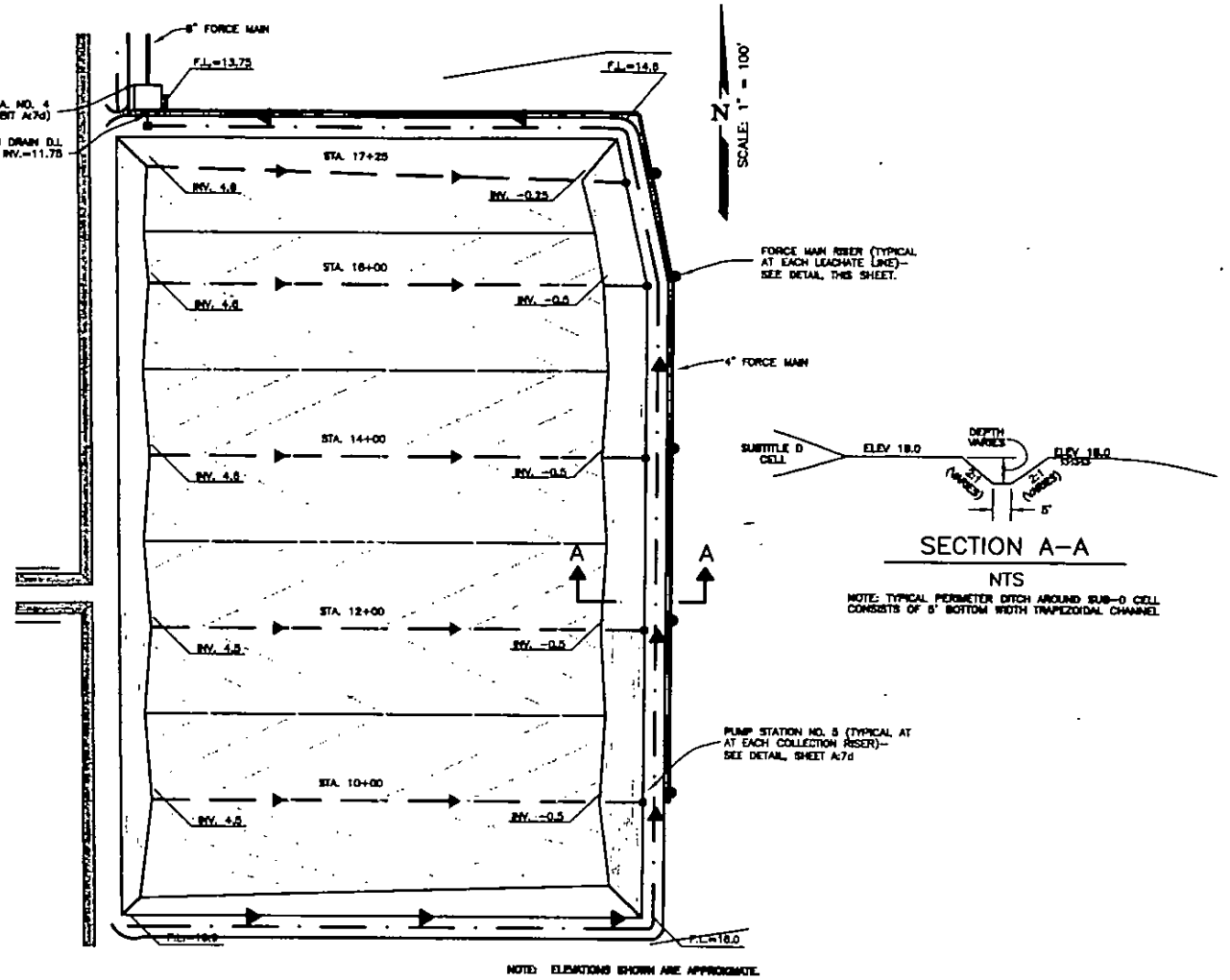
SHEET DESCRIPTION
EXHIBIT A:7

LEACHATE COLLECTION SYSTEM
& FORCE MAIN
VERMILION PARISH SOLID WASTE PLANT

ENGINEER WSC/DMS
DRAWN BY JFF
DATE 1994
SCALE 1" = 200'
PROJECT NO. 5263-27
FILE NO. P.M.#9
ACAD. DWG. NO. 5263-27\permits\a7



PERMIT MODIFICATION	DATE	DESCRIPTION
PERMIT MODIFICATION 5	11/94 REV. 2/96	SUBTITLE D LEACHATE COLLECTION SYSTEM
PERMIT MODIFICATION 9	10/04	PHASE II-B SUBTITLE D DISPOSAL CELL



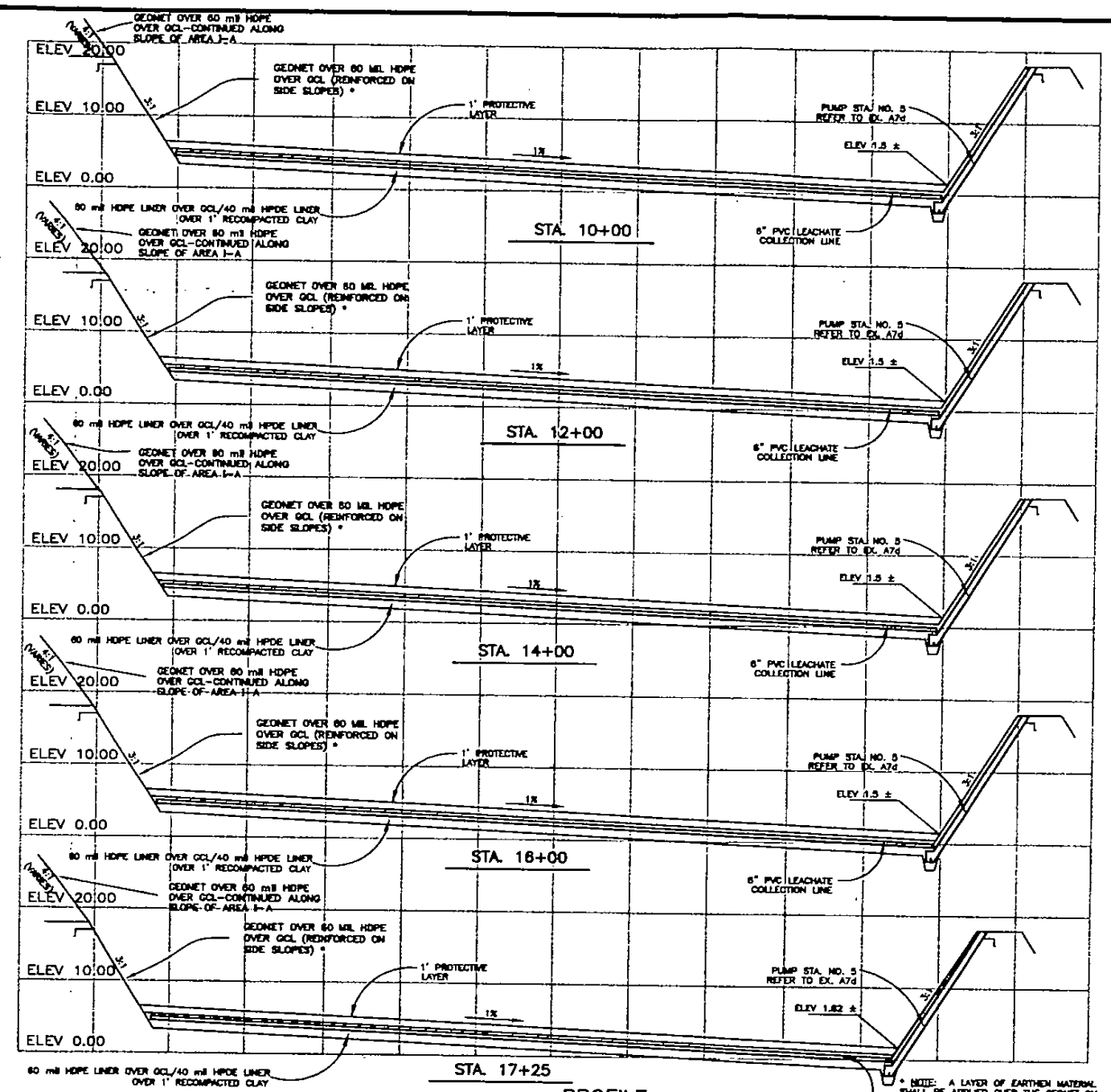
PLAN

SUB-TITLE D DISPOSAL AREA II-B
BOTTOM CONTOURS & LEACHATE COLLECTION SYSTEM

SECTION A-A

NTS

NOTE: TYPICAL PERIMETER DITCH AROUND SUB-D CELL CONSISTS OF 5' BOTTOM WIDTH TRAPEZOIDAL CHANNEL

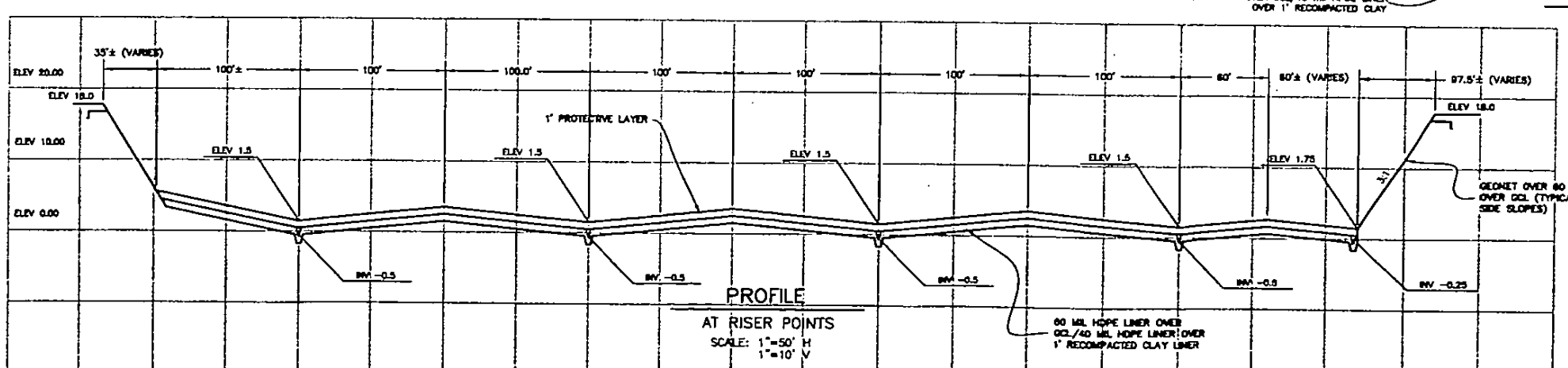


PROFILE

LEACHATE COLLECTION LINE

SCALE: 1"=50' H
1"=10'V

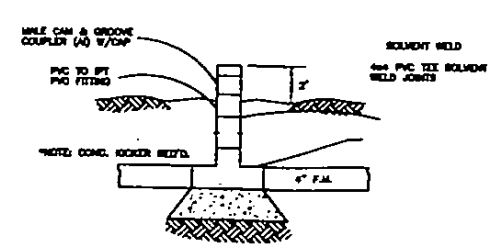
* NOTE: A LAYER OF EARTHEN MATERIAL SHALL BE APPLIED OVER THE GEONET ON SIDE SLOPES PRIOR TO WASTE PLACEMENT.



PROFILE

AT RISER POINTS

SCALE: 1"=50' H
1"=10' V



DETAIL SHOWING FORCE MAIN RISER

NTS

HALF SCALE

NOT FOR CONSTRUCTION

STATE OF LOUISIANA
E.M. SELLERS
Reg. No. 8457
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

REVISIONS	
DATE	BY
05/08	DMS

SHEET DESCRIPTION

EXHIBIT A:7c

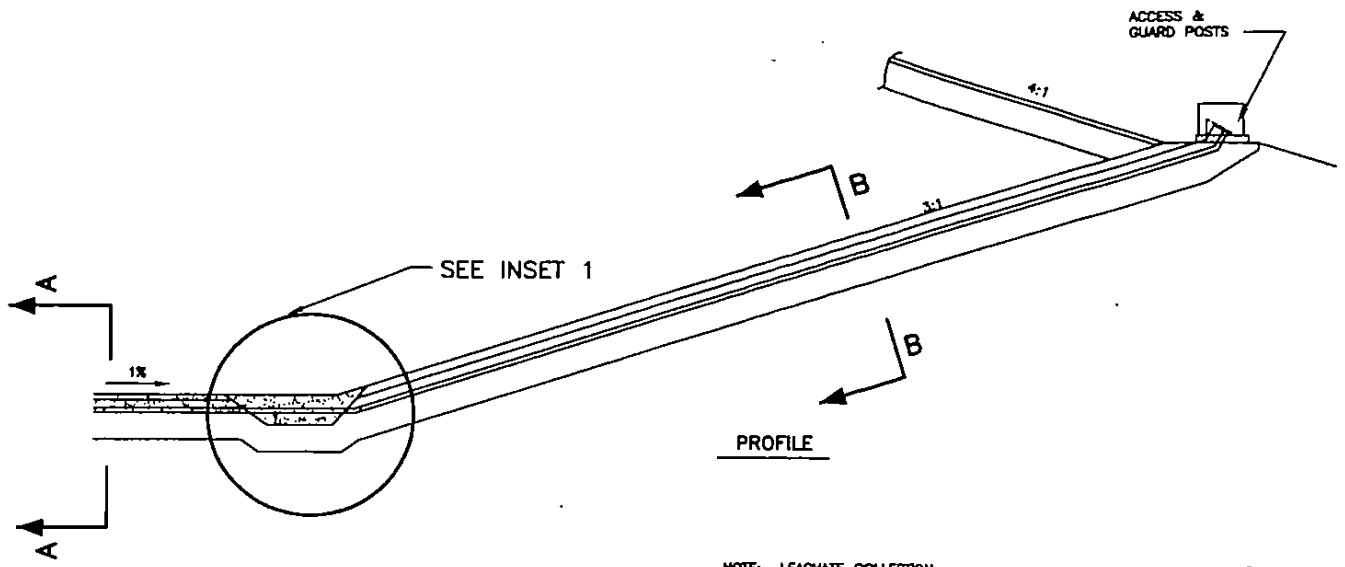
Sellers & Associates, Inc.
ENGINEERS PLANNERS SURVEYORS
Lafayette - Jennings

SUPPLEMENTAL SHEET

LEACHATE COLLECTION SYSTEM DETAILS

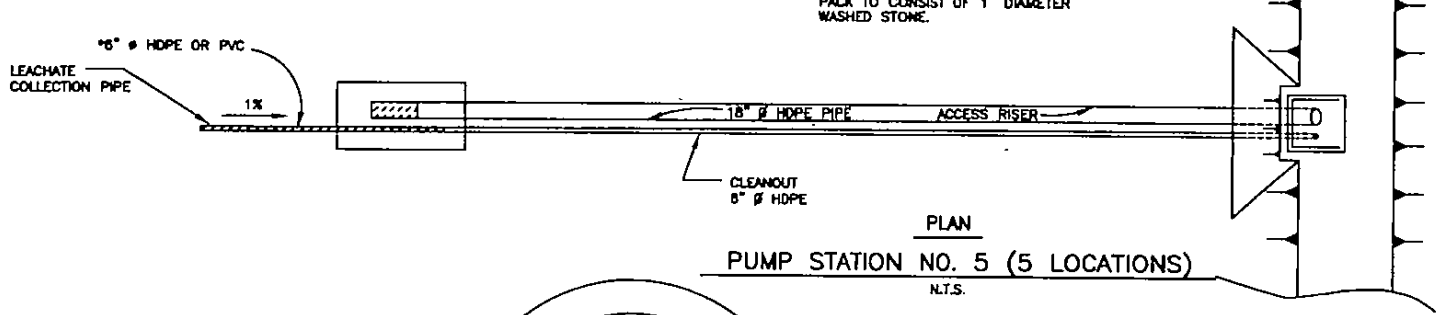
VERMILION PARISH SOLID WASTE PLANT

ENGINEER	DMS
DRAWN BY	DMS
DATE	2004
SCALE	1" = 100'
PROJECT NO.	5263-27
FILE NO.	PERMIT MOD. #9
ACAD. DWG. NO.	5263-27\PERMITS\A7C



PROFILE

NOTE: LEACHATE COLLECTION LINES SHALL CONSIST OF 6" DIAMETER PIPE (PVC OR HDPE) W/ 3/8" PERFORATIONS, GRAVEL PACK TO CONSIST OF 1" DIAMETER WASHED STONE.



PLAN

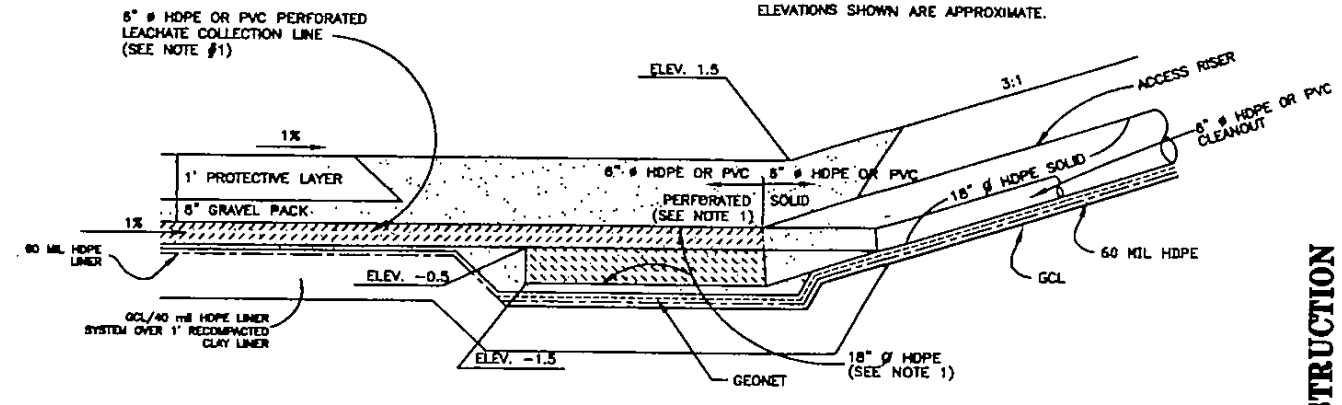
PUMP STATION NO. 5 (5 LOCATIONS)

N.T.S.

NOTE 1: 18"ø PIPE TO BE PERFORATED WITH 3/8"ø HOLES STAGGERED 6" C-C WITH A LINE OF HOLES EVERY 30° AROUND CIRCUMFERENCE

6"ø PIPE TO BE PERFORATED WITH 3/8"ø HOLES STAGGERED AT 45° FROM VERTICLE

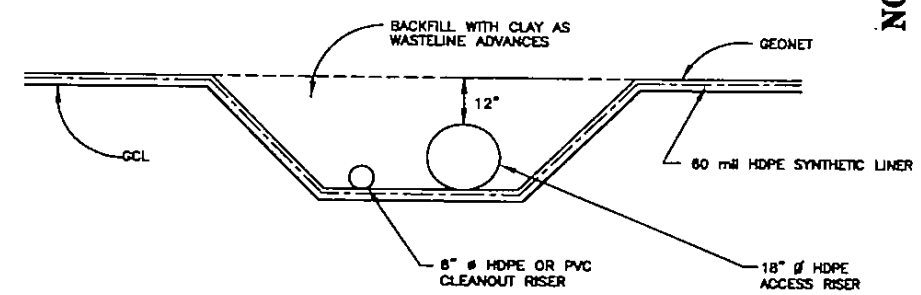
ELEVATIONS SHOWN ARE APPROXIMATE.



INSET 1

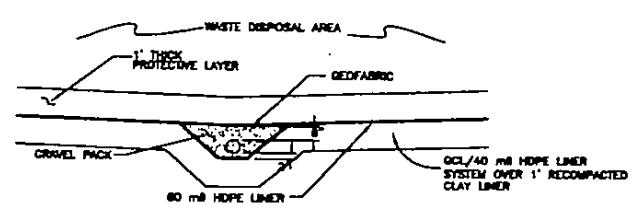
1" = 2'

NOT FOR CONSTRUCTION



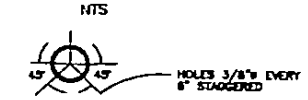
SECTION B-B

1" = 2'



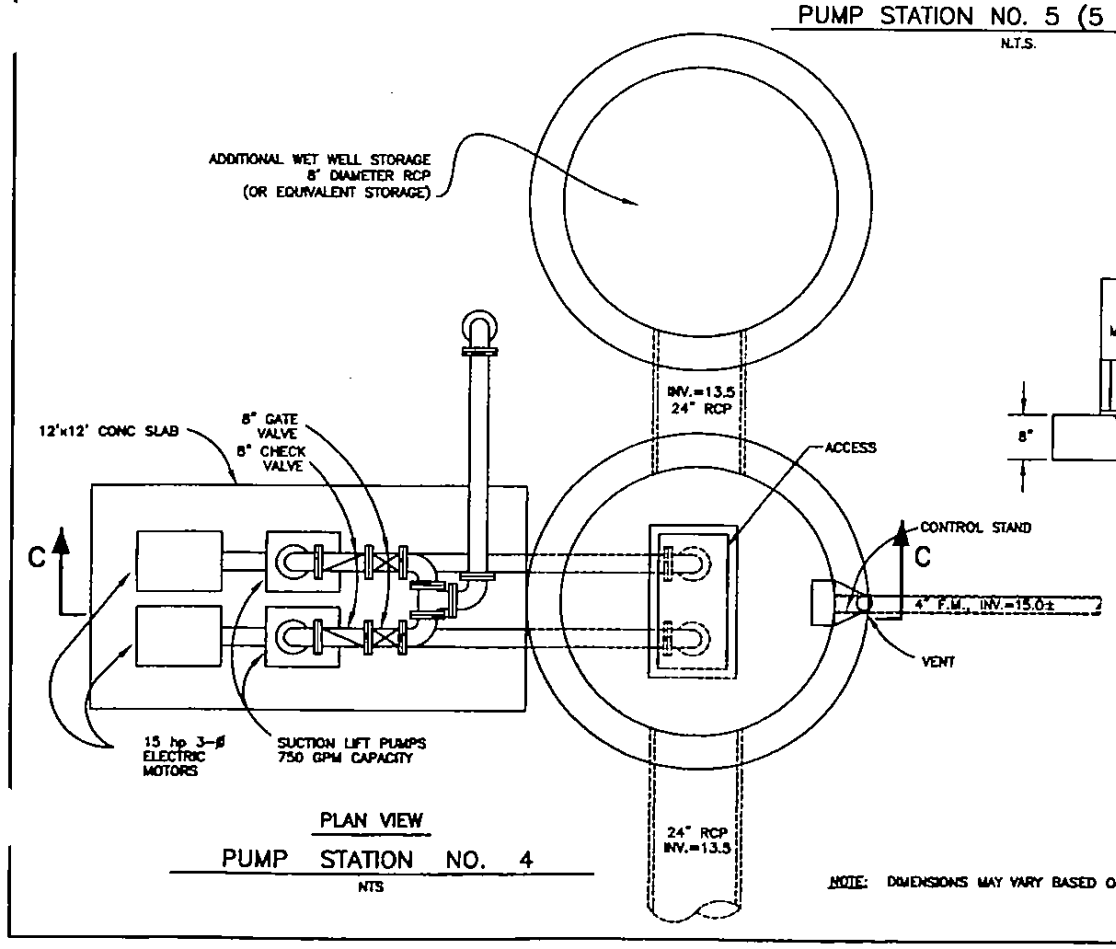
SECTION A-A

NTS



PERFORATED PIPE DETAIL

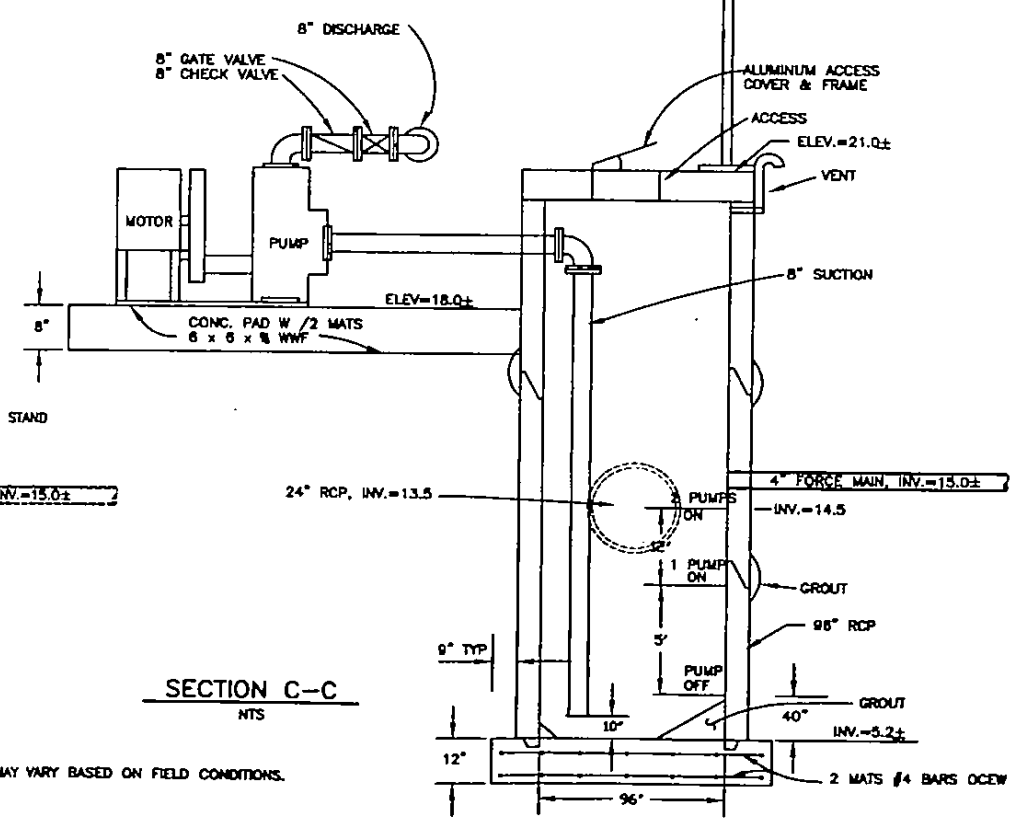
NTS



PLAN VIEW

PUMP STATION NO. 4

NTS



SECTION C-C

NTS

NOTE: DIMENSIONS MAY VARY BASED ON FIELD CONDITIONS.

NOTE: ELEVATIONS SHOWN ARE APPROXIMATE.

HALF SCALE

STATE OF LOUISIANA
E.M. SELLERS
Reg. No. 6457
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

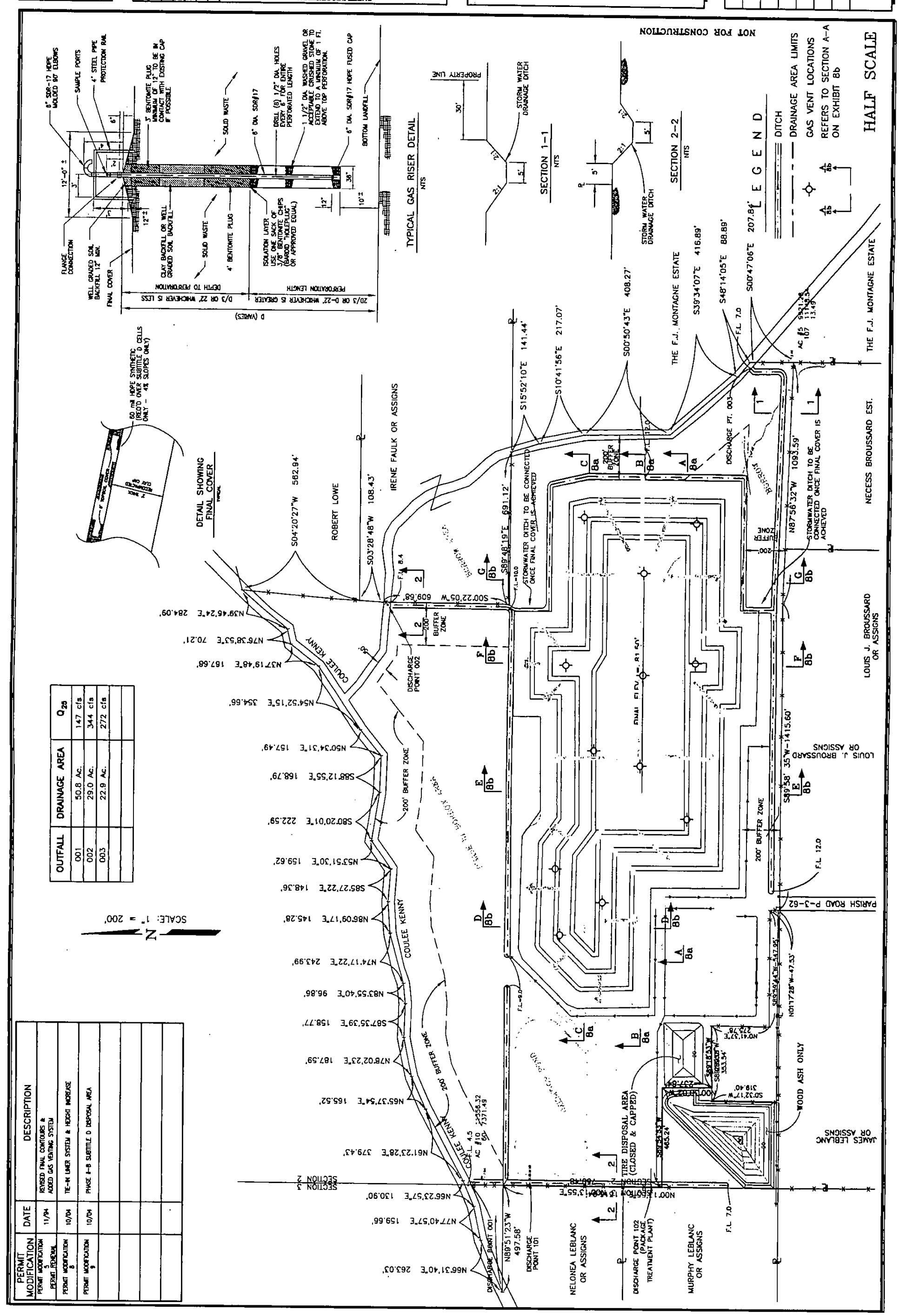
REVISIONS	
DATE	BY
11/96	DM
3/97	DM
2/98	DM

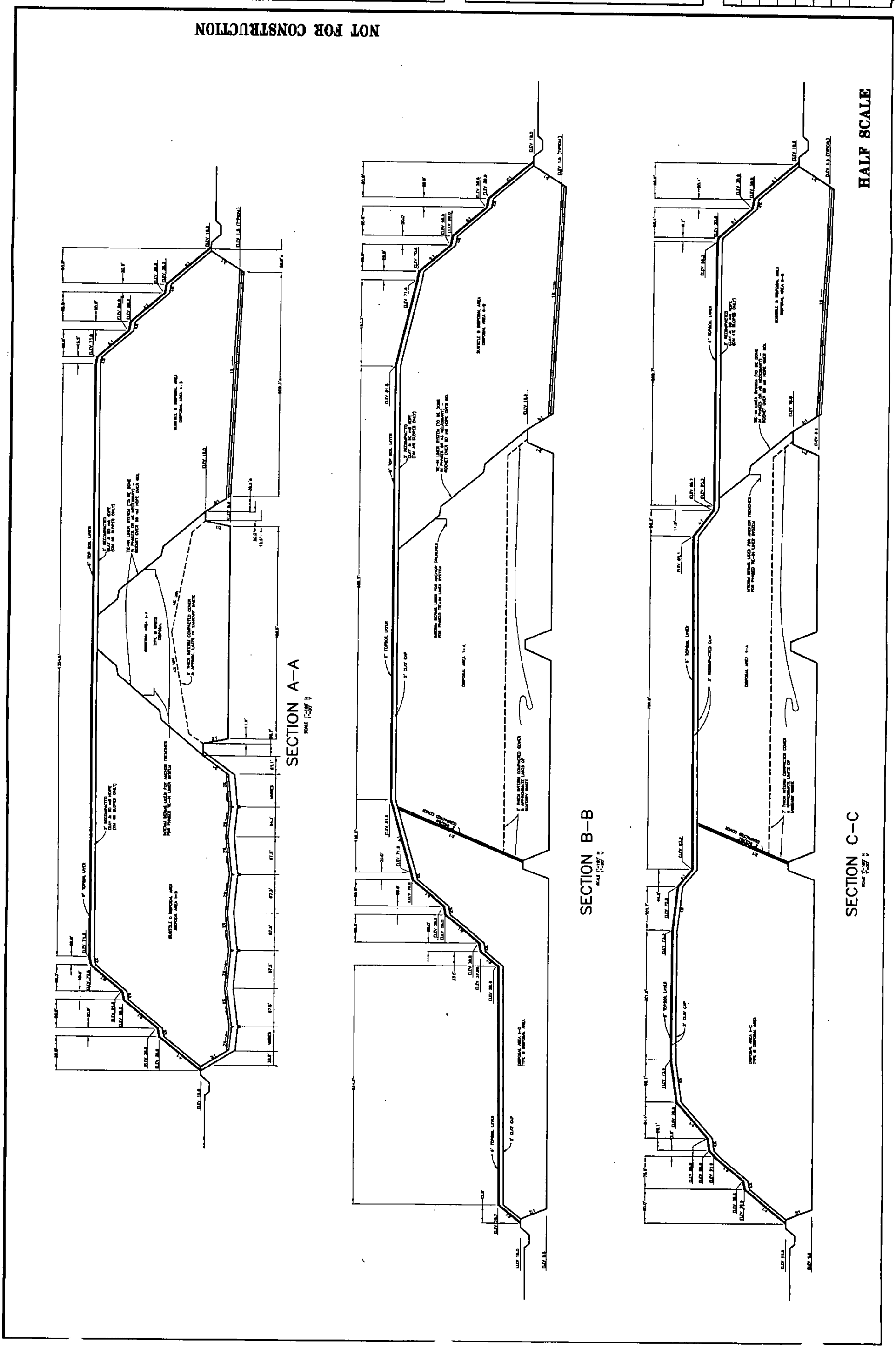
SHEET DESCRIPTION: EXHIBIT A-7d

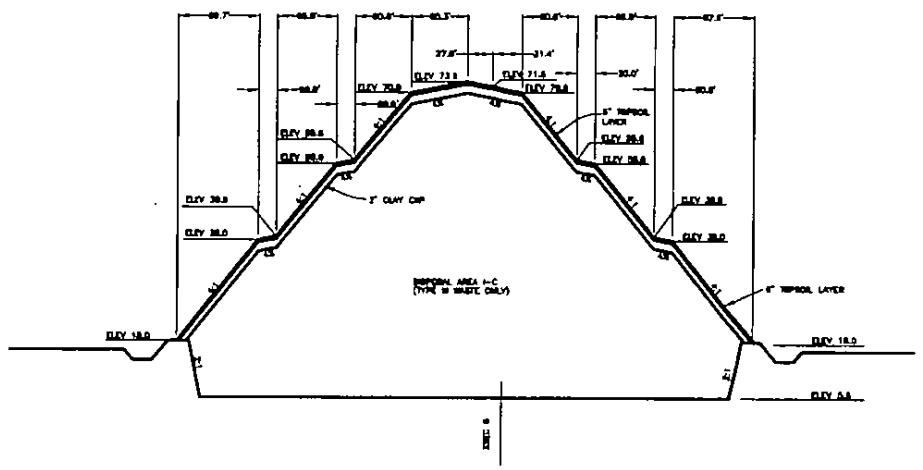
Sellers & Associates, Inc.
ENGINEERS Lafayette - Jennings SURVEYORS PLANNERS Lafayette

SUPPLEMENTAL SHEET
LEACHATE COLLECTION SYSTEM DETAILS
VERMILION PARISH SOLID WASTE PLANT

ENGINEER	WSC
DRAWN BY	JFF
DATE	1994
SCALE	1" = 1'
PROJECT NO.	5263-27
FILE NO.	PERMIT MOD. #9
ACAD. DWG. NO.	5263-27\PERMITS\A7D

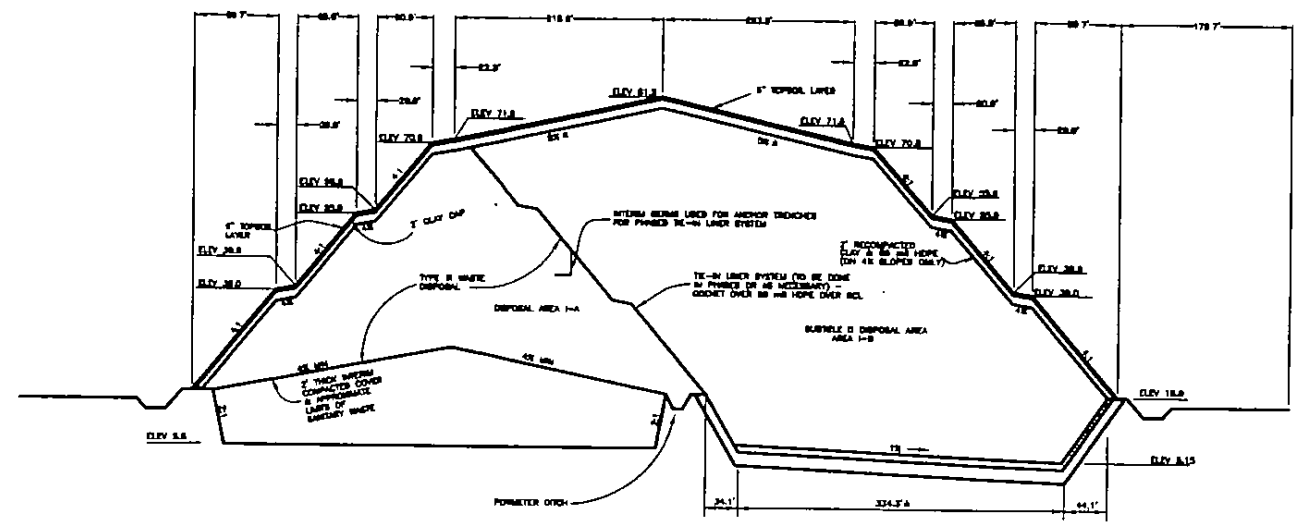

SITE PLAN SHOWING
FINAL CONTOURS
VERMILION PARISH SOLID WASTE PLANT
Sellers & Associates, Inc.
ENGINEERS SURVEYORS PLANNERS
EXHIBIT A:8
REVISIONS
DATE BY
11/96 DM
10/04 DMS
05/08 DMS
STATE OF LOUISIANA
E.M. SELLERS
Reg. No. 8457
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING
ENGINEER WSC/DMS
DRAWN BY JFT
DATE 1994
SCALE 1" = 200'
PROJECT NO. 5263-27
FILE NO. P.M.18
ACAD. DWG. NO. 5263-27\permits\a8
NOT FOR CONSTRUCTION
TYPICAL GAS RISER DETAIL
SECTION 1-1
SECTION 2-2
LEGEND
DITCH
DRAINAGE AREA LIMITS
GAS VENT LOCATIONS
REFERS TO SECTION A-A ON EXHIBIT 8b
HALF SCALE
DETAIL SHOWING FINAL COVER
ROBERT LOWE
IRENE FAULK OR ASSIGNS
THE F.J. MONTAGNE ESTATE
NECESS BROUSSARD EST.
LOUIS J. BROUSSARD OR ASSIGNS
COULEE KENNY
200' BUFFER ZONE
DISCHARGE POINT 002
DISCHARGE POINT 001
DISCHARGE POINT 101
DISCHARGE POINT 102 (PACKAGE TREATMENT PLANT)
NELONEA LEBLANC OR ASSIGNS
MURPHY LEBLANC OR ASSIGNS
JAMES LEBLANC OR ASSIGNS
TIRE DISPOSAL AREA (CLOSED & CAPPED)
WOOD ASH ONLY
PARISH ROAD P-3-62
STORMWATER DITCH TO BE CONNECTED ONCE FINAL COVER IS ACHIEVED
SCALE: 1" = 200'
OUTFALL | DRAINAGE AREA | Q25
001 | 50.8 Ac. | 147 cfs
002 | 29.0 Ac. | 344 cfs
003 | 22.9 Ac. | 272 cfs
PERMIT MODIFICATION | DATE | DESCRIPTION
PERMIT MODIFICATION 7 PERMIT REVISION | 11/04 | REVISED FINAL CONTOURS & ADDED GAS VENTING SYSTEM
PERMIT MODIFICATION 8 | 10/04 | TIE-IN UNDER SYSTEM & HEIGHT INCREASE
PERMIT MODIFICATION 9 | 10/04 | PHASE II-B SUBTITLE D DISPOSAL AREA


NOT FOR CONSTRUCTION
HALF SCALE
SECTION A–A
SECTION B–B
SECTION C–C
SUPPLEMENTAL SHEET
CROSS SECTIONS
VERMILION PARISH SOLID WASTE PLANT
EXHIBIT A:8a
Bellaire & Associates, Inc.
ENGINEERS SURVEYORS PLANNERS
Lafayette - Lake Charles
STATE OF LOUISIANA
E.M. SELLERS
Reg. No. 6457
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING
DATE
11/98
10/04
06/06
BY
DM
DMS
DMS
DMS
5263-27
PERMIT MOD #9
1" = 100'
2004



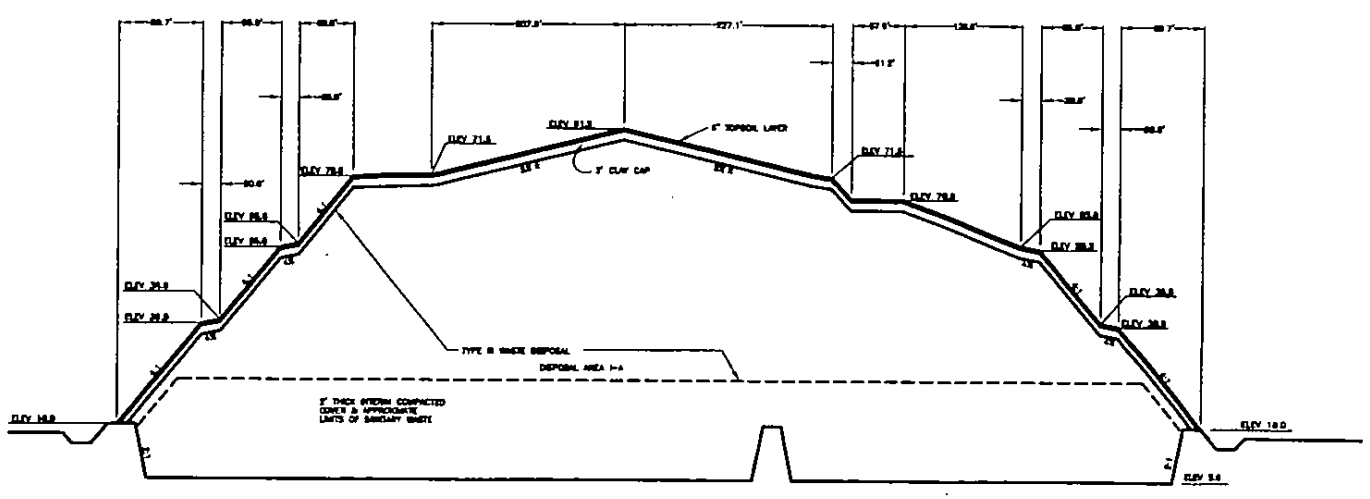
SECTION D–D

SCALE 1"=100' H
1"=20' V



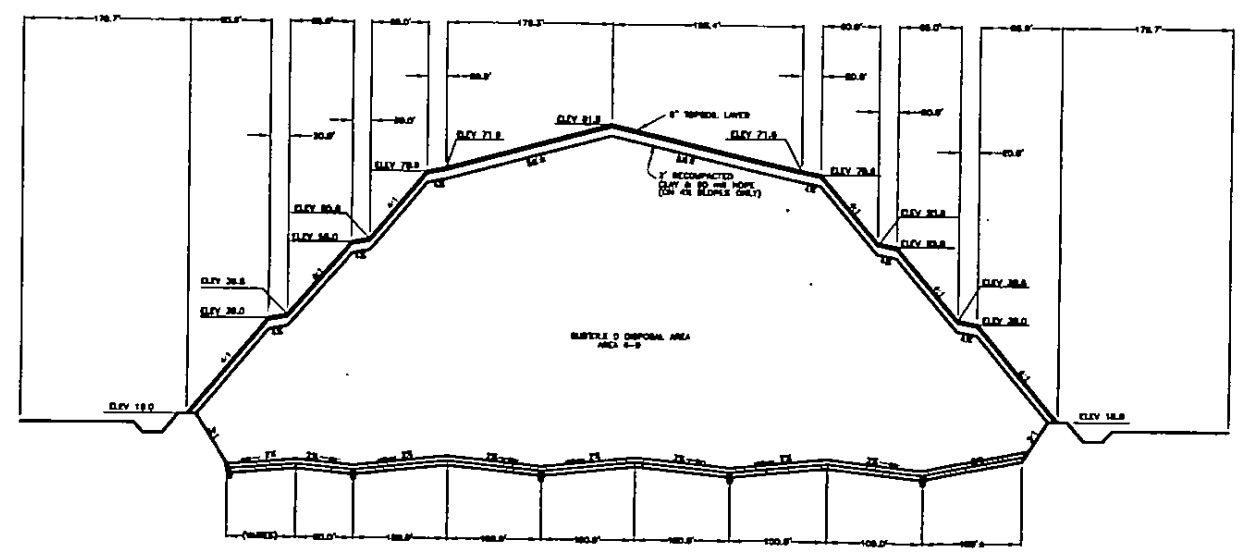
SECTION E–E

SCALE 1"=100' H
1"=20' V



SECTION F–F

SCALE 1"=100' H
1"=20' V



SECTION G–G

SCALE 1"=100' H
1"=20' V

NOT FOR CONSTRUCTION

HALF SCALE

STATE OF LOUISIANA
E.M. SELLERS
Reg. No. 8457
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

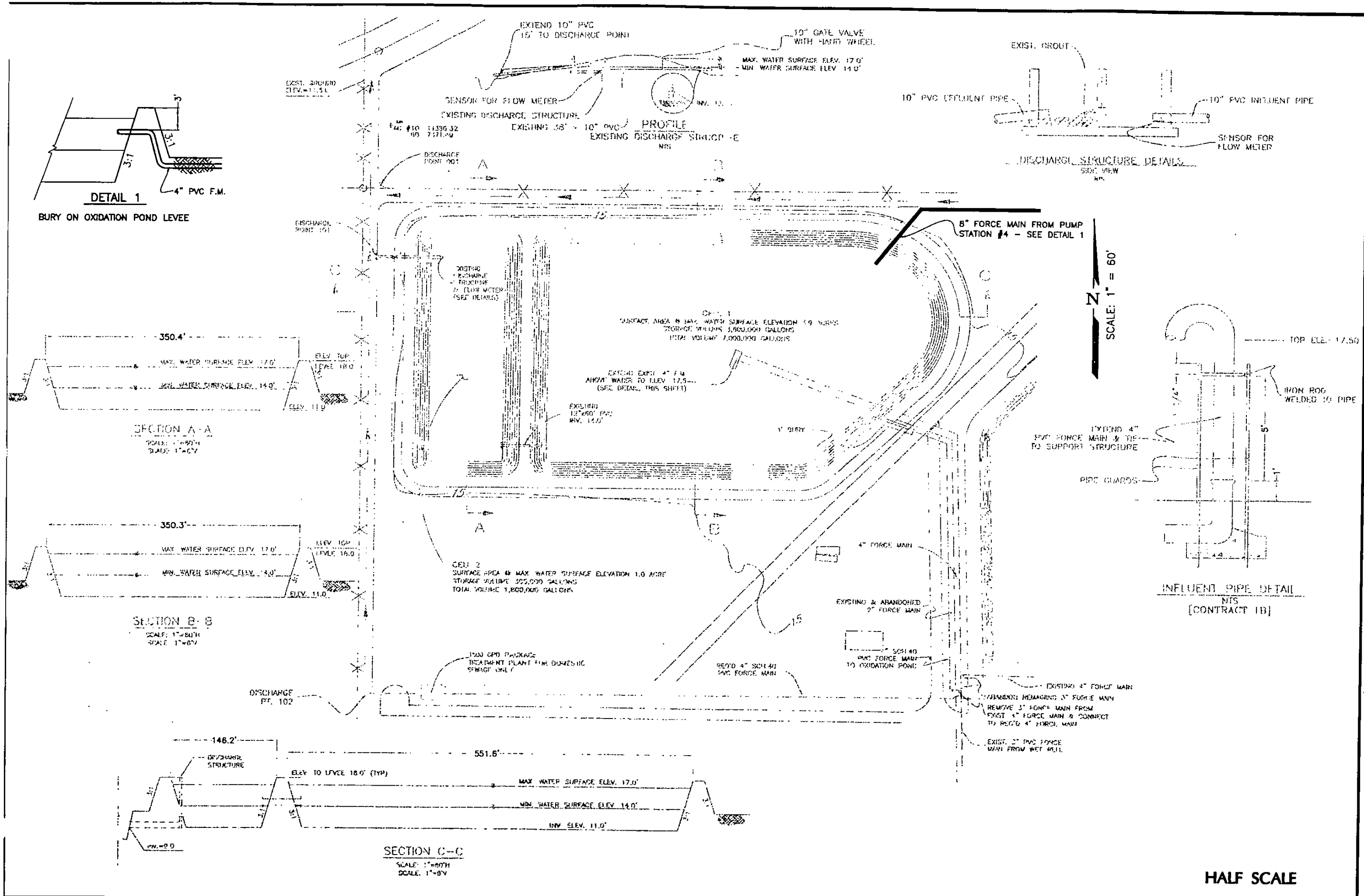
REVISIONS	
DATE	BY
05/08	DMS

SHEET DESCRIPTION
EXHIBIT A:8b

Sellers & Associates, Inc.
ENGINEERS SURVEYORS PLANNERS
Lafayette - Alexandria Louisiana

SUPPLEMENTAL SHEET
CROSS SECTIONS
VERMILION PARISH SOLID WASTE PLANT

ENGINEER	D&S
DRAWN BY	D&S
DATE	2004
SCALE	1" = 100'
PROJECT NO.	5263-27
FILE NO.	PERMIT MOD #9
ACAD. DWG. NO.	5263-27\PERMITS\A8A



STATE OF LOUISIANA
E.M. SELLERS
Reg. No. 6457
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

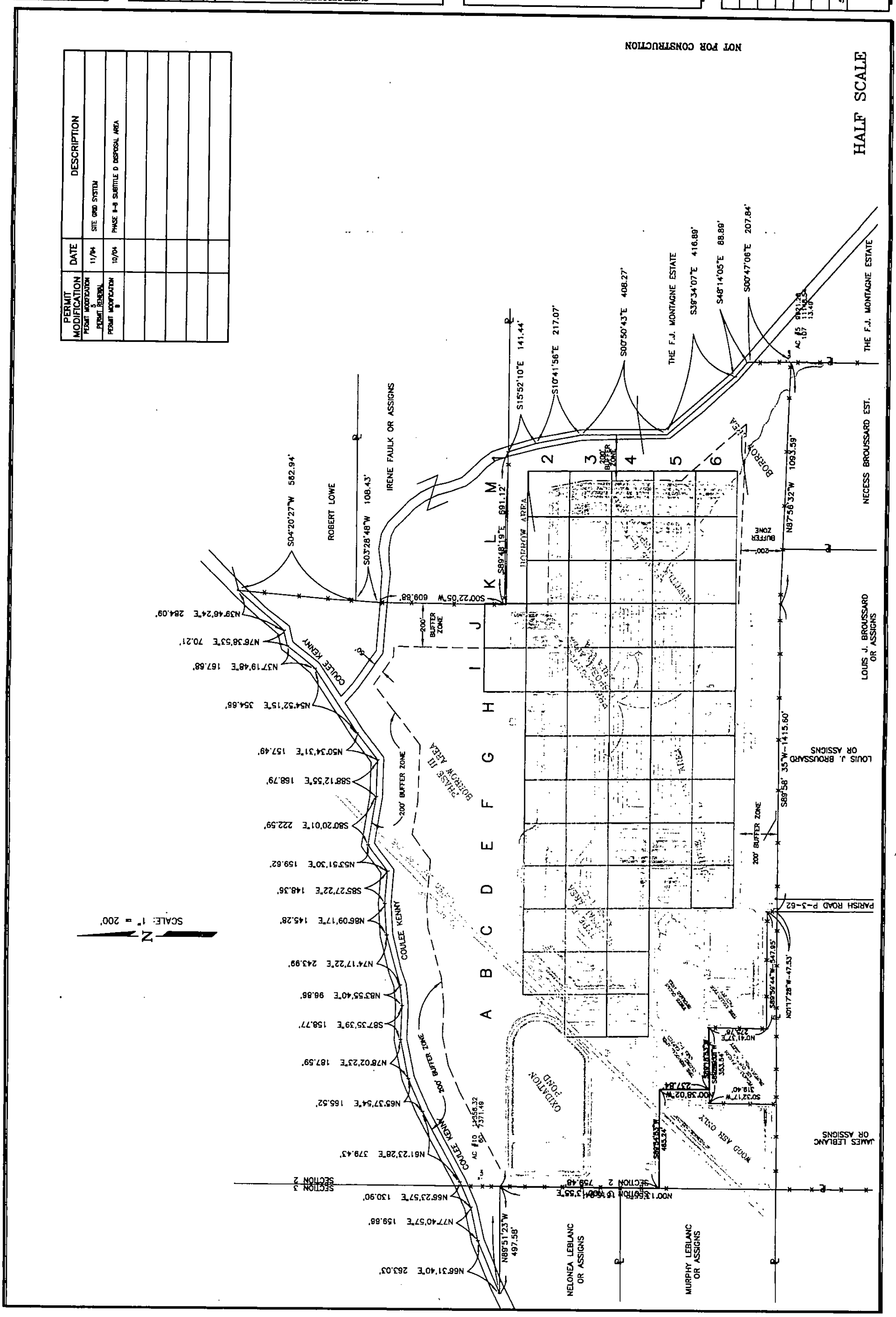
REVISIONS	
DATE	BY
11/96	DM
2/98	DM
10/04	DMS

SHEET DESCRIPTION
EXHIBIT A:9

Sellers & Associates, Inc.
ENGINEERS Lafayette - Abbeville
SURVEYORS
PLANNERS Lafayette

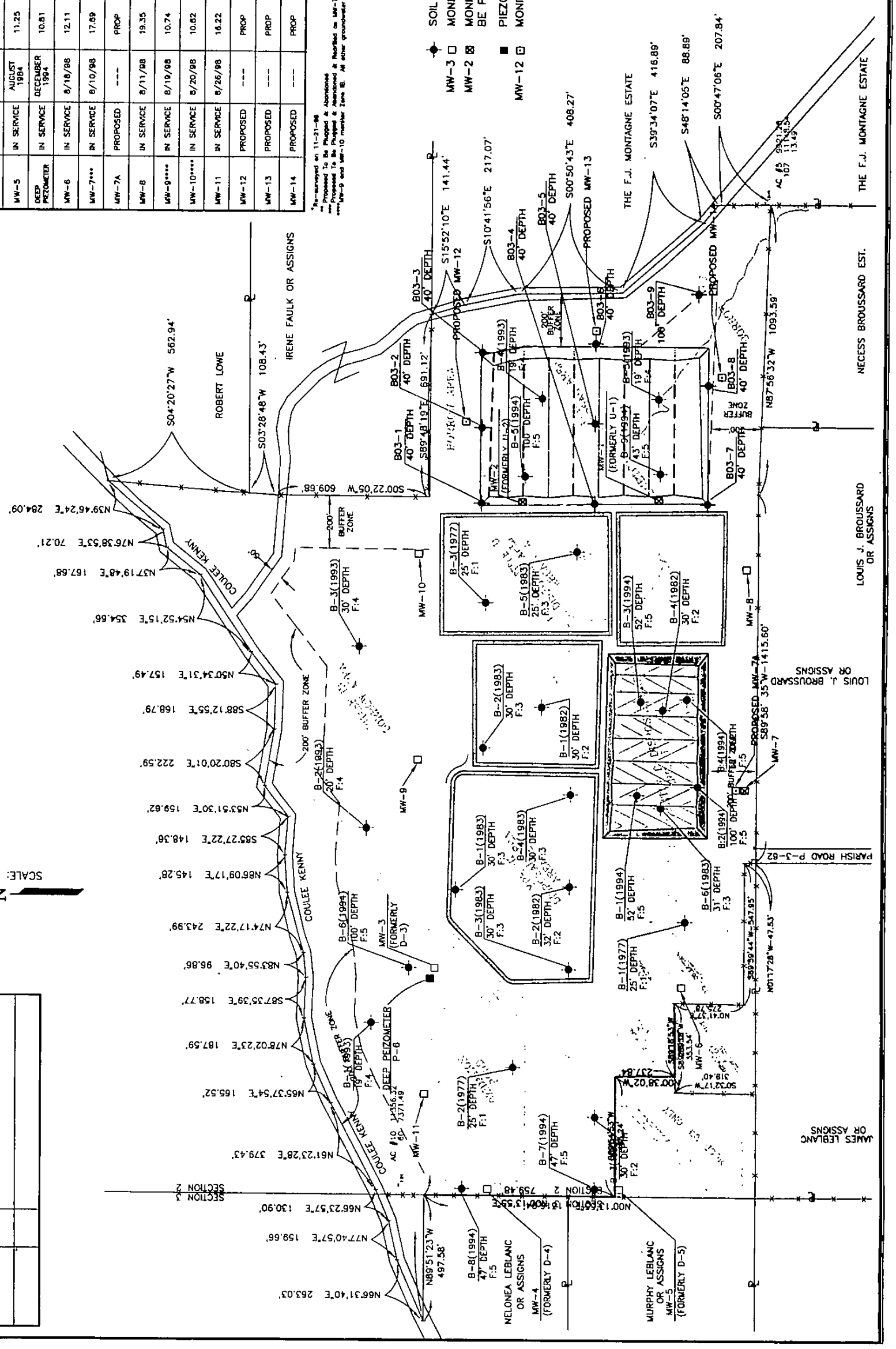
OXIDATION POND
VERMILION PARISH SOLID WASTE PLANT

ENGINEER	EMS
DRAWN BY	DLM
DATE	1994
SCALE	1" = 60'
PROJECT NO.	5263-27
FILE NO.	PERMIT MOD.#9
ACAD. DWG. NO.	5263-27\PERMITS\A9


STATE OF LOUISIANA
E.M. SELLERS
Reg. No. 6457
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING
REVISIONS
DATE BY
11/96 DM
10/04 DMS
SHEET DESCRIPTION
EXHIBIT A-10
Sellers & Associates, Inc.
ENGINEERS SURVEYORS PLANNERS
Lafayette - Abbeville Lockport
SITE GRID SYSTEM
VERMILION PARISH SOLID WASTE PLANT
ENGINEER WSC/DMS
DRAWN BY JFT
DATE 1994
SCALE 1" = 200'
PROJECT NO. 5263-27
FILE NO. P.M.#9
ACAD. DWG. NO. 5263-27\PERMITS\A10
PERMIT MODIFICATION
PERMIT MODIFICATION 5 PERMIT RENEWAL
PERMIT MODIFICATION 6
DATE
11/94
10/04
DESCRIPTION
SITE GRID SYSTEM
PHASE II-B SUBTITLE D DISPOSAL AREA
NOT FOR CONSTRUCTION
HALF SCALE
THE F.J. MONTAGNE ESTATE
S39°34'07"E 416.89'
S46°14'05"E 88.89'
S00°47'06"E 207.84'
S00°50'43"E 408.27'
S15°52'10"E 141.44'
S10°41'56"E 217.07'
S04°20'27"W 582.94'
ROBERT LOWE
S03°28'48"W 108.43'
IRENE FAULK OR ASSIGNS
S89°48'19"E 691.12'
S00°22'05"W 609.68'
200' BUFFER ZONE
NECESS BROUSSARD EST.
N87°58'32"W 1093.59'
LOUIS J. BROUSSARD OR ASSIGNS
S89°58' 35"W-1415.60'
PARISH ROAD P-3-62
N01°17'28"W-47.53'
S89°59'44"W 547.95'
JAMES LEBLANC OR ASSIGNS
COULEE KENNY
N39°46'24"E 284.09'
N76°38'53"E 70.21'
N37°19'48"E 167.68'
N54°52'15"E 354.66'
N50°34'31"E 157.49'
S88°12'55"E 168.79'
S80°20'01"E 222.59'
N57°51'30"E 159.62'
S85°27'22"E 148.36'
N86°09'17"E 145.28'
N74°17'22"E 243.99'
N83°55'40"E 98.86'
S87°35'39"E 158.77'
N78°02'23"E 187.59'
N65°37'54"E 165.52'
N61°23'28"E 379.43'
N66°23'57"E 130.90'
N77°40'57"E 159.88'
N66°31'40"E 263.03'
N89°51'23"W 497.58'
SECTION 2
SECTION 3
NELONEA LEBLANC OR ASSIGNS
MURPHY LEBLANC OR ASSIGNS
OXIDATION POND
WOOD ASH DUST
PHASE III BORROW AREA
BORROW AREA
BUFFER ZONE
A B C D E F G H I J K L M
1 2 3 4 5 6
SCALE 1" = 200'
N

MONITORING WELL	STATUS	DATE INSTALLED	ELEVATION MAT. GROUND (At time of installation-MSL)	ELEVATION TOP PVC RISER PIPE (MSL)*	SCREENED ELEV.(MSL)/ SCREENED DEPTH	DATE ABANDONED
MW-1**	IN SERVICE	AUGUST 1984	18.45	21.65	-22.05 to -32.05/ 40.5 to 50.5	-
MW-2**	IN SERVICE	AUGUST 1984	13.19	15.66	-29.81 to -39.81/ 43 to 53	-
MW-3	IN SERVICE	AUGUST 1984	12.49	15.12	-17.51 to -27.51/ 30 to 40	-
MW-4	IN SERVICE	AUGUST 1984	11.15	14.58	-30.85 to -40.85/ 42 to 52	-
MW-5	IN SERVICE	AUGUST 1984	11.25	13.85	-21.75 to -31.75/ 33 to 43	-
DEEP PIEZOMETER	IN SERVICE	DECEMBER 1994	10.81	16.93	-75.19 to -85.19/ 86 to 96	
MW-6	IN SERVICE	8/18/98	12.11	14.24	-13.76 to -23.76/ 28 to 38	-
MW-7***	IN SERVICE	8/10/98	17.69	19.95	-8.31 to -18.31/ 26 to 36	-
MW-7A	PROPOSED	---	PROP	PROP	-22.3 to -32.3/ 40 to 50	-
MW-8	IN SERVICE	8/11/98	19.35	21.49	-15.65 to -25.65/ 35 to 45	-
MW-9****	IN SERVICE	8/19/98	10.74	12.69	-14.26 to -24.26/ 25 to 35	-
MW-10****	IN SERVICE	8/20/98	10.62	12.72	-17.38 to -27.38/ 28 to 38	-
MW-11	IN SERVICE	8/26/98	16.22	18.16	-11.78 to -21.78/ 28 to 38	-
MW-12	PROPOSED	---	PROP	PROP	-37 to -47/ 40 to 50	-
MW-13	PROPOSED	---	PROP	PROP	-48.5 to -58.5/ 50 to 60	-
MW-14	PROPOSED	---	PROP	PROP	-25.5 to -35.5/ 30 to 40	-

*Re-surveyed on 11-21-98
** Proposed To Be Plugged & Abandoned
*** Proposed To Be Plugged & Abandoned & Replaced as MW-7A
**** MW-9 and MW-10 monitor Zone IB. All other groundwater monitoring wells monitor Zone II-A.



PERMIT MODIFICATION	DATE	DESCRIPTION
PERMIT MODIFICATION 5 PERMIT RENEWAL	11/04	THIS EXHIBIT PREPARED FOR THE PERMIT RENEWAL
PERMIT MODIFICATION 6	10/04	PHASE II-B SUBTITLE D DISPOSAL AREA

STATE OF LOUISIANA
E.M. SELLERS
Reg. No. 8457
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

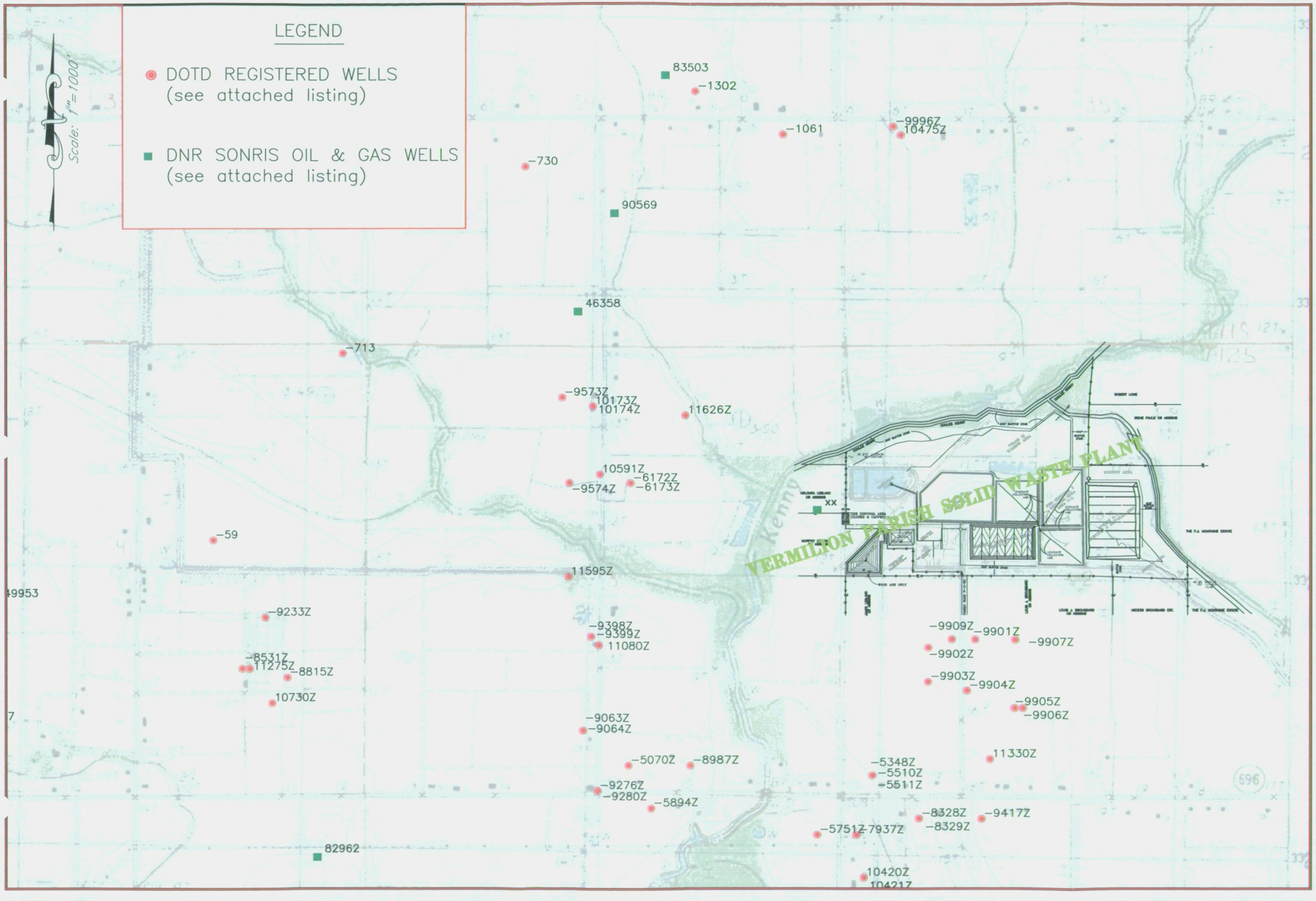
REVISIONS	
DATE	BY
02/97	DM
02/98	DM
10/04	DMS
05/08	DMS

SHEET DESCRIPTION
EXHIBIT A-11

Sellers & Associates, Inc.
ENGINEERS SURVEYORS PLANNERS
Lafayette – Abbeville Lake Charles

SITE PLAN SHOWING
GROUNDWATER MONITORING WELL LOCATIONS
AND BORING LOCATIONS
VERMILION PARISH SOLID WASTE PLANT

ENGINEER WSC/DMS
DRAWN BY JFT
DATE 1994
SCALE 1" = 200'
PROJECT NO. 5263-27
FILE NO. P.M.#9
ACAD. DWG. NO. 5263-27\PERMITS\A11



REVISIONS

DATE	BY

SHEET DESCRIPTION

EXHIBIT A:11a

Sellers & Associates, Inc.
ENGINEERS SURVEYORS PLANNERS
Lafayette – Abbeville Louisiana

SITE PLAN SHOWING
DOTD REGISTERED WELLS &
OIL AND/OR GAS WELLS
VERMILION PARISH SOLID WASTE PLANT

ENGINEER	DMS
DRAWN BY	DMS
DATE	MAY 2007
SCALE	1" = 1000'
PROJECT NO.	5263-27
FILE NO.	P.M.#9
ACAD. DWG. NO.	5263-27\PM-9\NOD\A11A

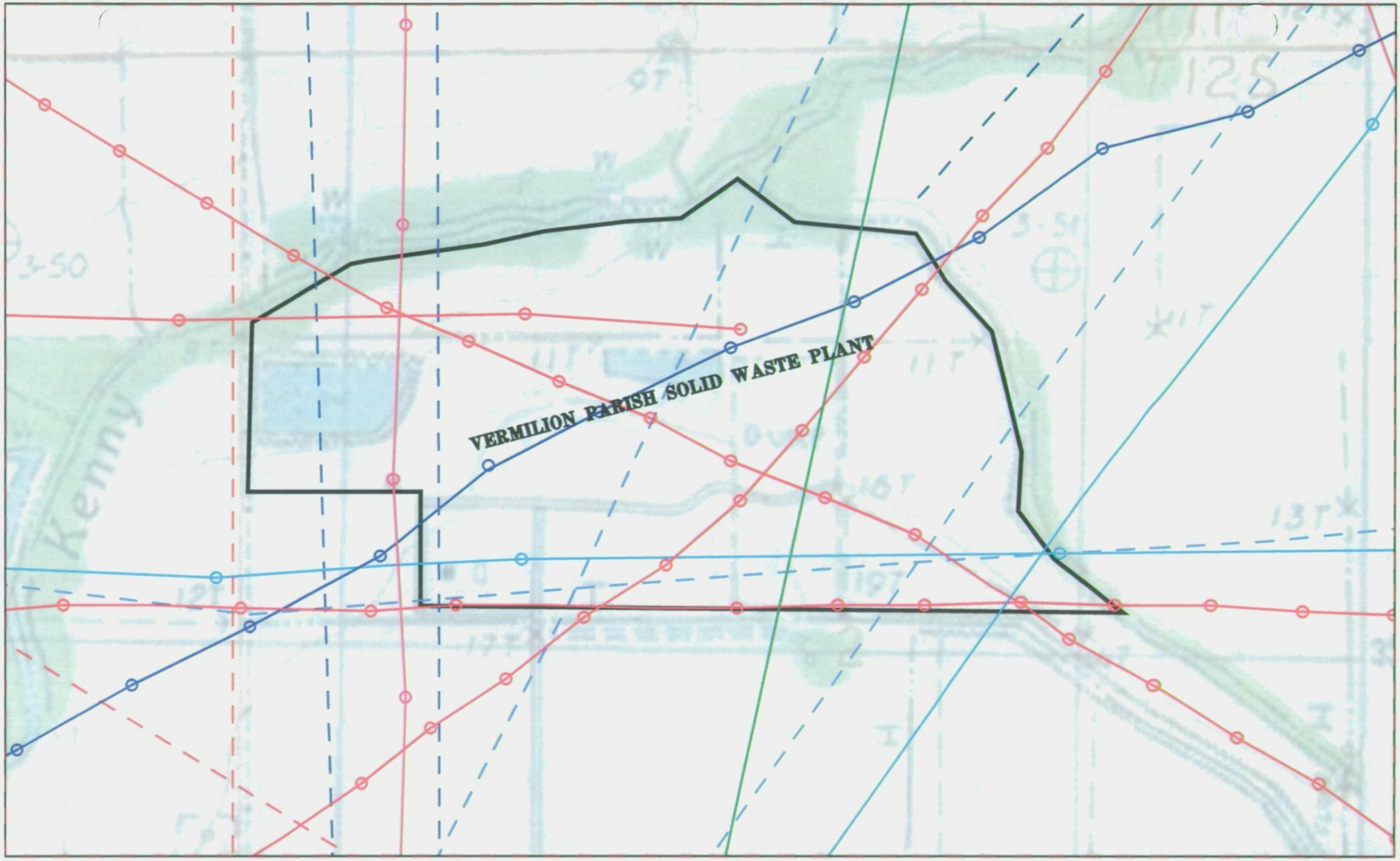


EXHIBIT A:11b

SITE PLAN SHOWING
KNOWN SHOT HOLE LINES

VERMILION PARISH SOLID WASTE PLANT

VERMILION PARISH POLICE JURY

LOCATED IN SECTION 2, T-13-S, R-3-E,
VERMILION PARISH, LOUISIANA

LEGEND

- SEI SPEC
- ARCO/Vostar
- BEAU COUP – Amoco, Burlington; Amerada, Unocal
- MILESTONE – Shell, Exxon (TX)
- MILESTONE II – ChevronTexaco
- LA PEGASUS – Mobil LA & TX
- NATIONAL SEISMIC – Oryx
- SEI – Fina, Nuevo
- CHARGER SEISMIC – EEI
- SEI OIL – KCOT, Saga, HPC
- Non-Prop. – Approx. Location
- Non-Prop. – Approx. Location
- Non-Prop. – Approx. Location

INFORMATION PRESENTED HEREIN WAS OBTAINED FROM SEISMIC EXHCANGE, INC. OF NEW ORLEANS, LA. – 05-04-07

ENGINEER	DRAWN BY	BOOK NO.	PAGE NO.
DMS	DMS	XX	XX
DATE	SCALE	PROJECT NO.	
05/07/07	1"=600'	0000-00	
SURVEY BOOK NO.	Pages	FILE NO.	
00-00	00-00	0-0-00	
ACAD. DWG. NO.		SHEET 00 OF 00	
\DATA\5263-27\A11b			

Sellers & Associates, Inc.
ENGINEERS SURVEYORS PLANNERS
Lafayette – Abbeville Louisiana

PERMIT MODIFICATION	DATE	DESCRIPTION
PERMIT MODIFICATION 5	11/94 (3/97 REV)	GAS MONITORING PROBE LOCATIONS.
PERMIT MODIFICATION 9	10/04	PHASE II-B SUBTITLE D DISPOSAL CELL

NOTES

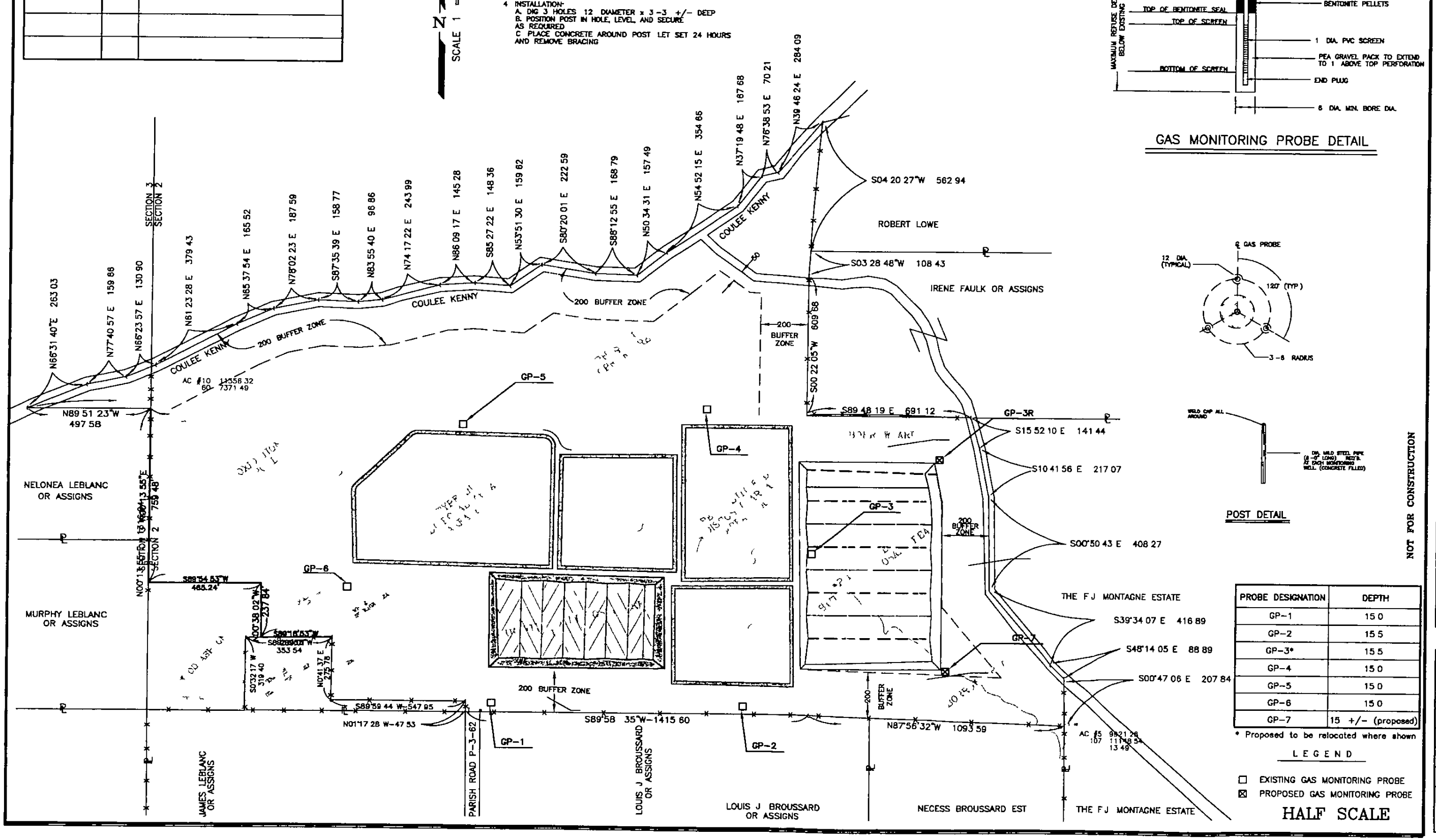
1 IF GEOLOGIC INVESTIGATION REVEALS VERY PERMEABLE STRATA SEPARATED BY DENSE IMPERMEABLE STRATA, SEPARATE MONITORING WELLS SHOULD BE INSTALLED IN EACH STRATA THAT HAS A HIGH PERMEABILITY THE MONITOR WELL SHOULD BE FULLY SCREENED ACROSS EACH PERMEABLE STRATA.

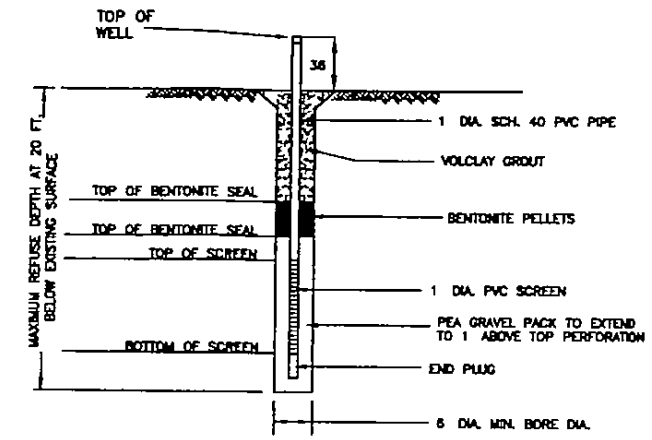
2. ABSOLUTELY NO PVC CEMENT IS TO BE USED ONLY THREADED PVC.

3 POST FINISH
1-COAT ZINC RICH PRIMER
2-COATS ENAMEL PAINT "CATERPILLAR YELLOW OR APPROVED EQUIVALENT

4 INSTALLATION-
A. DIG 3 HOLES 12 DIAMETER x 3-3 +/- DEEP
B. POSITION POST IN HOLE, LEVEL, AND SECURE AS REQUIRED
C PLACE CONCRETE AROUND POST LET SET 24 HOURS AND REMOVE BRACING

N
SCALE 1 = 200





GAS MONITORING PROBE DETAIL

POST DETAIL

NOT FOR CONSTRUCTION

PROBE DESIGNATION	DEPTH
GP-1	15 0
GP-2	15 5
GP-3*	15 5
GP-4	15 0
GP-5	15 0
GP-6	15 0
GP-7	15 +/- (proposed)

* Proposed to be relocated where shown

LEGEND

☐ EXISTING GAS MONITORING PROBE
☒ PROPOSED GAS MONITORING PROBE

HALF SCALE

STATE OF LOUISIANA
E.M. SELLERS
Reg. No. 8457
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

REVISIONS	
DATE	BY
03/97	DM
10/04	DMS

SHEET DESCRIPTION
EXHIBIT A 12

Sellers & Associates Inc
ENGINEERS Lafayette
PLANNERS Lafayette
SURVEYORS Abbeville

SITE PLAN SHOWING
GAS MONITORING PROBE LOCATIONS
VERMILION PARISH SOLID WASTE PLANT

ENGINEER	WSC
DRAWN BY	JFF
DATE	1994
SCALE	1 = 200
PROJECT NO.	5263-27
FILE NO.	PM #9
ACAD DWG. NO	5263-27\PERMITS\A12

Appendix B:3

U.S. Army Corps of Engineers Letter

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT CORPS OF ENGINEERS
PO BOX 60267
NEW ORLEANS LOUISIANA 70160-0267

REPLY TO
ATTENTION OF

January 9, 2008

Operations Division
Surveillance and Enforcement Section

Ms Dana Simon
Sellers & Associates, Inc
148B Easy St
Lafayette, LA 70506-3095

Dear Ms Simon

Reference is made to your request, on behalf of Vermilion Parish Police Jury, for a U S Army Corps of Engineers' (Corps) jurisdictional determination on property located in Section 2, Township 12 South, Range 3 East, Vermilion Parish, Louisiana (enclosed map) Specifically, this site is identified as the Vermilion Parish Solid Waste Plant

Based on review of recent maps, aerial photography, and soils data, we have determined that there are jurisdictional wetlands within 1,000 feet of the subject site A Department of the Army permit under Section 404 of the Clean Water Act will be required prior to the deposition or redistribution of dredged or fill material into this wetland Additionally, a DA permit will be required if you propose to deposit dredged or fill material into Coulee Kenny

This delineation/determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in your request This delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended If the property owner or tenant is a USDA farm participant, or anticipates participation in USDA programs, a certified wetland determination should be requested from the local office of the Natural Resources Conservation Service prior to starting work

You and your client are advised that this approved jurisdictional determination is valid for a period of 5 years from the date of this letter unless new information warrants revision prior to the expiration date or the District Engineer has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis

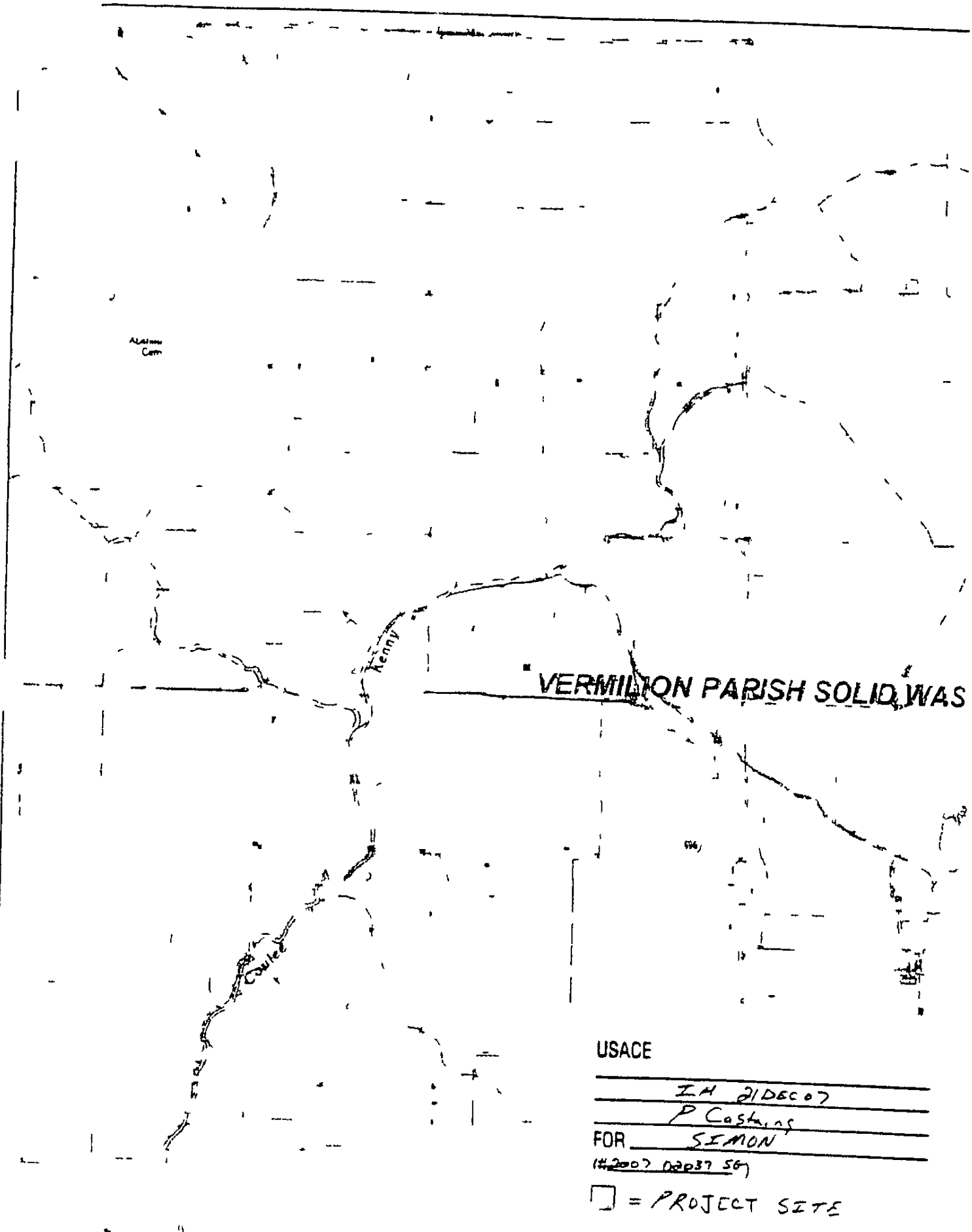
Should there be any questions concerning these matters, please contact Mr Pierre Castaing at (504) 862-1726 and reference our Account No MVN-2007 02037-SG If you have specific questions regarding the permit process or permit applications, please contact our Western Evaluation Section at (504) 862-1950 To obtain a customer service survey form, please visit our website at https //www mvn usace army mil/ops/regulatory/Cust_surv HTM

Sincerely,

John Berg

for Pete J Serio
Chief, Regulatory Branch

Enclosures



Name LEROY
Date 5 16/2007
Scale 1 inch equals 2000 feet

Location 030 0 19 33 N 092 08 1 36 W
Caption VERMILION PARISH SOLID WASTE PLANT

Appendix B:5

Louisiana Pollutant Discharge Elimination System Permit

PERMIT NUMBER LA0056031
AGENCY INTEREST NO AI 148
PER20000001

OFFICE OF ENVIRONMENTAL SERVICES

Water Discharge Permit

Pursuant to the Clean Water Act, as amended (33 U S C 1251 et seq), and the Louisiana Environmental Quality Act, as amended (La R. S 30 2001 et seq), rules and regulations effective or promulgated under the authority of said Acts, and in reliance on statements and representations heretofore made in the application, a Louisiana Pollutant Discharge Elimination System permit is issued authorizing

Vermilion Parish Police Jury
Vermilion Parish Solid Waste Plant
Courthouse Building – 100 N State St , Suite 200
Abbeville, 70510

Type Facility	existing municipal nonhazardous solid waste landfill serving Vermilion Parish
Location	the end of Birch Road, off La. Hwy 696 in Abbeville, Vermilion Parish
Receiving Waters	open ditch, thence into Coulee Kenny, thence into the Vermilion River

to discharge in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, and III attached hereto

This permit shall become effective on October 1, 2004

This permit and the authorization to discharge shall expire five (5) years from the effective date of the permit

Issued on September 15, 2004

Karen K. Gautreaux
Deputy Secretary

GALVEZ BUILDING 602 N FIFTH STREET P O BOX 4313 BATON ROUGE LA 70821 4313 PHONE (225) 219 3181

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning the effective date of the permit and lasting through the expiration date of the permit the permittee is authorized to discharge from

Outfall 101 at the west end of the oxidation pond Latitude 30°01 52 North Longitude 92°08 26 West treated leachate washwater and treated contact stormwater estimated flow is 0 02 MGD)

Such discharges shall be limited and monitored by the permittee as specified below

Effluent Characteristic	Storet Code	Discharge Limitations (lbs/day) Monthly Avg	Discharge Limitations other units (specify) Monthly Avg	Discharge Limitations other units (specify) Daily Max	Monitoring Requirements Measurement Frequency [1]	Monitoring Requirements Sample Type
Flow-MGD	50050	—	Report	Report	Estimate	1/day
BOD_5	00310	—	20 mg/l	30 mg/l	1/month	Grab
TSS	00530	—	90 mg/l	135 mg/l	1/month	Grab
Ammonia Nitrogen	00610	—	4 9mg/l	10 mg/l	1/month	Grab
Fecal Coliform 'onies/100ml [2]	74055	—	200	400	1/month	Grab
,tes	01007	—	—	250 mg/l	1/month	Grab
(ides	01002	—	—	250 mg/l	1/month	Grab
Dissolved oxygen [3]	00300	—	Report mg/l	N/A	1/month	Grab
pH (Standard Units) [4]	00400	—	—	—	1/month	Grab
Pollutant Scan [5]	57168	—	—	—	1/6 months	Grab
	Storet Code	(lbs/day) Monthly Avg	other units (specify) Monthly Avg	other units (specify) Daily Max	Measurement Frequency	Sample Type
Alpha Terpineol	51045	—	0 016 mg/l	0 033 mg/l	1/Quarter	Grab
Benzoic Acid	77247	—	0 071 mg/l	0 12 mg/l	1/Quarter	Grab
p-Cresol	77146	—	0 014 mg/l	0 025 mg/l	1/Quarter	Grab
Zinc	01092	—	0 11 mg/l	0 20 mg/l	1/Quarter	Grab
Phenol	34694	—	0 015 mg/l	0 026 mg/l	1/Quarter	Grab

1/ When discharging

2/ See Part II Section A, Paragraph 7

3/ Report average of daily discharges over a calendar month When monitoring is conducted the dissolved oxygen shall be analyzed immediately as per 40 CFR 136 3

4/ The pH shall not be less than 6 0 standard units nor greater than 9 0 standard units The permittee shall report on the Discharge Monitoring Reports both the minimum and maximum instantaneous pH values measured

5/ See Part II Section B Priority Scan

There shall be no discharge of floating solids or visible foam in other than trace amounts

Sar- -s taken in compliance with the monitoring requirements specified above shall be taken at the following location

Ot 101 at the point of discharge from the last treatment unit prior to mixing with other waters

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning the effective date of the permit and lasting through the expiration date of the permit the permittee is authorized to discharge from

Outfall 102 along the west side of the facility Latitude 30°01 45 North Longitude 92°08 26 West treated sanitary wastewater estimated flow is 0 002 MGD)

Such discharges shall be limited and monitored by the permittee as specified below

Effluent Characteristic	Storet Code	Discharge Limitations (lbs/day) Monthly Avg	Discharge Limitations other units (specify) Monthly Avg	Discharge Limitations other units (specify) Weekly Avg	Monitoring Requirements Measurement Frequency [1]	Monitoring Requirements Sample Type
Flow MGD	50050	—	Report	Report	Estimate	1/day
BOD_5	00310	—	—	45 mg/l	1/6 months	Grab
TSS	00530	—		45 mg/l	1/6 months	Grab
Fecal Coliform Colonies/100ml [2]	74055	—	200	400	1/6 months	Grab
pH (Standard Units)[3]	00400	—		—	1/6 months	Grab

1/ When discharging
2/ See Part II Section A Paragraph 7
3/ The pH shall not be less than 6 0 standard units nor greater than 9 0 standard units The permittee shall report on the Discharge Monitoring Reports both the minimum and maximum instantaneous pH values measured

There shall be no discharge of floating solids or visible foam in other than trace amounts

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location

Outfall 102 at the point of discharge from the last treatment unit prior to mixing with other waters

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning the effective date of the permit and lasting through the expiration date of the permit the permittee is authorized to discharge from

Outfall 001 northwest corner of the facility after outfall 101 and 102 Latitude 30°01 54 North Longitude 92°08 27 West treated leachate treated washwater and treated contact stormwater from outfall 101 treated sanitary wastewater from outfall 102 and non contact stormwater runoff (estimated flow is 0 0935 MGD)

Such discharges shall be limited and monitored by the permittee as specified below

Effluent Characteristic	Storet Code	Discharge Limitations (lbs/day) Monthly Avg	Discharge Limitations other units (specify) Monthly Avg	Discharge Limitations other units (specify) Daily Max	Monitoring Requirements Measurement Frequency [1]	Monitoring Requirements Sample Type
Flow-MGD	50050	—	Report	Report	1/day	Estimate
TOC	00082	-	—	50 mg/l	1/month	Grab
Oil&grease	00552	—	—	15 mg/l	1/month	Grab
T[illegible]	00530	—	—	Report mg/l	1/month	Grab
[illegible] Recoverable Iron	01045	—	—	Report mg/l	1/month	Grab
p [illegible]tandard Units) [2]	00400	—	—	—	1/month	Grab

QUALITY (PERCENT% UNLESS STATED)

		30 Day Avg Min	7 Day Min	Measurement Frequency [3]	Sample Type
Biomonitoring [5]	22414				
Ceriodaphnia dubia					
STORET TLP3B[4]		Report	Report	1/Quarter	24 Hr Composite
STORET TOP3B		Report	Report	1/Quarter	24 Hr Composite
STORET TPP3B		Report	Report	1/Quarter	24 Hr Composite
STORET TGP3B		Report	Report	1/Quarter	24-Hr Composite
STORET TQP3B		Report	Report	1/Quarter	24 Hr Composite
Pimephales promelas					
STORET TLP6C[4]		Report	Report	1/Quarter	24 Hr Composite
STORET TOP6C		Report	Report	1/Quarter	24-Hr Composite
STORET TPP6C		Report	Report	1/Quarter	24-Hr Composite
STORET TGP6C		Report	Report	1/Quarter	24 Hr Composite
STORET TQP6C		Report	Report	1/Quarter	24-Hr Composite

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

If a test failure has occurred and the required retests have been performed the test results are to be reported on the DMR as follows

Whole Effluent Toxicity Testing

	Storet Code	Monthly Avg Minimum	7 Day Minimum	Measurement Frequency	Sample Type
Retest #1	22415	Report[4/]	Report[4/]	As required	24-hr composite
Retest #2	22416	Report[4/]	Report[4/]	As required	24 hr composite

1/ When discharging

2/ The pH shall not be less than 6 0 standard units nor greater than 9 0 standard units The permittee shall report on the Discharge Monitoring Reports both the minimum and maximum instantaneous pH values measured

3/ Because the Environmental Protection Agency has changed its policy on the minimum WET testing frequency requirements it is recommended that the biomonitoring frequency remain as once per quarter per species If there are no significant lethal or sublethal effects demonstrated at or below the critical dilution during the first four quarters of testing the permittee may certify fulfillment of the WET testing requirements in writing to the permitting authority and WET testing may be reduced to not less than once per six months for the more sensitive species and not less than once per year for the less sensitive species for the remainder of the life of the permit If toxicity is demonstrated in future testing confirmation test is required A TRE is required upon confirmation of significant lethal effects and the permitting authority may require a TRE for repeated toxic incidents demonstrating lethal and/or sub lethal effects

If during the first four quarters of WET testing there is a significant lethal effect demonstrated at or below the critical dilution the permittee must perform two monthly toxicity confirmation tests for the affected species during the next two consecutive months If either confirmation test demonstrates toxicity at or below the critical dilution a TRE is required If neither confirmation test demonstrates toxicity the testing frequency returns to once per quarter and a decrease in WET testing frequency is not allowed for that species

If during the initial testing period there are no significant lethal effects demonstrated but a sub-lethal effect is demonstrated at or below the critical dilution the permittee must perform two monthly confirmation tests for the affected species during the next two consecutive months If more than one sub-lethal effect is demonstrated during the initial testing period the permittee must continue quarterly testing for the affected species until no sub lethal effects are demonstrated for four consecutive quarters of testing Upon demonstration of no significant sub lethal effects for four consecutive quarters the toxicity testing frequency for the affected species may be reduced to not less than once per six months

4/ Species Quality Reporting Units Pass = 0 Fail = 1

5/ See Part II Section D Whole Toxicity Toxicity Testing

There shall be no discharge of floating solids or visible foam in other than trace amounts

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location

all 001 at the point of discharge prior to mixing with other waters

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning the effective date of the permit and lasting through the expiration date of the permit the permittee is authorized to discharge from

Outfall 002 located in the northeastern corner of the facility Latitude 30°02 20 North Longitude 92°07 55 non-contact stormwater (estimated flow is 0 02 MGD)
Outfall 003 located in the southeast corner of the facility Latitude 30°01 43 North Longitude 92°07 42 non-contact stormwater (estimated flow is 0 02 MGD)

Such discharges shall be limited and monitored by the permittee as specified below

Effluent Characteristic	Storet Code	Discharge Limitations (lbs/day) Monthly Avg	Discharge Limitations other units (specify) Monthly Avg	Discharge Limitations other units (specify) Daily Max	Monitoring Requirements Measurement Frequency[1/]	Monitoring Requirements Sample Type
Flow MGD	50050	—	Report	Report	Estimate	1/day
TOC	00082	—	—	50 mg/l	1/month	Grab
Oil&grease	00552	—	—	15 mg/l	1/month	Grab
	00530	—	—	Report mg/l	1/month	Grab
[illegible] Recoverable Iron	01045	—	—	Report mg/l	1/month	Grab
F [illegible] standard Units) [2/]	00400	—	—	—	1/month	Grab

1/ When discharging

2/ The pH shall not be less than 6 0 standard units nor greater than 9 0 standard units The permittee shall report on the Discharge Monitoring Reports both the minimum and maximum instantaneous pH values measured

There shall be no discharge of floating solids or visible foam in other than trace amounts

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location

Outfall 002 and 003 at the point of discharge prior to mixing with other waters

PART II

OTHER REQUIREMENTS

In addition to the standard conditions required in all permits and listed in Part III, the office has established the following additional requirements in accordance with the Louisiana Water Quality Regulations

SECTION A GENERAL STATEMENTS

1 The Department of Environmental Quality reserves the right to impose more stringent discharge limitations and/or additional restrictions in the future to maintain the water quality integrity and the designated uses of the receiving water bodies based upon additional water quality studies and/or TMDL's The DEQ also reserves the right to modify or revoke and reissue this permit based upon any changes to established TMDL's for this discharge or to accommodate for pollutant trading provisions in approved TMDL watersheds as requested by the permittee and/or as necessary to achieve compliance with water quality standards Therefore, prior to upgrading or expanding this facility, the permittee should contact the Department to determine the status of the work being done to establish future effluent limitations and additional permit conditions

2 This permit does not in any way authorize the permittee to discharge a pollutant not listed or quantified in the application or limited or monitored for in the permit

Authorization to discharge pursuant to the conditions of this permit does not relieve the permittee of any liability for damages to state waters or private property For discharges to private land, this permit does not relieve the permittee from obtaining proper approval from the landowner for appropriate easements and rights of way

4 For definitions of monitoring and sampling terminology see Part III, Section F

5 <u>24 hour Oral Reporting Daily Maximum Limitation Violations</u>

Under the provisions of Part III Section D 6 e (3) of this permit, violations of daily maximum limitations for the following pollutants shall be reported orally to the Office of Environmental Compliance within 24 hours from the time the permittee became aware of the violation followed by a written report in five days

Pollutants None

6 The permittee shall achieve compliance with the effluent limitations and monitoring requirements specified for discharges in accordance with the following schedule

EFFECTIVE DATE OF THE PERMIT

7 Please be aware, concentrations of Total Residual Chlorine above 0 01 mg/L can cause or contribute to significant toxicity in receiving streams and biomonitoring testing It is the permittee's responsibility to assure that no Total Residual Chlorine remains in the effluent after dechlorination in order to prevent toxicity in the receiving stream and in whole effluent toxicity testing

OTHER REQUIREMENTS (continued)

8 Monitoring results must be reported on a Discharge Monitoring Report (DMR) form (EPA No 3320 1 or an approved substitute) All monitoring reports must be retained for a period of at least three (3) years from the date of the sample measurement The permittee shall make available to this Department upon request, copies of all monitoring data required by this permit

If there is a no discharge event at any of the monitored outfall(s) during the sampling period, place an X" in the NO DISCHARGE box located in the upper right corner of the Discharge Monitoring Report

Monitoring results for each month shall be summarized on a Discharge Monitoring Report (DMR) Form (one DMR Form per month) and submitted to the Office of Environmental Compliance on a quarterly basis The schedule for quarterly DMR submission is as follows

Monitoring Period	DMR Due Date
January February March	April 28th
April May June	July 28th
July, August, September	October 28th
October, November, December	January 28th

The original DMR signed and certified as required by LAC 33 IX 2503 B, and all other reports required by this permit shall be submitted to the Permits Compliance Unit, and a copy of the DMR and all other reports required by this permit shall also be submitted to the appropriate LDEQ regional office at the following addresses

Department of Environmental Quality
Office of Environmental Compliance
Enforcement Division
Post Office Box 4312
Baton Rouge, Louisiana 70821 4312
Attention Permit Compliance Unit

Acadiana Regional Office
Office of Environmental Compliance
Surveillance Division
111 New Center Drive
Lafayette, LA 70508

OTHER REQUIREMENTS (continued)

SECTION B POLLUTANT SCAN

This Office has established a list of priority pollutants with threshold values intended as action levels **Should a substance exceed the level of the established value in Part II Section B 3 the permittee shall notify the Office of Environmental Services of the exceedance, in writing, within five (5) days At this time the Vermilion Parish Police Jury – Vermilion Parish Solid Waste Plant shall institute a study to determine the source of the exceedance Within sixty (60) days of the written notification the permittee shall submit a written account of the nature of the study, and measures being taken to secure abatement Failure to comply with any provision of this paragraph shall constitute a violation of this permit** The Department reserves the right to establish effluent limitations for any of the parameters listed below based upon the results of submitted analyses

1 40 CFR Part 136 Analytical Requirements

Unless otherwise specified in this permit, monitoring shall be conducted according to analytical, apparatus and materials, sample collection, preservation, handling, etc , procedures listed at 40 CFR Part 136 in effect on the effective date of this permit Appendices A B and C to Part 136 are specifically referenced as part of this requirement Amendments to 40 CFR Part 136 promulgated after the effective date of this permit shall supersede these requirements as applicable The permittee may use other EPA approved test methods that provide more sensitive test results than those referenced in the permit

2 Minimum Quantification Levels

If any individual analytical test result is less than the minimum quantification level (MQL) listed below, a value of zero (0) may be used as the test result for those parameters for the Discharge Monitoring Report (DMR) calculations and reporting requirements

3 Priority Pollutant List

Chemical	Threshold Value ug/l	MQL Required ug/l	Test Method Required
METALS, CYANIDE AND TOTAL PHENOLS			
Antimony	600	60	200 7
Arsenic	100	10	206 2
Beryllium	100	5	200 7

OTHER REQUIREMENTS (continued)

Chemical	Threshold Value ug/l	MQL Required ug/l	Test Method Required
METALS CYANIDE, AND TOTAL PHENOLS (continued)			
Cadmium	1 86	1	213 2
Chromium III	100	10	200 7
Chromium VI	16	10	200 7
Copper	22	10	220 2
Cyanide	9	20	335 2
Lead	7	5	239 2
Mercury	0 049	0 2	245 1
Nickel (Freshwater)	371	40	200 7
Selenium	100	5	270 2
Silver	100	2	272 2
Thallium	100	10	279 2
Zinc	100	20	289 2
Total Phenols**	50	5	420 1
VOLATILE COMPOUNDS			
Acrolein	100	50	624
Acrylonitrile	100	50	624

OTHER REQUIREMENTS (continued)

Chemical	Threshold Value ug/l	MQL Required ug/l	Test Method Required
VOLATILE COMPOUNDS (continued)			
Benzene	30	10	624
Bromodichloromethane	8	10	624
Bromoform	83	10	624
Carbon Tetrachloride	3	10	624
Chlorobenzene	100	50	624
Chloroethane	100	10	624
2 Chloroethyl vinyl ether	100	50	624
Chloroform	100	10	624
Dibromochloromethane	12	10	624
1,1 Dichloroethane	100	10	624
1 2 Dichloroethane	16	10	624
1,1 Dichloroethylene {1,1 dichloroethene}	1	10	624
1 2 Dichloropropane	100	10	624
1,3-Dichloropropene {1 3 Dichloropropylene}	100	10	624
Ethylbenzene	100	10	624

OTHER REQUIREMENTS (continued)

Chemical	Threshold Value ug/l	MQL Required ug/l	Test Method Required
VOLATILE COMPOUNDS (continued)			
Methyl Bromide {Bromomethane}	100	50	624
Methyl Chloride {Chloromethane}	100	50	624
Methylene Chloride	4	20	624
1 1 2,2 Tetra-chloroethane	100	10	624
Tetrachloroethylene	6	10	624
Toluene	100	10	624
1,2 trans Dichloroethylene {1 2 dichloroethene}	100	10	624
1,1 1 Trichloroethane	100	10	624
1 1,2 Trichloroethane	16	10	624
Trichloroethylene {Trichloroethene}	50	10	624
Vinyl Chloride	85	10	624
ACID COMPOUNDS			
2 Chlorophenol {o-Chlorophenol}	100	10	625
2,4 Dichlorophenol	100	10	625

OTHER REQUIREMENTS (continued)

Chemical	Threshold Value ug/l	MQL Required ug/l	Test Method Required
ACID COMPOUNDS (continued)			
2,4 Dimethylphenol	100	10	625
2 4 Dinitrophenol	100	50	625
4,6 Dinitro o-Cresol {4,6 Dinitro-o phenol} {4,6 Dinitro 2 methyl phenol}	100	50	625
2 Nitrophenol	100	20	625
4 Nitrophenol	100	50	625
P Chloro M Cresol	100	10	625
Pentachlorophenol	100	50	625
Phenol	100	10	625
2 4 6 Trichlorophenol	100	10	625
PESTICIDES			
Aldrin	0 0009	0 05	608
Chlordane	0 0005	0 2	608
DDD	0 0006	0 1	608
DDE	0 0005	0 1	608

OTHER REQUIREMENTS (continued)

Chemical	Threshold Value ug/l	MQL Required ug/l	Test Method Required
PESTICIDES (continued)			
DDT	0 0005	0 1	608
Dieldrin	0 0001	0 1	608
Endosulfan-α	0 056*	0 1	608
Endosulfan-β	0 056*	0 1	608
Total Endosulfan	0 109	0 1	608
Endosulfan sulfate	10	0 1	608
Endrin	0 062	0 1	608
Endrin aldehyde	10	0 1	608
Heptachlor	0 0002	0 05	608
Heptachlor Epoxide	10	0 05	608
Hexachlorocyclohexane α (BHC α)	10	0 05	608
Hexachlorocyclohexane β (BHC β)	10	0 05	608
Hexachlorocyclohexane δ (BHC δ)	10	0 05	608
Hexachlorocyclohexane γ (Lindane)	0 35	0 05	608
Total PCB's	There shall be no discharge of polychlorinated biphenyls (PCB s)		

OTHER REQUIREMENTS (continued)

Chemical	Threshold Value ug/l	MQL Required ug/l	Test Method Required
Toxaphene	0 0003	5 0	608
BASE/NEUTRAL COMPOUNDS			
Acenaphthene	100	10	625
Acenapthylene	100	10	625
Anthracene	100	10	625
Benzidene	100	50	625
Benzo(a)anthracene	100	10	625
3,4 Benzofluoranthene {Benzo(b)fluoranthene}	100	10	625
Benzo(k)fluoranthene	100	10	625
Benzo(a)pyrene	100	10	625
Benzo(ghi)perylene	100	20	625
Benzyl butyl Phthalate {Butyl benzyl Phthalate}	100	10	625
Bis(2 chloroethyl) ether	100	10	625
Bis(2 chloroethoxy) methane	100	10	625
Bis(2 ethylhexyl) Phthalate	100	10	625

OTHER REQUIREMENTS (continued)

Chemical	Threshold Value ug/l	MQL Required ug/l	Test Method Required
BASE/NEUTRAL COMPOUNDS (continued)			
Bis(2 chloroisopropyl) ether	100	10	625
4 Bromophenyl phenyl ether	100	10	625
2 Chloronaphthalene	100	10	625
4 Chlorophenyl phenyl ether	100	10	625
Chrysene	100	10	625
Dibenzo (a,h) anthracene	100	20	625
Di n Butyl Phthalate	100	10	625
1,2 Dichlorobenzene	100	10	625
1 3 Dichlorobenzene	100	10	625
1,4 Dichlorobenzene {p Dichlorobenzene}	100	10	625
3 3 Dichlorobenzidine	100	50	625
Diethyl Phthalate	100	10	625
Dimethyl Phthalate	100	10	625
2 4 Dinitrotoluene	100	10	625

OTHER REQUIREMENTS (continued)

Chemical	Threshold Value ug/l	MQL Required ug/l	Test Method Required
BASE/NEUTRAL COMPOUNDS (continued)			
2 6 Dinitrotoluene	100	10	625
Di n octyl Phthalate	100	10	625
1,2-Diphenylhydrazine	100	20	625
Fluoranthene	100	10	625
Fluorene	100	10	625
Hexachlorobenzene	0 0006	10	625
Hexachlorobutadiene	0 26	10	625
Hexachlorocyclopentadiene	100	10	625
Hexachloroethane	100	20	625
Ideno (1 2 3 cd) pyrene	100	20	625
Isophorone	100	10	625
Naphthalene	100	10	625
Nitrobenzene	100	10	625
N nitrosodimethylamine	100	50	625
N nitrosodiphenylamine	100	20	625
N nitrosodi n propylamine	100	20	625

OTHER REQUIREMENTS (continued)

Chemical	Threshold Value ug/l	MQL Required ug/l	Test Method Required
Phenanthrene	100	10	625
Pyrene	100	10	625
1,2,4-Trichlorobenzene	100	10	625

5 Effluent Specific Minimum Quantification Levels

The permittee may develop an effluent specific method detection limit (MDL) in accordance with Appendix B to 40 CFR Part 136 For any pollutant for which the permittee determines an effluent specific MDL the permittee shall send the Department of Environmental Quality a report containing the QA/QC documentation, analytical results and calculations necessary to demonstrate that the effluent MDL was correctly calculated An effluent specific MQL shall be determined in accordance with the following calculation

$$MQL = 3\ 3 \times MDL$$

Upon written approval from DEQ, the effluent specific MQL may be utilized by the permittee for all future Discharge Monitoring Report (DMR) calculations and reporting requirements

OTHER REQUIREMENTS (continued)

SECTION C STORMWATER PROVISIONS

STORMWATER DISCHARGES

A This section applies to all stormwater discharges from the facility, either through permitted outfalls or through outfalls which are not listed in the permit or as sheet flow

B Any runoff leaving the developed areas of the facility, other than the permitted outfall(s), exceeding 50 mg/L TOC, 15 mg/L Oil and Grease, or having a pH less than 6 0 or greater than 9 0 standard units shall be a violation of this permit Any discharge in excess of these limitations, which is attributable to offsite contamination shall not be considered a violation of this permit A visual inspection of the facility shall be conducted and a report made annually as described in Paragraph 4 below

C The permittee shall prepare implement, and maintain a Storm Water Pollution Prevention Plan (SWP3) within six (6) months of the effective date of the final permit The terms and conditions of the SWP3 shall be an enforceable Part of the permit EPA document 833 R 92 002 (Storm Water Management for Industrial Activities) may be used as a guidance and may be obtained by writing to the U S Environmental Protection Agency, Office of Water Resources (RC 4100), 401 M Street, S W , Washington D C 20460 or by calling (202) 260 7786

D The following conditions are applicable to all facilities and shall be included in the SWP3 for the facility

1 The permittee shall conduct an annual inspection of the facility site to identify areas contributing to the storm water discharge from developed areas of the facility and evaluate whether measures to reduce pollutant loadings identified in the SWP3 are adequate and have been properly implemented in accordance with the terms of the permit or whether additional control measures are needed

2 The permittee shall develop a site map which includes all areas where stormwater may contact potential pollutants or substances which can cause pollution Any location where reportable quantities leaks or spills have previously occurred are to be documented in the SWP3 The SWP3 shall contain a description of the potential pollutant sources, including, the type and quantity of material present and what action has been taken to assure stormwater precipitation will not directly contact the substances and result in contaminated runoff

OTHER REQUIREMENTS (continued)

3 Where experience indicates a reasonable potential for equipment failure (e g a tank overflow or leakage), natural condition of (e g precipitation), or other circumstances which result in significant amounts of pollutants reaching surface waters, the SWP3 should include a prediction of the direction, rate of flow and total quantity of pollutants which could be discharged from the facility as a result of each condition or circumstance

4 The permittee shall maintain for a period of three years a record summarizing the results of the inspection and a certification that the facility is in compliance with the SWP3 and the permit, and identifying any incidents of noncompliance The summary report should contain, at a minimum, the date and time of inspection, name of inspector(s) conditions found, and changes to be made to the SWP3

5 The summary report and the following certification shall be signed in accordance with LAC 33 IX 2503 The summary report is to be attached to the SWP3 and provided to the Department upon request

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief true, accurate, and complete I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations "

Signatory requirements for the certification may be found in Part III, Section D 10 of this permit

6 The permittee shall make available to the Department, upon request, a copy of the SWP3 and any supporting documentation

E The following shall be included in the SWP3 if applicable

1 The permittee shall utilize all reasonable methods to minimize any adverse impact on the drainage system including but not limited to

OTHER REQUIREMENTS (continued)

a) maintaining adequate roads and driveway surfaces,
b) removing debris and accumulated solids from the drainage system, and
c) cleaning up immediately any spill by sweeping, absorbent pads, or other appropriate methods

2 All spilled product and other spilled wastes shall be immediately cleaned up and disposed of according to all applicable regulations, Spill Prevention and Control (SPC) plans or Spill Prevention Control and Countermeasures (SPCC) plans Use of detergents emulsifiers, or dispersants to clean up spilled product is prohibited except where necessary to comply with State or Federal safety regulations (i e , requirement for non slippery work surface) In all such cases, initial cleanup shall be done by physical removal and chemical usage shall be minimized

3 All waste fuel, lubricants, coolants solvents or other fluids used in the repair or maintenance of vehicles or equipment shall be recycled or contained for proper disposal Spills of these materials are to be cleaned up by dry means whenever possible

4 All equipment, parts, dumpsters trash bins petroleum products chemical solvents, detergents, or other materials exposed to stormwater shall be maintained in a manner which prevents contamination of stormwater by pollutants

5 All storage tank installations (with a capacity greater than 660 gallons for an individual container, or 1 320 gallons for two or more containers in aggregate within a common storage area) shall be constructed so that a secondary means of containment is provided for the entire contents of the largest tank plus sufficient freeboard to allow for precipitation Diked areas should be sufficiently impervious to contain spills

6 All diked areas surrounding storage tanks or stormwater collection basins shall be free of residual oil or other contaminants so as to prevent the accidental discharge of these materials in the event of flooding, dike failure or improper draining of the diked area. All drains from diked areas shall be equipped with valves which shall be kept in the closed condition except during periods of supervised discharge

OTHER REQUIREMENTS (continued)

7 All check valves, tanks, drains, or other potential sources of pollutant releases shall be inspected and maintained on a regular basis to assure their proper operation and to prevent the discharge of pollutants

8 The permittee shall assure compliance with all applicable regulations promulgated under the Louisiana Solid Waste and Resource Recovery Law and the Hazardous Waste Management Law (L R S 30 2151, etc) Management practices required under above regulations shall be referenced in the SWP3

9 The permittee shall amend the SWP3 whenever there is a change in the facility or change in the operation of the facility which materially increases the potential for the ancillary activities to result in a discharge of significant amounts of pollutants

10 If the SWP3 proves to be ineffective in achieving the general objectives of preventing the release of significant amounts of pollutants to water of the state then the specific objectives and requirements of the SWP3 shall be subject to modification to incorporate revised SWP3 requirements

F Facility specific SWP3 Conditions

1 **Drainage Area Site Map** Identify locations of the following activities where such activities are exposed to precipitation / runoff active and closed landfill cells or trenches active and closed land application areas, locations where open dumping is occurring or has occurred, locations of any known leachate springs or other areas where uncontrolled leachate may commingle with runoff, leachate collection and handling systems

OTHER REQUIREMENTS (continued)

2 **Summary of Potential Pollutant Sources** A narrative description of the potential pollutant associated with any of the following fertilizer, herbicide and pesticide application earth/soil moving, waste hauling and loading/unloading, outdoor storage of significant materials including daily, interim and final cover material stockpiles as well as temporary waste storage areas, exposure of active and inactive landfill and land application areas, uncontrolled leachate flows, failure or leaks from leachate collection and treatment systems

3 **Good Housekeeping Measures** As part of your good housekeeping program, consider providing protected materials storage areas for pesticides herbicides, fertilizer, and other significant materials

4 **Preventative Maintenance Program** This program must also maintain 1) containers used for outdoor chemical and significant materials storage to prevent leaking or rupture, 2) all elements of leachate collection and treatment systems to prevent commingling of leachate with storm water 3) the integrity and effectiveness of any intermediate or final cover (including repairing the cover as necessary to minimize the effects of settlement, sinking and erosion)

5 **Inspections of Active Sites** for operating landfills, open dumps, and land application sites, inspections must be conducted at least once every 7 days Qualified personnel must inspect areas of landfills that have not yet been finally stabilized, active land application areas, areas used for storage of material / wastes that are exposed to precipitation stabilization and structural control measures leachate collection and treatment systems, and locations where equipment and waste trucks enter and exit the site Ensure that sediment and erosion control measures are operating properly For stabilized sites and areas where land application has been completed, conduct inspections at least once every month

OTHER REQUIREMENTS (continued)

6 **Sediment and Erosion Control Plan** Provide temporary stabilization (e g , consider temporary seeding, mulching, and placing geotextiles on the inactive portions of stockpiles) for materials stockpiled for daily, intermediate and final cover; inactive areas of the landfill or open dump, any landfill or open dump area that has received a final cover until vegetation has established itself and where waste application has been completed at land application sites but final vegetation has not yet been established

7 Include plans for the possibility for and control of the upward and lateral seepage of leachate As a part of the plans, a method of prediction (estimation) of the direction of flow rate of flow, and total quantity of storm water being contaminated by toxic pollutants reaching the surface through the process of seepage

8 Include an outline plan of action to address pollutants which exceed the threshold criteria of the priority pollutants (Part II, Section B 3)

OTHER REQUIREMENTS (continued)

SECTION D WHOLE EFFLUENT TOXICITY TESTING(7-DAY CHRONIC NOEC FRESHWATER)

1 SCOPE AND METHODOLOGY

a The permittee shall test the effluent for toxicity in accordance with the provisions in this section

APPLICABLE TO OUTFALL(S)	**OUTFALL 001**
REPORTED ON DMR AS OUTFALL	**TX1Q**
CRITICAL DILUTION	**100%**
EFFLUENT DILUTION SERIES	**32%, 42%, 56%, 75%, and 100%**
COMPOSITE SAMPLE TYPE	**Defined at Section D 3 d i**
TEST SPECIES/METHODS	**LAC 33 IX 2531 (40 CFR Part 136)**

Ceriodaphnia dubia chronic static renewal survival and reproduction test Method 1002 0, EPA/600/4 91/002 or the most recent update thereof This test should be terminated when 60% of the surviving females in the control produce three broods or at the end of eight days, whichever comes first

Pimephales promelas (Fathead minnow) chronic static renewal 7 day larval survival and growth test, Method 1000 0, EPA/600/4 91/002, or the most recent update thereof A minimum of five (5) replicates with ten (10) organisms per replicate must be used in the control and in each effluent dilution of this test

b The NOEC (No Observed Effect Concentration) is defined as the greatest effluent dilution at and below which lethality that is statistically different from the control (0% effluent) at the 95% confidence level does not occur

c This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing and/or other appropriate actions to address toxicity

d Test failure is defined as a demonstration of statistically significant sub lethal or lethal effects to a test species at or below the effluent critical dilution

2 PERSISTENT LETHALITY

The requirements of this section apply only when a toxicity test demonstrates significant lethal effects at or below the critical dilution Significant lethal effects will be demonstrated if there is a statistically significant difference at the 95% confidence level between the survival of the appropriate test organism in a specified effluent dilution and the control (0% effluent)

OTHER REQUIREMENTS (continued)

a PART I TESTING FREQUENCY OTHER THAN MONTHLY

i The permittee shall conduct a total of two (2) additional tests for any species that demonstrates significant lethal effects at or below the critical dilution The two additional tests shall be conducted monthly during the next two consecutive months The permittee shall not substitute either of the two additional tests in lieu of routine toxicity testing, unless the specified testing frequency for the species demonstrating significant lethal effects is monthly The full report shall be prepared for each test required by this section in accordance with procedures outlined in item 4 of this section and submitted with the period discharge monitoring report (DMR) to the permitting authority for review

ii If one or both of the two additional tests demonstrates significant lethal effects at or below the critical dilution, the permittee shall initiate Toxicity Reduction Evaluation (TRE) requirements as specified in item 5 of this section The permittee shall notify the Department of Environmental Quality, Office of Environmental Services in writing within 5 days of the failure of any retest, and the TRE initiation date will be the test completion date of the first failed retest A TRE may also be required due to a demonstration of persistent significant sub lethal effects or intermittent lethal effects at or below the critical dilution or for failure to perform the required retests

iii If one or both of the two additional tests demonstrates significant lethal effects at or below the critical dilution, the permittee shall henceforth increase the frequency of testing for this species to once per quarter for the life of the permit

iv The provisions of item 2 a are suspended upon completion of the two additional tests and submittal of the TRE Action Plan

b PART I TESTING FREQUENCY OF MONTHLY

If the testing frequency is monthly for a species, the permittee shall initiate the Toxicity Reduction Evaluation (TRE) requirements as specified in item 5 of this section when any two of three consecutive monthly toxicity tests exhibit significant lethal effects at or below the critical dilution A TRE may also be required due to a demonstration of persistent significant sub lethal effects or intermittent lethal effects at or below the critical dilution, or for failure to perform the required retests

OTHER REQUIREMENTS (continued)

3 REQUIRED TOXICITY TESTING CONDITIONS

a Test Acceptance

The permittee shall repeat a test, including the control and all effluent dilutions, if the procedures and quality assurance requirements defined in the test methods or in this permit are not satisfied, including the following additional criteria

i The toxicity test control (0% effluent) must have survival equal to or greater than 80%

ii The mean number of Ceriodaphnia dubia neonates produced per surviving female in the control (0% effluent) must be 15 or more

iii 60% of the surviving control females must produce three broods

iv The mean dry weight of surviving Fathead minnow larvae at the end of the 7 days in the control (0% effluent) must be 0 25 mg per larva or greater

v The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent) for the young of surviving females in the Ceriodaphnia dubia reproduction test, the growth and survival endpoints of the Fathead minnow test

vi The percent coefficient of variation between replicates shall be 40% or less in the critical dilution unless significant lethal or nonlethal effects are exhibited for the young of surviving females in the Ceriodaphnia dubia reproduction test, the growth and survival endpoints of the Fathead minnow test

Test failure may not be construed or reported as invalid due to a coefficient of variation value of greater than 40% A repeat test shall be conducted within the required reporting period of any test determined to be invalid

b Statistical Interpretation

i For the Ceriodaphnia dubia survival test the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be Fisher's Exact Test as described in EPA/600/4 91/002 or the most recent update thereof

If the conditions of Test Acceptability are met in Item 3 a above and the percent survival of the test organism is equal to or greater than 80% in the critical dilution and all lower dilution concentrations, the test shall be considered to be a passing test, and the permittee shall report an NOEC of not less than the critical dilution for the DMR reporting requirements found in Item 4 below

OTHER REQUIREMENTS (continued)

ii For the Ceriodaphnia dubia reproduction test and the Fathead minnow larval survival and growth test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as described in EPA/600/4-91/002, or the most recent update thereof

c Dilution Water

i Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge The permittee shall substitute synthetic dilution water of similar pH hardness and alkalinity to the closest downstream perennial water for,

A toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams and

B toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions

ii If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of item 3 a) the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations

A a synthetic dilution water control which fulfills the test acceptance requirements of item 3 a was run concurrently with the receiving water control,

B the test indicating receiving water toxicity has been carried out to completion (i e , 7 days)

C the permittee includes all test results indicating receiving water toxicity with the full report and information required by item 4 below, and

D the synthetic dilution water shall have a pH, hardness and alkalinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water

OTHER REQUIREMENTS (continued)

d Samples and Composites

i The permittee shall collect a minimum of three flow weighted 24 hour composite samples from the outfall(s) listed at item 1 a above A 24 hour composite sample consists of a minimum of 4 effluent portions collected at equal time intervals representative of a 24 hour operating day and combined proportional to flow or a sample continuously collected proportional to flow over a 24 hour operating day

ii The permittee shall collect second and third 24 hour composite samples for use during 24-hour renewals of each dilution concentration for each test. The permittee must collect the 24 hour composite samples such that the effluent samples are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on an intermittent basis

iii The permittee must collect the 24-hour composite samples so that the maximum holding time for any effluent sample shall not exceed 72 hours The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of the first 24 hour composite sample Samples shall be chilled to 4 degrees Centigrade during collection shipping and/or storage

iv If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions and the sample holding time are waived during that sampling period However, the permittee must collect an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent When possible, the effluent samples used for the toxicity tests shall be collected on separate days if the discharge occurs over multiple days The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in item 4 of this section

4 REPORTING

a A valid test must be submitted during each reporting period The permittee shall prepare a full report of the results of all tests conducted pursuant to this section in accordance with the Report Preparation Section of EPA/600/4-91/002, or the most current publication, for every valid or invalid toxicity test initiated whether carried to completion or not The permittee shall retain each full report pursuant to the provisions of Part III C of this permit For any test which fails is considered invalid or which is terminated early for any reason, the full report must be submitted for agency review The permittee shall submit the first full report to the following address

OTHER REQUIREMENTS (continued)

Department of Environmental Quality
Office of Environmental Compliance
P O Box 4312
Baton Rouge, Louisiana 70821-4312
Attn Permit Compliance Unit

b The permittee shall submit the results of each valid toxicity test on the subsequent monthly DMR for that reporting period in accordance with Part III D 4 of this permit, as follows below Submit retest information clearly marked as such with the following month's DMR Only results of valid tests are to be reported on the DMR The permittee shall submit the Table I summary sheet with each valid test

i Pimephales promelas (Fathead Minnow)

A If the No Observed Effect Concentration (NOEC) for survival is less than the critical dilution, enter a "1" otherwise enter a "0' for Parameter No TLP6C

B Report the NOEC value for survival Parameter No TOP6C

C Report the NOEC value for growth, Parameter No TPP6C

D If the No Observed Effect Concentration (NOEC) for growth is less than the critical dilution, enter a "1", otherwise, enter a ' 0" for Parameter No TGP6C

E Report the highest (critical dilution or control) Coefficient of Variation, Parameter No TQP6C

ii Ceriodaphnia dubia

A If the NOEC for survival is less than the critical dilution enter a "1", otherwise enter a "0' for Parameter No TLP3B

B Report the NOEC value for survival, Parameter No TOP3B

C Report the NOEC value for reproduction Parameter No TPP3B

D If the No Observed Effect Concentration (NOEC) for reproduction is less than the critical dilution, enter a "1", otherwise, enter a ' 0' for Parameter No TGP3B

E Report the highest (critical dilution or control) Coefficient of Variation, Parameter No TQP3B

OTHER REQUIREMENTS (continued)

iii The permittee shall report the following results for all VALID toxicity retests on the DMR for that reporting period

A Retest #1 (STORET 22415) If the first monthly retest following failure of a routine test for either test species results in an NOEC for survival less than the critical dilution, report a '1", otherwise, report a '0"

B Retest #2 (STORET 22416) If the second monthly retest following failure of a routine test for either test species results in an NOEC for survival less than the critical dilution, report a "1", otherwise, report a '0"

If, for any reason, a retest cannot be performed during the reporting period in which the triggering routine test failure is experienced the permittee shall report it on the following reporting period's DMR and the comments section of both DMRs shall be annotated to that effect If retesting is not required during a given reporting period the permittee shall leave these DMR fields blank

The permittee shall submit the toxicity testing information contained in Table 1 of this permit with the DMR subsequent to each and every toxicity test reporting period The DMR and the summary table should be sent to the address indicated in 4 a The permittee is not required to send the first complete report nor summary tables to EPA

Monitoring Frequency Reduction

a The permittee may apply for a testing frequency reduction upon the successful completion of the first four consecutive quarters of testing for one or both test species with no lethal or sub lethal effects demonstrated at or below the critical dilution If granted, the monitoring frequency for that test species may be reduced to not less than once year for the less sensitive species (usually the Fathead minnow) and not less than twice per year for the more sensitive test species (usually the Ceriodaphnia dubia)

b CERTIFICATION The permittee must certify in writing that no test failures have occurred and that all tests meet all test acceptability criteria in item 3 a above In addition the permittee must provide a list with each test performed including test initiation date, species, NOECs for lethal and sub lethal effects , and the maximum coefficient of variation for the controls Upon review and acceptance of this information the agency will issue a letter of confirmation of the monitoring frequency reduction A copy of the letter will be forwarded to the agency's Permit Compliance Unit to update the permit reporting requirements

c SUB-LETHAL FAILURES If during the first four quarters of testing, sub lethal effects are demonstrated to a test species, two monthly retests are required In addition quarterly testing is required for that species until the effluent passes both the lethal and sub lethal test endpoints for the affected species for four consecutive quarters Monthly retesting is not required if the permittee is performing a TRE

OTHER REQUIREMENTS (continued)

d SURVIVAL FAILURES If any test fails the survival endpoint at any time during the life of this permit, two monthly retests are required and the monitoring frequency for the affected test species shall be increased to once per quarter until the permit is re issued Monthly retesting is not required if the permittee is performing a TRE

e This monitoring frequency reduction applies only until the expiration date of this permit, at which time the monitoring frequency for both test species reverts to once per quarter until the permit is re issued

5 TOXICITY REDUCTION EVALUATION (TRE)

a Within ninety (90) days OF CONFIRMING LETHALITY IN THE RETESTS the permittee shall submit a Toxicity Reduction Evaluation (TRE) Action Plan and Schedule for conducting a TRE The TRE Action Plan shall specify the approach and methodology to be used in performing the TRE A Toxicity Reduction Evaluation is an investigation intended to determine those actions necessary to achieve compliance with water quality based effluent limits by reducing an effluent's toxicity to an acceptable level A TRE is defined as a step wise process which combines toxicity testing and analyses of the physical and chemical characteristics of a toxic effluent to identify the constituents causing effluent toxicity and/or treatment methods which will reduce the effluent toxicity The TRE Action Plan shall lead to the successful elimination of effluent toxicity at the critical dilution and include the following

1 Specific Activities The plan shall detail the specific approach the permittee in tends to utilize in conducting the TRE The approach may include toxicity characterizations, identifications and confirmation activities, source evaluation, treatability studies or alternative approaches When the permittee conducts Toxicity Characterization Procedures the permittee shall perform multiple charac terizations and follow the procedures specified in the documents "Methods for Aquatic Toxicity Identification Evaluations Phase I Toxicity Characterization Procedures ' (EPA-600/6 91/003) and "Toxicity Identification Evaluation Characterization of Chronically Toxic Effluents Phase I" (EPA 600/6 91/005), or alternate procedures When the permittee conducts Toxicity Identification Evalua tions and Confirmations the permittee shall perform multiple identifications and follow the methods specified in the documents "Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R 92/080) and "Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R 92/081), as appropriate,

The documents referenced above may be obtained through the National Technical Information Service (NTIS) by phone at (703) 487-4650, or by writing

OTHER REQUIREMENTS (continued)

U S Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, Va 22161

ii Sampling Plan (e g , locations, methods, holding times, chain of custody, preservation, etc) The effluent sample volume collected for all tests shall be adequate to perform the toxicity test, toxicity characterization, identification and confirmation procedures, and conduct chemical specific analyses when a probable toxicant has been identified,

Where the permittee has identified or suspects specific pollutant(s) and/or source(s) of effluent toxicity, the permittee shall conduct, concurrent with toxicity testing, chemical specific analyses for the identified and/or suspected pollutant(s) and/or source(s) of effluent toxicity Where lethality was demonstrated within 48 hours of test initiation, each 24 hour composite sample shall be analyzed independently Otherwise the permittee may substitute a composite sample comprised of equal portions of the individual 24 hour composite samples, for the chemical specific analysis,

iii Quality Assurance Plan (e g QA/QC implementation, corrective actions, etc) and

iv Project Organization (e g project staff project manager, consulting services etc)

b The permittee shall initiate the TRE Action Plan within thirty (30) days of plan and schedule submittal The permittee shall assume all risks for failure to achieve the required toxicity reduction

c The permittee shall submit a quarterly TRE Activities Report, with the Discharge Monitoring Report in the months of January, April, July and October containing information on toxicity reduction evaluation activities including

i any data and/or substantiating documentation which identifies the pollutant(s) and/or source(s) of effluent toxicity,

ii any studies/evaluations and results on the treatability of the facility's effluent toxicity and

iii any data which identifies effluent toxicity control mechanisms that will reduce ef fluent toxicity to the level necessary to meet no significant lethality at the critical dilution

OTHER REQUIREMENTS (continued)

The TRE Activities Report shall be submitted to the following addresses

Department of Environmental Quality
Office of Environmental Compliance
P O Box 4312
Baton Rouge, Louisiana 70821-4312
Attn Permit Compliance U0nit

U S Environmental Protection Agency, Region 6
Water Enforcement Branch
1445 Ross Avenue
Dallas, Texas 75202

d The permittee shall submit a Final Report on Toxicity Reduction Evaluation Activities no later than twenty eight (28) months from confirming lethality in the retests, which provides information pertaining to the specific control mechanism selected that will when implemented, result in reduction of effluent toxicity to no significant lethality at the critical dilution The report will also provide a specific corrective action schedule for implementing the selected control mechanism

A copy of the Final Report on Toxicity Reduction Evaluation Activities shall also be submitted to the above addresses

e Quarterly testing during the TRE is a minimum monitoring requirement. EPA recommends that permittees required to perform a TRE not rely on quarterly testing alone to ensure success in the TRE and that additional screening tests be performed to capture toxic samples for identification of toxicants Failure to identify the specific chemical compound causing toxicity test failure will normally result in a permit limit for whole effluent toxicity limits per federal regulations at 40 CFR 122 44(d)(1)(v)

TABLE 1

SUMMARY SHEET
Ceriodaphnia dubia SURVIVAL AND REPRODUCTION TEST

PERMITTEE _____
FACILITY SITE _____
NPDES PERMIT NUMBER _____ WP PERMIT NUMBER _____
OUTFALL IDENTIFICATION _____
OUTFALL SAMPLE IS FROM _____ SINGLE _____ MULTIPLE DISCHARGE
BIOMONITORING LABORATORY _____
DILUTION WATER USED _____ RECEIVING WATER _____ LAB WATER
CRITICAL DILUTION _____% DATE TEST INITIATED _____

1 LOW FLOW NON-LETHALITY
Is the mean number of young produced per female significantly less (p=0 05) than the control's number of young per female for the low flow or critical dilution? ____yes ____no

2 LOW FLOW LETHALITY
Is the mean survival at 7 days significantly less (p=0 05) than the control survival at the low-flow or critical dilution? ____yes ____no

3 Are the test results to be considered valid? ____yes ____no
If _X_no (test invalid) what reasons for invalidity?

4 Is this a retest of a previous invalid test? ____ yes____no
Is this a retest of a previous test failure? ____ yes____no

5 Enter percent effluent corresponding to each NOEC (No Observed Effect Concentration) for Ceriodaphnia

a NOEC REPRODUCTION = ____% effluent
b NOEC SURVIVAL = ____% effluent

PERCENT SURVIVAL-CERIODAPHNIA

TIME OF READING	PERCENT EFFLUENT					
	0 %	%	%	%	%	%
24-HOUR						
48-HOUR						
7 DAY						

TABLE 1
SUMMARY SHEET
Pimphales promelas ("fathead minnow") SURVIVAL AND GROWTH TEST

PERMITTEE _____
FACILITY SITE _____
NPDES PERMIT NUMBER _____ WP PERMIT NUMBER _____
OUTFALL IDENTIFICATION _____
OUTFALL SAMPLE IS FROM A ____ SINGLE ____ MULTIPLE DISCHARGE
BIOMONITORING LABORATORY _____
DILUTION WATER USED ____ RECEIVING WATER ____LAB WATER
CRITICAL DILUTION ____ % DATE TEST INITIATED_____

1 LOW FLOW NON LETHALITY
Is the mean dry weight (growth) at 7 days significantly less (p=0 05) than the control's dry weight (growth) for the low flow or critical dilution?
____yes ____no

2 LOW-FLOW LETHALITY
Is the mean survival at 7 days significantly less (p=0 05) than the control survival at the low flow or critical dilution? ____yes ____no

3 Are the test results to be considered valid?___yes ____no
If _X_no (test invalid) , what reasons for invalidity?

4 Is this a retest of a previous invalid test? __yes___no
Is this a retest of a previous test failure?__yes____no

5 Enter percent effluent corresponding to each NOEC (No Observed Effect Concentration) for Pimephales
a NOEC GROWTH = ____% effluent
b NOEC SURVIVAL = ____% effluent

PERCENT EFFLUENT	% SURVIVAL / REPLICATES				MEAN % SURVIVAL			C V %
	A	B	C	D	24 HR	48-HR	7 DAY	
0 %								
%								
%								
%								
%								
%								

PART III
STANDARD CONDITIONS FOR LPDES PERMITS

SECTION A GENERAL CONDITIONS

1 Introduction
In accordance with the provisions of LAC 33 IX 2701 et seq this permit incorporates either expressly or by reference ALL conditions and requirements applicable to Louisiana Pollutant Discharge Elimination System Permits (LPDES) set forth in the Louisiana Environmental Quality Act (LEQA) as amended as well as ALL applicable regulations

2 Duty to Comply
The permittee must comply with all conditions of this permit Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Louisiana Environmental Quality Act and is grounds for enforcement action for permit termination revocation and reissuance or modification or for denial of a permit renewal application

3 Penalties for Violation of Permit Conditions
a LA R S 30 2025 provides for civil penalties for violations of these regulations and the Louisiana Environmental Quality Act LA R S 30 2076 2 provides for criminal penalties for violation of any provisions of the LPDES or any order or any permit condition or limitation issued under or implementing any provisions of the LPDES program (See Section E Penalties for Violation of Permit Conditions for additional details)

b Any person may be assessed an administrative penalty by the State Administrative Authority under LA R S 30 2025 for violating a permit condition or limitation implementing any of the requirements of the LPDES program in a permit issued under the regulations or the Louisiana Environmental Quality Act

Toxic Pollutants
a Other effluent limitations and standards under Sections 301 302 303 307 318 and 405 of the Clean Water Act If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the Clean Water Act for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in this permit the state administrative authority shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition

b The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal even if the permit has not yet been modified to incorporate the requirement

5 Duty to Reapply
a Individual Permits If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit the permittee must apply for and obtain a new permit The new application shall be submitted at least 180 days before the expiration date of the existing permit unless permission for a later date has been granted by the state administrative authority (The state administrative authority shall not grant permission for applications to be submitted later than the expiration date of the existing permit) Continuation of expiring permits shall be governed by regulations promulgated at LAC 33 IX 2321 and any subsequent amendments

b General Permits General permits expire five years after the effective date Unless otherwise specified in the general permit or notified by the Secretary or his designee a permittee must submit an NOI/application for the permitted activity

6 Permit Action
his permit may be modified revoked and reissued or terminated for cause in accordance with LAC 33 IX 2903 2905 2907 3105 and 6509 The causes may include but are not limited to the following

a Noncompliance by the permittee with any condition of the permit

b The permittee s failure in the application or during the permit issuance process to disclose fully all relevant acts or the permittee s misrepresentation of any relevant facts at any time

c A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination

d A change in any condition that requires either a temporary or a permanent reduction or elimination of any discharge or

e Failure to pay applicable fees under the provisions of LAC 33 IX Chapter 13

f Change of ownership or operational control

The filing of a request by the permittee for a permit modification revocation and reissuance or termination or a notification of planned changes or anticipated noncompliance does not stay any permit condition

7 Property Rights
This permit does not convey any property rights of any sort or any exclusive privilege

8 Duty to Provide Information
The permittee shall furnish to the state administrative authority within a reasonable time any information which the state administrative authority may request to determine whether cause exists for modifying revoking and reissuing or terminating this permit or to determine compliance with this permit The permittee shall also furnish to the state administrative authority upon request copies of records required to be kept by this permit

Criminal and Civil Liability
Except as provided in permit conditions on Bypassing and Upsets nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance Any false or materially misleading representation or concealment of information required to be reported by the provisions of the permit the Act or applicable regulations which avoids or effectively defeats the regulatory purpose of the Permit may subject the Permittee to criminal enforcement pursuant to La R S 30 2025

10 Oil and Hazardous Substance Liability
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities liabilities or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act.

11 State Laws
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities liabilities or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Clean Water Act

12 Severability
If any provision of these rules and regulations or the application thereof is held to be invalid the remaining provisions of these rules and regulations shall not be affected so long as they can be given effect without the invalid provision To this end the provisions of these rules and regulations are declared to be severable

13 Dilution
A permittee shall not achieve any effluent concentration by dilution unless specifically authorized in the permit A permittee shall not increase the use of process water or cooling water or otherwise attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve permit limitations or water quality

SECTION B PROPER OPERATION AND MAINTENANCE

1 Need to Halt or Reduce not a Defense
It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit

2 Duty to Mitigate
The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment
The permittee shall also take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with the permit including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge

3 Proper Operation and Maintenance

a The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures This provision requires the operation of back up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit

b The permittee shall provide an adequate operating staff which is duly qualified to carry out operation maintenance and other functions necessary to ensure compliance with the conditions of this permit

Bypass of Treatment Facilities

a *Bypass* The intentional diversion of waste streams from any portion of a treatment facility

b Bypass not exceeding limitations The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded but only if it also is for essential maintenance to assure efficient operation These bypasses are not subject to the provisions of Section B 4 c and 4 d of these standard conditions

c Notice

(1) Anticipated bypass If the permittee knows in advance of the need for a bypass it shall submit prior notice to the Office of Environmental Services Permits Division if possible at least ten days before the date of the bypass

(2) Unanticipated bypass The permittee shall submit notice of an unanticipated bypass as required in LAC 33 IX 2701 L 6 (24 hour notice) and Section D 6 e of these standard conditions

d Prohibition of bypass

(1) Bypass is prohibited and the state administrative authority may take enforcement action against a permittee for bypass unless

(a) Bypass was unavoidable to prevent loss of life personal injury or severe property damage

(b) There were no feasible alternatives to the bypass such as the use of auxiliary treatment facilities retention of untreated wastes or maintenance during normal periods of equipment downtime This condition is not satisfied if adequate back up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance and

(c) The permittee submitted notices as required by Section B 4 c of these standard conditions

(2) The state administrative authority may approve an anticipated bypass after considering its adverse effects if the state administrative authority determines that it will meet the three conditions listed in Section B 4 d(1) of these standard conditions

5 Upset Conditions

a **Upset** An exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee An upset does not include noncompliance to the extent caused by operational error improperly designed treatment facilities inadequate treatment facilities lack of preventive maintenance or careless or improper operation

b Effect of an upset An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Section B 5 c are met No determination made during administrative review of claims that noncompliance was caused by upset and before an action for noncompliance is final administrative action subject to judicial review

c Conditions necessary for a demonstration of upset A permittee who wishes to establish the affirmative defense of upset shall demonstrate through properly signed contemporaneous operating logs, or other relevant evidence that

(1) An upset occurred and that the permittee can identify the cause(s) of the upset

(2) The permitted facility was at the time being properly operated and

(3) The permittee submitted notice of the upset as required by LAC 33 IX 2701 L 6 b ii and Section D 6 e (2) of these standard conditions and

(4) The permittee complied with any remedial measures required by Section B 2 of these standard conditions

d Burden of proof In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof

6 Removed Substances
Solids sewage sludges filter backwash or other pollutants removed in the course of treatment or wastewater control shall be properly disposed of in a manner such as to prevent any pollutant from such materials from entering waters of the state and in accordance with environmental regulations

7 Percent Removal
For publicly owned treatment works the 30 day average percent removal for Biochemical Oxygen Demand and Total Suspended Solids shall not be less than 85 percent in accordance with LAC 33 IX 5905 A 3 and B 3

SECTION C MONITORING AND RECORDS

1 Inspection and Entry

The permittee shall allow the state administrative authority or an authorized representative (including an authorized contractor acting as a representative of the Administrator) upon the presentation of credentials and other documents as may be required by the law to

a Enter upon the permittee s premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit

Enter upon the permittee s premises where a discharge source is or might be located or in which monitoring equipment or records required by a permit are kept for inspection or sampling purposes Most inspections will be unannounced and should be allowed to begin immediately but in no case shall begin more than thirty (30) minutes after the time the inspector presents his/her credentials and announces the purpose(s) of the inspection Delay in excess of thirty (30) minutes shall constitute a violation of this permit However additional time can be granted if the inspector or the Administrative Authority determines that the circumstances warrant such action and

b Have access to and copy at reasonable times any records that the department or its authorized representative determines are necessary for the enforcement of this permit For records maintained in either a central or private office that is open only during normal office hours and is closed at the time of inspection the records shall be made available as soon as the office is open but in no case later than the close of business the next working day

c Inspect at reasonable times any facilities equipment (including monitoring and control equipment) practices or operations regulated or required under this permit and

d Sample or monitor at reasonable times for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act or the Louisiana Environmental Quality Act any substances or parameters at any location

e Sample Collection

(1) When the inspector announces that samples will be collected the permittee will be given an additional thirty (30) minutes to prepare containers in order to collect duplicates If the permittee cannot obtain and prepare sample containers within this time he is considered to have waived his right to collect duplicate samples and the sampling will proceed immediately Further delay on the part of the permittee in allowing initiation of the sampling will constitute a violation of this permit

(2) At the discretion of the administrative authority sample collection shall proceed immediately (without the additional 30 minutes described in Section C 1 a above) and the inspector shall supply the permittee with a duplicate sample

f It shall be the responsibility of the permittee to ensure that a facility representative familiar with provisions of its wastewater discharge permit including any other conditions or limitations be available either by phone or in person at the facility during all hours of operation The absence of such personnel on site who are familiar with the permit shall not be grounds for delaying the initiation of an inspection except in situations as described in Section C 1 b of these standard conditions The permittee shall be responsible for providing witnesses/escorts during inspections Inspectors shall abide by all company safety rules and shall be equipped with standard safety equipment (hard hat safety shoes safety glasses) normally required by industrial facilities

g Upon written request copies of field notes drawings etc taken by department personnel during an inspection shall be provided to the permittee after the final inspection report has been completed

2 Representative Sampling
Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity All samples shall be taken at the outfall location(s) indicated in the permit The state administrative authority shall be notified prior to any changes in the outfall location(s) Any changes in the outfall location(s) will be subject to modification revocation and reissuance in accordance with LAC 33 IX 2903

3 Retention of Records
Except for records of monitoring information required by this permit related to the permittee s sewage sludge use and disposal activities which shall be retained for a period of at least five years (or longer as required by 40 CFR 503) the permittee shall retain records of all monitoring information including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete the application for this permit for a period of at least 3 years from the date of the sample measurement report or application This period may be extended by request of the state administrative authority at any time

4 Record Contents
Records of monitoring information shall include

a The date exact place and time of sampling or measurements
b The individual(s) who performed the sampling or measurements
c The date(s) analyses were performed
d The time(s) analyses were begun and ended
e The individual(s) who performed the analyses
f The analytical techniques or methods used
g The results of such analyses and
h The results of all quality control procedures

5 Monitoring Procedures
a Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 (See LAC 33 IX 4901) or in the case of sludge use or disposal approved under 40 CFR part 136 (See LAC 33 IX 4901) unless otherwise specified in 40 CFR part 503 unless other test procedures have been specified in this permit This includes procedures contained in the latest EPA approved edition of the following publications

(1) Standard Methods for the Examination of Water and Waste Water This publication is available from the American Public Health Association Publication Sales P O Box 753 Waldorf MD 20604 0573 Phone number (301) 893 1894 Fax number (301) 843-0159

(2) Annual Book of Standards Vols 1101-1103 Water I Water II and Atmospheric Analysis This publication is available from the American Society for Testing Materials 100 Barr Harbor Drive West Conshohocken PA 19428 2959 Phone number (610) 832-9500

(3) Methods for Chemical Analysis of Water and Wastes Revised March 1983 U S Environmental Protection Agency Analytical Quality Control Laboratory Cincinnati Ohio This publication is available from the National Technical Information Service (NTIS) Springfield VA 22161 Phone number (800) 553 6847 Order by NTIS publication number PB 84 128677

b The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instruments at intervals frequent enough to insure accuracy of measurements and shall maintain appropriate records of such activities

c An adequate analytical quality control program including the analyses of sufficient standards spikes and duplicate samples to insure the accuracy of all required analytical results shall be maintained by the permittee or designated commercial laboratory General sampling protocol shall follow guidelines established in the Handbook for Sampling and Sample Preservation of Water and Wastewater 1982 U S Environmental Protection Agency This publication is available from the National Technical Information Service (NTIS) Springfield VA 22161 Phone number (800) 553 6847 Order by NTIS publication number PB 83 124503 General laboratory procedures including glassware cleaning etc can be found in the Handbook for Analytical Quality Control in Water and Wastewater Laboratories, 1979 U S Environmental Protection Agency Environmental Monitoring and Support Laboratory This publication is available from the Environmental Protection Agency Phone number (513) 569 7562 Order by EPA publication number EPA 600/4-79 019

6 Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges The devices shall be installed calibrated and maintained to insure that the accuracy of the measurements are consistent with the accepted capability of that type of device Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from true discharge rates throughout the range of expected discharge volumes Guidance in selection installation calibration and operation of acceptable flow measurement devices can be obtained from the following references

a A Guide to Methods and Standards for the Measurement of Water Flow 1975 U S Department of Commerce National Bureau of Standards This publication is available from the National Technical Information Service (NTIS) Springfield VA 22161 Phone number (800) 553 6847 Order by NTIS publication number COM-75 10683

b Flow Measurement in Open Channels and Closed Conduits, Volumes 1 and 2 U S Department of Commerce National Bureau of Standards This publication is available from the National Technical Service (NTIS) Springfield VA 22161 Phone number (800) 553-6847 Order by NTIS publication number PB-273 535

c NPDES Compliance Flow Measurement Manual U S Environmental Protection Agency Office of Water Enforcement This publication is available from the National Technical Information Service (NTIS) Springfield VA 22161 Phone number (800) 553 6847 Order by NTIS publication number PB-82 131178

7 Prohibition for Tampering Penalties

a LA R S 30 2025 provides for punishment of any person who falsifies tampers with or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit

b LA R S 30 2076 2 provides for penalties for any person who knowingly makes any false statement representation or certification in any record or other document submitted or required to be maintained under this permit including monitoring reports or reports of compliance or non compliance

8 Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 (See LAC 33 IX 4901) or in the case of sludge use and disposal approved under 40 CFR part 136 (See LAC 33 IX 4901) unless otherwise specified in 40 CFR part 503 or as specified in the permit the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the state administrative authority

9 Averaging of Measurements

Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the state administrative authority in the permit

10 Laboratory Accreditation

a LAC 33 I Subpart 3 Chapters 45 59 provide requirements for an accreditation program specifically applicable to commercial laboratories wherever located that provide chemical analyses analytical results or other test data to the department by contract or by agreement and the data is

(1) Submitted on behalf of any facility as defined in R S 30 2004
(2) Required as part of any permit application
(3) Required by order of the department
(4) Required to be included on any monitoring reports submitted to the department
(5) Required to be submitted by contractor
(6) Otherwise required by department regulations

b The department laboratory accreditation program is designed to ensure the accuracy precision and reliability of the data generated as well as the use of department approved methodologies in generation of that data Laboratory data generated by commercial environmental laboratories that are not accredited under these regulations will not be accepted by the department Retesting of analysis will be required by an accredited commercial laboratory

Where retesting of effluent is not possible (i e data reported on DMRs for prior month s sampling) the data generated will be considered invalid and in violation of the LPDES permit

c Regulations on the Environmental Laboratory Accreditation Program and a list of labs that have applied for accreditation are available on the department website located at

http //www deq state la us/laboratory/index htm

Questions concerning the program may be directed to (225) 765 0582

SECTION D REPORTING REQUIREMENTS

1 Facility Changes
The permittee shall give notice to the state administrative authority as soon as possible of any planned physical alterations or additions to the permitted facility Notice is required only when

a The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122 29(b) or

b The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged This notification applies to pollutants which are subject neither to effluent limitations in the permit nor to notification requirements under LAC 33 IX 2703 A 1

c For Municipal Permits Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to Section 301, or 306 of the CWA if it were directly discharging those pollutants and any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit In no case are any new connections increased flows or significant changes in influent quality permitted that will cause violation of the effluent limitations specified herein

2 Anticipated Noncompliance
The permittee shall give advance notice to the state administrative authority of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements

3 Transfers
This permit is not transferable to any person except after notice to the state administrative authority The state administrative authority may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Clean Water Act or the Louisiana Environmental Quality Act (See LAC 33 IX 2901 in some cases modification or revocation and reissuance is mandatory)

a Transfers by modification Except as provided in LAC 33 IX 2901 B a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued (under LAC 33 IX 2903 A 2 b) or a minor modification made (under LAC 33 IX 2905) to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act and the Louisiana Environmental Quality Act

b Automatic transfers As an alternative to transfers under LAC 33 IX 2901 A any LPDES permit may be automatically transferred to a new permittee if

(1) The current permittee notifies the state administrative authority at least 30 days in advance of the proposed transfer date in Section D 3 b (2) below

(2) The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility coverage and liability between them

(3) The state administrative authority does not notify the existing permittee and the proposed new permittee of his or her intent to modify or revoke and reissue the permit A modification under this subsection may also be a minor modification under LAC 33 IX 2905 If this notice is not received the transfer is effective on the date specified in the agreement mentioned in Section D 3 b (2) of these standard conditions

4 Monitoring Reports

Monitoring results shall be reported at the intervals and in the form specified in Part I or Part II of this permit

The permittee shall submit properly completed Discharge Monitoring Reports (DMRs) on the form specified in the permit Preprinted DMRs are provided to majors/92 500 s and other designated facilities Please contact the Permit Compliance Unit concerning preprints Self generated DMRs must be pre approved by the Permit Compliance Unit prior to submittal Self generated DMRs are approved on an individual basis Requests for approval of self generated DMRs should be submitted to

Supervisor Permit Compliance Unit
Office of Environmental Compliance
Post Office Box 4312
Baton Rouge, LA 70821-4312

Copies of blank DMR templates plus instructions for completing them and EPA s LPDES Reporting Handbook are available at the department website located at

http //www deq state la us/enforcement/index htm

5 Compliance Schedules

Reports of compliance or noncompliance with or any progress reports on interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date

6 Requirements for Notification

a Emergency Notification

As required by LAC 33 I 3915 in the event of an unauthorized discharge that does cause an emergency condition the discharger shall notify the hotline (DPS 24-hour Louisiana Emergency Hazardous Materials Hotline) by telephone at (225) 925 6595 (collect calls accepted 24 hours a day) immediately (a reasonable period of time after taking prompt measures to determine the nature quantity and potential off site impact of a release considering the exigency of the circumstances) but in no case later than one hour after learning of the discharge (An emergency condition is any condition which could reasonably be expected to endanger the health and safety of the public cause significant adverse impact to the land water or air environment or cause severe damage to property) Notification required by this section will be made regardless of the amount of discharge Verbal Notification Procedures are listed in Section D 6 c of these standard conditions

A written report shall be provided within seven calendar days after the telephone notification The report shall contain the information listed in Section D 6 d of these standard conditions and any additional information in LAC 33 I 3925 B

b Prompt Notification

As required by LAC 33 I 3917 in the event of an unauthorized discharge which exceeds reportable quantity specified in LAC 33 I Subchapter E but does not cause an emergency condition the discharger shall notify the Office of Environmental Compliance by e mail utilizing the Incident Report Form and procedures found at www deq state la us/surveillance or by telephone within 24 hours after learning of the discharge Otherwise verbal notification should be made to the Office of Environmental Compliance at (225) 219 3640 during office hours or (225) 342 1234 after hours weekends and holidays

c Information for Verbal Notifications The following guidelines will be utilized as appropriate based on the conditions and circumstances surrounding any unauthorized discharge to provide relevant information regarding the nature of the discharge

(1) name of person making the notification and telephone number where any return calls from response agencies can be placed

(2) name and location of facility or site where the unauthorized discharge is imminent or has occurred using common landmarks In the event of an incident involving transport include the name and address of transporter and generator

(3) date and time the incident began and ended or estimated time of continuation if discharge is continuing

(4) extent of any injuries and identification of any known personnel hazards which response agencies may face

(5) common or scientific chemical name U S Department of Transportation hazard classification and best estimate of amounts of any and all discharged pollutants

(6) brief description of the incident sufficient to allow response agencies to formulate level and extent of response activity

d Written Notification Procedures Written reports for any unauthorized discharge that requires verbal notification under Section D 6 a or 6 b or that requires written notification under LAC 33 I 3925 will be submitted by the discharger to the department in accordance with this section within seven calendar days after the telephone notification Written notification reports will include but are not limited to the following information

(1) name of person company or other party who is filing the written report

(2) time and date of verbal notification name of person making the notification and identification of the site or facility vessel transport vehicle or storage area from which the unauthorized discharge occurred

(3) date(s) time(s) and duration of the unauthorized discharge and if not corrected the anticipated time it is expected to continue

(4) details of the circumstances and events leading to any emergency condition including incidents of loss of sources of radiation

(5) common or scientific chemical name the CAS number U S Department of Transportation hazard classification and best estimate of amounts of any and all discharge pollutants including methodology for calculations and estimates

(6) statement of actual or probable fate or disposition of the pollutant or source of radiation

(7) remedial actions taken or to be taken to stop unauthorized discharges or to recover pollutants or sources of radiation

Please see LAC 33 I 3925 B for additional written notification procedures

e Twenty four Hour Reporting The permittee shall report any noncompliance which may endanger human health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances A written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances The written submission shall contain a description of the noncompliance and its cause the period of noncompliance including exact dates and times and if the noncompliance has not been corrected the anticipated time it is expected to continue and steps taken or planned to reduce eliminate and prevent recurrence of the noncompliance The following shall be included as information which must be reported within 24hours

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit (see LAC 33 IX 2701 M 3 b)

(2) Any upset which exceeds any effluent limitation in the permit

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the state administrative authority in Part II of the permit to be reported within 24 hours (LAC 33 IX 2707 G)

7 Other Noncompliance
The permittee shall report all instances of noncompliance not reported under Section D 4 5 and 6 at the time monitoring reports are submitted The reports shall contain the information listed in Section D 6 e

8 Other Information
Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the state administrative authority it shall promptly submit such facts or information

Discharges of Toxic Substances
In addition to the reporting requirements under Section D 1 8 all existing manufacturing commercial mining and silvicultural dischargers must notify the Office of Environmental Services Permits Division as soon as they know or have reason to believe

a That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis of any toxic pollutant

i listed at LAC 33 IX 7107 Tables II and III (excluding Total Phenols) which is not limited in the permit if that discharge will exceed the highest of the following notification levels

(1) One hundred micrograms per liter (100 µg/L)
(2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile five hundred micro-grams per liter (500 µg/L) for 2 4 -dinitro phenol and for 2 methyl-4,6-dinitrophenol and one milligram per liter (1 mg/L) for antimony
(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with LAC33 IX 2501 G 7 or
(4) The level established by the state administrative authority in accordance with LAC 33 IX 2707 F or

ii which exceeds the reportable quantity levels for pollutants at LAC 33 I Subchapter E

b That any activity has occurred or will occur which would result in any discharge on a non routine or infrequent basis of a toxic pollutant

i listed at LAC 33 IX 7107 Tables II and III (excluding Total Phenols) which is not limited in the permit, if that discharge will exceed the highest of the following notification levels

(1) Five hundred micrograms per liter (500 µg/L)

(2) One milligram per liter (1 mg/L) for antimony
(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with LAC 33 IX 2501 G 7, or
(4) The level established by the state administrative authority in accordance with LAC 33 IX 2707 F or

ii which exceeds the reportable quantity levels for pollutants at LAC 33 I Subchapter E

10 Signatory Requirements
All applications reports or information submitted to the state administrative authority shall be signed and certified

a All permit applications shall be signed as follows

(1) For a corporation by a responsible corporate officer For the purpose of this section a responsible corporate officer means

(a) A president secretary treasurer or vice president of the corporation in charge of a principal business function or any other person who performs similar policy or decision making functions for the corporation or

(b) The manager of one or more manufacturing production or operating facilities provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations and initiating and directing other comprehensive measures to ensure long term environmental compliance with environmental laws and regulations the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements and the authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures

NOTE DEQ does not require specific assignments or delegations of authority to responsible corporate officers identified in Section D 10 a (1)(a) The agency will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the state administrative authority to the contrary Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate positions under Section D 10 a (1)(b) rather than to specific individuals

(2) For a partnership or sole proprietorship by a general partner or the proprietor respectively or
(3) For a municipality, state, federal, or other public agency by either a principal executive officer or ranking elected official For purposes of this section a principal executive officer of a federal agency includes

(a) The chief executive officer of the agency or
(b) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e g Regional Administrators of EPA)

b All reports required by permits and other information requested by the state administrative authority shall be signed by a person described in Section D 10 a or by a duly authorized representative of that person A person is a duly authorized representative only if

(1) The authorization is made in writing by a person described in Section D 10 a of these standard conditions
(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager operator of a well or a well field superintendent position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company (a duly authorized representative may thus be either a named individual or an individual occupying a named position and
(3) The written authorization is submitted to the state administrative authority

c Changes to authorization If an authorization under Section D 10 b is no longer accurate because a different individual or position has responsibility for the overall operation of the facility a new authorization satisfying the requirements of Section D 10 b must be submitted to the state administrative authority prior to or together with any reports information or applications to be signed by an authorized representative

d Certification Any person signing a document under Section D 10 a or b above shall make the following certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information the information submitted is to the best of my knowledge and belief true accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations

11 Availability of Reports

All recorded information (completed permit application forms fact sheets draft permits or any public document) not classified as confidential information under R S 30 2030(A) and 30 2074(D) and designated as such in accordance with these regulations (LAC 33 IX 2323 and LAC 33 IX 6503) shall be made available to the public for inspection and copying during normal working hours in accordance with the Public Records Act R S 44 1 et seq

Claims of confidentiality for the following will be denied

a The name and address of any permit applicant or permittee
b Permit applications permits and effluent data
c Information required by LPDES application forms provided by the state administrative authority under LAC 33 IX 2501 may not be claimed confidential This includes information submitted on the forms themselves and any attachments used to supply information required by the forms

SECTION E PENALTIES FOR VIOLATIONS OF PERMIT CONDITION

1 Criminal

a Negligent Violations

The Louisiana Revised Statutes LA R S 30 2076 2 provides that any person who negligently violates any provision of the LPDES or any order issued by the secretary under the LPDES or any permit condition or limitation implementing any such provision in a permit issued under the LPDES by the secretary or any requirement imposed in a pretreatment program approved under the LPDES is subject to a fine of not less than $2 500 nor more than $25,000 per day of violation or by imprisonment for not more than 1 year or both If a conviction of a person is for a violation committed after a first conviction of such person he shall be subject to a fine of not more than $50 000 per day of violation or imprisonment of not more than two years or both

b Knowing Violations

The Louisiana Revised Statutes LA R S 30 2076 2 provides that any person who knowingly violates any provision of the LPDES or any permit condition or limitation implementing any such provisions in a permit issued under the LPDES or any requirement imposed in a pretreatment program approved under the LPDES is subject to a fine of not less than $5 000 nor more than $50 000 per day of violation or imprisonment for not more than 3 years or both If a conviction of a person is for a violation committed after a first conviction of such person he shall be subject to a fine of not more than $100 000 per day of violation or imprisonment of not more than six years or both

c Knowing Endangerment

The Louisiana Revised Statutes LA R S 30 2076 2 provides that any person who knowingly violates any provision of the LPDES or any order issued by the secretary under the LPDES or any permit condition or limitation implementing any of such provisions in a permit issued under the LPDES by the secretary and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250 000 or by imprisonment for not more than 15 years or both A person which is an organization shall upon conviction of violating this Paragraph be subject to a fine of not more than one million dollars If a conviction of a person is for a violation committed after a first conviction of such person under this Paragraph the maximum punishment shall be doubled with respect to both fine and imprisonment

d False Statements

The Louisiana Revised Statutes LA R S 30 2076 2 provides that any person who knowingly makes any false material statement representation or certification in any application record report plan or other document filed or required to be maintained under the LPDES or who knowingly falsifies tampers with or renders inaccurate any monitoring device or method required to be maintained under the LPDES shall upon conviction be subject to a fine of not more than $10 000 or imprisonment for not more than 2 years or both If a conviction of a person is for a violation committed after a first conviction of such person under this Subsection he shall be subject to a fine of not more than $20 000 per day of violation or imprisonment of not more than 4 years or both

2 Civil Penalties

The Louisiana Revised Statutes LA R S 30 2025 provides that any person found to be in violation of any requirement of this Subtitle may be liable for a civil penalty to be assessed by the secretary an assistant secretary or the court of not more than the cost to the state of any response action made necessary by such violation which is not voluntarily paid by the violator and a penalty of not more than $27 500 for each day of violation However when any such violation is done intentionally willfully or knowingly or results in a discharge or disposal which causes irreparable or severe damage to the environment or if the substance discharged is one which endangers human life or health such person may be liable for an additional penalty of not more than one million dollars

EASE NOTE These penalties are listed in their entirety in Subtitle II of Title 30 of the Louisiana Revised Statutes)

SECTION F DEFINITIONS

All definitions contained in Section 502 of the Clean Water Act shall apply to this permit and are incorporated herein by reference Unless otherwise specified in this permit additional definitions of words or phrases used in this permit are as follows

1 Clean Water Act ' (CWA) means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or the Federal Water Pollution Control Act Amendments of 1972) Pub L 92 500 as amended by Pub L 95-217 Pub L 95 576 Pub L 96-483 and Pub L 97-117 33 U S C 1251 et seq)

2 Accreditation means the formal recognition by the department of a laboratory s competence wherein specific tests or types of tests can be accurately and successfully performed in compliance with all minimum requirements set forth in the regulations regarding laboratory accreditation

3 Administrator' means the Administrator of the U S Environmental Protection Agency or an authorized representative

4 Applicable effluent standards and limitations means all state and Federal effluent standards and limitations to which a discharge is subject under the Clean Water Act including but not limited to effluent limitations standards or performance toxic effluent standards and prohibitions and pretreatment standards

5 Applicable water quality standards ' means all water quality standards to which a discharge is subject under the Clean Water Act

6 Bypass means the intentional diversion of waste streams from any portion of a treatment facility

7 Commercial Laboratory' means any laboratory that performs analyses or tests for third parties for a fee or other compensation except those commercial laboratories accredited by the Department of Health and Hospitals in accordance with R S 49 1001 et seq

8 Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24 hour period that reasonably represents the calendar day for purposes of sampling For pollutants with limitations expressed in terms of mass the daily discharge is calculated as the total mass of the pollutant discharged over the sampling day For pollutants with limitations expressed in other units of measurement the daily discharge is calculated as the average measurement of the pollutant over the sampling day Daily discharge determination of concentration made using a composite sample shall be the concentration of the composite sample When grab samples are used the daily discharge determination of concentration shall be arithmetic average (weighted by flow value) of all samples collected during that sampling day

9 Daily Maximum discharge limitation means the highest allowable daily discharge during the calendar month

10 Director' means the U S Environmental Protection Agency Regional Administrator or an authorized representative

11 Environmental Protection Agency means the U S Environmental Protection Agency

12 Grab sample means an individual sample collected in less than 15 minutes

13 Industrial user' means a nondomestic discharger as identified in 40 CFR 403 introducing pollutants to a publicly owned treatment works

14 LEQA means the Louisiana Environmental Quality Act

15 Louisiana Pollutant Discharge Elimination System (LPDES) means those portions of the Louisiana Environmental Quality Act and the Louisiana Water Control Law and all regulations promulgated under their authority which are deemed equivalent to the National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act in accordance with Section 402 of the Clean Water Act and all applicable federal regulations

16 Monthly Average (also known as Daily Average) other than for fecal coliform bacteria discharge limitations means the highest allowable average of daily discharge(s) over a calendar month calculated as the sum of all daily discharge(s) measured during a calendar month divided by the number of daily discharge(s) measured during that month When the permit establishes monthly average concentration effluent limitations or conditions and flow is measured as a continuous record the monthly average concentration means the arithmetic average (weighted by flow) of all 'daily discharge(s) of concentration determined during the calendar month where C = daily discharge concentration F = daily flow and n = number of daily samples monthly average discharge =

$$\frac{C_1F_1 + C_2F_2 + \quad + C_nF_n}{F_1 + F_2 + \quad + F_n}$$

The monthly average for fecal coliform bacteria is the geometric mean of the values for all effluent samples collected during a calendar month

17 National Pollutant Discharge Elimination System means the national program for issuing modifying revoking and reissuing terminating monitoring and enforcing permits and imposing and enforcing pretreatment requirements under Sections 307 318 402 and 405 of the Clean Water Act

18 Severe property damage means substantial physical damage to property damage to the treatment facilities which causes them to become inoperable or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass Severe property damage does not mean economic loss caused by delays in production

9 Sewage sludge means the solids residues and precipitates separated from or created in sewage by the unit processes of a publicly owned treatment works Sewage as used in this definition means any wastes including wastes from humans households commercial establishments industries and storm water runoff that are discharged to or otherwise enter a publicly owned treatment works

20 Treatment works means any devices and systems used in the storage treatment recycling and reclamation of municipal sewage and industrial wastes of a liquid nature to implement Section 201 of the Clean Water Act or necessary to recycle or reuse water at the most economical cost over the estimated life of the works including intercepting sewers, sewage collection systems pumping power and other equipment and their appurtenances extension improvement remodeling additions and alterations thereof

21 Upset' means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee An upset does not include noncompliance to the extent caused by operational error improperly designed treatment facilities inadequate treatment facilities lack of preventive maintenance or careless or improper operation

22 For fecal coliform bacteria a sample consists of one effluent grab portion collected during a 24 hour period at peak loads

23 The term MGD shall mean million gallons per day

24 The term mg/L' shall mean milligrams per liter or parts per million (ppm)

25 The term µg/L shall mean micrograms per liter or parts per billion (ppb)

26 Weekly average other than for fecal coliform bacteria is the highest allowable arithmetic mean of the daily discharges over a calendar week calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week The weekly average for fecal coliform bacteria is the geometric mean of the daily discharges over a calendar week

27 12 hour composite sample' consists of 12 effluent portions collected no closer together than one hour and composited according to flow The daily sampling intervals shall include the highest flow periods

28 6 hour composite sample consists of six effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10 00 a m) and composited according to flow

29 3 hour composite sample consists of three effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10 00 a m) and composited according to flow

30 24 hour composite sample consists of a minimum of 12 effluent portions collected at equal time intervals over the 24 hour period and combined proportional to flow or a sample collected at frequent intervals proportional to flow over the 24-hour period

FACT SHEET ADDENDUM

as required by LAC 33 IX 3111 for draft Louisiana Pollutant Discharge Elimination System Permit No LA0056031, AI148, Permit Activity Number 20000001 to discharge to waters of the State of Louisiana as per LAC 33 IX 2311

The permitting authority for the Louisiana Pollutant Discharge Elimination System (LPDES) is

Louisiana Department of Environmental Quality
Office of Environmental Services
P O Box 4313
Baton Rouge Louisiana 70821-4313

I THE APPLICANT IS Vermilion Parish Police Jury
Vermilion Parish Solid Waste Plant
Courthouse Building – 100 N State St , Suite 200
Hahnville LA 70057

II PREPARED BY Angela Marse

DATE PREPARED September 8 2004

III PERMIT ACTION LPDES permit LA0056031 AI148

IV MODIFICATIONS TO THE DRAFT PERMIT BASED ON COMMENTS FROM VERMILION PARISH POLICE JURY

A The TSS effluent limit at outfall 101 in the draft permit was 50 mg/l Daily Maximum The Parish requested the effluent limit remain 90mg/l Monthly Average and 135 mg/l Daily Maximum Based on recent DMRs the Parish felt they could not meet the 50 mg/l consistently with the technology currently utilized at the site (oxidation pond) Therefore, effluent limits from the previous permit will remain in the current permit These TSS limits are equivalent to secondary standards As stated in the fact sheet with the draft permit, landfills will be considered in the evaluation of the success in restoring designated uses in the Mermentau/Vermilion River scheduled for 2008 With the TMDLs emphasis on inorganic solids (soil and sediment particles) the permittee should be aware of the potential for TSS limits based upon the TMDL

Appendix B:12

U.S. Census Bureau Information

U.S. Census Bureau
American FactFinder

TM-P002. Persons per Square Mile: 2000
Universe: **Total population**
Data Set: **Census 2000 Summary File 1 (SF 1) 100-Percent Data**
United States by State

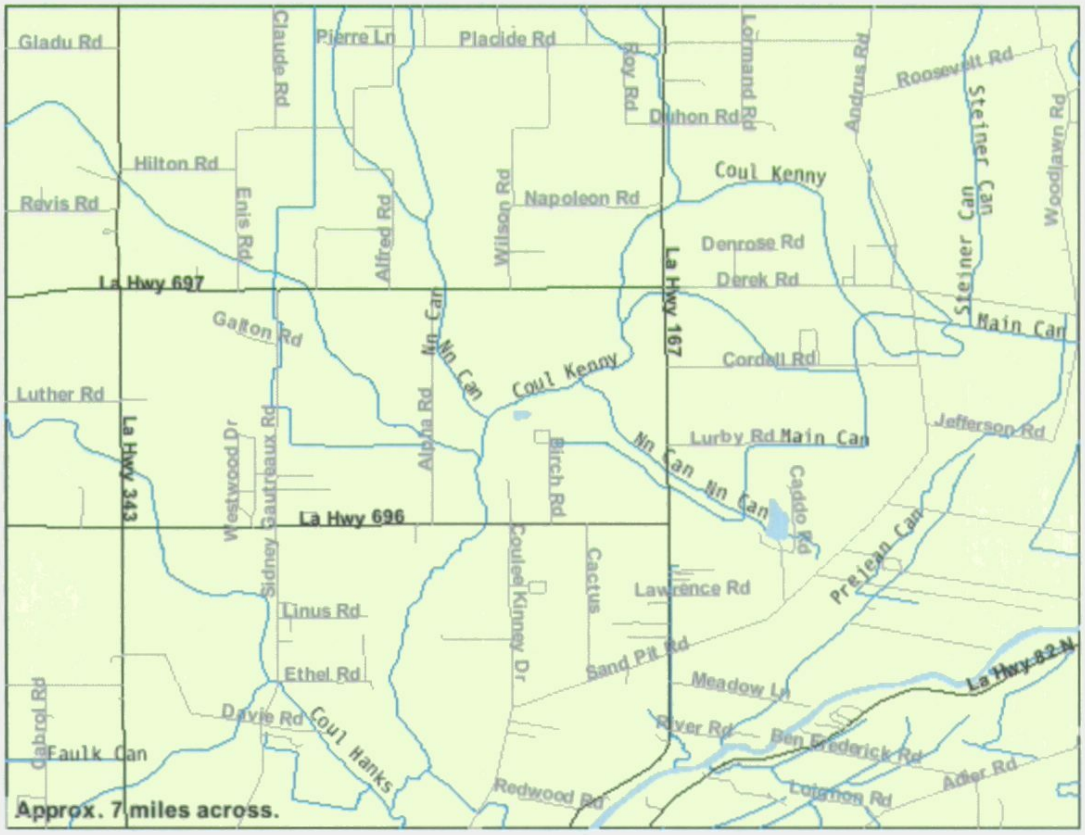
NOTE: For information on confidentiality protection, nonsampling error, definitions, and count corrections see http://factfinder.census.gov/home/en/datanotes/expsf1u.htm.

Legend

Data Classes

Persons/Sq Mile
- 1 - 103
- 133 - 296
- 401 - 703
- 810 - 1134
- 9316 - 9316

Features
- Major Road
- Street
- Stream/Waterbody
- Stream/Waterbody



Source: U.S. Census Bureau, Census 2000 Summary File 1, Matrix P1.

Appendix B:13

LDOTD Letter

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
P O Box 3648
Lafayette Louisiana 70502
(337) 262 6100 FAX (337) 262 6260

KATHLEEN BABINEAUX BLANCO
GOVERNOR

JOHNNY B BRADBERRY
SECRETARY

June 26, 2007

TRAFFIC IMPACT STUDY
VERMILION PARISH SOLID WASTE PLANT
VERMILION PARISH
DISTRICT 03

Dana Montet Simon, M S , P E
Sellers & Associates, Inc
148-B Easy St
Lafayette, Louisiana 70506-3095

Dear Mrs Simon

This will acknowledge receipt of your correspondence dated May 16, 2007, regarding a traffic flow impact statement for the proposed Vermilion Parish Solid Waste Plant modifications at the existing solid waste treatment plant located at 8500 Birch Rd, Abbeville, Louisiana 70510 in Vermilion Parish

A review by our Traffic and Planning Section noted that a minimal impact from this facility to the traffic on state maintained highways should be experienced

Accordingly, based on the information listed above, DOTD has no major objection to the issuance of a permit for the proposed modifications at the existing Vermilion Parish Solid Waste Plant located at 8500 Birch Rd, Abbeville, Louisiana 70510 in Vermilion Parish

If you have any questions or require additional information regarding this matter, please contact this office at your earliest convenience

Yours very truly,

WILLIAM K FONTENOT, JR
DISTRICT ENGINEER ADMINISTRATOR

RJB
WKF/RJB/FMD/npf

cc Mr Chris Theriot
Mr Rick LeBlanc
Mr Frank DeBlanc
Content Manager

AN EQUAL OPPORTUNITY EMPLOYER
A DRUG FREE WORKPLACE

Appendix C:1

Groundwater Monitoring Plan

(Revised pages only)

II GROUNDWATER MONITORING SYSTEM

A The Groundwater Monitoring System at the Vermilion Parish Solid Waste Plant consists of 5 **twelve (12)** Monitoring Wells **(existing and proposed)** The wells have been screened to monitor permeable zones identified during geotechnical investigations At the time of installation observations were made to ensure that the well would produce water All monitoring wells are located within the landfill property

B Exhibit A 11 indicates the location, status, and screened depth of all Monitoring Wells The Monitoring Wells have been sited to monitor groundwater entering and leaving the landfill site through the various permeable layers identified during geotechnical investigations Refer to the following responses for further discussion of subsurface features **§522 (formerly** §521 D)

C Well Construction

Wells shall be constructed in conformance with "Water Wells Rules, Regulations, and Standards, State of Louisiana" (LAC 70 XIII) as adopted by the Louisiana Department of Transpor-tation and Development, Water Resources Section and with "Construction of Geotechnical Boreholes and Groundwater Monitoring Systems Handbook," by the Louisana Department of Environmental Quality and the Louisiana Department of Transportation and Development

Construction of proposed Monitoring Wells shall not be initiated without prior written approval by the administrative authority

The following additional items shall be required for all Monitoring Wells

1 Protective casing with lockable cover and padlock to prevent unauthorized access to the monitoring well

2 Guard posts shall be installed around the well site The guard posts will be set in concrete just outside and not in contact with the well slab

3 The maximum allowable screen length is 10 feet

4 The borehole diameter shall be such that a three inch minimum annulus occurs between the well casing and the borehole wall

III GROUNDWATER SAMPLING AND ANALYSIS PLAN

A This section of the groundwater-monitoring plan includes consistent sampling and analysis procedures to ensure that monitoring results are representative of groundwater quality at background and downgradient well locations Persons who collect samples from the groundwater monitoring wells shall be familiar with the contents in this section A brief review of this part is recommended prior to sampling

B This Groundwater Sampling and Analysis Plan meets the requirements of **LAC 33 VII Chapter 8 (formerly** Subsection E 2 a of LAC 33 VII 709 and the requirements of Appendix C

This plan establishes procedures for sample collection, sample preservation, sample handling and shipping, chain of custody, QA/QC, detection limits, precision and accuracy of the analysis, field blanks, laboratory spikes, and laboratory blanks

Groundwater Monitoring The initial sampling event shall be a minimum of four (4) independent samples collected quarterly over a year period Thereafter, the groundwater monitoring wells shall be sampled every six months

Sampling Equipment Checklist Items utilized in the sampling of groundwater include, but are not limited to, the following

___ Weighted Tape Measure
___ Plastic Sheeting
___ Coolers
___ Vinyl Tubing
___ Field Activity Daily Log Notebook
___ Bailers
___ 55 Gallon Drum
___ Deionized Water
___ Safety Glasses
___ Compressor
___ Plastic Baggies
___ Rope

Order of Sampling In order to minimize the potential for any cross contamination, the groundwater samples shall first be collected from upgradient wells, then to downgradient wells, or beginning with the historically least contaminated well ~~Refer to the drawing in Attachment 2 for the locations of the monitoring wells~~

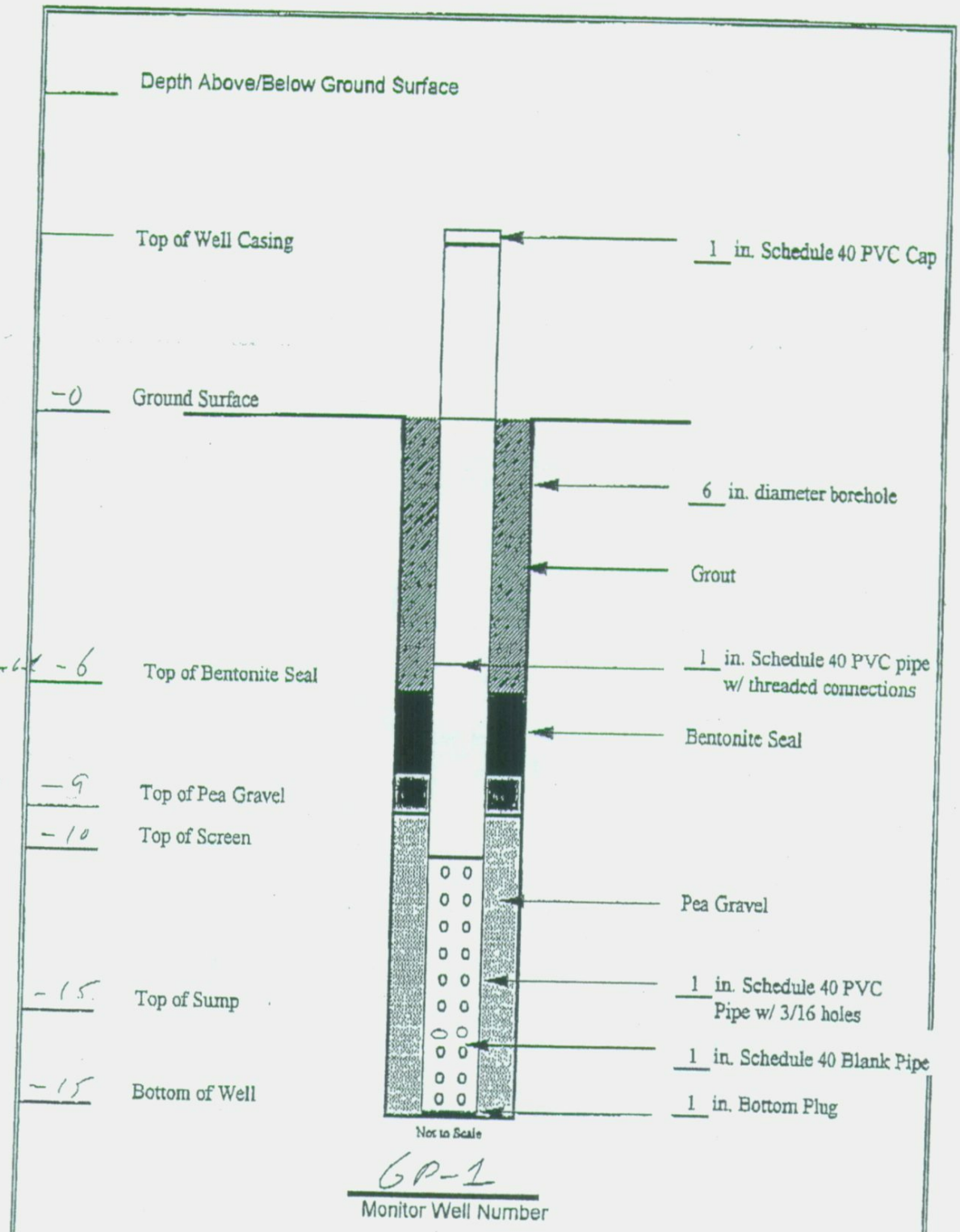
Additionally, upon arrival at each monitoring well, samples for volatiles then metals shall be collected and containerized

Monitoring Well Surface Inspections All monitoring wells are protected by locking shrouds and covers All wells will be visually inspected during each groundwater monitoring and sampling event for the following items

- Evidence of tampering,
- Presence of intact locking shrouds and covers,

Appendix C:2a

Gas Monitoring Probes As-Builts



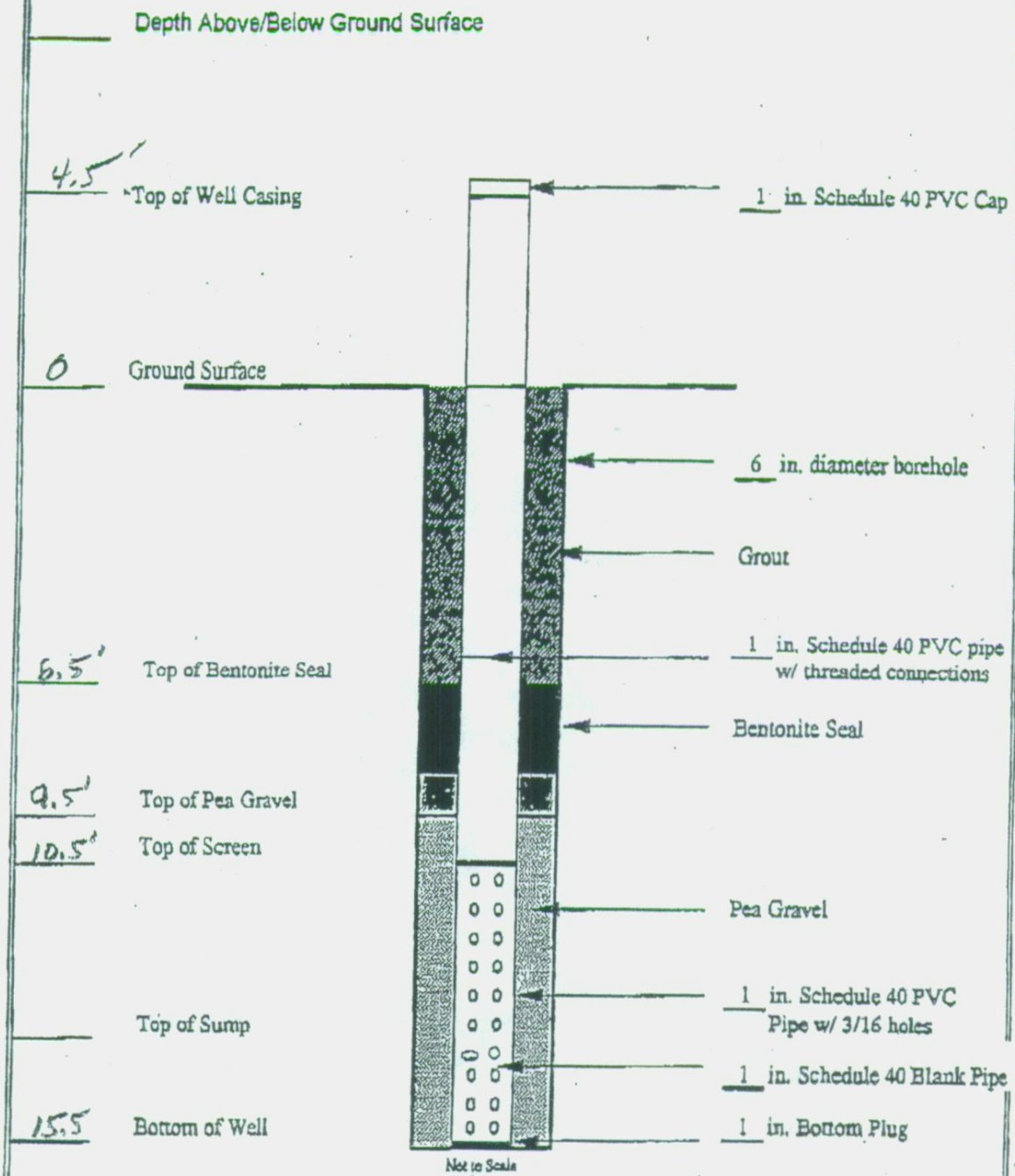
PROJECT NAME : GAS PROBE INSTALLATION

CLIENT : V.P POLICE JURY

PROJECT LOCATION : VERMILLION PARISH LANDFILL

STE PROJECT NO. 98-1139

8-12-98



GP-2

Monitor Well Number

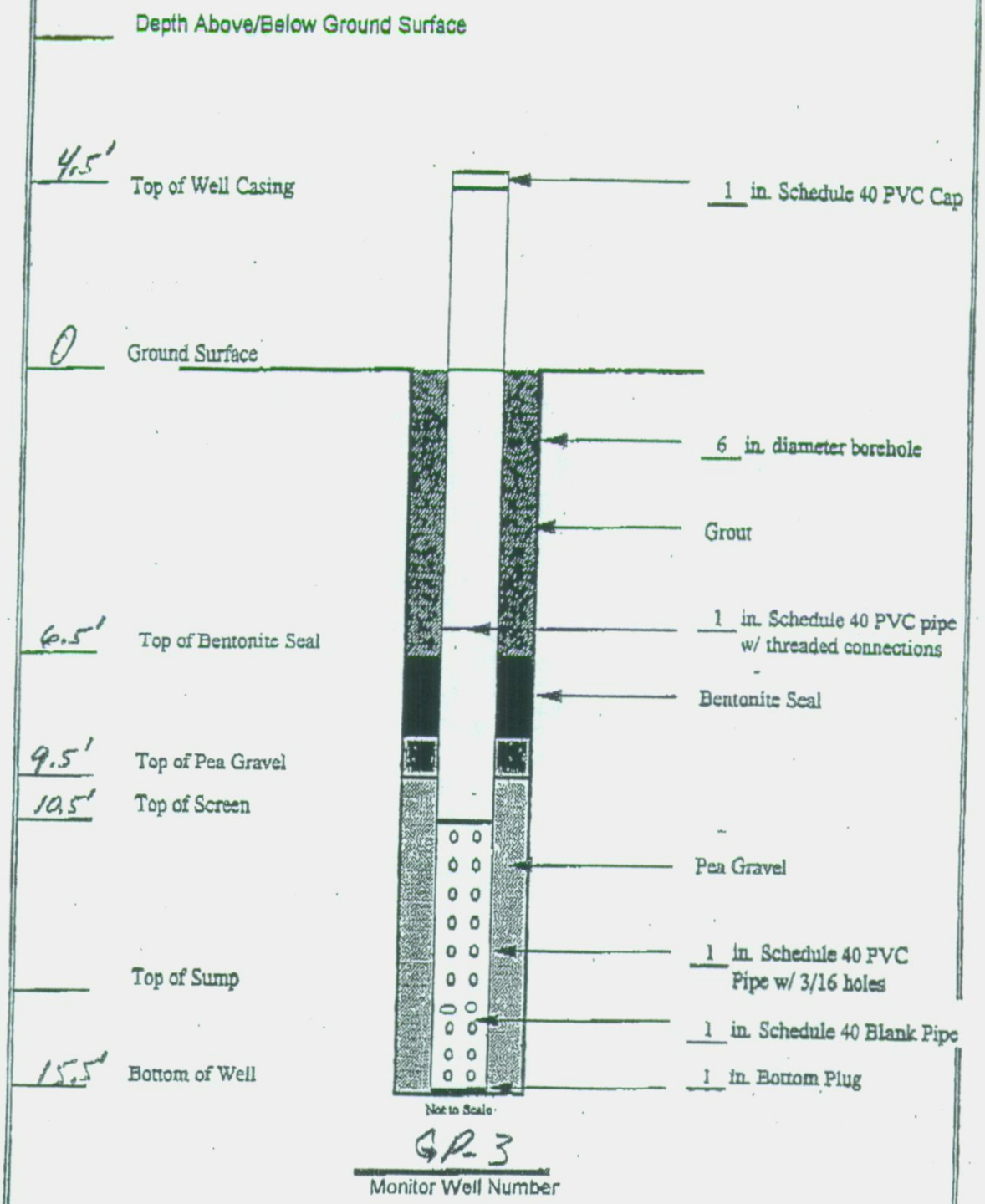
PROJECT NAME : GAS PROBE INSTALLATION

CLIENT : V.P POLICE JURY

PROJECT LOCATION : VERMILLION PARISH LANDFILL

STE PROJECT NO. 98-1139

8/12/98



GP-3

Monitor Well Number

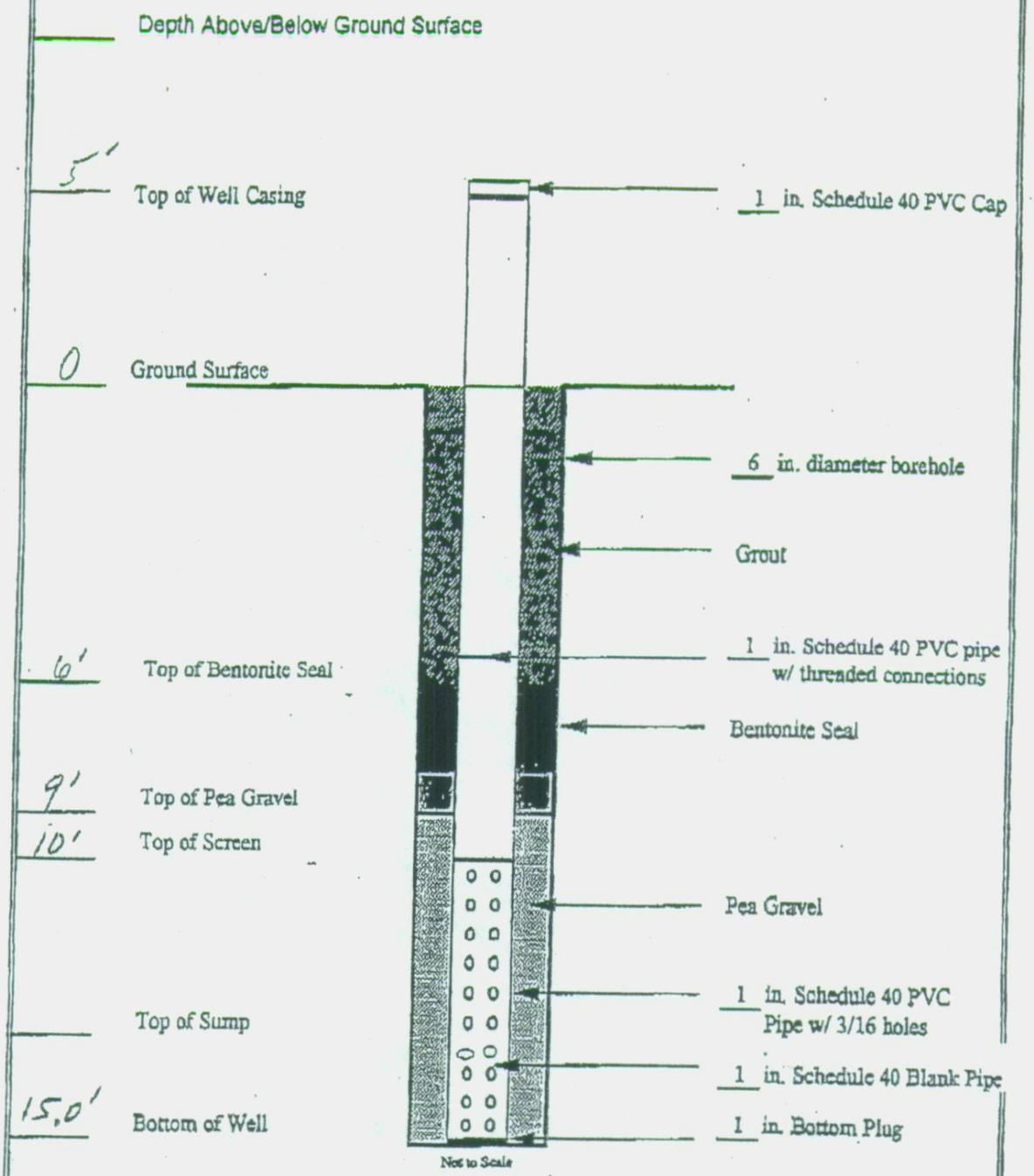
PROJECT NAME : GAS PROBE INSTALLATION

CLIENT : V.P POLICE JURY

PROJECT LOCATION : VERMILLION PARISH LANDFILL

STE PROJECT NO. 98-1139

8/13/98



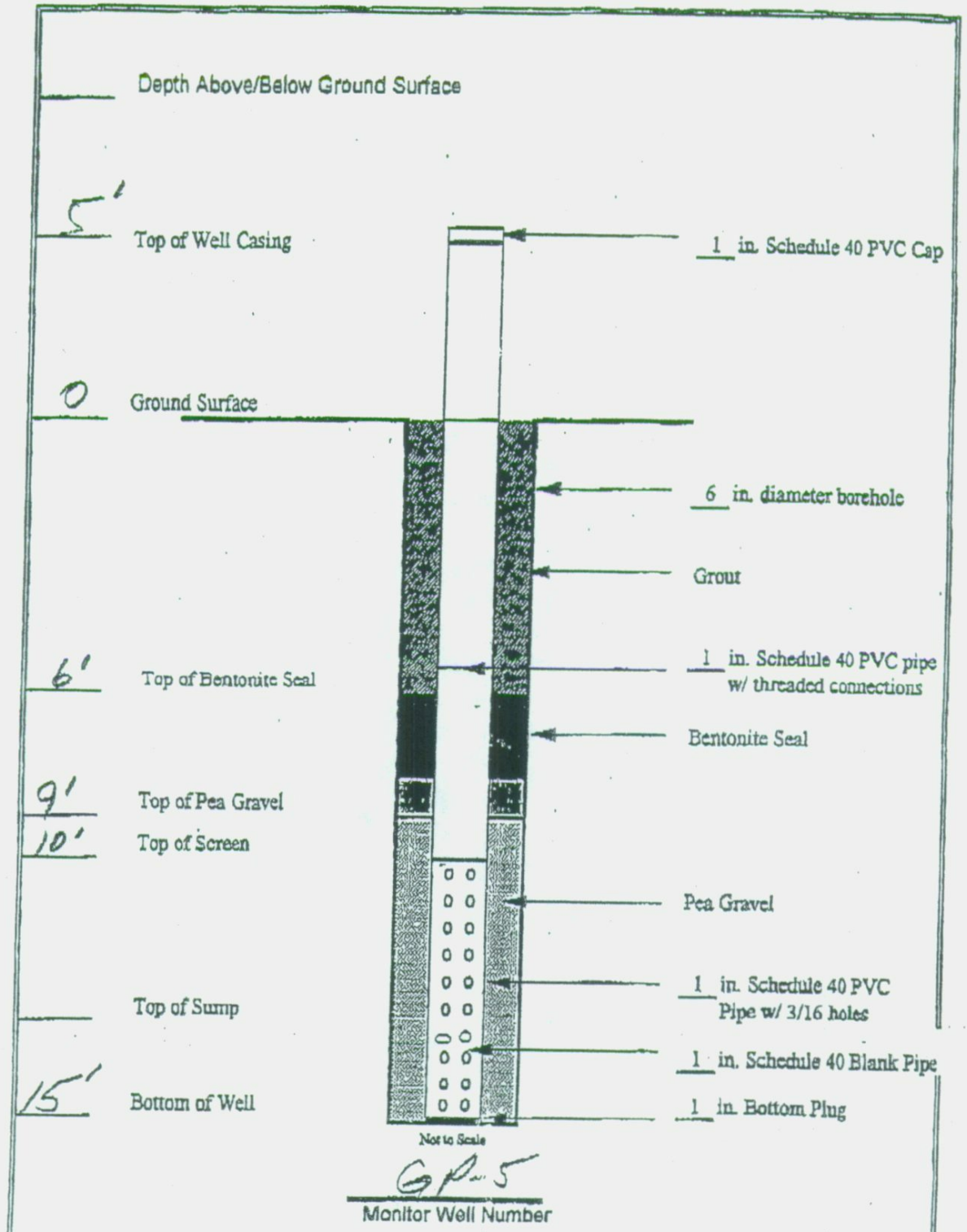
GP-4

Monitor Well Number

PROJECT NAME : GAS PROBE INSTALLATION CLIENT : V.P POLICE JURY

PROJECT LOCATION : VERMILLION PARISH LANDFILL STE PROJECT NO. 98-1139

8/13/98

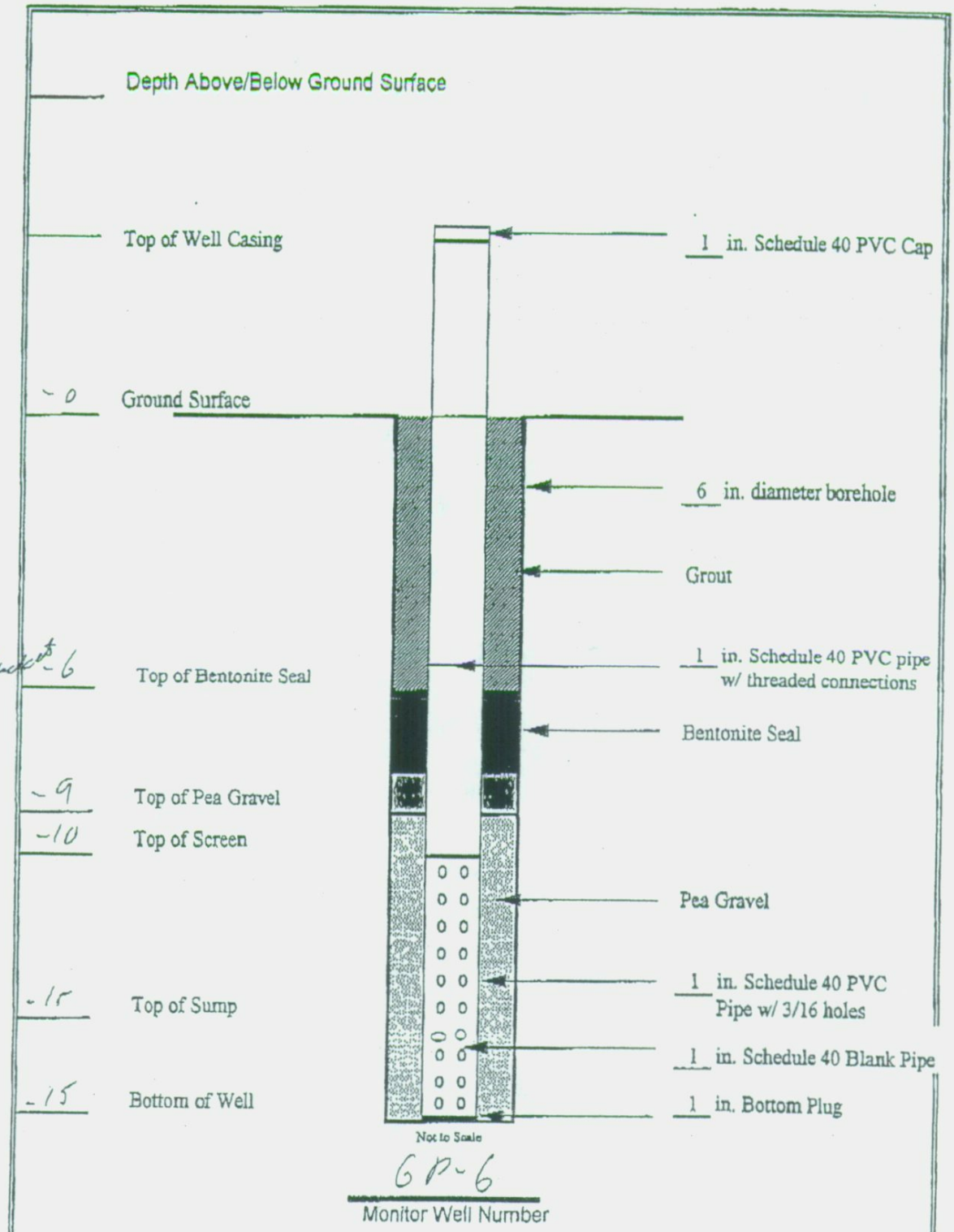


PROJECT NAME : GAS PROBE INSTALLATION

CLIENT : V.P POLICE JURY

PROJECT LOCATION : VERMILLION PARISH LANDFILL

STE PROJECT NO. 98-1139



PROJECT NAME : **GAS PROBE INSTALLATION** CLIENT : **V.P POLICE JURY**

PROJECT LOCATION : **VERMILLION PARISH LANDFILL** STE PROJECT NO. **98-1139**

Appendix D:4

Quality Assurance/Quality Control for Area II-B Alternate Liner System

APPENDIX D 4

Quality Assurance/Quality Control Plan for Area II-B Alternate Liner System

A PURPOSE

The purpose of this document is to establish a quality assurance/quality control plan for the material and placement of the alternate geosythetic clay liner (GCL) and flexible membrane liner (40 mil HDPE) system The alternate systems involving the use of this product are described below Appendices D 1 and D 2 should be referenced for the QA/QC plans for recompacted clay liner and 60 mil HDPE liner installations, respectively

As illustrated in Exhibits A 7c and A 7d, the bottom liner system for the Area II-B area shall consist of a 60 mil HDPE synthetic liner underlain by a geosynthetic clay liner (GCL)and 40-mil HDPE synthetic liner system underlain by 1' recompacted clay placed in 6-inch lifts in accordance with Appendix D 1 The GCL/40 mil HDPE system shall be placed with GCL up, shingled in the downgradient direction, and shall be overlapped at least 12-inches

B SCOPE

This document addresses the test methods, test frequencies, and installation procedures for the GCL/HDPE system necessary to verify adherence to the construction specifications in all phases of landfill construction

C TESTING METHODS AND TESTING FREQUENCIES

Lab tests for material control and plant testing have been established for the GCL/40 mil HDPE system and are listed in Table D 4 1 The physical properties of the actual material provided for cell construction shall be reviewed for conformity with the requirements established in Table D 4 1 prior to placement

Note These property values are subject to change based on industry standards

TABLE D 4 1

REQUIRED PHYSICAL PROPERTIES OF GCL/40 mil HDPE SYSTEM

Property of GCL	Test Method	Minimum Average Values
Bentonite Coasting lb/ft^2 (kg/m^2)[1]	ASTM D 5593	≥0 75 (3 7)
Hydraulic Conductivity GCL, m/sec	ASTM D 5887	≤4x10^{14}
Effective Hydraulic Conductivity Geomembrane m/s	ASTM E 96	≤7x10^{15}
Hydraulic Conductivity Bentonite m/sec	ASTM D 5887	≤5x10^{11}
Hydraulic Conductivity Overlapped Seam, m/sec	ASTM D 5887	≤5x10^{11}
Wet/Dry Cycles, 10 cycles	ASTM D 5887	No Effect on Permeability
Freeze/Thaw Cycles 4 cycles	ASTM D 5887	No Effect on Permeability

Property of HDPE	Test Method	Smooth Geomembrane	Textured Geomembrane
Thickness mil (mm)	ASTM D 5199	40 (0 91)	40 (0 91)
Density, g/cm^3	ASTM D 1505	0 94	0 94
Tensile Properties,	ASTM D 638, Type IV		
Strength at Break, lb/in width (N/mm)	Dumbell, 2 ipm (50mm/in)	162 (28)	60 (8)
Strength at Yield lb/in width (N/mm)		84 (15)	84 (15)
Elongation at Break, %	G L =2 0 in (50 mm)	700	150
Elongation at Yield, %	G L =1 3 in (33 mm)	13	13
Puncture Resistance, lb (N)	ASTM D 4833	79 (352)	72 (320)

Property of sodium bentonite used in the production of GCL	Test Method	Minimum Average Values
Hydraulic Flux Bentonite, m^3/m^2 sec	ASTM D 5887	≤1x10^{10}
Montmorillonite Content %	X ray Analysis	≥90
Fluid Loss ml	ASTM D 5891	≤18
Fluid Swell, ml	ASTM D 5890	≥24

[1] 0% adjusted moisture content

D INSTALLATION

1 Typical Procedures

A Subgrade Preparation

Surfaces to be lined should be smooth and free of all rocks greater than 0 75 inch diameter, sharp/angular objects, sticks, roots, or debris of any kind The surface should provide a firm, unyielding foundation for the GCL/HDPE system with no sudden, sharp, or abrupt changes or break in grade

B Installation - Geomembrane Side Down (Bottom Liner System)

The manufacturer's recommendations shall be followed for deployment and installation of this system This system shall be installed with the geomembrane side down

Panels shall be shingled in the downgradient direction

Seams between adjacent product panels shall be accomplished by overlapping adjacent roll edges No added granular bentonite shall be required for typical seams Overlap distance at all seams shall be a minimum of 12-inches to allow for movement and ensure long term seam performance

Covering of all exposed bentonite shall be performed on the same day as placement

C Repairs and Patching

All damaged areas shall be repaired by placing a patch of the same material over the damaged area Overlap distance of the patch around the damaged area should be a minimum of 12-inches For installations with geomembrane side up, the patch shall be secured to the installed geomembrane backing as per the manufacturer's recommendations

D Weather Conditions

Product placement shall not take place during any precipitation, in the presence of excessive moisture, or in the presence of excessive winds

E Hydrated Bentonite Coating

Any hydrated bentonite coating shall be cut and replaced as per Section D 1 C

Appendix F:6

Geotechnical Investigation Performed by Soil Testing Engineers, Inc. for Permit Modification 9

REPORT OF GEOSCIENCE INVESTIGATION

VERMILION PARISH SOLID WASTE PLANT

PERMIT MODIFICATION No 9
Subtitle D, Area 2-B Expansion
Vermilion Parish, Louisiana

PREPARED FOR

SELLERS & ASSOCIATES, INC

VERMILION PARISH POLICE JURY

NOVEMBER 19, 2004

STE
Soil Testing Engineers, Inc.
Geotechnical Environmental & Materials Consultants

Baton Rouge LA • Biloxi MS • New Orleans LA

STE
Soil Testing Engineers, Inc
316 HIGHLANDIA DRIVE (70810) P O BOX 83710 (70884) BATON ROUGE LOUISIANA
PHONE (225) 752-4790 FAX (225) 752 4878 www STEofLA com

GORDON P BOUTWELL JR Ph D
CHING N TSAI Ph D
CHAD M POCHE MS
CHARLES S HEDGES MS
KELLIE T McNAMARA
BEYONG SEOCK LIM Ph D
KEITH SPAMPNETO
RICARDO de ABREU Ph D

REGISTERED PROFESSIONAL ENGINEERS

November 19, 2004

Vermilion Parish Police Jury
c/o Sellers & Associates, Inc
148 B Easy Street
Lafayette, LA 70506

Attn Ms Dana M Simon, M S , P E

Re Geoscience Services Vermilion Parish Landfill
Modification 9 Expansion Area 2-B
Abbeville, LA
STE File 03-1063A

Ms Simon

We have completed this investigation, and the findings together with our analyses and conclusions based on them, are included in the attached report This work was authorized by your acceptance of our proposal dated July 2, 2003

We will be pleased to discuss any questions you may have concerning this project It has been a pleasure to serve the Vermilion Parish Police Jury and Sellers & Associates Inc on this project and we look forward to working with you in the future

Sincerely
Soil Testing Engineers Inc

Ricardo Abreu

Dr Ricardo C de Abreu, P
Senior Engineer

STATE OF LOUISIANA
RICARDO C DE ABREU
License No 31257
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

RCA/rca

REPORT OF GEOSCIENCE INVESTIGATION (2004)

VERMILION PARISH SOLID WASTE PLANT
PERMIT MODIFICATION NO 9
SUBTITLE D, AREA 2-B EXPANSION
VERMILION PARISH, LOUISIANA

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REPORT OF GEOSCIENCE INVESTIGATION

VERMILION PARISH SOLID WASTE PLANT PERMIT MODIFICATION NO 9 SUBTITLE D, AREA 2-B EXPANSION VERMILION PARISH, LOUISIANA

This report contains the site evaluation and development recommendations regarding the geosciences issues for the new Subtitle D Area 2-B located at the Vermilion Parish Solid Waste Plant in Vermilion Parish, Louisiana Findings, conclusions, and recommendations are covered in the main body of this report The field and laboratory investigations are presented in Appendix A Computations and other pertinent data are contained in Appendix B

I INTRODUCTION

1 1 Nature of Project

The Vermilion Parish Solid Waste Plant is an active landfill operating under the direction of the Vermilion Parish Police Jury This facility currently is a permitted and operating Type II facility, defined by Louisiana Administration Code (LAC), Title 33 (*a facility used for disposing of residential or commercial solid waste*) The jury wishes to pursue the permitting of an additional area, approximately 13 acres in size, for Type II wastes and to vertically expand other existing areas

Soil Testing Engineers, Inc (STE) was engaged by the Vermilion Parish Police Jury through their engineers, Sellers & Associates Inc (SAI) to perform an investigation and evaluation of this area The work included

- Detailed Subsurface Investigation,
- Geotechnical Laboratory Analyses to Define the Pertinent Characteristics of the Soils,
- Engineering and Geological Evaluation of the Gathered Data

1 2 Regulations

All solid waste facilities are regulated by the State of Louisiana through its Department of Environmental Quality (LDEQ) The original permit granted in 1983 was governed by the Louisiana Solid Waste Rules and Regulations (LSWRR) of 1981 Modifications to the permit followed that set of regulations and the regulations contained in Volume 14, Louisiana Administrative Code (LAC), Title 33 New solid waste regulations meet or

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exceed USEPA's 'Subtitle D" (40CFR258) Modification 9 for the new waste area addresses the current regulations

II SITE CONDITIONS

2 1 Surface Characteristics

The site is located in Section 2, Township 11 South, Range 2 East, Vermilion Parish, Louisiana Topographic information contained in the permit application indicates that the site had original elevation +15 ft NGVD along the south boundary and slopes downward to Elevations +8 to + 11 ft NGVD along its north boundary The area is bounded on the north and west by Coulee Kenny and on the east by an unnamed tributary to Coulee Kenny Off-site drainage flows via these channels to join the Vermilion River approximately 5 miles south of the site

Current activities at the facility include active waste cells to the west of the proposed expansion area These active cells were excavated to a depth near Elevation +6 ft NGVD or lower An oxidation pond is located in the northwest corner of the facility The bottom of this pond is near Elevation +8 ft NGVD

2 2 Area Geology

The geology of the site and its region is dominated by the ancestral and recent Mississippi and Red Rivers especially in Pleistocene times A detailed description of the area geology and references used was provided in Section 2 2 of the 1995 Geoscience Report for Vermilion Parish Solid Waste Plant Permit Modification No 5 The geologic stratification in the region around the site can be summarized as follows (Jones, 1954, Nyman, 1984)

Depth Range (feet)	Type of Material	Name	Geologic Origin
0 to 20	Clay	Beaumont Clay	Pleistocene
20 to 800	Sand	Chicot Aquifer	Pleistocene
800 to 1600	Sand and Clay	Evangeline Aquifer	Pliocene

LDEQ's 1993 regulations require consideration of faults within 200 ft of the facility which have had movements in Holocene time (LAC 33 VII 709 A 5) This is also a USEPA Subtitle "D" requirement (40CFR258 13), EPA's recommended source for

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faulting data is Howard, 1978 The appropriate portion of Howard's mapping is reproduced on Figure 5 of the 1995 Geoscience Report Neither Howard nor Pope's review (1984) of faults west of the Mississippi River indicates faulting of regulatory concern at the site

Earthquake vibrations are addressed in the 1993 regulations by LDEQ (LAC 33 VII 709 C 2) in the same terms as under EPA's Subtitle "D" (40CFR258 10) With regard to Seismic Impact Zoning, the USEPA recommends the use of Algermissen, 1982 (see, e g , EPA's *"Draft Manual for Solid Waste Disposal Criteria"*) The appropriate portion of Algermissen's mapping, which is reproduced on Figure 6 (Geotechnical Report 1995), shows that this site does not lie in a "Seismic Impact Zone "

2 3 Geohydrology

The Chicot Aquifer is the primary freshwater aquifer of southwestern Louisiana It begins near Elevation 0 MSL (about 10 to 20 ft below original ground surface) and extends to around Elevation -800 ft NGVD The sand composing the aquifer grades from a fine sand to a coarse sand with gravel in about its upper 50 to 100 feet

Historical potentiometric mapping for the Chicot is available in Jones (1954) for the period 1903 to 1951 Flow from the site is basically westwards to west northwestwards, towards the centroid of pumping along the Lake Charles-Eunice axis The hydraulic gradient is comparatively flat, only about 0 7 ft per mile The calculated water (particle) velocity is some 15 to 35 feet per year beneath the site The groundwater level at the site is mostly near Elevations -15 to 20 ft NGVD, with some localized fluctuations due to the influence of the Coulee Kenny and its tributary The expanse of the Chicot Aquifer makes it impossible to maintain a measurable vertical gradient of the aquifer within a confined area such as the Vermilion Parish Landfill (Paragraph 2 3 of the Geotechnical Report 1995)

Design of any facility such as this is concerned with the proximity of water wells and with any unsealed perforations of the effective aquitards Studies were made for both (Paragraph 2 3 5 1, Geotechnical Report 1995)

2 4 Site Stratigraphy

Soil borings have been made at this site for various projects since January 1977 These fell primarily into seven groups, as follows

1977 Geotechnical Investigation
Borings B-1 through B 3

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1982	Solid Waste Suitability Study Borings B 1 through B-4
1983	Geotechnical Investigation Borings B 1 through B-6
1993	Soil Borings for Visual Classification Borings B-1 through B-5
1994	Geoscience Investigation – Modification No 5 Borings B94 1 through B94-9
1998	Monitoring Well Installation Borings MW-6 through MW-11
2003	Geoscience Investigation – Area 2B Expansion Borings B03-1 through B03-9

Information gained from these investigations indicates that subsurface conditions throughout the site are generally consistent The approximate locations of the borings are shown on the Site Boring Plan, Figure 1 The Soil Boring Logs for the 2003 geotechnical investigation are presented in Appendix A of this report

The soil conditions encountered for all studies will be discussed in general terms with more emphasis placed on the latest borings made for this study Further details are discussed in the following paragraphs

2 4 1 Field Investigation

Nine soil borings were made for the expansion of Area 2B All borings were continuously sampled to a depth of 40 ft below grade, and one of them (B03 9) was drilled to a depth of 100 ft below grade These borings were drilled on a pattern such that the distance between any two borings was not greater than 450 ft

At the time of our field investigation some excavation had occurred in the area proposed for expansion Approximately 10 to 15 ft of soil had been removed from parts of this area and used as daily cover on active landfill areas

2 4 2 Stratification

The subsurface soil conditions at the Vermilion Parish Solid Waste Plan can be divided by general soil type in two major zones with some minor stratification A brief summary is provided so that more detailed description may be followed more easily

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ZONE	SUBSTRATUM	MATERIAL	TYPICAL DEPTH (FT)
I	I-A	CL, CH (continuous)	0 to 25
	I-B	SC, SM, ML (non-continuous)	0 to 25
II	II-A	SM, SP (continuous)	25 to >100
	II-B	CL, CH (non continuous)	35 to 50

Presented below are more descriptive narratives of the two zones and their substrata The materials encountered during this 2003 investigation performed by our company are essentially the same as those encountered during previous investigations Average material characteristics for the soils encountered during this 2003 investigation and previous investigations are presented together and separately as appropriate

Substratum IA This layer is continuous across the site, with thickness varying from 4 ft (at Boring B03 8) to more than 40 ft at the northwest location of the expansion of Area 2 B, depending upon whether excavation was performed near the boring location Generally, it consists of stiff to very stiff SILTY CLAY (CL) and CLAY (CH) This substratum provides an additional barrier to surface spills into underlying water bearing strata It often contains silt and sand seams and/or pockets Average values of the tests performed for some geotechnical properties are tabulated as follows

MATERIAL PROPERTY	TESTS AVERAGE VALUES	
	ALL INVESTIGATIONS	2003 INVESTIGATION ONLY
Compressive Strength (tsf)	1 6	1 3
Dry Density (pcf)	96	93
Moisture Content (%)	27	30
Liquid Limit (%)	53	56
Plasticity Index (%)	31	32
Vertical Permeability (cm/s)	$1\ 6 \times 10^{8}$	$2\ 5 \times 10^{7}$
Horizontal Permeability (cm/s)	$1\ 2 \times 10^{8}$	

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Substratum IB This layer is not continuous across the site CLAYEY SANDS (SC), SILTY SANDS (SM), and SANDY SILTS (ML) can be found in limited parts within the Substratum IA or immediately below that substratum The average values of the geotechnical tests performed for this zone are as follows

MATERIAL PROPERTY	TESTS AVERAGE VALUES ALL INVESTIGATIONS
Penetration Resistance (blows/ft)	16
Dry Density (pcf)	106
Moisture Content (%)	20
Liquid Limit (%)	24
Plasticity Index (%)	5
Vertical Permeability (cm/s)	$9\ 6 \times 10^{-6}$
Horizontal Permeability (cm/s)	$1\ 6 \times 10^{-6}$

Substratum IIA This zone of SANDS (SM and SP) is continuous across the site, and represents the top of the Chicot Aquifer, which underlies the site This zone begins immediately below Zone I and extends to a depth of about 800 ft The average values of the geotechnical tests performed for the upper part (<100 ft) of this zone are

MATERIAL PROPERTY	TESTS AVERAGE VALUES	
	ALL INVESTIGATIONS	2003 INVESTIGATION ONLY
Dry Density (pcf)	95	95
Moisture Content (%)	20	23
Liquid Limit (%)	22	22
Plasticity Index (%)	2	2
Vertical Permeability (cm/s)	$9\ 5 \times 10^{-4}$	$4\ 5 \times 10^{5}$ (1)
Sand Content (%)	79 (2)	82 (2)

(1) Only one test performed
(2) Sand contents are generally lower at low depths and increases as depth increases

Substratum IIB This substratum is not continuous across the site and is generally composed by SILTY CLAYS (CL) and CLAYS (CH), which can be found within the sand zone (Substratum IIA) It may contain sand seams and/or pockets The average values of the geotechnical tests performed for this zone are

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MATERIAL PROPERTY	TESTS AVERAGE VALUES ALL INVESTIGATIONS
Compressive Strength (tsf)	1 2 [1]
Dry Density (pcf)	89
Moisture Content (%)	35
Liquid Limit (%)	57
Plasticity Index (%)	31
Vertical Permeability (cm/s)	5 5 x 10^{9} [1]

[1] Only one test performed

It is important to note that such summaries as those presented above cannot define all variations For visualization of the stratification at the site facilities, refer to the Isometric Soil Profile (Figure 2) and the Soil Profiles (Figures 3 through 16) For details, refer to the individual logs of the borings drilled for this project, which are contained in Appendix A of this report

III - PROJECT CONSIDERATIONS

3 1 Description of Project

The site for the new Subtitle D Area 2B will cover roughly 13 acres in the east section of the landfill site The entire landfill site is to be expanded vertically by "piggybacking" the new Area 2 B over the existing, adjacent cells The cells constructed prior to 1993 (Areas I A) do not have liners meeting the 2003 standards Hydraulic separation of the old and new wastes will be required where the old liner does not meet current standards

3 1 1 New Area 2B Subtitle D Cell

The landfill is divided such that it consists of three phases as illustrated on Figure A 6 The new Subtitle D Area is Phase 2-B Maximum cell excavations for the new Subtitle D 2B Area will be made to nominal depths of about 10 to 15 ft below the ground surface (deeper at sump locations) with side slopes of one vertical on three horizontal [3(H) 1(V)] A side and bottom, composite liner will be installed in the waste disposal area The composite liner will consist of (from top to bottom)

- 12 inch protective soil layer,
- Leachate collection system,
- 60-mil HDPE,
- GCL/40 mil HDPE liners system,

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- 12-inches of recompacted clay having a permeability of 1x10(-7) cm/sec or less,

The cell will rise above natural grade on a [4(H) 1(V)] slope approximately 56 feet to Elevation +71 ft NGVD Twenty-foot wide erosion control terraces with a 4% slope will be constructed at Elevations 38, 55 and 70 ft NGVD Above the erosion control terrace at the 71-foot NGVD elevation level, the surface slopes upwards at approximately 5% to the maximum crown elevation of 81 5 ft NGVD, or 66 feet above mean natural grade

Upon completion, the landfill will be capped with a multi-layered, final cover system consisting of (from top to bottom)

- 6 inch vegetated topsoil layer,
- 24-inch protective soil layer,
- 60 mill HDPE

3 1 2 Vertical Expansion

In addition to laterally expanding the landfill with the new Subtitle D Area 2-B, Permit Modification 9 for the landfill includes a request to vertically expand existing cells and the Subtitle D cells over the existing older cells, i e , Pre subtitle D cells of Area I-A, Subtitle D Area I-B and the Construction/Demolition Debris & Yard Waste Area I-C The existing maximum crown elevation of +67 ft NGVD for Areas I-A and I B will be merged with Area 2-B and increased to +81-ft NGVD The crown elevation for Area I-C will be increased from +56 ft NGVD to +73 6 ft NGVD and tie in with the adjoining Area I-A cell, (Exhibit A 8, Exhibit A 8 a, and Exhibit A-8b, Sellers & Associates, Inc)

The added waste height for the vertical expansion will include hydraulic barriers between the non-Subtitle D areas I-A and the Subtitle D areas I-A and 2-B consisting of (from top to bottom)

- a geonet,
- a 60 mil HDPE,
- GCL

The hydraulic barrier will be constructed in phases or as necessary Interim berms will be used for anchor trenches for the phased-in liner system Areas I-A and I-C are separated by a 2-ft interim compacted cover on a 2(H) 1(V) slope

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3 1 3 Monitoring Wells

The Monitoring Groundwater Plan Map is presented on Figure 19 The lateral expansion of Area 2-B will require that the existing monitoring wells, MW-1 and MW 2, be plugged and abandoned Installation of new wells is proposed in the same figure Installation of the well screens in the sand will be approximately below Elevations -20 ft to 50 ft , NGVD, as proposed on Table A 3

3 1 4 Miscellaneous Items

Outlined below are other miscellaneous items which require some geotechnical considerations in design

3 1 4 i Flood Protection System

The landfill area is surrounded by a flood protection berm/levee system rising to Elevations +21 to +24 ft NGVD, or 2 to 6 ft above natural grade It is some 10 ft wide to allow vehicle passage, and has side slopes [3(H) 1(V)] The cell will be surrounded by a perimeter ditch and levee system which will intercept any runoff that comes into contact with the waste This system transports any potentially contaminated liquid to the oxidation pond The ditch has side slopes of approximately [3(H) 1(V)]

3 1 4 ii Leachate Collection System

Leachate formed within the cell has been designated to collect in the eastern-most part of the new Subtitle D cell, Area 2 B Bottom contouring is planed on 2% minimum (north south direction) and 1% minimum (east west direction) to allow gravity drainage toward the collection point From this sump, the leachate is pumped to the oxidation pond for treatment

3 1 4 iii Cover System

The final cover system for the Subtitle D cells, Areas I-A and 2-B, will consist of 2-ft of recompacted clay and a 60-mil HDPE with 6 in of top soil The final cover for the non-Subtitle D areas (I A, and I C) will consist of a 2 ft clay cap with 6 in of topsoil

3 2 Limitations

The analyses and recommendations presented in this report are based on information obtained from the literature, the geotechnical investigation performed by our firm, as well as information supplied by Sellers and Associate, Inc (SAI) The boreholes were spaced between 300 to 450 ft apart It is possible that conditions may vary between or away from those observed in the borings However, due to the nature of this project and the proposed method of construction, any variations within the upper 30 to 35 ft should become apparent during construction If it becomes apparent during construction that

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soil conditions differing significantly from those discussed in Paragraph (2 4) are encountered this office should be notified at once Also, should the nature of the project as described in Paragraphs 1 1 and 3 1 change, these recommendations may have to be re evaluated Re-evaluation would also be in order if there is a change in either the written regulations (Paragraph 3 3) or their unwritten interpretations by the LDEQ

3 3 Regulations

Construction at the landfill through February, 1993, was governed by the Louisiana Solid Waste Rules and Regulations of 1981, as later modified, and the Louisiana Administrative code (LAC 33 VII) dated December, 1987 In February, 1993, LDEQ promulgated its new regulations (LAC 33 VII) which incorporate the requirements of the US EPA's "Subtitle D" (40 CFR 258) The proposed new units at the facility meet the 1993 regulations

Regulatory responses provided in the Permit Application that changed for this Modification, regarding the geosciences are presented in the form of strike through text, which illustrates old language to be removed Underlined text illustrates the new proposed verbiage

3 4 Geoscience Considerations

The geoscience analyses provide a basis for design of the facility (as described above) with respect to the site subsurface conditions and the applicable regulations The primary concern is leachate control For a landfill, this includes both production and potential escape of leachate to the ground water However, construction must also be addressed so that there are no mass movements, etc, which can affect the integrity of the leachate control system as well as other landfill systems Analyses, conclusions, and recommendations are presented in the following sections

3 4 1 Excavations Bottom Heave

The allowable depth of excavation is governed by several factors Primary among these are the potential for bottom heave and the thickness of barrier clay remaining below the liner system When an excavation is made, the bottom can rise from two different phenomena elastic swell and potentiometric heave At a site underlain at depth by water-bearing permeable deposits, heave usually governs the depth of allowable excavation Another consideration is control of seepage into the excavation during construction These factors are examined in the following paragraphs Calculations for bottom heave are presented on Appendix B

3 4 1 1 Elastic Swell

The excavation itself reduces the pressure on the remaining soils below The soil expands elastically in response to this reduced stress condition

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Excavation should produce only about 2 to 4 in of elastic movement This can cause a small amount of opening of joints and slickensides in the remaining clays, however, these should close upon reapplication of pressure

3 4 1 ii Potentiometric Heave

Bottom heave is caused by unbalanced water pressure in a pervious stratum below the base of the excavation Analyses for heave were made with consideration for the highest, long term water level occurring after 24 hours in the individual boreholes, compared with the lowest level noted for all borings and the highest potentiometric level measured for the area The maximum excavated depths were computed using a minimum factor of safety of 1 1 in the method of balance of vertical forces Presented on Figure 17 are the maximum allowable excavations (expressed as minimum cut elevations) from consideration of bottom heave Figure 18 shows the safety factors for the excavations as actually proposed The new Subtitle D cell 2-B will terminate in the materials of Zone I at elevations averaging 4 feet NGVD

3 4 1 iii Lateral Heave

This phenomenon can occur when the side liner is placed over a water bearing permeable zone penetrated by the excavation The lined excavation for the new landfill cell does not penetrate the pervious, water bearing zones Excavation for the new cell will terminate a minimum of 3 feet above the average water table zone Lateral heave is not an issue for this project

3 4 1 iv Infiltration Control

It is possible that during excavation some seepage may occur when isolated pockets of sand/silt are encountered The water from these pockets is expected to be minor, seepage can most likely be handled by a simple sump and pump procedure until the water dissipates However, in the unlikely event that larger than anticipated seepage is encountered it may be necessary to install a composite drainage net behind the liner for relief A typical system would provide a gravel or geotextile drain over the exposed seeping zone This draining medium is hydraulically connected to a pipe (or pipes) which discharge into the excavation beyond the lined area

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3 4 2 Groundwater Protection

Protection of the groundwater is provided by controlling the hydraulics of surface water and the landfill's liner/leachate collection system The leachate collection system above the liner is described in section 3 1 4 ii The performance of these systems is further monitored through a groundwater-monitoring system consisting of a sufficient number of wells, installed at appropriate locations and depths

3 4 2 i Liner System

LDEQ specifies composite liners (LAC 33 VII 711 b 5 d ii) unless an equivalency demonstration is made under the provisions of LAC 33 VII 711 b 5 d iii As discussed in paragraph 3 1 1, an alternate liner system consisting of a 60 mil HDPE over a GCL/40 mil HDPE system over one foot of recompacted clay is being proposed A comparative analysis of the hydraulic equivalency between the standard composite liner and the alternate liner system proposed was considered, i e, the standard 60-mil HDPE (10^{12} hydraulic conductivity) with 3 ft of recompacted clay (10^{7} cm/sec hydraulic conductivity) was compared with a 60 mil HDPE (10^{12} cm/sec hydraulic conductivity) over a GCL/40 mil system (10^{9} and 10^{12} cm/sec hydraulic conductivity, respectively) and one foot of recompacted clay (10^{7} cm/sec hydraulic conductivity) Both systems include a 60-mil HDPE and the alternate liner system proposed includes an additional 40-mil HDPE as part of the GCL system Based on the thickness of the different layers and hydraulic properties of the materials, the proposed alternate liner system will produce less than one third of the flow taking place through the standard composite liner, i e, the alternate liner will meet and exceed the hydraulic performance of the standard liner system, as presented on Appendix B

3 4 2 ii Groundwater Monitoring Plan

The current system of monitoring wells is shown on Figure 19 Individual logs of the existing monitoring wells are given in Appendix A Their locations are also illustrated on the most recent potentiometric maps, Figures 20 through 22

As previously noted, the location of the new Subtitle D Cell 2 B cell will require that the existing monitoring wells MW 1 and MW 2 be plugged and abandoned and three new wells will be placed on the eastern edge of the new cell (see Figure 19) The new point of compliance is also indicated on Figure 19

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3 4 3 Stability

The liner, cover, and other parts of the ground water protection system should be safe from damage caused by mass movements such as a slope failure This section addresses the stability of the facility against such movements Computations are presented on Appendix B

3 4 3 i Excavation Slopes

Analyses were made for the stability of the landfill and excavations using the Simplified Bishop Method The stability analyses used soil properties representative of both short and long-term conditions The results of these analyses for the design slopes of 3(H) 1(V) are presented graphically on Figure 23 The minimum safety factor for the short-term condition for a 16 5 foot deep excavation was 4 1 For the long-term case, the minimum factor of safety was 1 8

3 4 3 ii Waste Mass Above Grade (Aerial Fill)

The stability of the waste mass above grade was also analyzed using the Simplified Bishop Method Values used for the municipal solid waste in the analyses were a cohesion value of 300 psf combined with a friction angle (ϕ) of 23 degrees, and unit weight (γ) of 63 pcf For the cell with the construction debris (Area I C), a cohesion value of zero with a friction angle of 33^0 and unit weight of 100 pcf was used

A block or wedge (non-circular surface) method was used in analyzing potential zones of weakness or low frictional resistance such as could occur along the interface of the cell liner and hydraulic barriers In this case strength values of zero cohesion with a 10 degree friction angle, and a unit weight of 65 pcf were used to simulate the GCL/membrane interface

The height of all waste areas is to be increased and the factor of safety for the stability of the slope in all areas was reviewed for the proposed design height increases This included the existing cells, I-A I-B, I C, and the new cell 2-B The smallest factor of safety computed by the Simplified Bishop Method occurs in the 2 B cell As shown in Figure 24, the east slope of the new cell 2-B has a minimum factor of safety of 1 7 for the geometric design as proposed and maximum elevation height of 81 5 feet NGVD The waste slope at this location is situated on a thicker section of the Zone I clays The analyses of all other slopes yielded F O S that equaled or exceeded 2 0 Figure 25 The failure surfaces investigated along the liner and hydraulic barrier surfaces are not critical The smallest factor of safety produced was 2 0 when using a specified noncircular

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surface analysis with a very low friction angle (ϕ=10 degrees) along the liner interface, Figure 24

3 4 4 Settlement

Settlement will occur in the natural soils below the waste mass, in the old waste under the vertical expansion areas, and ultimately, the new waste Foundation settlement distorts the bottom LCS and liner from the original position Under certain conditions, settlements can reduce the effectiveness of the liner/hydraulic barrier systems and impair leachate flow The combination of foundation and waste mass settlements can also distort the final cover

3 4 4 1 Natural Soil Settlement

When the weight of the waste mass begins to exceed the effective weight of the excavated earth, it begins to squeeze water from the underlying soils In the new cell 2-B, this will begin when the waste mass reaches a total thickness of approximately 20 ft for a 10 ft excavation, or a height of approximately 10 ft above grade Settlement is a time-dependent process the settlement proceeds at ever and ever decreasing rates until the ultimate settlements are achieved Settlement will depend on

- Compressibility characteristics of each zone
- Thickness of each zone
- Load applied

The amount of settlement to be expected under the proposed waste mass configurations were determined in those areas that would be impacted most, i e , beneath the liners and leachate collection systems Calculations were made for numerous points, since the loading and soil conditions vary between locations This included the settlement beneath LCS and liner system of the new cell 2 B as presented on Appendix B Neither the settlement magnitude nor the differential settlements occurring between the intersecting points of the LCC will significantly alter or impair the flow of the system as designed There is very little change in the slopes of the LCS system that will be produced by settlement of the in place soil

Settlement in the foundation soils will cause the recompacted liner to "dish" slightly, which tends to produce tensile stresses in the liner Excessive tensile stresses can lead to liner cracking If the clay cracks, its effectiveness as a barrier is severly compromised Analyses were therefore made to determine the effect, if any, of settlement on the liner's integrity using plate bending theory The maximum ground settlement computed

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(20 in settlement with 9 inches differential settlement) was used in these analyses A value of 100,000 psf was used for the modulus of elasticity (E) of the recompacted clay liner The tensile stress due to liner bending was calculated as being less than 2 psf, and stress due to elongation (change from plane to arc) was less than 6 psf The overburden pressure on the liner at the point of maximum bending stress will be at least 4000 psf This vertical pressure will induce a horizontal compressive stress 1000 psf or greater No true tension is produced and therefore, settlements should not affect the integrity of the 1-foot recompacted clay liner

The thickness of the GCL and geomembrane is so thin that bending strains/stresses can be neglected Using a value of 150,000 lbs /sq in for the elastic modulus of the HDPE the computed tensile stress is very small, i e, less than 10 psi and significantly less than the estimated HDPE breaking strength of 2000 psi The magnitudes of the foundation settlement and the settlement differentials are small They should not affect the performance of the liner/leachate system Calculations are presented on Appendix B

3 4 4 ii Waste Mass Settlement

Settlement occurring in the old waste can impact the performance of the hydraulic barrier between the Subtitle D areas and the non-Subtitle D areas Severe distortion of the hydraulic barrier with settlement of the underlying older waste can cause the leachate to accumulate in those areas Significant differential settlement in the waste can also produce distress in the cap resulting in material failure or surface ponding Settlement after the landfill has been capped can also affect the integrity of the final cover or liner cap

The older waste below the hydraulic barriers will initially undergo elastic and, ultimately, secondary/degradation settlement Estimates of the elastic or primary settlement were made using test results of large scale compression tests with MSW conducted at the University of New Orleans Degradation/secondary settlement was computed using the hyperbolic model and an ultimate strain value of 8 percent Large settlement occurs with added load and further degradation Maximum ultimate waste settlement was computed to be approximately 10 ft at some locations However, in checking the change in slopes (hydraulic barriers), the relative movement along the barrier was compatible and drainage will not be impaired The tension produced in the stretching of the GCL and geomembrane were also reviewed The maximum elongating strain was

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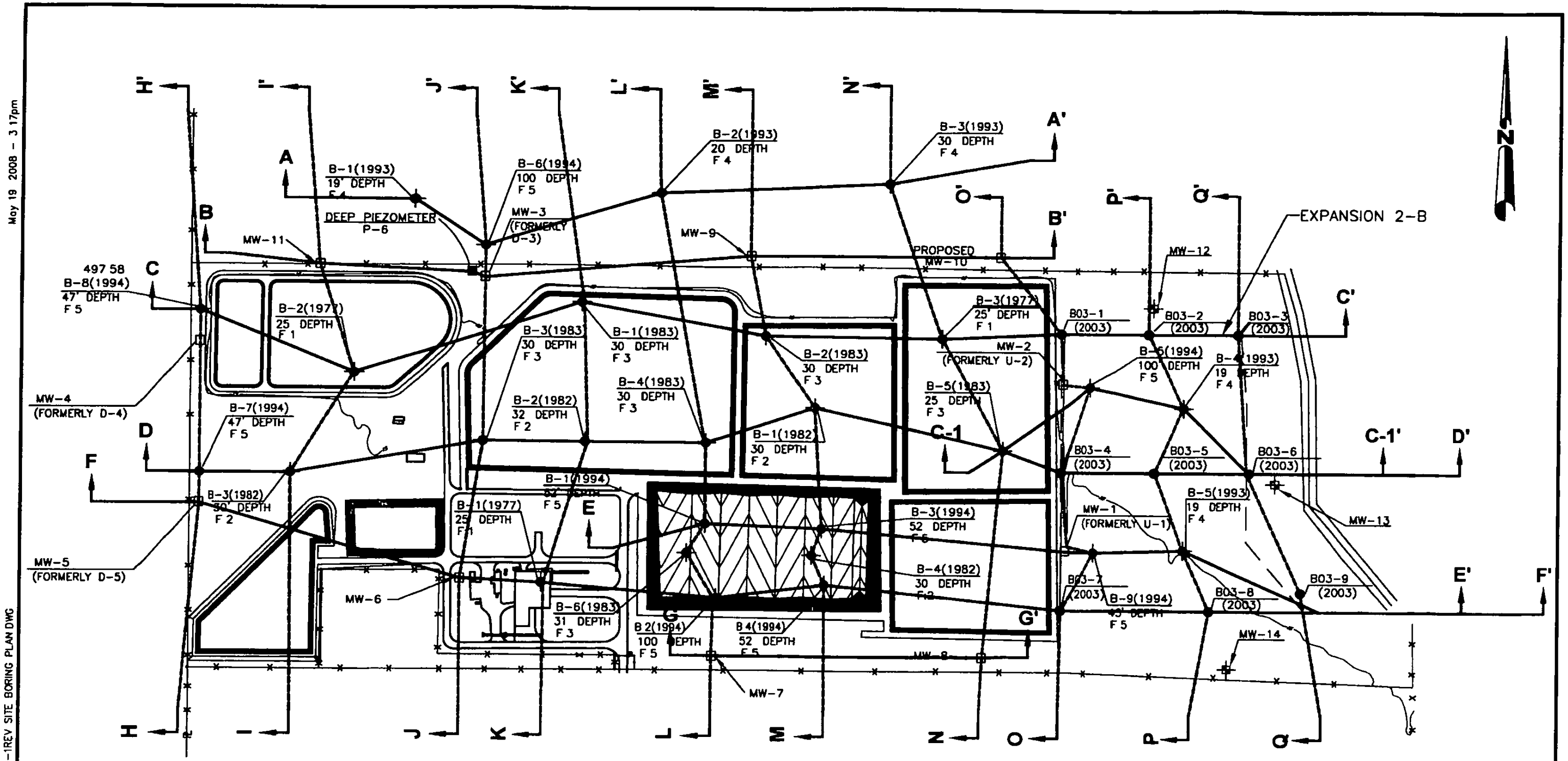
estimated to be approximately 2 percent The allowable tensile strain for a geosynthetic liner varies from 7 to 20 percent (LaGatte, et al, 1996 and Koerner, et al, 1996) Supported over the 4H 1V slope the proposed GCL/60 mil HDPE should perform well The GCL should be underlain by at least 18 in of earth or similar ' cushion" material to protect the liner from the waste Calculations are presented on Appendix B

FIGURES

Figure 1 - Soil Boring Plan
Figure 2 - Isometric Soil Profile
Figures 3 through 16 - Soil Profiles
Figure 17 - Minimum Allowable Cut Elevation Contour Map
Figure 18 - Bottom Heave Safety Factor Contours for Design Cuts
Figure 19 - Groundwater Monitoring Plan Map for Zone IIA
Figure 19A - Groundwater Monitoring Plan Map for Zone IB
Figures 20 through 22 - Most Recent Potentiometric Maps
Figure 23 - Excavation Cut Slope Stability
Figure 24 - Slope Stability Cell 2-B
Figure 25 - Slope Stability – Cell I-A



LEGEND

- SOIL BORING (LOCATION APPROXIMATE)
- MW-1 □ MONITORING WELL
- ■ TEMPORARY PIEZOMETER
- MONITORING WELL (PROPOSED)

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R de Abreu	BJ	
File No	Date	Figure No
03-1063A	3/1/04	1

Title
SITE BORING PLAN

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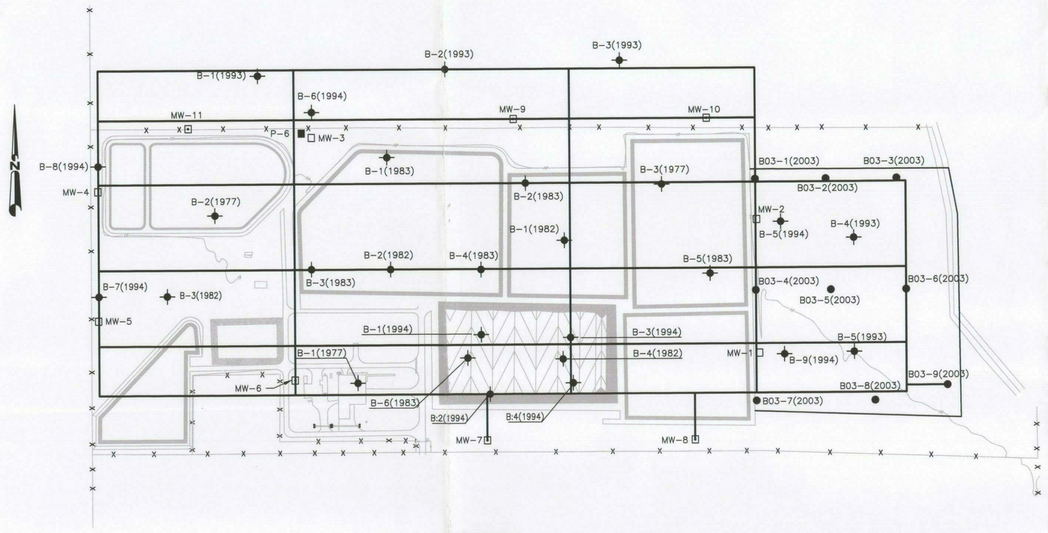

PLAN VIEW

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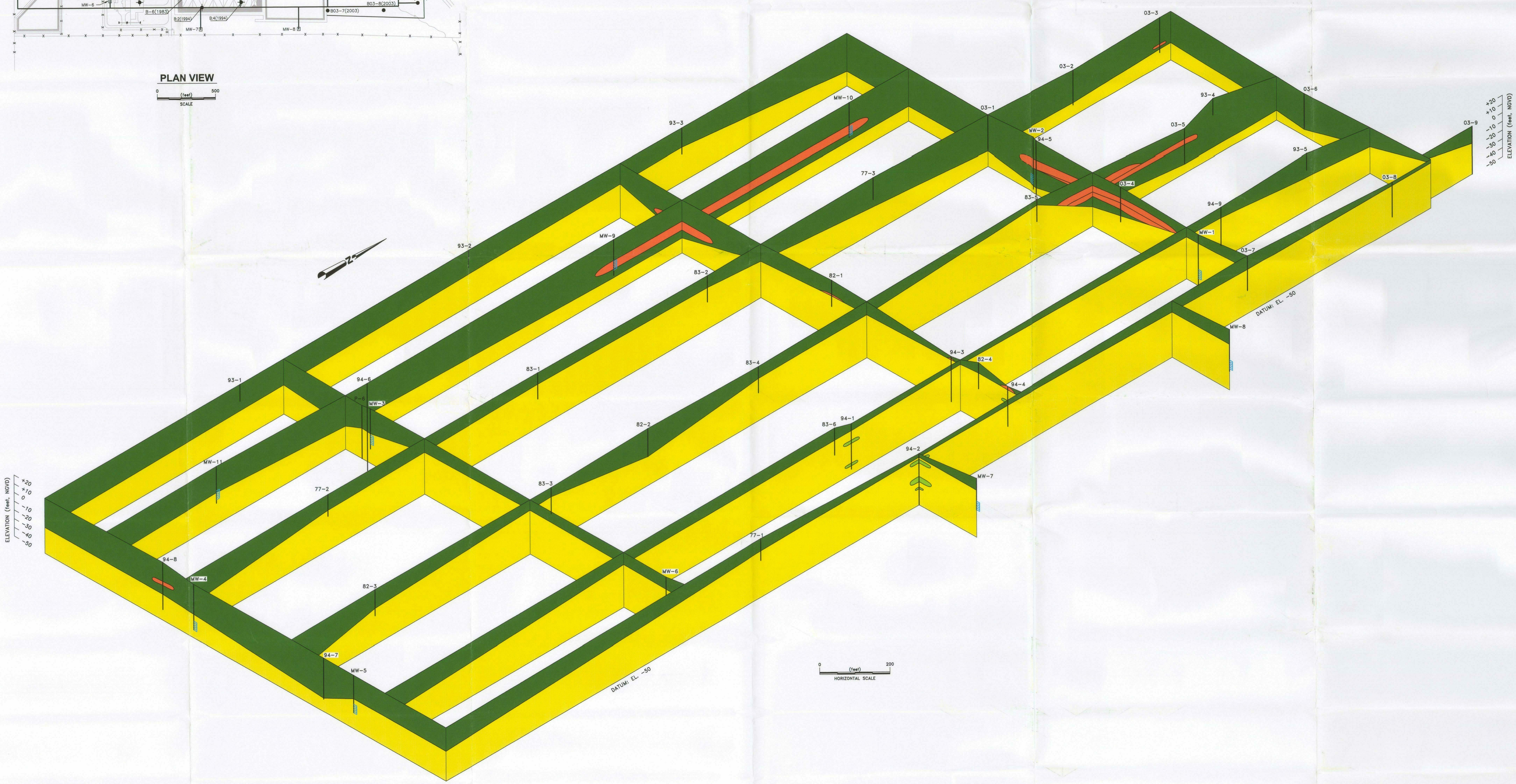
SCALE



LEGEND

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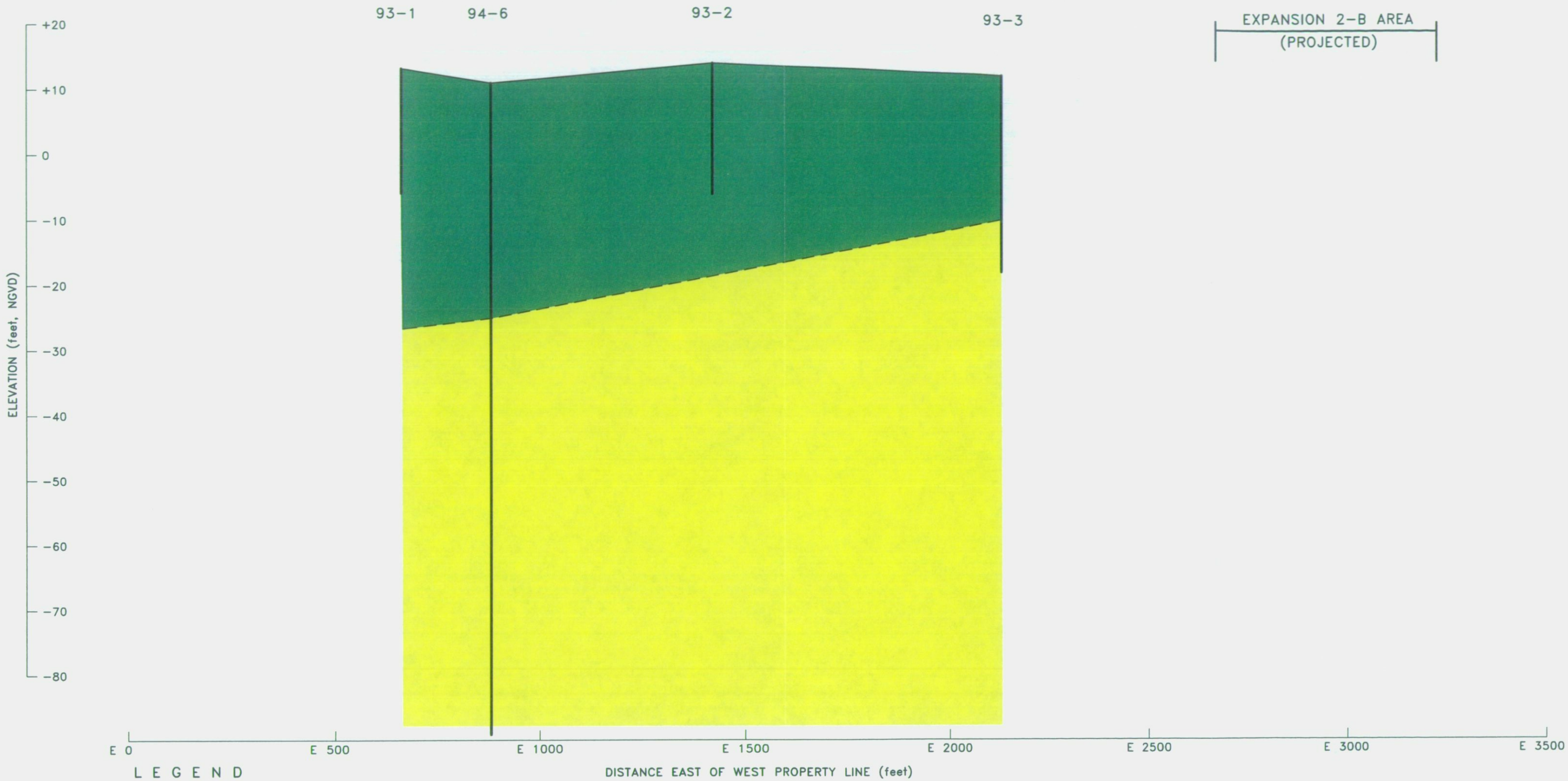
File No.: 03-1063A	Date: 10-25-04	Figure No.: 2

Title: **ISOMETRIC MAP**



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03-1063A	10-27-03	3

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SOIL PROFILE A-A'

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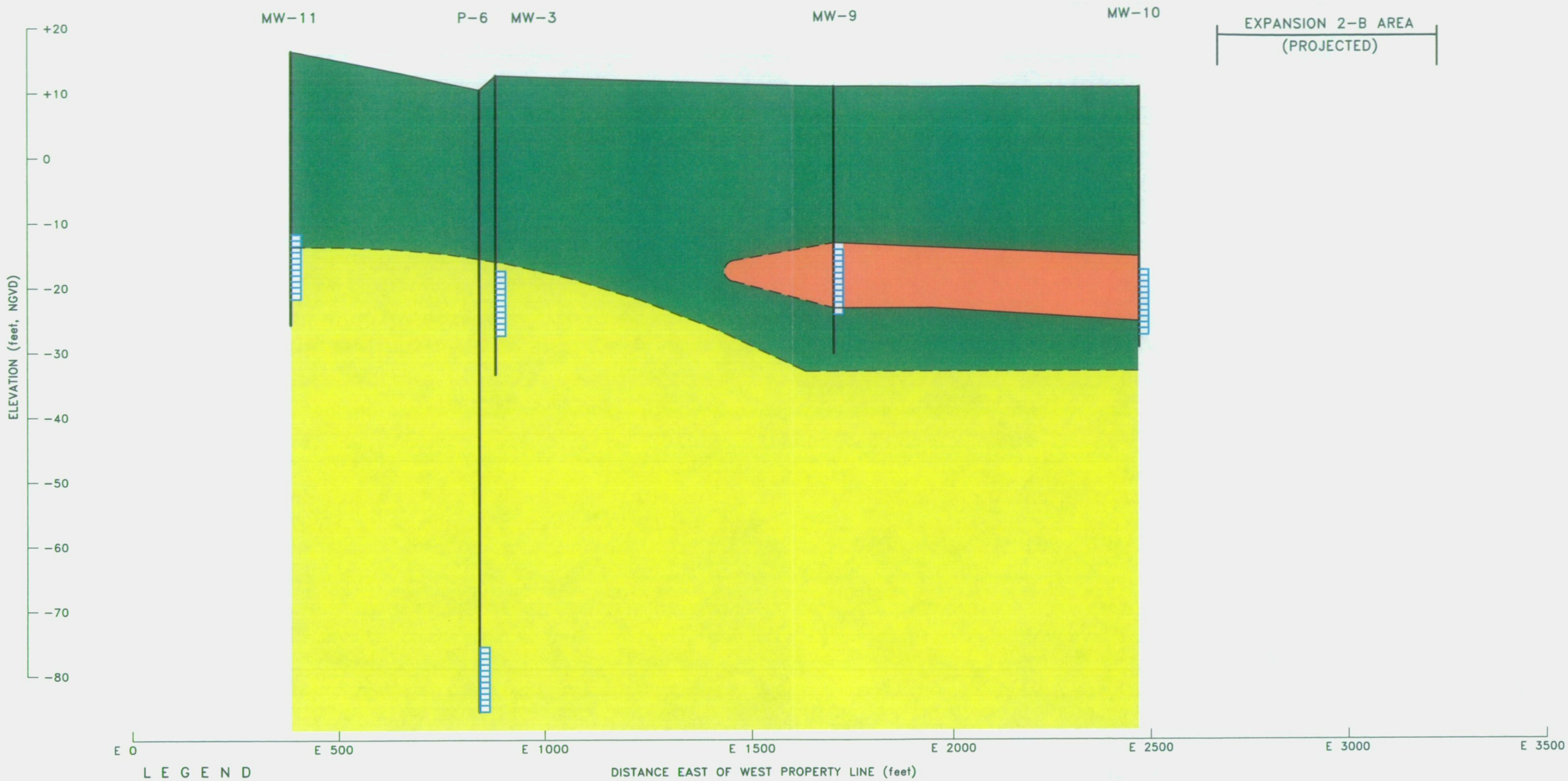

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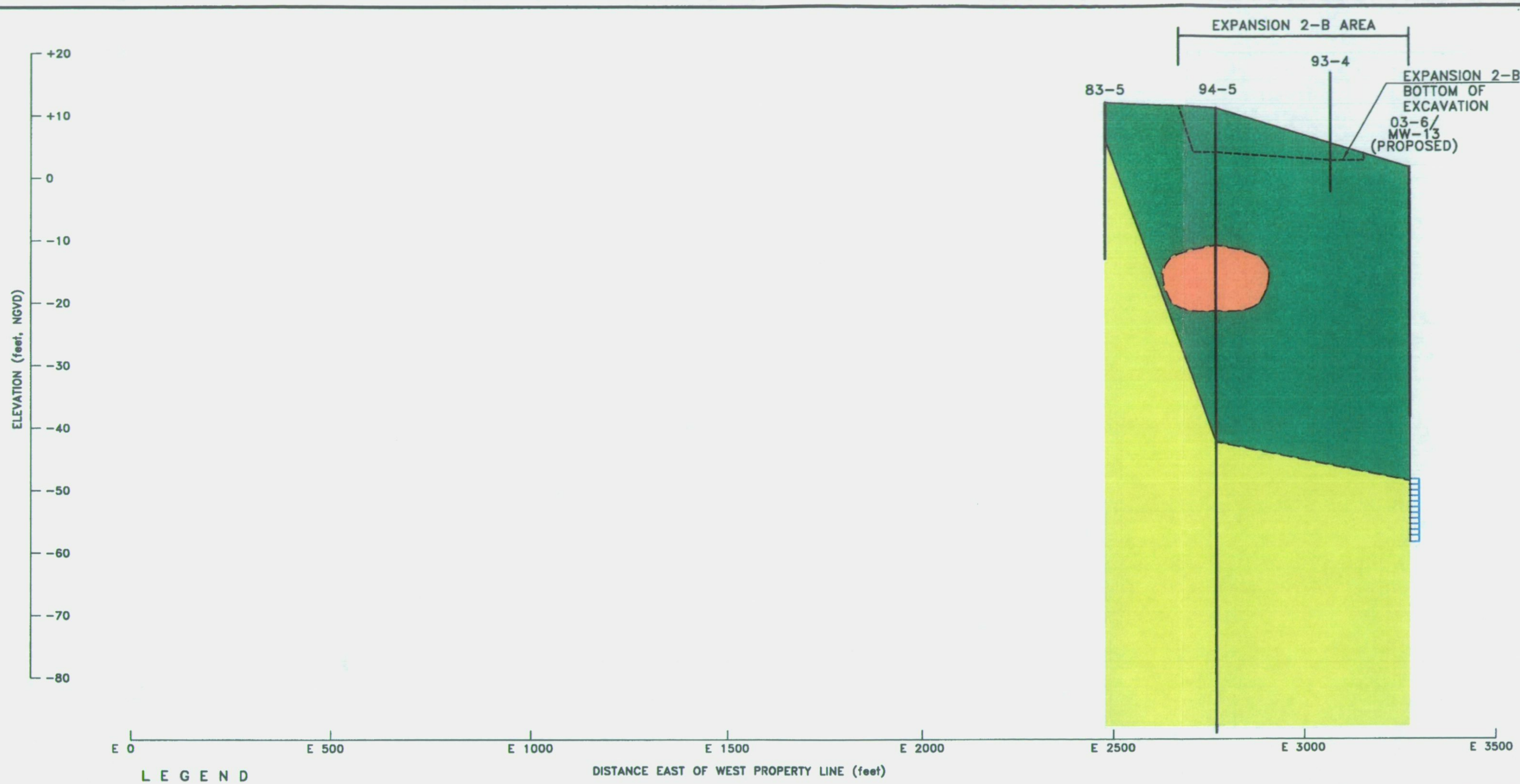

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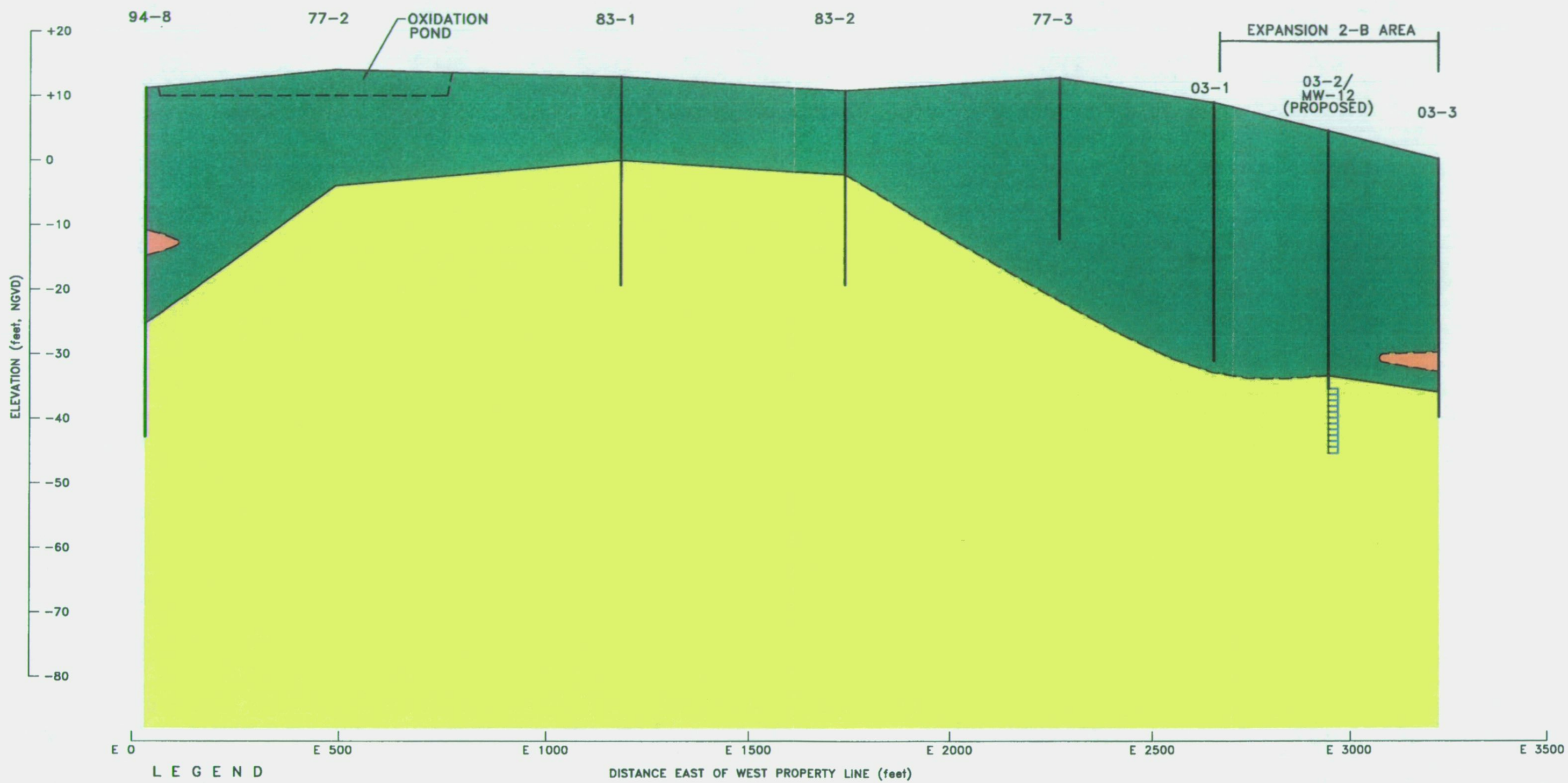

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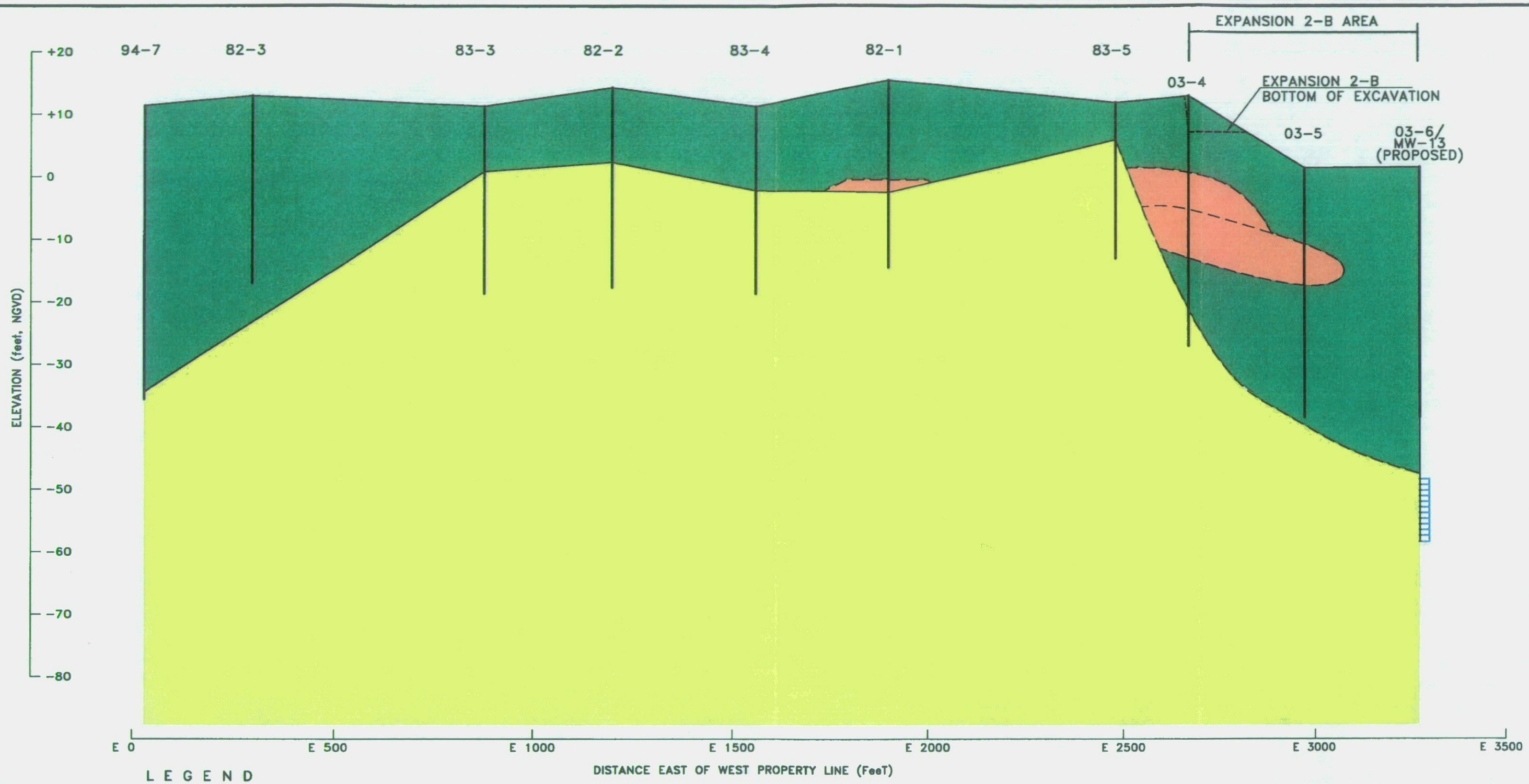

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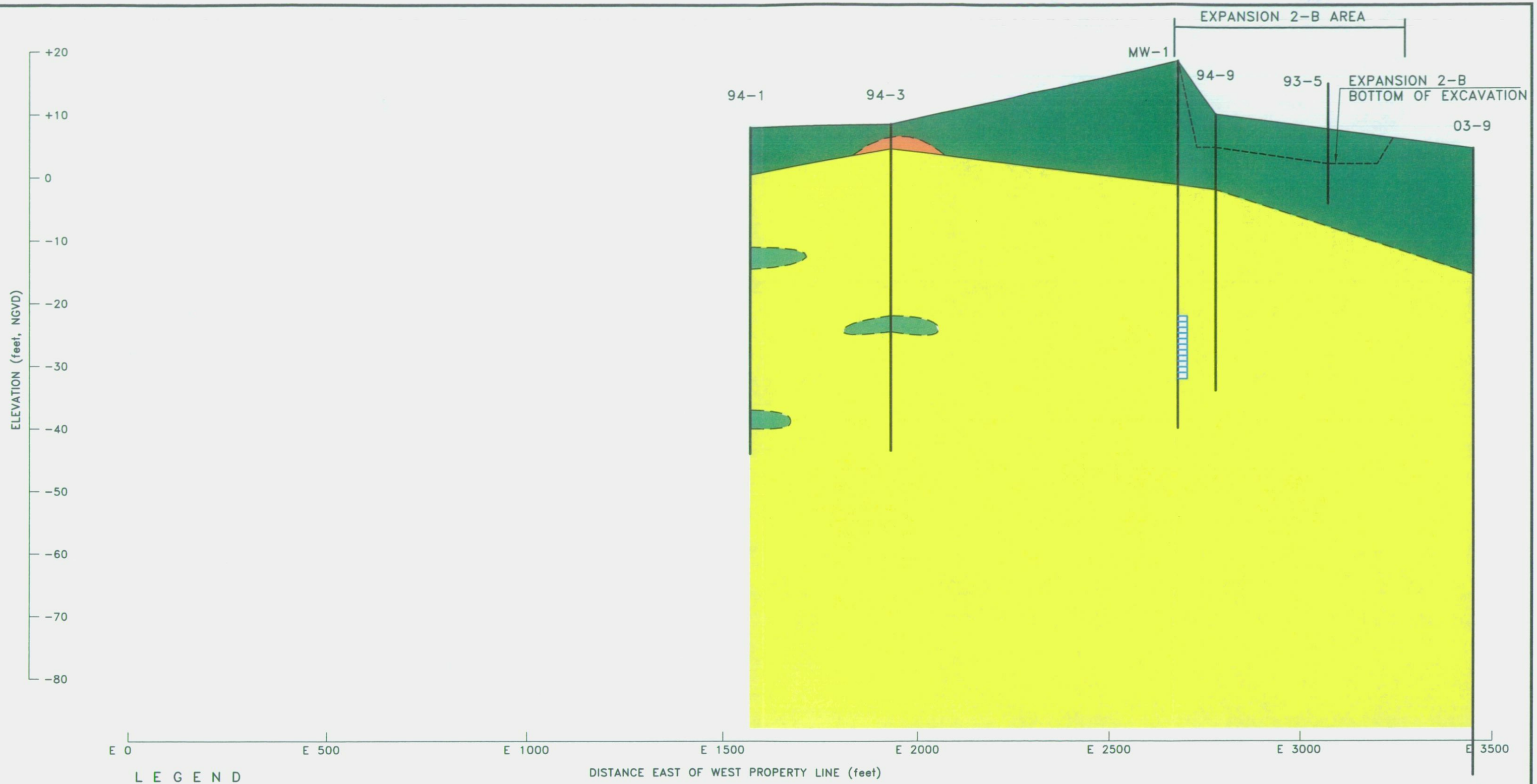

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ENGINEERS
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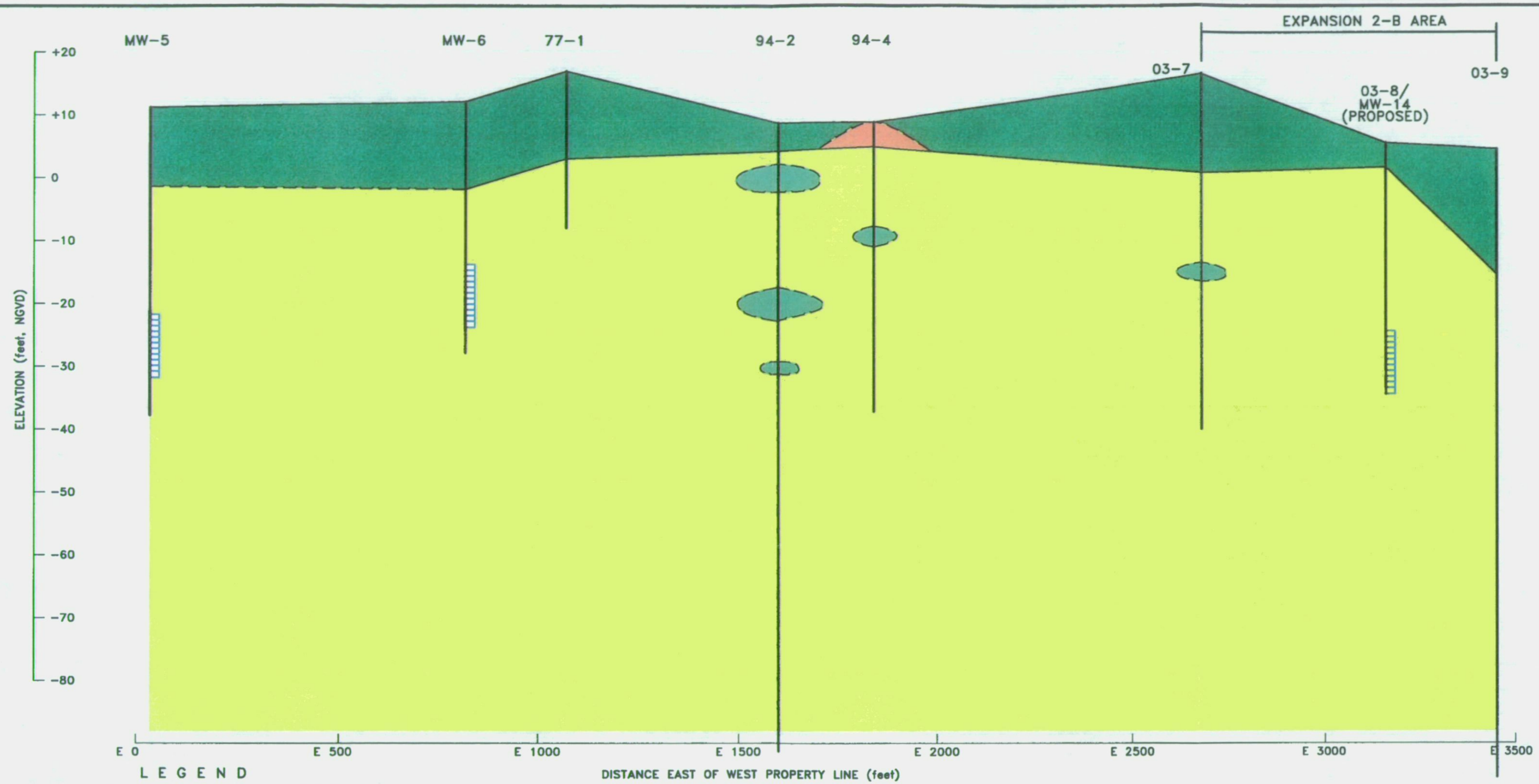

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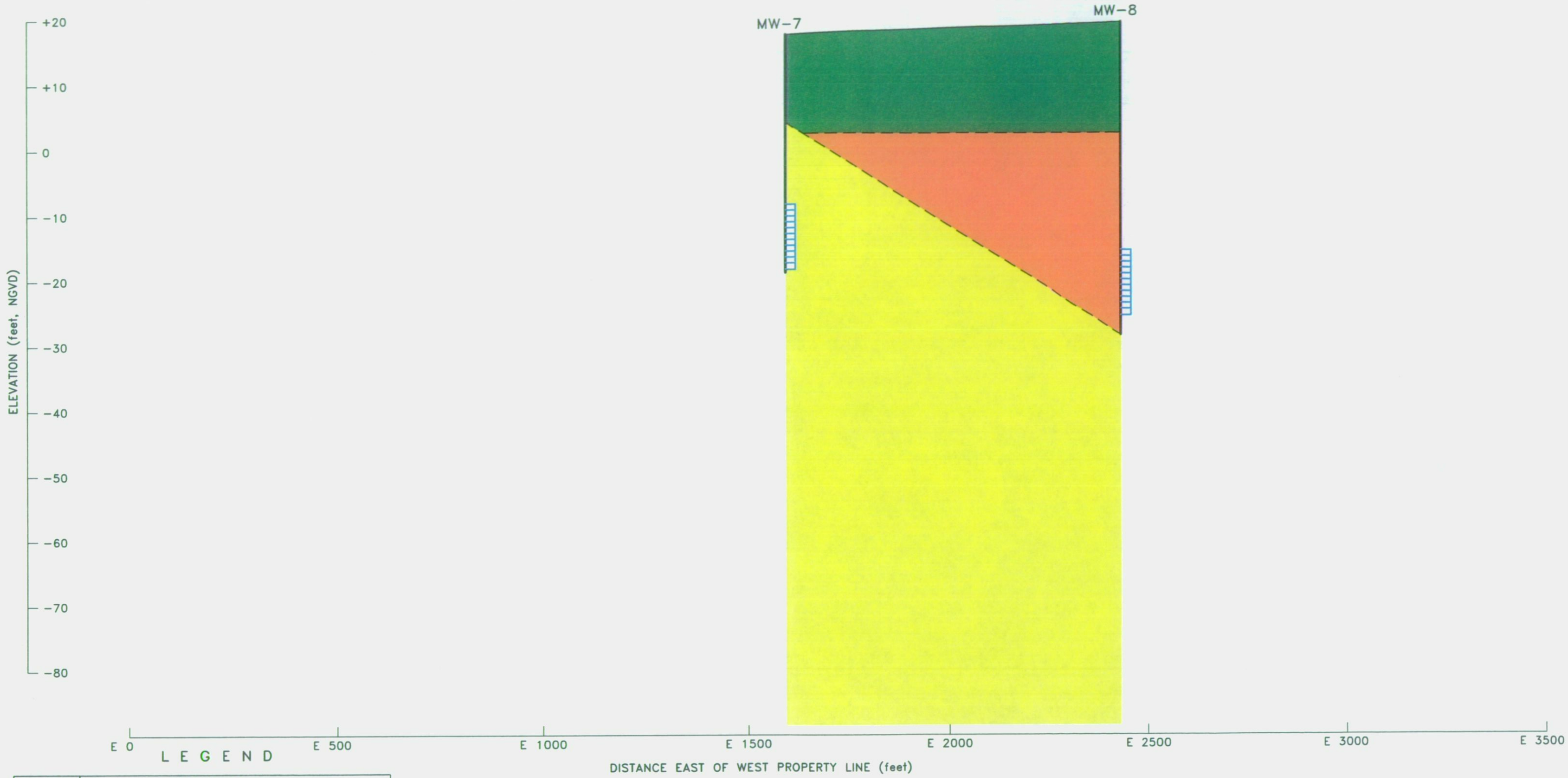

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ENGINEERS
LAFAYETTE, LOUISIANA

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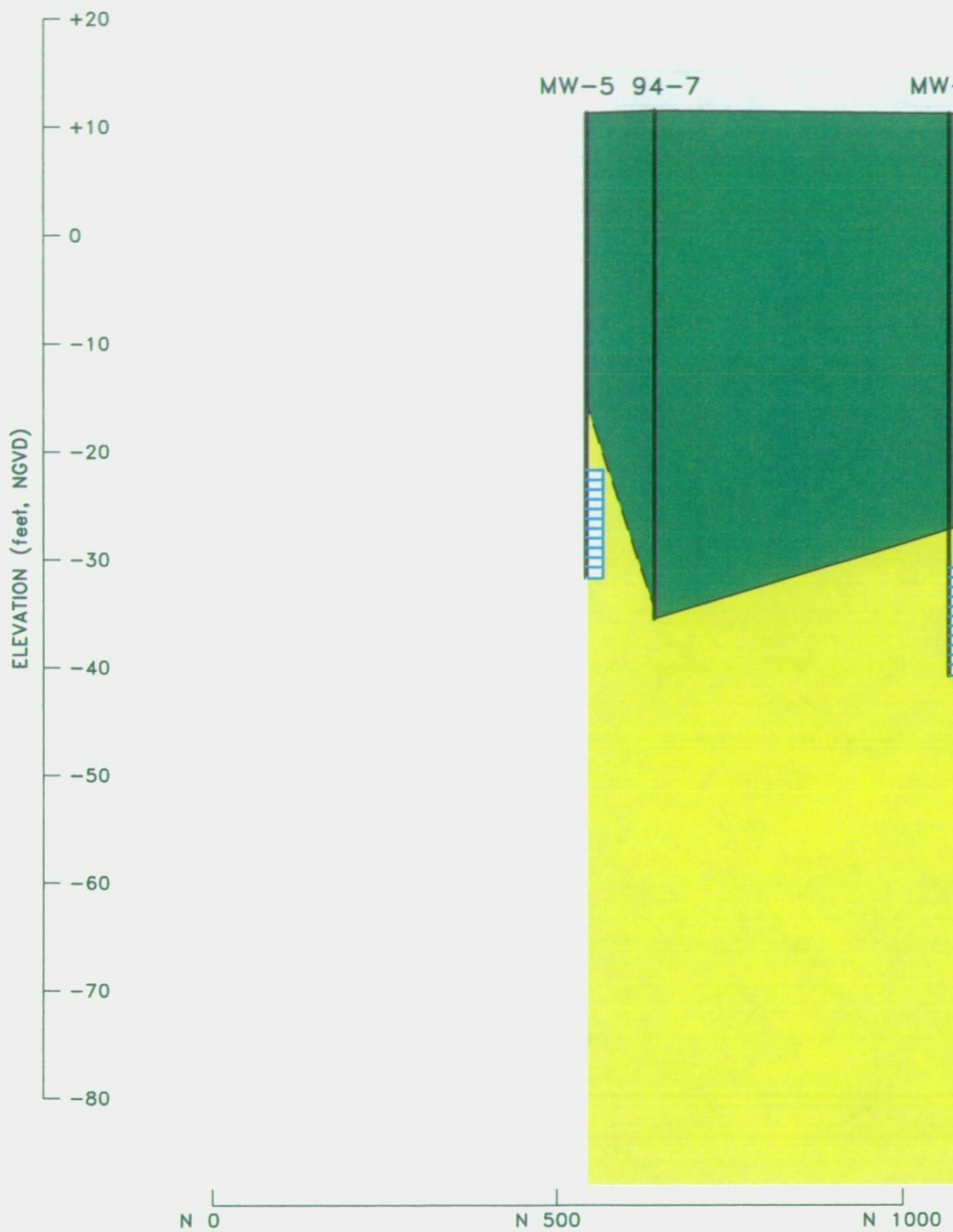
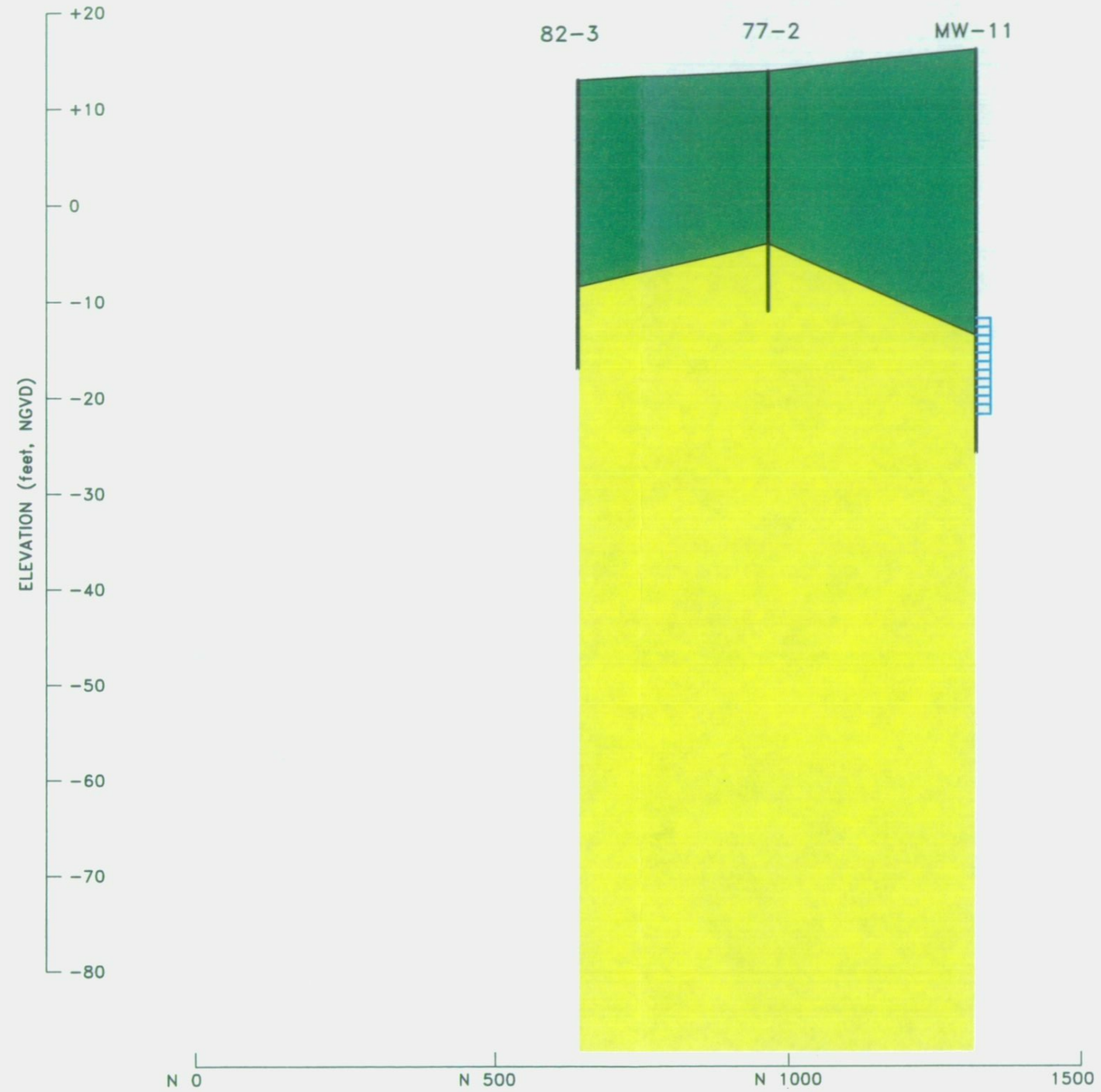


SECTION H-H'



SECTION I-I'

DISTANCE NORTH OF SOUTH PROPERTY LINE (feet)

LEGEND

SYMBOL	DESCRIPTION
	IA- LOW PERMEABILITY, CONTINUOUS ZONE (CH,CL)
	IB-PERMEABLE, NONCONTINUOUS ZONE (ML,SC,SM)
	IIA-PERMEABLE, CONTINUOUS ZONE (SM,SP)
	IIB- LOW PERMEABILITY, NONCONTINUOUS ZONE (CH,CL)

MODIFICATION NO. 9
EXPANSION 2-B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA
for
VERMILION PARISH POLICE JURY
ABBEVILLE, LOUISIANA

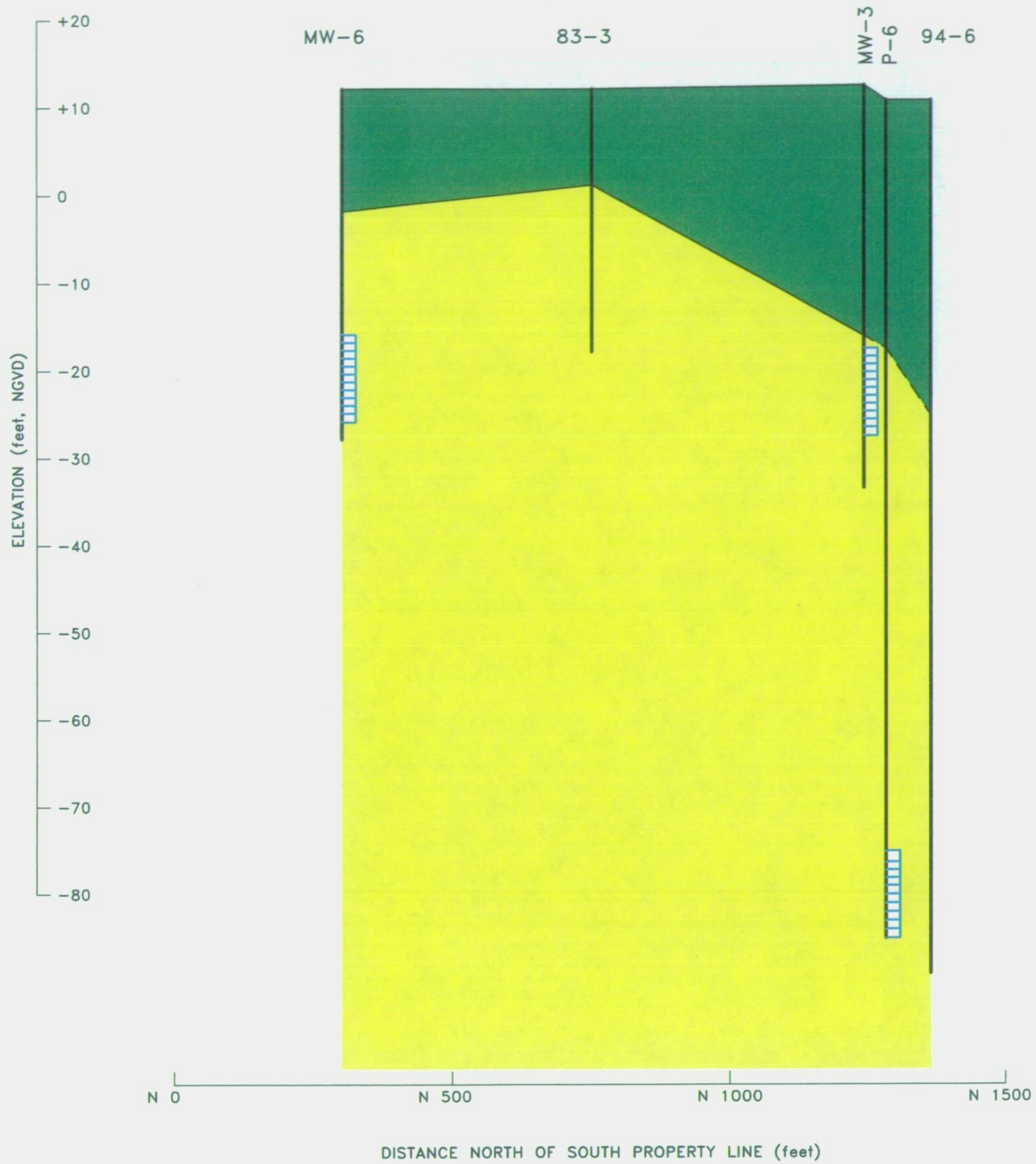
SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE, LOUISIANA

STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer:	Drawn by:	Checked by:
R. de Abreu	BJ	
File No.: 03-1063A	Date: 10-5-04	Figure No.: 11

Title:
SOIL PROFILES H-H' I-I'

May 05, 2008 - 4:4
P:\2003\1063A\CADD\031063A-11 PROFILE H-H & I-I.DWG



LEGEND

SYMBOL	DESCRIPTION
	IA- LOW PERMEABILITY, CONTINUOUS ZONE (CH,CL)
	IB-PERMEABLE, NONCONTINUOUS ZONE (ML,SC,SM)
	IIA-PERMEABLE, CONTINUOUS ZONE (SM,SP)
	IIB- LOW PERMEABILITY, NONCONTINUOUS ZONE (CH,CL)

MODIFICATION NO. 9
EXPANSION 2-B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA
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VERMILION PARISH POLICE JURY
ABBEVILLE, LOUISIANA

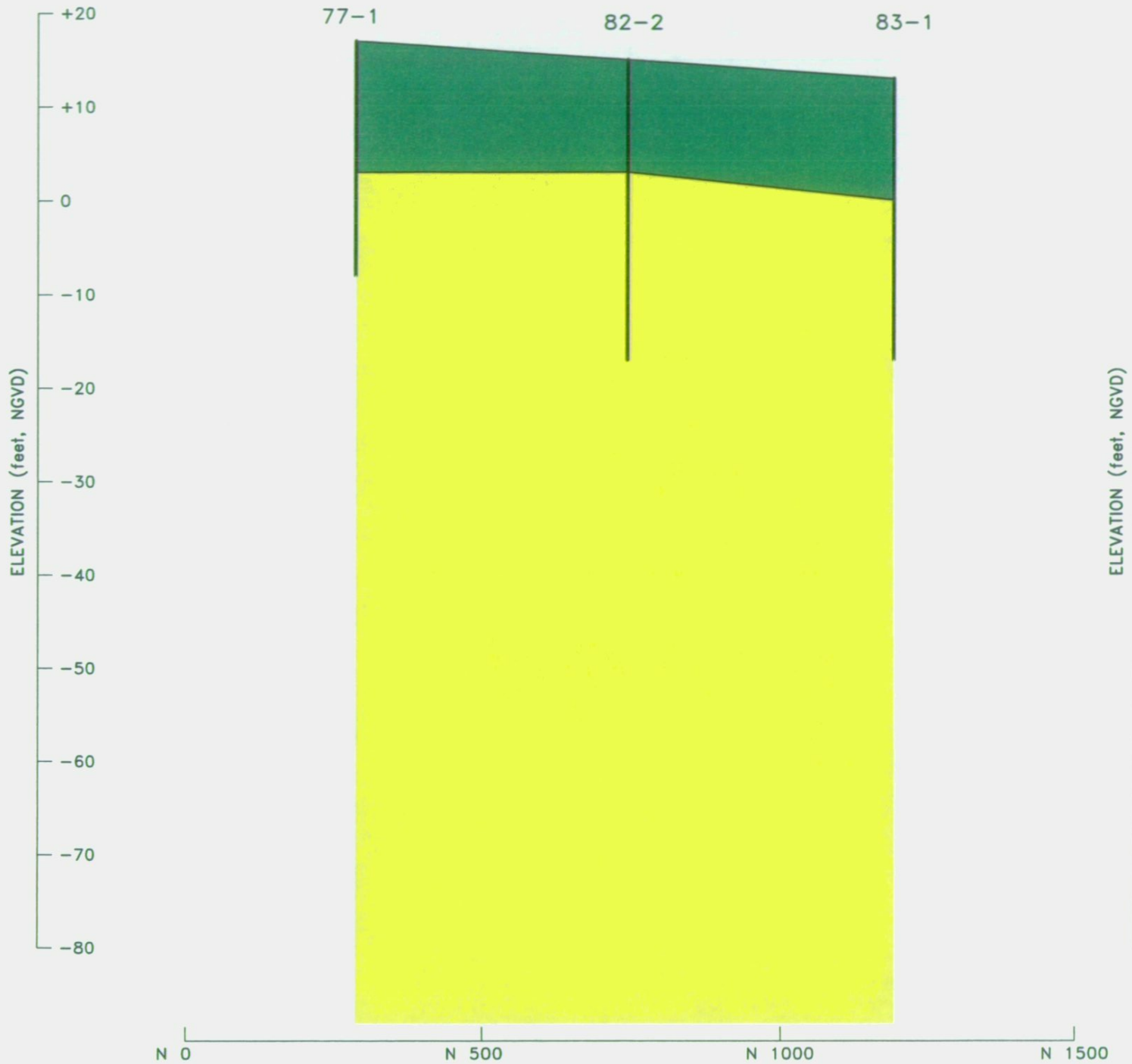
SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE, LOUISIANA

STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

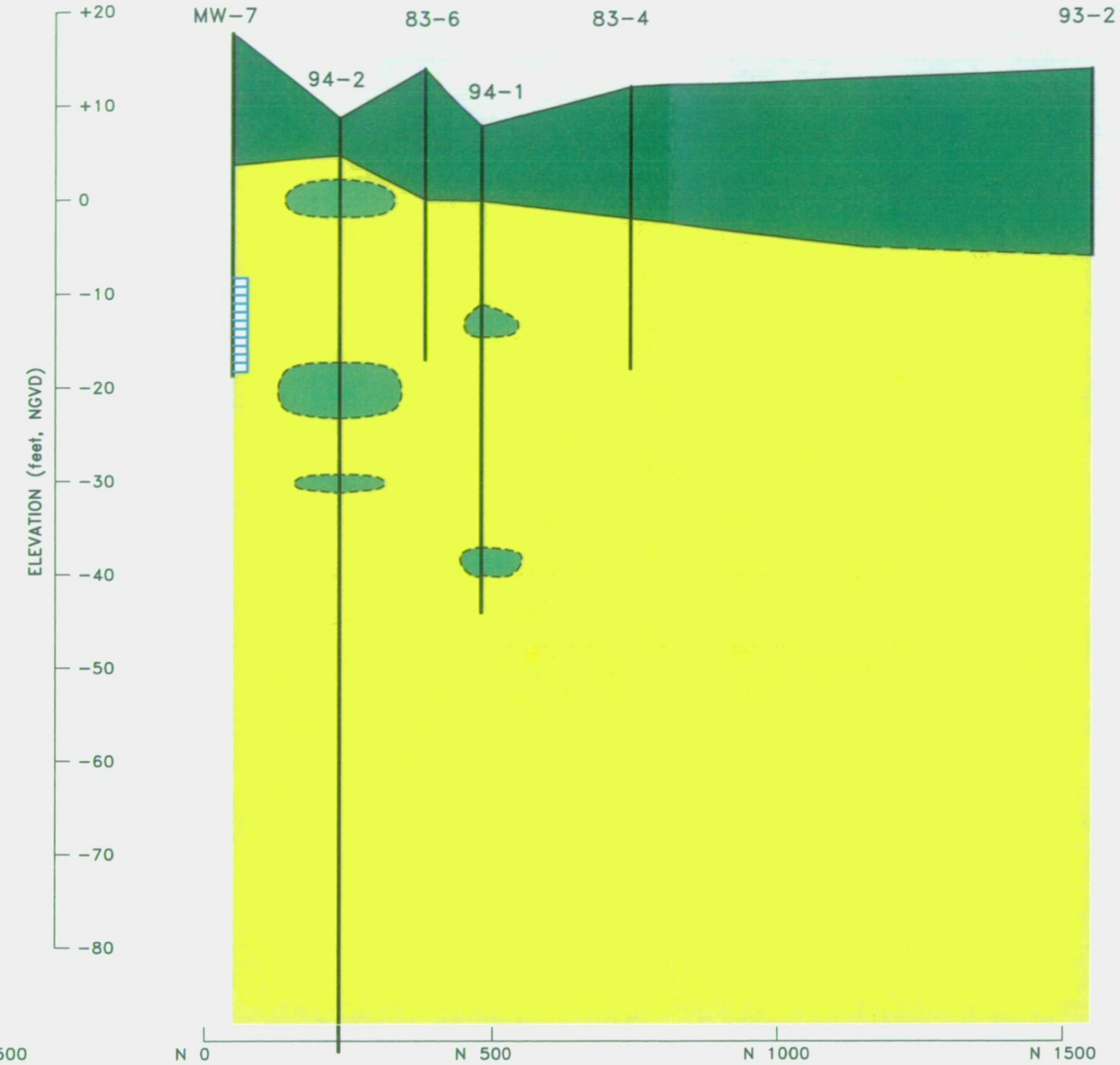
Project Engineer:	Drawn by:	Checked by:
R. de Abreu	BJ	
File No.: 03-1063A	Date: 10-5-04	Figure No.: 12

Title:
SOIL PROFILES J-J'

May 05, 2008 - 4:4
P:\2003\063A\CADD\031063A-12 PROFILE J-J.DWG



SECTION K-K'



SECTION L-L'

DISTANCE NORTH OF SOUTH PROPERTY LINE (feet)

LEGEND

SYMBOL	DESCRIPTION
	IA- LOW PERMEABILITY, CONTINUOUS ZONE (CH,CL)
	IB-PERMEABLE, NONCONTINUOUS ZONE (ML,SC,SM)
	IIA-PERMEABLE, CONTINUOUS ZONE (SM,SP)
	IIB- LOW PERMEABILITY, NONCONTINUOUS ZONE (CH,CL)

MODIFICATION NO. 9
EXPANSION 2-B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA
for
VERMILION PARISH POLICE JURY
ABBEVILLE, LOUISIANA

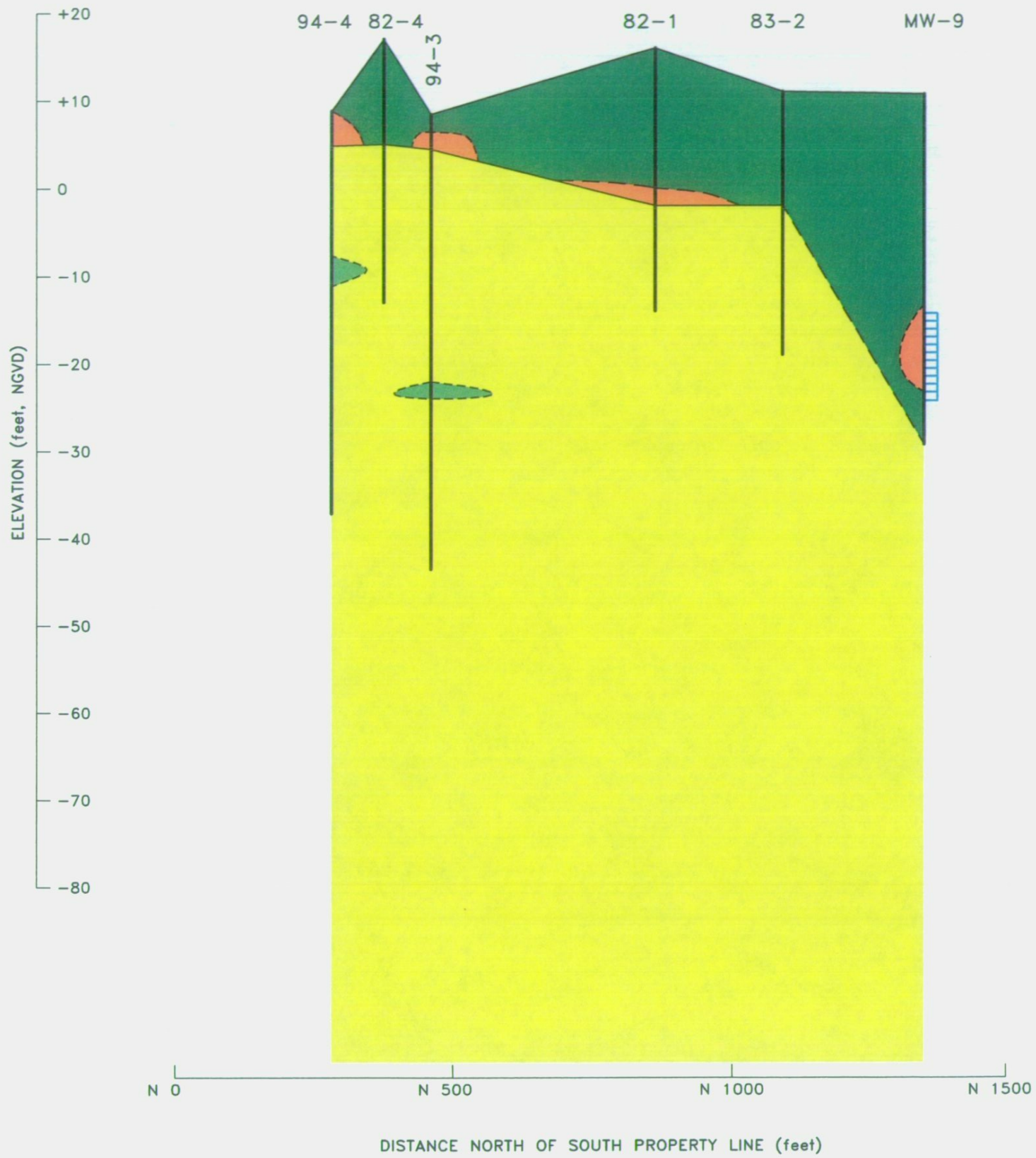
SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE, LOUISIANA

STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer:	Drawn by:	Checked by:
R. de Abreu	BJ	
File No.: 03-1063A	Date: 10-5-04	Figure No.: 13

Title:
SOIL PROFILES K-K' L-L'

May 05, 2008 - 4:4
P:\2003\1063A\CADD\031063A-13 PROFILE K-K & L-L.DWG



LEGEND

SYMBOL	DESCRIPTION
	IA- LOW PERMEABILITY, CONTINUOUS ZONE (CH,CL)
	IB-PERMEABLE, NONCONTINUOUS ZONE (ML,SC,SM)
	IIA-PERMEABLE, CONTINUOUS ZONE (SM,SP)
	IIB- LOW PERMEABILITY, NONCONTINUOUS ZONE (CH,CL)

MODIFICATION NO. 9
EXPANSION 2-B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA
for
VERMILION PARISH POLICE JURY
ABBEVILLE, LOUISIANA

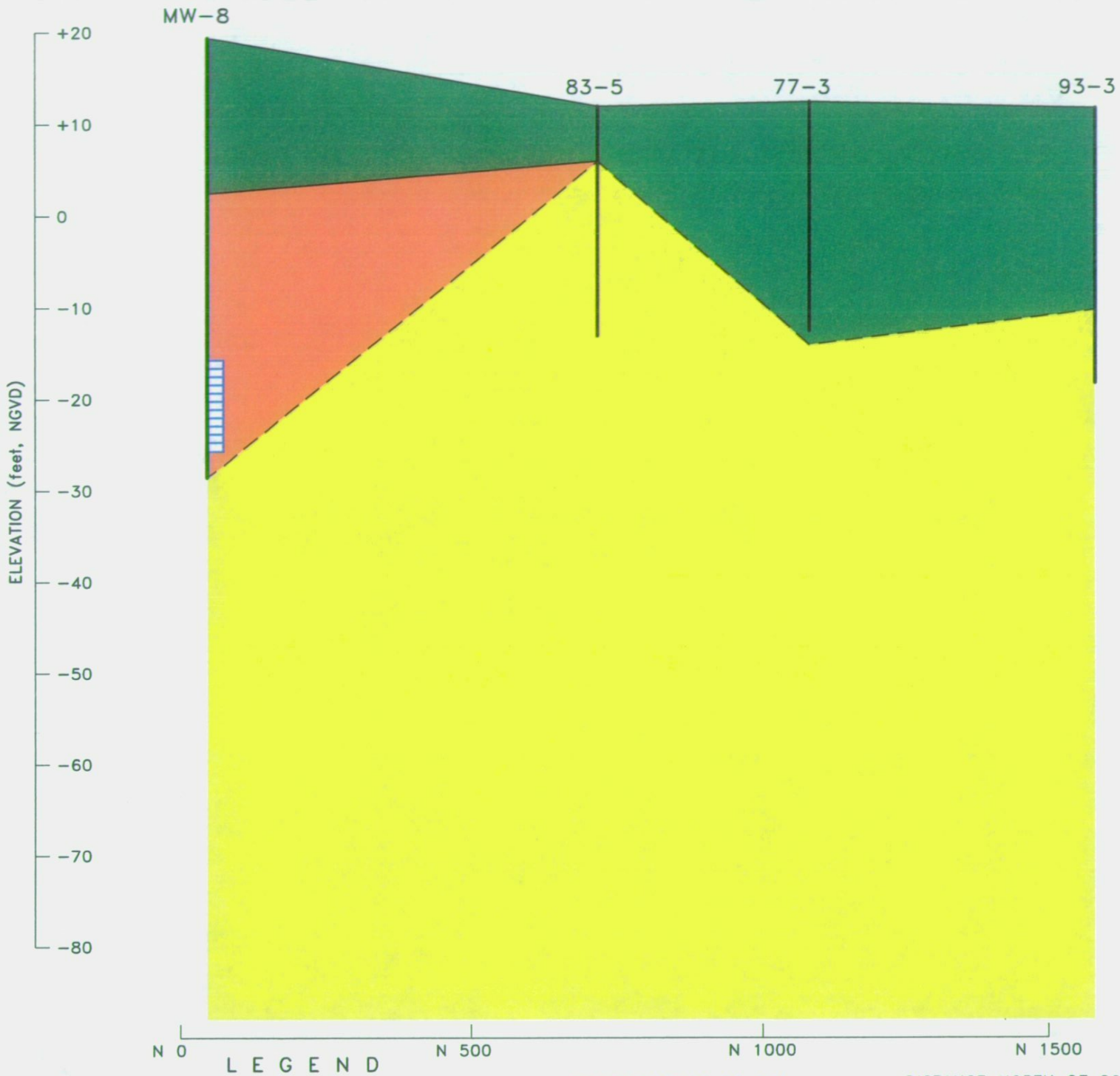
SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE, LOUISIANA

STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

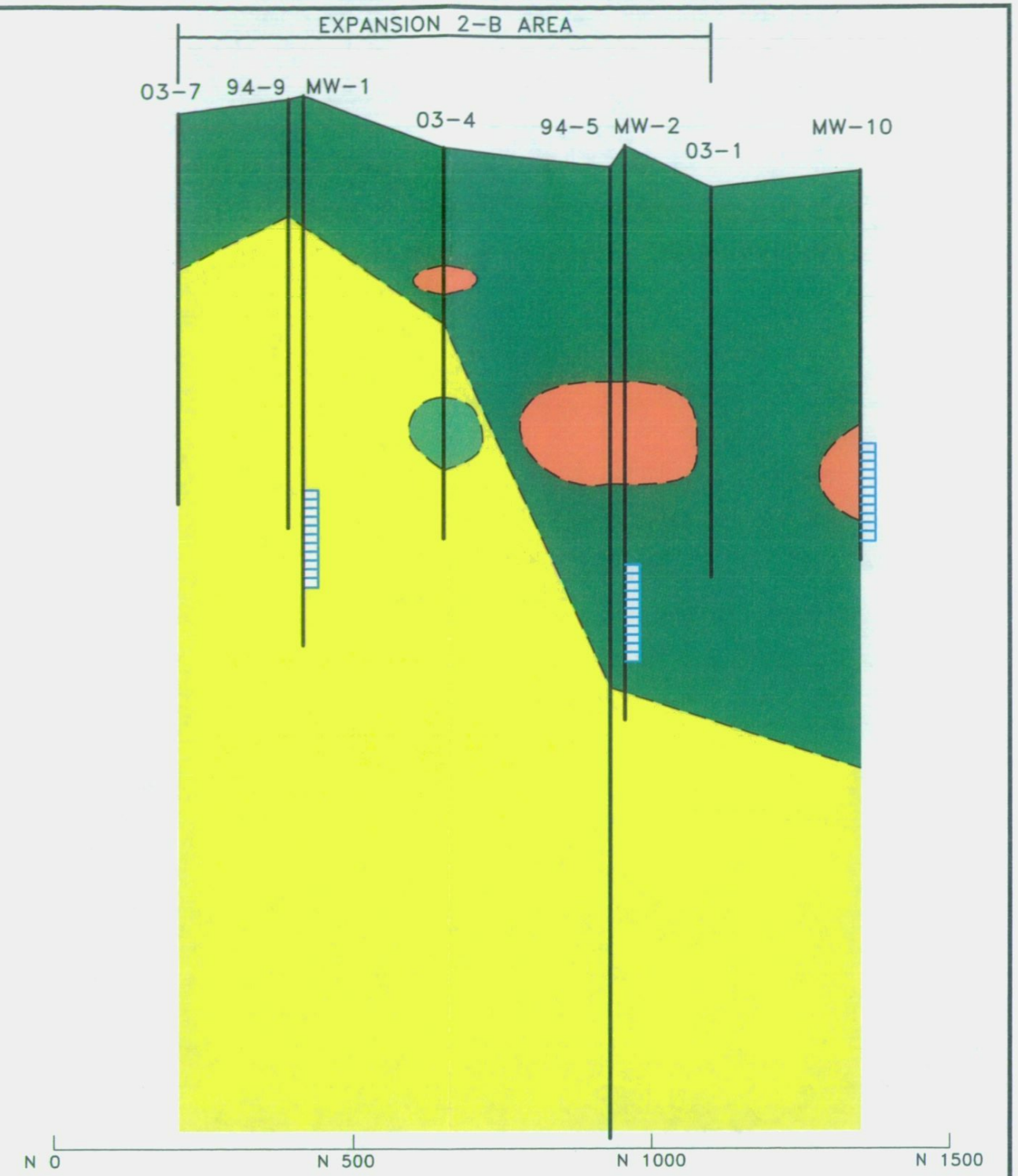
Project Engineer:	Drawn by:	Checked by:
R. de Abreu	BJ	
File No.: 03-1063A	Date: 10-5-04	Figure No.: 14

Title:
SOIL PROFILES M-M'

May 05, 2008 - 4:4
P:\2003\1063A\CADD\031063A-14 PROFILE M-M.DWG



SECTION N-N'



SECTION O-O'

DISTANCE NORTH OF SOUTH PROPERTY LINE (feet)

LEGEND

SYMBOL	DESCRIPTION
	IA- LOW PERMEABILITY, CONTINUOUS ZONE (CH,CL)
	IB-PERMEABLE, NONCONTINUOUS ZONE (ML,SC,SM)
	IIA-PERMEABLE, CONTINUOUS ZONE (SM,SP)
	IIB- LOW PERMEABILITY, NONCONTINUOUS ZONE (CH,CL)

MODIFICATION NO. 9
EXPANSION 2-B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA
for
VERMILION PARISH POLICE JURY
ABBEVILLE, LOUISIANA

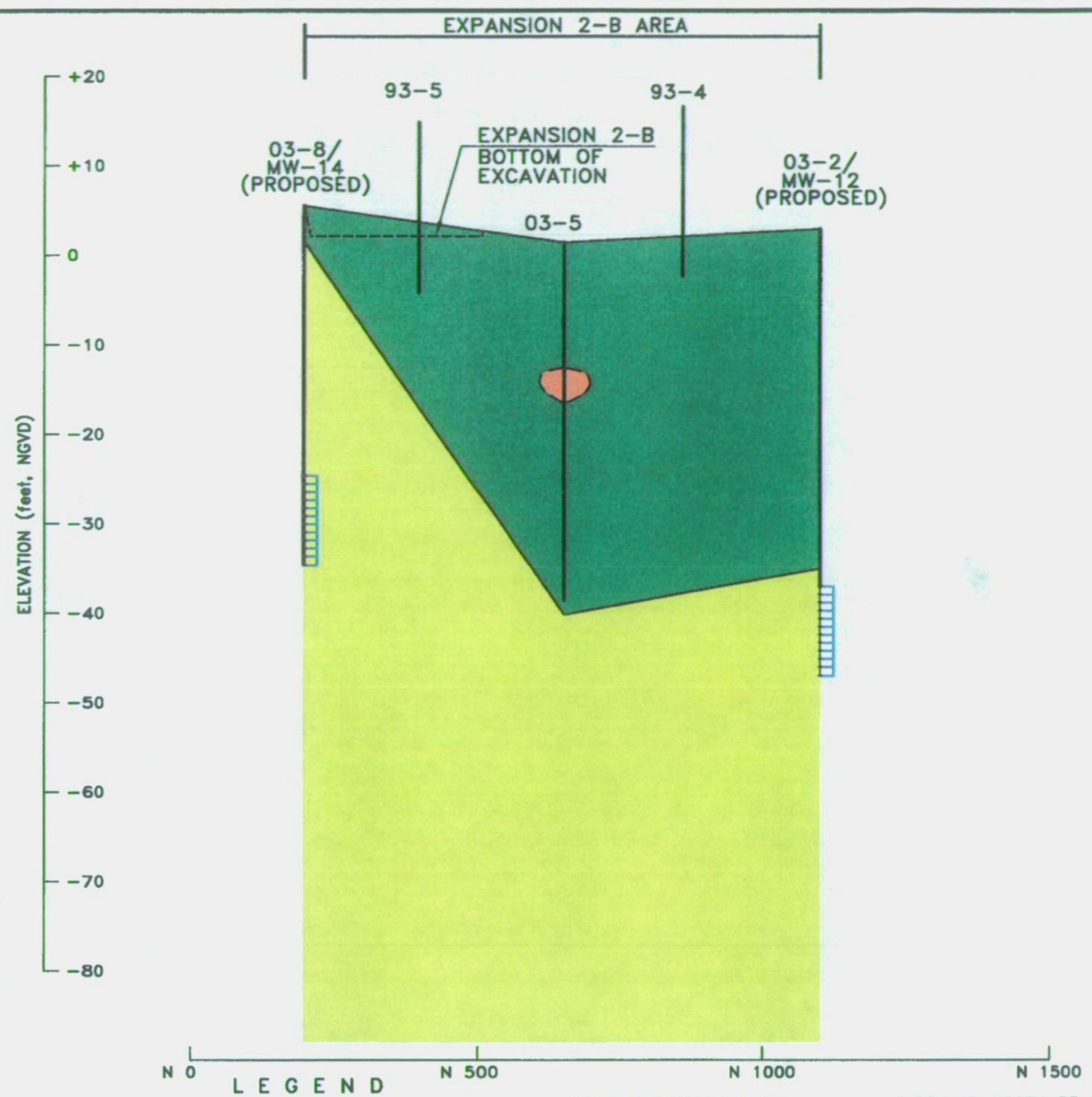
SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE, LOUISIANA

STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

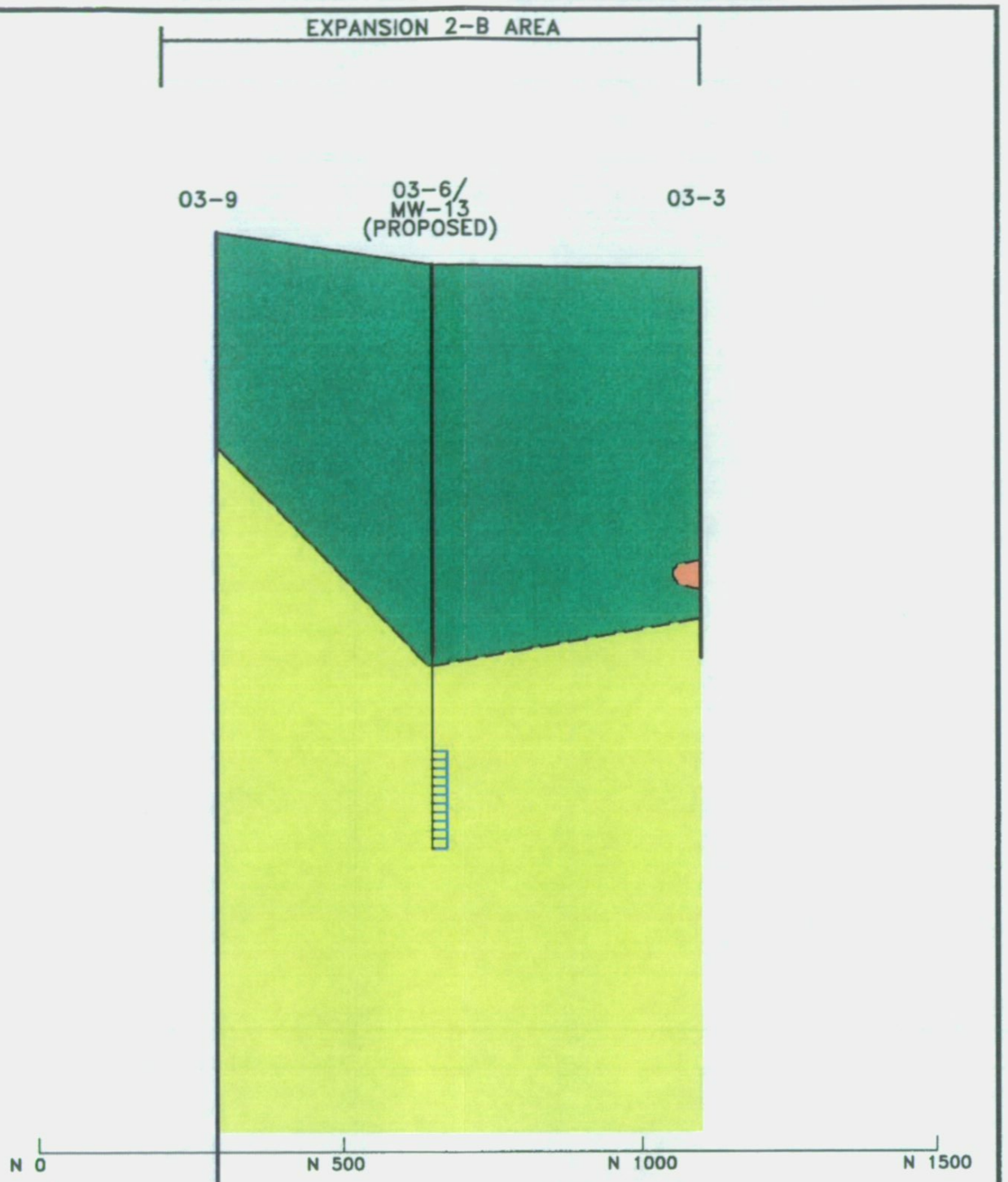
Project Engineer:	Drawn by:	Checked by:
R. de Abreu	BJ	
File No.: 03-1063A	Date: 11-5-03	Figure No.: 15

Title:
SOIL PROFILES N-N' & O-O'

May 05, 2008 - 4:4
P:\2003\063A\CADD\031063A-15 PROFILE N-N & O-O.DWG



SECTION P-P'



SECTION Q-Q'

LEGEND

SYMBOL	DESCRIPTION
	IA- LOW PERMEABILITY, CONTINUOUS ZONE (CH,CL)
	IB-PERMEABLE, NONCONTINUOUS ZONE (ML,SC,SM)
	IIA-PERMEABLE, CONTINUOUS ZONE (SM,SP)
	IIB- LOW PERMEABILITY, NONCONTINUOUS ZONE (CH,CL)

MODIFICATION NO. 9
EXPANSION 2-B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA
for
VERMILION PARISH POLICE JURY
ABBEVILLE, LOUISIANA

SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE, LOUISIANA

STE
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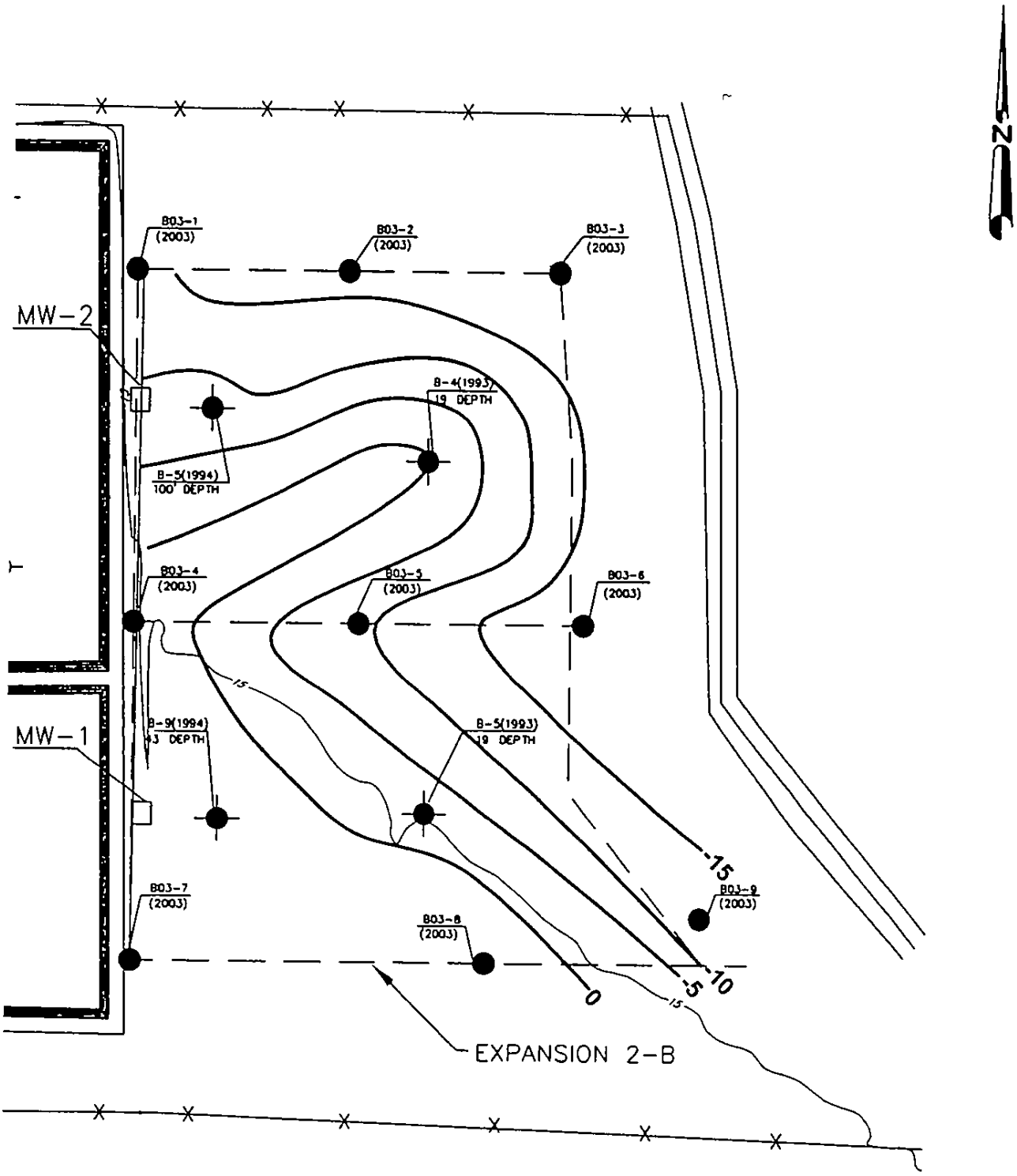
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer:	Drawn by:	Checked by:
R. de Abreu	BJ	
File No.: 03-1063A	Date: 11-5-03	Figure No.: 16

Title:
SOIL PROFILES P-P' & Q-Q'

May 19, 2008 - 3:19pm
P:\2003\03-1063A\CADD\031063A-16REV PROFILE P-P & Q-Q.DWG



0 200
(feet)
SCALE
ELEVATIONS IN FEET, NGVD

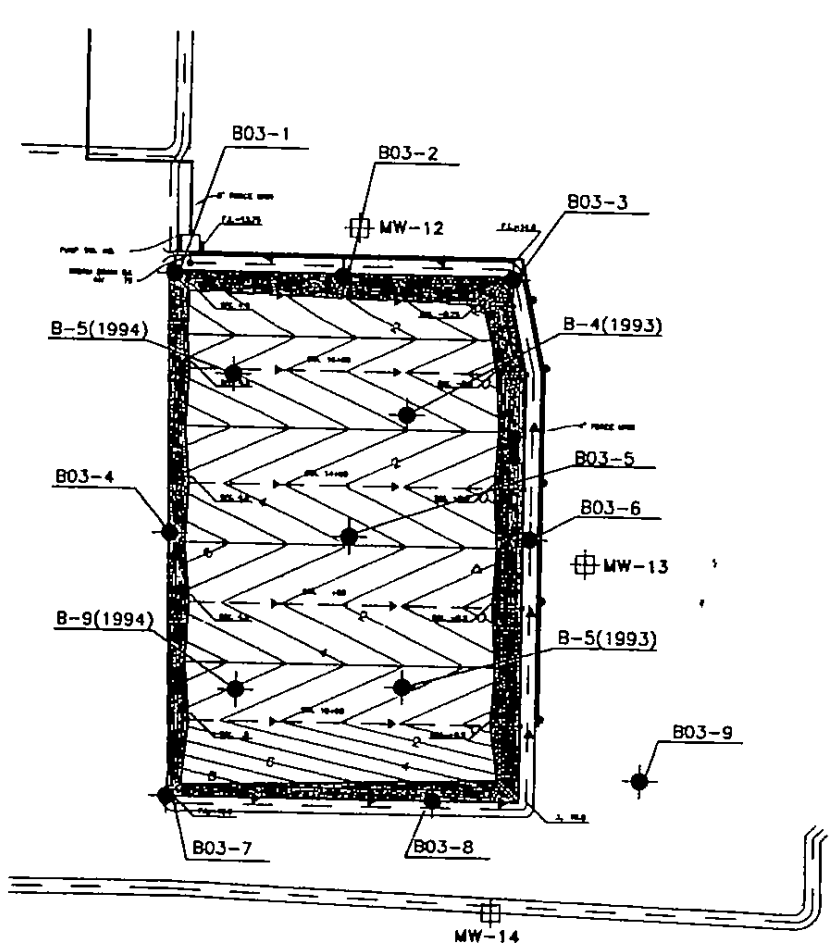
MODIFICATION NO 9
EXPANSION 2 B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA
for
VERMILION PARISH POLICE JURY
ABBEVILLE, LOUISIANA
SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE LOUISIANA

STE
Soil Testing Engineers Inc
Baton Rouge LA Jefferson LA Bilo MS

Project Engineer	Drawn by	Checked by
R De Abreu	BJ	
File No	Date	Figure No
03-1063A	10-18-04	17

Title MINIMUM ALLOWABLE CUT ELEVATION CONTOUR MAP

Dec 14 2004 - 10 33am
CADD\031063A-17 CONTOUR MAP DWG
BJ\2003\03-



0 (f et) 250
SCALE

LEGEND

SOIL BORING

PROPOSED MONITOR WELL

BOTTOM OF EXCAVATION CONTOURS

REFERENCE
Supplemental Sheet Leachate Collection System
Detail by Sellers & Associates Inc dated 2004

MODIFICATION NO 9
EXPANSION 2 B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH LOUISIANA
for
VERMILION PARISH POLICE JURY
ABBEVILLE, LOUISIANA

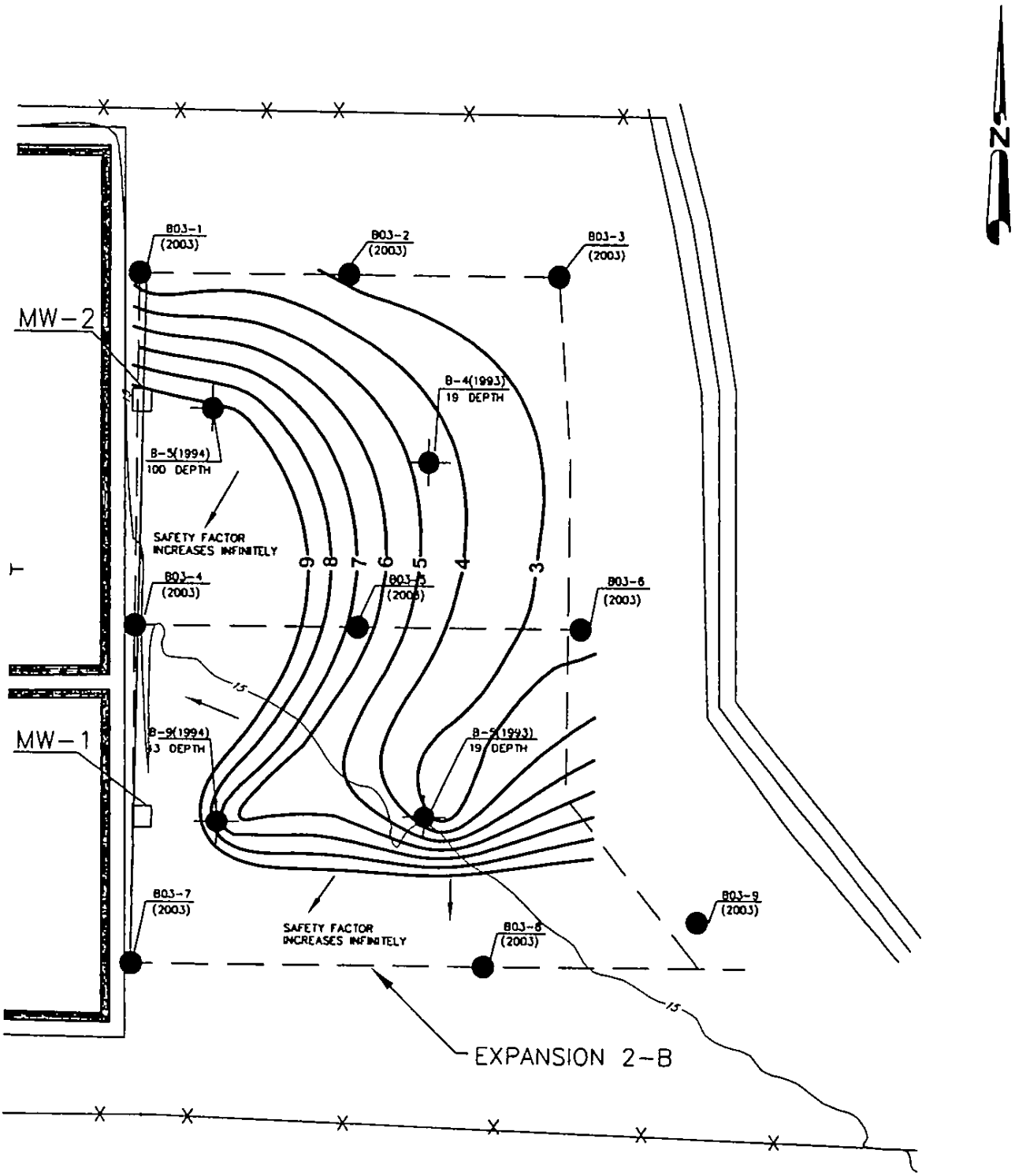
SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE LOUISIANA

STE
Soil Testing Engineers, Inc.
Baton Rouge, LA Jefferson, LA Biloxi, MS

Project Engineer	Drawn by	Checked by
R de Abreu	DMS	
File No	Date	Figure No
08-1063A	1-04-07	17A

Title
EXCAVATION CONTOUR MAP

P:\2003\03-1063A\CADD\031063A-17A EXCAVATION CONTOUR MAP.dwg
Jan 03 2007 - 9 44am



0 200
(feet)
SCALE
ELEVATIONS IN FEET NGVD

MODIFICATION NO 9
EXPANSION 2 B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA
for
VERMILION PARISH POLICE JURY
ABBEVILLE, LOUISIANA
SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE LOUISIANA

STE
Soil Testing Engineers Inc
Baton Rouge LA Jefferson LA Biloxi MS

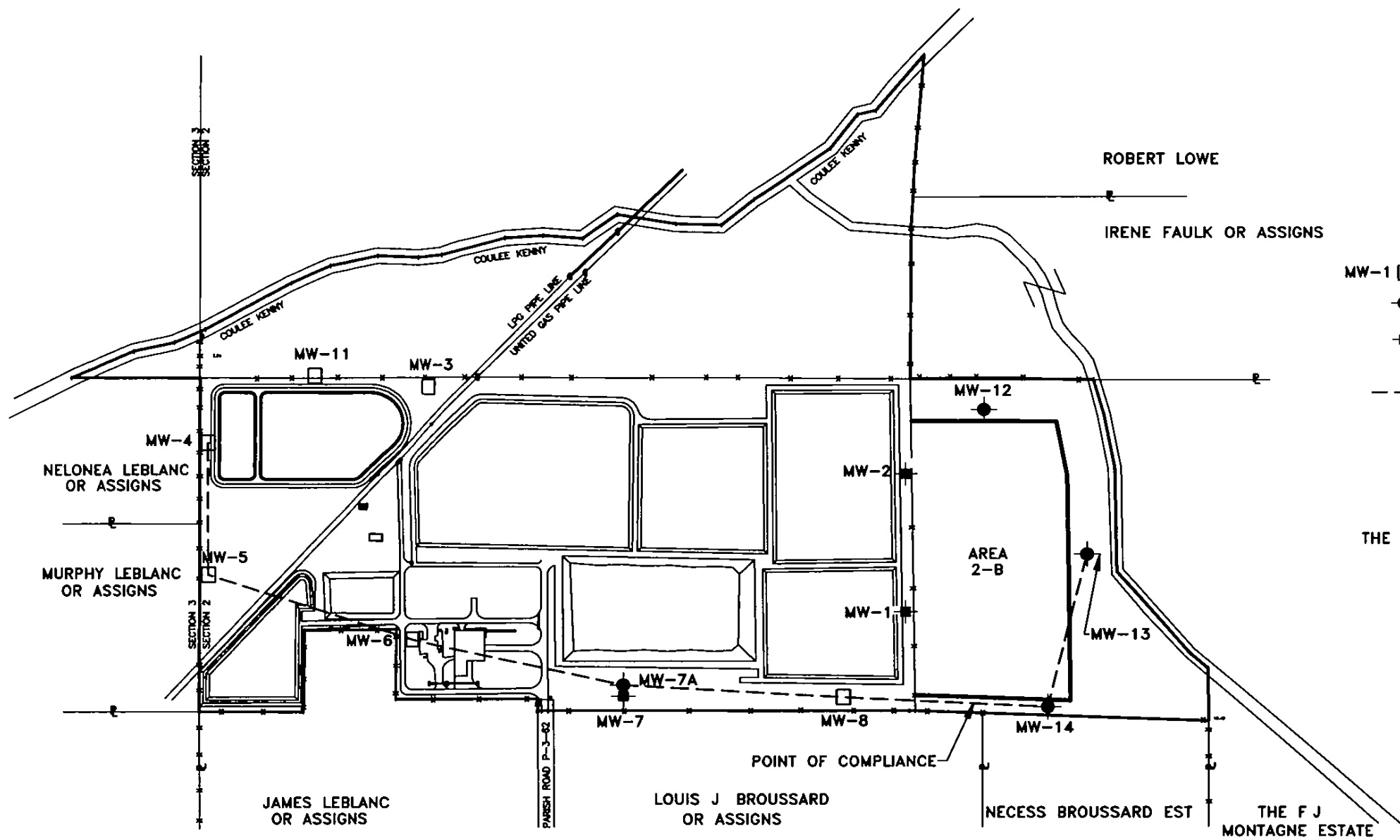
Project Engineer	Drawn by	Checked by
R De Abreu	BJ	
File No	Date	Figure No
03-1063A	10-18-04	18

Title **BOTTOM HEAVE SAFETY FACTOR CONTOURS**

Dec 14 2004 - 10 34am
CADD\031063A-18 BOTTOM HEAVE.DWG
BJ\2003\03-

Aug 11 2008 - 11 51am

P \2003\03-1063A\CADD\031063A-19 MW LOCATION PLAN DWG



LEGEND

MW-1 □ MONITORING WELL (IN SERVICE)

PROPOSED MONITORING WELL LOCATION

MONITORING WELL TO BE PLUGGED AND ABANDONED

— — — POINT OF COMPLIANCE

REFERENCE

Sellers & Associates Inc Ground Water Monitoring Well Locations and Boring Locations Map dated 1994

0 (feet) 500
SCALE

REV	DATE	DESCRIPTION	BY
2	08/08	Removed MW-9 & MW-10	RCA
1	01/07	Added MW-7A	RCA

MODIFICATION NO 9
EXPANSION 2-B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH LOUISIANA

for

VERMILION PARISH POLICE JURY
ABBEVILLE LOUISIANA

SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE LOUISIANA

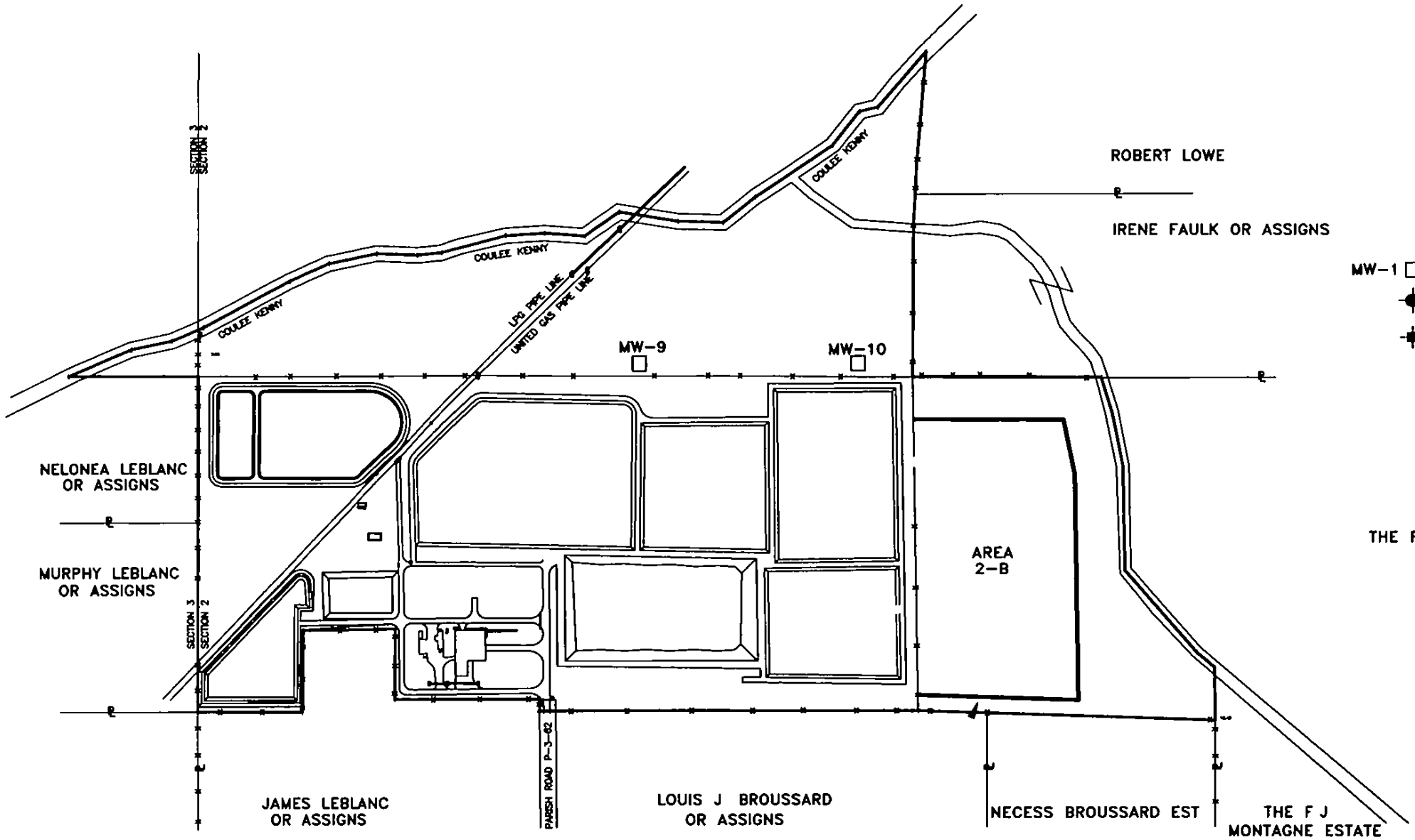
AAI
Ardaman & Associates Inc
Baton Rouge, LA Jefferson, LA

Project Engineer	Drawn by	Checked by
R de Abreu	BJ	
File No	Date	Figure No
03-1063A	11-12-04	19

Title **GROUNDWATER MONITORING PLAN MAP FOR ZONE IIA**

Aug 11 2008 - 11 52am

P \2003\03-1063A\CADD\031063A-19A GROUND WATER MONITORING PLAN DWG



LEGEND

MW-1 □ MONITORING WELL (IN SERVICE)

PROPOSED MONITORING WELL LOCATION

MONITORING WELL TO BE PLUGGED AND ABANDONED

REFERENCE

Sellers & Associates Inc Ground Water Monitoring Well Locations and Boring Locations Map dated 1994

0 (feet) 500
SCALE

MODIFICATION NO 9
EXPANSION 2-B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH LOUISIANA

for

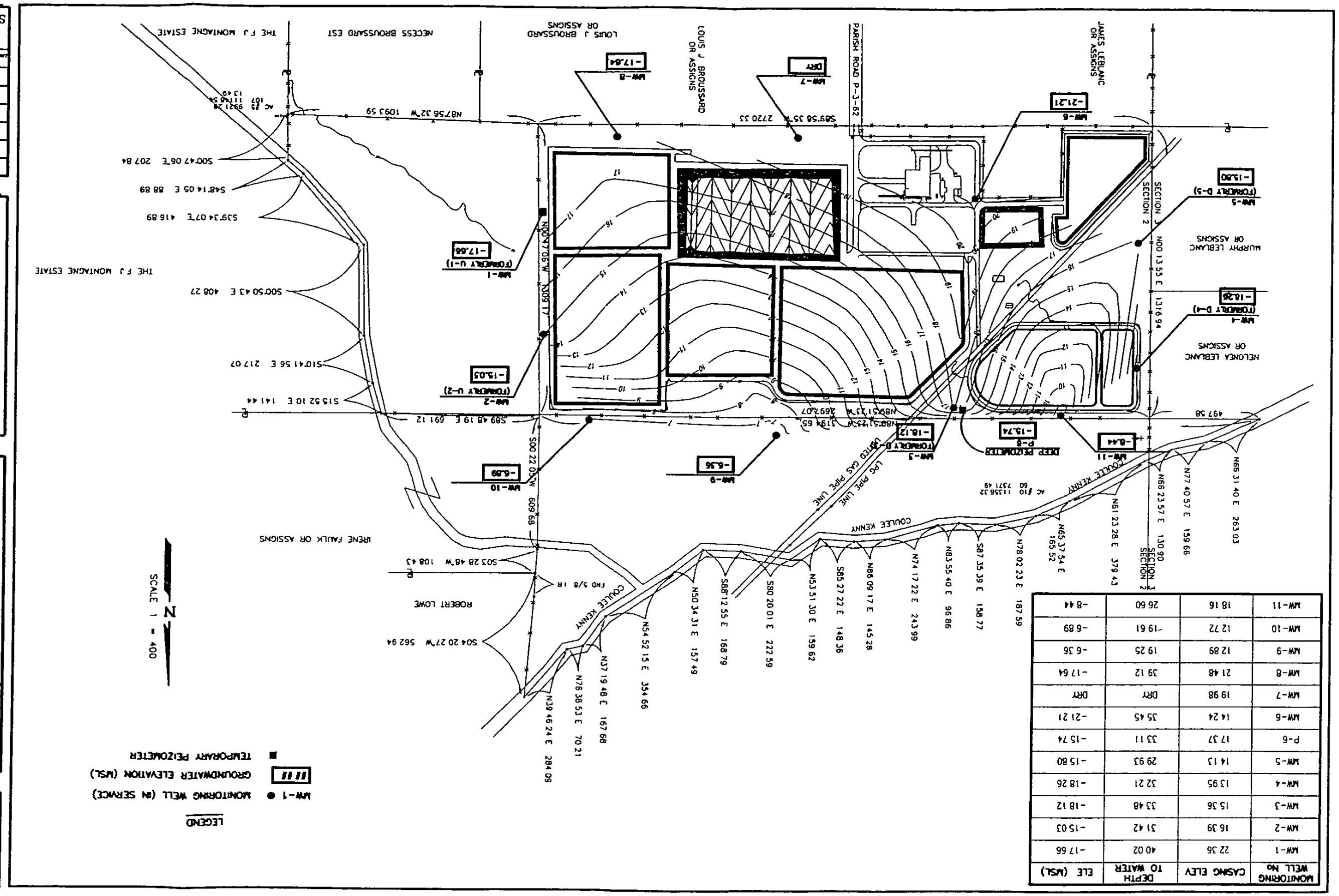
VERMILION PARISH POLICE JURY
ABBEVILLE LOUISIANA

SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE LOUISIANA

AAI
Ardaman & Associates Inc
Baton Rouge, LA Jefferson, LA

Project Engineer	Drawn by	Checked by
R de Abreu	NMS	
File No	Date	Figure No
03-1063A	08-11-08	19A

Title **GROUNDWATER MONITORING PLAN MAP FOR ZONE IB**



MONITORING WELL No	CASING ELEV	DEPTH TO WATER	ELE (MSL)
MW-1	22 36	40 02	-17 66
MW-2	16 39	31 42	-15 03
MW-3	15 36	33 48	-18 12
MW-4	13 95	32 21	-18 26
MW-5	14 13	29 93	-15 80
P-6	17 37	33 11	-15 74
MW-6	14 24	35 45	-21 21
MW-7	19 98	DRY	DRY
MW-8	21 48	39 12	-17 64
MW-9	12 89	19 25	-6 36
MW-10	12 72	-19 61	-6 89
MW-11	18 16	26 60	-8 44

POTENTIOMETRIC MAP
JUNE 2003 SAMPLING EVENT

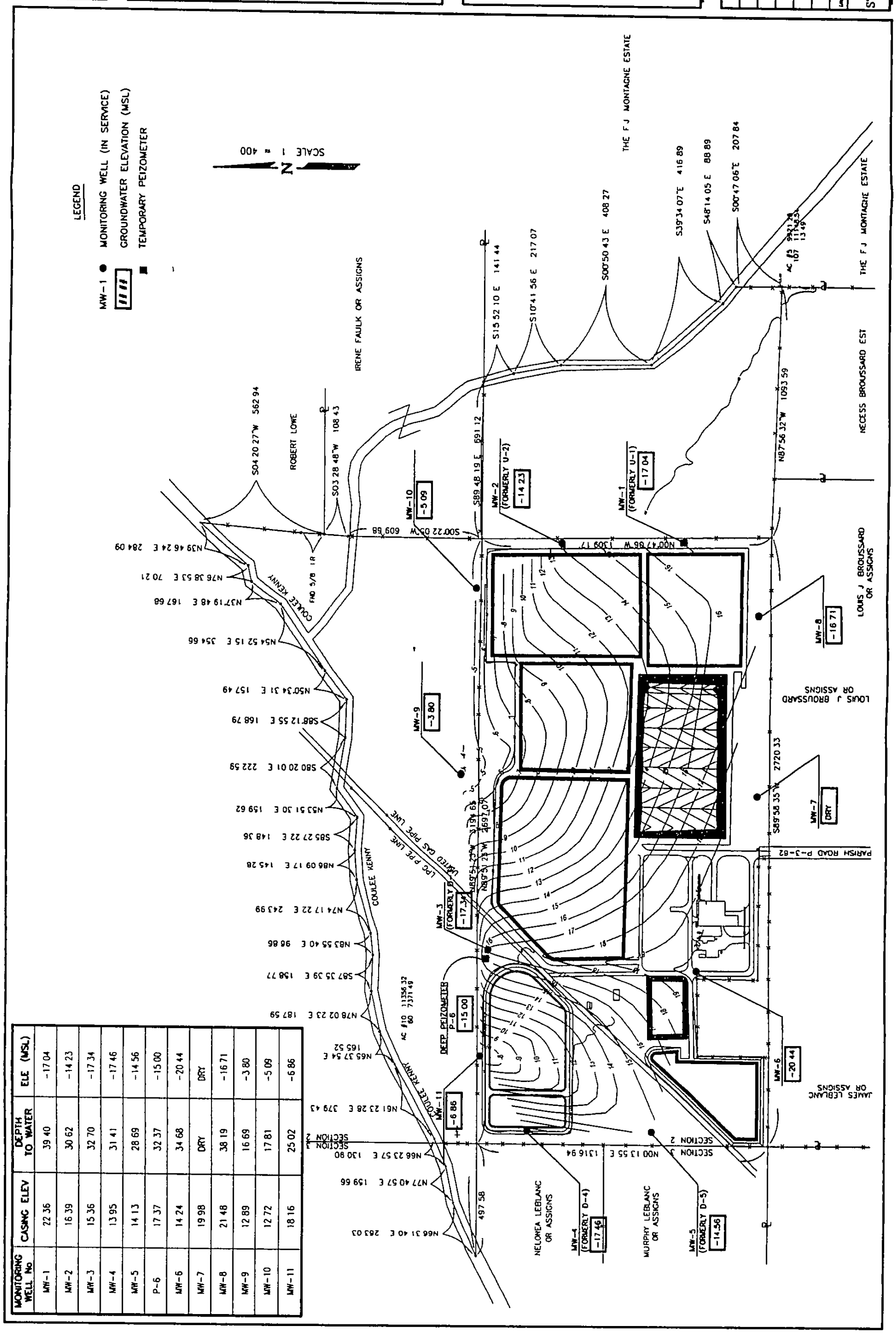
SHEET DESCRIPTION
VERMILION PARISH SOLID WASTE PLANT

Sellers & Associates Inc
ENGINEERS La 70582 Morgan City
SURVEYORS
PLANNERS Lafayette

REVISIONS	
DATE	BY

ENGINEER	DKS
DRAWN BY	
JFT	
DATE	
09-12-03	
SCALE	
1 400	
PROJECT NO	
3263-10	
FILE NO.	
—	
ACAD DWG. NO.	
LAPWU USER\PWU_CONV_ENG\	

STE Fig 20



MONITORING WELL No	CASING ELEV	DEPTH TO WATER	ELE (MSL)
MW-1	22 36	39 40	-17 04
MW-2	16 39	30 62	-14 23
MW-3	15 36	32 70	-17 34
MW-4	13 95	31 41	-17 46
MW-5	14 13	28 69	-14 56
P-6	17 37	32 37	-15 00
MW-6	14 24	34 68	-20 44
MW-7	19 98	DRY	DRY
MW-8	21 48	38 19	-16 71
MW-9	12 89	16 69	-3 80
MW-10	12 72	17 81	-5 09
MW-11	18 16	25 02	-6 86

SHEET DESCRIPTION

VERMILION PARISH SOLID WASTE PLANT

Sellers & Associates Inc
ENGINEERS SURVEYORS PLANNERS

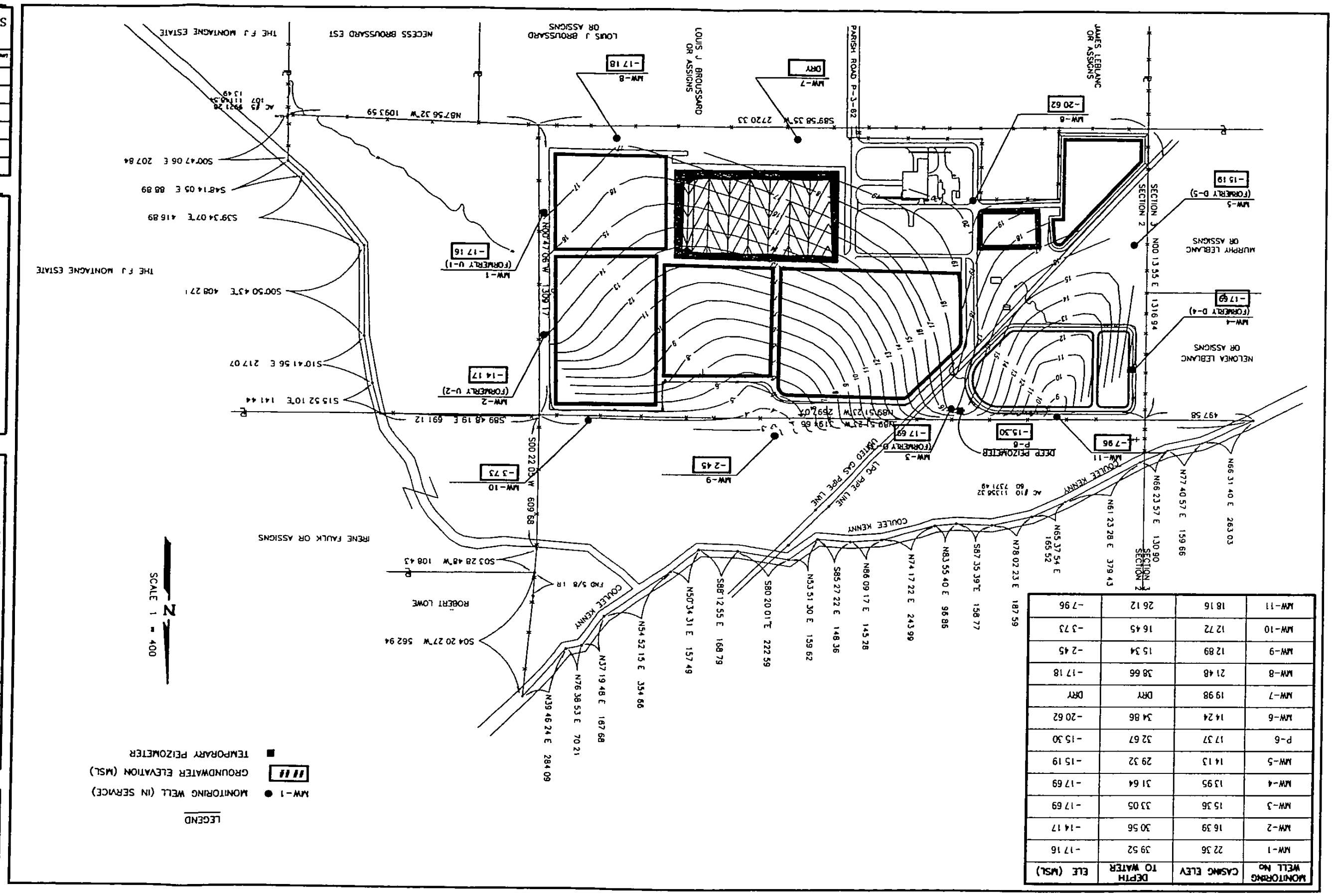
REVISIONS

DATE	BY

POTENTIOMETRIC MAP
DECEMBER 2003 SAMPLING EVENT

DWG # DMS
DRAWN JT
DATE 02 19-04
SCALE 1 400'
PROJECT NO. 3763-18
FILE NO. -
ACAD DWG NO. LMPR13SWD03-WQC_ESMC

STE Fig 21



MONITORING WELL No	CASING ELEV	DEPTH TO WATER	ELE (MSL)
MW-1	22 36	39 52	-17 16
MW-2	16 39	30 56	-14 17
MW-3	15 36	33 05	-17 69
MW-4	13 95	31 64	-17 69
MW-5	14 13	29 32	-15 19
MW-6	14 24	34 86	-20 62
P-6	17 37	32 67	-15 30
MW-7	19 98	DRY	DRY
MW-8	21 48	38 66	-17 18
MW-9	12 89	15 34	-2 45
MW-10	12 72	16 45	-3 73
MW-11	18 16	26 12	-7 96

POTENTIOMETRIC MAP
JUNE 2004 SAMPLING EVENT

SHEET DESCRIPTION
VERMILION PARISH SOLID WASTE PLANT

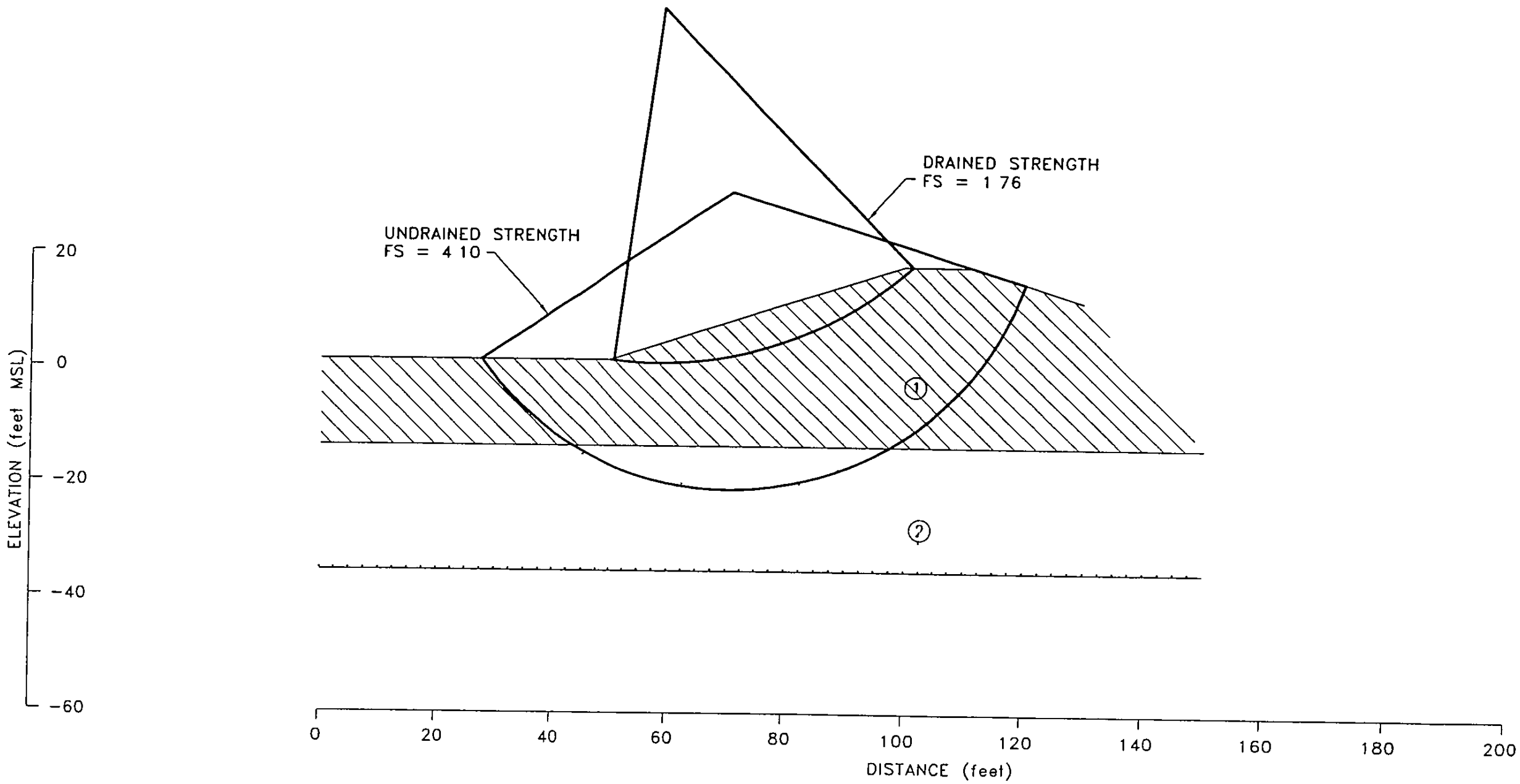
Sellers & Associates Inc
ENGINEERS SURVEYORS PLANNERS
Lic #4114 Lic #4114 Lic

REVISIONS

DATE	BY

ENGINEER DKS
DRAWN JFT
DATE 09-01-04
SCALE 1 400
PROJECT NO. 5283-18
FILE NO. -
CAD DWG NO. LANDFILL\SURVEY-MONITORING

STE Fig 22



Layer No – Description	γ (pcf)	Undrained Strength c (psf)	Undrained Strength ø (deg)	Drained Strength c (psf)	Drained Strength ø (deg)
1 In-situ Clay	120	1300	0	0	28
2 In-situ Sand	120	0	30	0	30

0 (feet) 20
SCALE

MODIFICATION NO 9
EXPANSION 2-B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA
for
VERMILION PARISH POLICE JURY
ABBEVILLE, LOUISIANA

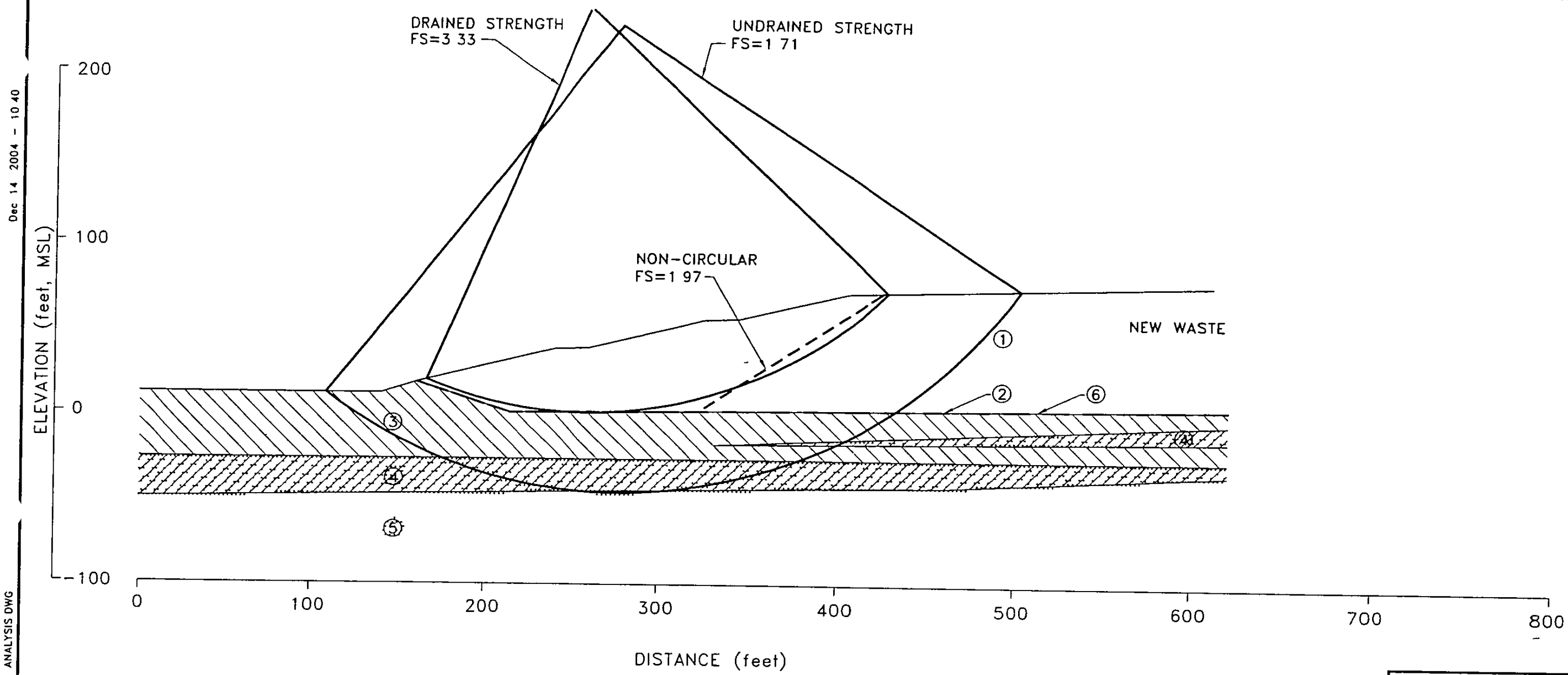
SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE LOUISIANA

STE
Soil Testing Engineers Inc
Baton Rouge LA Jefferson LA Biloxi MS

Project Engineer	Drawn by	Checked by
R de Abreu	BJ	
File No	Date	Figure No
03-1063A	11-11-04	23

Title
EXCAVATION CUT
SLOPE STABILITY ANALYSIS

Dec 14 2004 - 10 39a
P\2003\03A\CADD\031063A-23 EXCAVATION CUT DWG



0 (feet) 60
SCALE

Layer No – Description	γ (pcf)	Undrained Strength c (psf)	Undrained Strength ø (deg)	Drained Strength c (psf)	Drained Strength ø (deg)
1 New Waste	63	300	23	300	23
2 Recompacted Liner	120	1000	0	0	28
3 In-situ Clay	120	1300	0	0	30
4 In-situ SC/SM	115	400	0	0	25
5 In-situ Sand	115	0	30	0	30
6 HDPE/GCL	65	0	10	0	10

MODIFICATION NO 9
EXPANSION 2-B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA
for
VERMILION PARISH POLICE JURY
ABBEVILLE, LOUISIANA

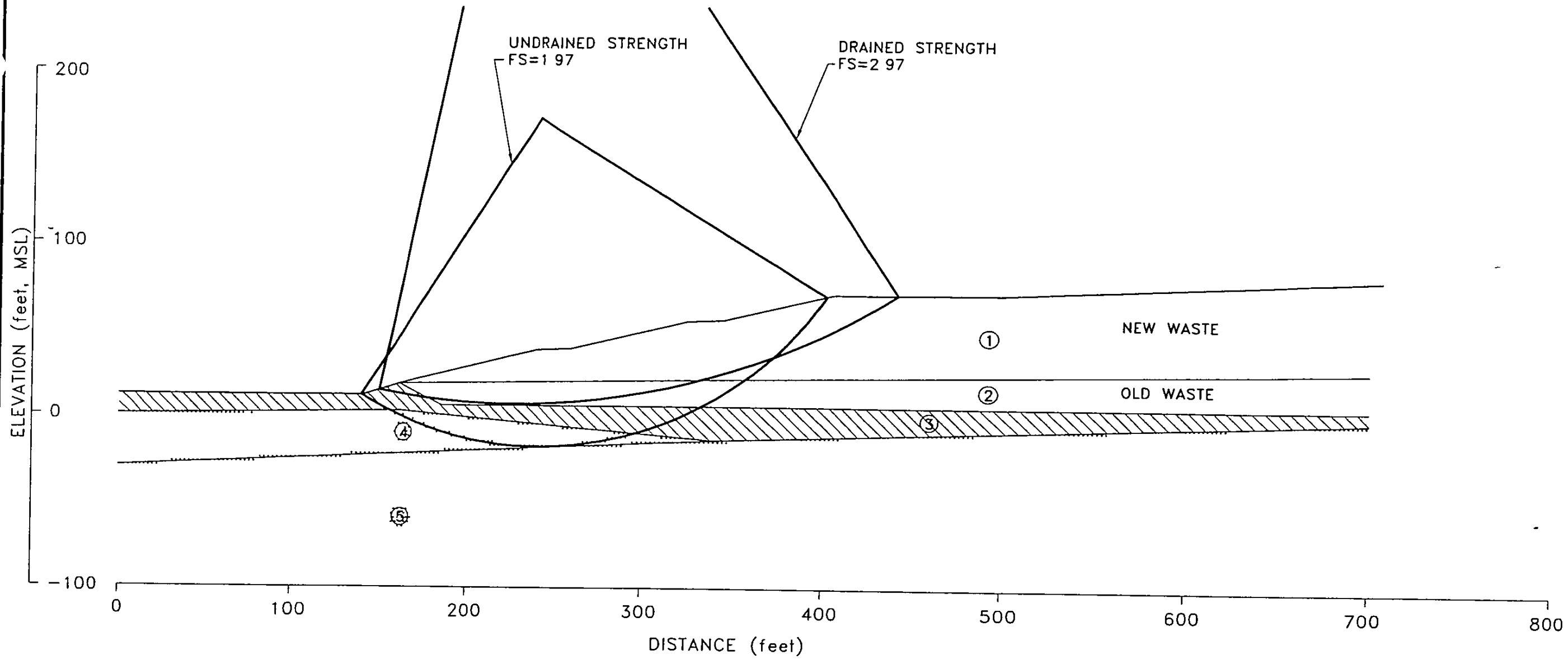
SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE LOUISIANA

STE
Soil Testing Engineers Inc
Baton Rouge LA Jefferson LA Biloxi MS

Project Engineer	Drawn by	Checked by
R de Abreu	BJ	
File No	Date	Figure No
03-1063A	11-11-04	24

Title
AREA 2 B SECTION B-B
SLOPE STABILITY ANALYSIS

Dec 14 2004 - 10 40
P \2003\ 3A\CADD\031063A-24 SECTION B-B SLOPE ANALYSIS DWG



0 (feet) 60
SCALE

Layer No – Description	γ (pcf)	Undrained Strength c (psf)	Undrained Strength ø (deg)	Drained Strength c (psf)	Drained Strength ø (deg)
1 New Waste	63	300	23	300	23
2 Old Waste	63	300	18	300	18
3 In-situ Clay	120	1300	0	0	30
4 In-situ Clayey Sand	115	400	0	0	25
5 In-situ Sand	115	0	30	0	30

MODIFICATION NO 9
EXPANSION 2-B
VERMILION PARISH
SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA
for
VERMILION PARISH POLICE JURY
ABBEVILLE, LOUISIANA
SELLERS & ASSOCIATES
ENGINEERS
LAFAYETTE LOUISIANA

STE
Soil Testing Engineers Inc
Baton Rouge LA Jefferson LA Biloxi MS

Project Engineer	Drawn by	Checked by
R de Abreu	BJ	
File No	Date	Figure No
03-1063A	10-28-04	25

Title
AREA I-A SECTION F-F
SLOPE STABILITY ANALYSIS

P:\2003\03A\CADD\031063A-25 SECTION F-F SLOPE ANALYSIS.DWG
Dec 14 2004 - 10 41L

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VERMILION PARISH WASTE PLANT
VERMILION PARISH, LOUISIANA
TABLE A-1
BOREHOLE WATER LEVEL READINGS

BORING No	DATE DRILLED	GROUND SURFACE ELEVATION (ft MSL)	ELEV WATER FIRST NOTED (ft MSL)	SHORT TERM READING		LONG TERM READING	
				ELEVATION (ft MSL)	TIME (MINS)	ELEVATION (ft MSL)	TIME (MINS)
B 1	1977	+17	NFWE to 8				
B 2	1977	+14	NFWE to -11				
B 3	1977	+13	NFWE to -12				
B 1	1982	+16	NFWE to 9				
B 2	1982	+15	NFWE to -7				
B 3	1982	+13	NFWE to -17				
B-4	1982	+17	NFWE to +9				
B 1	1983	+13	-15				
B 2	1983	+11	-18				
B 3	1983	+12	-14				
B-4	1983	+12	-16				
B 5	1983	+13	8				
B 6	1983	+14	-16				
B 1	1993	+13	6				
B 2	1993	+14	6				
B 3	1993	+12	-7				
B-4	1993	+17	NFWE to -2				
B 5	1993	+15	NFWE to -3				
B94 1	1994	+7 9	-14 6	12 8	15	-12 6	840
B94 2	1994	+8 7	13 8	13 6	15	14 9	3780
B94 3	1994	+8 4	-13 6	13 1	15	13 1	540
B94-4	1994	+8 8	13 2	13 2	15		
B94 5	1994	+11 0	7 0	-5 0	15		
B94 6	1994	+10 8	-7 2	5 2	15	9 7	780
B94 7	1994	+11 4	14 6	-9 8	30		
B94 8	1994	+11 2	8 8	8 8	30		
B94 9	1994	+18 0	10 0	8 0	15		
MW 6	1998	+12 11	16 9				
MW 7	1998	+17 69	-9 3				
MW 8	1998	+19 35	7 7				
MW 9	1998	+10 74	9 3	8 3	15		
MW 10	1998	+10 62	-17 4	-9 4	15		
MW 11	1998	+16 22	13 8				
B03 1	2003	+8 9	-19 1			13 1	1440
B03 2	2003	+2 9	15 1	11 1	20		
B03 3	2003	+0 7	19 3	14 3	20	13 5	1440
B03-4	2003	+12 9	5 1	-1 8	20		
B03 5	2003	+1 4	-20 1	14 3	20		
B03 6	2003	+1 5	18 5	14 0	20		
B03 7	2003	+16 5	NFWE to 5 5				
B03 8	2003	+5 5	NFWE to 12 5				
B03 9	2003	+4 5	NFWE to -21 5				

NOTE Elevation of borings drilled before 1994 are estimated from site topographic map made in 1992 since they were not surveyed at the time

NFWE No free water encountered during dry augering

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VERMILION PARISH WASTE PLANT
VERMILION PARISH, LOUISIANA

TABLE A 2
VERTICAL PERMEABILITY TESTS
(TRIAXIAL METHOD WITH BACK PRESSURE SATURATION)

BORING No	DEPTH (ft)	UNIFIED CLASSIF	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	VERTICAL PERMEABILITY (cm/sec)
B03 3	10 12	CH	80	51	37	82	2.5×10^{-7}
B03 5	14 16	SM	26	2	29	92	2.0×10^{-5}
B03 9	28 30	SM SC	22	2	22	104	4.5×10^{-5}

VERMILION PARISH SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA

Table A-3
MONITORING WELL DETAILS (as installed)

Well No	Relative Location	Drilled Depth (feet)	Casing Depth (feet)	Screen Interval		Slot Size (inches)	Casing ID (inches)	Grout Type	Surface Elevation (ft. MSL)	TOC Elevation Ft MSL)	Boring No
				Depth (feet)	Elevation (ft MSL)						
MW-1*	DG	56 5	40 5	40 5-50 5	-22 1 to -32 1	0 010	4	4% CB	+18 4	+21 5	B94-8
MW-2*	DG	59 0	43 0	43 0-53 0	-29 8 to -39 8	0 010	4	4% CB	+13 2	+15 5	B94-5
MW 3	UG	46 0	30 0	30 0-40 0	-17 5 to -27 5	0 010	4	4% CB	+12 5	+15 0	B94-6
MW-4	DG	58 0	42 0	42 0-52 0	-30 9 to -40 9	0 010	4	4% CB	+11 1	+14 5	B94-8
MW-5	DG	49 0	33 0	33 0-43 0	-21 8 to -31 8	0 010	4	4% CB	+11 2	+13 7	B94-7
MW-6	DG	40 0	30 0	28 0-38 0	-13 8 to -23 8	0 010	4	4% CB	+12 1	+14 2	MW-6
MW-7*	DG	37 0	27 0	26 0-36 0	-8 3 to -18 3	0 010	4	4% CB	+17 7	+20 0	MW-7
MW-7A	DG	Prop	Prop	40 0-50 0	-22 3 to -32 3	0 010	4	4% CB	Prop	Prop	MW-7
MW-8	DG	48 0	38 0	35 0-45 0	-15 7 to -25 7	0 010	4	4% CB	+19 4	+21 5	MW-8
MW-9	UG	41 0	28 0	25 0-35 0	14 3 to -24 3	0 010	4	4% CB	+10 7	+12 9	MW-9
MW-10	UG	40 0	30 0	28 0-38 0	-17 4 to -27 4	0 010	4	4% CB	+10 6	+12 7	MW-10
MW-11	UG	42 0	30 0	28 0-38 0	-11 8 to -21 8	0 010	4	4% CB	+16 2	+18 2	MW-11

*MW-1 MW-2 and MW-7 to be plugged and abandoned.

UG Upgradient
DG Downgradient
Prop Proposed
4% CB 4% Bentonite 1 sack cement / 7 gallons water (LDOTD / LDEQ Mix)

Table03

03-1003

VERMILION PARISH SOLID WASTE PLANT
VERMILION PARISH, LOUISIANA

Table A-3 (Cont.)
MONITORING WELL DETAILS (as proposed)

Well No	Relative Location	Drilled Depth (feet)	Casing Depth (feet)	Screen Interval		Slot Size (inches)	Casing ID (inches)	Grout Type	Surface Elevation (ft. MSL)	TOC Elevation Ft. MSL)	Boring No
				Depth (feet)	Elevation (ft. MSL)						
MW-12	UG	Prop	Prop	40-50	-37 to -47	0 010	4	4% CB	Prop	Prop	B03-2
MW-13	DG	Prop	Prop	50-60	-48 5 to -58 5	0 010	4	4% CB	Prop	Prop	B03-6
MW 14	DG	Prop	Prop	30-40	-25 5 to -35 5	0 010	4	4% CB	Prop	Prop	B03-8

UG Upgradient
DG Downgradient

Prop Proposed
4% CB 4% Bentonite 1 sack cement / 7 gallons water (LDOTD / LDEQ Mix)

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VERMILION PARISH WASTE PLANT
VERMILION PARISH, LOUISIANA
TABLE A-4
WATER LEVEL READINGS

	WELL/PIEZOMETER											
	MW-1	MW-2	MW-3	MW-4	MW 5	P 6	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11
Nearest Boring	B94 8	B94 5	B94 6	B94 8	B94 7	B94 6	MW 6	MW 7	MW 8	MW 9	MW 10	MW 11
T O C Elevation	21 5	15 5	15 0	14 5	13 7	17 1	14 2	20 0	21 5	12 9	12 7	18 2
Screened Elevation	22 1 to 32 1	29 8 to 39 8	17 5 to 27 5	30 9 to 40 9	21 8 to 31 8	69 3 to 79 3	13 8 to 23 8	8 3 to 18 3	15 7 to 25 7	14 3 to 24 3	17 4 to 27 4	11 8 to 21 8
Date Installed	Aug 84	Aug 84	Aug 84	Aug 84	Aug 84	Nov 94	Aug 98	Aug 98	Aug 98	Aug 98	Aug 98	Aug 98
Date	POTENTIOMETRIC LEVEL (feet, MSL)											
09/18/1984	13 35	12 74	13 71	13 66	13 34							
01/09/1985	12 52	12 79	12 71	13 50	12 34							
07/11/1985	13 27	13 07	12 71	13 66	13 00							
01/13/1986	12 35	11 32	11 21	12 33	12 17							
07/10/1986	12 93	12 57	12 05	13 25	12 75							
06/11/1990	12 13	9 80	10 84	12 88	11 96							
11/12/1990	12 81	11 24	10 71	13 07	12 34							
06/15/1991	12 23	9 55	9 86	12 46	11 42							
11/11/1991	11 58	9 28	9 51	11 83	11 00							
06/15/1992	11 98	9 20	9 88	12 33	11 34							
10/27/1992	12 02	9 99	11 94	12 50	11 59							
06/01/1993	11 52	8 57	11 46	12 00	10 75							
10/25/1993	11 70	9 49	11 30	12 31	11 17							
04/27/1994	11 52	8 45	11 38	11 87	10 75							
09/23/1994	11 27	8 61	11 13	11 71	10 84							
11/08/1994	11 18	9 12	11 47	11 67	10 77							
12/16/1994	11 15	9 20	11 23	11 58	10 69	12 40						
12/28/1994	11 05	9 11	11 15	11 50	10 57	11 50						
01/12/1995	10 91	8 60	10 98	11 33	10 46	11 45						
01/13/1995	10 88	8 47	10 93	11 32	10 43	11 24						
02/10/1995	10 76	7 97	10 83	11 16	10 27	11 30						
05/22/1995	11 35	7 70	11 17	11 66	10 54							
11/13/1995	12 02	9 44	12 21	12 48	11 21							

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VERMILION PARISH WASTE PLANT
VERMILION PARISH, LOUISIANA
TABLE A 4
WATER LEVEL READINGS

	WELL/PIEZOMETER											
	MW-1	MW-2	MW-3	MW-4	MW-5	P 6	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11
Nearest Boring	B94 8	B94 5	B94 6	B94 8	B94 7	B94 6	MW 6	MW 7	MW 8	MW 9	MW 10	MW 11
T O C Elevation	21 5	15 5	15 0	14 5	13 7	17 1	14 2	20 0	21 5	12 9	12 7	18 2
Screened Elevation	22 1 to 32 1	29 8 to 39 8	17 5 to 27 5	30 9 to 40 9	21 8 to 31 8	69 3 to 79 3	13 8 to 23 8	8 3 to 18 3	15 7 to 25 7	14 3 to 24 3	17 4 to 27 4	11 8 to 21 8
Date Installed	Aug 84	Aug 84	Aug 84	Aug 84	Aug 84	Nov 94	Aug 98	Aug 98	Aug 98	Aug 98	Aug 98	Aug 98
Date	POTENTIOMETRIC LEVEL (feet, MSL)											
05/09/1996	13 04	9 57	13 37	13 41	12 04							
08/21/1996	13 25	10 52	13 62	13 73	11 88	13 56						
08/28/1996	13 20	10 47	13 59	13 69	11 84	13 57						
09/09/1996	13 13	10 40	13 52	13 58	11 78							
09/17/1996	13 18	10 34	13 49	13 57	11 74	13 70						
09/27/1996	13 14	10 33	13 45	13 53	11 66	13 43						
10/01/1996	13 15	10 32	13 28	13 53	11 67	13 54						
11/20/1996	12 95	10 12	13 33	13 38	11 52	13 55						
12/09/1996	12 92	9 81	13 28	13 33	11 59	13 28						
Jan 97	12 48	9 11	12 86	12 94	11 04	12 89						
Apr 97	12 30	8 25	12 75	12 73	11 11	12 68						
Jul 97	13 10	9 10	13 50	13 43	11 66	13 52						
Dec 97	13 04	9 98	13 47	13 53	12 12	13 41						
Jun 98	14 07	10 32	14 46	14 53	12 17							
Dec 98	13 98	12 11	14 38	14 54	12 66	12 05	17 48	14 15	14 03	6 02	5 91	9 32
Jun 99	15 24	8 06	15 74	15 79	13 32		18 64	15 42	15 29	6 53	6 42	-10 64
Sep 99	15 29	13 54	15 77	15 88	13 22	13 53	18 79	15 51	15 35	7 05	6 90	-11 06
Dec 99	14 84	13 64	14 94	15 93	13 34	13 58	18 89	15 64	15 45	7 54	7 27	-11 40
Jun 00	17 12	15 24	17 69	17 73	14 67	15 26	20 43	17 02	16 98	8 43	8 38	-12 07
Dec 00	17 29	15 49	17 69	17 73	14 26	15 26	20 79	17 22	17 26	8 01	7 90	-11 84
Jun 01	18 01	15 73	18 47	18 60	16 14	16 13	21 28	Dry	17 53	6 97	7 16	10 75
Dec 01	17 36	15 35	17 65	17 87	15 67	15 49	20 90	Dry	17 36	14 79	7 36	9 38
Jun 02	18 33	16 00	18 82	18 93	16 62	16 13	21 75	Dry	17 93	7 03	7 49	9 34

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VERMILION PARISH WASTE PLANT
VERMILION PARISH, LOUISIANA
TABLE A 4
WATER LEVEL READINGS

	WELL/PIEZOMETER											
	MW 1	MW-2	MW-3	MW-4	MW-5	P 6	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11
Nearest Boring	B94 8	B94 5	B94 6	B94 8	B94 7	B94 6	MW 6	MW 7	MW 8	MW 9	MW 10	MW 11
T O C Elevation	21 5	15 5	15 0	14 5	13 7	17 1	14 2	20 0	21 5	12 9	12 7	18 2
Screened Elevation	22 1 to 32 1	29 8 to 39 8	17 5 to 27 5	30 9 to 40 9	21 8 to 31 8	69 3 to 79 3	13 8 to 23 8	8 3 to 18 3	15 7 to 25 7	14 3 to 24 3	17 4 to 27 4	11 8 to 21 8
Date Installed	Aug 84	Aug 84	Aug 84	Aug 84	Aug 84	Nov 94	Aug 98	Aug 98	Aug 98	Aug 98	Aug 98	Aug 98
Date	POTENTIOMETRIC LEVEL (feet MSL)											
Dec 02	17 66	15 29	18 04	18 08	15 64	16 33	20 94	Dry	17 33	6 23	7 03	8 57
Jun 03	17 66	15 03	18 12	18 26	15 80	15 74	21 21	Dry	17 64	6 36	6 89	8 44
Dec 03	17 04	14 23	17 34	17 46	14 56	-15 00	20 44	Dry	16 71	3 80	5 09	6 86
Jun 04	17 16	14 17	17 69	17 69	15 19	15 30	20 62	Dry	17 18	2 45	3 73	7 96

APPENDIX A
GEOTECHNICAL INVESTIGATION

- Soil Boring Logs - 2003 Geotechnical Investigation
- Monitoring Wells Installation (MW-6 to MW-11) - 1998

LOG OF BORING

LOUISIANA TESTING & INSPECTION INC
LAFAYETTE LOUISIANA

BORING 4
FILE
DATE 11-30-93

PROJECT . VERMILION PARISH WASTE FACILITY

LOCATION HWY 696

CLIENT VERMILION PARISH WASTE FACILITY, C/O SELLERS, DUBROC & ASSOCIATES

DRY AUGERED

DEPTH (FEET)	SAMPLES	S P T (B/FT) OR PKT PEN (TSF)	COMPRESSIVE STRENGTH (TSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	L L (%)	P L (%)	DESCRIPTION OF STRATUM
0								BROWN MEDIUM STIFF SILTY CLAY
5								YELLOWISH TAN STIFF SILTY CLAY
10								LIGHT GREY MEDIUM STIFF SILTY CLAY
15								REDDISH BROWN & LIGHT GREY HEAVY STIFF CLAY
20								TAN FINE SANDY CLAY
25								
30								
35								
40								

LOG OF BORING

LOUISIANA TESTING & INSPECTION INC
LAFAYETTE LOUISIANA

BORING 5
FILE
DATE 11-30-93

PROJECT VERMILION PARISH WASTE FACILITY

LOCATION HWY 696

CLIENT VERMILION PARISH WASTE FACILITY, C/O SELLERS, DUBROC & ASSOCIATES

DRY AUGURED

DEPTH (FEET)	SAMPLE	S P T (BPF) OR PST PEN (TSF)	COMPRESSIVE STRENGTH (TSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	L L (%)	P L (%)	DESCRIPTION OF STRATUM
0								BROWN MEDIUM STIFF SILTY CLAY
5								BROWN & LIGHT GREY SILTY CLAY
10								LIGHT GREY MEDIUM STIFF SILTY CLAY
								YELLOWISH TAN MEDIUM STIFF SILTY CLAY
15								REDDISH BROWN & TAN MEDIUM STIFF SILTY CLAY
20								LIGHT GREY SILTY CLAY
25								
30								
35								
40								

Vermilion Parish Solid Waste Plant
Vermilion Parish Louisiana

LOG OF SOIL BORING B94-5

STE
Soil Testing Engineers Inc

File	94-2078
Date	11/16/94
Geol	Fontenot
Driller	Landry
Rig	CME 550

Vermilion Parish Police Jury Owners
Seller & Associates Engineers

Sheet 1 of 4

Location (MW 2)
Surface Elevation 11 0 MSL

Ground Water Level	Depth (feet)	Samples	Field Test Results	Comp Strength (tsf)	MC (%)	γd (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			2 0 (P)		21		42	18			Firm dark gary SILTY CLAY (CL)
			3 5 (P)								Very stiff gray CLAY (CH)
	5		4 5 (P)		18		58	37			Very stiff light gray & brown CLAY (CH) w/silt pockets
			3 2 (P)								Stiff light gray CLAY (CH) w/slickensides
			2 5 (P)	0 54 s 1 74 r	33	92					
	10		2 8 (P)								
			3 5 (P)								Very stiff light gray & red CLAY (CH) w/joints & slickensides
	15		2 5 (P)								
▽			3 0 (P)								–w/ 1/2 to 2 silt layers 2 to 4 apart @ 16
			2 0 (P)	0 81	26	100					Firm brown & gray SILTY CLAY (CL) w/silt seams
	20		2 0 (P)								
			19 b/f 7 6 13								Medium dense red SILTY SAND (SM) w/ 2 clay layers
	25		14 b/f 3 6 8								
			13 b/f 7 6 7								Medium dense gray SILTY SAND (SM) w/alternating layers of stiff gray & brown CLAY (CH)
			19 b/f 6 9 10								
	30										

Continued Next Page

Ground Water Level Data

▽ Free Water First Encountered

Boring Advancement Method

Hollow Stem Auger 0 to 46
Wash 46 to 100

Boring Abandonment Method

Borehole Grouted w/Cement Bentonite Grout Upon Completion

Notes

s Slickensided Failure
r Remolded Strength

Strata Boundaries May Not Be Exact

Vermilion Parish Solid Waste Plant
Vermilion Parish Louisiana

LOG OF SOIL BORING B94-5

STE
Soil Testing Engineers, Inc.

File	94 2078
Date	11/16/94
Geol	Fontenot
Driller	Landry
Rig	CME 550

Vermilion Parish Police Jury Owners
Seller & Associates Engineers

Sheet 2 of 4

Location (MW 2)
Surface Elevation 11 0 MSL

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	Comp Strength (tsf)	MC (%)	γd (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			3 5 (P)		26		75	45			Medium dense gray SILTY SAND (SM) w/alternating layers of stiff gray & brown CLAY (CH)
			6 b/f 3 3 5								Firm gray CLAY (CH)
	35		3 b/f 1 1 2								
			1 0 (P)								w/sand lenses 1/2 to 6 apart @ 36
			1 0 (P)								
	40										
			1 0 (P)		48	78	74	45	KH		w/sand lenses 1 to 6 apart @ 40
			1 0 (P)								
	45		3 b/f 1 1 2								–w/ 1/2 thick sand seams 6 to 8 apart @ 44 5
			10 b/f 3 3 7								–w/ 10 thick sand layer @ 48 5
	50										
			33 b/f 10 15 18		22				PSA		Dense gray SILTY SAND (SM)
	55										
			36 b/f 14 16 20								
	60										

Ground Water Level Data

▽ Free Water First Encountered

Boring Advancement Method

Hollow Stem Auger 0 to 46
Wash 46 to 100

Boring Abandonment Method

Borehole Grouted w/Cement Bentonite Grout Upon Completion

Notes

KH Horizontal Permeability = 2 8x10(8) cm/sec
PSA Particle Size Analyses
Sand Content = 90%

Continued Next Page

Strata Boundaries May Not Be Exact

LOG OF SOIL BORING B94-5

Vermilion Parish Solid Waste Plant
Vermilion Par sh Louisiana

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Vermilion Parish Police Jury Owners
Seller & Associates Engineers

Sheet 3 of 4

File 94 2078
Date 11/16/94
Geol Fontenot
Driller Landry
Rig CME 550

Location (MW 2)
Surface Elevation 11 0 MSL

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	Comp Strength (sf)	MC (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Dense gray SILTY SAND (SM)
			31 b/f 12 13 18								
	65										
			50 b/7 27 42 8/1								becoming very dense @ 68 5
	70										
			50 b/9 24 33 17/3"								
	75										
			50 b/9 21 30 20/3"								
	80										
											Very dense gray SILTY SAND (SM)
			50 b/9 24 36 14/3"								
	85										
			50 b/10 21 31 19/4"	23					PSA		–w/pea gravel @ 88 5
	90										

Continued Next Page

Ground Water Level Data

▽ Free Water First Encountered

Boring Advancement Method

Hollow Stem Auger 0 to 46
Wash 46 to 100

Boring Abandonment Method

Borehole Grouted w/Cement Bentonite Grout Upon Completion

Notes

PSA Particle Size Analyses
Sand Content = 83%
Silt Content = 6%
Clay Content = 11%

Strata Boundaries May Not Be Exact

LOG OF SOIL BORING B94-5

Vermilion Parish Solid Waste Plant
Vermilion Parish, Louisiana

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Soil Testing Engineers Inc

Vermilion Parish Police Jury Owners
Seller & Associates Engineers

Sheet 4 of 4

File 94 2078
Date 11/16/94
Geol Fontenot
Driller Landry
Rig CME 550

Location (MW 2)
Surface Elevation 11 0 MSL

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	Comp Strength (tsf)	MC (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
											Very dense gray SILTY SAND (SM)
			50 b/8 19 38 12/2"								
	95										
			50 b/11 17 28 22/5"								
	100										
											Boring completed @ 100
	105										
	110										
	115										
	120										

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free Water First Encountered	Hollow Stem Auger 0 to 46 Wash 46 to 100	
	Boring Abandonment Method Borehole Grouted w/Cement Bentonite Grout Upon Completion	

Strata Boundaries May Not Be Exact

LOG OF SOIL BORING B94-9

Vermilion Parish Solid Waste Plant
Vermilion Parish Louisiana

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Soil Testing Engineers Inc.

Vermilion Parish Police Jury, Owners
Seller & Associates Engineers

Sheet 1 of 2

File	94 2078
Date	11/23/94
Geol	Fontenot
Driller	Landry
Rig	CME 550

Location (MW 1)
Surface Elevation 10 0 MSL

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	Comp Strength (tsf)	MC (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			4 5 (P)				63	37			Very stiff gray & tan CLAY (CH)
			4 0 (P)								Very stiff gray & brown CLAY (CH)
	5		4 2 (P)								
			3 2 (P)	2 61	22	107	58	40			
			3 8 (P)								w/sand traces @ 8
	10										
			4 5 (P)		21		35	15			Very stiff tan SANDY CLAY (CL)
			1 5 (P)								Medium dense tan SILTY SAND (SM)
	15		1 2 (P)								
			25 b/f 12 14 11								w/ 4 thick clay layer 15 5
			30 b/f 10 12 18		5				PSA		–w/ 1 thick clay layer @ 18
	20										
			39 b/f 12 18 21								
			38 b/f 10 17 21								
	25		14 b/f 7 7 7								–w/ 3 to 4 thick alternating layers of clay @ 24 5
▽			31 b/f 10 14 17								Medium dense gray SAND (SP)
			31 b/f 7 10 21								
	30										

Continued Next Page

Ground Water Level Data

▽ Free Water First Encountered

Boring Advancement Method

Hollow Stem Auger 0 to 44

Boring Abandonment Method

Borehole Grouted w/Cement Bentonite Grout Upon Completion

Notes

PSA Particle Size Analyses
Sand Content = 86%

Strata Boundaries May Not Be Exact

Vermilion Parish Solid Waste Plant
Vermilion Parish Louisiana

LOG OF SOIL BORING B94-9

STE
Soil Testing Engineers Inc.

File 94 2078
Date 11/23/94
Geol Fontenot
Driller Landry
Rig CME 550

Vermilion Parish Police Jury Owners
Seller & Associates Engineers

Sheet 2 of 2

Location (MW 1)
Surface Elevation 10 0 MSL

FIELD DATA				LABORATORY DATA							
Ground Water Level	Depth (feet)	Samples	Field Test Results	Comp Strength (tsf)	MC (%)	γ_d (pcf)	LL (%)	PI (%)	Other	Soil Type	DESCRIPTION
			39 b/f 8 18 21								Medium dense gray SAND (SP)
			12 b/f 2 4 8								
	35		19 b/f 6 9 10		21				PSA1		
			23 b/f 7 10 13								
			29 b/f 10 14 15								
	40		23 b/f 7 10 13								Medium dense gray SAND (SP)
			19 b/f 6 7 12		26				PSA2		
	45										
											Boring completed @ 44
	50										
	55										
	60										

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free Water First Encountered	Hollow Stem Auger 0 to 44	PSA1 Particle Size Analyses Sand Content = 97% Silt Content = 2% Clay Content = 1% PSA2 Particle Size Analyses Sand Content = 98%
	Boring Abandonment Method Borehole Grouted w/Cement Bentonite Grout Upon Completion	

Strata Boundaries May Not Be Exact

Soil Boring Logs
2003 Geotechnical Investigation

STE
Soil Testing Engineers Inc

VERMILION PARISH SOLID WASTE PLANT MODIFICATION No 9 - AREA 2B EXPANSION VERMILION PARISH, LOUISIANA

APPENDIX A

FIELD AND LABORATORY PROCEDURES

A 1 FIELD EXPLORATION

Soil Testing Engineers, Inc (STE) performed the field investigation and laboratory testing portions of this project during May and June, 2003 The number, depths, and locations of the borings are in compliance with the current regulations set by the Louisiana Department of Environmental Quality (LDEQ) The field investigation consisted of nine soil borings Logs of all borings, with the results of laboratory testing are included in this Appendix

The locations and elevations of the borings were established by survey made by Sellers & Associates, Inc , of Lafayette, Louisiana. The location of the borings is shown on the Soil Boring Plan, Figure 1 The surface elevations are presented on the boring logs

A 1 1 Drilling Methods

The borings were drilled with a rotary-type drilling equipment All boreholes were initially dry-augered using a four-inch diameter short flight auger to determine the first free water encountered Whenever borehole advancement was made using the wet rotary method, a four-inch diameter rotary wash drag bit was placed at the end of the drill stem with a recirculated drilling fluid and a "mud tank placed over the borehole

This technique allowed the proper borehole advancement to secure the appropriate samples (see "Sampling Procedures") and allowed the observation of the presence of free water in the borehole

Each borehole was grouted upon completion of the borehole water-level readings The grout mixture was prepared mixing 4 7 pounds of bentonite per sack of portland cement per 8 gallons of water, producing a grout weight of about 13 8 ± 0 2 pounds per gallon After the grout was thoroughly mixed, it was pumped to the bottom of the borehole through a PVC tremie pipe placed to the bottom of the hole

A 1 2 Sampling Procedures

In the cohesive and semi-cohesive soils, relatively undisturbed samples were secured using a three-inch diameter, thin-wall steel tube sampler In this sampling procedure, the borehole is

advanced to the desired level, and the tube is lowered to the bottom of the boring It is then pushed about two feet into the undisturbed soil in one continuous stroke The sample and tube is retrieved from the borehole and detached from the drill string

The sample is extruded by a hydraulic piston onto a rigid sample catcher to minimize disturbance The sample is then visually classified The classification includes description of soil color, strength estimates, identification of structural conditions (layering, seams, etc), and variations (organics, oxide inclusions, etc) A pocket penetrometer strength test is performed Any disturbed portions are discarded, and the sample is sealed to minimize disturbance and moisture loss during transportation to the laboratory This procedure conforms essentially to ASTM D 1587

In the less cohesive materials, standard penetration tests were performed These tests provide a measure of the in situ characteristics of the soil and secure a disturbed sample In this test, a 2-inch OD, 1 37 ID, heavy-walled split spoon sampler is driven into the undisturbed soil at the bottom of the borehole with a drop hammer weighing 140 pounds and having a stroke of 30 inches It is first seated 6 inches, then driven additional two 6 inch increments The Penetration Resistance is the number of such blows required to drive the spoon the final 12 inches It is recorded on the boring log in the following manner

15 b/f
6-7 8

where the figures in parentheses indicate the number of blows required for each 6-inch increment This procedure essentially conforms to ASTM D 1586

Preliminary observations of groundwater levels were made during soil boring advancement This information is provided on the soil boring logs and summarized on Table A-1

A 2 LABORATORY PROCEDURES

Samples from the various strata as selected by a geotechnical engineer were tested in the laboratory to determine their pertinent physical characteristics The samples and types of tests performed were selected by a geotechnical engineer to develop information necessary for the appropriate analyses The testing program conducted is described below

A 2 1 Strength Tests

The strength characteristics of the various soil strata are important for almost all geotechnical engineering analyses Nineteen unconfined compression tests (ASTM D 2166) and three unconsolidated undrained triaxial compression tests (ASTM D 2850) were performed to develop this data

A 2 2 Classification Tests

To classify the soils more definitely than can be done by field methods, 38 Atterberg Limit Determinations (ASTM D 4318), 44 Moisture Content Determinations (ASTM D 2216), 8 Particle Size Analyses (ASTM D 422), and 3 Particle Size Analyses with Hydrometer (ASTM D 422) were made There were also 27 dry unit weight determinations

A 2 3 Consolidation Test

Data for settlement analysis was collected by performing a consolidation test (ASTM D 2435) on an undisturbed sample of the natural soil The results are presented on this Appendix

A 2 4 Permeability Tests

Three permeability tests were conducted on samples of the natural soils Samples were trimmed and arranged for flow in the vertical direction All tests were conducted a sufficient length of time to achieve steady state conditions The results of these tests are presented on the boring logs, and summarized on Table A 2

The results of the unconfined and unconsolidated undrained triaxial compression tests are tabulated in the laboratory data portion of the soil boring logs under the column heading "Compressive Strength" The moisture content and dry density data are tabulated in the subsequent two columns within the laboratory data portion of the logs

Area 2 B Expansion
Vermilion Parish Landfill
Abbeville LA

LOG OF SOIL BORING B03-01

STE
Soil Testing Engineers Inc
Sheet 1 of 1

File	03 1063
Date	05/21/03
Logged by	K Moody
Driller	D Robinson
Rig	Ardco K 1000

Vermilion Parish Police Jury
Sellers & Associates Engineers

LELAP Certificate No 02052

Location N 30° 01 53 08
W 92 07 56 46
Surface Elevation +8 9 (ft NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			4 5 (P)									Very stiff tan and gray SILTY CLAY (CL) w/organic matter
			4 5 (P)									Stiff to very stiff dark brown CLAY (CH) w/ferrous nodules
	5		3 0 (P)	1 66j	25	89	63	21	42			-- jointed at 4 to 6 ft
			3 7 (P)									Stiff bluish gray and tan CLAY (CH) w/ferrous nodules
			3 5 (P)									
	10		2 5 (P)									w/calcareous nodules at 10 to 12 ft
			2 2 (P)	1 07s	36	87	85	29	56			-- slickensided below 12 ft.
	15		2 7 (P)									
			3 5 (P)									
			4 0 (P)									
	20		4 5 (P)									Very stiff tan and gray SILTY CLAY (CL) w/ferrous nodules
			2 5 (P)		27		43	19	24			Medium to stiff gray and tan SILTY CLAY (CL) w/ferrous nodules
	25		3 0 (P)									
			15 b/f 6 6 9		28		35	20	15	GS1		Stiff to very stiff tan and gray SILTY CLAY (CL) w/2 inch sand layers
			30 b/f 9 16 14									
	30		3 2 (P)									Stiff brown and gray SANDY CLAY (CL)
			2 5 (P)									
	35		1 7 (P)	0 65	34	85	80	27	53			Medium gray CLAY (CH) w/1 inch sand layers
			1 2 (P)									
			1 5 (P)									
	40											Boring completed at 40 ft

Ground Water Level Data

Free water first encountered

Long term water level after 24 hrs

Boring Advancement Method

4 Nom Dia Short Flight Auger 0 to 28 ft
4 Dia Rotary Wash 28 to 40 ft.

Boring Abandonment Method

Tremie grouted bottom to top with cement/bentonite grout

Notes

J Jointed Failure
s Slickensided Failure
GS Particle Size Analysis
GS1 Sand Content = 4%

Strata Boundaries May Not Be Exact

LOG01 031063.GPJ LOG01.GDT 06/17/03

Area 2 B Expansion
Vermilion Parish Landfill
Abbeville LA

LOG OF SOIL BORING B03-2

STE
Soil Testing Engineers Inc

Vermilion Parish Police Jury
Sellers & Associates Engineers

Sheet 1 of 1

LELAP Certificate No 02052

File	03 1063
Date	05/23/03
Logged by	K Moody
Driller	D Robinson
Rig	Ardco K 1000

Location N30° 01 53 08
W92 07 53 22

Surface Elevation +2 9 (ft NGVD)

Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			2 0 (P)									Stiff tan and gray CLAY (CH) w/ferrous and calcareous nodules
			3 2 (P)		23	100	57	18	39			
	5		1 7 (P)									Medium tan and gray SILTY CLAY (CL)
			2 2 (P)									
			1 5 (P)	0 42	25	96	32	20	12			Soft tan and gray SILTY CLAY (CL) w/ferrous nodules
	10		1 2 (P)									
			2 0 (P)									Soft to medium brown and gray VERY SILTY CLAY (CL ML)
	15		0 7 (P)									
			2 0 (P)	0 78t1	26	97	28	20	8			-- w/3 inch sand layer at 17 ft
			15 b/f 4 6 9		34		53	22	31			Stiff brown and gray CLAY (CH) w/siltstones -- w/8 inch sand layer at 20 ft
	20											
			2 2 (P)									Medium to stiff gray and tan SILTY CLAY (CL)
			2 2 (P)									w/3 inch sand layer at 24 ft
	25		3 2 (P)	1 34	34	84	64	24	40			Stiff gray and tan CLAY (CH) w/ferrous nodules and 2 inch layers of sandy clay
			2 5 (P)									
			15 b/f 6 6 9									w/1 inch sand layers at 28 to 30 ft
	30		1 7 (P)									Soft to medium gray SANDY CLAY (CL)
			4 b/f 2 2 2									
	35		1 0 (P)									
			1 0 (P)									
			1 2 (P)	0 56t2	37	85	22	22	0			Loose gray SILTY SAND (SM) w/clay layers
	40											Boring completed at 40 ft

Ground Water Level Data

Free water first encountered

Water level after 20 mins

Boring Advancement Method

4 Nom Dia Short Flight Auger 0 to 20 ft
4 Dia Rotary Wash 20 to 40 ft.

Boring Abandonment Method

Tremie grouted bottom to top with cement/bentonite grout

Notes

t Unconsolidated Undrained Triaxial Compression Test
t1 Lateral Pressure = 10 0 psi
t2 Lateral Pressure = 19 4 psi

Strata Boundaries May Not Be Exact

LOG01 031063 GPJ LOG01 GDT 06/17/03

Area 2 B Expansion
Vermilion Parish Landfill
Abbeville LA

LOG OF SOIL BORING B03-3

STE
Soil Testing Engineers Inc
Sheet 1 of 1

Vermilion Parish Police Jury
Sellers & Associates Engineers

LELAP Certificate No 02052

File 03 1063
Date 05/22/03
Logged by K Moody
Driller D Robinson
Rig Ardco K 1000

Location N30° 01 53 10
W92 07 49 98
Surface Elevation +0 7 (ft NGVD)

Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			1 7 (P)									Medium tan SILTY CLAY (CL) w/calcareous nodules
			2 7 (P)									Stiff tan and gray CLAY (CH) w/calcareous and ferrous nodules and trace of organic matter
	5		3 2 (P)	1 80j	33	88	70	26	44			jointed at 4 to 6 ft
			4 2 (P)									
			4 5 (P)									slickensided at 8 to 12 ft
	10		2 2 (P)		37	82	80	29	51	Kv		
			2 2 (P)									
	15		2 5 (P)									
			2 5 (P)									Stiff tan and gray VERY SANDY CLAY (CL SC)
			9 b/f 3 4 5									
	20		3 2 (P)									Stiff gray and tan CLAY (CH) slickensided w/silty clay layers
			3 7 (P)	1 36s	37	79	93	32	61			
	25		0 5 (P)									Soft to medium gray SANDY CLAY (CL)
			0 7 (P)									
			0 5 (P)	0 49t	30	88	39	24	15			
	30		16 b/f 6 8 8									Firm gray VERY CLAYEY SAND (SC CL)
			1 2 (P)									Soft dark gray CLAY (CH)
	35		1 0 (P)		45		68	28	40			
			15 b/f 4 5 10									Firm gray SILTY SAND (SM) w/1 inch to 4 inch clay layers
			30 b/f 6 14 16									dense at 38 to 40 ft
	40											Boring completed at 40 ft

Ground Water Level Data

- Free water first encountered
- Water level after 20 mins
- Long term water level after 24 hrs

Boring Advancement Method

4 Nom Dia Short Flight Auger
0 to 20 ft
4 Dia Rotary Wash
20 to 40 ft

Boring Abandonment Method

Tremie grouted bottom to top with cement/bentonite grout

Notes

J Jointed Failure
Kv Vertical Permeability = 2 5 x 10(7) cm/sec
s Slickensided Failure
t Unconsolidated Undrained Triaxial Compression Test
Lateral Pressure = 15 7 psi

Strata Boundaries May Not Be Exact

LOG01 031063 GPJ LOG01 GDT 06/17/03

Area 2 B Expansion
Vermilion Parish Landfill
Abbeville LA

LOG OF SOIL BORING B03-4

STE
Soil Testing Engineers Inc
Sheet 1 of 1

File	03 1063
Date	05/20/03
Logged by	K Moody
Driller	D Robinson
Rig	Ardco K 1000

Vermilion Parish Police Jury
Sellers & Associates Engineers

LELAP Certificate No 02052

Location N30° 01 48 62
W92 07 56 42
Surface Elevation +12 9 (ft NGVD)

Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			0 2 (P)									Soft gray SILTY CLAY (CL) w/ferrous nodules
			1 5 (P)		25		42	24	18			Medium tan and gray SILTY CLAY (CL) w/ferrous nodules
	5		3 7 (P)									Stiff to very stiff tan and brown SANDY CLAY (CL)
			22 b/f 11 11 11									w/1 inch sand layer at 6 ft
			4 0 (P)									
	10		1 5 (P)	0 66	23	103	31	20	11			Medium tan SILTY CLAY (CL) w/organic matter
			25 b/f 7 13 12									Firm tan SILTY SAND (SM)
	15		6 b/f 3 3 3									Loose tan CLAYEY SAND (SC)
			1 2 (P)		19		21	15	6			Loose gray VERY SANDY CLAY (CL SC)
			23 b/f 11 11 12									Firm tan SILTY SAND (SM) w/clay
	20		25 b/f 12 12 13									
			24 b/f 15 12 12		23					GS1		
	25		27 b/f 18 13 14									
			7 b/f 3 3 4									Medium to stiff gray and tan CLAY (CH)
			1 5 (P)	1 23	30	90	65	27	38			
	30		1 2 (P)									w/sand seams below 30 ft
			1 2 (P)									
	35		26 b/f 12 13 13									Firm gray SAND (SP)
			25 b/f 3 11 14									w/clay layers at 36 to 38 ft
			43 b/f 19 20 23		19					GS2		
	40											Boring completed at 40 ft

Ground Water Level Data

Free water first encountered

Water level after 20 mins

Boring Advancement Method

4 Nom Dia Short Flight Auger
0 to 20 ft
4 Dia Rotary Wash
20 to 40 ft

Boring Abandonment Method

Tremie grouted bottom to top with cement/bentonite grout

Notes

GS Particle Size Analysis
GS1 Sand = 51% Silt = 35% Clay = 14%
GS2 Sand Content = 94%

Strata Boundaries May Not Be Exact

LOG01 031063 GPJ LOG01 GDT 06/17/03

Area 2 B Expansion
Vermilion Parish Landfill
Abbeville LA

LOG OF SOIL BORING B03-5

File 03 1063
Date 05/28/03
Logged by K Moody
Driller D Robinson
Rig Ardco K 1000

STE
Soil Testing Engineers Inc
Sheet 1 of 1

Vermilion Parish Police Jury
Sellers & Associates Engineers

LELAP Certificate No 02052

Location N30° 01 48 63
W92 07 52 98
Surface Elevation +1 4 (ft NGVD)

Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			2 0 (P)									Stiff gray SILTY CLAY (CL)
			2 2 (P)									
	5		2 5 (P)									w/trace of organic matter at 4 to 6 ft
			3 5 (P)	2 04	28	98	50	22	28			Very stiff tan and brown CLAY (CH)
			2 5 (P)									Medium to stiff tan and gray SILTY CLAY (CL)
	10		2 5 (P)									– w/ferrous and calcareous nodules at 10 to 14 ft
			2 0 (P)									
▽	15		3 0 (P)		29	92	26	24	2	Kv		Firm gray and tan SILTY SAND (SM) w/clay layers
			2 5 (P)									
			2 2 (P)									Stiff tan and gray CLAY (CH)
	20		3 2 (P)									
▽			3 0 (P)									
	25		3 0 (P)	1 82	30	94	61	23	38			
			2 5 (P)									
			0 5 (P)									Soft to medium gray CLAY (CH)
	30		0 5 (P)		48	72	85	31	54	CS		w/wood fragments at 30 to 32 ft
			1 2 (P)									Medium dark gray CLAY (CH) w/calcareous nodules at 32 to 34 ft
	35		1 0 (P)									
			1 0 (P)	0 69	32	88	50	20	30			
			1 0 (P)									slickensided at 38 to 40 ft
	40											Boring completed at 40 ft

Ground Water Level Data

▽ Free water first encountered

▽ Water level after 20 mins

Boring Advancement Method

4 Nom Dia Short Flight Auger 0 to 22 ft
4 Dia Rotary Wash 22 to 40 ft

Boring Abandonment Method

Tremie grouted bottom to top with cement/bentonite grout

Notes

Kv Vertical Permeability = 2 0 x 10(5) cm/sec
CS See Consolidation Curve

Strata Boundaries May Not Be Exact

LOG01 031083 GPJ LOG01 GDT 06/17/03

Area 2 B Expansion
Vermilion Parish Landfill
Abbeville LA

LOG OF SOIL BORING B03-6

STE
Soil Testing Engineers Inc
Sheet 1 of 1

File	03 1063
Date	05/27/03
Logged by	K Moody
Driller	D Robinson
Rig	Ardco K 1000

Vermilion Parish Police Jury
Sellers & Associates Engineers

LELAP Certificate No 02052

Location N30° 01 48 64
W92 07 49 53

Surface Elevation +1 5 (ft NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			1 7 (P)									Medium to stiff gray and tan SILTY CLAY (CL) w/ferrous and calcareous nodules
			2 0 (P)									
	5		2 2 (P)		32		80	28	52			Stiff tan and gray CLAY (CH) w/ferrous and calcareous nodules
			2 2 (P)									
			3 0 (P)									
	10		3 2 (P)									Stiff tan and gray SLIGHTLY SILTY CLAY (CL CH) w/ferrous nodules
			3 0 (P)	1 63	25	98	47	24	23			
▼	15		1 5 (P)									Medium to stiff tan SANDY CLAY (CL)
			2 7 (P)									
			16 b/f 4 6 10		31		53	22	31	GS		Stiff tan CLAY (CH) w/sand seams
	20		13 b/f 5 6 7									
			1 7 (P)									Medium tan and gray SANDY CLAY (CL)
	25		3 2 (P)									Stiff bluish gray CLAY (CH)
			2 7 (P)									
			3 0 (P)									
	30		1 2 (P)	0 21	36	84	49	24	25			Soft bluish gray SLIGHTLY SILTY CLAY (CL CH)
			1 2 (P)									
	35		1 0 (P)									Soft to medium bluish gray SILTY CLAY (CL) w/1 inch sand layers at 34 to 38 ft
			1 0 (P)									
			1 2 (P)									
	40											Boring completed at 40 ft

Ground Water Level Data

▽ Free water first encountered

▼ Water level after 20 mins

Boring Advancement Method

4 Nom Dia Short Flight Auger
0 to 20 ft
4 Dia Rotary Wash
20 to 40 ft

Boring Abandonment Method

Tremie grouted bottom to top with cement/bentonite grout

Notes

GS Particle Size Analysis
Sand Content = 3%

Strata Boundaries May Not Be Exact

LOG01 031063 GPJ LOG01 GDT 06/17/03

Area 2 B Expansion
Vermilion Parish Landfill
Abbeville LA

LOG OF SOIL BORING B03-7

STE
Soil Testing Engineers Inc
Sheet 1 of 1

File	03 1063
Date	05/19/03
Logged by	K Moody
Driller	D Robinson
Rig	Ardco K 1000

Vermilion Parish Police Jury
Sellers & Associates Engineers

LELAP Certificate No 02052

Location N30° 01 44 17
W92 07 56 38

Surface Elevation +16 5 (ft NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
☒			4 5 (P)									Very stiff to hard tan and gray SILTY CLAY (CL) FILL
			4 5 (P)									
	5		4 2 (P)									Very stiff tan and gray SILTY CLAY (CL) w/ferrous nodules w/trace of organic matter at 4 to 6 ft
			3 2 (P)									
			2 5 (P)	2 81	18	112	39	15	24			
	10		4 5 (P)									
			3 7 (P)									w/trace of organic matter at 12 to 14 ft
	15		2 2 (P)	1 34	22	104	39	18	21			Stiff dark brown SILTY CLAY (CL) w/ferrous nodules
			24 b/f 10 12 12									Firm tan SLIGHTLY SILTY SAND (SM SP)
			24 b/f 7 12 12									
	20		19 b/f 11 10 9							GS		
			24 b/f 12 12 12									
	25		26 b/f 13 13 13									
			36 b/f 13 18 18									dense at 26 to 28 ft
			20 b/f 11 10 10									w/2 inch to 4 inch layers of gray clay at 28 to 30 ft
	30		2 7 (P)		17		20	16	4			Firm dark brown CLAYEY SAND (SC)
			20 b/f 11 12 8									
	35		17 b/f 9 9 8									Firm to dense tan brown and gray SILTY SAND (SM)
			35 b/f 17 19 16									
			27 b/f 11 13 14									SAND (SP) at 38 to 40 ft
	40											Boring completed at 40 ft

Ground Water Level Data

☒ No free water encountered to 22 ft during drilling

Boring Advancement Method

4 Nom Dia Short Flight Auger 0 to 22 ft
4 Dia Rotary Wash 22 to 40 ft

Boring Abandonment Method

Tremie grouted bottom to top with cement/bentonite grout

Notes

GS Particle Size Analysis
Sand = 85% Silt = 11% Clay = 4%

Strata Boundaries May Not Be Exact

LOG01 031063 GPJ LOG01 GDT 06/17/03

Area 2 B Expansion
Vermilion Parish Landfill
Abbeville LA

LOG OF SOIL BORING B03-8

STE
Soil Testing Engineers Inc
Sheet 1 of 1

File	03 1063
Date	05/27/03
Logged by	K Moody
Driller	D Robinson
Rig	Ardco K 1000

Vermilion Parish Police Jury
Sellers & Associates Engineers

LELAP Certificate No 02052

Location N30° 01 44 18
W92 07 51 26

Surface Elevation +5 5 (ft NGVD)

Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			3 5 (P)									Stiff tan and gray SILTY CLAY (CL) w/ferrous nodules
			2 2 (P)	1 39	24	102	35	18	17			
	5		13 b/f 5 5 8									Firm gray SILTY SAND (SM)
			16 b/f 8 8 8									
			17 b/f 6 8 9							GS1		
	10		13 b/f 7 7 6									
			0 2 (P)									w/trace of clay at 12 to 14 ft
	15		29 b/f 10 12 17									
			27 b/f 15 15 12									
			28 b/f 8 11 17									
	20		16 b/f 8 7 9									w/2 inch sandy clay layer at 19 ft
			36 b/f 12 18 18							GS2		
	25		26 b/f 13 13 13									
			23 b/f 8 10 13									
			25 b/f 10 12 13									
	30		25 b/f 10 12 13									
			33 b/f 10 16 17									dense at 32 to 34 ft
	35		23 b/f 10 11 12									
			41 b/f 12 18 23									Dense gray SAND (SP)
			46 b/f 14 23 23									w/1 inch sandy clay layer at 39 ft
	40											Boring completed at 40 ft

Ground Water Level Data

No free water encountered to 18 ft during drilling

Boring Advancement Method

4 Nom Dia Short Flight Auger
0 to 18 ft
4 Dia Rotary Wash
18 to 40 ft

Boring Abandonment Method

Tremie grouted bottom to top with cement/bentonite grout

Notes

GS Particle Size Analysis
GS1 Sand Content = 73%
GS2 Sand Content = 84%

Strata Boundaries May Not Be Exact

LOG01 031063 GPJ LOG01 GDT 06/17/03

Area 2 B Expansion
Vermilion Parish Landfill
Abbeville LA

LOG OF SOIL BORING B03-9

STE
Soil Testing Engineers Inc
Sheet 1 of 3

File 03 1063
Date 05/29/03
Logged by K Moody
Driller D Robinson
Rig Ardco K 1000

Vermilion Parish Police Jury
Sellers & Associates Engineers

LELAP Certificate No 02052

Location N30° 01 44 64
W92 07 47 28
Surface Elevation +4 5 (ft NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Comp essive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
☒			2 5 (P)									Stiff tan and gray SILTY CLAY (CL) w/ferrous nodules
			2 2 (P)									
	5		2 0 (P)	3 30	26	100	63	20	43			Very stiff gray and tan CLAY (CH) w/ferrous nodules
			3 7 (P)									
			3 0 (P)									Stiff brown red and tan SILTY CLAY (CL)
	10		2 5 (P)		28		44	26	18			
			1 5 (P)									Medium gray SILTY CLAY (CL) w/ferrous nodules
	15		0 7 (P)									
			0 5 (P)	0 72	26	99	42	23	19			
			8 b/f 3 4 4									
	20		3 0 (P)									-- w/2 inch sand layer at 19 ft
			1 0 (P)									Loose tan SLIGHTLY CLAYEY SAND (SM SC)
	25		4 b/f 2 2 2		27		23	20	3			
			1 7 (P)									
			0 5 (P)		22	104	22	20	2	Kv		
	30		18 b/f 3 7 11									Firm gray SLIGHTLY SILTY SAND (SM SP)
			21 b/f 10 10 11		21					GS1		w/1 inch clay layers at 32 to 34 ft
	35		28 b/f 14 13 15									
			47 b/f 17 21 26									Dense gray SAND (SP SM)
			37 b/f 11 17 20									w/2 inch clay layer at 37 ft
	40											

Continued Next Page

Ground Wate Level Dat

☒ No free water encountered to 26 ft during drilling

Bor ng Advancement Method

4 Nom Dia Short Flight Auger
0 to 26 ft
4 Dia Rotary Wash
26 to 100 ft

Boring Abandonment Method

Tremie grouted bottom to top with cement/bentonite grout

Notes

Kv Vertical Permeability = 4 5 x 10(5) cm/sec
GS Particle Size Analysis
GS1 Sand = 82% Silt = 14% Clay = 4%

Strata Boundaries May Not Be Exact

Area 2 B Expansion
Vermilion Parish Landfill
Abbeville LA

LOG OF SOIL BORING B03-9

STE
Soil Testing Engineers Inc

Vermilion Parish Police Jury
Sellers & Associates Engineers

Sheet 2 of 3

LELAP Certificate No 02052

File	03 1063
Date	05/29/03
Logged by	K Moody
Driller	D Robinson
Rig	Ardco K 1000

Location N30° 01 44 64
W92 07 47 28

Surface Elevation +4 5 (ft NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
												Very dense gray SLIGHTLY SILTY SAND (SM SP)
	45	X	56 b/f 22 22 34									
	50	X	63 b/f 17 31 32		20					GS2		
	55	X	56 b/f 21 25 31									
	60	X	70 b/f 22 39 31									
	65	X	36 b/f 10 11 25									dense at 63 to 65 ft
	70	X	64 b/f 23 32 32		20					GS3		
	75	X	37 b/f 10 15 22									w/clay layers at 73 to 75 ft
	80	X	71 b/f 30 40 31									

Continued Next Page

Ground Water Level Data

☒ No free water encountered to 26 ft during drilling

Boring Advancement Method

4 Nom Dia Short Flight Auger
0 to 26 ft
4 Dia Rotary Wash
26 to 100 ft

Boring Abandonment Method

Tremie grouted bottom to top with cement/bentonite grout

Notes

GS Particle Size Analysis
GS2 Sand Content = 83%
GS3 Sand Content = 87%

Strata Boundaries May Not Be Exact

Area 2 B Expansion
Vermilion Parish Landfill
Abbeville LA

LOG OF SOIL BORING B03 9

STE
Soil Testing Engi eers Inc

Vermilion Parish Police Jury
Sellers & Associates Engineers

Sheet 3 of 3

LELAP Certificate No 02052

File	03 1063
Date	05/29/03
Logged by	K Moody
Driller	D Robinson
Rig	Ardco K 1000

Location N30° 01 44 64
W92 07 47 28

Surface Elevation +4 5 (ft NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
												Very dense gray SAND (SP)
	85		61 b/f 26 30 31									
	90		83 b/f 24 42 41		19					GS4		
	95		76 b/f 21 40 36									
	100		57 b/f 18 25 32									
												Boring completed at 100 ft
	105											
	110											
	115											
	120											

Ground Water Level Data

No free water encountered to 26 ft during drilling

Boring Adv ncement Method

4 Nom Dia Short Flight Auger
0 to 26 ft
4 Dia Rotary Wash
26 to 100 ft

Bo ing Abandonment Method

Tremie grouted bottom to top with cement/bentonite grout

Notes

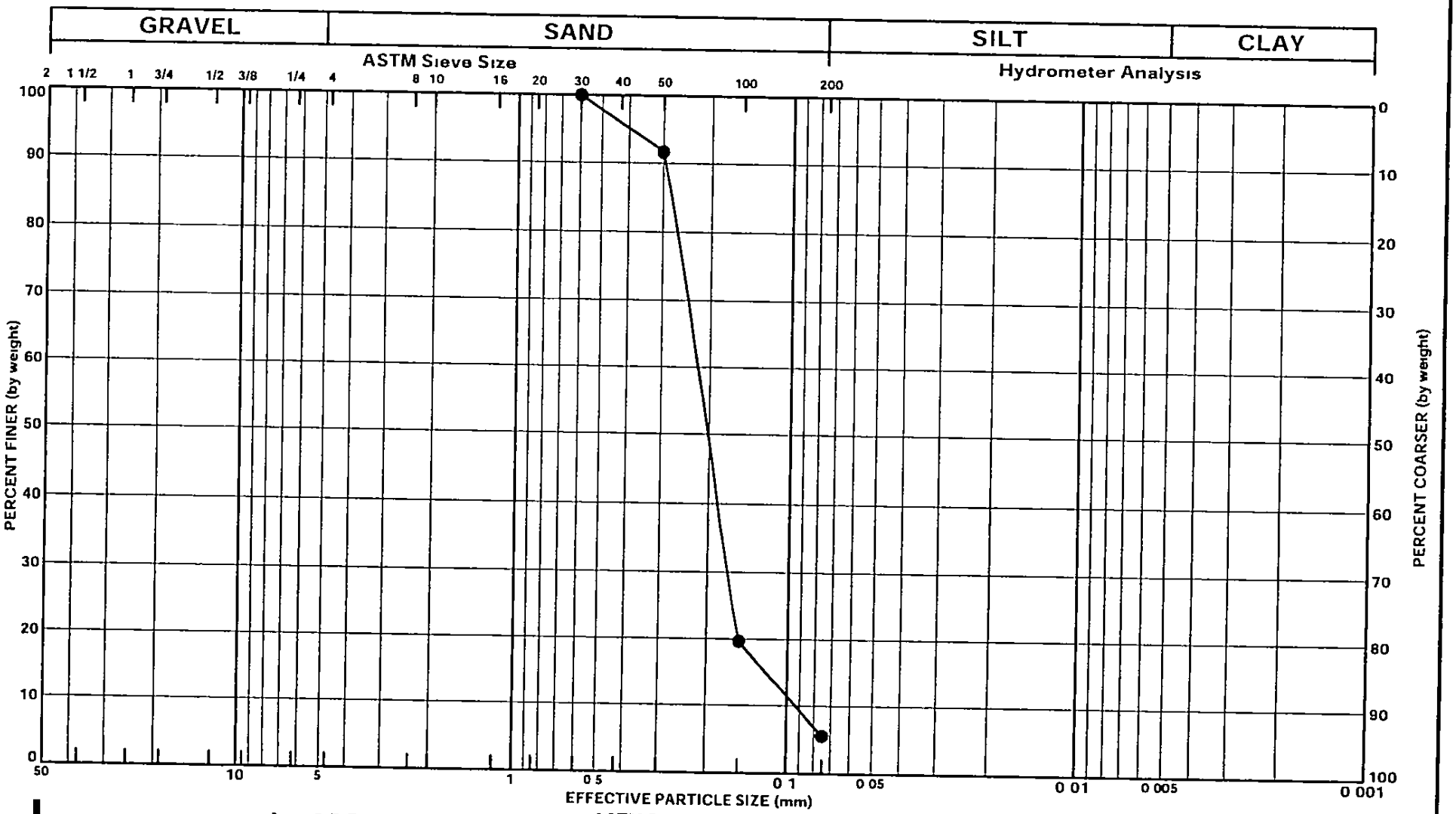
GS Particle Size Analysis
GS4 Sand Content = 95%

Strata Boundaries May Not Be Exact

LOG01 031083 GPJ LOG01 GDT 06/17/03

Boring No	Depth (ft)	Gravel (%)	Sand (%)
● B03 4	38 5 40 0	0 0	94 4

LELAP Certificate No 02052



STE

Area 2 B Expansion
Vermilion Parish
Landfill

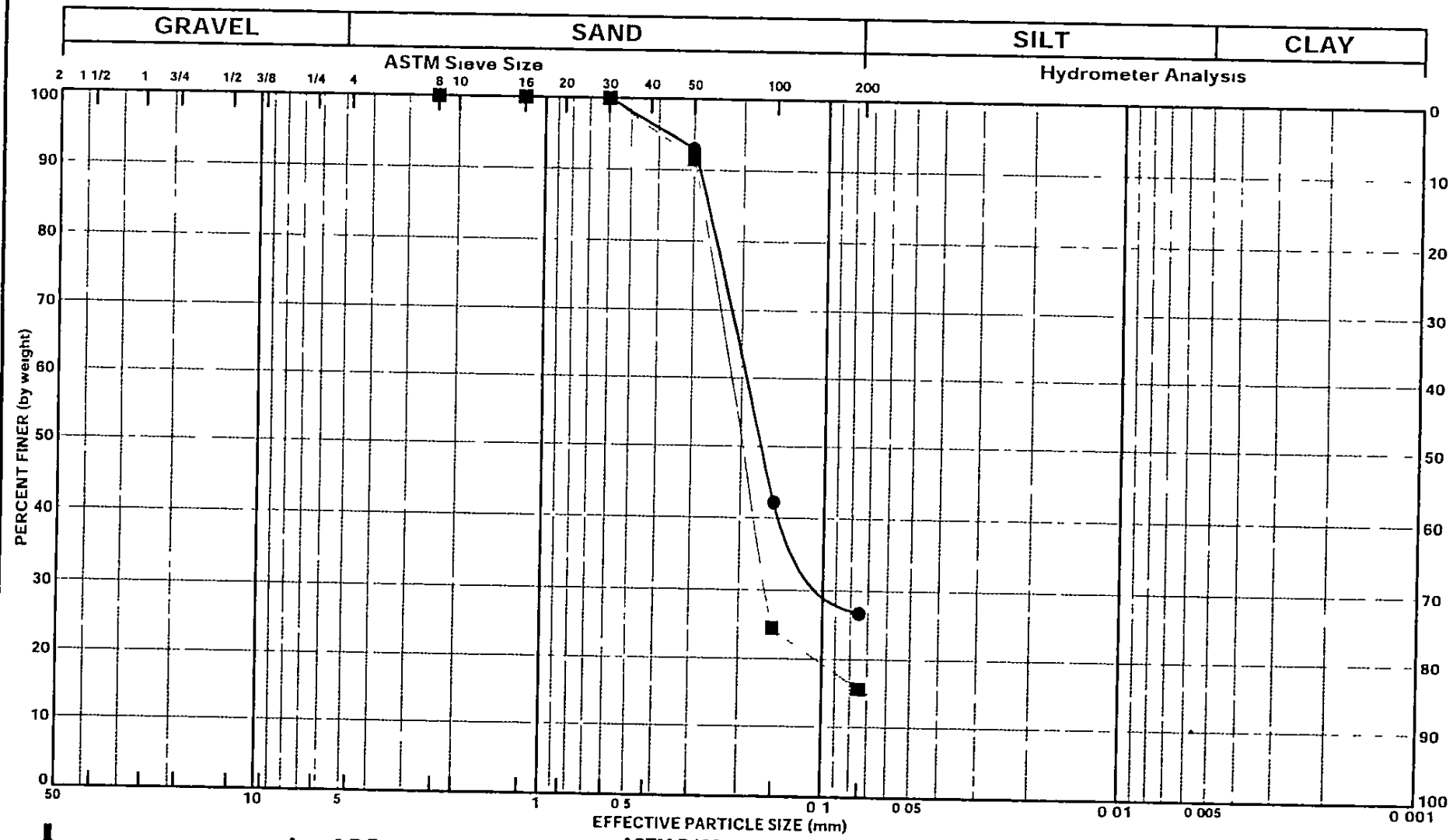
GRAIN SIZE ANALYSIS

File No 03 1063
Date 06/03/2003

GRAINSZ 031063 GPJ GRAINSZ GDT 06/09/03

Boring No	Depth (ft)	Gravel (%)	Sand (%)
● B03 8	8 0 9 5	0 0	73 3
■ B03 8	22 0 23 5	0 0	84 3

LELAP Certificate No 02052



STE

Area 2 B Expansion
Vermilion Parish
Landfill

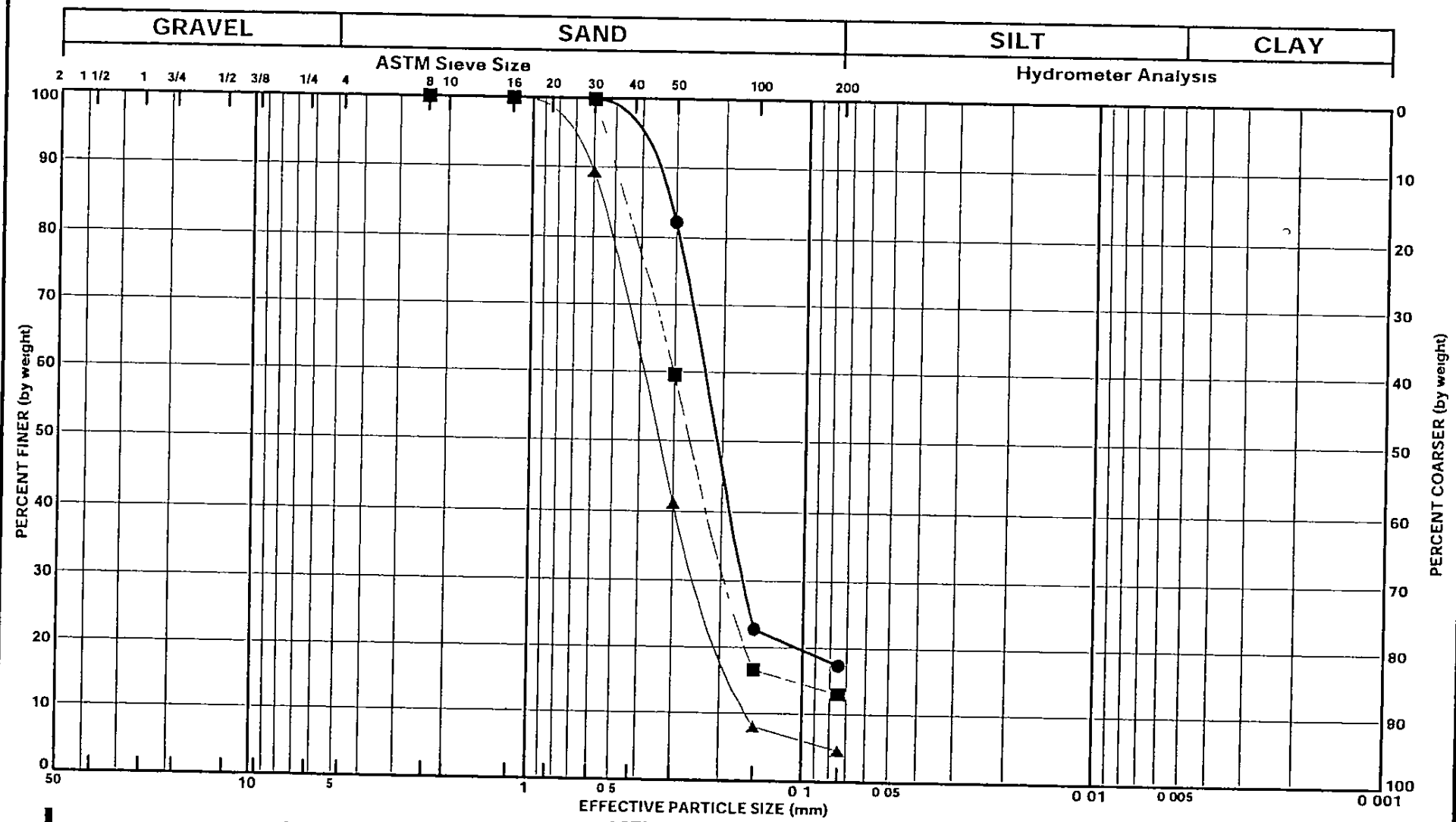
GRAIN SIZE ANALYSIS

File No 03 1063
Date 06/03/2003

GRAINSZ 031063.GPJ GRAINSZ.GDT 06/06/03

Boring No	Depth (ft)	Gravel (%)	Sand (%)
● B03 9	48 5 50 0	0 0	82 6
■ B03 9	68 5 70 0	0 0	87 0
▲ B03 9	88 5 90 0	0 0	95 4

LELAP Certificate No 02052



STE

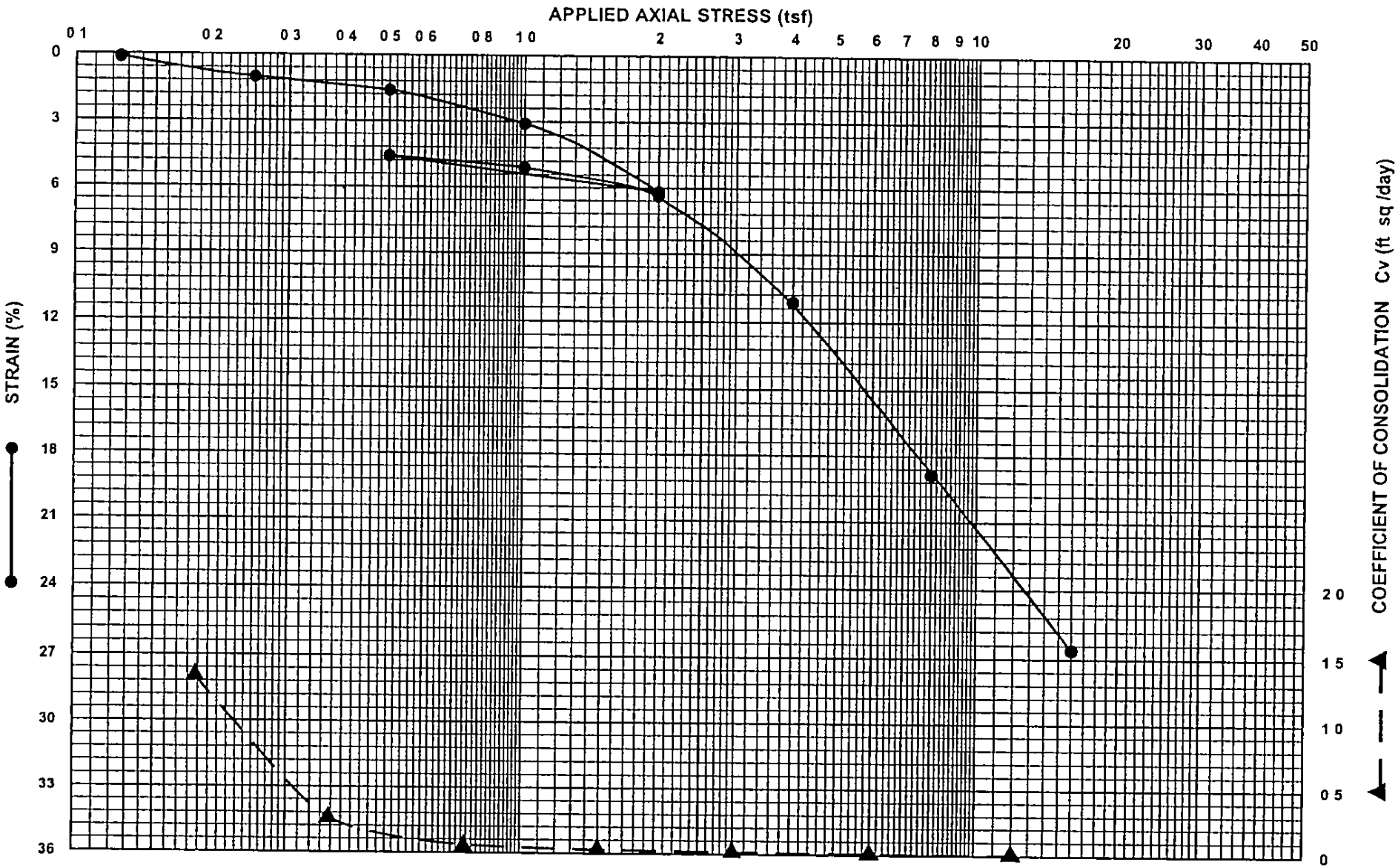
Area 2 B Expansion
Vermilion Parish
Landfill

GRAIN SIZE ANALYSIS

File No 03 1063
Date 06/03/2003

GRAINSZ 031063 GPJ GRAINSZ GDT 06/06/03

P\2003\(3\CADD\CS B03-5 30-32 DWG Jun 17 20(J 22am



CONSOLIDATION TEST

SAMPLE IDENTIFICATION

BORING NO B03 5
DEPTH (feet) 30 32
MATERIAL Gray CLAY (CH)

FILE NO 03 1063

STE
Soil Testing Engineers Inc

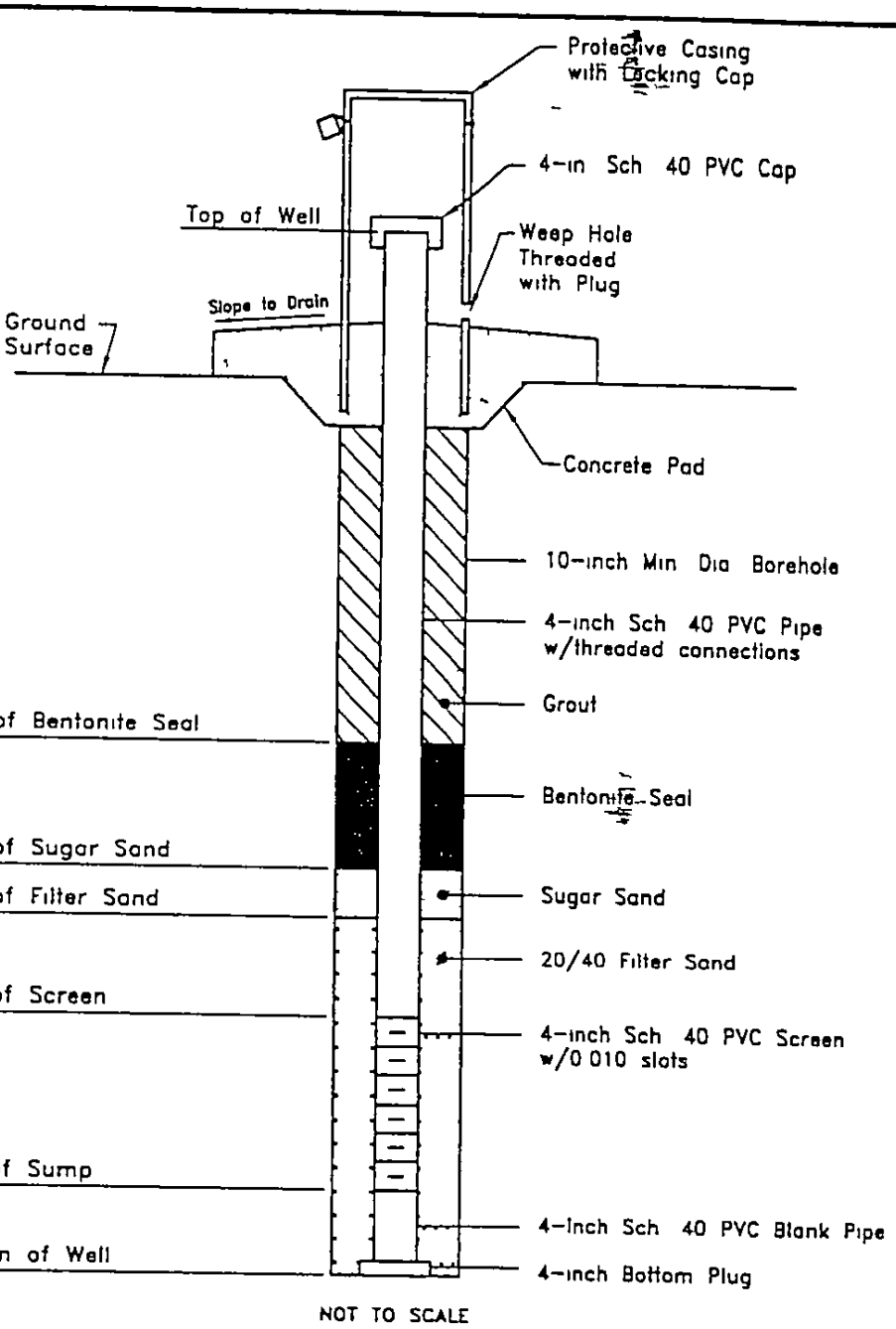
CLASSIFICATION DATA

INITIAL MOISTURE CONTENT (%) = 47 6 LL = 85
INITIAL DRY DENSITY (lbs /cu ft) = 71 6 PL = 31
FINAL MOISTURE CONTENT (%) = 32 3 PI = 54

FIGURE NO

Monitoring Wells Installation (MW-6 to MW-11) - 1998

ELEV (ft , MSL)	DEPTH (feet)	
+14 24	2 5	Top of Well
+12 11	0	Ground Surface
-9 89	22	Top of Bentonite Seal
-10 76	25	Top of Sugar Sand
-11 76	26	Top of Filter Sand
-13 76	28	Top of Screen
-23 76	38	Top of Sump
-25 76	40	Bottom of Well



MONITOR WELL NO MW-6

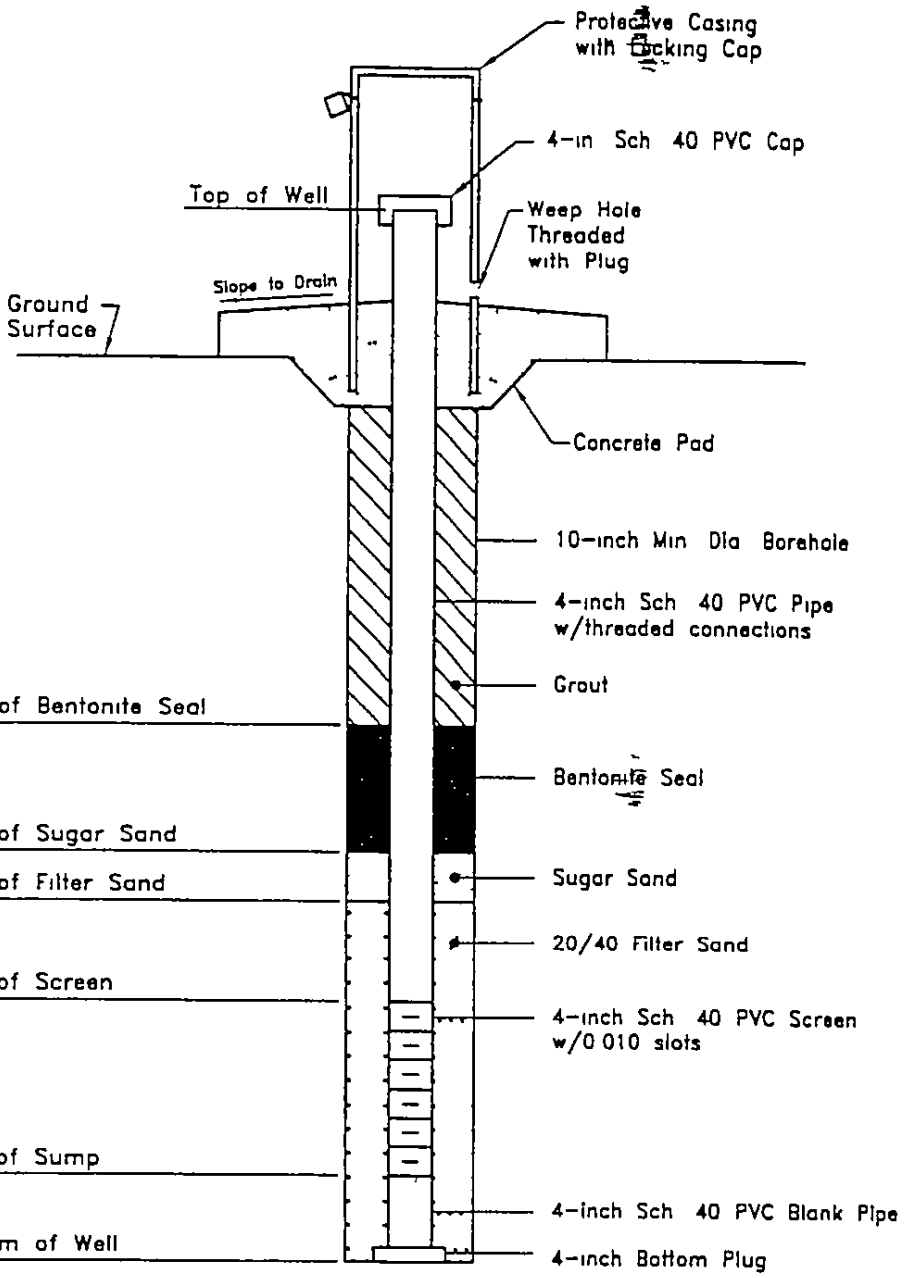
Date Installed 8/18/98

C\98-1139\MW-6 DWG\10-02-98 PLT

STE
Soil Testing Engineers Inc

PROJECT VERMILION PARISH SOLID WASTE PLANT
LOCATION VERMILION PARISH, LA
JOB NO 98-1139

ELEV (ft , MSL)	DEPTH (feet)	
+19 98	2 5	Top of Well
+17 69	0	Ground Surface
−2 31	20	Top of Bentonite Seal
−5 31	23	Top of Sugar Sand
−6 31	24	Top of Filter Sand
−8 31	26	Top of Screen
−18 31	36	Top of Sump
−18 81	36 5	Bottom of Well



NOT TO SCALE

MONITOR WELL NO. MW-7

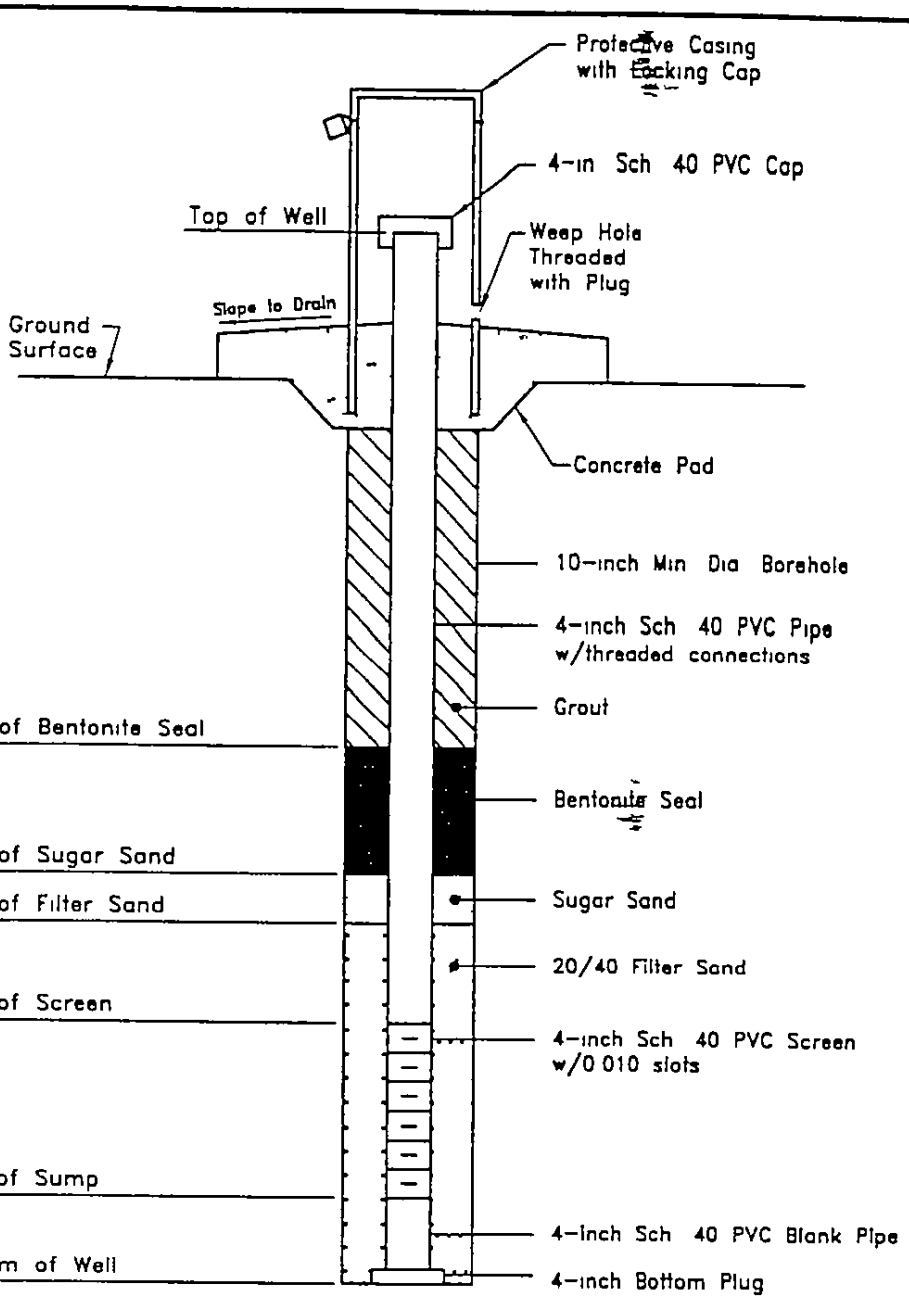
Date Installed 8/10/98

STE
Soil Testing Engineers Inc

PROJECT	VERMILION PARISH SOLID WASTE PLANT
LOCATION	VERMILION PARISH LA
JOB NO	98-1139

C\98-1139\MW-7 DWG\10-02-98 PLT

ELEV (ft , MSL)	DEPTH (feet)	
+21 48	2 5	Top of Well
+19 35	0	Ground Surface
−9 65	29	Top of Bentonite Seal
−12 65	32	Top of Sugar Sand
−13 65	33	Top of Filter Sand
−15 65	35	Top of Screen
−25 65	45	Top of Sump
−28 15	47 5	Bottom of Well



NOT TO SCALE

MONITOR WELL NO. MW-8

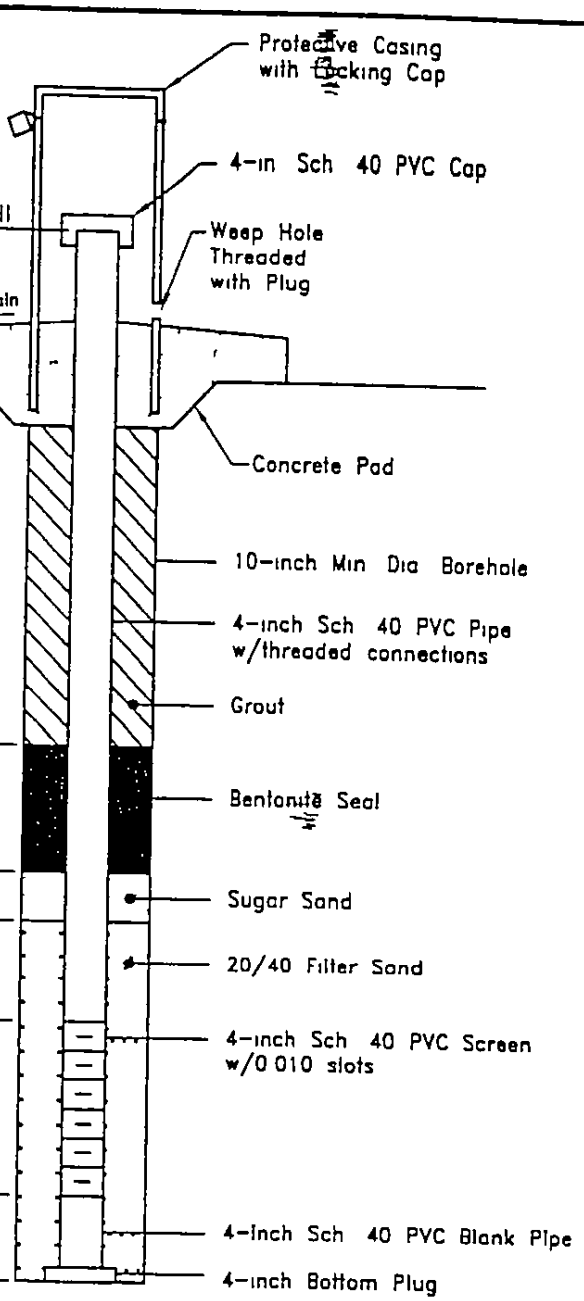
Date Installed 8/11/98

C\98-1139\MW-8 DWG\10-02-98 PLT

STE
Soil Testing Engineers Inc

PROJECT	VERMILION PARISH SOLID WASTE PLANT
LOCATION	VERMILION PARISH, LA
JOB NO	98-1139

ELEV (ft, MSL)	DEPTH (feet)	
+12 89	2 5	Top of Well
+10 74	0	Ground Surface
-8 26	19	Top of Bentonite Seal
-11 26	22	Top of Sugar Sand
-12 26	23	Top of Filter Sand
-14 26	25	Top of Screen
-24 26	35	Top of Sump
-26 76	37 5	Bottom of Well



NOT TO SCALE

MONITOR WELL NO. MW-9

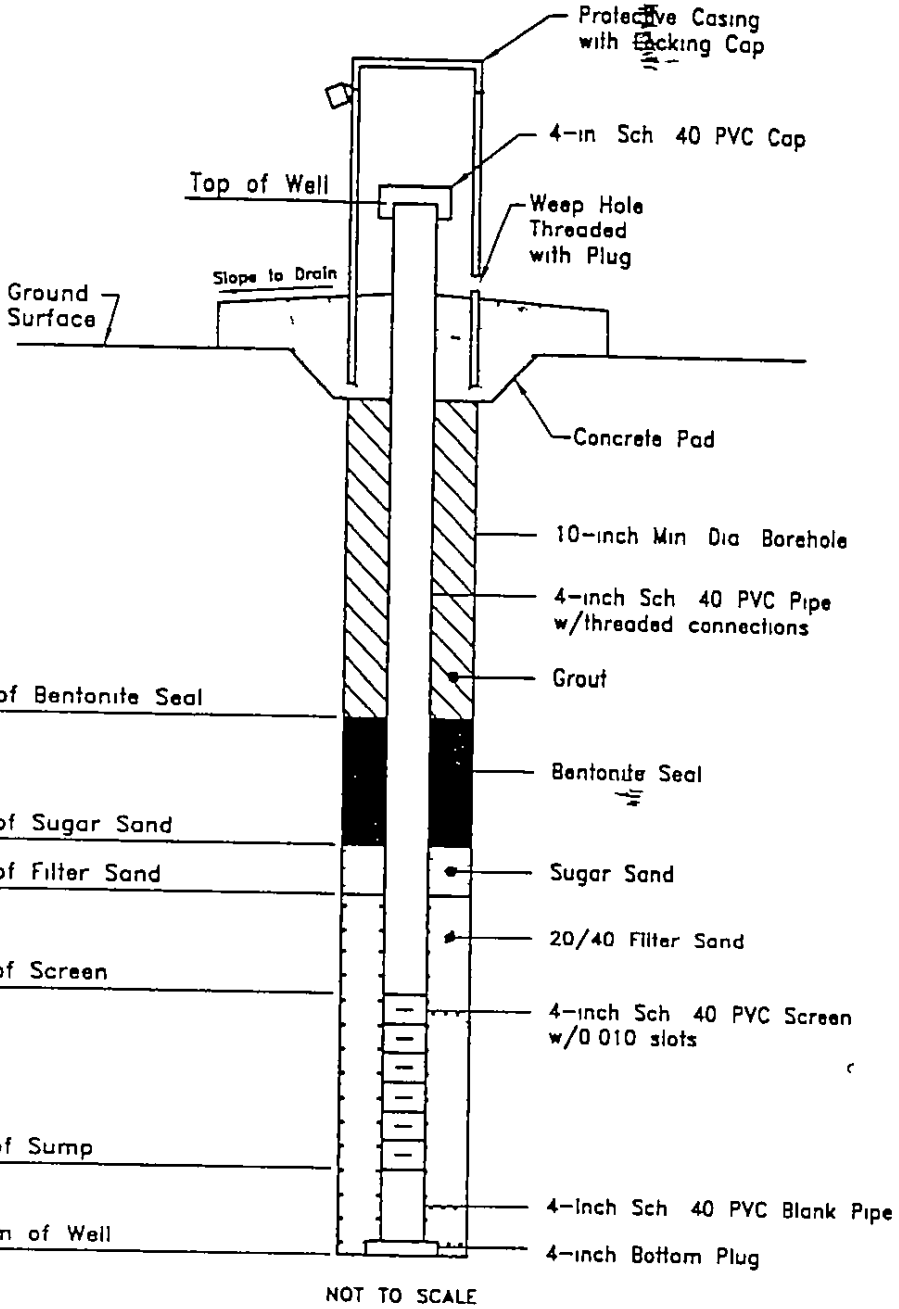
Date Installed 8/19/98

STE
Soil Testing Engineers Inc

PROJECT VERMILION PARISH SOLID WASTE PLANT
LOCATION VERMILION PARISH LA
JOB NO 98-1139

C\98-1139\MW-9 DWG\10-02-98 PLT

ELEV (ft , MSL)	DEPTH (feet)	
+12 72	2 5	Top of Well
+10 62	0	Ground Surface
-11 38	22	Top of Bentonite Seal
-14 38	25	Top of Sugar Sand
-15 38	26	Top of Filter Sand
-17 38	28	Top of Screen
-27 38	38	Top of Sump
-29 38	40	Bottom of Well



MONITOR WELL NO. MW-10

Date Installed 8/20/98

C\98-1139\W 10 DWG\10-02-98 PLT

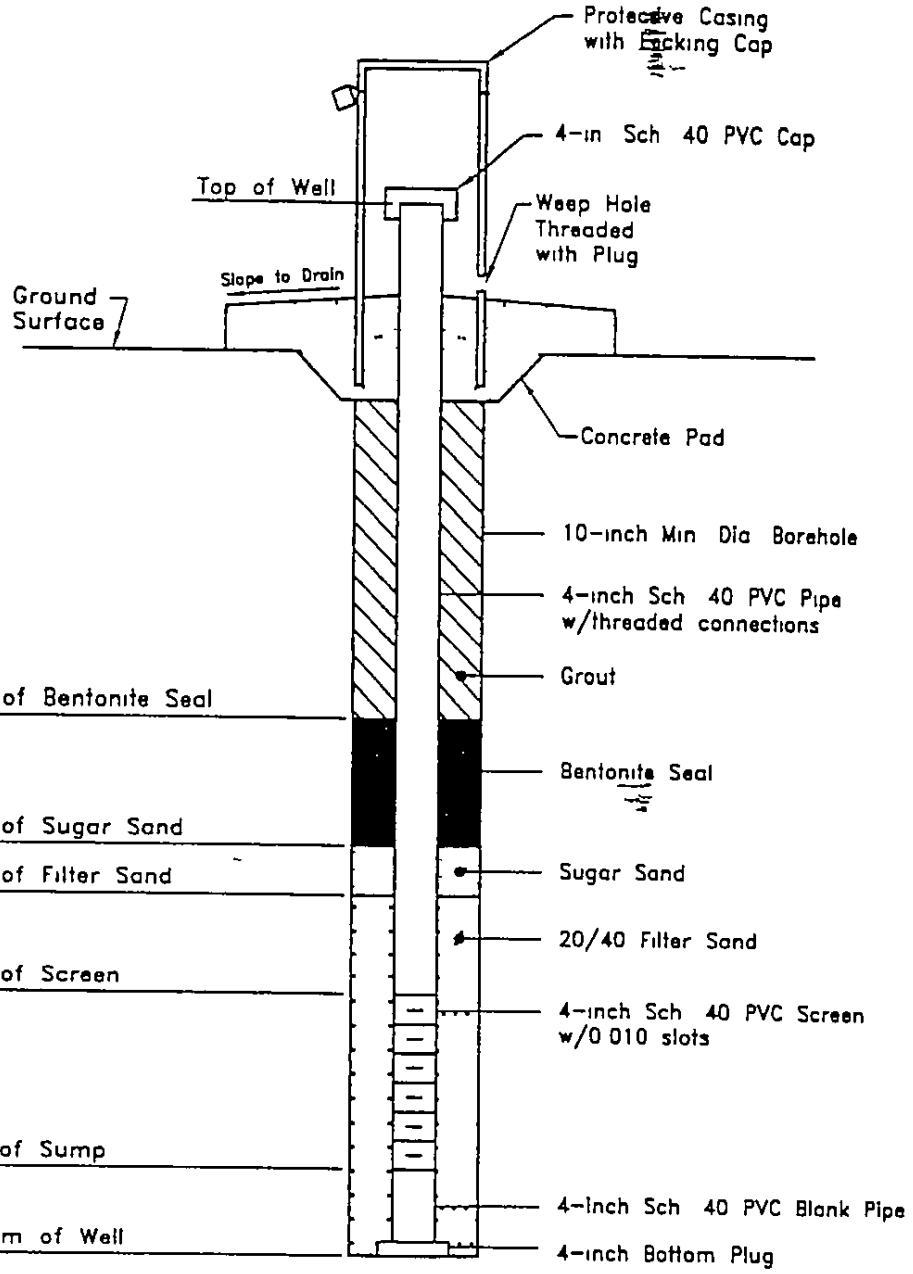
STE
Soil Testing Engineers Inc

PROJECT VERMILION PARISH SOLID WASTE PLANT

LOCATION VERMILION PARISH, LA

JOB NO 98-1139

ELEV (ft , MSL)	DEPTH (feet)	
+18 16	2 5	Top of Well
+16 22	0	Ground Surface
-5 28	21 5	Top of Bentonite Seal
-8 28	24 5	Top of Sugar Sand
-9 28	25 5	Top of Filter Sand
-11 78	28	Top of Screen
-21 78	38	Top of Sump
-23 78	40	Bottom of Well



NOT TO SCALE

MONITOR WELL NO. MW-11

Date Installed 8/26/98

STE
Soil Testing Engineers Inc

PROJECT VERMILION PARISH SOLID WASTE PLANT
LOCATION VERMILION PARISH LA
JOB NO 98-1139

C\98-1139\MW-11 DWG\10-02-98 PLT

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION REPORT FORM (DOTD GW 1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1 USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER

2 WELL OWNER Vermillion Parish Police Jury PHONE (318) 898-4300

3 WELL OWNER S ADDRESS P O Box 430 Abbeville La 70511 0430

4 OWNER S WELL NUMBER OR NAME (if any) MW 6

5 DATE COMPLETED 9/9/98 DEPTH OF HOLE 40 FT DEPTH OF WELL 40 FT

6 STATIC WATER LEVEL 29 FT BELOW GROUND SURFACE MEASURED ON 8/18/98

7 CASING 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 30 FT

8 SCREEN 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE 010 LENGTH 10 FT

9 CEMENTED FROM 22 FT BELOW GROUND SURFACE USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10 LOCATION OF WELL PARISH Vermillion WELL IS NEAR Abbeville La (Town or city)

APPROXIMATELY 0 5 MILES FROM Hwy 67 west on Hwy 696 (Crossroads railroad any landmark, etc)

(Please draw sketch on back of Original)

11 REMARKS Note 2 ft sump below the screen

12 DRILLER S LOG (Description and color of cuttings such as shale sand etc In feet)

FROM	TO		FROM	TO	
0	1	Dark Brown silty clay			
1	14	Tan & Gray silty clay			
14	40	Tan sand			

13 FOR HEAT PUMP ONLY AVG DEPTH FT NUMBER OF HOLES

14 ABANDONMENT INFORMATION DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15 NAME OF PERSON WHO DRILLED THE WELL Dempsey Thibadoux

CONTRACTORS / OWNERS COPY

Soil Testing Engineers, Inc
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 10-5-98 Date

MAIL ORIGINAL TO
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN CHIEF WATER RESOURCES SECTION
P O BOX 94245
BATON ROUGE LA 70804 9245
(504) 379 1434

FOR OFFICE USE ONLY

PARISH 113 WELL NO 9904E

IDENTIFICATION NUMBER 0

REVISED COORDINATES

Geologic Unit

Use of well M

SECTION TOWNSHIP RANGE

ELEV QUAD NO

INPUT BY DATE 10/9/98

INSPECTED BY DATE

REMARKS

FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 300127 LONGITUDE 920811

SECTION 002 TOWNSHIP 12S RANGE 03E

ELEV 0012 QUAD NO 182C Leroy LA

SITE ADDRESS Birch Rd
Abbeville La 70510

WATER RESC ES SECTION
WATER WELL REGISTRATIO ORT FORM (DOTD GW 1S)

PLEASE PRINT IN JR TYPE WHEN COMPLETING THIS FORM

1 USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER

2 WELL OWNER Vermillion Parish Police Jury PHONE (318) 898-4300

3 WELL OWNER S ADDRESS P O Box 430 Abbeville La 70511 0430

4 OWNER S WELL NUMBER OR NAME (if any) MW 7

5 DATE COMPLETED 9/9/98 DEPTH OF HOLE 37 FT DEPTH OF WELL 37 FT

6 STATIC WATER LEVEL 27 FT BELOW GROUND SURFACE MEASURED ON 8/10/98

7 CASING 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 27 FT

8 SCREEN 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE 010 LENGTH 10 FT

9 CEMENTED FROM 20 FT BELOW GROUND SURFACE USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10 LOCATION OF WELL PARISH Vermillion WELL IS NEAR Abbeville La (Town or city)

APPROXIMATELY 0 5 MILES FROM Hwy 67 west on Hwy 696 (Crossroads railroad any landmark etc)

(Please draw sketch on back of Original)

11 REMARKS Note 1/2 ft sump below the screen Actual depth of well is 36 5 ft

12 DRILLER S LOG (Description and color of cuttings such as shale sand etc in feet)

FROM	TO		FROM	TO	
0	6	Dark Gray & Tan silty clay			
6	13	Gray clay			
13	36 5	Tan silty sand			

13 FOR HEAT PUMP ONLY AVG DEPTH FT NUMBER OF HOLES

14 ABANDONMENT INFORMATION DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15 NAME OF PERSON WHO DRILLED THE WELL Dempsey Thibadoux

CONTRACTORS / OWNERS COPY

Soil Testing Engineers, Inc
Name of Water Well Contractor

LICENSE NUMBER WWC 212

Authorized Signature 10-5-98 Date

MAIL ORIGINAL TO
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN CHIEF WATER RESOURCES SECTION
P O BOX 94245
BATON ROUGE LA 70804 9245
(504) 379 1434

FOR OFFICE USE ONLY

PARISH 113 WELL NO 9905 2

IDENTIFICATION NUMBER 0

REVISED COORDINATES

Geologic Unit

Use of well m

SECTION TOWNSHIP RANGE

ELEV QUAD NO

INPUT BY BMB DATE 10/9/98

INSPECTED BY DATE

REMARKS

FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 300125 LONGITUDE 920805

SECTION 002 TOWNSHIP 12S RANGE 03E

ELEV 0018 QUAD NO 182C Leroy LA

SITE ADDRESS Birch Rd
Abbeville La 70510

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION REPORT FORM (DOTD GW 1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1 USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER

2 WELL OWNER Vermillion Parish Police Jury PHONE (318) 898-4300

3 WELL OWNER S ADDRESS P O Box 430 Abbeville La 70511 0430

4 OWNER S WELL NUMBER OR NAME (If any) MW 8

5 DATE COMPLETED 9/9/98 DEPTH OF HOLE 48 FT DEPTH OF WELL 48 FT

6 STATIC WATER LEVEL 27 FT BELOW GROUND SURFACE MEASURED ON 8/11/98

7 CASING 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 38 FT

8 SCREEN 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE 010 LENGTH 10 FT

9 CEMENTED FROM 29 FT BELOW GROUND SURFACE USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10 LOCATION OF WELL PARISH Vermillion WELL IS NEAR Abbeville La (Town or city)

APPROXIMATELY 0 5 MILES FROM Hwy 67 west on Hwy 696 (Crossroads railroad any landmark etc)

(Please draw sketch on back of Original)

11 REMARKS Note 2 1/2 ft sump below the screen Actual depth of well is 47 5 ft

12 DRILLER S LOG (Description and color of cuttings such as shale sand etc in feet)

FROM	TO		FROM	TO	
0	17	Gray clay			
17	20	Clayey sand			
20	48	Tan sandy silt			

13 FOR HEAT PUMP ONLY AVG DEPTH FT NUMBER OF HOLES

14 ABANDONMENT INFORMATION DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15 NAME OF PERSON WHO DRILLED THE WELL Dempsey Thibadoux

Soil Testing Engineers Inc
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 10-5-98 Date

MAIL ORIGINAL TO
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN CHIEF WATER RESOURCES SECTION
P O BOX 94245
BATON ROUGE LA 70804 9245
(504) 379 1434

FOR OFFICE USE ONLY

PARISH 113 WELL NO 99062

IDENTIFICATION NUMBER 0

REVISED COORDINATES

Geologic Unit

Use of well M

SECTION TOWNSHIP RANGE

ELEV QUAD NO

INPUT BY BMB DATE 10/9/98

INSPECTED BY DATE

REMARKS

FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 300125 LONGITUDE 920804

SECTION 002 TOWNSHIP 12S RANGE 03E

ELEV 0019 QUAD NO 182C Leroy LA

SITE ADDRESS Birch Rd
Abbeville La 70510

CONTRACTORS / OWNERS COPY

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION REPORT FORM (DOTD GW 1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1 USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER

2 WELL OWNER Vermillion Parish Police Jury PHONE (318) 898-4300

3 WELL OWNER S ADDRESS P O Box 430 Abbeville La 70511 0430

4 OWNER S WELL NUMBER OR NAME (if any) MW 9

5 DATE COMPLETED 9/9/98 DEPTH OF HOLE 41 FT DEPTH OF WELL 38 FT

6 STATIC WATER LEVEL 19 FT BELOW GROUND SURFACE MEASURED ON 8/19/98

7 CASING 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 28 FT

8 SCREEN 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE 010 LENGTH 10 FT

9 CEMENTED FROM 19 FT BELOW GROUND SURFACE USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10 LOCATION OF WELL PARISH Vermillion WELL IS NEAR Abbeville La (Town or city)

APPROXIMATELY 0 5 MILES FROM Hwy 67 west on Hwy 696 (Crossroads railroad any landmark, etc)

(Please draw sketch on back if Origin)

11 REMARKS Note 2 1/2 ft sump below the screen Actual depth of well is 37 5 ft

12 DRILLER S LOG (Description and color of cuttings such as shale sand etc in feet)

FROM	TO		FROM	TO	
0	8	Dark gray clay			
8	24	Gray silty clay			
24	34	Clayey sand			
34	41	Gray silty clay			

13 FOR HEAT PUMP ONLY AVG DEPTH _____ FT NUMBER OF HOLES _____

14 ABANDONMENT INFORMATION DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15 NAME OF PERSON WHO DRILLED THE WELL Dempsey Thibadoux

Soil Testing Engineers, Inc
Name of Water Well Contractor

LICENSE NUMBER WWC 212

Authorized Signature 10-5-98 Date

MAIL ORIGINAL TO
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN CHIEF WATER RESOURCES SECTION
P O BOX 94245
BATON ROUGE LA 70804 9245
(504) 379 1434

FOR OFFICE USE ONLY

PARISH 113 WELL NO 990777

IDENTIFICATION NUMBER

REVISED COORDINATES

G log Unit

Use of well M

SECTION TOWNSHIP RANGE

ELEV QUAD NO

INPUT BY BMB DATE 10/9/98

INSPECTED BY DATE

REMARKS

FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 300133 LONGITUDE 920805

SECTION 002 TOWNSHIP 12S RANGE 03E

ELEV 0011 QUAD NO 182C Leroy LA

SITE ADDRESS Birch Rd
Abbeville La 70510

CONTRACTORS / OWNERS COPY

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION REPORT FORM (DOTD GW - 1S)

PLEASE PRINT IN OR TYPE WHEN COMPLETING THIS FORM

1 USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER

2 WELL OWNER Vermillion Parish Police Jury PHONE (318) 898-4300

3 WELL OWNER S ADDRESS P O Box 430 Abbeville La 70511 0430

4 OWNER S WELL NUMBER OR NAME (if any) MW 10

5 DATE COMPLETED 9/9/98 DEPTH OF HOLE 40 FT DEPTH OF WELL 40 FT

6 STATIC WATER LEVEL 20 FT BELOW GROUND SURFACE MEASURED ON 8/20/98

7 CASING 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 30 FT

8 SCREEN 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE 010 LENGTH 10 FT

9 CEMENTED FROM 22 FT BELOW GROUND SURFACE USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10 LOCATION OF WELL PARISH Vermillion WELL IS NEAR Abbeville La (Town or city)

APPROXIMATELY 0 5 MILES FROM Hwy 67 west on Hwy 696 (Crossroad railroad any landmark, etc)

(Please desw sketch on back of Origin l

11 REMARKS Note 2 ft sump below the screen

12 DRILLER S LOG (Description and color of cuttings such as shale sand etc in feet)

FROM	TO		FROM	TO	
0	4	Dark Gray clay			
4	26	Tan & Gray clay			
26	36	Sandy silt			
36	40	Gray silty clay			

13 FOR HEAT PUMP ONLY AVG DEPTH _____ FT NUMBER OF HOLES _____

14 ABANDONMENT INFORMATION DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15 NAME OF PERSON WHO DRILLED THE WELL Dempsey Thibadoux

Soil Testing Engineers, Inc
Name of Water Well Contractor

LICENSE NUMBER WWC 212

Authorized Signature 10-5-98 Date

MAIL ORIGINAL TO
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN CHIEF WATER RESOURCES SECTION
P O BOX 94245
BATON ROUGE LA 70804 9245
(504) 379 1434

FOR OFFICE USE ONLY

PARISH 113 WELL NO 9908Z

IDENTIFICATION NUMBER 0

REVISED COORDINATES

G of gl Unit

Use of well M1

SECTION TOWNSHIP RANGE

ELEV QUAD NO

INPUT BY BMB DATE 10/9/98

INSPECTED BY DATE

REMARKS

FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 30 01 33 LONGITUDE 92 07 35

SECTION 02 TOWNSHIP 12S RANGE 03E

ELEV 0011 QUAD NO 182C Leroy LA

SITE ADDRESS Birch Rd
Abbeville La 70510

CONTRACTORS / OWNERS COPY

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION REPORT FORM (DOTD GW 1S)

PLEASE PRINT IN OR TYPE WHEN COMPLETING THIS FORM

1 USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER

2 WELL OWNER Vermillion Parish Police Jury PHONE (318) 898-4300

3 WELL OWNER S ADDRESS P O Box 430 Abbeville La 70511 0430

4 OWNER S WELL NUMBER OR NAME (if any) MW 11

5 DATE COMPLETED 9/9/98 DEPTH OF HOLE 42 FT DEPTH OF WELL 40 FT

6 STATIC WATER LEVEL 30 FT BELOW GROUND SURFACE MEASURED ON 8/26/98

7 CASING 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 30 FT

8 SCREEN 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE 010 LENGTH 10 FT

9 CEMENTED FROM 22 FT BELOW GROUND SURFACE USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10 LOCATION OF WELL PARISH Vermillion WELL IS NEAR Abbeville La (Town or city)

APPROXIMATELY 0 5 MILES FROM Hwy 67 west on Hwy 696 (Crossroad railroad any landm rk, etc)

(Pleas deaw sketch on back of Original

11 REMARKS Note 2 ft sump below the screen

12 DRILLER S LOG (Description and color of cuttings such as shale sand etc in feet)

FROM	TO		FROM	TO	
0	14	Gray clay			
14	30	Gray silty clay			
30	42	Tan silty sand			

13 FOR HEAT PUMP ONLY AVG DEPTH _____ FT NUMBER OF HOLES _____

14 ABANDONMENT INFORMATION DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15 NAME OF PERSON WHO DRILLED THE WELL Dempsey Thibadoux

Soil Testing Engineers Inc
Name of Water Well Contractor

LICENSE NUMBER WWC 212

Authorized Signature 10-5-98 Date

MAIL ORIGINAL TO
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN CHIEF WATER RESOURCES SECTION
P O BOX 94245
BATON ROUGE LA 70804 9245
(504) 379 1434

FOR OFFICE USE ONLY

PARISH 113 WELL NO 99097

IDENTIFICATION NUMBER

REVISED COORDINATES

G logl Unit

Use of well

SECTION TOWNSHIP RANGE

ELEV QUAD NO

INPUT BY DATE 10/9/98

INSPECTED BY DATE

REMARKS

FOR MONITOR/PIEZOMETER WELLS ONLY

LATITUDE 30 01 33 LONGITUDE 92 08 13

SECTION 02 TOWNSHIP 12 S RANGE 03 E

ELEV 016 QUAD NO 18 2 C Leroy LA

SITE ADDRESS Birch Rd
Abbeville La 70510

CONTRACTORS / OWNERS COPY

Vermilion Parish
Solid Waste Plant
Vermilion Parish LA

LOG OF SOIL BORING MW-6

STE
Soil Testing Engineers Inc

Sellers & Associates Inc
Lafayette LA

Sheet 1 of 1

File 98 1139
Date 08/18/98
Geol A Malatesta
Driller D Thibodaux
Rig CME 75

Location

Surface Elevation +12 11 (ft NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
												Dark brown SILTY CLAY (CL)
												Stiff tan and gray SILTY CLAY (CL)
	5		4 5 (P)									
			3 0 (P)									
			2 5 (P)				34	17	17			
	10		2 5 (P)									
			2 0 (P)									
	15											Medium dense tan SAND (SP SM)
	20											
	25											
▽	30											
	35											
	40				20					GS		

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered	Hollow Stem Auger 0 to 40 ft	Boring completed at 40 ft GS Particle Size Analysis Sand Content = 95%
	Boring Abandonment Method Borehole completed as MW 6	Soil descriptions are based primarily upon visual classifications with limited laboratory test data

Form LOG1995R 10/02/98

Strata Boundaries May Not Be Exact

Vermilion Parish
Solid Waste Plant
Vermilion Parish LA

LOG OF SOIL BORING MW-7

STE
Soil Testing Engineers Inc

File 98 1139
Date 08/10/98
Geol A Malatesta
Driller D Thibodaux
Rig CME 75

Sellers & Associates Inc
Lafayette LA

Sheet 1 of 1

Location

Surface Elevation +17 69 (ft NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
			No (P)									Dark gray and tan SILTY CLAY (CL)
			No (P)									
	5		4 0 (P)									
			4 0 (P)				51	18	33			Gray CLAY (CH)
			2 0 (P)									
	10		2 8 (P)									
	15		10 b/f 8 4 6									Medium dense tan SILTY SAND (SM)
			14 b/f 9 7 7		8					GS		
	20		17 b/f 7 10 7									
			15 b/f 5 7 8									
	25											
▽			19 b/f 4 9 10									
	30		12 b/f 6 5 7									
			17 b/f 8 9 8									
	35		4 b/f 2 1 3									
	40											Boring completed at 36 5 ft

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered	Hollow Stem Auger 0 to 36 5 ft	GS Particle Size Analysis Sand = 52% Silt = 36% Clay = 12% Soil descriptions are based primarily upon visual classifications with limited laboratory test data
	Boring Abandonment Method	
	Borehole completed as MW 7	

F m LOG1995R 10/02/98

Strata Boundaries May Not Be Exact

Vermilion Parish
Solid Waste Plant
Vermilion Parish LA

LOG OF SOIL BORING MW-8

STE
Soil Testing Engineers Inc

Sellers & Associates Inc
Lafayette LA

Sheet 1 of 2

File 98 1139
Date 08/11/98
Geol A Malatesta
Driller D Thibodaux
Rig CME 75

Location

Surface Elevation +19 35 (ft NGVD)

Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other	Soil Type	Description
			4 5 (P)									Stiff gray CLAY (CH)
			4 0 (P)									
	5		2 5 (P)									
			2 5 (P)									
			1 5 (P)									
	10		1 8 (P)				67	22	45			
			1 8 (P)									
	15		1 8 (P)									
												Stiff tan and gray CLAYEY SAND (SC)
	20											Medium dense tan SANDY SILT (ML) w/clay lenses
▽	25											
	30				28					GS		
	35											
	40											

Continued Next Page

Ground Water Level Data

▽ Free water first encountered

Boring Advancement Method

Hollow Stem Auger 0 to 48 ft

Boring Abandonment Method

Borehole completed as MW 8

Notes

GS Particle Size Analysis
Sand = 14% Silt = 74% Clay = 12%

Soil descriptions are based primarily upon visual classifications with limited laboratory test data

Form LOG1995R 10/14/98

Strata Boundaries May Not Be Exact

Vermilion Parish
Solid Waste Plant
Vermilion Parish LA

LOG OF SOIL BORING MW-8

STE
Soil Testing Engineers Inc

Sellers & Associates Inc
Lafayette LA

Sheet 2 of 2

File 98 1139
Date 08/11/98
Geol A Malatesta
Driller D Thibodaux
Rig CME 75

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Location Surface Elevation +19 35 (ft NGVD) Description
												Medium dense tan SANDY SILT (ML) w/clay lenses and layers
	45											
												Boring completed at 48 ft
	50											
	55											
	60											
	65											
	70											
	75											
	80											

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered	Hollow Stem Auger 0 to 48 ft	
	Boring Abandonment Method Borehole completed as MW 8	

Form LOG1995R 10/1 /98

Strata Boundaries May Not Be Exact

Vermilion Parish
Solid Waste Plant
Vermilion Parish LA

LOG OF SOIL BORING MW-9

STE
Soil Testing Engineers, Inc

File 98 1139
Date 08/19/98
Geol A Malatesta
Driller D Thibodaux
Rig CME 75

Sellers & Associates Inc
Lafayette LA

Location

Surface Elevation +10 74 (ft NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
												Stiff dark gray CLAY (CH)
	5		3 5 (P)				59	19	40			
			3 2 (P)									
			1 5 (P)									Stiff gray SILTY CLAY (CL)
	10		1 8 (P)									
			2 0 (P)									
	15		3 0 (P)									
			2 0 (P)									
	20		2 5 (P)				38	18	20			– w/silt lenses at 20 ft
	25		4 0 (P)									Stiff CLAYEY SAND (SC) w/clay lenses
	30											
	35		2 5 (P)									Stiff gray SILTY CLAY (CL) w/sand lenses
			1 0 (P)									
			0 5 (P)									
	40											

Continued Next Page

Ground Water Level Data

▽ Free water first encountered
▽ Water level after 15 mins

Boring Advancement Method

Hollow Stem Auger 0 to 41 ft

Boring Abandonment Method

Borehole completed as MW 9

Notes

Soil descriptions are based primarily upon visual classifications with limited laboratory test data

Strata Boundaries May Not Be Exact

Vermilion Parish
Solid Waste Plant
Vermilion Parish LA

LOG OF SOIL BORING MW-9

STE
Soil Testing Engineers Inc

File 98 1139
Date 08/19/98
Geol A Malatesta
Driller D Thibodaux
Rig CME 75

Sellers & Associates Inc
Lafayette LA

Sheet 2 of 2

FIELD DATA				LABORATORY DATA								Location
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Surface Elevation +10 74 (ft NGVD)
												Description
			0 5 (P)									Stiff gray SILTY CLAY (CL) w/sand lenses
												Boring completed at 41 ft
	45											
	50											
	55											
	60											
	65											
	70											
	75											
	80											

Ground Water Level Data	Boring Advancement Method	Notes
Free water first encountered Water level after 15 mins	Hollow Stem Auger 0 to 41 ft	
	Boring Abandonment Method Borehole completed as MW 9	

F m LOG1995R 10/02/98

Strata Boundaries May Not Be Exact

Vermilion Parish
Solid Waste Plant
Vermilion Parish LA

LOG OF SOIL BORING MW-10

STE
Soil Testing Engineers Inc

File 98 1139
Date 08/20/98
Geol A Malatesta
Driller D Thibodaux
Rig CME 75

Sellers & Associates Inc
Lafayette LA

Sheet 1 of 1

Location

Surface Elevation +10 62 (ft NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
												Dark gray CLAY (CH)
	5		3 5 (P)									Stiff tan and gray CLAY (CH)
			2 5 (P)									
			2 2 (P)									
	10		2 2 (P)									
			2 5 (P)									
	15		2 0 (P)									
			2 0 (P)									
▽	20											
	25						64	23	41			
▽												Medium dense tan SANDY SILT (ML) w/clay lenses
	30				23					GS		
			1 0 (P)									
	35											
			0 5 (P)									Soft gray SILTY CLAY (CL) w/silt and sand lenses
	40											

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered ▽ Water level after 15 mins	Hollow Stem Auger 0 to 40 ft	Boring completed at 40 ft GS Particle Size Analysis Sand = 22% Silt = 60% Clay = 18%
	Boring Abandonment Method Borehole completed as MW 10	Soil descriptions are based primarily upon visual classifications with limited laboratory test data

Form LOG1995R 10/14/98

Strata Boundaries May Not Be Exact

Vermilion Parish
Solid Waste Plant
Vermilion Parish LA

LOG OF SOIL BORING MW-11

STE
Soil Testing Engineers, Inc

Sellers & Associates Inc
Lafayette LA

Sheet 1 of 2

File 98 1139
Date 08/26/98
Geol A Malatesta
Driller D Thibodaux
Rig CME 75

Location

Surface Elevation +16 22 (ft NGVD)

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Description
												Backfill dark gray CLAY (CH)
	5											
	10		4 0 (P)									Very stiff gray CLAY (CH)
			3 5 (P)									
	15		4 5 (P)									Stiff gray SILTY CLAY (CL)
	20						36	16	20			– w/sand layers at 20 ft
	25											
▽	30		3 5 (P)		25					GS		Medium dense tan SILTY SAND (SM)
	35											
	40											

Continued Next Page

Ground Water Level Data

▽ Free water first encountered

Boring Advancement Method

Hollow Stem Auger 0 to 42 ft

Boring Abandonment Method

Borehole completed as MW 11

Notes

GS Particle Size Analysis
Sand Content = 87%

Soil descriptions are based primarily upon visual classifications with limited laboratory test data

Form LOG1995R 10/02/98

Strata Boundaries May Not Be Exact

Vermilion Parish
Solid Waste Plant
Vermilion Parish LA

LOG OF SOIL BORING MW-11

STE
Soil Testing Engineers Inc.

Sellers & Associates Inc
Lafayette LA

Sheet 2 of 2

File 98 1139
Date 08/26/98
Geol A Malatesta
Driller D Thibodaux
Rig CME 75

FIELD DATA				LABORATORY DATA								
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Other	Soil Type	Location Surface Elevation +16 22 (ft NGVD) Description
												Medium dense tan SILTY SAND (SM)
												Boring completed at 42 ft
	45											
	50											
	55											
	60											
	65											
	70											
	75											
	80											

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered	Hollow Stem Auger 0 to 42 ft	
	Boring Abandonment Method Borehole completed as MW 11	

F m LOG1995R 10/02/98

Strata Boundaries May Not Be Exact

APPENDIX B
ENGINEERING CALCULATIONS

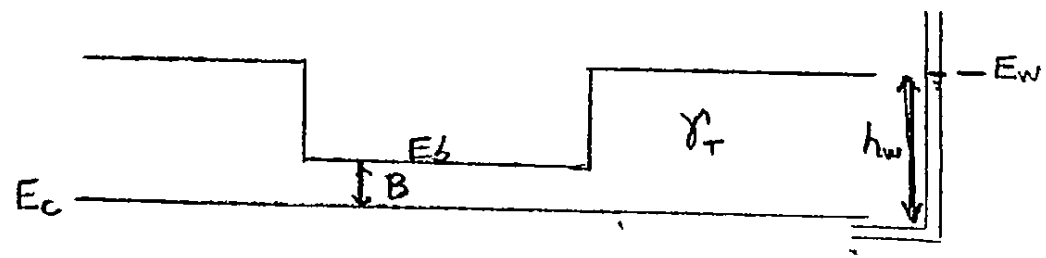
- Bottom Heave Calculations
- Groundwater Protection Calculations
- Stability Analysis Calculations
- Settlement Calculations

Bottom Heave Calculations

Vermillion Parish Solid Waste Plant

Factor of Safety Against Bottom Heave Area 2B

Point	Boring	Surf Elev	Eb	Ec	Ew	hw	B	γT	FS
1	B 03 1	7 1	7 1	-31 1	8	23 1	38 2	114	3 0
2	B 03 2	4 3	4 3	-35 1	8	27 1	39 4	113	2 6
3	B 03 3	1 6	1 6	35 3	8	27 3	36 9	109	2 4
4	B 94 5	3 9	3 9	11	8	3	14 9	114	9 1
5	B 93 4	2 9	2 9	3	8	0	5 9	109	-
6	B 03 4	7 1	7 1	0 9	1 7	0	6 2	127	-
7	B 03 5	4 1	1 5	12 6	8	4 6	14 1	124	6 1
8	B 94 9	3 8	3 8	2		2	5 8	125	5 8
9	B 93 5	0 92	0 92	4		4	4 92	126	2 5
10	B 03 7	9 1	9 1	0 5	8	0	8 6	125	
11	B 03 8	4 9	4 9	1 5	8	0	3 4	126	-
12	B 03 6	1 6	1 6	38	8	30	39 6	126	2 7



$$FS = \frac{B}{h_w} \times \frac{\gamma_T}{\gamma_w}$$

STE
Soil Testing Engineers Inc
316 Highlandia Drive • P O Box 83710
Baton Rouge Louisiana 70884
Telephone (225) 752 4790
FAX (225) 752 4878

Project _____ Client _____ Job # 03-1063

By _____ Checked by _____ Date 27 June 03 Sheet H-D of _____

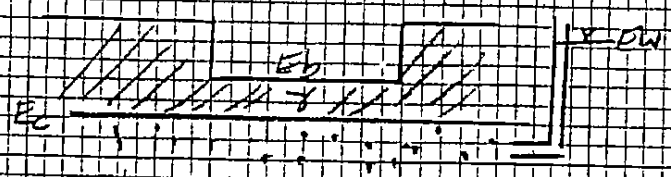
SUMMARY – EXPANSION 2B AREA

BORING NO.	SURF. ELEV. (FT NAVD)	BOT SPOIL ELEV (FT NAVD)	MINIMUM ALLOWABLE CUT ELEVATION (FT NAVD) BY HEAVE	3' CLAY	USE	CUT DEPTH (FT)	
B03-1	+9	-31	-17	-14	-14	23	
B03-2	+3	-35	-18	-35	-18	21	Avid -9+6=15
B03-3	+1	-35	-18	-26	-18	19	
B03-4	+18	+1	+1	+4	+4	9	
B03-5	+1	-12	-10	-9	-9	10	
B03-6	+2	-38	-20	-35	-20	22	(Signal -10=12')
B03-7	+16	+1	+1	+4	+4	12	
B03-8	+6	+2	+2	+5	+5	1	
B03-9	+4	-17	-12	-14	-12	16	
MW-1	N/A	-11	-1	+2	+2	—	
MW 2	N/A	-12	-9	-9	-9	—	
B-5/94	N/A	-11	-9	-8	-8	—	
B-9/94	N/A	-2	-2	+1	+1	—	
B-4/93	N/A	-3	-3	0	0	—	
B-5/93	N/A	-4	-4	-1	-1	—	

STE
Soil Testing Engineers Inc
316 Highlandia Drive • P O Box 83710
Baton Rouge Louisiana 70884
Telephone (225) 752 4790
FAX (225) 752 4878

Project V. P. LF Client _____ Job # 03-1063

By [illegible] Checked by _____ Date 26 June 03 Sheet H-1 of _____



Highest 1996 Pot = -9
use -8

$F\downarrow = (E_b - E_c)\,\gamma_T$

$F\uparrow = 3F \cdot (E_w - E_c)\,\gamma_w$

$(E_b - E_c)\,\gamma_T = 3F \cdot \gamma_w (E_w - E_c)$

$E_b = E_c + 3F \cdot (\gamma_w/\gamma_T)(E_w - E_c)$

B03-01

$E_c = -31.1$

$E_w = -13.1,\ -1.7$

$\gamma_T \sim 114$

$E_b = -31.1 + 1.1\left(\frac{62.4}{114}\right)(E_w + 31.1)$

$= -31.1 + 0.602\,(E_w + 31.1)$

$E_b = -12.37 + .602\,E_w$

Lo water: -20.26 (29.2' cut)

Hi water: $\boxed{-13.39}$ (22.3' cut)

-8: $-17.2 \longrightarrow -17$

-14

B03-02

$E_c = -35.1$

$E_w = -11.1,\ -1.7$

$\gamma_T \sim 113$

$E_b = -35.1 + 1.1\left(\frac{62.4}{113}\right)(E_w + 35.1)$

$= -35.1 + .607\,(E_w + 35.1)$

$E_b = -13.78 + .607\,E_w$

Lo water: $E_b = -13.78 - 6.73 = -20.5$ (23.4' cut)

Hi water: $E_b = -13.78 - 1.03 = \boxed{-14.81}$ (17.7' cut)

-8: $E_b = -18.6$

-18

-14

B03-03

$E_c = -35.3$

$E_w = -13.5,\ -1.7$

$\gamma_T \sim 109$

$E_b = -35.3 + 1.1\left(\frac{62.4}{109}\right)(E_w + 35.3)$

$= -35.3 + .630\,(E_w + 35.3)$

$E_b = -13.07 + .630\,E_w$

Lo water $E_b = -21.6$ (22.4' cut)

Hi water $\boxed{E_b = -14.1}$ (14.8' cut)

-8: $E_b = -18.1$

-14

-18

STE
Soil Testing Engineers Inc
316 Highlandia Drive • P O Box 83710
Baton Rouge Louisiana 70884
Telephone (225) 752 4790
FAX (225) 752 4878

Project _____ Client _____ Job # 03-1063
By [signature] Checked by _____ Date 26 June 03 Sheet H-2 of _____

B03-04 $E_c = +0.9$
$E_w = -1.7$
cut to +0.9 (Hence Only)

$\boxed{\text{cut to +4}}$

B03-05 DEEP
$E_c = -38.6$
$E_w = -14.2, -1.7$
$\gamma = 111$

$E_b = -38.6 + 1.1\left(\frac{62.4}{111}\right)(E_w + 38.6)$
$= -38.6 + 0.618(E_w + 38.6)$
$E_b = -14.75 + .618 E_w$

Lo water: -23.5' (24.9' cut)
Hi water: -15.8' (17.2' cut)
-8: -19.7 -19

SHALLOW:
$E_c = -12.6$
$E_w = -14.2, -1.7$
$\gamma = 124$

Lo water SF >>>
Hi water: $E_b = -12.6 + \frac{1.1 \cdot 62.4}{124}(-1.7 + 12.6)$
$E_b = -6.6$ (8.0 FT)
GW -8: $E_b = -10$

B03-06 $E_c = -38.5$
$E_w = -14.0, -1.7$
$\gamma = 114$

$E_b = -38.5 + 1.1\left(\frac{62.4}{114}\right)(E_w + 38.5)$
$= -38.5 + .602(E_w + 38.5)$
$= -15.3 + .602 E_w$

Lo water: -23.7 (25.22 FT)
Hi water: -16.3 (17.8')
GWC -8 -20.1

B03-7 $E_c = +0.5$
$E_w = -1.7$
$\gamma = 125$

$E_b = +0.5 + 1.1\left(\frac{62.4}{125}\right)(-1.7 + 0.5)$
$= 0.5 - 0.7 = -0.2$
(3' dry: 13' = +3.5 FT)
GWC -8: -3.6 FT -3

B03-9 $E_c = -17.5$
$E_w = -1.7$
$\gamma = 124$

$E_b = -17.5 + 1.1\left(\frac{62.4}{124}\right)(-1.7 + 17.5)$
$= -17.5 + 8.7$
$E_b = -8.8$ -12.2 -12

GWC -8

STE
Soil Testing Engineers Inc
316 Highlandia Drive • P O Box 83710
Baton Rouge Louisiana 70884
Telephone (225) 752 4790
FAX (225) 752 4878

Project [illegible] Client _____ Job # 03-1063

By [illegible] Checked by _____ Date 27 Jan 03 Sheet H-3 of _____

MW-2 SAG-12

$E_c = -12$

$E_w = -8$

$E_b = -12 + 1.1\left(\frac{62.4}{118}\right)(-8+12)$

$= -12 + .60(4)$

$E_b = -9.6$ $\boxed{-9}$

B-5/1994

SAG-11 $E_b = -11 + .60(3) = \boxed{-9}$

B-4/1993

SAG-3 ~~$E_b = -3 + .60$~~ $\boxed{-3}$ here

MW-1

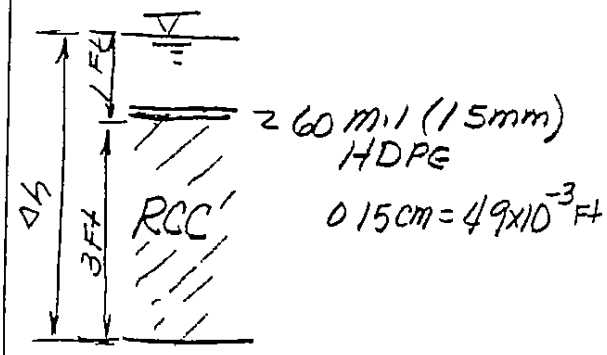
SAG-1 -1

B-5 1993 SAG-4 -4

Groundwater Protection Calculations

Alternate Liner
Hydraulic Equivalency

Std Liner.



$K_{FML} \cong 10^{-12} \frac{cm}{sec} = 10^{-6} \frac{Ft}{YR}$

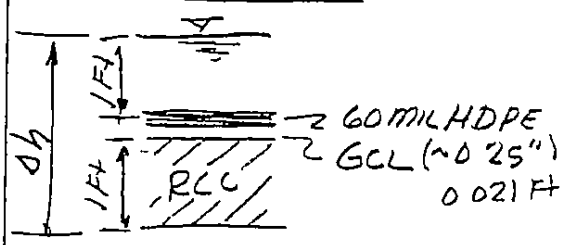
$K_{RCC} = 10^{-7} cm/sec = 10^{-1} Ft/yr$

$$K_{Eq} = \frac{H}{\frac{H_1}{K_1} + \frac{H_2}{K_2}} = \frac{3.005}{\frac{4.9\times10^{-3}}{10^{-6}} + \frac{3}{10^{-1}}}$$

$$= \frac{3.005}{4930} = 6.1\times10^{-4} \frac{Ft}{YR}$$

$$q = Kia$$
$$= (6.1\times10^{-4} \frac{Ft}{YR})(\frac{4.005}{3.005})(1 \frac{Ft^2}{Ft^2})$$
$$= 8.13\times10^{-4} Ft^3/Ft^2/YR$$
$$= \underline{35.4 \; Ft^3/AC/YR}$$

~~Proposed~~ Alternate Liner



$K_{GCL} = 10^{-9} cm/sec = 10^{-3} Ft/yr$

$$K_{Eq} = \frac{H}{\frac{H_1}{K_1} + \frac{H_2}{K_2} + \frac{H_3}{K_3}} = \frac{1 + 0.021 + 0.005}{\frac{1}{10^{-1}} + \frac{0.021}{10^{-3}} + \frac{4.9\times10^{-3}}{10^{-6}}}$$

$$= \frac{1.026}{10 + 21 + 4900}$$

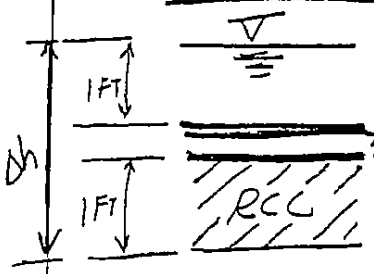
$$= 2.1\times10^{-4} \; Ft/YR$$

doesn't include 40-mil geomembrane w/GCL

$$q = Kia$$
$$= (2.1\times10^{-4} Ft/yr)(\frac{2.026}{1.026})(\frac{1 \; Ft^2}{1 \; Ft^2})$$
$$= 4.15\times10^{-4} Ft^3/Ft^2/YR$$
$$= \underline{18.1 \; Ft^3/AC/YR}$$

Approximately ½ of the flow when compared to the standard liner

Alternate Liner



60 mil (1.5mm) HDPE → 49×10^{-3} FT

GCL/40 mil (1mm) HDPE — 3.3×10^{-3}

assume ~ ¼" GCL → 0.02 FT

$K_{FML} = 10^{-12}$ cm/sec $= 10^{-6}$ FT/YR

$K_{GCL} = 10^{-9}$ cm/sec $= 10^{-3}$ FT/YR

$K_{RCL} = 10^{-7}$ cm/sec $= 10^{-1}$ FT/yr

$$K_{eq} = \frac{H}{\frac{H_1}{K_1} + \frac{H_2}{K_2} + \frac{H_3}{K_3} + \frac{H_4}{K_3}}$$

$$= \frac{(49+33)(10^3) + 0.02 + 1}{\frac{49 \times 10^{-3}}{10^{-6}} + \frac{33 \times 10^{-3}}{10^{-6}} + \frac{0.2}{10^3} + \frac{1}{10^{-1}}}$$

$$= \frac{1.0282}{4900 + 3300 + 200 + 10} = \frac{10282}{8410}$$

$$= 1.22 \times 10^{-4} \text{ FT/YR}$$

$$q = Kia$$

$$= (1.22 \times 10^{-4} \text{ FT/YR})\left(\frac{20282}{10282}\right)\left(\frac{1 \text{ FT}^2}{1 \text{ FT}^2}\right)$$

$$= 2.41 \times 10^{4} \text{ FT}^3/\text{FT}^2/\text{YR}$$

$$= \underline{\underline{10.5 \text{ FT}^3/\text{AC/yr}}}$$

Less than 1/3 of the flow when compared to the standard liner

Stability Analysis Calculations

Excavation Cut

Excavation Cut
Long Term
C=0, Φ=28°
F.O.S = 1.8

XSTABL File VERMCE1 11-07-04 10 29

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
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*****************************************
```

Problem Description Vermilion Landfill - Exp 2B

SEGMENT BOUNDARY COORDINATES
---

5 SURFACE boundary segments

Segment No	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	0	101 5	50 0	101 5	2
2	50 0	101 5	99 5	118 0	2
3	99 5	118 0	111 5	118 0	2
4	111 5	118 0	129 5	112 0	2
5	129 5	112 0	150 0	112 0	2

1 SUBSURFACE boundary segments

Segment No	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	0	64 7	150 0	64 7	4

ISOTROPIC Soil Parameters
---

5 Soil unit(s) specified

Soil Unit No	Unit Weight Moist (pcf)	Unit Weight Sat (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No

1	63 0	63 0	300 0	23 00	000	0	1
2	120 0	120 0	0	28 00	000	0	1
3	115 0	115 0	300 0	00	000	0	1
4	120 0	120 0	0	30 00	000	0	1
5	65 0	65 0	0	12 00	000	0	1

1 Water surface(s) have been specified

Unit weight of water = 62 40 (pcf)

Water Surface No 1 specified by 2 coordinate points

****
PHREATIC SURFACE
****

Point No	x-water (ft)	y-water (ft)
1	00	86 50
2	150 00	86 50

A critical failure surface searching method using a random technique for generating CIRCULAR surfaces has been specified

2500 trial surfaces will be generated and analyzed

50 Surfaces initiate from each of 50 points equally spaced along the ground surface between x = 0 ft
and x = 50 0 ft

Each surface terminates between x = 99 5 ft
and x = 130 0 ft

Unless further limitations were imposed the minimum elevation at which a surface extends is y = 0 ft

5 0 ft line segments define each trial failure surface

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined

within the angular range defined by

Lower angular limit = -60 0 degrees
Upper angular limit = -5 0 degrees

Factors of safety have been calculated by the

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 13 coordinate points

Point No	x-surf (ft)	y-surf (ft)
1	50 00	101 50
2	54 98	101 03
3	59 98	100 97
4	64 97	101 31
5	69 91	102 06
6	74 78	103 20
7	79 54	104 73
8	84 16	106 65
9	88 60	108 93
10	92 85	111 56
11	96 88	114 53
12	100 64	117 82
13	100 82	118 00

**** Simplified BISHOP FOS = 1 755 ****

The following is a summary of the TEN most critical surfaces

Problem Description Vermilion Landfill - Exp 2B

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1	1 755	58 26	162 62	61 67	50 00	100 82	8 782E+05
2	1 784	58 74	164 71	64 12	47 96	102 63	1 066E+06
3	1 808	60 36	162 63	62 01	50 00	103 33	1 091E+06
4	1 814	53 44	169 96	70 01	38 78	100 31	1 062E+06
5	1 828	44 81	206 96	106 41	30 61	103 17	1 351E+06
6	1 843	49 53	202 25	101 69	35 71	106 45	1 675E+06
7	1 848	51 00	197 09	96 65	36 73	106 50	1 679E+06

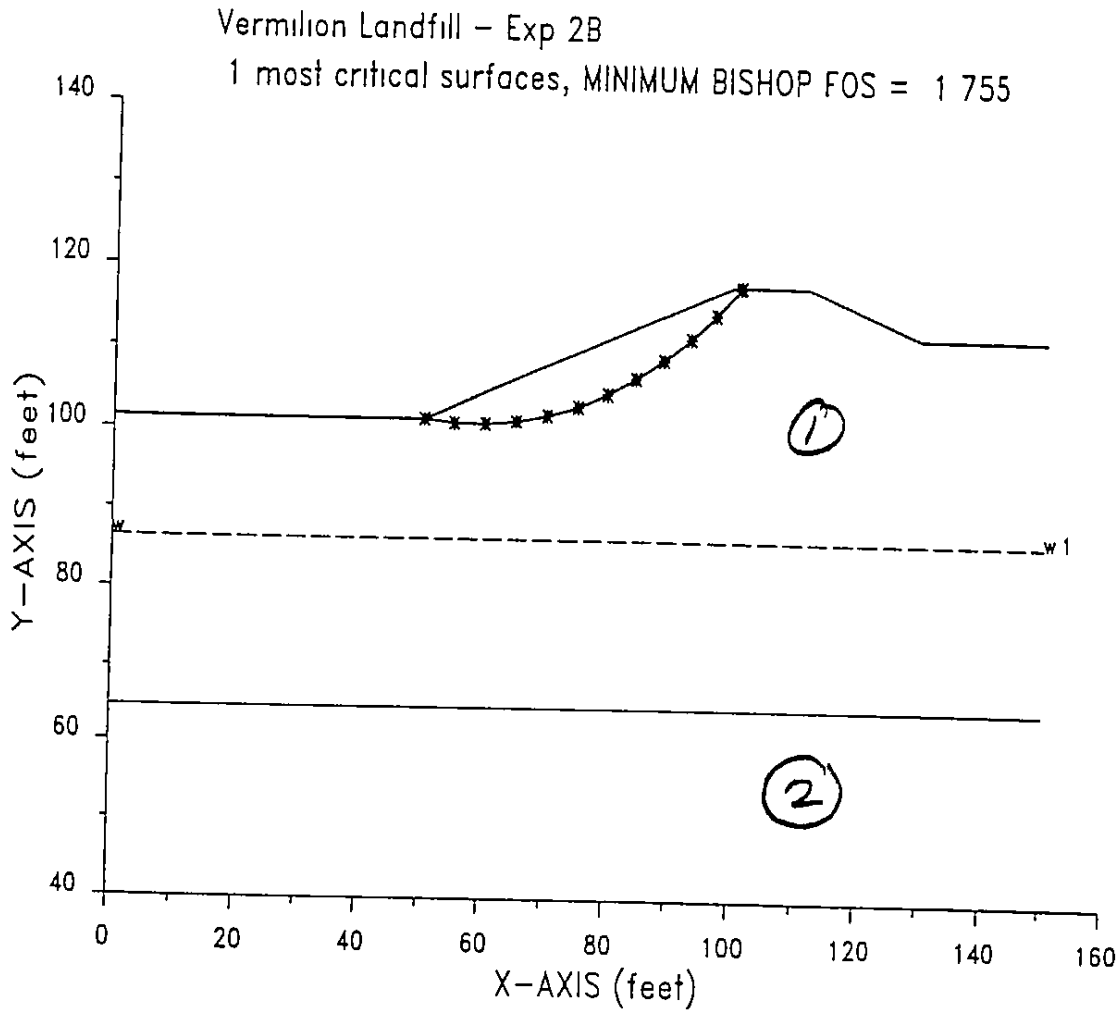
8	1 854	59 48	159 54	60 10	43 88	102 88	1 228E+06
9	1 857	48 16	206 45	105 95	33 67	106 43	1 719E+06
10	1 873	52 20	193 61	93 40	36 73	107 00	1 764E+06

* * * END OF FILE * * *

Excavation Cut

Drained

VERMCE1 11-09-04 14 48



SURFACE

X	Y
0	101 5
50	101.5
99 5	118
111.5	118
129.5	112

CH-CL/SM-SP

X	Y
0	64.7
150	64.7

Phreatic Surface

X	Y
0	86.5
150	86.5

LAYER	γ	Undrain Str		Drain. Str	
		C PSF	φ deg	C	φ
Insitu Clay	120	1000	0	0	28
Insitu Sand	120	0	30	0	30

Excavation Cu
C = 1300 psf

FOS-41

XSTABL File VERMCE3 11-10-04 12 14

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
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*                                       *
*  Ver  5 204                96 - 1822  *
*****************************************
```

Problem Description Vermilion Landfill - Exp 2B

SEGMENT BOUNDARY COORDINATES
---

5 SURFACE boundary segments

Segment No	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	0	101 5	50 0	101 5	2
2	50 0	101 5	99 5	118 0	2
3	99 5	118 0	111 5	118 0	2
4	111 5	118 0	129 5	112 0	2
5	129 5	112 0	150 0	112 0	2

1 SUBSURFACE boundary segments

Segment No	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	0	64 7	150 0	64 7	4

ISOTROPIC Soil Parameters
---

5 Soil unit(s) specified

Soil Unit No	Unit Weight Moist (pcf)	Unit Weight Sat (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No

1	63 0	63 0	300 0	23 00	000	0	1
2	120 0	120 0	1300 0	00	000	0	1
3	115 0	115 0	300 0	00	000	0	1
4	120 0	120 0	0	30 00	000	0	1
5	65 0	65 0	0	12 00	000	0	1

1 Water surface(s) have been specified

Unit weight of water = 62 40 (pcf)

Water Surface No 1 specified by 2 coordinate points

****
PHREATIC SURFACE,
****

Point No	x-water (ft)	y-water (ft)
1	00	86 50
2	150 00	86 50

A critical failure surface searching method using a random technique for generating CIRCULAR surfaces has been specified

2500 trial surfaces will be generated and analyzed

50 Surfaces initiate from each of 50 points equally spaced along the ground surface between x = 0 ft
and x = 50 0 ft

Each surface terminates between x = 99 5 ft
and x = 130 0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = 0 ft

5 0 ft line segments define each trial failure surface

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined

within the angular range defined by

Lower angular limit = -60 0 degrees
Upper angular limit = -5 0 degrees

```
*************************************************************
**     Factor of safety calculation for surface #    16    **
**     failed to converge within FIFTY iterations          **
**                                                         **
**    The last calculated value of the FOS was  23 4664    **
**    This will be ignored for final summary of results    **
*************************************************************
```

Circular surface (FOS= 23 4664) is defined by xcenter = 28 95
ycenter = 251 05 Init Pt = 00 Seg Length = 5 00

```
***********************************************************************
   -- WARNING -- WARNING -- WARNING -- WARNING -- (# 48)
***********************************************************************
Negative effective stresses were calculated at the base of a slice
This warning is usually reported for cases where slices have low self
weight and a relatively high c shear strength parameter In such
cases this effect can only be eliminated by reducing the c value
***********************************************************************
```

```
-------------------------------------------------------------
USER SELECTED option to maintain strength greater than zero
-------------------------------------------------------------
```

```
*************************************************************
**     Factor of safety calculation for surface #    63    **
**     failed to converge within FIFTY iterations          **
**                                                         **
**    The last calculated value of the FOS was  20 8881    **
**    This will be ignored for final summary of results    **
*************************************************************
```

Circular surface (FOS= 20 8881) is defined by xcenter = 29 97
ycenter = 253 37 Init Pt = 1 02 Seg Length = 5 00

```
*************************************************************
**     Factor of safety calculation for surface #   250    **
**     failed to converge within FIFTY iterations          **
**                                                         **
**    The last calculated value of the FOS was  20 8601    **
**    This will be ignored for final summary of results    **
*************************************************************
```

Circular surface (FOS= 20 8601) is defined by xcenter = 29 36
ycenter = 278 97 Init Pt = 4 08 Seg Length = 5 00

```
*************************************************************
**     Factor of safety calculation for surface #   318    **
**     failed to converge within FIFTY iterations          **
**                                                         **
**    The last calculated value of the FOS was  21 3849    **
**    This will be ignored for final summary of results    **
*************************************************************
```

Circular surface (FOS= 21 3849) is defined by xcenter = 33 35
ycenter = 224 87 Init Pt = 6 12 Seg Length = 5 00

```
*************************************************************
**     Factor of safety calculation for surface #   952    **
**     failed to converge within FIFTY iterations          **
**                                                         **
**    The last calculated value of the FOS was  22 3114    **
**    This will be ignored for final summary of results    **
*************************************************************
```

Circular surface (FOS= 22 3114) is defined by xcenter = 35 67
ycenter = 238 81 Init Pt = 19 39 Seg Length = 5 00

Factors of safety have been calculated by the

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface
is specified by 25 coordinate points

Point No	x-surf (ft)	y-surf (ft)
1	27 55	101 50
2	30 57	97 51
3	33 96	93 84
4	37 68	90 50
5	41 71	87 54
6	46 01	84 98
7	50 53	82 85
8	55 24	81 16
9	60 08	79 93

10	65 03	79 18
11	70 02	78 90
12	75 01	79 10
13	79 97	79 79
14	84 83	80 95
15	89 56	82 57
16	94 11	84 63
17	98 44	87 13
18	102 52	90 03
19	106 29	93 31
20	109 73	96 94
21	112 81	100 88
22	115 49	105 10
23	117 75	109 56
24	119 58	114 22
25	119 86	115 21

**** Simplified BISHOP FOS = 4 103 ****

```
*********************************************************************
**                                                                 **
**  Out of the   2500 surfaces generated and analyzed by XSTABL    **
**        5 surfaces were found to have MISLEADING FOS values      **
**                                                                 **
*********************************************************************
```

The following is a summary of the TEN most critical surfaces

Problem Description Vermilion Landfill - Exp 2B

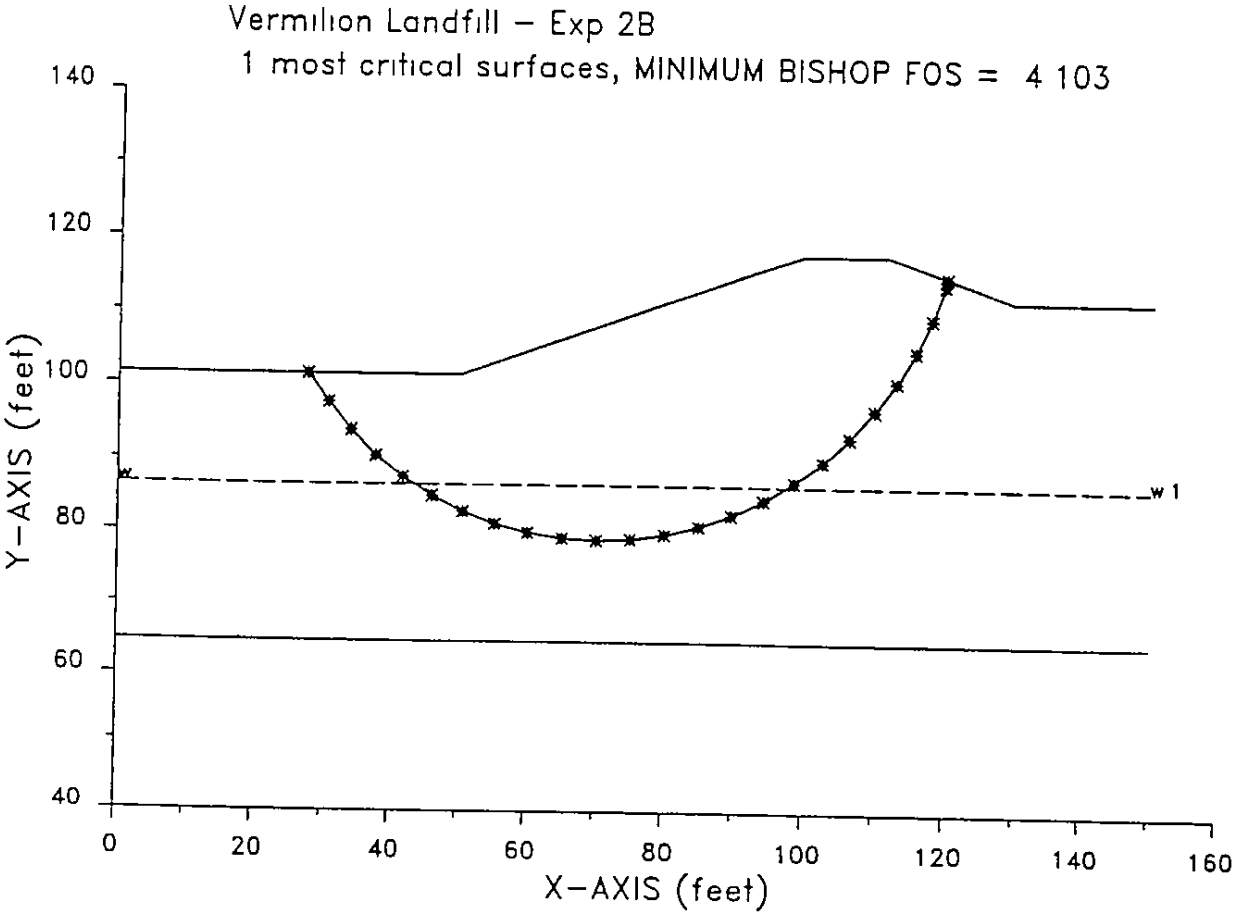
	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1	4 103	70 39	130 80	51 90	27 55	119 86	7 830E+06
2	4 105	69 53	128 39	52 46	24 49	120 22	8 393E+06
3	4 108	68 68	128 22	53 39	22 45	120 37	8 773E+06
4	4 109	68 33	133 30	54 99	23 47	120 21	8 596E+06
5	4 110	68 26	133 01	56 44	21 43	121 62	9 182E+06
6	4 111	68 91	131 11	51 70	26 53	118 27	7 746E+06
7	4 112	70 05	133 34	53 92	26 53	120 69	8 167E+06
8	4 113	71 77	130 04	51 77	28 57	121 18	7 865E+06
9	4 114	66 99	129 42	55 19	19 39	120 27	9 294E+06
10	4 115	69 42	127 96	53 91	22 45	121 59	8 982E+06

* * * END OF FILE * * *

To Dr Ricardo de Abreu
From K McMorris

Excavation Cut
Undrained

VERMCE3 11-10-04 12 14



X = 70 39
Y = 130.80
R = 51 90

Layer	γ	undrained	
		c psf	φ
Insitu Clay	120	1300	0
Insitu Sand	120	0	30°

Section B-B (Area 2-B)

Vern Por Landfill | Stability Analysis | KLM 10/29/04

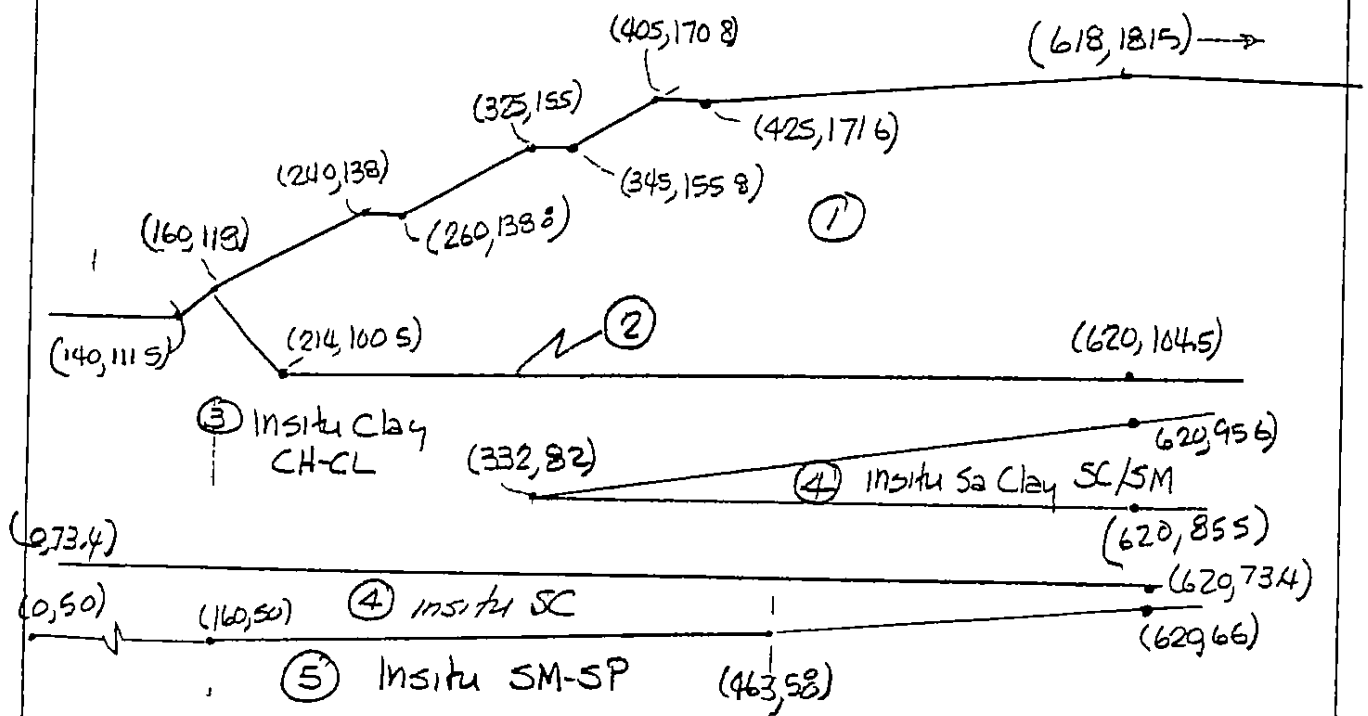
AREA 2-B
West Slope

VSECTBWG8

FOS = 1.71 | FOS = 3.3

undrain { X = 276.6, Y = 326.4, R = 272.8 }

DRAINED { X = 258.7, Y = 336.9, R = 236.4 }



SURFACE X	SURFACE Y
0	111.5
140	111.5
160	118
240	138
260	138.5
325	155
345	155.8
405	170.8
425	171.6
618	181.6

Bottom EXCAVATION X	Bottom EXCAVATION Y
160	118
214	100.5
620	104.5

Liner X	Liner Y
159	118
214	99.5
620	103.5

CH-CL/SC SM Wedge

X	Y
332	82
620	95.6

SC-SM/CH-CL Wedge

332	82
620	85.5

CH-CL/SC layer

0	73.4
620	73.4

SC/SM-SP

0	50
463	58
620	66

LAYER	γ PCF	undrain str C (PSF)	undrain str Φ (deg)	DRAIN C	DRAIN Φ
1 WASTE	63	300	23	300	23°
2 RCC Liner	120	1000	0	1000	0
3 Insitu Clay	120	1300	0	0	30°
4 Insitu SC/SM	115	400	0	0	25
5 Insitu Sand	115	0	30	0	30

Phreatic Surface

X	Y
0	85
620	87.5

AREA 2-B
West Slope

XSTABL File VSECTBW8 10-29-04 11 15

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
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*  Ver  5 204                96 - 1822  *
*****************************************
```
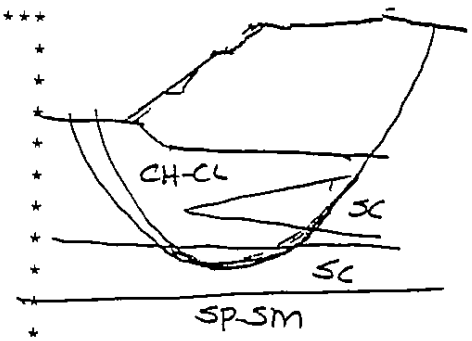



FOS = 1.71

Problem Description Vermilion Parish Landfill Sect BB

SEGMENT BOUNDARY COORDINATES
---

11 SURFACE boundary segments

Segment No	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	0	111 5	140 0	111 5	5
2	140 0	111 5	160 0	118 0	5
3	160 0	118 0	240 0	138 0	1
4	240 0	138 0	260 0	138 8	1
5	260 0	138 8	325 0	155 0	1
6	325 0	155 0	345 0	155 8	1
7	345 0	155 8	405 0	170 8	1
8	405 0	170 8	425 0	171 6	1
9	425 0	171 6	618 3	181 5	1
10	618 3	181 5	1247 4	181 5	1
11	1247 4	181 5	1300 0	181 5	1

32 SUBSURFACE boundary segments

Segment No	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	160 0	118 0	213 9	100 5	3
2	213 9	100 5	943 7	105 9	3
3	943 7	105 9	980 0	118 0	3
4	980 0	118 0	1060 0	138 0	4
5	1060 0	138 0	1080 0	138 8	4
6	1080 0	138 8	1145 0	160 1	4

7	1145 0	160 1	1165 0	160 9	4
8	1165 0	160 9	1247 4	181 5	4
9	159 0	118 0	213 9	99 5	5
10	213 9	99 5	943 7	104 9	5
11	943 7	104 9	981 0	118 0	5
12	981 0	118 0	1019 4	127 6	2
13	1019 4	127 6	1060 0	137 0	1
14	1060 0	137 0	1080 0	137 8	1 new wed
15	1080 0	137 8	1145 0	159 1	1
16	1145 0	159 1	1165 0	159 9	1
17	1165 0	159 9	1248 0	181 5	1
18	1019 4	127 6	1300 0	127 6	2
19	981 0	118 0	1005 8	105 6	5
20	1005 8	105 6	1250 0	105 6	5 wedge
21	332 0	82 0	733 0	100 9	6
22	733 0	100 9	766 0	101 0	6 C-400
23	766 0	101 0	966 0	105 0	6
24	966 0	105 0	1300 0	98 0	7
25	332 0	82 0	733 0	86 9	5
26	733 0	86 9	766 0	78 0	7
27	766 0	78 0	966 0	105 0	7
28	0	73 4	686 3	73 4	6
29	686 3	73 4	733 0	78 9	7
30	0	50 0	160 0	50 0	7
31	160 0	50 0	463 0	58 0	7
32	463 0	58 0	766 0	73 4	7

ISOTROPIC Soil Parameters
---

7 Soil unit(s) specified

Soil Unit No	Unit Weight Moist (pcf)	Unit Weight Sat (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No
1	63 0	63 0	300 0	23 00	000	0	1
2	63 0	63 0	300 0	18 00	000	0	1
3	120 0	120 0	1000 0	00	000	0	1
4	65 0	65 0	0	18 00	000	0	1
5	120 0	120 0	1300 0	00	000	0	1
6	115 0	115 0	400 0	00	000	0	1
7	115 0	115 0	0	30 00	000	0	1

RCC liner

Q-25 sand

1 Water surface(s) have been specified

Unit weight of water = 62 40 (pcf)

Water Surface No 1 specified by 2 coordinate points

****
PHREATIC SURFACE,

****

Point No	x-water (ft)	y-water (ft)
1	00	85 00
2	1300 00	90 00

A critical failure surface searching method using a random technique for generating CIRCULAR surfaces has been specified

2500 trial surfaces will be generated and analyzed

50 Surfaces initiate from each of 50 points equally spaced along the ground surface between x = 75 0 ft
and x = 240 0 ft

Each surface terminates between x = 350 0 ft
and x = 700 0 ft

Unless further limitations were imposed the minimum elevation at which a surface extends is y = 0 ft

10 0 ft line segments define each trial failure surface

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by

Lower angular limit = -45 0 degrees
Upper angular limit = -5 0 degrees

Factors of safety have been calculated by the

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 46 coordinate points

Point No	x-surf (ft)	y-surf (ft)
1	108 67	111 50
2	116 66	105 49
3	124 87	99 77
4	133 28	94 36
5	141 88	89 26
6	150 67	84 48
7	159 62	80 03
8	168 73	75 91
9	177 99	72 12
10	187 37	68 67
11	196 88	65 58
12	206 50	62 83
13	216 21	60 43
14	226 00	58 40
15	235 85	56 72
16	245 77	55 41
17	255 72	54 46
18	265 71	53 88
19	275 70	53 66
20	285 70	53 81
21	295 69	54 32
22	305 65	55 21
23	315 57	56 45
24	325 44	58 06
25	335 25	60 03
26	344 97	62 36
27	354 60	65 04
28	364 13	68 07
29	373 54	71 45
30	382 83	75 18
31	391 96	79 24
32	400 95	83 63
33	409 76	88 35
34	418 40	93 39
35	426 85	98 75
36	435 09	104 40
37	443 12	110 36
38	450 93	116 61
39	458 50	123 14
40	465 83	129 94
41	472 91	137 01
42	479 72	144 33
43	486 26	151 90
44	492 52	159 70
45	498 48	167 72
46	503 93	175 64

**** Simplified BISHOP FOS = 1 707 ****

The following is a summary of the TEN most critical surfaces

Problem Description Vermilion Parish Landfill Sect BB

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1	1 707	276 63	326 43	272 78	108 67	503 93	9 969E+07
2	1 716	269 12	302 32	249 31	108 67	483 19	8 662E+07
3	1 721	268 16	330 55	277 02	98 57	497 55	1 019E+08
4	1 735	266 44	378 10	324 33	81 73	520 47	1 299E+08
5	1 742	273 01	299 71	245 48	115 41	484 17	8 508E+07
6	1 744	303 43	368 04	312 20	125 51	551 13	1 241E+08
7	1 752	290 43	422 16	366 91	95 20	564 93	1 583E+08
8	1 754	335 79	299 77	244 79	169 29	548 10	8 745E+07
9	1 759	328 52	426 90	371 48	132 24	606 86	1 624E+08
10	1 768	333 57	404 92	349 59	142 35	601 73	1 487E+08

* * * END OF FILE * * *

AREA 2-B
West Slope
long term
properties
$\phi = 30°$
& $\phi = 25°$

FOS = 3.3

XSTABL File VSECTBWG 11-10-04 9 41

```
*****************************************
*              X S T A B L              *
*                                       *
*       Slope Stability Analysis        *
*              using the                *
*           Method of Slices            *
*                                       *
*       Copyright (C) 1992 - 2000       *
*  Interactive Software Designs  Inc    *
*       Moscow  ID 83843, U S A         *
*                                       *
*         All Rights Reserved           *
*                                       *
*  Ver  5 204                96 - 1822  *
*****************************************
```

Problem Description Vermilion Parish Landfill Sect BB

SEGMENT BOUNDARY COORDINATES
---

11 SURFACE boundary segments

Segment No	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	0	111 5	140 0	111 5	5
2	140 0	111 5	160 0	118 0	5
3	160 0	118 0	240 0	138 0	1
4	240 0	138 0	260 0	138 8	1
5	260 0	138 8	325 0	155 0	1
6	325 0	155 0	345 0	155 8	1
7	345 0	155 8	405 0	170 8	1
8	405 0	170 8	425 0	171 6	1
9	425 0	171 6	618 3	181 5	1
10	618 3	181 5	1247 4	181 5	1
11	1247 4	181 5	1300 0	181 5	1

32 SUBSURFACE boundary segments

Segment No	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	160 0	118 0	213 9	100 5	3
2	213 9	100 5	943 7	105 9	3
3	943 7	105 9	980 0	118 0	3
4	980 0	118 0	1060 0	138 0	4
5	1060 0	138 0	1080 0	138 8	4
6	1080 0	138 8	1145 0	160 1	4

7	1145 0	160 1	1165 0	160 9	4
8	1165 0	160 9	1247 4	181 5	4
9	159 0	118 0	213 9	99 5	5
10	213 9	99 5	943 7	104 9	5
11	943 7	104 9	981 0	118 0	5
12	981 0	118 0	1019 4	127 6	2
13	1019 4	127 6	1060 0	137 0	1
14	1060 0	137 0	1080 0	137 8	1
15	1080 0	137 8	1145 0	159 1	1
16	1145 0	159 1	1165 0	159 9	1
17	1165 0	159 9	1248 0	181 5	1
18	1019 4	127 6	1300 0	127 6	2
19	981 0	118 0	1005 8	105 6	5
20	1005 8	105 6	1250 0	105 6	5
21	332 0	82 0	733 0	100 9	6
22	733 0	100 9	766 0	101 0	6
23	766 0	101 0	966 0	105 0	6
24	966 0	105 0	1300 0	98 0	7
25	332 0	82 0	733 0	86 9	5
26	733 0	86 9	766 0	78 0	7
27	766 0	78 0	966 0	105 0	7
28	0	73 4	686 3	73 4	6
29	686 3	73 4	733 0	78 9	7
30	0	50 0	160 0	50 0	7
31	160 0	50 0	463 0	58 0	7
32	463 0	58 0	766 0	73 4	7

ISOTROPIC Soil Parameters
---

7 Soil unit(s) specified

Soil Unit No	Unit Weight Moist (pcf)	Unit Weight Sat (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No
1	63 0	63 0	300 0	23 00	000	0	1
2	63 0	63 0	300 0	18 00	000	0	1
3	120 0	120 0	1000 0	00	000	0	1
4	65 0	65 0	0	18 00	000	0	1
5	120 0	120 0	0	30 00	000	0	1
6	115 0	115 0	0	25 00	000	0	1
7	115 0	115 0	0	30 00	000	0	1

1 Water surface(s) have been specified

Unit weight of water = 62 40 (pcf)

Water Surface No 1 specified by 2 coordinate points

****
PHREATIC SURFACE

****

Point No	x-water (ft)	y-water (ft)
1	00	85 00
2	1300 00	90 00

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified

2500 trial surfaces will be generated and analyzed

50 Surfaces initiate from each of 50 points equally spaced along the ground surface between x = 75 0 ft
and x = 240 0 ft

Each surface terminates between x = 350 0 ft
and x = 700 0 ft

Unless further limitations were imposed the minimum elevation at which a surface extends is y = 0 ft

10 0 ft line segments define each trial failure surface

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by

Lower angular limit = -45 0 degrees
Upper angular limit = -5 0 degrees

Factors of safety have been calculated by the

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 30 coordinate points

****

Point No	x-water (ft)	y-water (ft)
1	00	85 00
2	1300 00	90 00

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified

2500 trial surfaces will be generated and analyzed

50 Surfaces initiate from each of 50 points equally spaced along the ground surface between x = 75 0 ft
and x = 240 0 ft

Each surface terminates between x = 350 0 ft
and x = 700 0 ft

Unless further limitations were imposed the minimum elevation at which a surface extends is y = 0 ft

10 0 ft line segments define each trial failure surface

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by

Lower angular limit = -45 0 degrees
Upper angular limit = -5 0 degrees

Factors of safety have been calculated by the

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 30 coordinate points

Point No	x-surf (ft)	y-surf (ft)
1	165 92	119 48
2	175 20	115 75
3	184 63	112 42
4	194 19	109 49
5	203 86	106 97
6	213 64	104 86
7	223 49	103 16
8	233 41	101 88
9	243 38	101 03
10	253 37	100 59
11	263 37	100 58
12	273 36	100 99
13	283 32	101 82
14	293 24	103 08
15	303 10	104 75
16	312 88	106 84
17	322 56	109 34
18	332 13	112 24
19	341 57	115 55
20	350 86	119 26
21	359 98	123 35
22	368 92	127 83
23	377 67	132 68
24	386 20	137 90
25	394 50	143 47
26	402 56	149 39
27	410 37	155 64
28	417 90	162 22
29	425 14	169 11
30	427 68	171 74

**** Simplified BISHOP FOS = 3 325 ****

The following is a summary of the TEN most critical surfaces

Problem Description Vermilion Parish Landfill Sect BB

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1	3 325	258 65	336 92	236 39	165 92	427 68	7 003E+07
2	3 366	235 57	428 73	322 12	155 82	429 89	8 481E+07
3	3 374	241 07	385 21	285 95	149 08	431 52	9 022E+07
4	3 377	219 21	467 28	361 48	145 71	427 26	9 453E+07
5	3 383	254 51	388 48	287 04	159 18	443 56	9 311E+07
6	3 389	251 75	378 93	275 15	162 55	433 08	8 014E+07
7	3 392	214 14	497 43	393 84	135 61	436 16	1 151E+08
8	3 393	212 38	495 40	391 50	135 61	433 01	1 114E+08

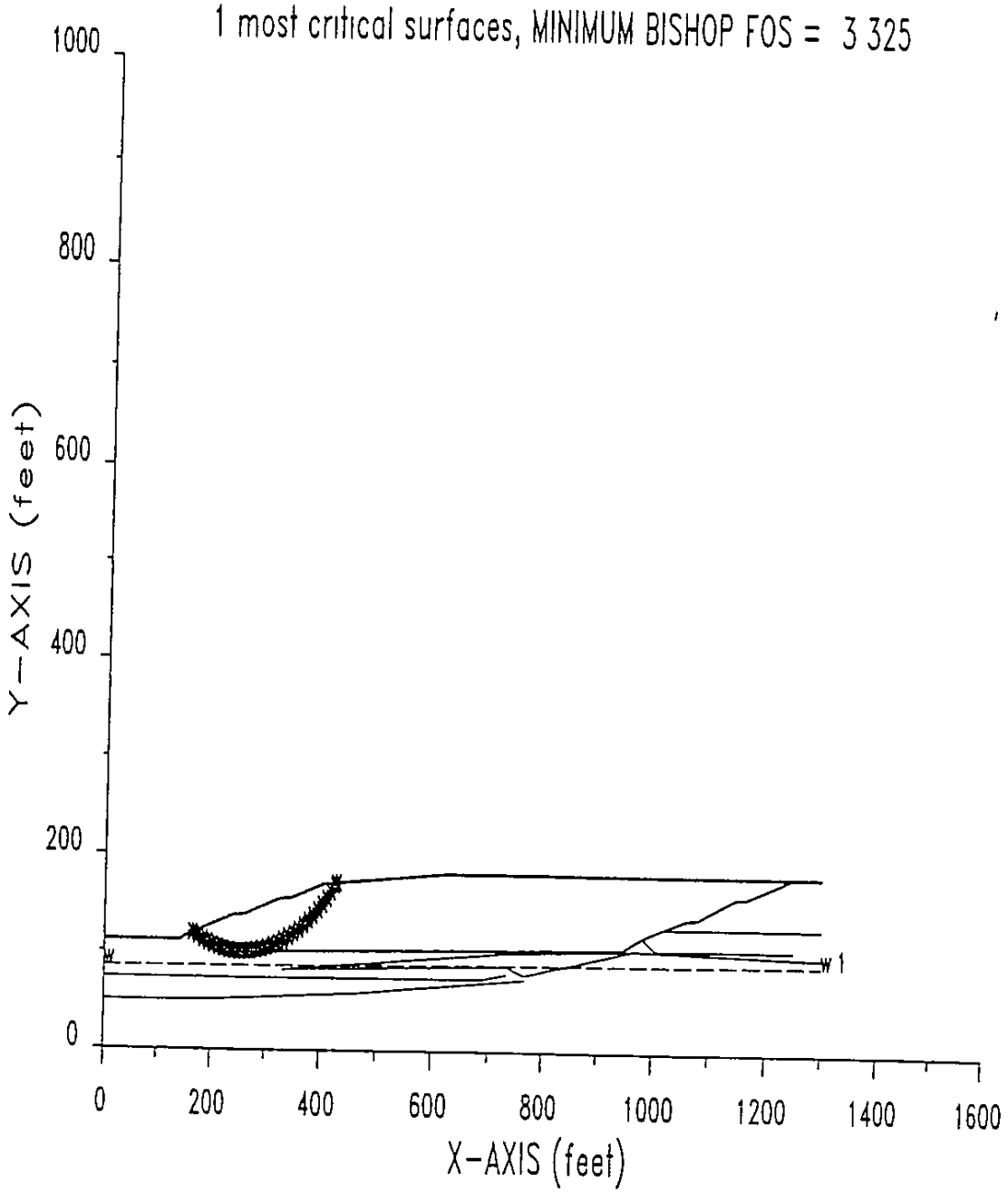
9	3 399	203 90	522 04	416 18	135 61	428 62	1 083E+08
10	3 402	230 37	450 63	351 23	138 98	444 96	1 193E+08

* * * END OF FILE * * *

VSECTBWC 11-10-04 9 41

Vermilion Parish Landfill Sect BB

1 most critical surfaces, MINIMUM BISHOP FOS = 3 325



Area 2-B
Block
liner Interface

XSTABL File VSECTBWD 11-09-04 15 19

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 - 2000      *
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*        Moscow, ID 83843  U S A        *
*                                       *
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*                                       *
*  Ver  5 204                96 - 1822  *
*****************************************
```

FS-1.97

Problem Description Vermilion Parish Landfill Sect BB

SEGMENT BOUNDARY COORDINATES
---

11 SURFACE boundary segments

Segment No	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	0	111 5	140 0	111 5	5
2	140 0	111 5	160 0	118 0	5
3	160 0	118 0	240 0	138 0	1
4	240 0	138 0	260 0	138 8	1
5	260 0	138 8	325 0	155 0	1
6	325 0	155 0	345 0	155 8	1
7	345 0	155 8	405 0	170 8	1
8	405 0	170 8	425 0	171 6	1
9	425 0	171 6	618 3	181 5	1
10	618 3	181 5	1247 4	181 5	1
11	1247 4	181 5	1300 0	181 5	1

32 SUBSURFACE boundary segments

Segment No	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	160 0	118 0	213 9	100 5	3
2	213 9	100 5	943 7	105 9	3
3	943 7	105 9	980 0	118 0	3
4	980 0	118 0	1060 0	138 0	4
5	1060 0	138 0	1080 0	138 8	4
6	1080 0	138 8	1145 0	160 1	4

7	1145 0	160 1	1165 0	160 9	4
8	1165 0	160 9	1247 4	181 5	4
9	159 0	118 0	213 9	99 5	5
10	213 9	99 5	943 7	104 9	5
11	943 7	104 9	981 0	118 0	5
12	981 0	118 0	1019 4	127 6	2
13	1019 4	127 6	1060 0	137 0	1
14	1060 0	137 0	1080 0	137 8	1
15	1080 0	137 8	1145 0	159 1	1
16	1145 0	159 1	1165 0	159 9	1
17	1165 0	159 9	1248 0	181 5	1
18	1019 4	127 6	1300 0	127 6	2
19	981 0	118 0	1005 8	105 6	5
20	1005 8	105 6	1250 0	105 6	5
21	332 0	82 0	733 0	100 9	6
22	733 0	100 9	766 0	101 0	6
23	766 0	101 0	966 0	105 0	6
24	966 0	105 0	1300 0	98 0	7
25	332 0	82 0	733 0	86 9	5
26	733 0	86 9	766 0	78 0	7
27	766 0	78 0	966 0	105 0	7
28	0	73 4	686 3	73 4	6
29	686 3	73 4	733 0	78 9	7
30	0	50 0	160 0	50 0	7
31	160 0	50 0	463 0	58 0	7
32	463 0	58 0	766 0	73 4	7

ISOTROPIC Soil Parameters
---

7 Soil unit(s) specified

Soil Unit No	Unit Weight Moist (pcf)	Unit Weight Sat (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No
1	63 0	63 0	300 0	23 00	000	0	1
2	63 0	63 0	300 0	18 00	000	0	1
3	120 0	120 0	0	10 00	000	0	1
4	65 0	65 0	0	18 00	000	0	1
5	120 0	120 0	1300 0	00	000	0	1
6	115 0	115 0	400 0	00	000	0	1
7	115 0	115 0	0	30 00	000	0	1

1 Water surface(s) have been specified

Unit weight of water = 62 40 (pcf)

Water Surface No 1 specified by 2 coordinate points

****
PHREATIC SURFACE

****

Point No	x-water (ft)	y-water (ft)
1	00	85 00
2	1300 00	90 00

A SINGLE FAILURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by
the following 4 coordinate points

Point No	x-surf (ft)	y-surf (ft)
1	160 00	118 00
2	214 00	100 00
3	325 00	100 50
4	425 00	171 60

****

SELECTED METHOD OF ANALYSIS Spencer (1973)

****

****

SUMMARY OF INDIVIDUAL SLICE INFORMATION

****

Slice	x-base (ft)	y-base (ft)	height (ft)	width (ft)	alpha	beta	weight (lb)
1	186 95	109 02	15 72	53 90	-18 43	14 04	54100
2	213 95	100 02	31 47	10	-18 43	14 04	201
3	227 00	100 06	34 69	26 00	26	14 04	57622
4	250 00	100 16	38 24	20 00	26	2 29	48869
5	292 50	100 35	46 55	65 00	26	13 99	193305
6	325 58	100 92	54 11	1 17	35 41	2 29	4010
7	335 58	108 03	47 40	18 83	35 41	2 29	56233
8	375 00	136 05	27 25	60 00	35 41	14 04	103005
9	415 00	164 49	6 71	20 00	35 41	2 29	8455

ITERATIONS FOR SPENCER'S METHOD

Iter #	Theta	FOS_force	FOS_moment
2	8 5892	1 9648	2 0063
3	8 6263	1 9654	1 9648

SLICE INFORMATION continued

Slice	Sigma (psf)	c-value (psf)	phi	U-base (lb)	U-top (lb)	P-top (lb)	Delta
1	1108 0	0	10 00	0	0	0	00
2	2219 0	0	10 00	0	0	0	00
3	2244 4	0	10 00	0	0	0	00
4	2474 5	0	10 00	0	0	0	00
5	3011 6	0	10 00	0	0	0	00
6	2963 8	0	10 00	0	0	0	00
7	2360 9	300 0	23 00	0	0	0	00
8	1327 8	300 0	23 00	0	0	0	00
9	274 6	300 0	23 00	0	0	0	00

SPENCER'S (1973) - TOTAL Stresses at center of slice base

Slice #	Base x-coord (ft)	Normal Stress (psf)	Vertical Stress (psf)	Pore Water Pressure (psf)	Shear Stress (psf)
1	186 95	1108 0	1003 7	0	99 4
2	213 95	2219 0	2010 2	0	199 1
3	227 00	2244 4	2216 2	0	201 4
4	250 00	2474 5	2443 5	0	222 0
5	292 50	3011 6	2973 9	0	270 2
6	325 58	2963 8	3432 2	0	265 9
7	335 58	2360 9	2986 1	0	662 5
8	375 00	1327 8	1716 8	0	439 4
9	415 00	274 6	422 7	0	211 9

SPENCER S (1973) - Magnitude & Location of Interslice Forces

Slice #	Right x-coord (ft)	Force Angle (degrees)	Interslice Force (lb)	Force Height (ft)	Boundary Height (ft)	Height Ratio
1	213 90	8 63	25553	13 07	31 44	416
2	214 00	8 63	25648	13 07	31 50	415
3	240 00	8 63	30677	14 44	37 88	381
4	260 00	8 63	34943	15 44	38 59	400
5	325 00	8 63	51814	18 42	54 50	338
6	326 17	8 63	49638	18 56	53 72	346
7	345 00	8 63	30285	16 53	41 08	402
8	405 00	8 63	-339	5 59	13 42	417
9	425 00	00	-1	3 54	00	000

AVERAGE VALUES ALONG FAILURE SURFACE

Total Normal Stress = 1823 93 (psf)
Pore Water Pressure = 00 (psf)
Shear Stress = 296 42 (psf)

Total Length of failure surface = 290 62 feet

For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a

FACTOR OF SAFETY = 1 965

Total shear strength available along specified failure surface = 169 31E+03 lb

****

For the specified surface the analysis computed the following

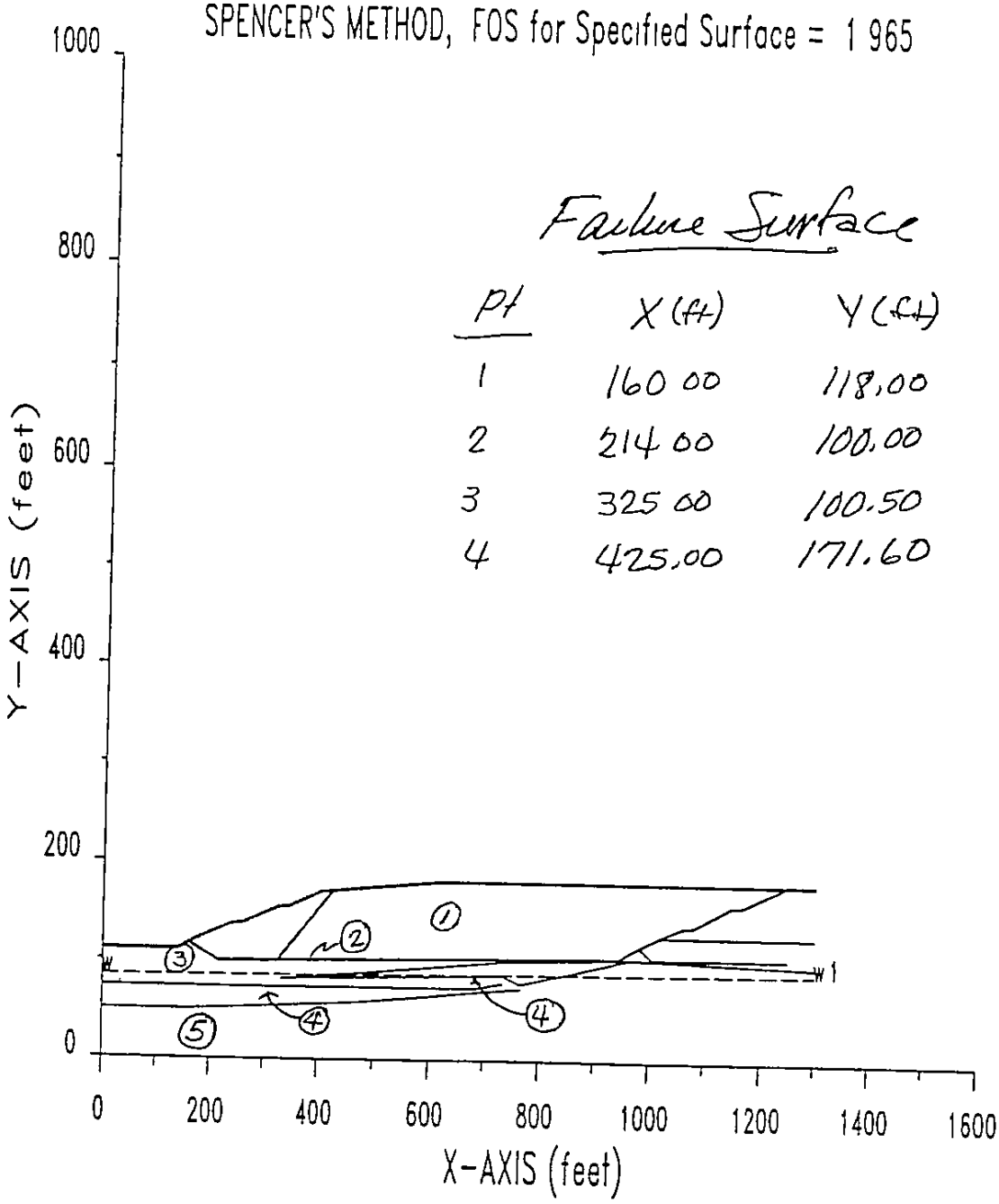
Negative (tensile) Normal Effective Force = 0 slices
Negative (tensile) Interslice Force = 1 slices
Unreasonable Location of Interslice Force = 0 slices

Area 2-B
Undrained
Non-Circular/Bloc
Failure at
liner interface

VSECTBWD 11-09-04 15 19

Vermilion Parish Landfill Sect BB

SPENCER'S METHOD, FOS for Specified Surface = 1 965



Failure Surface

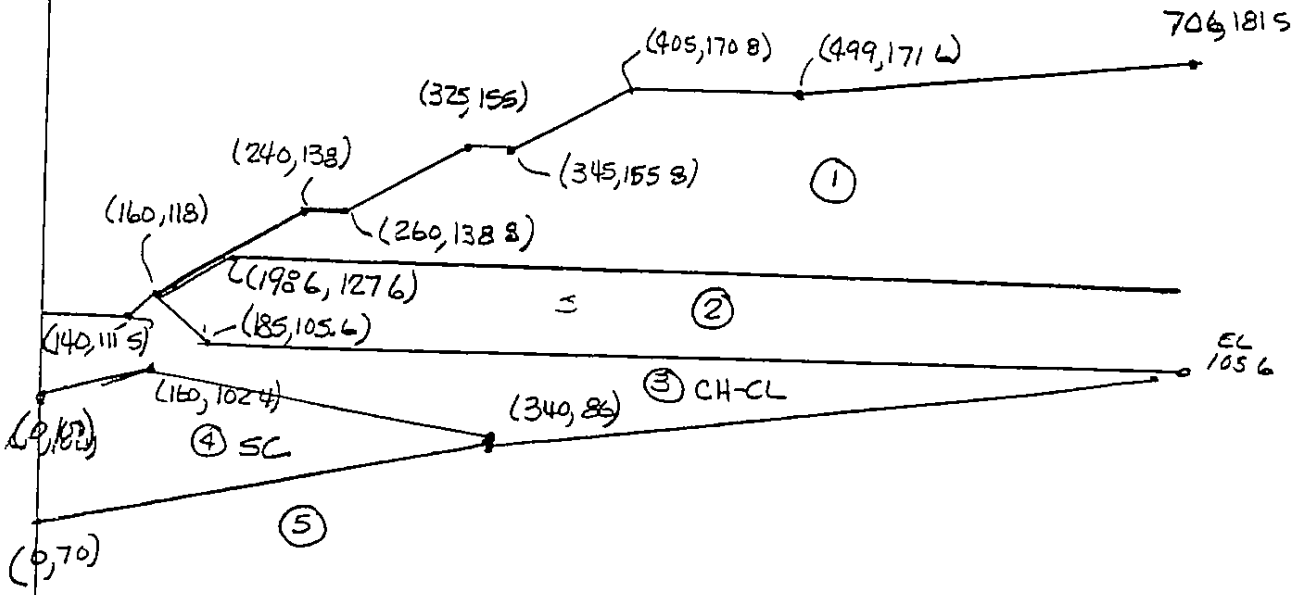
Pt	X (ft)	Y (ft)
1	160 00	118.00
2	214 00	100.00
3	325 00	100.50
4	425.00	171.60

Section F-F (Area I-A)

AREA I-A
SECT FF
F.O.S = 2

Undrained
F.O.S = 1.97
X = 240.9
Y = 271.9
R = 190.16

DRAINED
F.O.S. = 2.97
X = 226.8
Y = 496.8
R = 390.3



SURFACE X	SURFACE Y
0	111.5
140	111.5
160	118
240	138
260	138.8
325	155
345	155.8
405	170.8
499	171.6
706	181.5

EXCAVATION X	EXCAVATION Y
160	118
185	105.6
700+	105.6

SANITARY WASTE X	SANITARY WASTE Y
199	127.6
700+	127.6

CH-CL/SC X	CH-CL/SC Y
0	100
160	102.4
340	86

Phreatic Surface X	Phreatic Surface Y
0	97
700	89

SC/SM SP X	SC/SM SP Y
0	70
340	86

CH-CL/SM-SP X	CH-CL/SM-SP Y
340	86
750	100.5

LAYER	γ PCF	Undrain St C (PSF)	Undrain St Φ (deg)	DRAIN. STR C	DRAIN. STR Φ
1 WASTE	63	300	23	300	23
2 Sanitary Waste	63	300	18	300	18
3 Insitu CLAY	120	1300	0	300	30°
4 Insitu SC	115	400	0	450	25°
5 Insitu Sand	115	0	30°	0	30°

AREA I-A
SECT FF
North Slope
Reduce T=c=400
ML/SM

XSTABL File VSECTFN2 10-25-04 15 07

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*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 - 2000      *
*   Interactive Software Designs, Inc   *
*        Moscow, ID 83843, U S A        *
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*                                       *
*  Ver  5 204                96 - 1822  *
*****************************************
```

FOS = 2.0

Problem Description Vermilion Parish Landfill Sect FF

SEGMENT BOUNDARY COORDINATES
---

19 SURFACE boundary segments

Segment No	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	0	111 5	140 0	111 5	3
2	140 0	111 5	160 0	118 0	3
3	160 0	118 0	198 6	127 6	2
4	198 6	127 6	240 0	138 0	1
5	240 0	138 0	260 0	138 8	1
6	260 0	138 8	324 8	155 0	1
7	324 8	155 0	344 8	155 8	1
8	344 8	155 8	404 8	170 8	1
9	404 8	170 8	498 8	171 6	1
10	498 8	171 6	706 7	181 5	1
11	706 7	181 5	933 8	171 6	1
12	933 8	171 6	955 0	170 8	1
13	955 0	170 8	1141 7	155 8	1
14	1141 7	155 8	1161 7	155 0	1
15	1161 7	155 0	1226 5	138 8	1
16	1226 5	138 8	1246 5	138 0	1
17	1246 5	138 0	1287 9	127 6	1
18	1287 9	127 6	1326 5	118 0	1
19	1326 5	118 0	1346 5	111 5	3

13 SUBSURFACE boundary segments

Segment	x-left	y-left	x-right	y-right	Soil Unit

No	(ft)	(ft)	(ft)	(ft)	Below Segment
1	198 6	127 6	1287 9	127 6	2
2	160 0	118 0	184 8	105 6	3
3	184 8	105 6	839 8	105 6	3
4	839 8	105 6	864 6	118 0	3
5	864 6	118 0	884 6	118 0	3
6	884 6	118 0	909 4	105 6	3
7	909 4	105 6	1301 7	105 6	3
8	1301 7	105 6	1326 5	118 0	3
9	0	100 0	160 0	102 4	4
10	160 0	102 4	340 0	86 0	4
11	0	70 0	340 0	85 9	5
12	340 0	85 9	750 0	105 0	5
13	750 0	105 0	1345 0	100 5	5

ISOTROPIC Soil Parameters
---

5 Soil unit(s) specified

Soil Unit No	Unit Weight Moist (pcf)	Unit Weight Sat (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No
1	63 0	63 0	300 0	23 00	000	0	1
2	63 0	63 0	300 0	18 00	000	0	1
3	120 0	120 0	1300 0	00	000	0	1
4	115 0	115 0	400 0	00	000	0	1
5	115 0	115 0	0	30 00	000	0	1

1 Water surface(s) have been specified

Unit weight of water = 62 40 (pcf)

Water Surface No 1 specified by 2 coordinate points

****
PHREATIC SURFACE
****

Point No	x-water (ft)	y-water (ft)
1	00	97 00
2	1320 00	83 00

A critical failure surface searching method using a random technique for generating CIRCULAR surfaces has been specified

2500 trial surfaces will be generated and analyzed

50 Surfaces initiate from each of 50 points equally spaced along the ground surface between x = 75 0 ft
and x = 200 0 ft

Each surface terminates between x = 350 0 ft
and x = 710 0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = 0 ft

10 0 ft line segments define each trial failure surface

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by

Lower angular limit = -45 0 degrees
Upper angular limit = -5 0 degrees

Factors of safety have been calculated by the

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 31 coordinate points

Point No	x-surf (ft)	y-surf (ft)
1	138 78	111 50
2	147 35	106 36
3	156 18	101 67
4	165 25	97 45
5	174 53	93 72
6	183 99	90 48
7	193 61	87 74
8	203 36	85 51
9	213 21	83 80
10	223 14	82 61

11	233 11	81 94
12	243 11	81 79
13	253 11	82 17
14	263 06	83 08
15	272 96	84 51
16	282 77	86 46
17	292 46	88 92
18	302 01	91 88
19	311 39	95 35
20	320 58	99 30
21	329 55	103 73
22	338 27	108 62
23	346 72	113 97
24	354 87	119 75
25	362 72	125 96
26	370 22	132 57
27	377 37	139 56
28	384 14	146 92
29	390 51	154 63
30	396 47	162 66
31	401 30	169 92

**** Simplified BISHOP FOS = 1 968 ****

The following is a summary of the TEN most critical surfaces

Problem Description Vermilion Parish Landfill Sect FF

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1	1 968	240 85	271 93	190 16	138 78	401 30	3 980E+07
2	1 988	249 11	396 39	313 46	118 37	467 23	9 252E+07
3	2 010	227 82	370 14	287 16	103 06	434 76	7 702E+07
4	2 011	229 89	328 88	245 49	115 82	417 75	5 954E+07
5	2 017	228 64	286 10	203 82	123 47	394 93	4 316E+07
6	2 021	244 98	369 48	285 16	123 47	449 84	7 895E+07
7	2 034	240 05	461 50	379 69	92 86	485 08	1 240E+08
8	2 039	271 39	337 33	254 31	148 98	463 96	7 203E+07
9	2 048	207 41	371 83	290 92	77 55	417 80	7 543E+07
10	2 060	205 33	348 61	268 15	80 10	406 00	6 535E+07

* * * END OF FILE * * *

SECT FF
North Slope
Area I-A
F.O.S = 2.96
long term

XSTABL File ' VSECTFN5 11-10-04 9 55

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 - 2000      *
*   Interactive Software Designs, Inc   *
*        Moscow, ID 83843  U S A        *
*                                       *
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*                                       *
*  Ver  5 204                96 -'1822  *
*****************************************
```

Problem Description Vermilion Parish Landfill Sect FF

SEGMENT BOUNDARY COORDINATES
---

19 SURFACE boundary segments

Segment No	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	0	111 5	140 0	111 5	3
2	140 0	111 5	160 0	118 0	3
3	160 0	118 0	198 6	127 6	2
4	198 6	127 6	240 0	138 0	1
5	240 0	138 0	260 0	138 8	1
6	260 0	138 8	324 8	155 0	1
7	324 8	155 0	344 8	155 8	1
8	344 8	155 8	404 8	170 8	1
9	404 8	170 8	498 8	171 6	1
10	498 8	171 6	706 7	181 5	1
11	706 7	181 5	933 8	171 6	1
12	933 8	171 6	955 0	170 8	1
13	955 0	170 8	1141 7	155 8	1
14	1141 7	155 8	1161 7	155 0	1
15	1161 7	155 0	1226 5	138 8	1
16	1226 5	138 8	1246 5	138 0	1
17	1246 5	138 0	1287 9	127 6	1
18	1287 9	127 6	1326 5	118 0	1
19	1326 5	118 0	1346 5	111 5	3

13 SUBSURFACE boundary segments

Segment	x-left	y-left	x-right	y-right	Soil Unit

No	(ft)	(ft)	(ft)	(ft)	Below Segment
1	198 6	127 6	1287 9	127 6	2
2	160 0	118 0	184 8	105 6	3
3	184 8	105 6	839 8	105 6	3
4	839 8	105 6	864 6	118 0	3
5	864 6	118 0	884 6	118 0	3
6	884 6	118 0	909 4	105 6	3
7	909 4	105 6	1301 7	105 6	3
8	1301 7	105 6	1326 5	118 0	3
9	0	100 0	160 0	102 4	4
10	160 0	102 4	340 0	86 0	4
11	0	70 0	340 0	85 9	5
12	340 0	85 9	750 0	105 0	5
13	750 0	105 0	1345 0	100 5	5

ISOTROPIC Soil Parameters
---

5 Soil unit(s) specified

Soil Unit No	Unit Weight Moist (pcf)	Unit Weight Sat (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No
1	63 0	63 0	300 0	23 00	000	0	1
2	63 0	63 0	300 0	18 00	000	0	1
3	120 0	120 0	0	30 00	000	0	1
4	115 0	115 0	0	25 00	000	0	1
5	115 0	115 0	0	30 00	000	0	1

1 Water surface(s) have been specified

Unit weight of water = 62 40 (pcf)

Water Surface No 1 specified by 2 coordinate points

****
PHREATIC SURFACE
****

Point No	x-water (ft)	y-water (ft)
1	00	97 00
2	1320 00	83 00

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified

2500 trial surfaces will be generated and analyzed

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and x = 200 0 ft

Each surface terminates between x = 350 0 ft
and x = 710 0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = 0 ft

10 0 ft line segments define each trial failure surface

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by

Lower angular limit = -45 0 degrees
Upper angular limit = -5 0 degrees

Factors of safety have been calculated by the

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 32 coordinate points

Point No	x-surf (ft)	y-surf (ft)
1	148 98	114 42
2	158 80	112 55
3	168 67	110 93
4	178 58	109 57
5	188 52	108 46
6	198 48	107 60
7	208 46	107 01
8	218 46	106 66
9	228 46	106 58
10	238 45	106 75

11	248 45	107 17
12	258 42	107 85
13	268 38	108 79
14	278 31	109 98
15	288 20	111 43
16	298 06	113 13
17	307 86	115 08
18	317 62	117 28
19	327 31	119 73
20	336 94	122 43
21	346 50	125 37
22	355 98	128 56
23	365 37	131 99
24	374 67	135 66
25	383 88	139 56
26	392 98	143 70
27	401 98	148 08
28	410 85	152 68
29	419 61	157 51
30	428 24	162 56
31	436 74	167 83
32	441 75	171 11

**** Simplified BISHOP FOS = 2 967 ****

The following is a summary of the TEN most critical surfaces

Problem Description Vermilion Parish Landfill Sect FF

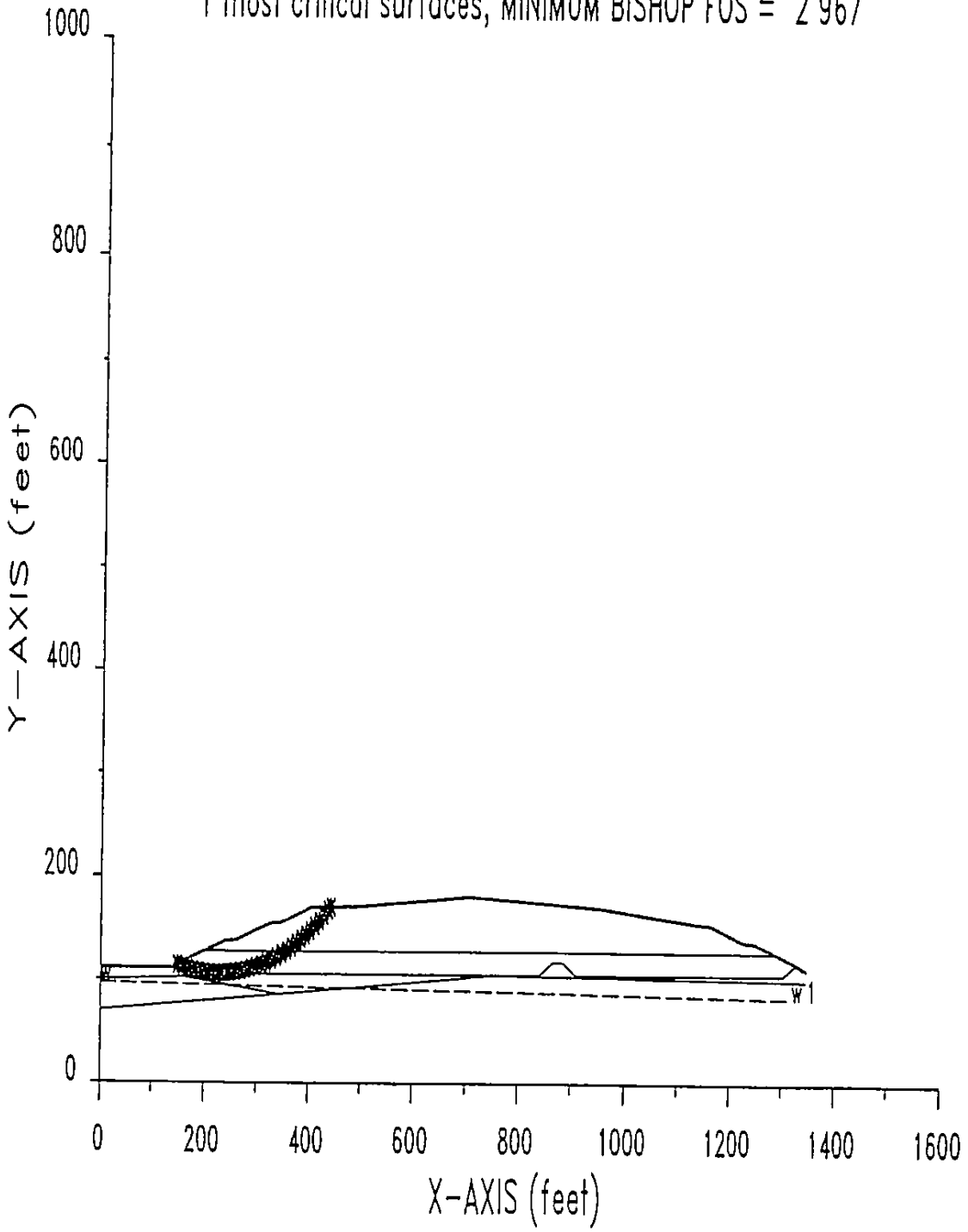
	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1	2 967	226 84	496 83	390 26	148 98	441 75	9 610E+07
2	2 971	224 16	492 09	385 08	148 98	436 83	9 131E+07
3	3 005	240 42	378 84	272 04	161 73	415 79	5 843E+07
4	3 012	240 83	407 91	302 94	156 63	429 63	7 520E+07
5	3 018	203 34	554 69	449 04	131 12	436 69	1 098E+08
6	3 019	255 95	399 51	292 28	169 39	438 23	7 083E+07
7	3 022	214 27	535 90	427 73	146 43	437 50	9 855E+07
8	3 027	212 25	485 24	379 99	141 33	425 82	8 991E+07
9	3 068	244 82	389 53	284 97	159 18	427 64	7 200E+07
10	3 071	271 55	339 52	232 23	184 69	431 29	5 362E+07

* * * END OF FILE * * *

VSECTFN5 11-10-04 9 55

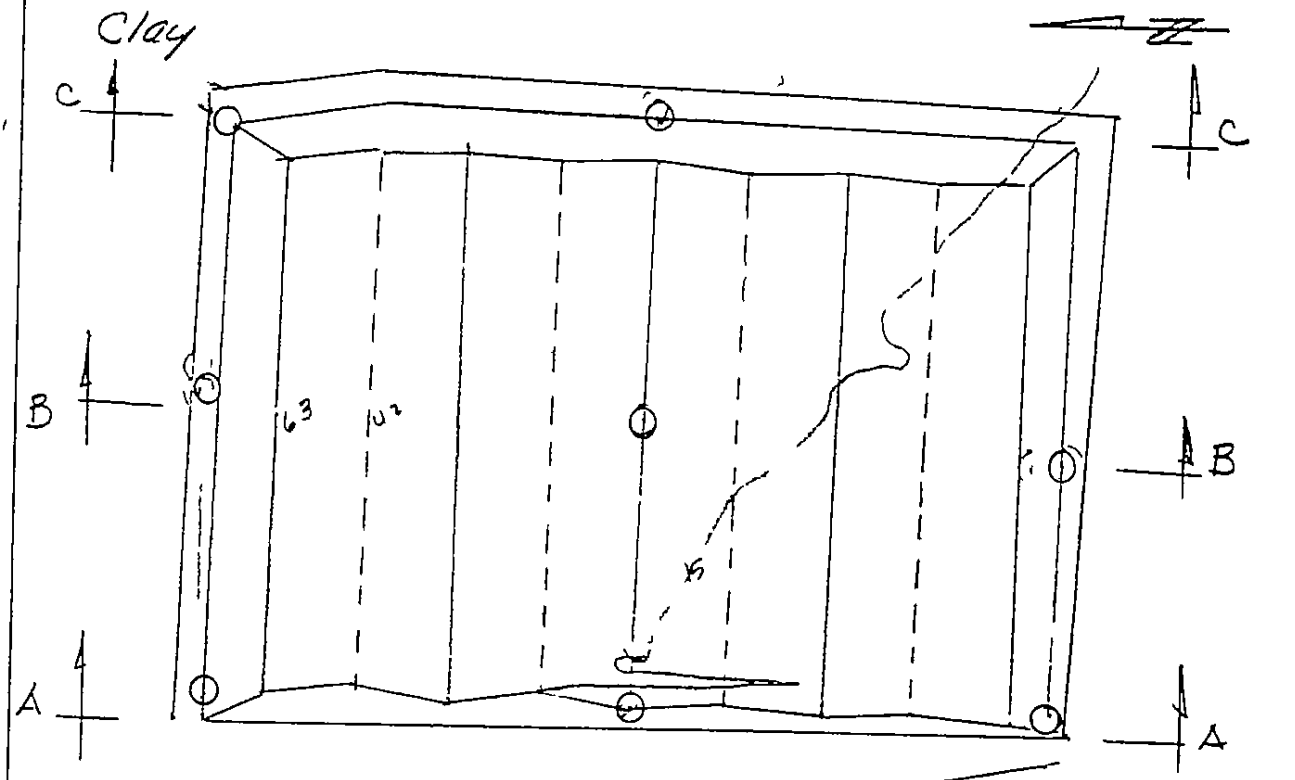
Vermilion Parish Landfill Sect FF

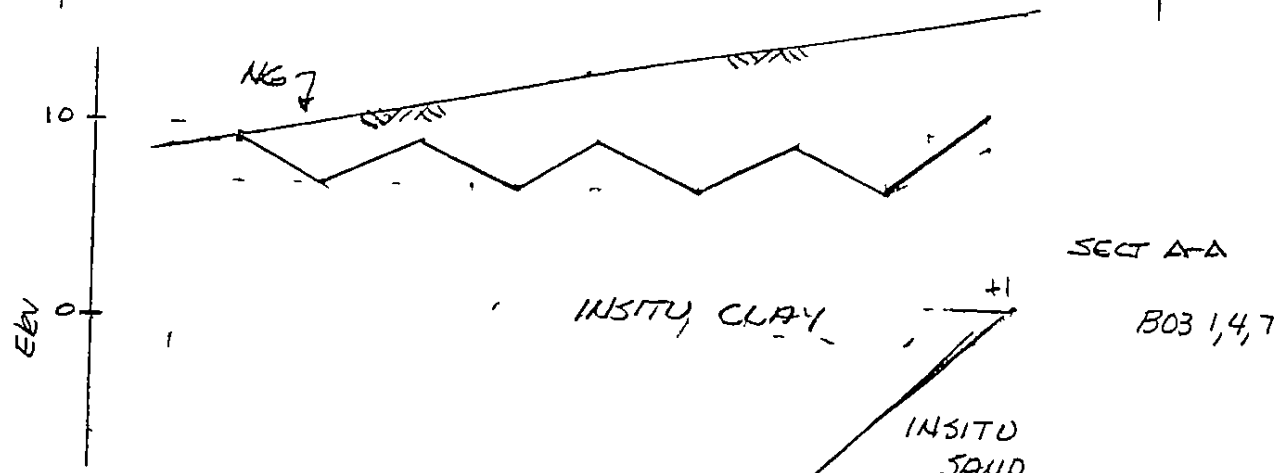
1 most critical surfaces, MINIMUM BISHOP FOS = 2 967



Settlement Calculations

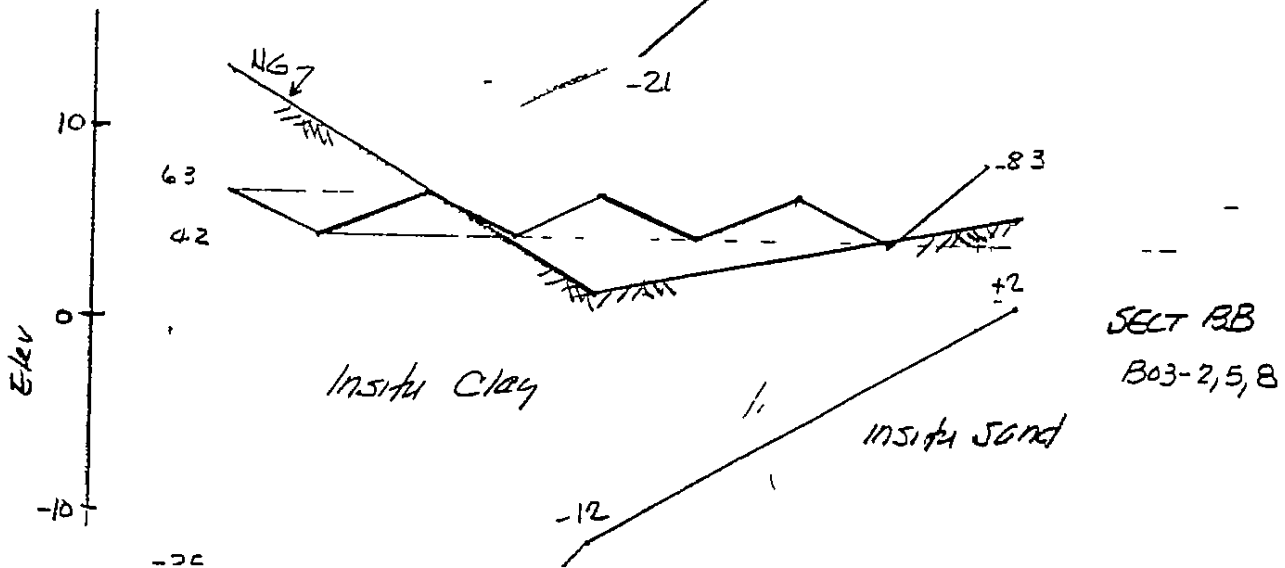
SETTLEMENT IN NATURAL SOILS





SECT A-A

B03 1,4,7

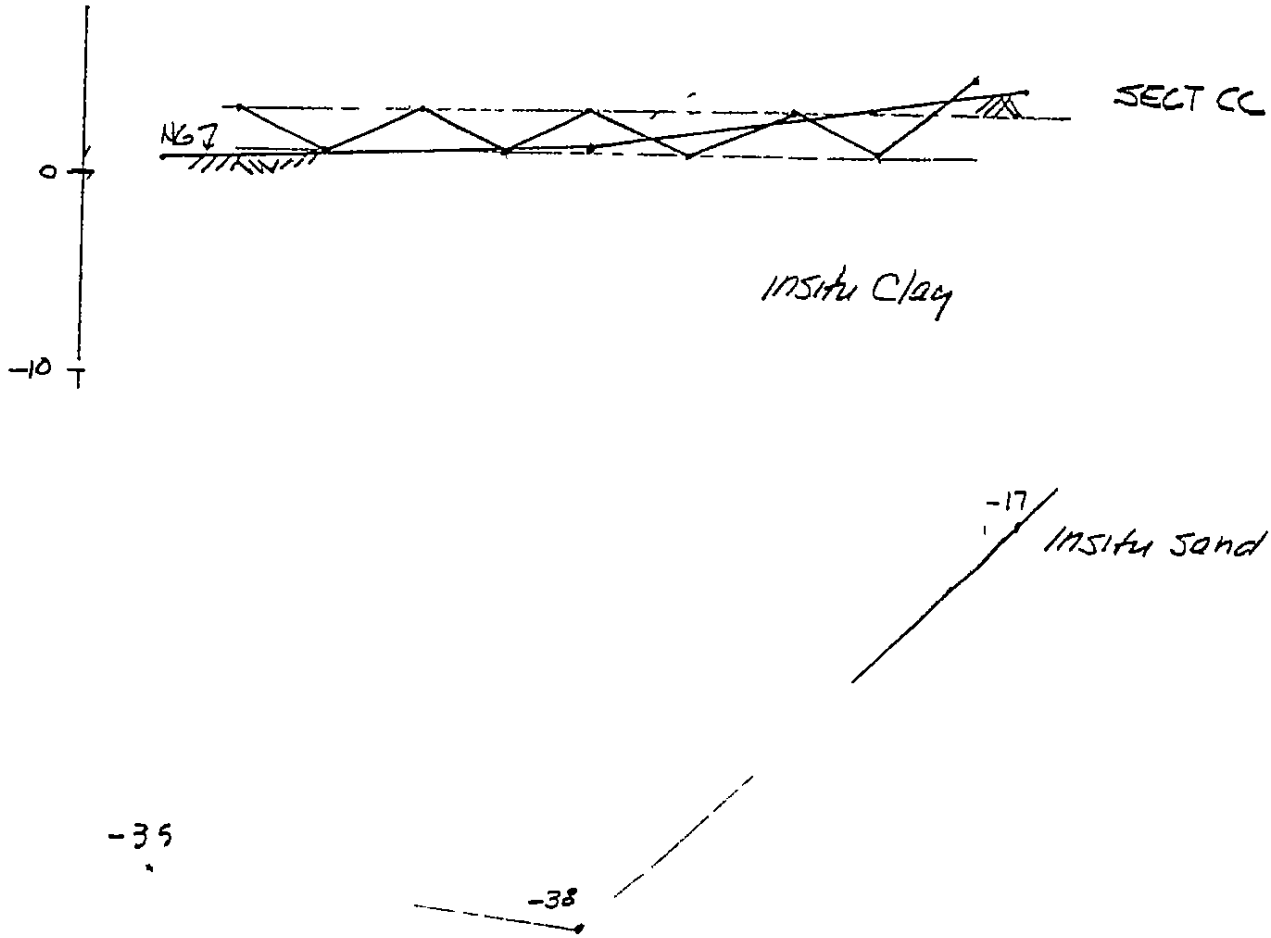


SECT BB

B03-2,5,8

VERM PAR LF

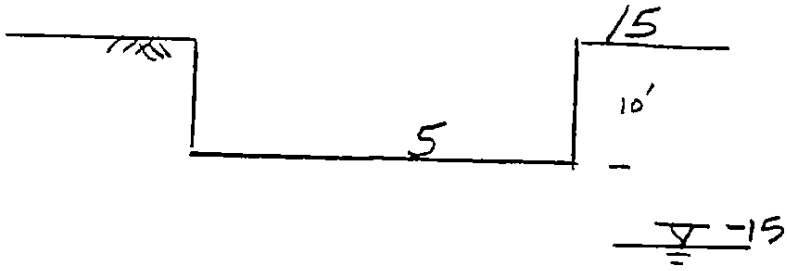
11/02/04 KLM



Settlement in Natural Soil

Area 2-B is located in borrow area. The Site Plan Showing Existing Topography (Exhibit A-5) showed the natural grade to vary from ~ El 11 ft to El 17 ft in 1994 Survey.

Seller's design places liner protective sand at elevations varying from El +9.1 to 3.6 and El 6.9 to +1.5 ft. Say, on average, apprx EL+5 ft.



1) Liner (+4) stresses

$\gamma \cong 125$ pcf

unload $-10(125) = -1250$ psf
Reload $+10(63) = +630$

No settlement until waste = (1250-630)/63 = 98 ft

SAY ~ 10 ft Above Grade

2) Rebound

DEPTH EL	$\bar{z}$ Ft below EL	+tsf $\bar{\sigma}_o$ $\gamma(\bar{z}+10)$	+tsf $\Delta\sigma$ $\gamma_f \times 10$	+tsf $\bar{\sigma}_f$ $\bar{\sigma}_o - \Delta\sigma$	Consol Test	Consol Graph ϵ_o	ϵ_f	$\Delta\epsilon$	h in	Δh in
4 - -1	2.5	0.78	-0.625	0.155	B03-5	.051	.0315	-.0195	60	-1.17
-1 -6	7.5	1.09	"	0.465	03-1063	.054	.045	-.009	60	-0.54
-6 - 11	12.5	1.40	"	0.775		.0576	.0504	-.0072	60	-0.432
-11 - 16	17.5	1.71	"	1.085		.06	.054	-.006	60	-0.36
-16 - 21	22.5	2.03	"	1.405		.063	.0576	-.0054	60	-0.324
-21 - 26	27.5	2.34		1.716		0.064	.06	-.004	60	-0.24
-26 -31	32.5	2.65		2.025		0.066	.063	-.003	60	-0.18
+4 - -1		0.78	-0.32	0.46		.051	.045	.006	60	+0.36
-1 -6		1.09	"	0.77		.054	.0504	.0036	60	+0.21
-6 - -11		1.40	"	1.08		.0576	.054	.0036	60	+0.21
-11 - 16		1.71	"	1.38		.06	.0576	.0024	60	+0.14
-16 - -21		2.03	"	1.71		.063	.06	.003	60	+0.18
-21 -26		2.34		2.308		.064	.0668	.0022		+0.132
-26 -31		2.65								

Verm Parish LP | MOD - 2-B | 11/03/04 | KLM

$\Delta\sigma = 63(Hg - 10)$ psf

DEPTH RANGE	σ_o tsf	Hg	$\Delta\sigma$ TSF	$\bar{\sigma}_f$ TSF	ϵ_o	ϵ_f	$\Delta\epsilon$	in h	in Δh	$\Sigma\Delta h$ XTRA	W/ RBD
+4 -1	0.78	20	0.315	1.095	.051	.054	0.003	60	0.18	0.18	
-1 -6	1.09			1.405	.054	0.0576	0.0036		0.216	0.396	→
-6 -11	1.40			1.715	.0576	0.06	0.0024		0.144	0.54	cont
-11 -16	1.71			2.025	.06	0.0642	0.0042		0.252	0.792	
-16 -21	2.03			2.345	.063	0.0738	0.0108		0.648	1.44	
-21 -26	2.34			2.655	.0737	0.081	0.0073		0.438	1.878	
-26 -31	2.65			2.965	.081	0.0888	0.0078		0.468	2.346	
+4 -1	0.78	30	0.63	1.41	.051	.057	.006	60	0.36	.36	
-1 -6	1.09			1.72	.054	.06	.006		0.36	.72	
-6 -11	1.40			2.03	.0576	.0642	.0066		0.396	1.116	
-11 -16	1.71			2.34	.06	0.0738	.0138		0.828	1.944	
-16 -21	2.03			2.66	.063	0.0816	.0186		1.116	3.06	
-21 -26	2.34			2.97	.0737	.0888	.0151		0.906	3.966	
-26 -31	2.65			3.28	.081	.096	.015		0.90	4.866	
+4 -1	0.78	40	0.945	1.725	.051	0.06	.009	60	0.54	.54	
-1 -6	1.09			2.035	.054	0.0642	.0102		0.612	1.152	
-6 -11	1.40			2.345	.0576	0.0738	.0162		0.972	2.124	
-11 -16	1.71			2.655	.06	0.081	.021		1.26	3.384	
-16 -21	2.03			2.975	.063	0.1182	.0552		3.312	6.696	
-21 -26	2.34			3.285	.0737	.096	.0223		1.338	8.034	
-26 -31	2.65			3.595	.081	.1032	.0222		1.332	9.366	
+4 -1	0.78	50	1.26	2.04	.051	.0654	.0144	60	0.864	.864	
-1 -6	1.09			2.35	.054	.0738	.0198		1.188	2.052	
-6 -11	1.40			2.66	.0576	.081	.0234		1.404	3.456	
-11 -16	1.71			2.97	.06	.0882	.0282		1.692	5.148	
-16 -21	2.03			3.29	.063	.1026	.0396		2.376	7.524	
-21 -26	2.34			3.60	.0737	.1032	.0295		1.77	9.294	
-26 -31	2.65			3.91	.081	.111	.030		1.8	11.094	

VERM PAR L.F MOD AREA 2-B KLM 11/03/64

55/

$\Delta\sigma = 43(H_5 - 10)$ PSF

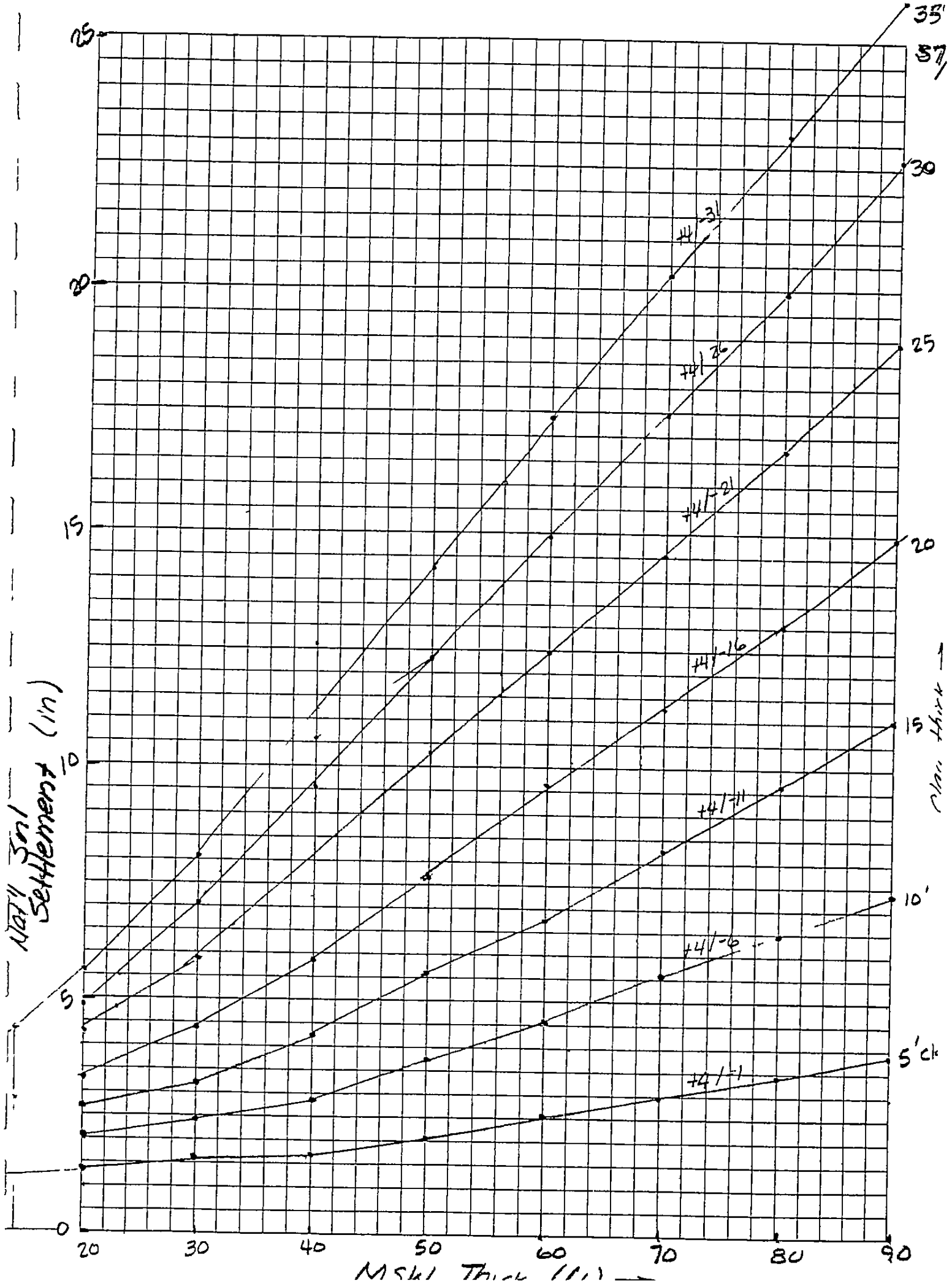
DEPTH RANGE	σ_o tsf	H_9	$\Delta\sigma$ tsf	$\bar{\sigma}_f$ tsf	e_o	e_f	Δe	in h	in Δh	$\Sigma\Delta h$ XTRA	W/RB
+4 -1	0.78	60	1.575	2.355	.051	.0738	.0228	60	1.368	1.368	
-1 -6	1.09			2.665	.054	.0816	.024		1.440	2.808	
-6 -11	1.40			2.975	.0576	.0882	.0306		1.836	4.644	
-11 -16	1.71			3.285	.06	.102	.042		2.52	7.164	
-16 -21	2.03			3.605	.063	.1044	.0414		2.484	9.648	cont →
-21 -26	2.34			3.915	.0737	.111	.0373		2.238	11.886	
-26 -31	2.65			4.225	.081	.1188	.0378		2.268	14.154	
+4 -1	0.78	70	1.89	2.67	.051	.081	.03	60	1.800	1.80	
-1 -6	1.09			2.98	.054	.0888	.0348		2.088	3.888	
-6 -11	1.40			3.29	.0576	.096	.0384		2.304	6.192	
-11 -16	1.71			3.60	.060	.1032	.0432		2.592	8.784	
-16 -21	2.03			3.92	.063	.1116	.0486		2.916	11.7	
-21 -26	2.34			4.23	.0737	.1188	.0451		2.706	14.406	
-26 -31	2.65			4.54	.081	.1254	.0444		2.664	17.07	
+4 -1	0.78	80	2.205	2.985	.051	.0888	.0378	60	2.268	2.268	
-1 -6	1.09			3.295	.054	.096	.042		2.52	4.788	
-6 -11	1.40			3.605	.0576	.1032	.0456		2.736	7.524	
-11 -16	1.71			3.915	.060	.111	.051		3.06	10.584	
-16 -21	2.03			4.235	.063	.1188	.0558		3.348	13.932	
-21 -26	2.34			4.545	.0737	.123	.0493		2.958	16.89	
-26 -31	2.65			4.855	.081	.132	.051		3.06	19.95	
+4 -1	0.78	90	2.52	3.30	.051	.096	.045	60	2.70	2.7	
-1 -6	1.09			3.61	.054	.1038	.0498		2.988	5.688	
-6 -11	1.40			3.92	.0576	.111	.0534		3.204	8.892	
-11 -16	1.71			4.23	.060	.1188	.0588		3.528	12.42	
-16 -21	2.03			4.55	.063	.1248	.0618		3.708	16.128	
-21 -26	2.34			4.86	.0737	.132	.0583		3.498	19.626	
-26 -31	2.65			5.17	.081	.138	.057		3.42	23.046	

42 381 50 SHEETS 5 SQUARE
42 382 100 SHEETS 5 SQUARE
42 389 200 SHEETS 5 SQUARE
NAT'L OFFICE

Settlement Natural Soils (cont)

DEPTH RANGE		Hg	in ΣΔh	in ΣRbd	Settle in Δh+RBD
+4	-1	20'	0.18	1.17	1.35
-1	-6		0.396	1.71	2.106
-6	-11		0.54	2.142	2.682
-11	-16		0.792	2.502	3.294
-16	-21		1.44	2.826	4.266
-21	-26		1.878	3.066	4.944
-26	-31		2.346	3.246	5.592
+4	-1	30'	.36	1.17	1.53
-1	-6		.72	1.71	2.43
-6	-11		1.116	2.142	3.258
-11	-16		1.944	2.502	4.446
-16	-21		3.06	2.826	5.886
-21	-26		3.966	3.066	7.032
-26	-31		4.866	3.246	8.112
+4	-1	40'	.54	1.17	1.71
-1	-6		1.152	1.71	2.862
-6	-11		2.124	2.142	4.266
-11	-16		3.384	2.502	5.886
-16	-21		6.696	2.826	9.522
-21	-26		8.034	3.066	11.100
-26	-31		9.366	3.246	12.612
+4	-1	50'	0.864	1.17	2.034
-1	-6		2.052	1.71	3.762
-6	-11		3.456	2.142	5.598
-11	-16		5.148	2.502	7.65
-16	-21		7.524	2.826	10.35
-21	-26		9.294	3.066	12.36
-26	-31		11.094	3.246	14.34
+4	-1	60'	1.368	1.17	2.538
-1	-6		2.808	1.71	4.518
-6	-11		4.644	2.142	6.786
-11	-16		7.164	2.502	9.666
-16	-21		9.648	2.826	12.474
-21	-26		11.886	3.066	14.952
-26	-31		14.154	3.246	17.40

Hg	ΣΔh in	ΣRbd in	Settle in Δh+RBD
70	1.80	1.17	2.97
	3.888	1.71	5.598
	6.192	2.142	8.334
	8.784	2.502	11.286
	11.70	2.826	14.526
	14.406	3.066	17.472
	17.07	3.246	20.316
80	2.268	1.17	3.438
	4.788	1.71	6.498
	7.524	2.14	9.666
	10.584	2.502	13.086
	13.932	2.826	16.758
	16.89	3.066	19.956
	19.95	3.246	23.196
90	2.70	1.17	3.870
	5.688	1.71	7.398
	8.892	2.142	11.034
	12.42	2.502	14.922
	16.128	2.826	18.954
	19.626	3.066	22.692
	23.046	3.246	26.292



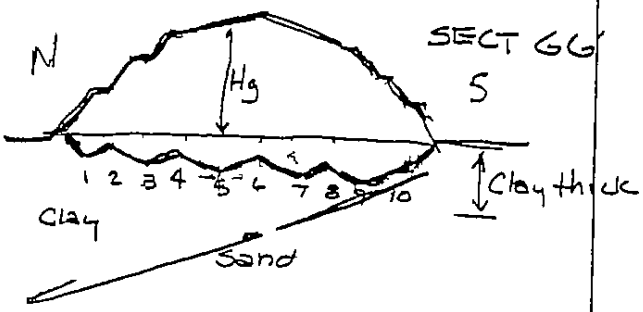
Nat'l Snl Settlement (in)
0
5
10
15
20
25
20
30
40
50
60
70
80
90
35'
37'
30
25
20
15
10'
5' ck
+4/-31
+4/-26
+4/-21
+4/-16
+4/-11
+4/-6
+4/-1

Settlement in Not'l Soils

Area 2-B
Sellar's Dwg Section G-G'

	Pt.*	Hg	Clay Thick =	in SETTLE	DIFF
B03 1	1	14	35	4.4	
	2	23	30	5.5	1.1
	3	40	29	9.3	3.8
	4	56	26	12.0	2.7
B03 4	5	62	22	17.0	1.0
	6	68	19	10.0	1.0
	7	62	15	7.0	3.0
	8	55	10	4.1	2.9
	9	33	5	1.6	2.5
B03-7	10	12	0	1.0	0.6

Soil Profile B03-1, 4, & 7



*see Sellar's Dwg for location of pts (approx locations at LCS intersections)

AREA 2-B
Section G-G

	Pt	Hg	Clay Thick	in SETTLE	DIFF
B03-2	1	14	35	4.4	
	2	23	30	5.5	1.1
	3	40	25	9.6	4.1
	4	56	20	8.8	0.8
	5	62	15	7.0	1.8
B03-5	6	68	12	6.3	0.7
	7	62	8	4.0	2.3
	8	55	5	2.3	1.7
	9	33	5	1.6	0.7
B03-8	10	12	5	1.3	0.3

Soil Profile
B03-2, 5 & 8

AREA 2-B
Section G-G

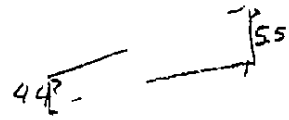
	Pt	Hg	Clay Thick	in Settle	DIFF
B03-3	1	14	35	4.4	
	2	23	35	6.3	1.9
	3	40	35	11.5	5.2
	4	56	35	16.2	4.7
B03 6	5	62	35	18.0	1.8
	6	68	35	19.75	1.75
	7	62	32	16.0	3.75
	8	55	30	13.7	2.3
	9	33	25	6.6	7.1
B03 9	10	12	20	5.3	1.3

Soil Profile
B03-3, 6, 9

note
actual Hg cross-section is less than shown here.

Section G-G.

leachate collect System 2% in 100 ft

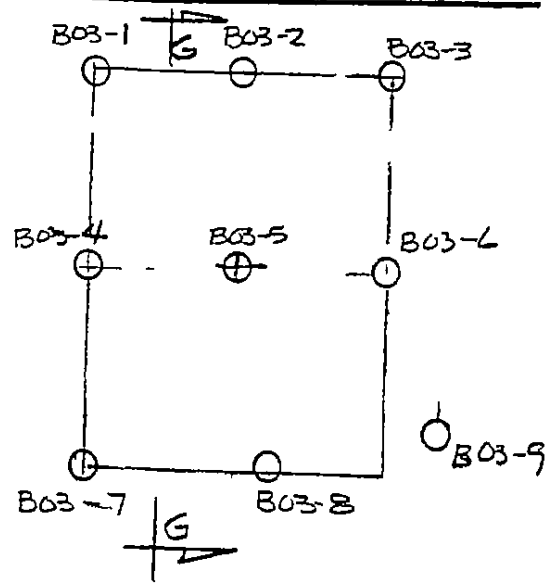


Corresponds to settlements along profile defined by BOB-2, 5, 8 –

Pt	2% Slope	ΔS_{10}	Post Sett Slope
1			
2	14.4"	-1.1"	1.8%
3	24"	+4.1"	2.3%
4	24"	+0.8	2%
5	24"	-1.8	1.85%
6	24"	+0.7	2%
7	24"	-2.3	1.8%
8	24"	+1.7	2.1%
9	24"	-0.7	1.9%
10	24"	+0.3	2%

Small insignificant changes in slopes –

Settlement in Natural Soils



Previous settlement estimates were along N-S lines

Settlements along section defined by B03-3, B03-6 and B03-9 are excessive because the X-sect of the waste mass will not reach the ht's given in Section G-G.

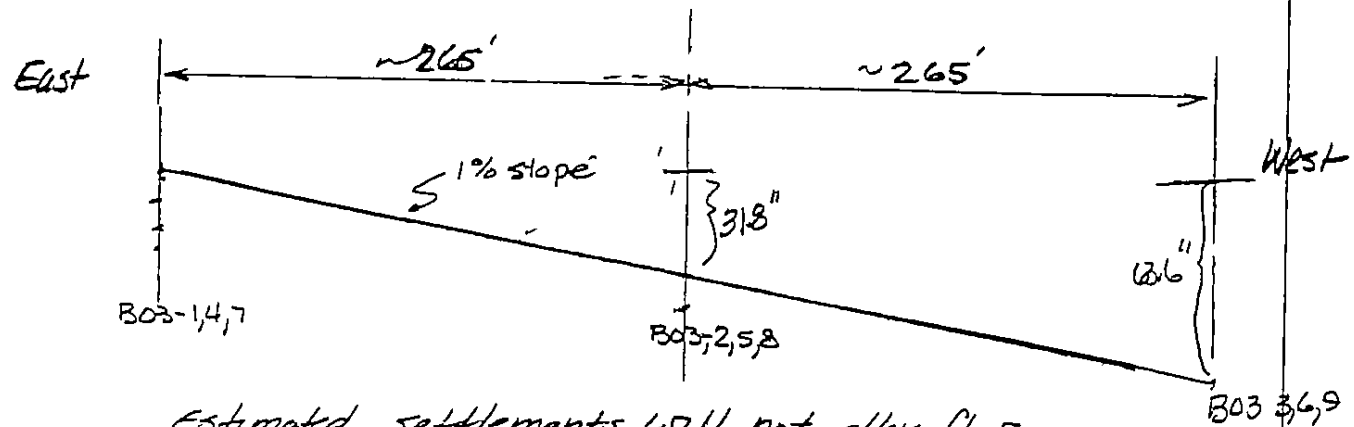
Those settlements computed for the soil profile defined by B03-1, 4 and 7 (and possibly B03-2, 5, & 8) match the physical conditions more accurately -

Estimates of the settlements and differential settlements along the E-W should not exceed the following:

Settlement in Nat'l Sol - Section B8 (E-W Section)

E-W Line	B03-	in S	Diff in ΔS
1	1,4,7	4.4	0
	2,5,8	4.4	0
	3,6,9	4.4	
2	1,4,7	5.5	0
	2,5,8	5.5	+0.8
	3,6,9	6.3	
3	1,4,7	9.3	+0.3
	2,5,8	9.6	+1.9
	3,6,9	11.5	
4	1,4,7	12.0	-3.2
	2,5,8	8.8	+7.4
	3,6,9	16.2	
5	1,4,7	11.0	-4.0
	2,5,8	7.0	+11.0
	3,6,9	18.0	

E-W LINE	B03-	in S	Diff in ΔS
6	1,4,7	10	-3.7
	2,5,8	6.3	+13.5
	3,6,9	19.8	
7	1,4,7	7.0	-3.0
	2,5,8	4.0	+12.0
	3,6,9	16.0	
8	1,4,7	4.1	-1.8
	2,5,8	2.3	+11.4
	3,6,9	13.7	
9	1,4,7	1.6	0
	2,5,8	1.6	+5.0
	3,6,9	6.6	
10	1,4,7	1.0	+0.3
	2,5,8	1.3	+4.0
	3,6,9	5.3	



Estimated settlements will not alter flow.

Max decrease Changes in slope: (original slope = 1%)

Line 5: Slope = $\frac{31.8-4}{(265)(12)} = \underline{\underline{0.009}}$ ≈ 1% O.K

Bending & Elongation Strains in Liner w/ Found Settlement

Bending strain: $\epsilon_b = 6TS/B^2$

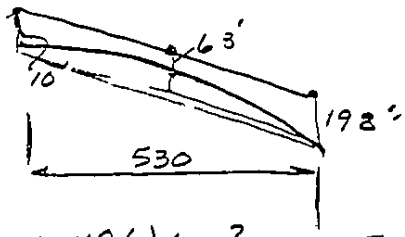
$T = 1'$ RCC

Line 6

$S = \frac{63}{2} - \frac{A8+10}{2}$

$= 63 - 149''$

$= \underline{8.6''}$



$\epsilon_b = 6(1')(\frac{8.6}{12})/530^2$ T = RCC thick

$= 1.53 \times 10^{-5}$ $\sigma_b = E\epsilon_c = (10^5)(1.15 \times 10^{-5})$

$= 1$ PSF O.K

$T = 66'$ (Fill Ht) $\epsilon_b = (6)(66)(\frac{8.6}{12})/530^2$ T = fill ht

$= 0.001$

Elongation Strain: $\epsilon_e = \sqrt{2}[(2R/B)\sin^{-1}(B/2R) - 1]$

$R = B^2/8S + S/2$

use max diff settlement between 2 pts $\simeq \underline{13.5''}$ in 265 ft

$R = (265)^2/8(\frac{13.5}{12}) + \frac{13.5}{12 \times 2}$

$= 7802.8 + 0.6$

$= 7803.4$ ft

$\epsilon_e = \sqrt{2}\left[\left(\frac{(2)(7803.4)}{265}\right)\left(\sin^{-1}\left(\frac{265}{(2)(7803)}\right)\right) - 1\right]$

$= 1.414[(58.89)(0.0127) - 1]$

$= 1.414[1.000038 - 1]$

$= 5.4 \times 10^{-5}$

$\sigma_e = E\epsilon_e$

$(10^5)(5.4 \times 10^{-5})$

$= 5.4$ PSF

Total strain

$\epsilon_T = \epsilon_b + \epsilon_e \lll 1\%$ ∴ No tensile cracking

Murphy & Gilbert (1985)

Stress Criterion -

use E 20,000 PSF

$\sigma_{hT} = E\epsilon_T' < K_0\sigma' = \sigma_{hc}$

$(20{,}000)(.001) < (0.5)(66 \times 63)$

$20 < 2079$ ∴ no net tension

O.K

Stress/Strain Synthetic Components

geomembrane & GCL

(T/B^2) so small can be neglected

$\epsilon_T = \epsilon_e$

$\sigma_{h_T} = \epsilon_L' E$

$\sigma_{h_T} = (5.4 \times 10^{-5})(100{,}000\,psi)$

$= 5.4\,psi$ <<< Breaking Str $\cong 2{,}000\,psi$

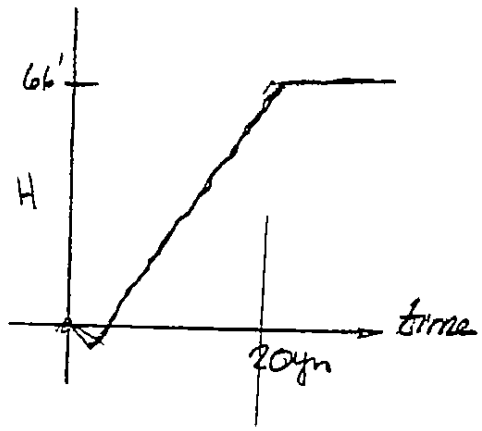
2 301 0 SHEETS 2 SQUARE
2 302 100 SHEETS 5 SQUARE
2 309 200 SHEETS 5 SQUARE

Settlement under time-dependent loading: (Olson, 1977)

$\Delta\sigma = (66)(63) - (120)(10) = 2958$ psf $\sigma = \sigma_o + \Delta\sigma \cong 4800$ psf = 2.5 tsf

Consolidation test B03-5 (36'-32):

From graph $C_v \cong 0.002$ ft²/Day



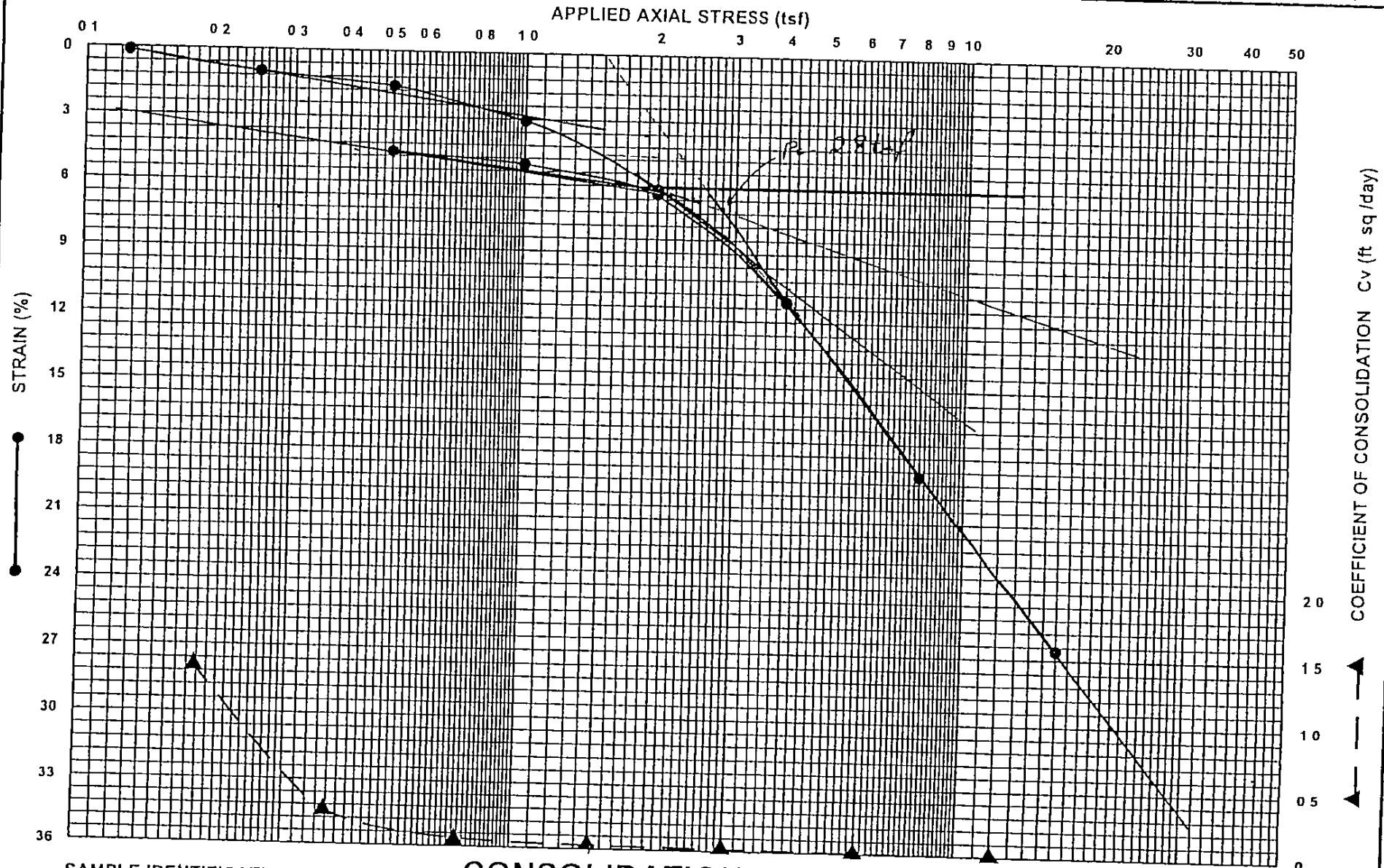
$$T_c = \frac{(0.002)(20 \times 365)}{70^2} = 0.15$$

t_L YRS	T_L	U_L %
5	0.03	3
10	0.073	12
15	0.11	20
20	0.146	28
25	0.183	34
30	0.219	47
40	0.292	54
50	0.365	

~ ⅓ in situ soil settlement complete when mass tops out

P\2003\03-1 ADD\CS B03-5 30-32 DWG

Jun 17 2003 - 2am



SAMPLE IDENTIFICATION

BORING NO B03 5
DEPTH (feet) 30 32
MATERIAL Gray CLAY (CH)

FILE NO 03 1063

CONSOLIDATION TEST

STE
Soil Testing Engineers Inc

CLASSIFICATION DATA

INITIAL MOISTURE CONTENT (%) = 47 6 LL = 85
INITIAL DRY DENSITY (lbs /cu ft) = 71 6 PL = 31
FINAL MOISTURE CONTENT (%) = 32 3 PI = 54

FIGURE NO

03 1063a
10/06/03

Consolidation Test

$p_c = 2.8\ tsf$ (Casagrande) — $p_c = 2.3\ tsf$ (Pacheco Silva)

$$C'_c = \frac{\frac{\Delta h}{H_0}}{\log\left(\frac{\sigma_f}{\sigma_0}\right)} \Rightarrow C'_c = \frac{0.317 - 0.078}{\log\left(\frac{2.5}{3}\right)} = 0.260$$

$$C'_c = \frac{C_c}{1+e_0} \Rightarrow C_c = C'_c\,(1+e_0)$$

$$e_0 = \frac{G_s \times \gamma_w}{\gamma_d} - 1 \Rightarrow e_0 = \frac{2.7 \times 62.4}{72} - 1$$

$$e_0 = 1.34$$

$$C_c = 0.260\,(1+1.34) \Rightarrow C_c = 0.608$$

$$C'_r = \frac{\frac{\Delta h}{H_0}}{\log\left(\frac{\sigma_f}{\sigma_0}\right)} \Rightarrow C'_r = \frac{0.06 - 0.03}{\log\left(\frac{1.58}{0.126}\right)} \Rightarrow C'_r = 0.027$$

$$C_r = C_r\,(1+e_0) \Rightarrow C_r = 0.027 \times (1+1.34) \Rightarrow C_r = 0.063$$

t_1 In days (1)	T_1 (2)	U_1 as a per centage (3)	S_1 In inches (4)	t_2 In days (5)	T_2 (6)	U_2 as per centage (7)	S_2 In inches (8)	t_3 In days (9)	T_3 (10)	U_3 as a per centage (11)	S_3 In Inches (12)	S In inches (13)
10	0 020	4	0 4									0 4
30	0 060	17	1 7									1 7
50	0 100	27	2 7	0	0	0	0					2 7
100	0 200	47	4 7	50	0 100	21	4 2					8 9
200	0 400	68	6 8	150	0 300	57	11 4	0	0	0	0	18 2
400	0 800	89	8 9	350	0 700	84	16 8	200	0 400	70	−7 0	18 7

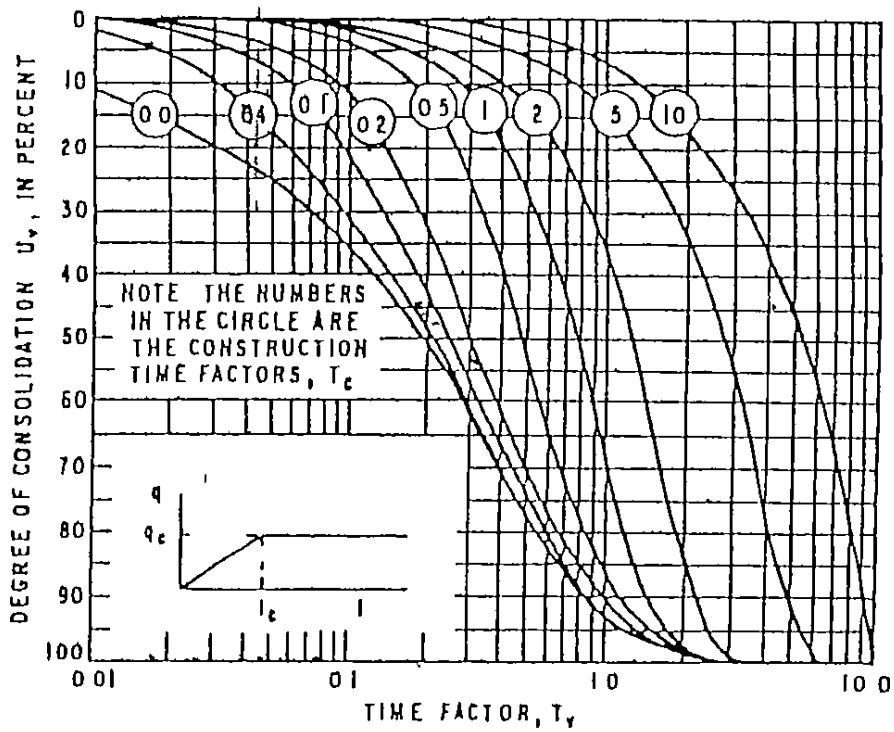


FIG 1 —U_v – T Curves for One Dimensional Vertical Flow and Single Ramp Loading

be obtained by simply adding the solutions for each of the constituent loadings As an example of the analysis, consider a case with the same soil conditions as above, with a ramp load of 10 ft (3 m) of fill applied between days 0 and 30 a second ramp load of 20 ft (6 m) applied between days 50 and 100 and

Settlement of Waste Mass

Degradation Settlement

HYPERBOLIC MODEL

$$S = \frac{S_u}{1 + \frac{S_u}{\rho t}}$$

Where S = Settlement @ time - t
S_u = Ult settlement @ $t = \infty$
ρ = Time-Rate Parameter
t = time
Let T = Waste thick

STRAIN

$$\frac{S}{T} = \epsilon = \frac{S_u/T}{1 + \frac{S_u/T}{t\rho/T}}$$

or

$$\epsilon = \frac{\epsilon_u}{1 + \frac{\epsilon_u}{\rho t}}$$

ϵ = Strain @ time = t
ϵ_u = Ultimate strain
ρ' = modified Time-Rate Parameter

Typical Values ⇒ $\epsilon_u \sim 8\%$
(Ref Tang. Analy.)

$t_{90} = 50$ yrs

$$\epsilon/\epsilon_u = \frac{1}{1 + \frac{\epsilon_u}{\rho' t}}$$

$$0.9 = \frac{1}{1 + \frac{0.08}{\rho' 50}}$$

$$1 + \frac{0.0016}{\rho'} = 1.1111$$

$$\rho' = 0.0144$$

The existing waste is estimated to have been in place for approximately

AREA'S I-A +/- 1977 - present ~ 25 yrs use 12 yrs

AREA I-C +/- 1977 - present ~ 25 yrs - const waste

AREA I-B +/- 1995 - present ~ 9 yrs use 4 yrs

AREA I-A

YEAR 2005
$t \approx 12$

$$\epsilon = \frac{0.08}{1 + \frac{5.556}{t}} = 0.0547$$

Δt	YEAR	$\bar{t}$ $\Delta t + 12$	$\epsilon = \frac{\epsilon_u}{1 + \epsilon_u / pt}$	$\Delta\epsilon$ $\epsilon - 0.0547$
5	2010	17	0.0603	0.0056
10	2015	22	0.0639	0.0092
20	2025	32	0.0682	0.0135
30	2035	42	0.0707	0.0160
40	2045	52	0.0723	0.0176
50	2095	62	0.0734	0.0187
	∞	∞	0.0800	0.0253

AREA I-C - construction debris - negligible decomposition elastic settlement

AREA I-B

YEAR 2005
$t \approx 4$ yrs

$$\epsilon = \frac{0.08}{1 + \frac{5.556}{t}} = 0.0335$$

Δt	YEAR	$\bar{t}$	ϵ	$\Delta\epsilon$ $\epsilon - 0.0335$
5	2010	9	0.0495	0.0160
10	2015	14	0.0573	0.0238
20	2025	24	0.0650	0.0315
30	2035	34	0.0688	0.0353
40	2045	44	0.0710	0.0375
50	2055	54	0.0725	0.0390
	∞	∞	0.0800	0.0445

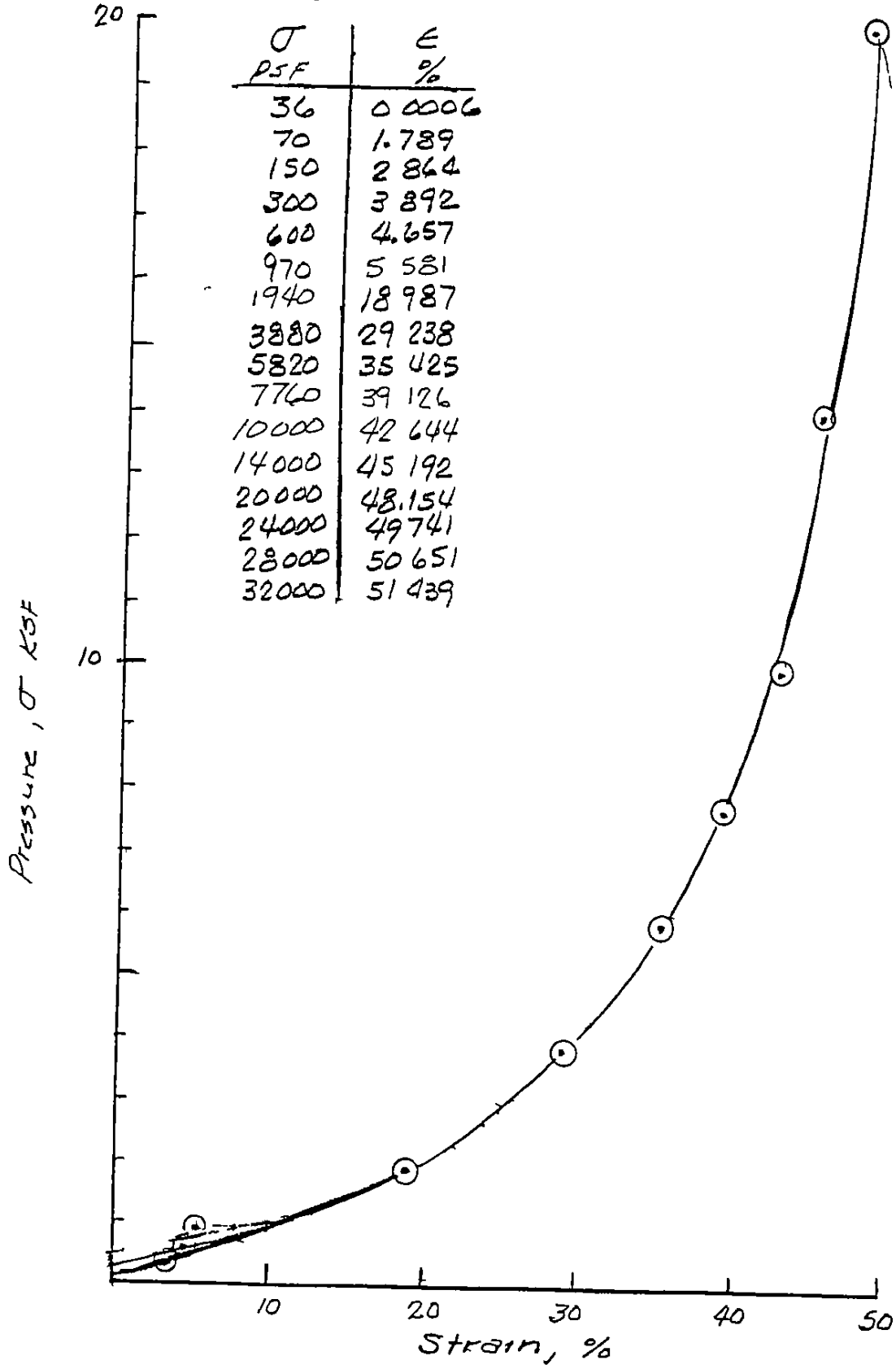
AREA 2-B

$$\epsilon = \frac{0.08}{1 + \frac{5.556}{t}}$$

t	ϵ
5	0.0379
10	0.0514
20	0.0626
30	0.0675
40	0.0702
50	0.0720
∞	0.08

University of New Orleans
MSW Comp. Test # 7
γ_i = 55 pcf

σ psf	ϵ %
36	0.0006
70	1.789
150	2.864
300	3.892
600	4.657
970	5.581
1940	18.987
3880	29.238
5820	35.425
7760	39.126
10000	42.644
14000	45.192
20000	48.154
24000	49.741
28000	50.651
32000	51.439



22 141 50 SHEETS
22 142 100 SHEETS
22 144 200 SHEETS
AMPAD

2 381 50 SHEETS 5 SQUARE
42 382 100 SHEETS 5 SQUARE
42 389 200 SHEETS 5 SQUARE

Hydraulic Barrier between Area 1-A and Area 1-B

X Section E E (Sellars DWG Exhibit A 8b

Pt		old T_o FT.	New T_N FT	Earth Cap T_{RCC} FT	adj T_N	γ=68 pcf PSF $\Delta\sigma = \gamma T_N$	ϵ_o UNO	S_o FT	ΔS = .0092 T_o Δt = 10 YR ΔS	S	ΔS = .0135 T_o Δt - 20 YR ΔS	S FT	ΔS = .016 T_o Δt = 30 YR ΔS	S	ΔS - .0253 Δt ∞ ΔS	S
1	CAP	68	–	2.5x2	5	315	0.04	2.7	0.63	3.33	.92	3.62	1.1	3.8	1.7	4.4
2		65	15	2.5x2	20	1260	0.13	8.5	0.60	9.1	.88	9.4	1.0	9.5	1.6	10.1
3		64	16	2.5x2	22	1386	0.15	9.6	0.59	10.2	.86	10.5	1.0	10.6	1.6	11.2
4		33	42	2.5x2	47	2961	0.25	8.3	0.30	8.6	.45	8.7	0.5	8.8	0.8	9.1
5		32	43	2.5x2	48	3024	0.26	8.3	0.29	8.59	.43	8.7	0.5	8.8	0.8	9.1
6	BERM	0	62	2.5x2	67	4221	—	–	–	–	–	–	–	–		

X-SECTION A-A

Pt		T_o FT	T_N FT	Earth Cap T_{RCC} FT	adj T_N	γ_g - 63 pcf $\Delta\sigma = \gamma T_N$ PSF	ϵ_o UNO	$S_o - \epsilon_o T_o$ FT	ΔS - 0.0092 T_o Δt = 10 YRS ΔS FT	S FT	ΔS - .0135 T_o Δt - 20 YRS ΔS	S FT	ΔS = .016 T_o Δt - 30 YRS ΔS	S FT	.0253 ∞ ΔS	S
1	CAP	65	–	2.5x2	5	315	.04	2.6	0.6	3.2	0.9	3.5	1.04	3.6	1.6	4.2
2		55	9.5	"	14.5	913.5	.09	5.0	0.5	5.5	0.7	5.7	0.9	5.9	1.4	6.4
3		54.5	10	"	15	945	.10	5.5	0.5	6.0	0.7	6.2	0.9	6.4	1.4	6.9
4		34	31	"	36	2268	.21	7.1	0.3	7.4	0.5	7.6	0.5	7.6	0.8	7.9
5		33	32	"	37	2331	.22	7.3	0.3	7.6	0.4	7.7	0.5	7.8	0.8	8.1
6	BERM	–	–													

62 ~~18~~

SETTLEMENT - AREA 1-A & 2-B

Sellar's DWG Exhibit A-8a
SECTION B-B

HYDRAULIC BARRIER

Pt		T_o FT	T_N FT	T_{RCL}	$\bar{T}_N$ FT	$\Delta\sigma$ PSF	e_o	S_o FT	$\Delta S = .0092 T_o$, $\Delta t = 10$: ΔS	S FT	$\Delta S = .0135 T_o$, $\Delta t = 20$: ΔS	S FT	$\Delta S = .016 T_o$, $\Delta t = 30$: ΔS	S FT
1	CAP	76.5	0	2.5x2	5	315	0.04	3.1	0.7	3.8	1.03	4.1	1.2	4.3
2		55.5	20	2.5x2	25	1575	0.17	9.4	0.5	9.9	0.7	10.1	0.9	10.3
3		55.5	20	2.5x2	25	1575	0.17	9.4	0.5	9.9	0.7	10.1	0.9	10.3
4		34	41.5	2.5x2	46.5	2930	0.25	8.5	0.3	8.8	0.5	9.0	0.5	9.0
5		33.5	42	2.5x2	47	2961	0.25	8.4	0.3	8.7	0.5	9.0	0.5	9.0
6	BERM	0	63	2.5x2	68	4284	.31							

$\Delta t = 0.025$

Pt	ΔS	S
1	1.9	5.0
2	1.4	10.8
3	1.4	10.8
4	.86	9.4
5	.85	9.2
6		0

Garbage Settlement - Area 1-A & 2-B

Ref Sellar's Exh A-8a -
SECT B-B

Settlement between CAP and hydraulic barrier/liner
AREA 2-B

Pt	To	ΔS FT
1	0	0
2	19.5	0.49
3	20	0.5
4	41.5	1.04
5	42	1.05
6	62	1.55
7	73	1.83
8	74	1.85
9	65	1.63
10	50	1.25
11	33	0.825

* Numbers here correspond to total distance along cap -

Years to fill ≈ 25 yrs
use 12 yrs

AREA 2-B ⇒ $\epsilon = \frac{0.08}{1 + \frac{5 \text{ SSL}}{12}} = 0.055$

$\epsilon_\infty = \epsilon_\infty - 0.055$
$= 0.08 - 0.055$
$= 0.025$

2-B Post-Cap Settlement -
$\Delta S = (0.025)\, To$

*See sketch (A-8a) for location of pts -

Pt	To Ft	ΔS Ft
1	75	1.125
2	55	0.83
3	55	0.83
4	34	0.51
5	33	0.50
6	0	0

Disposal AREA 1-A

Has been operating for ~25 yrs (1977 - Present). If closure, capped approx same time as Area 2-B. Operation time ≈ 50 yrs
use 25 yrs

$\epsilon = \frac{0.08}{1 + \frac{5 \text{ SSL}}{25}} = 0.065$

$\epsilon_\infty = 0.08 - 0.065$
$= 0.015$

Post cap Settlement - 1-A
$\Delta S = (0.015)\, To$

Cumulative Post-Cap Settlement:

Pt	ΣS CAP FT
1	1.13
2	1.32
3	1.33
4	1.56
5	1.55
6	1.55
7	1.83
8	1.85
9	1.63
10	1.25
11	0.83

Cap Settlement

The estimated settlement in the garbage after the cap is placed is fairly uniform, ie, differential settlement on a large area doesn't seem to be a problem. However, there could be significant diff settlement in areas due to variation in the waste –

Considering magnitudes of settlement from insitu clay settlement, max settlement 20" (conservative) with diff settlement est as 13.5" (19.8 - 6.3) over a dist of 265', with ~30% completion when fill is completed

$T_c = 0.15$ (end of const assumed 20 yrs)

$U_c = 28$ (Olson, JGE 1977)

$\Delta h_{soil} = 20 - (0.28)(20) = 14.4"$ remaining

+ Waste Mass Settlement.. say 1.8 ft (max conservative) to 0.83 (edge

$\Delta h_T = \Delta h_{soil} + \Delta h_{MSW}$

$= \frac{(20)(0.7)}{12} + 1.8 = 2.97$ ft (max values at all pts estimated)

$\Delta h_{Tedge} = \frac{(6.3)(7)}{12} + 0.8 = 1.17$ for post closure

$\Delta h_{DIFF} = 2.97 - 1.17 = 1.8$ ft

Cover Bending / Elongation –

Bending: $\epsilon_b' = 6TS/B^2 = (6)(2)(1.8)/265^2 = 0.0003\%$

$\sigma_b = (100{,}000)(3 \times 10^{-4}) = 0.3$ psf

Elongation: $R = B^2/8S + S/2 = \frac{265^2}{8(18)} + \frac{1.8}{2} = 4877.6$ ft

$\epsilon_e' = \sqrt{2}\,[(2R/B)\sin^{-1}(B/2R) - 1]$

$= \sqrt{2}\,[(2 \times 4877.6/265)\sin^{-1}(265/2 \times 4877.6) - 1]$

$= \sqrt{2}\,[(36.8)(0.027) - 1] = 0.000174$ (comp)

$\sigma_e = (100{,}000)(.000174) = 17.4$ psf

diff settlement will not affect cover –

Appendix G:2

Closure and Post-Closure Care Cost Estimate

APPENDIX G 2
CLOSURE COST ESTIMATE

****** This closure cost estimate is based on final cover & closure of approximately 10 acres of Pre-Subtitle D / C-D disposal cells and approximately 12 acres of Subtitle D disposal cell ******

DESCRIPTION	QUANTITY	UNIT COST	EXTENSION
Load, Overhaul & Placement of 6" Cover Material, per cubic yard,	25,000	$ 4 50	$ 112,500
Spread, Compact & Test 24" Recompacted Clay Cap (on Subtitle D disposal areas), per cubic yard,	39,000	$ 7 50	$ 292,500
HDPE Liner (60 mil) on 4% slopes only, per square foot,	250,000	$ 0 75	$ 187,500
2' Clay Liner (on pre-Subtitle D/C-D disposal areas), per cubic yard,	48,400	$ 6 00	$ 290,400
Seeding & Fertilizing, per acre,	66	$ 2,500 00	$ 165,000
5-acre Oxidation Pond (one-time discharge, sampling & disposing of sludge), per lump sum,	1	$ 50,000 00	$ 50,000
Gas Venting System, per vent,	18	$ 600 00	$ 10,800
Closure Certification, per hour,	36	$ 100 00	$ 3,600
Miscellaneous Expenses, per lump sum,	1	$ 100,000 00	$ 100,000
SUBTOTAL			$ 1,212,300
CONTINGENCY (15%)			$ 181,845
TOTAL CLOSURE COST			**$ 1,394,145**

APPENDIX G 2
30-YEAR POST-CLOSURE CARE COST ESTIMATE

DESCRIPTION	QUANTITY	FREQ	UNIT COST	EXT
Site Maintenance	LUMP	annually for 30 years	$13,000/year	$ 360,000
Oxidation Pond & SW Monitoring/Sampling	1 discharge pt 1 discharge pt 1 discharge pt 1 discharge pt 1 discharge pt	weekly for 30 years bi monthly for 30 years monthly for 30 years quarterly for 30 years semi annually for 30 years	$4,160/year $2,040/year $180/year $120/year $1 357/year	$ 235,710
Groundwater Monitoring	14 wells	semi annually for 30 years	$6 000/event	$ 360 000
Gas Monitoring	5 hours/event	quarterly for 30 years	$84/hour/event	$ 50,400
Miscellaneous Expenses	LUMP	annually for 30 years	$5,500/year	$ 165,000
TOTAL CLOSURE COST			$ 34,537 00	**$ 1,171,110**

Appendix G:3

Financial Assurance Documentation

HER BUSTER HARDEE
PRESIDENT

HUBERT FAULK
VICE PRESIDENT

CHRIS THERIOT
PARISH ADMINISTRATOR /
SECRETARY TRESURER

MEMBERS

DISTRICT 1
CARROLL DUHON

DISTRICT 2
HUBERT FAULK

DISTRICT 3
MINOS BROUSSARD

DISTRICT 4
RONALD DARBY

DISTRICT 5
WAYNE TOUCHET

DISTRICT 6
MARK POCHE

DISTRICT 7
DAVID MAYARD

DISTRICT 8
EDVAL SIMON JR

DISTRICT 9
MAXWELL CHREENE

DISTRICT 10
GAULMAN GASPARD

DISTRICT 11
RAVIS MENARD

DISTRICT 12
PURVIS ABSHIRE

DISTRICT 13
T J PREJEAN JR

DISTRICT 14
LUTHER BUSTER HARDEE

VERMILION PARISH POLICE JURY
Courthouse Bldg
100 N State St , Suite 200
Abbeville, Louisiana 70510

337-898-4300
FAX 337-898-4310

January 29, 2008

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
P O BOX 4303
Baton Rouge, La 70821-4303
Attention Office of Management and Finance
Financial Services Division

RE Vermilion Parish Police Jury
Vermilion Parish Solid Waste Plant
Agency Interest #148
Solid Waste Identification #D-113-0023

To Whom It May Concern

Attached please find Letter of Credit Number 2526 issued by First Guaranty Bank dated October 16, 2007 in the amount of $1,000,000 assured for liability coverage and Letter of Credit Number 2798 also issued by First Guaranty Bank dated June 12, 2007 in the amount of $3,079,228 00 for the above referenced facility, in accordance with LAC 33 VII 1301 B 2 c and 1303 F 3

Also attached is the corresponding Standby Trust Agreement by and between the Vermilion Parish Police Jury and Capital One Bank entered into on July 5, 2007 for both Letters of Credit

Should you require additional information, please do not hesitate to contact our office

Sincerely,

VERMILION PARISH POLICE JURY

Chris P Theriot

CHRIS P THERIOT
ADMINISTRATOR/SECRETARY TREASURER

Attachments

Member FDIC

FIRST GUARANTY BANK

SOLID WASTE FACILITY IRREVOCABLE LETTER OF CREDIT

October 16 2007

Secretary
Louisiana Department of Environmental Quality
Post Office Box 4303
Baton Rouge, Louisiana 70821 4303
Attention Office of Management and Finance,
Financial Services Division

Dear Sir

We hereby establish our Irrevocable Standby Letter of Credit No 2826 at the request and for the account of the Vermilion Parish Police Jury, Courthouse Building, 100 N State Street Suite 200 Abbeville Louisiana 70510 for its AI #148 Facility ID #D 113 0023 Type II and III Solid Waste Disposal Facility Vermilion Parish Solid Waste Plant Permit Number P 0030 at 8500 Birch Road Abbeville, Louisiana, in favor of any governmental body person, or other entity for any sum or sums up to the aggregate amount of U S dollars $1,000,000 00 upon presentation of

1 A final judgment issued by a competent court of law in favor of a governmental body person or other entity and against Vermilion Parish Police Jury for sudden and accidental occurrences for claims arising out of injury to persons or property due to the operation of the solid waste site at the Vermilion Parish Solid Waste Plant at 8500 Birch Road Abbeville, Louisiana as set forth in the LAC 33 VII 727 A 1

2 A sight draft bearing reference to the Letter of Credit No 2826 drawn by the governmental body person, or other entity in whose favor the judgment has been rendered as evidenced by documentary requirement in Paragraph 1

The Letter of Credit is effective as of 10 16 2007 and will expire on 10 16 2008, but such expiration date will be automatically extended for a period of at least one year on the above expiration date 10 16-2008 and on each successive expiration date thereafter unless at least 120 days before the then current expiration date we notify both the administrative authority and Vermilion Parish Police Jury by certified mail that we have decided not to extend this Letter of Credit beyond the then-current expiration date In the event we give such notification, any unused portion of this Letter of Credit shall be available upon presentation of your sight draft for 120 days after the date of receipt by both the Department of Environmental Quality and Vermilion Parish Police Jury as shown on the signed return receipts

POST OFFICE BOX 2009 HAMMOND LOUISIANA 70404 2009 (985) 345 7685 (888) 375 3093 • FAX (985) 542 8949

Whenever this Letter of Credit is drawn under and in compliance with the terms of this credit, we shall duly honor such draft upon presentation to us, and we shall deposit the amount of the draft directly into the standby trust fund of Vermilion Parish Police Jury in accordance with the administrative authority's instructions

Except to the extent otherwise expressly agreed to, the Uniform Customs and Practice for Documentary Letters of Credit (1983), International Chamber of Commerce Publication No 400, shall apply to this Letter of Credit

We certify that the wording of this Letter of Credit is identical to the wording specified in LAC 33 VII 727 A 1 d ii (e), effective on the date shown immediately below

First Guaranty Bank

By

Mark W Mobley
Senior Vice President

By

Michael R Sharp
President and Chief Executive Officer

October 16, 2007

FIRST GUARANTY BANK
Member FDIC

SOLID WASTE FACILITY
IRREVOCABLE LETTER OF CREDIT

June 12, 2007

Secretary
Louisiana Department of Environmental Quality
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313
Attention Office of Environmental Services,
Water and Waste Permits Division

Dear Sir

We hereby establish our Irrevocable Standby Letter of Credit No 2798 in favor of the Department of Environmental Quality of the State of Louisiana, at the request and for the account of Vermilion Parish Police Jury, Courthouse Building, 100 N State Street, Suite 200, Abbeville, La. 705 0, for the closure and/or post-closure fund for its 4.14-148 Vermilion Parish Solid Waste Plant, D-113-0023 P-0030 at north of Abbeville, Louisiana, for any sum or sums up to the aggregate amount of Three Million Seventy Nine Thousand Two Hundred twenty eight and no/100 U S Dollars ($3,079,228 00) upon presentation of

1. A sight draft bearing reference to the Letter of Credit No 2798 drawn by the administrative authority, together with,
2. A statement, signed by the administrative authority, declaring that the amount of the draft is payable into the standby trust fund pursuant to the Louisiana Environmental Quality Act, R.S 30:2001, et seq

The Letter of Credit is effective as of June 12, 2007, and will expire June 12, 2008, but such expiration date will be automatically extended for a period of at least one (1) year on the above expiration date and on each successive expiration date thereafter unless at least 120 days before the then current expiration date, we notify both the administrative authority and the Vermilion Parish Police Jury by certified mail that we have decided not to extend this Letter of Credit beyond the then-current expiration date In the event that we give such notification, any unused portion of this Letter of Credit shall be available upon presentation of your sight draft for 120 days after the date of receipt by both the Department of Environmental Quality and the Vermilion Parish Police Jury as shown on the signed return receipts

Whenever this Letter of Credit is drawn under and in compliance with the terms of this Credit, we shall duly honor such draft upon presentation to us and we shall deposit the

Louisiana Department of Environmental Quality
June 12, 2007
Page Two

amount of the draft directly into the standby trust fund of the Vermilion Parish Police Jury in accordance with the administrative authority's instructions.

Except so far as otherwise expressly stated, this documentary credit is subject to the "International Standby Practice" (ISP98) International Chamber of Commerce Publication 590

We certify that the wording of this Letter of Credit is identical to the wording specified in LAC 33 VII 727 A.2.g.iii, effective on the date shown immediately below

FIRST GUARANTY BANK

By _____
Bart J. Lessler Jr.
Senior Vice President and
Commercial Lending Division Head

By _____
Michael R. Sharp
President & Chief Executive
Officer

June 12, 2007
Effective date

SOLID WASTE FACILITY
STANDBY TRUST AGREEMENT

Standby Trust Agreement, the Agreement' entered into as of _July 5 2007 by and between the Vermilion Parish Police Jury a Louisiana parish government, the Grantor and Capital One Bank, NA, a 'a state bank" the "Trustee '

WHEREAS, the Department of Environmental Quality of the State of Louisiana, an agency of the state of Louisiana, has established certain regulations applicable to the Grantor requiring that a permit holder or applicant for a permit of a solid waste processing or disposal facility shall provide assurance that funds will be available when needed for liability or closure and/or post closure care of the facility

WHEREAS, the Grantor has elected to establish a trust to provide all or part of such financial assurance for the facility identified herein

WHEREAS the Grantor acting through its duly authorized officers has selected First Guaranty Bank to be the trustee under this Agreement and Capital One Bank is willing to act as trustee

NOW THEREFORE the Grantor and the Trustee agree as follows

SECTION 1 DEFINITIONS

As used in this Agreement

(a) The term *Grantor* means the permit holder or applicant who enters into this Agreement and any successors or assigns of the Grantor

(b) The term *Trustee* means the Trustee who enters into this Agreement and any successor trustee

(c) The term *Secretary* means the Secretary of the Louisiana Department of Environmental Quality

(d) The term *administrative authority* means the Secretary or a person designated by him to act therefor

SECTION 2 IDENTIFICATION OF FACILITIES AND COST ESTIMATES

This Agreement pertains to the facilities and cost estimates identified on attached Schedule A

SECTION 3 ESTABLISHMENT OF FUND

The Grantor and the Trustee hereby establish a trust fund the 'Fund for the benefit of the Louisiana Department of Environmental Quality The Grantor and the Trustee intend that no third party shall have access to the Fund except as herein provided The Fund is established initially as consisting of the property which is acceptable to the Trustee described in Schedule B attached hereto Such property and any other property subsequently transferred to the Trustee is referred to as the Fund together with all earnings and profits thereon less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee in trust as hereinafter provided. The Trustee shall not be responsible nor

shall it undertake any responsibility for the amount or adequacy of nor any duty to collect from the Grantor any payments necessary to discharge any liabilities of the Grantor established by the administrative authority

SECTION 4 PAYMENT FOR CLOSURE AND/OR POST CLOSURE CARE OR LIABILITY COVERAGE

The Trustee shall make payments from the Fund as the administrative authority shall direct, in writing to provide for the payment of the costs of liability claims closure and/or post closure care of the facility covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by the administrative authority from the Fund for liability claims closure and/or post closure expenditures in such amounts as the administrative authority shall direct in writing In addition the Trustee shall refund to the Grantor such amounts as the administrative authority specifies in writing Upon refund such funds shall no longer constitute part of the Fund as defined herein

SECTION 5 PAYMENTS COMPRISED BY THE FUND

Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee

SECTION 6 TRUSTEE MANAGEMENT

The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund without distinction between principal and income in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time subject, however to the provisions of this Section In investing, reinvesting exchanging selling and managing the Fund the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the beneficiary and with the care skill prudence and diligence under the circumstances then prevailing which persons of prudence acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of like character and with like aims except that

(a) Securities or other obligations of the Grantor or any owner of the Vermilion Parish Police Jury or any of their affiliates as defined in the Investment Company Act of 1940 as amended, 15 U S C 80a 2 (a) shall not be acquired or held, unless they are securities or other obligations of the federal or a state government

(b) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee to the extent insured by an agency of the federal or state government and

(c) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon

SECTION 7 COMMINGLING AND INVESTMENT

The Trustee is expressly authorized, at its discretion

(a) To transfer from time to time any or all of the assets of the Fund to any common commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate subject to all provisions thereof to be commingled with the assets of other trusts participating therein, and

(b) To purchase shares in any investment company registered under the Investment Company Act of 1940 15 U S C 80a 1 et seq including one which may be created managed or underwritten, or one to which investment advice is rendered or the shares of which are sold by the Trustee The Trustee may vote such shares at its discretion

SECTION 8 EXPRESS POWERS OF TRUSTEE

Without in any way limiting the powers and discretion conferred upon the Trustee by the

other provisions of this Agreement or by law the Trustee is expressly authorized and empowered

(a) To sell exchange convey transfer or otherwise dispose of any property held by it, by public or private sale No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition,

(b) To make execute, acknowledge and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted

(c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof with a Federal Reserve Bank but the books and records of the Trustee shall at all times show that all securities are part of the Fund,

(d) To deposit any cash in the Fund in interest bearing accounts maintained or savings certificates issued by the Trustee in its separate corporate capacity or in any other banking institution affiliated with the Trustee to the extent insured by an agency of the federal or state government, and

(e) To compromise or otherwise adjust all claims in favor of or against, the Fund

SECTION 9 TAXES AND EXPENSES

All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee the compensation of the Trustee to the extent not paid directly by the Grantor and other proper charges and disbursements of the Trustee shall be paid from the Fund

SECTION 10 ANNUAL VALUATION

The Trustee shall annually at least 30 days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the administrative authority a statement confirming the value of the Trust Any securities in the Fund shall be valued at market value as of no more than 60 days prior to the anniversary date of establishment of the Fund The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and the administrative authority shall constitute a conclusively binding assent by the Grantor barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement

SECTION 11 ADVICE OF COUNSEL

The Trustee may from time to time consult with counsel who may be counsel to the Grantor with respect to any questions arising as to the construction of this Agreement or any action to be taken hereunder The Trustee shall be fully protected, to the extent permitted by law in acting upon the advice of counsel

SECTION 12 TRUSTEE COMPENSATION

The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time o time with the Grantor

SECTION 13 SUCCESSOR TRUSTEE

The Trustee may resign or the Grantor may replace the Trustee but such resignation or replacement shall not be effective until the Grantor has appointed a successor or trustee and this successor accepts the appointment The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder Upon the successor trustee s acceptance of the appointment, the Trustee shall assign transfer and pay over to the successor trustee the funds and properties then constituting the Fund If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions The successor trustee shall in writing specify to the Grantor the administrative authority and the present Trustee by certified mail 10 days before such change becomes effective the date on which it assumes administration of the trust. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9

SECTION 14 INSTRUCTIONS TO THE TRUSTEE

All orders requests and instructions by the Grantor to the Trustee shall be in writing, signed by the persons designated in the attached Exhibit A or such other persons as the Grantor may designate by amendment to Exhibit A The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders requests and instructions All orders requests and instructions by the administrative authority to the Trustee shall be in writing and signed by the administrative authority The Trustee shall act and shall be fully protected in acting in accordance with such orders requests and instructions The Trustee shall have the right to assume in the absence of written notice to the contrary that no event constituting a change or termination of the authority of any person to act on behalf of the Grantor or administrative authority hereunder has occurred The Trustee shall have no duty to act in the absence of such orders requests and instructions from the Grantor and/or administrative authority except as provided for herein

SECTION 15 NOTICE OF NONPAYMENT

The Trustee shall notify the Grantor and the administrative authority by certified mail within 10 days following the expiration of the 30 day period after the anniversary of the establishment of the Trust if no payment is received from the Grantor during that period After the pay in period is completed, the Trustee shall not be required to send a notice of nonpayment.

SECTION 16 AMENDMENT OF AGREEMENT

This Agreement may be amended by an instrument in writing executed by the Grantor the Trustee and the administrative authority or by the Trustee and the administrative authority if the Grantor ceases to exist

SECTION 17 IRREVOCABILITY AND TERMINATION

Subject to the right of the parties to amend this Agreement as provided in Section 16 this

Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor the Trustee and the administrative authority, or by the Trustee and the administrative authority if the Grantor ceases to exist Upon termination of the Trust, all remaining trust property less final trust administration expenses shall be delivered to the Grantor

SECTION 18 IMMUNITY AND INDEMNIFICATION

The Trustee shall not incur personal liability of any nature in connection with any act or omission made in good faith in the administration of this Trust, or in carrying out any direction by the Grantor or the administrative authority issued in accordance with this Agreement The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity including all reasonable expenses incurred in its defense in the event that the Grantor fails to provide such defense

SECTION 19 CHOICE OF LAW

This Agreement shall be administered, construed, and enforced according to the laws of the state of Louisiana.

SECTION 20 INTERPRETATION

As used in this Agreement, words in the singular include the plural and words in the plural include the singular The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement

IN WITNESS WHEREOF the parties have caused this Agreement to be executed by their respective officers duly authorized [and their corporate seals to be hereunto affixed] and attested to as of the date first above written The parties below certify that the wording of this Agreement is identical to the wording specified in LAC 33 VII 727 A 2 d ix, on the date first written above

WITNESSES

Linda Fabon

Stella LeJeune

GRANTOR

Luther Buster Hardee

By Luther Buster Hardee

Vermilion Parish Police Jury

Its President

[Seal]

TRUSTEE

Capital One Bank

By Budget Director

Its Trust Officer

[Seal]

THUS DONE AND PASSED in my office in Baton Rouge, Louisiana on the 5th day of July 2007, in the presence of Peggy Buchanan and Julie Earle competent witnesses who hereunto sign their names with the said appearers and me Notary after reading the whole

Notary Public

WITNESSES

Peggy L Buchanan

Peggy L Buchanan

Julie A Earle

JOHN V EDMONSTON JR
NOTARY PUBLIC
Louisiana Notary I D # 60856
Parish of East Baton Rouge Louisiana
My Commission is issued for life

STATE OF LOUISIANA

PARISH OF Vermilion

BE IT KNOWN that on this 10th day of July, 20 07, before me, the undersigned Notary Public duly commissioned and qualified within the State and Parish aforesaid and in the presence of the witnesses hereinafter named and undersigned, personally came and appeared Luther Buster Hardee, to me well known, who declared and acknowledged that he had signed and executed the foregoing instrument as his act and deed and as the act and deed of the Vermilion Parish Police Jury, a corporation, for the consideration, uses and purposes and on terms and conditions therein set forth

And the said appearer being by me first duly sworn, did depose and say that he is the President of said corporation and that he signed and executed said instrument in his said capacity and under authority of the Board of Directors of said corporation.

Thus done and passed in the State and Parish aforesaid, on the day and date first hereinabove written and in the presence of Linda Duhon and Stella LeJeune competent witnesses who have hereunto subscribed their name as such together with said appearer and me said authority after due reading of the whole

WITNESSES

Linda Duhon

Stella LeJeune

Selina Perry #7621

NOTARY PUBLIC

Selina Perry

SCHEDULE A

Name of Permit Holder Vermilion Parish Police Jury
Courthouse Bldg, 100 N State Street – Suite 200 Abbeville La 70510

Site ID # AI# 148

Site Name Vermilion Parish Solid Waste Plant

Facility Name Vermilion Parish Solid Waste Plant, D 113 0023

Permit # P 0030

Annual Aggregate Amount of Liability Coverage $1 000 000 00

Closure + Post Closure Care Costs $3 079,228 00

Dated June 20 2007

SCHEDULE B

The Standby Trust Agreement is not presently funded but shall be funded by the Letters of Credit used by Vermilion Parish Police Jury "Grantor in accordance with the terms of the Letters of Credit dated 10 13 2007 and 06 12 2007

Site ID AI# 148
Permit # P 0030
Site Name Vermilion Parish Solid Waste Plant

Letter of Credit Number 2770
Issued by First Guaranty Bank
In the amount of $1 000 000
For Liability Coverage During Operation

Letter of Credit Number 2798
Issued by First Guaranty Bank
In the amount of $3 079 228 00
For Closure and Post Closure Care

Appendix H:1

Engineering Certification

APPENDIX H 1

Vermilion Parish Solid Waste Plant

Engineering Certification

Permit Modification 9
Area 2B Expansion

I certify under penalty of law that I have personally examined and I am familiar with the information submitted in this permit application and that the facility as described in this permit application meets the requirements of the Solid Waste Rules and Regulations I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment

Certification to Civil Engineering aspects of the Permit Modification

Eugene M Sellers, P E
Registered Professional Engineer
Louisiana License Number 6457

03/03/08
Date

Appendix H:2

Engineering Calculations

Appendix H:2

Oxidation Pond Calculations

OXIDATION POND CAPACITY CALCULATIONS

- **LEACHATE GENERATION**

THE HELP MODEL V 3 WAS UTILIZED TO ESTIMATE LEACHATE VOLUMES GENERATED/COLLECTED FROM THE LATERAL DRAINAGE LAYER (LEACHATE COLLECTION SYSTEM) PEAK DAILY VALUES WERE USED FOR A CONSERVATIVE ESTIMATE

THE FOLLOWING SCENARIOS WERE USED TO CONSIDER AREAS OF THE FACILITY WHICH MAY NOT HAVE RECEIVED FINAL COVER THESE AREAS INCLUDE THE ACTIVE WORKING FACE AREAS THAT CONTAIN ONLY DAILY COVER AND ALL AREAS THAT DO NOT CONTAIN INTERIM COMPACTED COVER THE SCENARIOS WERE CHOSEN SUCH THAT PHASE 1A (Pre Subtitle D) AND PHASE 2A (Subtitle D) ARE ASSUMED TO HAVE RECEIVED FINAL COVER CONSERVATIVE ESTIMATES OR ACREAGE WHICH HAVE RECEIVED DAILY COVER INTERIM COVER, ETC WERE UTILIZED FOR THE PHASE 2B AREA (OUTPUT FROM THE HELP MODEL FOR EACH SCENARIO IS ATTACHED)

AREA DESCRIPTION	*ACREAGE*	*COVER MATERIAL*	*ASSUMED AVG WASTE DEPTH*	*PEAK DAILY VALUE OF LEACHATE COLLECTED (CU FT)*
Phase 1A	19	Final (6" topsoil over 2 clay)	350	47 45
Phase 1B	6 5	Final (12 topsoil over 40 mil HDPE over 2 clay)	400	1 34
Phase 2B Active Face	2	none	400"	1 126 31
Phase 2B Daily Cover	3	Daily (6 earthen material)	400"	1 246 12
Phase 2B Interim Cover	3	Interim (1 clay)	400"	1 771 47
Phase 2B Interim Compacted Cover	3	Interim Compacted (2' clay)	400	43 90
Phase 2B Final Cover	1 5	Final (12 topsoil over 40 mil HDPE over 2 clay)	400	0 31
			ESTIMATED LEACHATE QUANTITY CU FT /DAY	*4 236 90*
			ESTIMATED LEACHATE QUANTITY, GAL/DAY	*31,692 01*

- **CONTAMINATED STORMWATER RUNOFF**

CONTAMINATED STORMWATER QUANTITIES (TO BE ROUTED TO OXIDATION POND FOR TREATMENT) WERE ESTIMATED USING THE 25-YEAR 24 HOUR STORM EVENT RUNOFF FROM AREAS WHICH HAVE NOT RECEIVED FINAL OR INTERIM COMPACTED COVER IS CONSIDERED CONTAMINATED STORMWATER RUNOFF BASED ON THE ABOVE SCENARIOS ASSUME 5 ACRES WILL BE THE MAXIMUM AREA FROM WHICH CONTAMINATED STORMWATER WILL BE COLLECTED AND ROUTED TO THE OXIDATION POND

RUNOFF CURVE NUMBER
USE AMC-II → AVG ANTECEDENT MOISTURE CONDITION
CN=85

24-HOUR RAINFALL (INCHES) FOR 25-YEAR RETURN INTERVAL FOR VERMILION PARISH = 10" (REFER TO ATTACHED FIGURE)

COMPUTE RUNOFF

$R = [P\ 0\ 2(1000/CN\ 10)]^2 / [P+0\ 8(1000/CN\ 10)]$

$R = [10in\ 0\ 2(1000/85-10)]^2 / [10in+0\ 8(1000/85-10)]$

R = 8 16 INCHES

COMPUTE VOLUME PER DAY

VOLUME = (8 16 /12in/ft)(5 acres)(43 560 ft^2/acre)(7 48 gal/ft^3) = 1 1 MGD

- **OXIDATION POND**

TOTAL VOLUME OF POND = 7 MILLION GALLONS

CALCULATE DETENTION TIME FOR LEACHATE ONLY (DRY WEATHER)

$T_{detention}$ = (TOTAL VOL)/Q = (7 MILLION GALLONS) / (0 03 MGD) = **233 DAYS (MINIMUM)**

CALCULATE DETENTION TIME FOR LEACHATE & CONTAMINATED STORMWATER (25 YEAR/24 HOUR STORM EVENT)

$T_{detention}$ = (TOTAL VOL)/Q = (7 MILLION GALLONS) / (1 1 MGD + 0 03 MGD) = **6 DAYS (MINIMUM)**

Phase 1A - HELPv3 07 Model

VERMILION PARISH SOLID WASTE PLANT

Final Cap System	6 inch topsoil 24 inches clay
Average Waste Depth	30' = 350"
Bottom Liner System	NONE
Acreage	19 acres

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 ** *** *    *  *   ******  **   *  ** **      *     **   **      *   *  ** *
**                                                                          *
*                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               *
*                HELP MODEL VERSION 3 07  (1 NOVEMBER 1997)                *
 *                DEVELOPED BY ENVIRONMENTAL LABORATORY                    **
**                  USAE WATERWAYS EXPERIMENT STATION                      **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY             **
**                                                                          *
*   *      * ***     *** *       *       *      *     **** **  ** *   **    *
**  *** *         *  *** *  ** * *    *              **    *  **   *     ** **
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PRECIPITATION DATA FILE      C \HELP3\VPSWP\DATA4 D4
TEMPERATURE DATA FILE        C \HELP3\VPSWP\DATA7 D7
SOLAR RADIATION DATA FILE    C \HELP3\VPSWP\DATA13 D13
EVAPOTRANSPIRATION DATA      C \HELP3\VPSWP\DATA11 D11
SOIL AND DESIGN DATA FILE    C \HELP3\VPSWP\DATA10 D10
OUTPUT DATA FILE             C \HELP3\VPSWP\VPSWPOUT OUT
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TIME 13 50 DATE 10/25/2004

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TITLE VERMILION PARISH SOLID WASTE PLANT AREA 1A

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**   ***   *    **    **  * *   *       *  *       **   ** *      ***  *  * **
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NOTE INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE COMPUTED AS NEARLY STEADY STATE VALUES BY THE PROGRAM

LAYER 1

TYPE 1 VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 8

THICKNESS	=	6 00 INCHES
POROSITY	=	0 4630 VOL/VOL
FIELD CAPACITY	=	0 2320 VOL/VOL
WILTING POINT	=	0 1160 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4578 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 369999994000E 03 CM/SEC

NOTE SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 3 00 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE

LAYER 2

TYPE 3 BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	24 00 INCHES
POROSITY	=	0 4270 VOL/VOL
FIELD CAPACITY	=	0 4180 VOL/VOL
WILTING POINT	=	0 3670 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4270 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000001000E-06 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	350 00 INCHES
POROSITY	=	0 6710 VOL/VOL
FIELD CAPACITY	=	0 2920 VOL/VOL
WILTING POINT	=	0 0770 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 2920 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000005000E 02 CM/SEC

LAYER 4

TYPE 2 LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12 00 INCHES
POROSITY	=	0 4370 VOL/VOL
FIELD CAPACITY	=	0 0620 VOL/VOL
WILTING POINT	=	0 0240 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0644 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 579999993000E 02 CM/SEC
SLOPE	=	2 00 PERCENT
DRAINAGE LENGTH	=	100 0 FEET

LAYER 5

TYPE 3 BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36 00 INCHES
POROSITY	=	0 4270 VOL/VOL
FIELD CAPACITY	=	0 4180 VOL/VOL
WILTING POINT	=	0 3670 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4270 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000001000E 06 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 8 WITH A FAIR STAND OF GRASS A SURFACE SLOPE OF 4 % AND A SLOPE LENGTH OF 450 FEET

SCS RUNOFF CURVE NUMBER	=	79 10	
FRACTION OF AREA ALLOWING RUNOFF	=	100 0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	19 000	ACRES
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2 747	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	2 778	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0 696	INCHES
INITIAL SNOW WATER	=	0 000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	131 339	INCHES
TOTAL INITIAL WATER	=	131 339	INCHES
TOTAL SUBSURFACE INFLOW	=	0 00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE EVAPOTRANSPIRATION DATA WAS OBTAINED FROM LAKE CHARLES LOUISIANA

STATION LATITUDE	=	30 10	DEGREES
MAXIMUM LEAF AREA INDEX	=	2 00	
START OF GROWING SEASON (JULIAN DATE)	=	32	
END OF GROWING SEASON (JULIAN DATE)	=	361	
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
AVERAGE ANNUAL WIND SPEED	=	8 70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	77 00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	77 00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	80 00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	78 00	%

NOTE PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4 58	4 97	4 59	5 59	4 82	3 11
7 07	5 05	4 42	2 63	3 95	4 99

NOTE TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
51 50	54 30	60 70	68 40	74 90	80 40
82 30	81 60	78 20	69 30	59 70	53 90

NOTE SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA AND STATION LATITUDE = 30 10 DEGREES

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	4 71	4 38	4 29	4 25	4 71	3 04
	7 87	5 25	4 07	2 76	3 67	4 43
STD DEVIATIONS	2 14	2 77	2 76	2 91	2 61	1 45
	2 92	2 63	2 09	1 98	2 09	2 08
RUNOFF						
TOTALS	3 111	2 511	1 568	1 344	0 966	0 140
	1 664	0 820	0 456	0 695	1 547	3 065
STD DEVIATIONS	2 062	2 516	2 171	1 795	1 508	0 436
	2 031	1 155	1 153	1 159	1 845	2 027
EVAPOTRANSPIRATION						
TOTALS	1 528	2 069	3 081	3 376	3 743	3 017
	5 548	4 471	3 543	2 024	1 153	0 977
STD DEVIATIONS	0 130	0 160	0 683	1 150	1 568	1 163
	0 923	1 227	1 246	0 615	0 342	0 146
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	0 1280	0 1143	0 1157	0 0766	0 0539	0 0283
	0 0736	0 0578	0 0626	0 0712	0 0879	0 1261
STD DEVIATIONS	0 0022	0 0036	0 0155	0 0302	0 0309	0 0256
	0 0270	0 0349	0 0348	0 0384	0 0436	0 0148
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	0 0158	0 0164	0 0173	0 0095	0 0020	0 0005
	0 0017	0 0019	0 0018	0 0025	0 0047	0 0108
STD DEVIATIONS	0 0031	0 0017	0 0026	0 0052	0 0025	0 0007
	0 0014	0 0020	0 0022	0 0025	0 0040	0 0045
PERCOLATION/LEAKAGE THROUGH LAYER 5						
TOTALS	0 1057	0 0963	0 1045	0 0874	0 0569	0 0293
	0 0673	0 0577	0 0603	0 0669	0 0754	0 1034
STD DEVIATIONS	0 0000	0 0015	0 0060	0 0203	0 0298	0 0247

	0 0236	0 0303	0 0306	0 0323	0 0364	0 0108

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2						
AVERAGES	5 1267	4 5717	3 2343	1 6934	1 3428	0 5558
	1 9900	1 3400	1 4857	1 6671	2 9477	5 2064
STD DEVIATIONS	0 5061	0 6947	1 1839	1 1139	1 0190	0 7025
	1 0988	1 1179	1 1731	1 4895	1 9146	1 1152
DAILY AVERAGE HEAD ON TOP OF LAYER 5						
AVERAGES	0 0774	0 0883	0 0847	0 0480	0 0097	0 0028
	0 0086	0 0093	0 0092	0 0121	0 0237	0 0528
STD DEVIATIONS	0 0155	0 0092	0 0130	0 0263	0 0124	0 0038
	0 0069	0 0097	0 0110	0 0122	0 0203	0 0219

AVERAGE ANNUAL TOTALS & (STD DEVIATIONS) FOR YEARS 1 THROUGH 30

	INCHES		CU FEET	PERCENT
PRECIPITATION	53 41	(7 432)	3683871 5	100 00
RUNOFF	17 886	(5 9913)	1233628 25	33 487
EVAPOTRANSPIRATION	34 530	(3 2876)	2381545 00	64 648
PERCOLATION/LEAKAGE THROUGH LAYER 2	0 99595	(0 10966)	68690 641	1 86463
AVERAGE HEAD ON TOP OF LAYER 2	2 597	(0 373)		
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0 08477	(0 01038)	5846 791	0 15871
PERCOLATION/LEAKAGE THROUGH LAYER 5	0 91104	(0 09664)	62834 375	1 70566
AVERAGE HEAD ON TOP OF LAYER 5	0 036	(0 004)		
CHANGE IN WATER STORAGE	0 000	(0 2446)	16 87	0 000

PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

	(INCHES)	(CU FT)
PRECIPITATION	8 09	557967 312
RUNOFF	6 789	468224 8440
PERCOLATION/LEAKAGE THROUGH LAYER 2	0 004252	293 25406
AVERAGE HEAD ON TOP OF LAYER 2	6 000	
DRAINAGE COLLECTED FROM LAYER 4	0 00069	47 45385
PERCOLATION/LEAKAGE THROUGH LAYER 5	0 003411	235 28493
AVERAGE HEAD ON TOP OF LAYER 5	0 105	
MAXIMUM HEAD ON TOP OF LAYER 5	0 202	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	3 3 FEET	
SNOW WATER	1 61	111063 4220

MAXIMUM VEG SOIL WATER (VOL/VOL)	0 4630
MINIMUM VEG SOIL WATER (VOL/VOL)	0 1160

* Maximum heads are computed using McEnroe s equations **

Reference Maximum Saturated Depth over Landfill Liner
by Bruce M McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol 119 No 2 March 1993 pp 262 270

FINAL WATER STORAGE AT END OF YEAR 30

LAYER	(INCHES)	(VOL/VOL)
1	2 7503	0 4584
2	10 2480	0 4270
3	102 2000	0 2920
4	0 7764	0 0647
5	15 3720	0 4270
SNOW WATER	0 000	

Phase 1B - HELPv3 07 Model

VERMILION PARISH SOLID WASTE PLANT

Final Cap System	12 inch topsoil 40 mil HDPE 24 inches clay
Average Waste Depth	33' = 400"
Bottom Liner System	12 inch sand drainage 60 mil HDPE liner 36 inches recompacted clay
Acreage	6 5 acres

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0
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**   * *     *** ***   *       * * ** **  * *   ** **       * *    *       *
**                                                                         *
**                                                                         *
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE              *
**                HELP MODEL VERSION 3 07  (1 NOVEMBER 1997)               *
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                  *
*                     USAE WATERWAYS EXPERIMENT STATION                    *
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY             *
**                                                                         *
**                                                                         *
 **  * *  ***** *** **  *   *    **  ** * ***  *      *  **   * * *     *  **
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PRECIPITATION DATA FILE      C \HELP3\VPSWP\DATA4 D4
TEMPERATURE DATA FILE        C \HELP3\VPSWP\DATA7 D7
SOLAR RADIATION DATA FILE    C \HELP3\VPSWP\DATA13 D13
EVAPOTRANSPIRATION DATA      C \HELP3\VPSWP\DATA11 D11
SOIL AND DESIGN DATA FILE    C \HELP3\VPSWP\DATA10 D10
OUTPUT DATA FILE             C \HELP3\VPSWP\VPSWPOUT OUT
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TIME 14 59 DATE 10/25/2004

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**    **    *  *****     **  ******   **    **          * * **  *  *    **   *
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TITLE VERMILION PARISH SOLID WASTE PLANT PHASE1B

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NOTE INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM

LAYER 1

TYPE 1 VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 8

THICKNESS	=	12 00 INCHES
POROSITY	=	0 4630 VOL/VOL
FIELD CAPACITY	=	0 2320 VOL/VOL
WILTING POINT	=	0 1160 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4612 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 369999994000E 03 CM/SEC

NOTE SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 3 00 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE

LAYER 2

TYPE 4 FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0 04 INCHES
POROSITY	=	0 0000 VOL/VOL
FIELD CAPACITY	=	0 0000 VOL/VOL
WILTING POINT	=	0 0000 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0000 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 199999996000E 12 CM/SEC
FML PINHOLE DENSITY	=	1 00 HOLES/ACRE
FML INSTALLATION DEFECTS	=	10 00 HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD

LAYER 3

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	24 00 INCHES
POROSITY	=	0 4270 VOL/VOL
FIELD CAPACITY	=	0 4180 VOL/VOL
WILTING POINT	=	0 3670 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4270 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000001000E 06 CM/SEC

LAYER 4

TYPE 1 VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	400 00 INCHES
POROSITY	=	0 6710 VOL/VOL
FIELD CAPACITY	=	0 2920 VOL/VOL
WILTING POINT	=	0 0770 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 2920 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000005000E 02 CM/SEC

LAYER 5

TYPE 2 LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12 00 INCHES
POROSITY	=	0 4370 VOL/VOL
FIELD CAPACITY	=	0 0620 VOL/VOL
WILTING POINT	=	0 0240 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0622 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 579999993000E 02 CM/SEC
SLOPE	=	2 00 PERCENT
DRAINAGE LENGTH	=	100 0 FEET

VPSWPOUT OUT
LAYER 6

TYPE 4 FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0 06	INCHES
POROSITY	=	0 0000	VOL/VOL
FIELD CAPACITY	=	0 0000	VOL/VOL
WILTING POINT	=	0 0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0000	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 199999996000E 12	CM/SEC
FML PINHOLE DENSITY	=	1 00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	10 00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 GOOD	

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36 00	INCHES
POROSITY	=	0 4270	VOL/VOL
FIELD CAPACITY	=	0 4180	VOL/VOL
WILTING POINT	=	0 3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4270	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000001000E 06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 8 WITH A FAIR STAND OF GRASS A SURFACE SLOPE OF 4 % AND A SLOPE LENGTH OF 350 FEET

SCS RUNOFF CURVE NUMBER	=	79 40	
FRACTION OF AREA ALLOWING RUNOFF	=	100 0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	6 500	ACRES
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2 757	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	2 778	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0 696	INCHES
INITIAL SNOW WATER	=	0 000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	148 702	INCHES
TOTAL INITIAL WATER	=	148 702	INCHES
TOTAL SUBSURFACE INFLOW	=	0 00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE EVAPOTRANSPIRATION DATA WAS OBTAINED FROM LAKE CHARLES LOUISIANA

VPSWPOUT OUT

STATION LATITUDE	=	30 10	DEGREES
MAXIMUM LEAF AREA INDEX	=	2 00	
START OF GROWING SEASON (JULIAN DATE)	=	32	
END OF GROWING SEASON (JULIAN DATE)	=	361	
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
AVERAGE ANNUAL WIND SPEED	=	8 70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	77 00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	77 00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	80 00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	78 00	%

NOTE PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4 58	4 97	4 59	5 59	4 82	3 11
7 07	5 05	4 42	2 63	3 95	4 99

NOTE TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
51 50	54 30	60 70	68 40	74 90	80 40
82 30	81 60	78 20	69 30	59 70	53 90

NOTE SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA AND STATION LATITUDE = 30 10 DEGREES

********* ** *** ** ** *** *** * * ** * ** *** ***

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	4 71	4 38	4 29	4 25	4 71	3 04
	7 87	5 25	4 07	2 76	3 67	4 43
STD DEVIATIONS	2 14	2 77	2 76	2 91	2 61	1 45
	2 92	2 63	2 09	1 98	2 09	2 08
RUNOFF						

TOTALS	3 249	2 608	1 667	1 391	0 978	0 145
	1 696	0 841	0 470	0 721	1 630	3 206
STD DEVIATIONS	2 079	2 543	2 209	1 837	1 523	0 445
	2 054	1 185	1 173	1 181	1 896	2 046
EVAPOTRANSPIRATION						
TOTALS	1 520	2 063	3 077	3 466	3 781	3 042
	5 579	4 507	3 576	2 054	1 156	0 972
STD DEVIATIONS	0 132	0 159	0 682	1 097	1 578	1 172
	0 923	1 232	1 240	0 602	0 336	0 143
PERCOLATION/LEAKAGE THROUGH LAYER 3						
TOTALS	0 0018	0 0016	0 0015	0 0012	0 0012	0 0010
	0 0013	0 0012	0 0012	0 0013	0 0014	0 0018
STD DEVIATIONS	0 0001	0 0001	0 0002	0 0002	0 0002	0 0001
	0 0002	0 0002	0 0002	0 0002	0 0003	0 0002
LATERAL DRAINAGE COLLECTED FROM LAYER 5						
TOTALS	0 0016	0 0015	0 0016	0 0015	0 0014	0 0012
	0 0012	0 0013	0 0012	0 0012	0 0012	0 0014
STD DEVIATIONS	0 0001	0 0001	0 0001	0 0001	0 0001	0 0001
	0 0001	0 0001	0 0001	0 0001	0 0001	0 0002
PERCOLATION/LEAKAGE THROUGH LAYER 7						
TOTALS	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
STD DEVIATIONS	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2						
AVERAGES	11 2374	10 6855	9 4227	7 8292	7 3636	6 5676
	8 0186	7 3738	7 5413	7 7478	9 0943	11 3189
STD DEVIATIONS	0 4508	0 6474	1 0778	1 0792	1 0270	0 7179
	1 1082	1 1375	1 1970	1 5241	1 9730	1 0892
DAILY AVERAGE HEAD ON TOP OF LAYER 6						
AVERAGES	0 0078	0 0081	0 0080	0 0075	0 0069	0 0063
	0 0061	0 0061	0 0061	0 0061	0 0063	0 0071
STD DEVIATIONS	0 0005	0 0003	0 0003	0 0004	0 0004	0 0004
	0 0003	0 0004	0 0004	0 0004	0 0007	0 0008

AVERAGE ANNUAL TOTALS & (STD DEVIATIONS) FOR YEARS 1 THROUGH 30

	INCHES		CU FEET	PERCENT
PRECIPITATION	53 41	(7 432)	1260271 9	100 00
RUNOFF	18 603	(6 0723)	438939 69	34 829
EVAPOTRANSPIRATION	34 793	(3 2972)	820940 37	65 140
PERCOLATION/LEAKAGE THROUGH LAYER 3	0 01650	(0 00067)	389 279	0 03089
AVERAGE HEAD ON TOP OF LAYER 2	8 683	(0 376)		
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0 01647	(0 00051)	388 514	0 03083
PERCOLATION/LEAKAGE THROUGH LAYER 7	0 00003	(0 00000)	0 647	0 00005
AVERAGE HEAD ON TOP OF LAYER 6	0 007	(0 000)		
CHANGE IN WATER STORAGE	0 000	(0 1896)	2 71	0 000

PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

	(INCHES)	(CU FT)
PRECIPITATION	8 09	190883 547
RUNOFF	6 821	160946 6090
PERCOLATION/LEAKAGE THROUGH LAYER 3	0 000061	1 44560
AVERAGE HEAD ON TOP OF LAYER 2	12 000	
DRAINAGE COLLECTED FROM LAYER 5	0 00006	1 34292
PERCOLATION/LEAKAGE THROUGH LAYER 7	0 000000	0 00215
AVERAGE HEAD ON TOP OF LAYER 6	0 009	
MAXIMUM HEAD ON TOP OF LAYER 6	0 017	
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	1 7 FEET	
SNOW WATER	1 61	37995 3828

MAXI VEG SOIL WATER (VOL/VOL) 0 4630

MINIMUM VEG SOIL WATER (VOL/VOL) 0 1160

* Maximum heads are computed using McEnroe s equations *

Reference Maximum Saturated Depth over Landfill Liner
by Bruce M McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol 119 No 2 March 1993 pp 262 270

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FINAL WATER STORAGE AT END OF YEAR 30

LAYER	(INCHES)	(VOL/VOL)
1	5 5379	0 4615
2	0 0000	0 0000
3	10 2480	0 4270
4	116 8000	0 2920
5	0 7471	0 0623
6	0 0000	0 0000
7	15 3720	0 4270
SNOW WATER	0 000	

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Phase 2B, Active Face - HELPv3 07 Model

VERMILION PARISH SOLID WASTE PLANT

Final Cap System	None
Average Waste Depth	33' = 400"
Bottom Liner System	12 inch sand drainage 60 mil HDPE liner 36 inches recompacted clay
Acreage	2 acres

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********* **  *  * *    **  *    *** ** **   ** *  *  **   *  **  **    ** ***
* **** *   *  * *****   *  **  * **   *  *   *** **    **  **  ** *** * *** **
**                                                                          *
*                                                                           *
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               *
**                HELP MODEL VERSION 3 07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   *
**                    USAE WATERWAYS EXPERIMENT STATION                     *
**              FOR USEPA RISK REDUCTION ENGINEERING LABORATORY             *
*                                                                           *
* *        * *      *      *                  *          * **  * *  * * *  *
**    *  ***    * *   *****        *  *        * *   ** **   * *  *    * * *
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PRECIPITATION DATA FILE      C \HELP3\VPSWP\DATA4 D4
TEMPERATURE DATA FILE        C \HELP3\VPSWP\DATA7 D7
SOLAR RADIATION DATA FILE    C \HELP3\VPSWP\DATA13 D13
EVAPOTRANSPIRATION DATA      C \HELP3\VPSWP\DATA11 D11
SOIL AND DESIGN DATA FILE    C \HELP3\VPSWP\DATA10 D10
OUTPUT DATA FILE             C \HELP3\VPSWP\VPSWPOUT OUT
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TIME 13 54 DATE 10/25/2004

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TITLE VERMILION PARISH SOLID WASTE PLANT AREA 2B ACTIVE FACE

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NOTE INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE COMPUTED AS NEARLY STEADY STATE VALUES BY THE PROGRAM

LAYER 1

TYPE 1 VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	400 00	INCHES
POROSITY	=	0 6710	VOL/VOL
FIELD CAPACITY	=	0 2920	VOL/VOL
WILTING POINT	=	0 0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 2967	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000005000E 02	CM/SEC

NOTE SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 3 00 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE

LAYER 2

TYPE 2 LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12 00	INCHES
POROSITY	=	0 4370	VOL/VOL
FIELD CAPACITY	=	0 0620	VOL/VOL
WILTING POINT	=	0 0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 2636	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 579999993000E 02	CM/SEC
SLOPE	=	2 00	PERCENT
DRAINAGE LENGTH	=	100 0	FEET

LAYER 3

TYPE 4 FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0 06	INCHES
POROSITY	=	0 0000	VOL/VOL
FIELD CAPACITY	=	0 0000	VOL/VOL
WILTING POINT	=	0 0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0000	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 199999996000E 12	CM/SEC
FML PINHOLE DENSITY	=	1 00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	10 00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 GOOD	

LAYER 4

TYPE 3 BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36 00	INCHES
POROSITY	=	0 4270	VOL/VOL
FIELD CAPACITY	=	0 4180	VOL/VOL
WILTING POINT	=	0 3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4270	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000001000E 06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE SCS RUNOFF CURVE NUMBER WAS USER SPECIFIED

SCS RUNOFF CURVE NUMBER	=	78 40	
FRACTION OF AREA ALLOWING RUNOFF	=	100 0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	2 000	ACRES
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	1 608	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	4 026	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0 462	INCHES
INITIAL SNOW WATER	=	0 000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	137 221	INCHES

VPSWPOUT OUT

TOTAL INITIAL WATER = 137 221 INCHES
TOTAL SUBSURFACE INFLOW = 0 00 INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
LAKE CHARLES LOUISIANA

STATION LATITUDE	=	30 10 DEGREES
MAXIMUM LEAF AREA INDEX	=	2 00
START OF GROWING SEASON (JULIAN DATE)	=	32
END OF GROWING SEASON (JULIAN DATE)	=	361
EVAPORATIVE ZONE DEPTH	=	6 0 INCHES
AVERAGE ANNUAL WIND SPEED	=	8 70 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	77 00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	77 00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	80 00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	78 00 %

NOTE PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4 58	4 97	4 59	5 59	4 82	3 11
7 07	5 05	4 42	2 63	3 95	4 99

NOTE TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR LAKE CHARLES LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
51 50	54 30	60 70	68 40	74 90	80 40
82 30	81 60	78 20	69 30	59 70	53 90

NOTE SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR LAKE CHARLES LOUISIANA
AND STATION LATITUDE = 30 10 DEGREES

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

VPSWPOUT OUT

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	4 71	4 38	4 29	4 25	4 71	3 04
	7 87	5 25	4 07	2 76	3 67	4 43
STD DEVIATIONS	2 14	2 77	2 76	2 91	2 61	1 45
	2 92	2 63	2 09	1 98	2 09	2 08
RUNOFF						
TOTALS	0 105	0 143	0 095	0 161	0 168	0 005
	0 188	0 066	0 081	0 062	0 076	0 056
STD DEVIATIONS	0 134	0 294	0 193	0 316	0 574	0 011
	0 302	0 117	0 286	0 157	0 149	0 116
EVAPOTRANSPIRATION						
TOTALS	1 607	2 042	2 647	2 609	3 108	2 646
	5 043	3 882	3 099	1 770	1 202	1 072
STD DEVIATIONS	0 130	0 260	0 785	1 085	1 262	0 993
	0 930	1 112	1 129	0 704	0 377	0 163
LATERAL DRAINAGE COLLECTED FROM LAYER 2						
TOTALS	1 4907	1 7258	2 2083	2 2801	2 3391	2 1802
	1 8625	1 7608	1 6432	1 4920	1 2090	1 2156
STD DEVIATIONS	0 5132	0 5381	0 7015	0 8268	0 9329	0 8638
	0 8469	0 6740	0 5934	0 6575	0 5588	0 5306
PERCOLATION/LEAKAGE THROUGH LAYER 4						
TOTALS	0 0011	0 0013	0 0016	0 0017	0 0017	0 0016
	0 0014	0 0013	0 0012	0 0011	0 0009	0 0009
STD DEVIATIONS	0 0003	0 0004	0 0005	0 0006	0 0007	0 0006
	0 0006	0 0004	0 0004	0 0004	0 0004	0 0004

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3						
AVERAGES	7 0480	8 8613	10 4512	11 1859	11 1417	10 6674
	8 7828	8 2472	7 9073	6 9939	5 9468	5 8008
STD DEVIATIONS	2 2472	2 7312	3 7390	4 4825	4 7317	4 4685
	3 9865	3 0429	2 6490	2 8451	2 5605	2 3459

AVERAGE ANNUAL TOTALS & (STD DEVIATIONS) FOR YEARS 1 THROUGH 30

	INCHES	CU FEET	PERCENT
PRECIPITATION	53 41 (7 432)	387776 0	100 00
RUNOFF	1 207 (0 9373)	8759 35	2 259
EVAPOTRANSPIRATION	30 727 (2 8507)	223078 70	57 528
LATERAL DRAINAGE COLLECTED FROM LAYER 2	21 40720 (5 47898)	155416 250	40 07888
PERCOLATION/LEAKAGE THROUGH LAYER 4	0 01591 (0 00392)	115 491	0 02978
AVERAGE HEAD ON TOP OF LAYER 3	8 586 (2 281)		
CHANGE IN WATER STORAGE	0 056 (5 7007)	406 16	0 105

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

	(INCHES)	(CU FT)
PRECIPITATION	8 09	58733 402
RUNOFF	3 164	22972 1699
DRAINAGE COLLECTED FROM LAYER 2	0 15514	1126 31860
PERCOLATION/LEAKAGE THROUGH LAYER 4	0 000131	0 95056
AVERAGE HEAD ON TOP OF LAYER 3	27 621	
MAXIMUM HEAD ON TOP OF LAYER 3	32 472	
LOCATION OF MAXIMUM HEAD IN LAYER 2 (DISTANCE FROM DRAIN)	63 4 FEET	
SNOW WATER	1 61	11690 8867

MAXIMUM VEG SOIL WATER (VOL/VOL) 0 5412

MINIMUM VEG SOIL WATER (VOL/VOL) 0 0770

* Maximum heads are computed using McEnroe s equations *

Reference Maximum Saturated Depth over Landfill Liner
by Bruce M McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol 119 No 2 March 1993 pp 262 270

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FINAL WATER STORAGE AT END OF YEAR 30

LAYER	(INCHES)	(VOL/VOL)
1	119 2049	0 2980
2	4 3221	0 3602
3	0 0000	0 0000
4	15 3720	0 4270
SNOW WATER	0 000	

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Phase 2B, Daily Cover - HELPv3 07 Model

VERMILION PARISH SOLID WASTE PLANT

Final Cap System	6" Topsoil
Average Waste Depth	33' = 400"
Bottom Liner System	12 inch sand drainage 60 mil HDPE liner 36 inches recompacted clay
Acreage	3 acres

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* * *          * *     ***    * **   *   ** *  **     *   **   ***
*  * *     *      *  *     *    * ** *     * *          *     *   *** * *
**                                                                      *
 *                                                                      *
*
*              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
                HELP MODEL VERSION 3 07  (1 NOVEMBER 1997)                **
                 DEVELOPED BY ENVIRONMENTAL LABORATORY                    **
                   USAE WATERWAYS EXPERIMENT STATION                      *
             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY
*
 *   **** *   *      *   *   * *    **   **    ** *  *      *     *       *
*  *     * **      * * *     *          **        *            *     *
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PRECIPITATION DATA FILE      C \HELP3\VPSWP\DATA4 D4
TEMPERATURE DATA FILE        C \HELP3\VPSWP\DATA7 D7
SOLAR RADIATION DATA FILE    C \HELP3\VPSWP\DATA13 D13
EVAPOTRANSPIRATION DATA      C \HELP3\VPSWP\DATA11 D11
SOIL AND DESIGN DATA FILE    C \HELP3\VPSWP\DATA10 D10
OUTPUT DATA FILE             C \HELP3\VPSWP\VPSWPOUT OUT

TIME   13 58     DATE   10/25/2004

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    TITLE   VERMILION PARISH SOLID WASTE PLANT   AREA 2B  DAILY COVER
**  * *     *  *         *  **   **     *   *              * * *****       **

    NOTE   INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
             COMPUTED AS NEARLY STEADY STATE VALUES BY THE PROGRAM

                          LAYER  1
                            -

              TYPE 1   VERTICAL PERCOLATION LAYER
                 MATERIAL TEXTURE NUMBER   8
THICKNESS                    =      6 00   INCHES
POROSITY                     =      0 4630 VOL/VOL
FIELD CAPACITY               =      0 2320 VOL/VOL
WILTING POINT                =      0 1160 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0 2624 VOL/VOL
EFFECTIVE SAT  HYD  COND     =  0 369999994000E 03 CM/SEC
NOTE   SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  3 00
         FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE

                          LAYER  2
                           - -
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              TYPE 1   VERTICAL PERCOLATION LAYER
                 MATERIAL TEXTURE NUMBER  18
THICKNESS                    =    400 00   INCHES
POROSITY                     =      0 6710 VOL/VOL
FIELD CAPACITY               =      0 2920 VOL/VOL
WILTING POINT                =      0 0770 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0 2957 VOL/VOL
EFFECTIVE SAT  HYD  COND     =  0 100000005000E-02 CM/SEC

                          LAYER  3
                           - -  -

              TYPE 2   LATERAL DRAINAGE LAYER
                 MATERIAL TEXTURE NUMBER   2
THICKNESS                    =     12 00   INCHES
POROSITY                     =      0 4370 VOL/VOL
FIELD CAPACITY               =      0 0620 VOL/VOL
WILTING POINT                =      0 0240 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0 2474 VOL/VOL
EFFECTIVE SAT  HYD  COND     =  0 579999993000E 02 CM/SEC
SLOPE                        =      2 00   PERCENT
DRAINAGE LENGTH              =    100 0    FEET

                          LAYER  4
                            -

              TYPE 4   FLEXIBLE MEMBRANE LINER
                 MATERIAL TEXTURE NUMBER  35
THICKNESS                    =      0 06   INCHES
POROSITY                     =      0 0000 VOL/VOL
FIELD CAPACITY               =      0 0000 VOL/VOL
WILTING POINT                =      0 0000 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0 0000 VOL/VOL
EFFECTIVE SAT  HYD  COND     =  0 199999996000E 12 CM/SEC
FML PINHOLE DENSITY          =      1 00   HOLES/ACRE
FML INSTALLATION DEFECTS     =     10 00   HOLES/ACRE
FML PLACEMENT QUALITY        =  3   GOOD

                          LAYER  5
                            -

              TYPE 3   BARRIER SOIL LINER
                 MATERIAL TEXTURE NUMBER  16
THICKNESS                    =     36 00   INCHES
POROSITY                     =      0 4270 VOL/VOL
FIELD CAPACITY               =      0 4180 VOL/VOL
WILTING POINT                =      0 3670 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0 4270 VOL/VOL
EFFECTIVE SAT  HYD  COND     =  0 100000001000E 06 CM/SEC
```

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 8 WITH BARE GROUND CONDITIONS A SURFACE SLOPE OF 4 % AND A SLOPE LENGTH OF 200 FEET

SCS RUNOFF CURVE NUMBER	=	90 80	
FRACTION OF AREA ALLOWING RUNOFF	=	100 0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	3 000	ACRES
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	1 574	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	2 778	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0 696	INCHES
INITIAL SNOW WATER	=	0 000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	138 180	INCHES
TOTAL INITIAL WATER	=	138 180	INCHES
TOTAL SUBSURFACE INFLOW	=	0 00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE EVAPOTRANSPIRATION DATA WAS OBTAINED FROM LAKE CHARLES LOUISIANA

STATION LATITUDE	=	30 10 DEGREES
MAXIMUM LEAF AREA INDEX	=	2 00
START OF GROWING SEASON (JULIAN DATE)	=	32
END OF GROWING SEASON (JULIAN DATE)	=	361
EVAPORATIVE ZONE DEPTH	=	6 0 INCHES
AVERAGE ANNUAL WIND SPEED	=	8 70 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	77 00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	77 00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	80 00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	78 00 %

NOTE PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4 58	4 97	4 59	5 59	4 82	3 11
7 07	5 05	4 42	2 63	3 95	4 99

NOTE TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
51 50	54 30	60 70	68 40	74 90	80 40

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
82 30	81 60	78 20	69 30	59 70	53 90

NOTE SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA AND STATION LATITUDE = 30 10 DEGREES

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	4 71	4 38	4 29	4 25	4 71	3 04
	7 87	5 25	4 07	2 76	3 67	4 43
STD DEVIATIONS	2 14	2 77	2 76	2 91	2 61	1 45
	2 92	2 63	2 09	1 98	2 09	2 08
RUNOFF						
TOTALS	0 787	0 834	0 727	0 966	0 875	0 196
	1 339	0 685	0 571	0 467	0 609	0 592
STD DEVIATIONS	0 647	1 078	0 889	1 086	1 103	0 261
	1 180	0 696	0 762	0 616	0 682	0 538
EVAPOTRANSPIRATION						
TOTALS	1 618	1 901	2 278	2 134	2 645	2 394
	4 538	3 460	2 673	1 543	1 222	1 158
STD DEVIATIONS	0 205	0 370	0 773	0 978	1 080	0 908
	0 869	1 029	1 007	0 679	0 418	0 185
LATERAL DRAINAGE COLLECTED FROM LAYER 3						
TOTALS	1 2696	1 4641	1 8437	1 8547	1 8747	1 6530
	1 3746	1 3586	1 2843	1 1673	0 9744	1 0456
STD DEVIATIONS	0 3964	0 4287	0 6160	0 6887	0 7580	0 6597
	0 5852	0 4183	0 4400	0 4313	0 4236	0 4209
PERCOLATION/LEAKAGE THROUGH LAYER 5						
TOTALS	0 0010	0 0011	0 0014	0 0014	0 0014	0 0012
	0 0011	0 0010	0 0010	0 0009	0 0008	0 0008
STD DEVIATIONS	0 0003	0 0003	0 0004	0 0005	0 0005	0 0004
	0 0004	0 0003	0 0003	0 0003	0 0003	0 0003

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

AVERAGES	6 0898	7 5642	8 6184	8 9013	8 6844	8 0191
	6 5408	6 4881	6 3323	5 6103	4 8642	5 0529
STD DEVIATIONS	1 7866	2 0427	2 7844	3 2809	3 4243	3 1458
	2 6348	1 8300	2 0133	1 9590	1 9685	1 9345

AVERAGE ANNUAL TOTALS & (STD DEVIATIONS) FOR YEARS 1 THROUGH 30

	INCHES		CU FEET	PERCENT
PRECIPITATION	53 41	(7 432)	581663 9	100 00
RUNOFF	8 648	(2 7872)	94178 72	16 191
EVAPOTRANSPIRATION	27 565	(2 6029)	300177 44	51 607
LATERAL DRAINAGE COLLECTED FROM LAYER 3	17 16451	(4 05239)	186921 500	32 13565
PERCOLATION/LEAKAGE THROUGH LAYER 5	0 01301	(0 00275)	141 685	0 02436
AVERAGE HEAD ON TOP OF LAYER 4	6 897	(1 583)		
CHANGE IN WATER STORAGE	0 022	(4 1282)	244 61	0 042

PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

	(INCHES)	(CU FT)
PRECIPITATION	8 09	88100 102
RUNOFF	5 647	61499 2187
DRAINAGE COLLECTED FROM LAYER 3	0 11443	1246 12476
PERCOLATION/LEAKAGE THROUGH LAYER 5	0 000091	0 99233
AVERAGE HEAD ON TOP OF LAYER 4	18 854	
MAXIMUM HEAD ON TOP OF LAYER 4	22 048	
LOCATION OF MAXIMUM HEAD IN LAYER 3 (DISTANCE FROM DRAIN)	55 7 FEET	

SNOW WATER	1 61	17536 3301
MAXIMUM VEG SOIL WATER (VOL/VOL)	0 4081	
MINIMUM VEG SOIL WATER (VOL/VOL)	0 1160	

* Maximum heads are computed using McEnroe s equations **

Reference Maximum Saturated Depth over Landfill Liner by Bruce M McEnroe, University of Kansas ASCE Journal of Environmental Engineering Vol 119 No 2 March 1993 pp 262 270

FINAL WATER STORAGE AT END OF YEAR 30

LAYER	(INCHES)	(VOL/VOL)
1	1 4643	0 2441
2	118 1644	0 2954
3	3 8529	0 3211
4	0 0000	0 0000
5	15 3720	0 4270
SNOW WATER	0 000	

Phase 2B, Interim Cover - HELPv3 07 Model

VERMILION PARISH SOLID WASTE PLANT

Final Cap System	12" Clay
Average Waste Depth	33' = 400"
Bottom Liner System	12 inch sand drainage 60 mil HDPE liner 36 inches recompacted clay
Acreage	3 acres

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0
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* *  ** ***         *  *   * * **** * ***** *          **
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**                                                                    **
*                                                                     *
 *            HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE            *
 *              HELP MODEL VERSION 3 07  (1 NOVEMBER 1997)             *
 *               DEVELOPED BY ENVIRONMENTAL LABORATORY                 *
 *                 USAE WATERWAYS EXPERIMENT STATION                   *
 *          FOR USEPA RISK REDUCTION ENGINEERING LABORATORY            *
 *                                                                     *
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  ****    *     *    *  *       *  *     * **  *****   ****  * **      *** *
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PRECIPITATION DATA FILE      C \HELP3\VPSWP\DATA4 D4
TEMPERATURE DATA FILE        C \HELP3\VPSWP\DATA7 D7
SOLAR RADIATION DATA FILE    C \HELP3\VPSWP\DATA13 D13
EVAPOTRANSPIRATION DATA      C \HELP3\VPSWP\DATA11 D11
SOIL AND DESIGN DATA FILE    C \HELP3\VPSWP\DATA10 D10
OUTPUT DATA FILE             C \HELP3\VPSWP\VPSWPOUT OUT
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TIME 14 13 DATE 10/25/2004

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***** *  * *   *    **     *    *    *         *   *        *** *    *** ** **
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TITLE VERMILION PARISH SOLID WASTE PLANT AREA 2B INTERIM COVER

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NOTE INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE COMPUTED AS NEARLY STEADY STATE VALUES BY THE PROGRAM

LAYER 1

TYPE 1 VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 8

THICKNESS	=	6 00 INCHES
POROSITY	=	0 4630 VOL/VOL
FIELD CAPACITY	=	0 2320 VOL/VOL
WILTING POINT	=	0 1160 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 2563 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 369999994000E 03 CM/SEC

NOTE SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 3 00 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE

LAYER 2

TYPE 3 BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 8

THICKNESS	=	12 00 INCHES
POROSITY	=	0 4630 VOL/VOL
FIELD CAPACITY	=	0 2320 VOL/VOL
WILTING POINT	=	0 1160 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4630 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 369999994000E 03 CM/SEC

LAYER 3

TYPE 1 VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	400 00 INCHES
POROSITY	=	0 6710 VOL/VOL
FIELD CAPACITY	=	0 2920 VOL/VOL
WILTING POINT	=	0 0770 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 2964 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000005000E 02 CM/SEC

LAYER 4

TYPE 2 LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12 00 INCHES
POROSITY	=	0 4370 VOL/VOL
FIELD CAPACITY	=	0 0620 VOL/VOL
WILTING POINT	=	0 0240 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 3079 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 579999993000E 02 CM/SEC
SLOPE	=	2 00 PERCENT
DRAINAGE LENGTH	=	100 0 FEET

LAYER 5

TYPE 4 FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0 06 INCHES
POROSITY	=	0 0000 VOL/VOL
FIELD CAPACITY	=	0 0000 VOL/VOL
WILTING POINT	=	0 0000 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0000 VOL/VOL
EFFECTIVE SAT HYD COND	=	0 199999996000E 12 CM/SEC
FML PINHOLE DENSITY	=	1 00 HOLES/ACRE
FML INSTALLATION DEFECTS	=	10 00 HOLES/ACRE
FML PLACEMENT QUALITY	=	3 GOOD

LAYER 6

TYPE 3 BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36 00	INCHES
POROSITY	=	0 4270	VOL/VOL
FIELD CAPACITY	=	0 4180	VOL/VOL
WILTING POINT	=	0 3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4270	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000001000E 06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 8 WITH A FAIR STAND OF GRASS A SURFACE SLOPE OF 4 % AND A SLOPE LENGTH OF 200 FEET

SCS RUNOFF CURVE NUMBER	=	80 10	
FRACTION OF AREA ALLOWING RUNOFF	=	100 0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	3 000	ACRES
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	1 538	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	2 778	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0 696	INCHES
INITIAL SNOW WATER	=	0 000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	144 717	INCHES
TOTAL INITIAL WATER	=	144 717	INCHES
TOTAL SUBSURFACE INFLOW	=	0 00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE EVAPOTRANSPIRATION DATA WAS OBTAINED FROM LAKE CHARLES LOUISIANA

STATION LATITUDE	=	30 10	DEGREES
MAXIMUM LEAF AREA INDEX	=	2 00	
START OF GROWING SEASON (JULIAN DATE)	=	32	
END OF GROWING SEASON (JULIAN DATE)	=	361	
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
AVERAGE ANNUAL WIND SPEED	=	8 70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	77 00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	77 00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	80 00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	78 00	%

NOTE PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4 58	4 97	4 59	5 59	4 82	3 11
7 07	5 05	4 42	2 63	3 95	4 99

NOTE TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
51 50	54 30	60 70	68 40	74 90	80 40
82 30	81 60	78 20	69 30	59 70	53 90

NOTE SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA AND STATION LATITUDE = 30 10 DEGREES

* ** * * * ** ** * ** * ** **** ** * * *** *

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	4 71	4 38	4 29	4 25	4 71	3 04
	7 87	5 25	4 07	2 76	3 67	4 43
STD DEVIATIONS	2 14	2 77	2 76	2 91	2 61	1 45
	2 92	2 63	2 09	1 98	2 09	2 08
RUNOFF						
TOTALS	0 188	0 230	0 150	0 241	0 240	0 014
	0 306	0 118	0 130	0 088	0 128	0 098
STD DEVIATIONS	0 228	0 446	0 282	0 414	0 636	0 032
	0 464	0 184	0 411	0 196	0 237	0 162
EVAPOTRANSPIRATION						
TOTALS	1 622	1 893	2 267	2 109	2 607	2 391
	4 500	3 444	2 655	1 546	1 230	1 166
STD DEVIATIONS	0 206	0 380	0 779	0 973	1 064	0 925
	0 850	1 016	1 004	0 682	0 420	0 185
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	2 9496	2 3983	1 9205	2 1474	1 8589	0 6323
	2 9247	1 6886	1 2813	1 1618	2 0127	3 0786

STD DEVIATIONS	1 8782	2 0537	1 9889	1 8327	1 3828	0 7116
	1 9045	1 5602	1 0822	1 2447	1 7159	1 7831
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	1 6472	1 7991	2 2270	2 2890	2 3995	2 3396
	2 1819	2 0713	1 9932	1 9127	1 6119	1 4979
STD DEVIATIONS	0 5287	0 5429	0 6707	0 7841	0 8438	0 7954
	0 8139	0 6359	0 5888	0 6890	0 6108	0 5549
PERCOLATION/LEAKAGE THROUGH LAYER 6						
TOTALS	0 0012	0 0013	0 0016	0 0017	0 0017	0 0017
	0 0016	0 0015	0 0014	0 0014	0 0012	0 0011
STD DEVIATIONS	0 0003	0 0004	0 0005	0 0006	0 0006	0 0006
	0 0006	0 0004	0 0004	0 0004	0 0004	0 0004

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2						
AVERAGES	0 0699	0 0685	0 0513	0 0595	0 0412	0 0133
	0 0807	0 0437	0 0337	0 0260	0 0547	0 0699
STD DEVIATIONS	0 0516	0 0709	0 0592	0 0589	0 0335	0 0168
	0 0623	0 0459	0 0351	0 0374	0 0525	0 0451
DAILY AVERAGE HEAD ON TOP OF LAYER 5						
AVERAGES	7 7393	9 2269	10 5198	11 1412	11 3376	11 4209
	10 2429	9 6138	9 4588	8 8629	7 7728	7 0578
STD DEVIATIONS	2 3223	2 8082	3 6022	4 2791	4 2976	4 1807
	3 9166	2 9154	2 6402	2 9808	2 7567	2 4008

AVERAGE ANNUAL TOTALS & (STD DEVIATIONS) FOR YEARS 1 THROUGH 30

	INCHES		CU FEET	PERCENT
PRECIPITATION	53 41	(7 432)	581663 9	100 00
RUNOFF	1 931	(1 2256)	21029 94	3 615
EVAPOTRANSPIRATION	27 429	(2 5792)	298706 87	51 354
PERCOLATION/LEAKAGE THROUGH LAYER 2	24 05472	(5 66195)	261955 937	45 03562
AVERAGE HEAD ON TOP OF LAYER 2	0 051	(0 013)		

LATERAL DRAINAGE COLLECTED FROM LAYER 4	23 97021	(5 61707)	261035 641	44 87740
PERCOLATION/LEAKAGE THROUGH LAYER 6	0 01756	(0 00404)	191 237	0 03288
AVERAGE HEAD ON TOP OF LAYER 5	9 533	(2 365)		
CHANGE IN WATER STORAGE	0 064	(5 7820)	700 26	0 120

PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

	(INCHES)	(CU FT)
PRECIPITATION	8 09	88100 102
RUNOFF	3 455	37620 8359
PERCOLATION/LEAKAGE THROUGH LAYER 2	2 774564	30215 00200
AVERAGE HEAD ON TOP OF LAYER 2	2 056	
DRAINAGE COLLECTED FROM LAYER 4	0 16267	1771 47192
PERCOLATION/LEAKAGE THROUGH LAYER 6	0 000137	1 48778
AVERAGE HEAD ON TOP OF LAYER 5	28 863	
MAXIMUM HEAD ON TOP OF LAYER 5	34 140	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	64 4 FEET	
SNOW WATER	1 61	17536 3301

MAXIMUM VEG SOIL WATER (VOL/VOL) 0 4630

MINIMUM VEG SOIL WATER (VOL/VOL) 0 1160

* Maximum heads are computed using McEnroe s equations ***

Reference Maximum Saturated Depth over Landfill Liner
by Bruce M McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol 119 No 2 March 1993 pp 262 270

FINAL WATER STORAGE AT END OF YEAR 30

LAYER	(INCHES)	(VOL/VOL)
1	1 4588	0 2431
2	5 5560	0 4630
3	119 5662	0 2989
4	4 6934	0 3911
5	0 0000	0 0000
6	15 3720	0 4270
SNOW WATER	0 000	

Phase 2B, Interim Compacted - HELPv3 07 Model

VERMILION PARISH SOLID WASTE PLANT

Final Cap System	6" Topsoil 2" Clay
Average Waste Depth	33' = 400"
Bottom Liner System	12 inch sand drainage 60 mil HDPE liner 36 inches recompacted clay
Acreage	3 acres

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*  *   ***** ** * **  *   *   *   *   **  **  **      * *     *   *       * *
* *  *   * ****  * *          **     *   * *           * *   * * ** **  * * **
**                                                                            *
*                                                                             *
 *                                                                            *
*            HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE                   *
              HELP MODEL VERSION 3 07  (1 NOVEMBER 1997)                     *
**              DEVELOPED BY ENVIRONMENTAL LABORATORY                        *
*                 USAE WATERWAYS EXPERIMENT STATION                          *
**            FOR USEPA RISK REDUCTION ENGINEERING LABORATORY                **
*                                                                             *
  ** ** *  **    *  ** * *  * ** * *  * * *     *     *        * **           **
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PRECIPITATION DATA FILE	C \HELP3\VPSWP\DATA4 D4
TEMPERATURE DATA FILE	C \HELP3\VPSWP\DATA7 D7
SOLAR RADIATION DATA FILE	C \HELP3\VPSWP\DATA13 D13
EVAPOTRANSPIRATION DATA	C \HELP3\VPSWP\DATA11 D11
SOIL AND DESIGN DATA FILE	C \HELP3\VPSWP\DATA10 D10
OUTPUT DATA FILE	C \HELP3\VPSWP\VPSWPOUT OUT

TIME 14 16 DATE 10/25/2004

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**    *      *            *   ***  *              *       *   *  *       **
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TITLE VERMILION PARISH SOLID WASTE PLANT AREA2B INTERIM COMPACTED

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NOTE INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
COMPUTED AS NEARLY STEADY STATE VALUES BY THE PROGRAM

LAYER 1

TYPE 1 VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 8

THICKNESS	=	6 00	INCHES
POROSITY	=	0 4630	VOL/VOL
FIELD CAPACITY	=	0 2320	VOL/VOL
WILTING POINT	=	0 1160	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4577	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 369999994000E 03	CM/SEC

NOTE SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 3 00
FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE

LAYER 2

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	24 00	INCHES
POROSITY	=	0 4270	VOL/VOL
FIELD CAPACITY	=	0 4180	VOL/VOL
WILTING POINT	=	0 3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4270	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000001000E 06	CM/SEC

LAYER 3

TYPE 1 VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	400 00	INCHES
POROSITY	=	0 6710	VOL/VOL
FIELD CAPACITY	=	0 2920	VOL/VOL
WILTING POINT	=	0 0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 2920	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000005000E 02	CM/SEC

LAYER 4

TYPE 2 LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12 00	INCHES
POROSITY	=	0 4370	VOL/VOL
FIELD CAPACITY	=	0 0620	VOL/VOL
WILTING POINT	=	0 0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0784	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 579999993000E-02	CM/SEC
SLOPE	=	2 00	PERCENT
DRAINAGE LENGTH	=	100 0	FEET

LAYER 5

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0 06	INCHES
POROSITY	=	0 0000	VOL/VOL
FIELD CAPACITY	=	0 0000	VOL/VOL
WILTING POINT	=	0 0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0000	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	1 00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	10 00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 GOOD	

LAYER 6

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36 00	INCHES
POROSITY	=	0 4270	VOL/VOL
FIELD CAPACITY	=	0 4180	VOL/VOL
WILTING POINT	=	0 3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4270	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000001000E 06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 8 WITH A POOR STAND OF GRASS A SURFACE SLOPE OF 4 % AND A SLOPE LENGTH OF 250 FEET

SCS RUNOFF CURVE NUMBER	=	86 20	
FRACTION OF AREA ALLOWING RUNOFF	=	100 0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	3 000	ACRES
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2 746	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	2 778	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0 696	INCHES
INITIAL SNOW WATER	=	0 000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	146 107	INCHES
TOTAL INITIAL WATER	=	146 107	INCHES
TOTAL SUBSURFACE INFLOW	=	0 00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE EVAPOTRANSPIRATION DATA WAS OBTAINED FROM LAKE CHARLES LOUISIANA

STATION LATITUDE	=	30 10	DEGREES
MAXIMUM LEAF AREA INDEX	=	2 00	
START OF GROWING SEASON (JULIAN DATE)	=	32	
END OF GROWING SEASON (JULIAN DATE)	=	361	
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
AVERAGE ANNUAL WIND SPEED	=	8 70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	77 00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	77 00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	80 00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	78 00	%

NOTE PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4 58	4 97	4 59	5 59	4 82	3 11
7 07	5 05	4 42	2 63	3 95	4 99

NOTE TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
51 50	54 30	60 70	68 40	74 90	80 40
82 30	81 60	78 20	69 30	59 70	53 90

NOTE SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA AND STATION LATITUDE = 30 10 DEGREES

***** * ** * *** ** * *** **** * *** * ** * * * * * *** ** * *

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	4 71	4 38	4 29	4 25	4 71	3 04
	7 87	5 25	4 07	2 76	3 67	4 43
STD DEVIATIONS	2 14	2 77	2 76	2 91	2 61	1 45
	2 92	2 63	2 09	1 98	2 09	2 08
RUNOFF						
TOTALS	3 104	2 510	1 581	1 383	1 007	0 170
	1 711	0 843	0 532	0 689	1 533	3 058
STD DEVIATIONS	2 061	2 515	2 161	1 762	1 491	0 445
	1 996	1 133	1 143	1 111	1 848	2 019
EVAPOTRANSPIRATION						
TOTALS	1 533	2 072	3 081	3 347	3 707	2 980
	5 504	4 449	3 500	2 003	1 151	0 981
STD DEVIATIONS	0 130	0 160	0 683	1 144	1 564	1 174
	0 932	1 249	1 238	0 629	0 342	0 147
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	0 1279	0 1143	0 1151	0 0756	0 0520	0 0274
	0 0712	0 0570	0 0609	0 0692	0 0875	0 1261

STD DEVIATIONS	0 0022	0 0036	0 0169	0 0297	0 0306	0 0252
	0 0271	0 0350	0 0345	0 0391	0 0436	0 0148
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	0 1040	0 1031	0 1165	0 1054	0 0881	0 0661
	0 0590	0 0635	0 0595	0 0633	0 0665	0 0873
STD DEVIATIONS	0 0139	0 0071	0 0056	0 0090	0 0135	0 0145
	0 0147	0 0147	0 0164	0 0170	0 0227	0 0225
PERCOLATION/LEAKAGE THROUGH LAYER 6						
TOTALS	0 0001	0 0001	0 0001	0 0001	0 0001	0 0001
	0 0001	0 0001	0 0001	0 0001	0 0001	0 0001
STD DEVIATIONS	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2						
AVERAGES	5 1145	4 5635	3 2095	1 6318	1 2746	0 5128
	1 8764	1 2808	1 3839	1 5879	2 8896	5 1940
STD DEVIATIONS	0 5115	0 6948	1 1830	1 0987	1 0068	0 6500
	1 0847	1 0943	1 1440	1 4965	1 9136	1 1331
DAILY AVERAGE HEAD ON TOP OF LAYER 5						
AVERAGES	0 5106	0 5560	0 5717	0 5345	0 4323	0 3349
	0 2895	0 3114	0 3016	0 3109	0 3371	0 4286
STD DEVIATIONS	0 0683	0 0400	0 0277	0 0457	0 0664	0 0733
	0 0720	0 0720	0 0832	0 0835	0 1152	0 1105

***** ** * * * * * **** ** * *** ** * ** ** ** * **** *

** * * * * * ** * **** * ** **** * * ** * ******* ****** *** *

AVERAGE ANNUAL TOTALS & (STD DEVIATIONS) FOR YEARS 1 THROUGH 30

	INCHES	CU FEET	PERCENT
PRECIPITATION	53 41 (7 432)	581663 9	100 00
RUNOFF	18 121 (5 9531)	197337 19	33 926
EVAPOTRANSPIRATION	34 307 (3 2706)	373608 22	64 231
PERCOLATION/LEAKAGE THROUGH LAYER 2	0 98414 (0 10931)	10717 308	1 84253
AVERAGE HEAD ON TOP OF LAYER 2	2 543 (0 372)		

LATERAL DRAINAGE COLLECTED FROM LAYER 4	0 98239 (0 08445)	10698 181	1 83924
PERCOLATION/LEAKAGE THROUGH LAYER 6	0 00100 (0 00008)	10 928	0 00188
AVERAGE HEAD ON TOP OF LAYER 5	0 410 (0 035)		
CHANGE IN WATER STORAGE	0 001 (0 2544)	9 39	0 002

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

	(INCHES)	(CU FT)
PRECIPITATION	8 09	88100 102
RUNOFF	6 789	73928 0078
PERCOLATION/LEAKAGE THROUGH LAYER 2	0 004252	46 30327
AVERAGE HEAD ON TOP OF LAYER 2	6 000	
DRAINAGE COLLECTED FROM LAYER 4	0 00403	43 90353
PERCOLATION/LEAKAGE THROUGH LAYER 6	0 000004	0 04333
AVERAGE HEAD ON TOP OF LAYER 5	0 613	
MAXIMUM HEAD ON TOP OF LAYER 5	1 090	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	11 1 FEET	
SNOW WATER	1 61	17536 3301

MAXIMUM VEG SOIL WATER (VOL/VOL) 0 4630

MINIMUM VEG SOIL WATER (VOL/VOL) 0 1160

*** Maximum heads are computed using McEnroe s equations *

Reference Maximum Saturated Depth over Landfill Liner
by Bruce M McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol 119 No 2 March 1993 pp 262 270

**** * * ** ** ********* ****** ** ** * * ** ***** *** * *** ***

FINAL WATER STORAGE AT END OF YEAR 30

LAYER	(INCHES)	(VOL/VOL)
1	2 7495	0 4582
2	10 2480	0 4270
3	116 8000	0 2920
4	0 9630	0 0803
5	0 0000	0 0000
6	15 3720	0 4270
SNOW WATER	0 000	

Phase 2B, Final Cover - HELPv3 07 Model

VERMILION PARISH SOLID WASTE PLANT

Final Cap System	6" Topsoil 40 mil HDPE 2' Recompacted Clay
Average Waste Depth	33' = 400"
Bottom Liner System	12 inch sand drainage 60 mil HDPE liner 36 inches recompacted clay
Acreage	1 5 acres

```
0
***  *  * ** *      **       **     * *   *  *  *****     * *     *   *      *
 *   * *  *                  *     *      *   *            *     *
 *
**                                                                          *
*                HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
 *                 HELP MODEL VERSION 3 07  (1 NOVEMBER 1997)                *
 *                  DEVELOPED BY ENVIRONMENTAL LABORATORY
 *                    USAE WATERWAYS EXPERIMENT STATION                      *
 *              FOR USEPA RISK REDUCTION ENGINEERING LABORATORY
**
**   * ** ***       *            * **                                          *
* ***** ***** *     **    **    **  *    *       *       *  * *   **    *
                                                                  *  ** **      *

PRECIPITATION DATA FILE      C \HELP3\VPSWP\DATA4 D4
TEMPERATURE DATA FILE        C \HELP3\VPSWP\DATA7 D7
SOLAR RADIATION DATA FILE    C \HELP3\VPSWP\DATA13 D13
EVAPOTRANSPIRATION DATA      C \HELP3\VPSWP\DATA11 D11
SOIL AND DESIGN DATA FILE    C \HELP3\VPSWP\DATA10 D10
OUTPUT DATA FILE             C \HELP3\VPSWP\VPSWPOUT OUT

TIME   15  0     DATE   10/25/2004

*    * *  * **  *  *    *     *   *  *  *       **  * **** **** **    * *

   TITLE   VERMILION PARISH SOLID WASTE PLANT  AREA 2B - FINAL COVER

 **** ** **              **   **   *     *            *     ***        * *

   NOTE   INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
            COMPUTED AS NEARLY STEADY STATE VALUES BY THE PROGRAM

                                LAYER  1
                                -

                  TYPE 1   VERTICAL PERCOLATION LAYER
                       MATERIAL TEXTURE NUMBER   8
      THICKNESS                    =      12 00   INCHES
      POROSITY                     =       0 4630 VOL/VOL
      FIELD CAPACITY               =       0 2320 VOL/VOL
      WILTING POINT                =       0 1160 VOL/VOL
      INITIAL SOIL WATER CONTENT   =       0 4612 VOL/VOL
      EFFECTIVE SAT  HYD  COND     =  0 369999994000E-03 CM/SEC
   NOTE   SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  3 00
            FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE

                                LAYER  2
                                -
```



```
                  TYPE 4   FLEXIBLE MEMBRANE LINER
                       MATERIAL TEXTURE NUMBER  35
      THICKNESS                    =       0 04   INCHES
      POROSITY                     =       0 0000 VOL/VOL
      FIELD CAPACITY               =       0 0000 VOL/VOL
      WILTING POINT                =       0 0000 VOL/VOL
      INITIAL SOIL WATER CONTENT   =       0 0000 VOL/VOL
      EFFECTIVE SAT  HYD  COND     =  0 199999996000E 12 CM/SEC
      FML PINHOLE DENSITY          =       1 00   HOLES/ACRE
      FML INSTALLATION DEFECTS     =      10 00   HOLES/ACRE
      FML PLACEMENT QUALITY        =  3   GOOD

                                LAYER  3
                                --

                  TYPE 3 - BARRIER SOIL LINER
                       MATERIAL TEXTURE NUMBER  16
      THICKNESS                    =      24 00   INCHES
      POROSITY                     =       0 4270 VOL/VOL
      FIELD CAPACITY               =       0 4180 VOL/VOL
      WILTING POINT                =       0 3670 VOL/VOL
      INITIAL SOIL WATER CONTENT   =       0 4270 VOL/VOL
      EFFECTIVE SAT  HYD  COND     =  0 100000001000E-06 CM/SEC

                                LAYER  4
                                - -

                  TYPE 1   VERTICAL PERCOLATION LAYER
                       MATERIAL TEXTURE NUMBER  18
      THICKNESS                    =     400 00   INCHES
      POROSITY                     =       0 6710 VOL/VOL
      FIELD CAPACITY               =       0 2920 VOL/VOL
      WILTING POINT                =       0 0770 VOL/VOL
      INITIAL SOIL WATER CONTENT   =       0 2920 VOL/VOL
      EFFECTIVE SAT  HYD  COND     =  0 100000005000E 02 CM/SEC

                                LAYER  5
                                ---

                  TYPE 2 - LATERAL DRAINAGE LAYER
                       MATERIAL TEXTURE NUMBER   2
      THICKNESS                    =      12 00   INCHES
      POROSITY                     =       0 4370 VOL/VOL
      FIELD CAPACITY               =       0 0620 VOL/VOL
      WILTING POINT                =       0 0240 VOL/VOL
      INITIAL SOIL WATER CONTENT   =       0 0622 VOL/VOL
      EFFECTIVE SAT  HYD  COND     =  0 579999993000E 02 CM/SEC
      SLOPE                        =       2 00   PERCENT
      DRAINAGE LENGTH              =     100 0    FEET
```

VPSWPOUT OUT
LAYER 6

TYPE 4 FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0 06	INCHES
POROSITY	=	0 0000	VOL/VOL
FIELD CAPACITY	=	0 0000	VOL/VOL
WILTING POINT	=	0 0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0000	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 199999996000E 12	CM/SEC
FML PINHOLE DENSITY	=	1 00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	10 00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 GOOD	

LAYER 7

TYPE 3 BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36 00	INCHES
POROSITY	=	0 4270	VOL/VOL
FIELD CAPACITY	=	0 4180	VOL/VOL
WILTING POINT	=	0 3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4270	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000001000E 06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 8 WITH A FAIR STAND OF GRASS A SURFACE SLOPE OF 4 % AND A SLOPE LENGTH OF 200 FEET

SCS RUNOFF CURVE NUMBER	=	80 10	
FRACTION OF AREA ALLOWING RUNOFF	=	100 0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1 500	ACRES
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2 757	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	2 778	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0 696	INCHES
INITIAL SNOW WATER	=	0 000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	148 702	INCHES
TOTAL INITIAL WATER	=	148 702	INCHES
TOTAL SUBSURFACE INFLOW	=	0 00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE EVAPOTRANSPIRATION DATA WAS OBTAINED FROM LAKE CHARLES LOUISIANA

VPSWPOUT OUT

STATION LATITUDE	=	30 10 DEGREES
MAXIMUM LEAF AREA INDEX	=	2 00
START OF GROWING SEASON (JULIAN DATE)	=	32
END OF GROWING SEASON (JULIAN DATE)	=	361
EVAPORATIVE ZONE DEPTH	=	6 0 INCHES
AVERAGE ANNUAL WIND SPEED	=	8 70 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	77 00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	77 00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	80 00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	78 00 %

NOTE PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4 58	4 97	4 59	5 59	4 82	3 11
7 07	5 05	4 42	2 63	3 95	4 99

NOTE TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
51 50	54 30	60 70	68 40	74 90	80 40
82 30	81 60	78 20	69 30	59 70	53 90

NOTE SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA AND STATION LATITUDE = 30 10 DEGREES

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	4 71	4 38	4 29	4 25	4 71	3 04
	7 87	5 25	4 07	2 76	3 67	4 43
STD DEVIATIONS	2 14	2 77	2 76	2 91	2 61	1 45
	2 92	2 63	2 09	1 98	2 09	2 08
RUNOFF						

TOTALS	3 249	2 608	1 667	1 393	0 980	0 147
	1 697	0 841	0 472	0 719	1 632	3 206
STD DEVIATIONS	2 079	2 543	2 210	1 837	1 522	0 446
	2 052	1 183	1 173	1 179	1 898	2 046
EVAPOTRANSPIRATION						
TOTALS	1 520	2 064	3 076	3 466	3 778	3 042
	5 577	4 506	3 575	2 054	1 155	0 972
STD DEVIATIONS	0 132	0 159	0 682	1 097	1 579	1 174
	0 923	1 234	1 239	0 603	0 335	0 143
PERCOLATION/LEAKAGE THROUGH LAYER 3						
TOTALS	0 0018	0 0016	0 0015	0 0012	0 0012	0 0010
	0 0013	0 0012	0 0012	0 0013	0 0014	0 0018
STD DEVIATIONS	0 0001	0 0001	0 0002	0 0002	0 0002	0 0001
	0 0002	0 0002	0 0002	0 0002	0 0003	0 0002
LATERAL DRAINAGE COLLECTED FROM LAYER 5						
TOTALS	0 0016	0 0015	0 0016	0 0015	0 0014	0 0012
	0 0012	0 0013	0 0012	0 0012	0 0012	0 0014
STD DEVIATIONS	0 0001	0 0001	0 0001	0 0001	0 0001	0 0001
	0 0001	0 0001	0 0001	0 0001	0 0001	0 0002
PERCOLATION/LEAKAGE THROUGH LAYER 7						
TOTALS	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
STD DEVIATIONS	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2						
AVERAGES	11 2371	10 6851	9 4232	7 8281	7 3615	6 5661
	8 0101	7 3728	7 5410	7 7485	9 0963	11 3186
STD DEVIATIONS	0 4506	0 6471	1 0783	1 0777	1 0272	0 7161
	1 1063	1 1379	1 1962	1 5257	1 9746	1 0893
DAILY AVERAGE HEAD ON TOP OF LAYER 6						
AVERAGES	0 0078	0 0081	0 0080	0 0075	0 0069	0 0063
	0 0061	0 0061	0 0061	0 0061	0 0063	0 0071
STD DEVIATIONS	0 0005	0 0003	0 0003	0 0004	0 0004	0 0004
	0 0003	0 0004	0 0004	0 0004	0 0007	0 0008

AVERAGE ANNUAL TOTALS & (STD DEVIATIONS) FOR YEARS 1 THROUGH 30

	INCHES		CU FEET	PERCENT
PRECIPITATION	53 41	(7 432)	290832 0	100 00
RUNOFF	18 610	(6 0688)	101333 79	34 843
EVAPOTRANSPIRATION	34 786	(3 2996)	189407 75	65 126
PERCOLATION/LEAKAGE THROUGH LAYER 3	0 01650	(0 00067)	89 823	0 03088
AVERAGE HEAD ON TOP OF LAYER 2	8 682	(0 376)		
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0 01646	(0 00051)	89 647	0 03082
PERCOLATION/LEAKAGE THROUGH LAYER 7	0 00003	(0 00000)	0 149	0 00005
AVERAGE HEAD ON TOP OF LAYER 6	0 007	(0 000)		
CHANGE IN WATER STORAGE	0 000	(0 1896)	0 63	0 000

PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

	(INCHES)	(CU FT)
PRECIPITATION	8 09	44050 051
RUNOFF	6 821	37141 5508
PERCOLATION/LEAKAGE THROUGH LAYER 3	0 000061	0 33360
AVERAGE HEAD ON TOP OF LAYER 2	12 000	
DRAINAGE COLLECTED FROM LAYER 5	0 00006	0 30987
PERCOLATION/LEAKAGE THROUGH LAYER 7	0 000000	0 00050
AVERAGE HEAD ON TOP OF LAYER 6	0 009	
MAXIMUM HEAD ON TOP OF LAYER 6	0 017	
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	0 0 FEET	
SNOW WATER	1 61	8768 1650

MAXIMUM VEG SOIL WATER (VOL/VOL) 0 4630

MINIMUM VEG SOIL WATER (VOL/VOL) 0 1160

* Maximum heads are computed using McEnroe s equations *

Reference Maximum Saturated Depth over Landfill Liner
by Bruce M McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol 119 No 2 March 1993 pp 262 270

FINAL WATER STORAGE AT END OF YEAR 30

LAYER	(INCHES)	(VOL/VOL)
1	5 5379	0 4615
2	0 0000	0 0000
3	10 2480	0 4270
4	116 8000	0 2920
5	0 7471	0 0623
6	0 0000	0 0000
7	15 3720	0 4270
SNOW WATER	0 000	

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 3 07 (1 NOVEMBER 1997)
DEVELOPED BY ENVIRONMENTAL LABORATORY
USAE WATERWAYS EXPERIMENT STATION
FOR USEPA RISK REDUCTION ENGINEERING LABORATORY

PRECIPITATION DATA FILE	C \HELP3\VPSWP\DATA4 D4
TEMPERATURE DATA FILE	C \HELP3\VPSWP\DATA7 D7
SOLAR RADIATION DATA FILE	C \HELP3\VPSWP\DATA13 D13
EVAPOTRANSPIRATION DATA	C \HELP3\VPSWP\DATA11 D11
SOIL AND DESIGN DATA FILE	C \HELP3\VPSWP\DATA10 D10
OUTPUT DATA FILE	C \HELP3\VPSWP\VPSWPOUT OUT

TIME 10 18 DATE 10/26/2004

TITLE VERMILION PARISH SOLID WASTE PLANT AREA 2B FINAL COVER (ENTIRE AREA)

NOTE INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM

LAYER 1

TYPE 1 VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 8

THICKNESS	=	12 00	INCHES
POROSITY	=	0 4630	VOL/VOL
FIELD CAPACITY	=	0 2320	VOL/VOL
WILTING POINT	=	0 1160	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4612	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 369999994000E 03	CM/SEC

NOTE SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 3 00
FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE

TYPE 4 FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0 04	INCHES
POROSITY	=	0 0000	VOL/VOL
FIELD CAPACITY	=	0 0000	VOL/VOL
WILTING POINT	=	0 0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0000	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 199999996000E 12	CM/SEC
FML PINHOLE DENSITY	=	1 00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	10 00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 GOOD	

LAYER 3

TYPE 3 BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	24 00	INCHES
POROSITY	=	0 4270	VOL/VOL
FIELD CAPACITY	=	0 4180	VOL/VOL
WILTING POINT	=	0 3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4270	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000001000E 06	CM/SEC

LAYER 4

TYPE 1 VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	400 00	INCHES
POROSITY	=	0 6710	VOL/VOL
FIELD CAPACITY	=	0 2920	VOL/VOL
WILTING POINT	=	0 0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 2920	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000005000E 02	CM/SEC

LAYER 5

TYPE 2 LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12 00	INCHES
POROSITY	=	0 4370	VOL/VOL
FIELD CAPACITY	=	0 0620	VOL/VOL
WILTING POINT	=	0 0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0622	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 579999993000E 02	CM/SEC
SLOPE	=	2 00	PERCENT
DRAINAGE LENGTH	=	100 0	FEET

LAYER 6

TYPE 4 FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0 06	INCHES
POROSITY	=	0 0000	VOL/VOL
FIELD CAPACITY	=	0 0000	VOL/VOL
WILTING POINT	=	0 0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0000	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 199999996000E 12	CM/SEC
FML PINHOLE DENSITY	=	1 00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	10 00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 GOOD	

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36 00	INCHES
POROSITY	=	0 4270	VOL/VOL
FIELD CAPACITY	=	0 4180	VOL/VOL
WILTING POINT	=	0 3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4270	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000001000E 06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 8 WITH A FAIR STAND OF GRASS A SURFACE SLOPE OF 4 % AND A SLOPE LENGTH OF 450 FEET

SCS RUNOFF CURVE NUMBER	=	79 10	
FRACTION OF AREA ALLOWING RUNOFF	=	100 0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	12 500	ACRES
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2 757	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	2 778	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0 696	INCHES
INITIAL SNOW WATER	=	0 000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	148 701	INCHES
TOTAL INITIAL WATER	=	148 701	INCHES
TOTAL SUBSURFACE INFLOW	=	0 00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE EVAPOTRANSPIRATION DATA WAS OBTAINED FROM LAKE CHARLES LOUISIANA

STATION LATITUDE	=	30 10 DEGREES
MAXIMUM LEAF AREA INDEX	=	2 00
START OF GROWING SEASON (JULIAN DATE)	=	32
END OF GROWING SEASON (JULIAN DATE)	=	361
EVAPORATIVE ZONE DEPTH	=	6 0 INCHES
AVERAGE ANNUAL WIND SPEED	=	8 70 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	77 00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	77 00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	80 00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	78 00 %

NOTE PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4 58	4 97	4 59	5 59	4 82	3 11
7 07	5 05	4 42	2 63	3 95	4 99

NOTE TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
51 50	54 30	60 70	68 40	74 90	80 40
82 30	81 60	78 20	69 30	59 70	53 90

NOTE SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA AND STATION LATITUDE = 30 10 DEGREES

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	4 71	4 38	4 29	4 25	4 71	3 04
	7 87	5 25	4 07	2 76	3 67	4 43
STD DEVIATIONS	2 14	2 77	2 76	2 91	2 61	1 45
	2 92	2 63	2 09	1 98	2 09	2 08
RUNOFF						

TOTALS	3 249	2 608	1 667	1 391	0 977	0 145
	1 694	0 840	0 470	0 721	1 630	3 206
STD DEVIATIONS	2 080	2 543	2 209	1 837	1 523	0 445
	2 055	1 184	1 175	1 182	1 896	2 046
EVAPOTRANSPIRATION						
TOTALS	1 520	2 063	3 076	3 467	3 781	3 043
	5 580	4 508	3 576	2 054	1 156	0 972
STD DEVIATIONS	0 132	0 159	0 683	1 096	1 581	1 173
	0 923	1 232	1 239	0 602	0 336	0 143
PERCOLATION/LEAKAGE THROUGH LAYER 3						
TOTALS	0 0018	0 0016	0 0015	0 0012	0 0012	0 0010
	0 0013	0 0012	0 0012	0 0013	0 0014	0 0018
STD DEVIATIONS	0 0001	0 0001	0 0002	0 0002	0 0002	0 0001
	0 0002	0 0002	0 0002	0 0002	0 0003	0 0002
LATERAL DRAINAGE COLLECTED FROM LAYER 5						
TOTALS	0 0016	0 0015	0 0016	0 0015	0 0014	0 0012
	0 0012	0 0013	0 0012	0 0012	0 0012	0 0014
STD DEVIATIONS	0 0001	0 0001	0 0001	0 0001	0 0001	0 0001
	0 0001	0 0001	0 0001	0 0001	0 0001	0 0002
PERCOLATION/LEAKAGE THROUGH LAYER 7						
TOTALS	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
STD DEVIATIONS	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2						
AVERAGES	11 2373	10 6852	9 4230	7 8315	7 3639	6 5674
	8 0224	7 3761	7 5456	7 7487	9 0945	11 3189
STD DEVIATIONS	0 4509	0 6476	1 0767	1 0798	1 0269	0 7183
	1 1074	1 1373	1 1976	1 5254	1 9730	1 0889
DAILY AVERAGE HEAD ON TOP OF LAYER 6						
AVERAGES	0 0078	0 0081	0 0080	0 0075	0 0069	0 0063
	0 0061	0 0061	0 0061	0 0061	0 0063	0 0071
STD DEVIATIONS	0 0005	0 0003	0 0003	0 0004	0 0004	0 0004
	0 0003	0 0004	0 0004	0 0004	0 0007	0 0008

AVERAGE ANNUAL TOTALS & (STD DEVIATIONS) FOR YEARS 1 THROUGH 30

	INCHES		CU FEET	PERCENT
PRECIPITATION	53 41	(7 432)	2423599 7	100 00
RUNOFF	18 599	(6 0695)	843938 31	34 822
EVAPOTRANSPIRATION	34 797	(3 2971)	1578907 62	65 147
PERCOLATION/LEAKAGE THROUGH LAYER 3	0 01650	(0 00067)	748 706	0 03089
AVERAGE HEAD ON TOP OF LAYER 2	8 685	(0 376)		
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0 01647	(0 00051)	747 234	0 03083
PERCOLATION/LEAKAGE THROUGH LAYER 7	0 00003	(0 00000)	1 245	0 00005
AVERAGE HEAD ON TOP OF LAYER 6	0 007	(0 000)		
CHANGE IN WATER STORAGE	0 000	(0 1897)	5 52	0 000

PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

	(INCHES)	(CU FT)
PRECIPITATION	8 09	367083 750
RUNOFF	6 821	309512 8440
PERCOLATION/LEAKAGE THROUGH LAYER 3	0 000061	2 77999
AVERAGE HEAD ON TOP OF LAYER 2	12 000	
DRAINAGE COLLECTED FROM LAYER 5	0 00006	2 58270
PERCOLATION/LEAKAGE THROUGH LAYER 7	0 000000	0 00414
AVERAGE HEAD ON TOP OF LAYER 6	0 009	
MAXIMUM HEAD ON TOP OF LAYER 6	0 017	
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	0 2 FEET	
SNOW WATER	1 61	73068 0391

MAXIMUM VEG SOIL WATER (VOL/VOL)	0 4630
MINIMUM VEG SOIL WATER (VOL/VOL)	0 1160

*** Maximum heads are computed using McEnroe s equations **

Reference Maximum Saturated Depth over Landfill Liner
by Bruce M McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol 119 No 2 March 1993 pp 262 270

FINAL WATER STORAGE AT END OF YEAR 30

LAYER	(INCHES)	(VOL/VOL)
1	5 5380	0 4615
2	0 0000	0 0000
3	10 2480	0 4270
4	116 8000	0 2920
5	0 7471	0 0623
6	0 0000	0 0000
7	15 3720	0 4270
SNOW WATER	0 000	

```
0
***** ** ******* * *   ** *  *  * ** **** * **********      *  * *       *
 *    ** ******* *   * *  ** *   ** **                  **  *  * **      **
**                                                                        *
**                                                                        *
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
*                 HELP MODEL VERSION 3 07  (1 NOVEMBER 1997)
**                 DEVELOPED BY ENVIRONMENTAL LABORATORY                  **
**                   USAE WATERWAYS EXPERIMENT STATION                    **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY
*
**                                                                        *
** **            *  *                                  *  **    *    *
* ** **            ** **    *   * *       *   ** *   *  *     ** *     *  *
```

```
PRECIPITATION DATA FILE      C \HELP3\VPSWP\DATA4 D4
TEMPERATURE DATA FILE        C \HELP3\VPSWP\DATA7 D7
SOLAR RADIATION DATA FILE    C \HELP3\VPSWP\DATA13 D13
EVAPOTRANSPIRATION DATA      C \HELP3\VPSWP\DATA11 D11
SOIL AND DESIGN DATA FILE    C \HELP3\VPSWP\DATA10 D10
OUTPUT DATA FILE             C \HELP3\VPSWP\VPSWPOUT OUT

TIME   10 18     DATE   10/26/2004

***  **      *        **  *  ****        *    *      * **      *    * * *
    TITLE   VERMILION PARISH SOLID WASTE PLANT  AREA 2B   FINAL COVER (ENTIRE
AREA)
***  *  **  * * * *** * *            *     *      *  *            *     *  *

    NOTE   INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
             COMPUTED AS NEARLY STEADY STATE VALUES BY THE PROGRAM

                                LAYER  1
                                -  -  -

                    TYPE 1   VERTICAL PERCOLATION LAYER
                        MATERIAL TEXTURE NUMBER   8
        THICKNESS                  =      12 00   INCHES
        POROSITY                   =       0 4630 VOL/VOL
        FIELD CAPACITY             =       0 2320 VOL/VOL
        WILTING POINT              =       0 1160 VOL/VOL
        INITIAL SOIL WATER CONTENT =       0 4612 VOL/VOL
        EFFECTIVE SAT  HYD  COND   =  0 369999994000E 03 CM/SEC
      NOTE   SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  3 00
               FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE

                                LAYER  2
```



```
                    TYPE 4   FLEXIBLE MEMBRANE LINER
                        MATERIAL TEXTURE NUMBER  35
        THICKNESS                  =       0 04    INCHES
        POROSITY                   =       0 0000 VOL/VOL
        FIELD CAPACITY             =       0 0000 VOL/VOL
        WILTING POINT              =       0 0000 VOL/VOL
        INITIAL SOIL WATER CONTENT =       0 0000 VOL/VOL
        EFFECTIVE SAT  HYD  COND   =  0 199999996000E 12 CM/SEC
        FML PINHOLE DENSITY        =       1 00    HOLES/ACRE
        FML INSTALLATION DEFECTS   =      10 00    HOLES/ACRE
        FML PLACEMENT QUALITY      =  3 - GOOD

                                LAYER  3
                                -    -

                    TYPE 3   BARRIER SOIL LINER
                        MATERIAL TEXTURE NUMBER  16
        THICKNESS                  =      24 00   INCHES
        POROSITY                   =       0 4270 VOL/VOL
        FIELD CAPACITY             =       0 4180 VOL/VOL
        WILTING POINT              =       0 3670 VOL/VOL
        INITIAL SOIL WATER CONTENT =       0 4270 VOL/VOL
        EFFECTIVE SAT  HYD  COND   =  0 100000001000E-06 CM/SEC

                                LAYER  4
                                --  --

                    TYPE 1   VERTICAL PERCOLATION LAYER
                        MATERIAL TEXTURE NUMBER  18
        THICKNESS                  =     400 00   INCHES
        POROSITY                   =       0 6710 VOL/VOL
        FIELD CAPACITY             =       0 2920 VOL/VOL
        WILTING POINT              =       0 0770 VOL/VOL
        INITIAL SOIL WATER CONTENT =       0 2920 VOL/VOL
        EFFECTIVE SAT  HYD  COND   =  0 100000005000E 02 CM/SEC

                                LAYER  5
                                ---

                    TYPE 2   LATERAL DRAINAGE LAYER
                        MATERIAL TEXTURE NUMBER   2
        THICKNESS                  =      12 00   INCHES
        POROSITY                   =       0 4370 VOL/VOL
        FIELD CAPACITY             =       0 0620 VOL/VOL
        WILTING POINT              =       0 0240 VOL/VOL
        INITIAL SOIL WATER CONTENT =       0 0622 VOL/VOL
        EFFECTIVE SAT  HYD  COND   =  0 579999993000E 02 CM/SEC
        SLOPE                      =       2 00    PERCENT
        DRAINAGE LENGTH            =     100 0     FEET
```

LAYER 6

TYPE 4 FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0 06	INCHES
POROSITY	=	0 0000	VOL/VOL
FIELD CAPACITY	=	0 0000	VOL/VOL
WILTING POINT	=	0 0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 0000	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 199999996000E 12	CM/SEC
FML PINHOLE DENSITY	=	1 00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	10 00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 GOOD	

LAYER 7

TYPE 3 BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36 00	INCHES
POROSITY	=	0 4270	VOL/VOL
FIELD CAPACITY	=	0 4180	VOL/VOL
WILTING POINT	=	0 3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0 4270	VOL/VOL
EFFECTIVE SAT HYD COND	=	0 100000001000E 06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 8 WITH A FAIR STAND OF GRASS A SURFACE SLOPE OF 4 % AND A SLOPE LENGTH OF 450 FEET

SCS RUNOFF CURVE NUMBER	=	79 10	
FRACTION OF AREA ALLOWING RUNOFF	=	100 0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	12 500	ACRES
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2 757	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	2 778	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0 696	INCHES
INITIAL SNOW WATER	=	0 000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	148 701	INCHES
TOTAL INITIAL WATER	=	148 701	INCHES
TOTAL SUBSURFACE INFLOW	=	0 00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE EVAPOTRANSPIRATION DATA WAS OBTAINED FROM LAKE CHARLES LOUISIANA

STATION LATITUDE	=	30 10	DEGREES
MAXIMUM LEAF AREA INDEX	=	2 00	
START OF GROWING SEASON (JULIAN DATE)	=	32	
END OF GROWING SEASON (JULIAN DATE)	=	361	
EVAPORATIVE ZONE DEPTH	=	6 0	INCHES
AVERAGE ANNUAL WIND SPEED	=	8 70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	77 00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	77 00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	80 00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	78 00	%

NOTE PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4 58	4 97	4 59	5 59	4 82	3 11
7 07	5 05	4 42	2 63	3 95	4 99

NOTE TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
51 50	54 30	60 70	68 40	74 90	80 40
82 30	81 60	78 20	69 30	59 70	53 90

NOTE SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR LAKE CHARLES LOUISIANA AND STATION LATITUDE = 30 10 DEGREES

** * * * ** * * *** * * *** * **** * * ** **

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	4 71	4 38	4 29	4 25	4 71	3 04
	7 87	5 25	4 07	2 76	3 67	4 43
STD DEVIATIONS	2 14	2 77	2 76	2 91	2 61	1 45
	2 92	2 63	2 09	1 98	2 09	2 08
RUNOFF						

TOTALS	3 249	2 608	1 667	1 391	0 977	0 145
	1 694	0 840	0 470	0 721	1 630	3 206
STD DEVIATIONS	2 080	2 543	2 209	1 837	1 523	0 445
	2 055	1 184	1 175	1 182	1 896	2 046
EVAPOTRANSPIRATION						
TOTALS	1 520	2 063	3 076	3 467	3 781	3 043
	5 580	4 508	3 576	2 054	1 156	0 972
STD DEVIATIONS	0 132	0 159	0 683	1 096	1 581	1 173
	0 923	1 232	1 239	0 602	0 336	0 143
PERCOLATION/LEAKAGE THROUGH LAYER 3						
TOTALS	0 0018	0 0016	0 0015	0 0012	0 0012	0 0010
	0 0013	0 0012	0 0012	0 0013	0 0014	0 0018
STD DEVIATIONS	0 0001	0 0001	0 0002	0 0002	0 0002	0 0001
	0 0002	0 0002	0 0002	0 0002	0 0003	0 0002
LATERAL DRAINAGE COLLECTED FROM LAYER 5						
TOTALS	0 0016	0 0015	0 0016	0 0015	0 0014	0 0012
	0 0012	0 0013	0 0012	0 0012	0 0012	0 0014
STD DEVIATIONS	0 0001	0 0001	0 0001	0 0001	0 0001	0 0001
	0 0001	0 0001	0 0001	0 0001	0 0001	0 0002
PERCOLATION/LEAKAGE THROUGH LAYER 7						
TOTALS	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
STD DEVIATIONS	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000
	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2						
AVERAGES	11 2373	10 6852	9 4230	7 8315	7 3639	6 5674
	8 0224	7 3761	7 5456	7 7487	9 0945	11 3189
STD DEVIATIONS	0 4509	0 6476	1 0767	1 0798	1 0269	0 7183
	1 1074	1 1373	1 1976	1 5254	1 9730	1 0889
DAILY AVERAGE HEAD ON TOP OF LAYER 6						
AVERAGES	0 0078	0 0081	0 0080	0 0075	0 0069	0 0063
	0 0061	0 0061	0 0061	0 0061	0 0063	0 0071
STD DEVIATIONS	0 0005	0 0003	0 0003	0 0004	0 0004	0 0004
	0 0003	0 0004	0 0004	0 0004	0 0007	0 0008

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AVERAGE ANNUAL TOTALS & (STD DEVIATIONS) FOR YEARS 1 THROUGH 30

	INCHES		CU FEET	PERCENT
PRECIPITATION	53 41	(7 432)	2423599 7	100 00
RUNOFF	18 599	(6 0695)	843938 31	34 822
EVAPOTRANSPIRATION	34 797	(3 2971)	1578907 62	65 147
PERCOLATION/LEAKAGE THROUGH LAYER 3	0 01650	(0 00067)	748 706	0 03089
AVERAGE HEAD ON TOP OF LAYER 2	8 685	(0 376)		
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0 01647	(0 00051)	747 234	0 03083
PERCOLATION/LEAKAGE THROUGH LAYER 7	0 00003	(0 00000)	1 245	0 00005
AVERAGE HEAD ON TOP OF LAYER 6	0 007	(0 000)		
CHANGE IN WATER STORAGE	0 000	(0 1897)	5 52	0 000

** * * * * * *** *** * * * * * ** * * * ***

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*** * * * **** * **** * * * * ** *** * ** * * *** * * **

PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

	(INCHES)	(CU FT)
PRECIPITATION	8 09	367083 750
RUNOFF	6 821	309512 8440
PERCOLATION/LEAKAGE THROUGH LAYER 3	0 000061	2 77999
AVERAGE HEAD ON TOP OF LAYER 2	12 000	
DRAINAGE COLLECTED FROM LAYER 5	0 00006	2 58270
PERCOLATION/LEAKAGE THROUGH LAYER 7	0 000000	0 00414
AVERAGE HEAD ON TOP OF LAYER 6	0 009	
MAXIMUM HEAD ON TOP OF LAYER 6	0 017	
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	0 2 FEET	
SNOW WATER	1 61	73068 0391

VPSWPOUT OUT

MAXIMUM VEG SOIL WATER (VOL/VOL) 0 4630

MINIMUM VEG SOIL WATER (VOL/VOL) 0 1160

* Maximum heads are computed using McEnroe s equations **

Reference Maximum Saturated Depth over Landfill Liner
by Bruce M McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol 119 No 2 March 1993 pp 262 270

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FINAL WATER STORAGE AT END OF YEAR 30

LAYER	(INCHES)	(VOL/VOL)
1	5 5380	0 4615
2	0 0000	0 0000
3	10 2480	0 4270
4	116 8000	0 2920
5	0 7471	0 0623
6	0 0000	0 0000
7	15 3720	0 4270
SNOW WATER	0 000	

* * ** * * * * ** *** * * ** ** * * * **
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Appendix H:2

Stormwater Drainage Ditches Calculations

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR11
30-071498
HYDRAULICS SECTION
DESIGNER Sellers and Assoc DATE 10-19-2004
REMARKS Outfall 001

STATE PROJECT NUMBER 5263-27

SCS PEAK DISCHARGE

****

STATION	001
DRAINAGE AREA (ACRES)	50 80
HYDRAULIC LENGTH (FEET)	1200 00
CURVE NUMBER	80 00
RAINFALL (INCHES)	12 00
SLOPE (PERCENT)	10
PEAK ADJUSTMENT FACTOR	1 00

****

PEAK DISCHARGE (CFS) 147

****

UNKNOWN PARAMETER IS NOT DEFINED - CHECK YOUR INPUT DATA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR11
40-071498
HYDRAULICS SECTION

DESIGNER SELLERS & ASSOCIATES DATE 10-19-2004
REMARKS VERMILION PARISH SOLID WASTE PLANT - OUTFALL 001

STATE PROJECT NUMBER 5263-27

OPEN CHANNEL DESIGN

****
****

STATION	110+00 00
DESIGN DISCHARGE (C F S)	198 16
WIDTH OF CHANNEL BOTTOM (FT)	5 00
DEPTH OF FLOW (FT)	3 00
SIDE SLOPE RATIO, LEFT (FT 1)	2 0
SIDE SLOPE RATIO, RIGHT (FT 1)	2 0
ROUGHNESS COEFFICIENT	020
SLOPE OF CHANNEL BOTTOM (FT /FT)	00300

****
****

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR11
30-071498
HYDRAULICS SECTION
DESIGNER Sellers and Assoc DATE 10-19-2004
REMARKS Outfall 002

STATE PROJECT NUMBER 5263-27

SCS PEAK DISCHARGE

STATION	002
DRAINAGE AREA (ACRES)	29 00
HYDRAULIC LENGTH (FEET)	575 00
CURVE NUMBER	80 00
RAINFALL (INCHES)	12 00
SLOPE (PERCENT)	4 00
PEAK ADJUSTMENT FACTOR	1 00
PEAK DISCHARGE (CFS)	344

UNKNOWN PARAMETER IS NOT DEFINED - CHECK YOUR INPUT DATA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR11
40-071498
HYDRAULICS SECTION

DESIGNER SELLERS & ASSOCIATES DATE 10-19-2004
REMARKS VERMILION PARISH SOLID WASTE PLANT - OUTFALL 002

STATE PROJECT NUMBER 5263-27

OPEN CHANNEL DESIGN

****
****

STATION	110+00 00
DESIGN DISCHARGE (C F S)	365 82
WIDTH OF CHANNEL BOTTOM (FT)	5 00
DEPTH OF FLOW (FT)	4 00
SIDE SLOPE RATIO, LEFT (FT 1)	2 0
SIDE SLOPE RATIO, RIGHT (FT 1)	2 0
ROUGHNESS COEFFICIENT	020
SLOPE OF CHANNEL BOTTOM (FT /FT)	00300

****
****

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR11
30-071498
HYDRAULICS SECTION
DESIGNER Sellers and Assoc DATE 10-19-2004
REMARKS Outfall 003

STATE PROJECT NUMBER 5263-27

SCS PEAK DISCHARGE

STATION	003
DRAINAGE AREA (ACRES)	22 90
HYDRAULIC LENGTH (FEET)	575 00
CURVE NUMBER	80 00
RAINFALL (INCHES)	12 00
SLOPE (PERCENT)	4 00
PEAK ADJUSTMENT FACTOR	1 00
PEAK DISCHARGE (CFS)	272

UNKNOWN PARAMETER IS NOT DEFINED - CHECK YOUR INPUT DATA

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT HYDR11
40-071498
HYDRAULICS SECTION

DESIGNER SELLERS & ASSOCIATES DATE 10-19-2004
REMARKS VERMILION PARISH SOLID WASTE PLANT - OUTFALL 003

STATE PROJECT NUMBER 5263-27

OPEN CHANNEL DESIGN

****
****

STATION	110+00 00
DESIGN DISCHARGE (C F S)	365 82
WIDTH OF CHANNEL BOTTOM (FT)	5 00
DEPTH OF FLOW (FT)	4 00
SIDE SLOPE RATIO, LEFT (FT 1)	2 0
SIDE SLOPE RATIO, RIGHT (FT 1)	2 0
ROUGHNESS COEFFICIENT	020
SLOPE OF CHANNEL BOTTOM (FT /FT)	00300

****
****

Appendix H:2

Leachate Piping Calculations

Sellers & Associates, Inc
148B EASY STREET LAFAYETTE LA 70506
(337) 232 0777 Fax (337) 232 0851

JOB NO 5263 E7 SHEET 1 OF 3
CALCULATED BY DMS DATE 5 31 07
CHECKED BY _____ DATE _____
SCALE _____

DESIGN CALCULATIONS FOR SIZING OF LEACHATE PIPING

- FROM HELP (HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE) MODEL THE PEAK DAILY VALUE VALUE COLLECTED FROM THE LATERAL DRAINAGE LAYER = 1,126 CF (OVER A 2-ACRE ACTIVE DISPOSAL CELL, PHASE 2B — REFER TO APP H 2)

$$\frac{1{,}126\ CF}{2AC} \times 2.8\ AC = 1{,}576\ CF/DAY \times \frac{1\ DAY}{1440\ MIN} \times \frac{7.48\ GAL}{FT^3}$$

(AREA CONVERTED BY 1 LEACHATE LINE)

= 8.2 GPM TO BE CARRIED BY LEACHATE

- (DIAMETER) 6-INCH HDPE, DR 1 PIPE IS PROPOSED TO BE USED
- [illegible] PIPE CAPACITY USING CHEZY-MANNING FORMULA

$$Q = \frac{1.49}{n}(A)(r_H)^{2/3} S^{1/2}$$

WHERE r 0.009 FOR [illegible]-HDPE

$A = \frac{\pi D^2}{4}$ (FULL PIPE) or $\frac{\pi D^2}{8}$ (HALF FULL)

r_H = HYDRAULIC RADIUS = $\frac{A}{P} = \frac{\pi D^2/4}{\pi D} = D/4$ (FULL OR HALF FULL)

S = 1% SLOPE OR 0.01

$$Q_{FULL} = \frac{1.49}{0.009}\left(\frac{\pi(0.5)^2}{4}\right)\left(\frac{0.5}{4}\right)^{2/3}(0.01)^{1/2}$$

$$Q_{FULL} = 0.814\ CFS \times \frac{60\ SEC}{MIN} \times \frac{7.48\ GAL}{FT^3} = 365\ GPM$$ [illegible]

$$Q_{1/2\text{-}FULL} = \frac{1.49}{0.009}\left(\frac{\pi(0.5)^2}{8}\right)\left(\frac{0.5}{8}\right)^{2/3}(0.01)^{1/2}$$

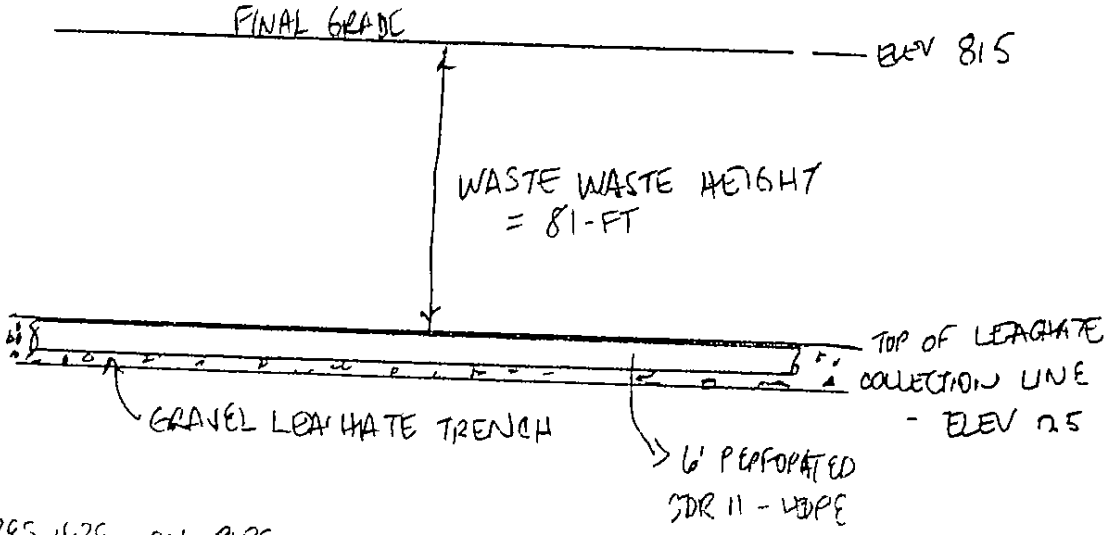
$$Q_{1/2\ FULL} = 0.406\ CFS \times \frac{60\ SEC}{MIN} \times \frac{7.48\ GAL}{FT^3} = 182\ GPM$$ [illegible]

- [illegible] WILL NOT BE [illegible] TO CARRY FULL [illegible] WILL ALSO [illegible] PIPE [illegible]

Sellers & Associates, Inc
148B EASY STREET LAFAYETTE LA 70506
(337) 232 0777 Fax (337) 232 0851

JOB NO 5263-27 SHEET 2 OF 3
CALCULATED BY DMS DATE 5/31/07
CHECKED BY _____ DATE _____
SCALE _____

- PIPE LOADING CALCULATIONS
  - USE DRISCOPIPE SYSTEMS DESIGN PROCEDURES



- EXTERNAL PRESSURE ON PIPE

$P_T = P_S - P_L - P_I$, $P_S = P_{DE} - P_{WE}$ (ASSUME WATER TABLE = 0 ∴ P_{WE} = 0)

$- P_S - P_{DE} = \gamma h = (4500\ \text{lb/cy})(81)$, 13,500 lb/cy² = 93.75 lb/in²

↑ SHREDDED + COMPACTED WASTE = 3 / 500 lb/cy

- P_L - LIVE LOAD (ASSUME ≈ 0 @ 81 DEPTH, ONLY LIGHT VEHICLES OVER FINAL COVER + LOAD DISSIPATED @ 81 DEPTH)

- $P_I = 0$ (NO INTERNAL VACUUM)

$P_T = P_S = 93.75$ psi

- SHORT-TERM WALL CRUSHING

$- S_A = \frac{(SDR - 1) P_T}{2}$, WHERE SDR = 11

$S_A = \frac{(11 - 1)(93.75\ \text{lb/in}^2)}{2} = 46.375$ lb/in²

$FS = \frac{1500}{S_A} = \frac{500}{46.375} = 3.2$ (SAFETY FACTOR > 2)

NO CRUSHING OF HDPE PIPE

Sellers & Associates, Inc
148B EASY STREET LAFAYETTE LA 70506
(337) 232 0777 Fax (337) 232 0851

JOB NO 5263 27 SHEET 3 OF 3
CALCULATED BY DMS DATE 5/31/07
CHECKED BY _____ DATE _____
SCALE _____

- CRITICAL COLLAPSE PRESSURE

$$P_{CB} = 0.8\sqrt{E' \times P_C}$$

WHERE $P_C = \frac{2.32E}{(SDR)^3}$; WHERE E = 20,000 psi (CHART 25, 73.4°F, SDR-11, S_A = 470 psi, 50 YRS)

$$P_C = \frac{2.32(20000)}{(11)^3} = 34.86$$

E' - 3,000 psi (Slightly compacted granular leachate trench) - Chart 24

$$P_{CB} = 0.8\sqrt{(3,000)(34.86)}$$

P_{CB} - 258.7 psi

$P_{CB} > P_T$ (93.75 psi) ; OK -> NO [illegible]

- THEREFORE, 6-INCH, SDR 11 HDPE PIPE IS CAPABLE OF WITHSTANDING THE LOADING FROM THE IN-PLACE MUNICIPAL WASTE & IS ALSO CAPABLE OF CARRYING THE ANTICIPATED LEACHATE VOLUMES.

Appendix H:2

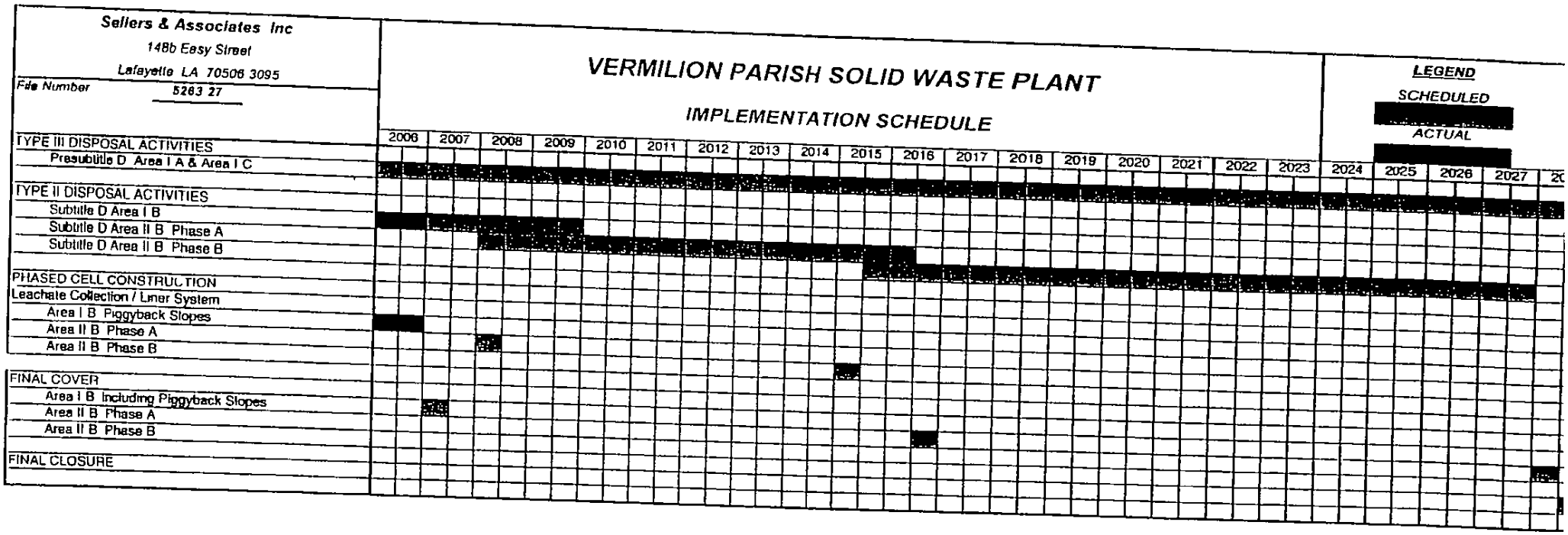
Area II-B - Implementation Schedule

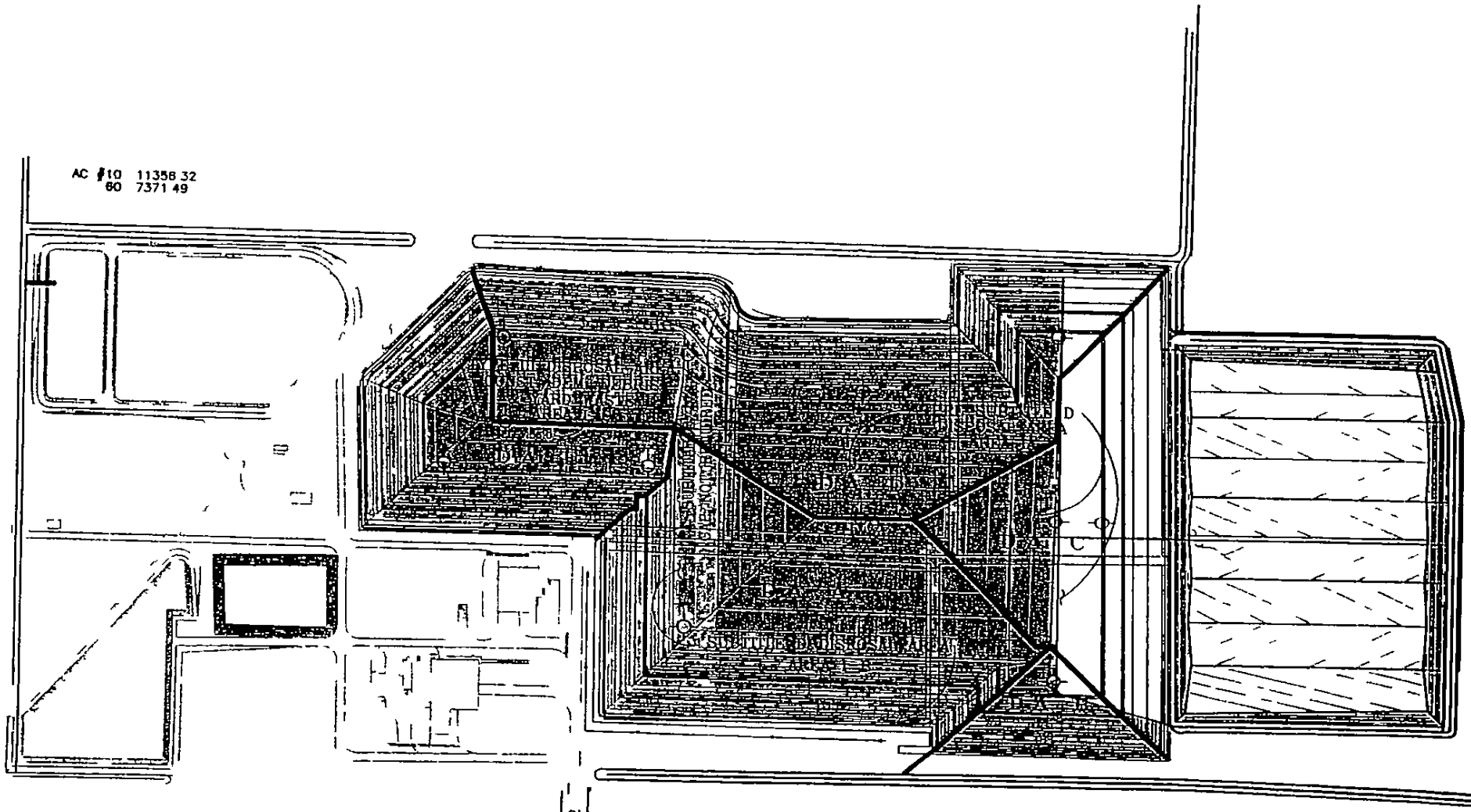
Sellers & Associates Inc
14Bb Easy Street
Lafayette LA 70506 3095

File Number 5263 27

VERMILION PARISH SOLID WASTE PLANT

IMPLEMENTATION SCHEDULE





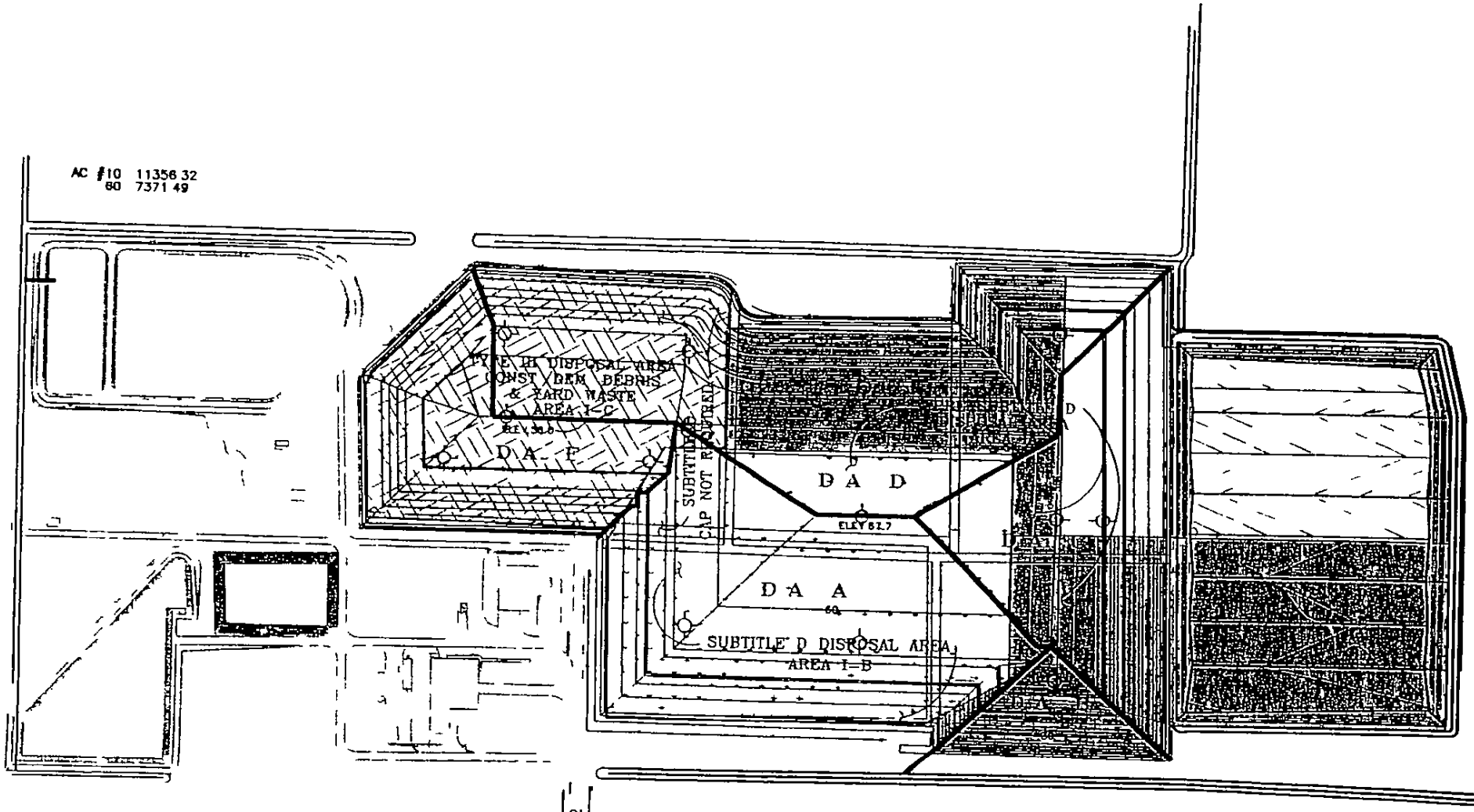
DISPOSAL AREA

AREA OF INTERIM COVER

AREA OF FINAL COVER

DISPOSAL SCHEME
CURRENT DISPOSAL ACTIVITIES

VERMILION PARISH SOLID WASTE PLANT



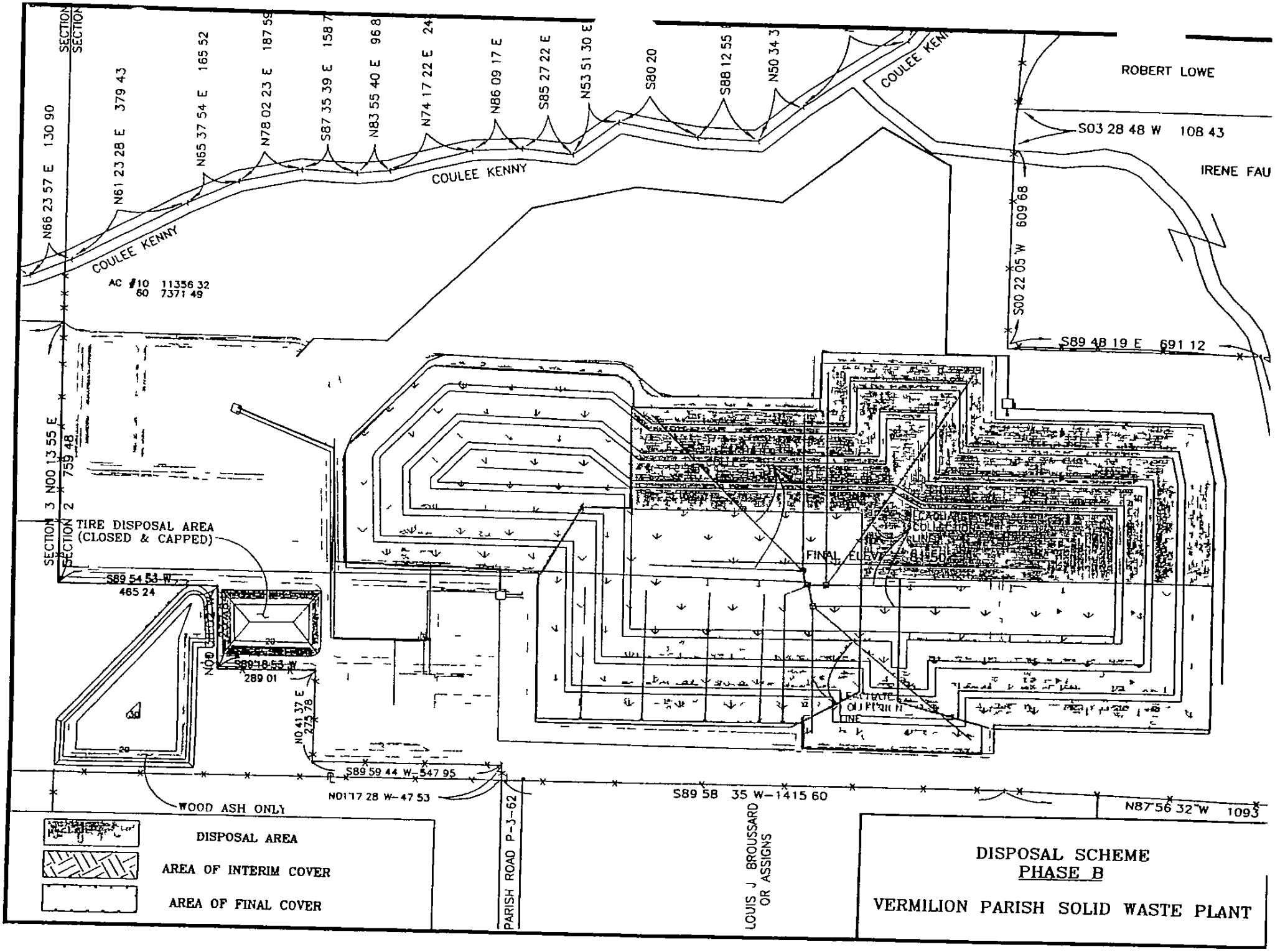
DISPOSAL AREA

AREA OF INTERIM COVER

AREA OF FINAL COVER

DISPOSAL SCHEME
PHASE A

VERMILION PARISH SOLID WASTE PLANT



ROBERT LOWE
IRENE FAU
COULEE KENNY
COULEE KENNY
COULEE KENNY
N66 23 57 E 130 90
N61 23 28 E 379 43
N65 37 54 E 165 52
N78 02 23 E 187 59
S87 35 39 E 158 7
N83 55 40 E 96 8
N74 17 22 E 24
N86 09 17 E
S85 27 22 E
N53 51 30 E
S80 20
S88 12 55
N50 34 3
S03 28 48 W 108 43
S00 22 05 W 609 68
S89 48 19 E 691 12
AC #10 11356 32
60 7371 49
SECTION 3 N00 13 55 E
SECTION 2 759 48
TIRE DISPOSAL AREA
(CLOSED & CAPPED)
S89 54 53 W
465 24
S89 18 53 W
289 01
N0 41 37 E
275 78
S89 59 44 W-547 95
N01 17 28 W-47 53
S89 58 35 W-1415 60
N87 56 32 W 1093
WOOD ASH ONLY
PARISH ROAD P-3-62
LOUIS J BROUSSARD
OR ASSIGNS
FINAL ELEV
DISPOSAL AREA
AREA OF INTERIM COVER
AREA OF FINAL COVER
DISPOSAL SCHEME
PHASE B
VERMILION PARISH SOLID WASTE PLANT

Appendix H:2

Area II-B - Soil Balance

Sellers & Associates, Inc
148B EASY STREET LAFAYETTE LA 70506
(337) 232 0777 Fax (337) 232 0851

JOB NO 5263-01 SHEET 1 OF 1
CALCULATED BY DMS DATE 5/31/07
CHECKED BY _____ DATE _____
SCALE _____

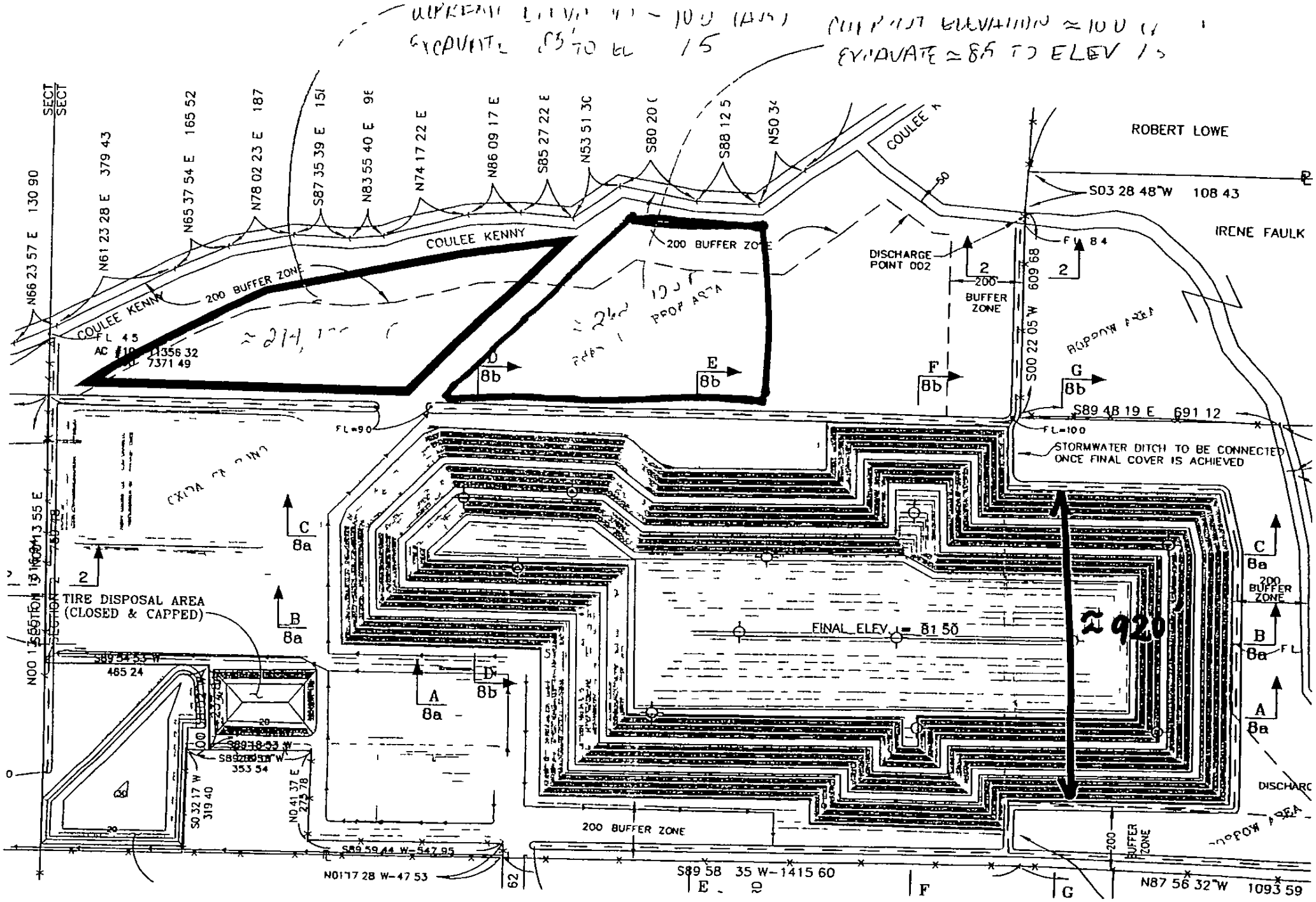
AREA II-B : SOIL BALANCE

- EXCAVATION OF REMAINING PHASE III BORROW AREAS (AS DEPICTED ON THE ATTACHED) — 175,270 CY

$$\frac{(294,735\ S.F)(8.5')}{27\ CF/CY} + \frac{(262,000\ SF)(8.5')}{27\ CF/CY}$$

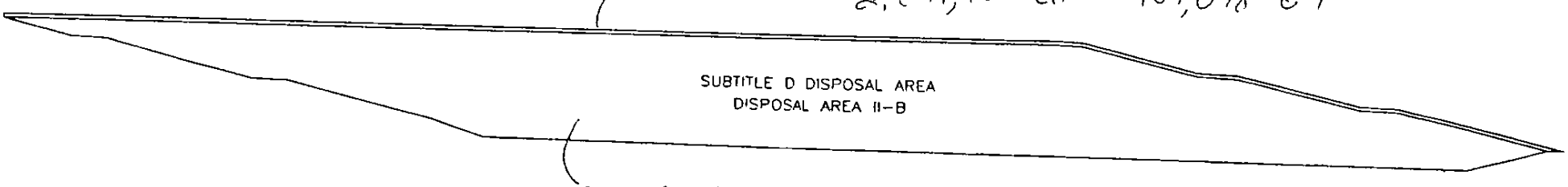
- REQ'D FINAL COVER MATERIAL FOR AREA II-B — 107,078 CY
- REQ'D DAILY & INTERIM MATERIAL FOR AREA II-B — 61,986 CY
- SUBTOTAL - REQ'D MATERIAL — 169,064 CY
- NET SOIL BALANCE — + 6,204 CY

* IT IS ANTICIPATED THAT ADDITIONAL SOIL MATERIAL MAY BE REQUIRED. AS NECESSARY, THE PARISH SHALL OBTAIN SUITABLE COVER MATERIAL ON A CONTRACT BASIS, AS NEEDED, BY A LOCAL SUPPLIER.


ROBERT LOWE
IRENE FAULK
COULEE KENNY
200 BUFFER ZONE
DISCHARGE POINT 002
S03 28 48"W 108 43
S89 48 19 E 691 12
STORMWATER DITCH TO BE CONNECTED ONCE FINAL COVER IS ACHIEVED
TIRE DISPOSAL AREA (CLOSED & CAPPED)
FINAL ELEV = 81 50
≈ 920
S89 58 35 W-1415 60
N87 56 32"W 1093 59
N01 17 28 W-47 53
S89 59 44 W-547 95

2.5' FINAL COVER: 2095 SF × 920' = 1,927,400 × 1.5 COMPACTION FACTOR

= 2,891,100 C.F = 107,078 C.Y



DAILY & INTERIM COVER

$$5\% \times \frac{(26{,}383\ SF \times 920')}{27\ FT^3/YD^3} = 61{,}986\ CY$$