180370

RECEIVED
MAR 10 1998
DEPT. OF ENV. PROTECTION

RINKER MATERIALS CORPORATION
1200 N.W. 137TH AVENUE
MIAMI, FLORIDA 33182

JOINT APPLICATION FOR ENVIRONMENTAL RESOURCE PERMIT (ERP)

INDIVIDUAL PERMIT APPLICATION
Per Chapter 40E-4, F.A.C

~~Case Closed~~
FLD 981758485
Permit Auth
Permit - Applicatn

3-9-98 - 3-10-98

MARCH 1998

Entire Case File - Formerly known as Rinker Materia

Metcalf & Eddy
An Air & Water Technologies Company

Metcalf & Eddy
An Air & Water Technologies Company

RECEIVED
MAR 10 1998
DEPT. OF ENV. PROTECTION

March 9, 1998

Mr. Marwan Fakhoury, P.E.
Environmental Resources Permitting
Florida Department of Environmental Protection
400 N. Congress Avenue
West Palm Beach, FL 33416

Subject: Submittal of Environmental Resources Permit Application for Rinker Portland Cement Corporation, 1200 NW 137th Avenue, Miami, Florida

Dear Mr. Fakhoury:

Please find attached three (3) copies above the above referenced permit application, included with the processing fee of $3,050.

If you have questions or comments please contact Steve Diamond of Metcalf & Eddy at (954) 450-7770, ext 5151.

Sincerely,
METCALF & EDDY, INC.

James G. Penkosky, P.E.
Project Manager

Attachments: Environmental Resources Permit

pc: Mike Vardeman - CSR Rinker
File - 023016

Recycled Paper

INDEX OF EXHIBITS

EXHIBIT #1

DESCRIPTION OF WORK
INDIVIDUAL ENVIRONMENTAL RESOURCES PERMIT (ERP)

RINKER MATERIALS CORPORATION
1200 N.W. 137TH AVENUE
MIAMI, FLORIDA 33182

December 1997

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Form 0671

FOR AGENCY USE ONLY

ACOE Application # ____________________
Date Application Received ____________________
Proposed Project Lat. ____° ____' ____"
Proposed Project Long. ____° ____' ____"

DEP/WMD Application # ____________________
Date Application Received ____________________
Fee Received $ ____________________
Fee Receipt # ____________________

SECTION A

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

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

A. Type of Environmental Resource Permit Requested (check at least one)

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

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

☐ Construction or operation of a new system including dredging or filling in, on or over wetlands and other surface waters.
☒ Alteration or operation of an existing system which was not previously permitted by a WMD or DEP.
☐ Modification of a system previously permitted by a WMD or DEP. Provide previous permit numbers. ____________________
☐ Alteration of a system ☐ Extension of permit duration ☐ Abandonment of a system
☐ Construction of additional phases of a system ☐ Removal of a system

C. Are you requesting authorization to use State Owned Lands. ☐ yes ☒ no
(If yes include the information requested in Section G.)

D. For activities in, on or over wetlands or other surface waters, check type of federal dredge and fill permit requested:
☐ Individual ☐ Programmatic General
☐ General ☐ Nationwide ☒ Not Applicable

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

OWNER(S) OF LAND	**ENTITY TO RECEIVE PERMIT (IF OTHER THAN OWNER)**
NAME Michael Vardeman	**NAME**
ADDRESS 1200 N.W. 37th Avenue	**ADDRESS**
CITY, STATE, ZIP Miami, FL 33182	**CITY, STATE, ZIP**
COMPANY AND TITLE Rinker Materials Corp., Environmental Manager	**COMPANY AND TITLE**
TELEPHONE (305 229-2955 **FAX** (305) 229-8015	**TELEPHONE** ( ) **FAX** ( )
AGENT AUTHORIZED TO SECURE PERMIT (IF AN AGENT IS USED)	**CONSULTANT (IF DIFFERENT FROM AGENT)**
NAME Grethe Loland McLauchlin	**NAME**
COMPANY AND TITLE Metcalf & Eddy, Inc.	**COMPANY AND TITLE**
ADDRESS 3740 Executive Way	**ADDRESS**
CITY, STATE, ZIP Miramar, FL 33025	**CITY, STATE, ZIP**
TELEPHONE (954) 450-7770 **FAX** (954 450-5100	**TELEPHONE** ( ) **FAX** ( )

Name of project, including phase if applicable Rinker Cement Mill Plant /Modifiation Is this application for part of a multi-phase project? ☐ yes ☒ no

Total applicant-owned area contiguous to the project 122 ac

Total project area for which a permit is sought 122 ac

Impervious area for which a permit is sought 45 ac

What is the total area (metric equivalent for federally funded projects) of work in, on, or over wetlands or other surface waters? N/A

_____ acres _____ square feet _____ hectares _____ square meters

Number of new boat slips proposed. N/A

Project location (use additional sheets, if needed)

County(ies) Dade

Section(s) 35 Township 53S Range 39E

Section(s) _____ Township _____ Range _____

Land Grant name, if applicable N/A

Tax Parcel Identification Number 30-39-34-0000020

Street address, road, or other location 1200 N.W. 37th Avenue

City, Zip Code if applicable Miami, FL 33182

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

The proposed project includes the modification of existing on-site structures and construction of new structures (i.e. industrial warehouses) to house new equipment for transformation from an existing semi-wet cement manufacturing process to a dry cement manufacturing process (see enclosed description of project).

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

A meeting on 8/23/96 with Eli Mehu of the Metro-Dade County Department of Environmental Resources (DERM) was conducted to determine the proper application to be submitted

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

N/A

Agency	Date	No.\Type of Application	Action Taken

Note: The following information is required only for projects proposed to occur in, on or over wetlands that need a federal dredge and fill permit and/or authorization to use state owned submerged lands and is not necessary when applying solely for an Environmental Resource Permit.

Please provide the names, addresses and zip codes of property owners whose property directly adjoins the project (excluding applicant). Please attach a plan view showing the owner's names and adjoining property lines. Attach additional sheets if necessary. N/A

1. ______________________

2. ______________________

3. ______________________

4. ______________________

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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

Michael Vardeman
Typed/Printed Name of Applicant (If no Agent is used) or Agent (If one is so authorized below)

1/26/97
Signature of Applicant/Agent Date

Environmental Manager, Cement Division
(Corporate Title if applicable)

AN AGENT MAY SIGN ABOVE <u>ONLY</u> IF THE APPLICANT COMPLETES THE FOLLOWING:

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

Typed/Printed Name of Applicant Signature of Applicant Date

(Corporate Title if applicable)

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

PERSON AUTHORIZING ACCESS TO THE PROPERTY MUST COMPLETE THE FOLLOWING:

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

Michael Vardeman 1/26/98
Typed/Printed Name Signature Date

Environmental Manager, Cement Division
(Corporate Title if applicable)

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Form 0971

SECTION C

Environmental Resource Permit Notice of Receipt of Application

This information is required in addition to that required in other sections of the application. Please submit five copies of this notice of receipt of application and all attachments with the other required information. **PLEASE SUBMIT ALL INFORMATION ON PAPER NO LARGER THAN 2' x 3'.**

Project Name: Rinker Cement Mill Plant Modification
County: Dade
Owner: Rinker Materials Corporation
Applicant: Michael Vardeman, Environmental Manager
Applicant's Address: 1200 N.W. 137th Avenue
Miami, FL 33182

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

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

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

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

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

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

FOR AGENCY USE ONLY

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

EXHIBIT #2

RESPONSES TO SECTION "C"
INDIVIDUAL ENVIRONMENTAL RESOURCES PERMIT (ERP)

RINKER MATERIALS CORPORATION
1200 N.W. 137TH AVENUE
MIAMI, FLORIDA 33182

January 1998

1. A Site Location Map indicating the project boundaries (taken from a USGS Quadrangle map, Hialeah S.W., FL) is presented as **Exhibit #2A**. This facility is at the following location:

   Section: 35
   Township: 53S
   Range: 39E

2. This facility is identified in the SFWMDs publication, *An Atlas of Eastern Dade County Surface Water Management Basins*, as being within in the Tamiami Canal (C-4) Basin, also described as Area B. Refer to **Exhibit #2B** for location of the project facility within the drainage basin.

   With regards to wetlands jurisdiction, this facility was filled prior to the Henderson Act, and in accordance with Section 373.414 Florida Statutes (FS), subsection 16, this facility is exempt from state jurisdiction. Originally this expemtion was approved until 1994; however, House Bill 1073 extended this exemption until October 1, 2000. This issue was discussed with the SFWMD for Surface Water Management Permit applications for other Rinker facilities located within the same Section, Township and Range. It was deemed by Mr. Ron Peekstock (SFWMD) that facilities in this region are not considered under state jurisdiction.

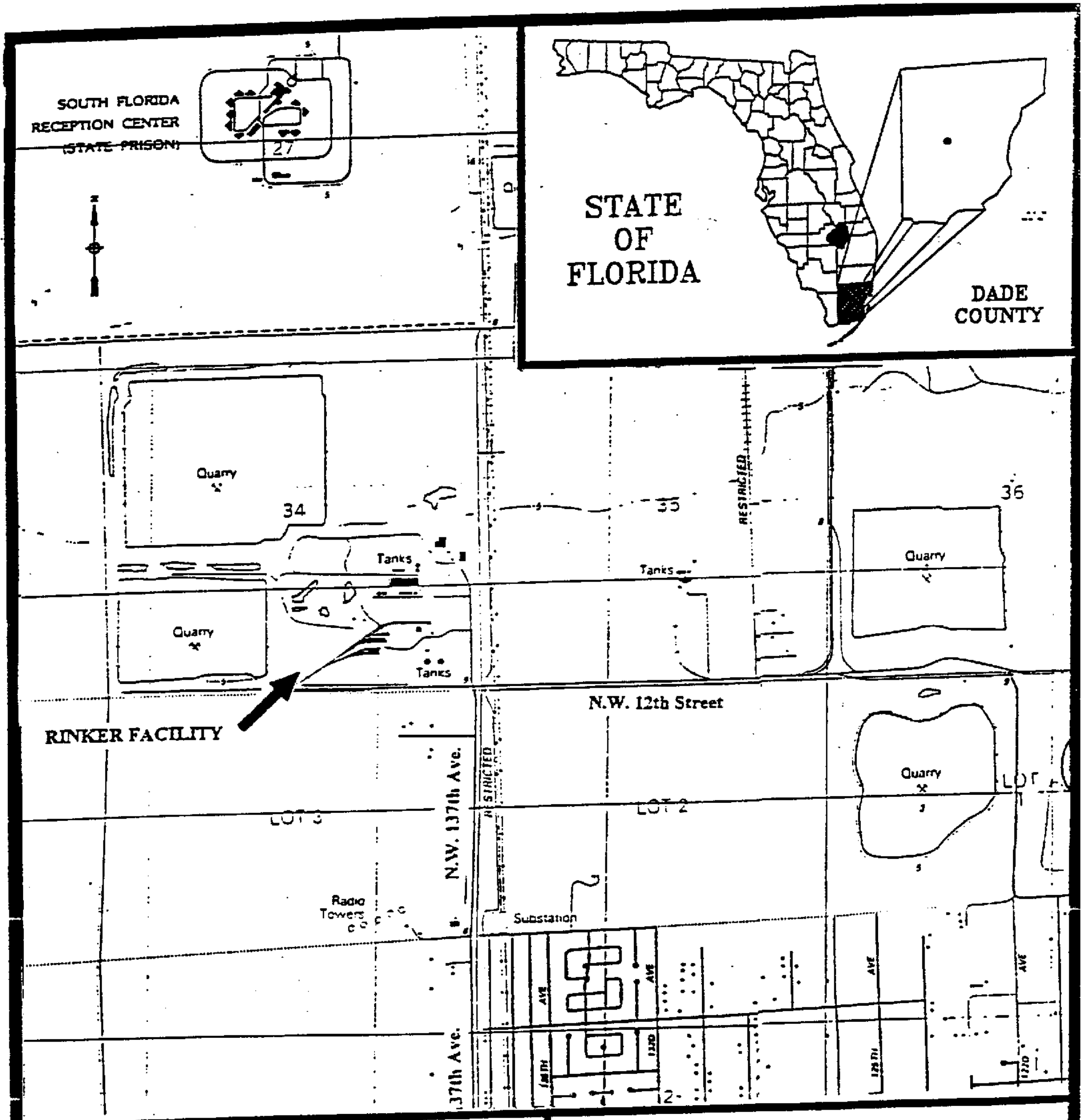
3. A drawing identifying the size and location of new construction is provided as **Exhibit #2C**. Additionally, an existing site map is provided (**Exhibit #2D**) to illustrate the location of existing structures and impervious/pervious areas with respect to the proposed plant modifications. The Site boundary survey for the Plat area is provided as **Exhibit #2E**.

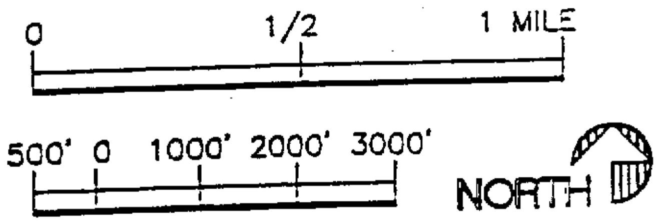
4. The proposed work includes the modification of existing buildings and construction of new buildings for the purpose of housing new equipment and materials to facilitate the transformation of Rinker's cement manufacturing process from "semi-wet" to "dry". The

"dry" cement manufacturing process is a more efficient process than the previous one in that it requires significantly less water. Additional site work associated with the plant modification and surface water management system, including grading and filling, will only be performed over land previously developed.

5. The proposed activity as described above will take place over an existing, developed site. Any excavation or fill work associated with this proposed work will occur in areas of the existing site previously developed. Refer to Section "C", response No. 2.

6. No mitigation plans are proposed. Refer to Section "C", response No. 2.





USGS SITE LOCATION MAP

1200 N.W. 137th AVENUE
SECTION 35
HIALEAH, FLORIDA
USGS QUAD, HIALEAH S.W., FL.
DATE 1988 SEC 35, T 53S, R 39E

Metcalf & Eddy Inc. EXHIBIT #2A

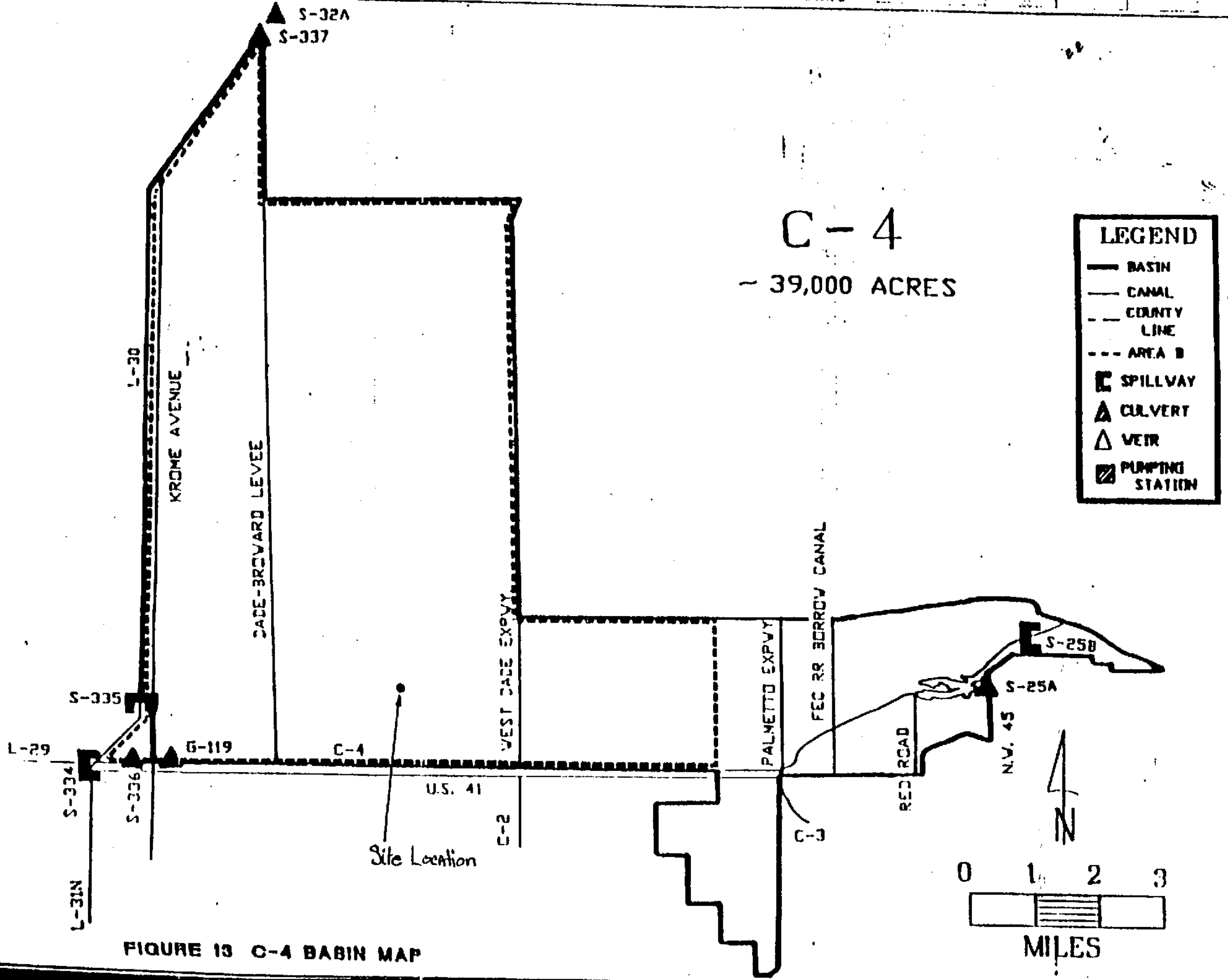


FIGURE 13 C-4 BASIN MAP

EXHIBIT #2C

2C

REVISION			
DATE	NO.	COMMENTS	BY
.	.		

OCT.31/97	BIDS / 1-21	C	GMJ
SEPT.18/97	CLIENT APPROVAL	B	GMJ
SEPT.04/97	DRAWING RENAMED. WAS 10PM-001, REV.D	A	GMJ
DATE	ISSUED FOR	REV	BY

"HOLDERBANK"
Holderbank Engineering Canada Ltd.
Mississauga,Ontario,Canada

Rinker
Rinker Materials Corporation
Miami, Florida, U.S.A.

ISSUED for BIDS
BY: GMJ DATE: OCT.31 1997
HOLDERBANK ENGINEERING CANADA

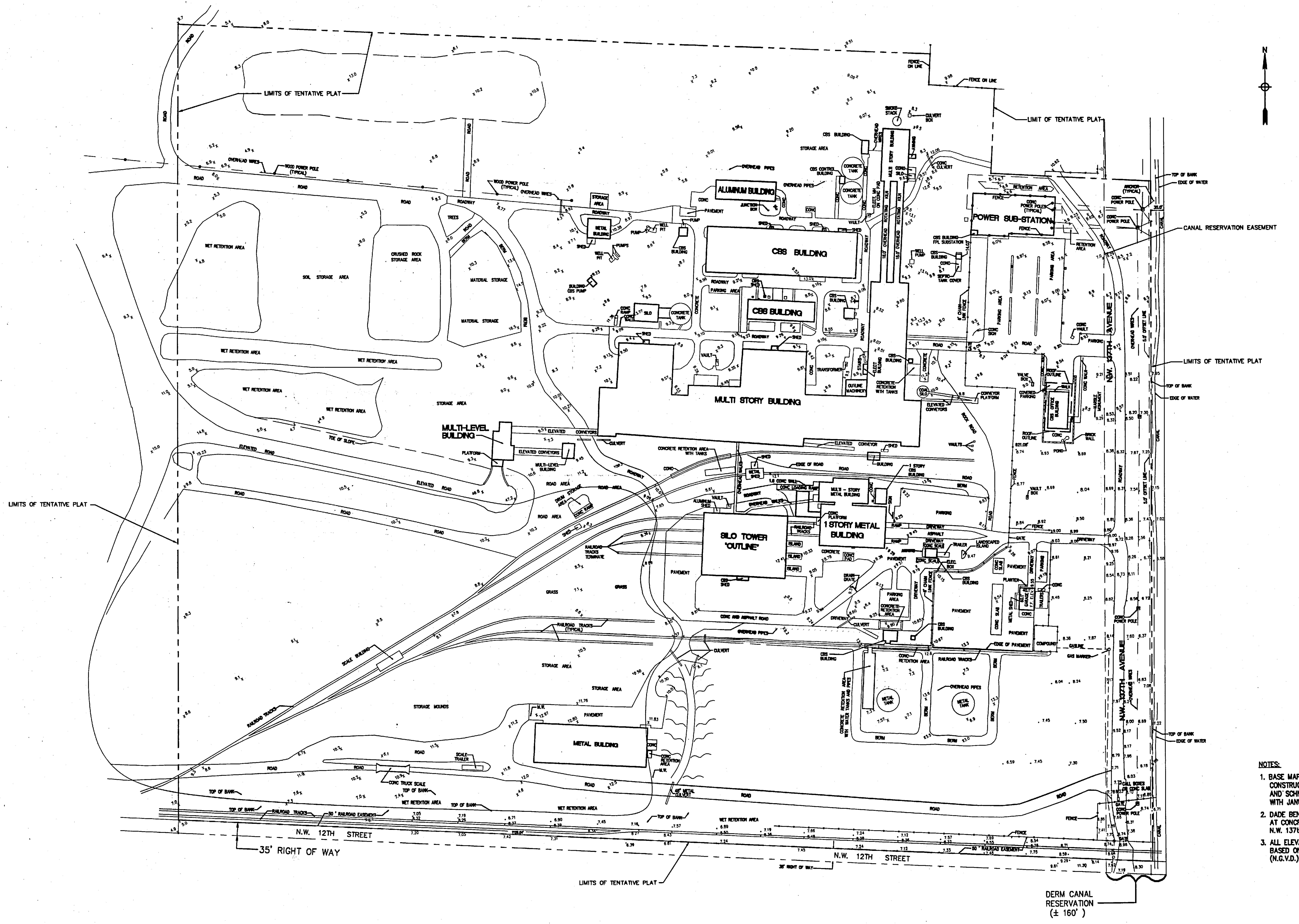
CONCEPT INFORMATION
OCT.14,97
HOLDERBANK CONSULTING LTD

PLANT LAYOUT

DRAWN	DF	NOV. 1996
CHECK	.	.
APPROVED	.	.
SCALE	1" = 75'-0"	
DRAWING NUMBER	EX-2C	REV. C

EXHIBIT #2D

2D



LEGEND

BLDG.	BUILDING
CBS	CONCRETE BLOCK STRUCTURE
CONC.	CONCRETE
ELEV.	ELEVATION
FF	FINISH FLOOR
FPL	FLORIDA POWER & LIGHT
OH	OVERHEAD WIRE
x5.59	ELEVATION AT "X" NGVD
R/W	RIGHT OF WAY

NOTES:

1. BASE MAP AND ELEVATIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE BASED ON KEITH AND SCHNARS SURVEY DATED DECEMBER 12, 1995 WITH JANUARY 12, 1996 REVISIONS.
2. DADE BENCHMARK TC-14-A, LOCATOR INDEX 4921N AT CONCRETE WALL EMBANKMENT ON N.E. CORNER OF N.W. 137th AVENUE AND S.W. 8th STREET
3. ALL ELEVATIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929 (N.G.V.D.), UNLESS OTHERWISE NOTED.

Number	Date	Drawn By	Checked By	Revision Description

L:\RINKER\ENVPERM\FINAL\EX2D MAN/KJH DEC. 9, 1996

Drawn By: M. NARDELLA

Department Check: S. DIAMOND

Project Check: J. PENKOSKY

Metcalf & Eddy
An Air & Water Technologies Company
3740 Executive Way
Miramar, Florida 33025
Phone (954) 450-7770

Date

SCALE:
0 120' 240' 360'
1" = 120'-0"
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

ENVIRONMENTAL RESOURCES PERMIT
RINKER MATERIALS CORPORATION
1200 N.W. 137th AVENUE, MIAMI, FLORIDA .

EXISTING SITE PLAN

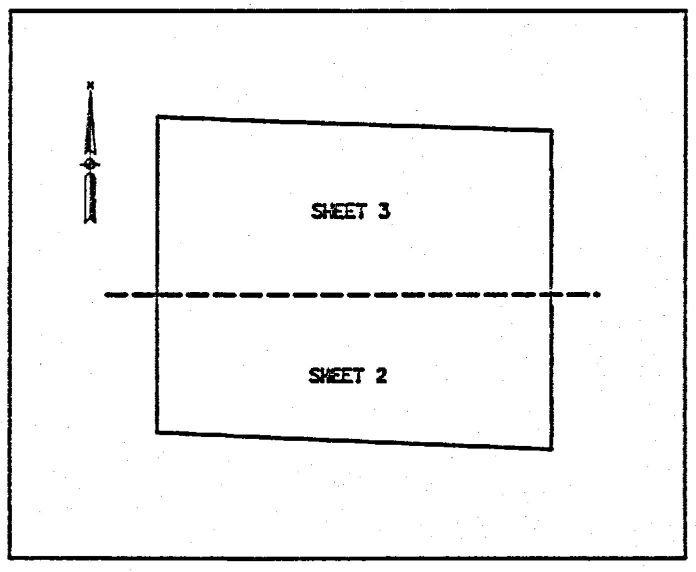
Job: 019416

Sheet: EX.#2D

EXHIBIT #2E

LOCATION MAP

(1"=300')



SHEET INDEX

NOTE

ACCESS TO THIS SITE IS PROVIDED BY N.W. 12TH STREET AND N.W.137TH AVENUE.

LAND DESCRIPTION

A PORTION OF SECTION 34, TOWNSHIP 53 SOUTH, RANGE 39 EAST, DADE COUNTY, FLORIDA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCE AT THE SOUTHEAST CORNER OF SAID SECTION 34; THENCE ALONG THE EAST LINE OF SAID SECTION 34, NORTH 00°02'56" WEST, 35.04 FEET; THENCE NORTH 87°27'45" WEST, 35.04 FEET TO THE POINT OF BEGINNING; THENCE ALONG A LINE 35.00 FEET NORTH OF AND PARALLEL WITH AS MEASURED AT RIGHT ANGLES TO THE THE SOUTH LINE OF SAID SECTION 34, SAME BEING THE NORTH LINE OF A 35' RIGHT OF WAY DEDICATION AS DESCRIBED IN OFFICIAL RECORDS BOOK 79, PAGE 641 OF THE DADE COUNTY PUBLIC RECORDS, NORTH 87°27'45" WEST, 2610.63 FEET TO THE THE WEST LINE OF THE SOUTHEAST ONE-QUARTER OF SAID SECTION 34; THENCE ALONG SAID WEST LINE OF THE SOUTHEAST ONE-QUARTER OF SECTION 34, NORTH 00°01'29" WEST, 2094.23 FEET; THENCE SOUTH 87°56'44" EAST, 2019.26 FEET; THENCE SOUTH 02°39'11" WEST, 80.13 FEET; THENCE SOUTH 82°32'06" EAST, 175.18 FEET; THENCE SOUTH 02°32'53" WEST, 217.81 FEET; THENCE SOUTH 87°20'10" EAST, 428.46 FEET TO A POINT ON A LINE 35.00 FEET WEST OF PARALLEL WITH AS MEASURED AT RIGHT ANGLES TO THE EAST LINE OF SAID SECTION 34; SAME BEING THE WEST LINE OF A 35' RIGHT OF WAY DEDICATION AS DESCRIBED IN OFFICIAL RECORDS BOOK 79, PAGE 641 OF THE DADE COUNTY PUBLIC RECORDS; THENCE ALONG SAID PARALLEL LINE AND ALONG SAID WEST RIGHT OF WAY LINE, SOUTH 00°02'56" EAST, 1809.29 FEET TO THE POINT OF BEGINNING.

SAID LANDS LYING IN DADE COUNTY, FLORIDA.
CONTAINING 5,346,801 SQUARE FEET (122.7457 ACRES), MORE OR LESS.

SURVEY NOTES

1. UNLESS IT BEARS THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER THIS DRAWING, SKETCH, PLAT OR MAP IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT VALID.
2. "PCP" INDICATES NAIL IN BRASS SURVEY CAP.
3. "PRM" INDICATES BRASS DISC IN 4" x 4 "x 24" CONCRETE MONUMENT.
4. LANDS SHOWN HEREON WERE NOT ABSTRACTED FOR RIGHTS-OF-WAY, EASEMENTS, OWNERSHIP, OR OTHER INSTRUMENTS OF RECORD.
5. ELEVATIONS SHOWN HEREON ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 AND SAID ELEVATIONS ARE BASED ON BENCHMARKS SUPPLIED BY DADE COUNTY ENGINEERING DEPARTMENT BENCHMARK NO. TC-14-A. BENCHMARK ELEVATION =10.06 FEET.
6. BEARINGS SHOWN HEREON ARE RELATIVE TO AN ASSUMED DATUM. REFERENCE BEARING OF N 87°27'45" W ALONG THE SOUTH LINE OF SECTION 34-53-39.
7. THE "LAND DESCRIPTION" HEREON WAS PREPARED BY THE SURVEYOR.
8. THERE IS NO EVIDENCE THAT UNDERGROUND ENCROACHMENTS EXIST; HOWEVER, NO SUBSURFACE INVESTIGATION WAS PERFORMED TO DETERMINE IF UNDERGROUND ENCROACHMENTS ARE PRESENT.
9. TREES NOT LOCATED OR SHOWN.
10. ACCORDING TO THE NATIONAL FLOOD INSURANCE PROGRAM, FLOOD INSURANCE RATE MAP NO. 12025C0155J, COMMUNITY PANEL NUMBER 120635 0155J, DATED MARCH 2, 1994, THIS PROPERTY LIES IN ZONE AH, BASE FLOOD ELEVATION=7.0 FEET.
11. DADE COUNTY FLOOD CRITERIA: 7.5' MORE OR LESS.

CERTIFICATE

I HEREBY CERTIFY THAT THE ATTACHED BOUNDARY AND TOPOGRAPHIC SURVEY OF THE HEREON DESCRIBED PROPERTY IS DEPICTED TO THE BEST OF MY KNOWLEDGE, BELIEF, AND INFORMATION AS SURVEYED IN THE FIELD UNDER MY DIRECTION ON DECEMBER 2, 1995. I FURTHER CERTIFY THAT THIS BOUNDARY AND TOPOGRAPHIC SURVEY MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS IN CHAPTER 61G17-6, FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 472.027, FLORIDA STATUES. SUBJECT TO THE QUALIFICATIONS NOTED HEREON.

KEITH AND SCHNARS, P.A.
ENGINEERS-PLANNERS-SURVEYORS

BY: JON P. WEBER, P.L.S.
FLORIDA REGISTRATION NO. 4323

SHEET NO. 1
OF 3 SHEETS
PROJECT NO.
15218C-

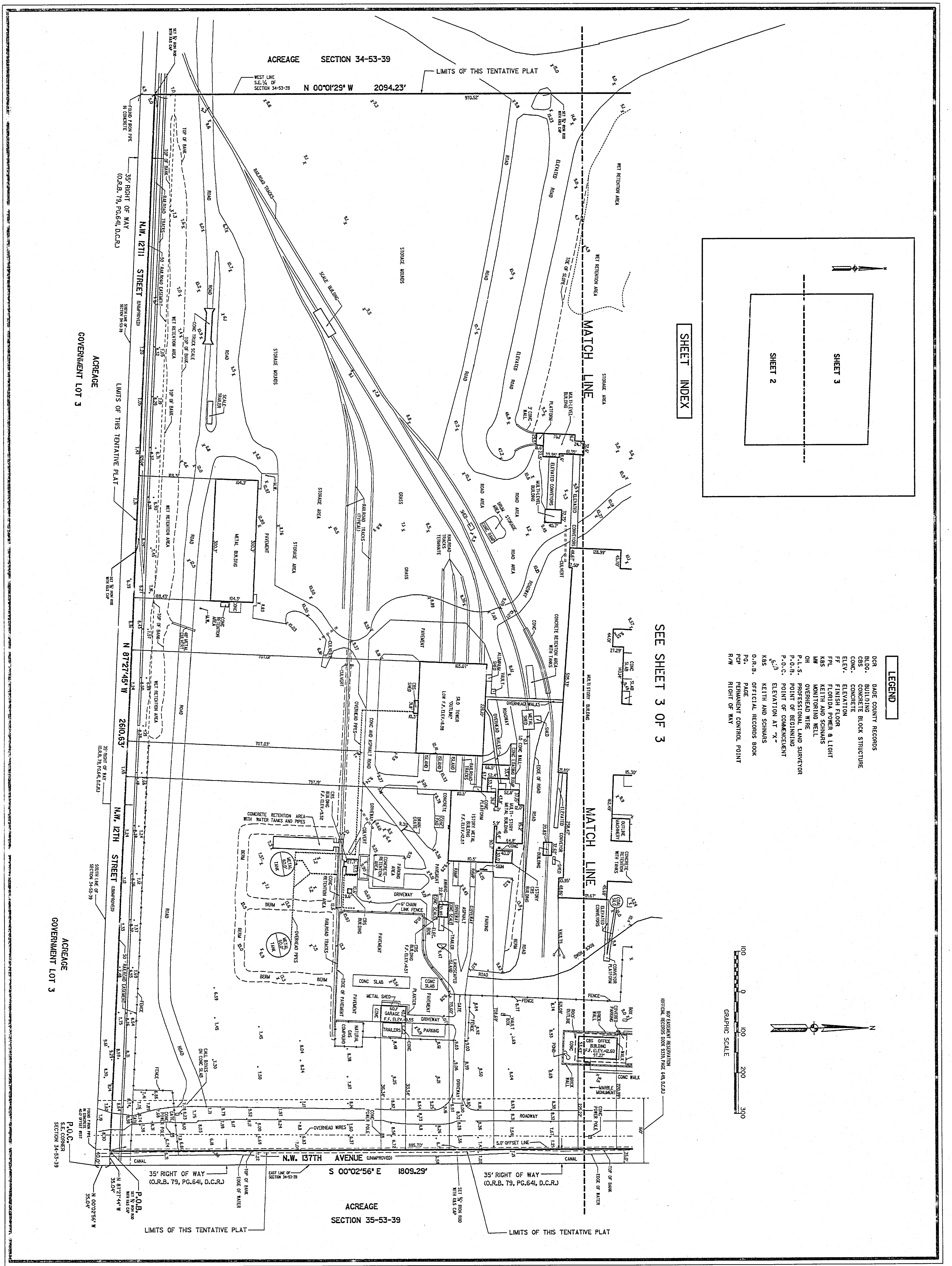
TENTATIVE PLAT
BOUNDARY AND TOPOGRAPHIC SURVEY

A PORTION OF SECTION 34, TOWNSHIP 53 SOUTH, RANGE 39 EAST
DADE COUNTY FLORIDA

DATE DECEMBER 2, 1995
SCALE AS SHOWN
FIELD BK. 860, 862
DWNG. BY M.R.
CHECKED BY J.P.W.

DATE	REVISIONS
1-12-96	REVISE BOUNDARY, SHEET LAYOUT, R/W DEDICATION AND SCALE

KEITH and SCHNARS, P.A.
ENGINEERS - PLANNERS - SURVEYORS
6500 N. ANDREWS AVE, Ft. LAUDERDALE, FL. 33309-2132 (305) 776-1616



LEGEND

DCR	DADE COUNTY RECORDS
BLDG.	BUILDING
CBS	CONCRETE BLOCK STRUCTURE
CONC.	CONCRETE
ELEV.	ELEVATION
FF	FINISH FLOOR
FPL	FLORIDA POWER & LIGHT
K&S	KEITH AND SCHNARS
MW	MONITORING WELL
OH	OVERHEAD WIRE
P.L.S.	PROFESSIONAL LAND SURVEYOR
P.O.B.	POINT OF BEGINNING
P.O.C.	POINT OF COMMENCEMENT
x6.39	ELEVATION AT "X"
K&S	KEITH AND SCHNARS
O.R.B.	OFFICIAL RECORDS BOOK
PG.	PAGE
PCP	PERMANENT CONTROL POINT
R/W	RIGHT OF WAY

SHEET NO. 2
OF 3 SHEETS
PROJECT NO.
15218C-

TENTATIVE PLAT
BOUNDARY AND TOPOGRAPHIC SURVEY

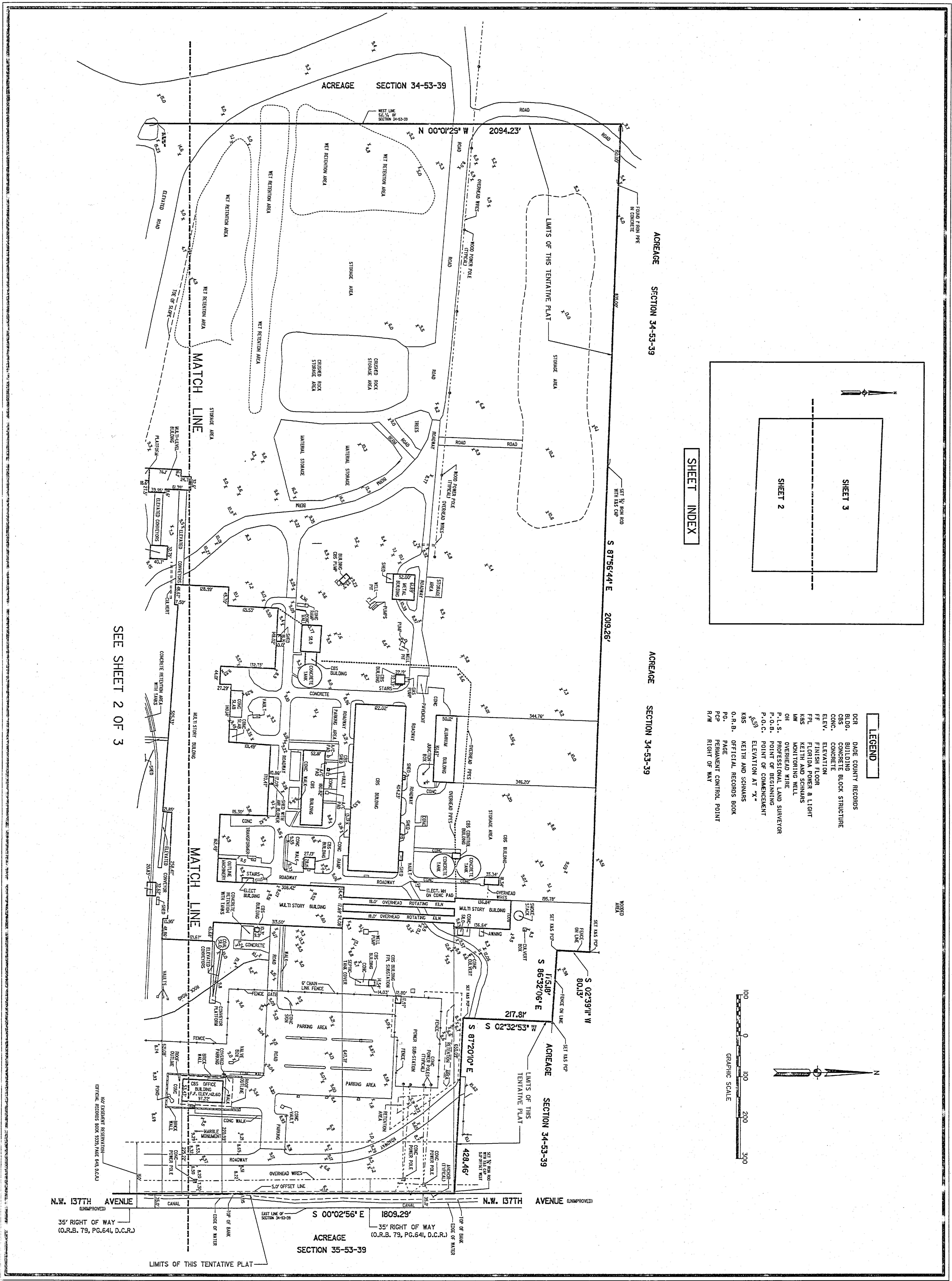
A PORTION OF SECTION 34, TOWNSHIP 53 SOUTH, RANGE 39 EAST
DADE COUNTY FLORIDA

DATE DECEMBER 2, 1995
SCALE AS SHOWN
FIELD BK. 860, 862
DWNG. BY M.R.
CHECKED BY J.P.W.

DATE	REVISIONS
1-2-96	REVISE BOUNDARY, SHEET LAYOUT, R/W DEDICATION AND SCALE

KEITH and SCHNARS, P.A.
ENGINEERS - PLANNERS - SURVEYORS
6500 N. ANDREWS AVE, Ft. LAUDERDALE, FL. 33309-2132 (305) 776-1616

26



LEGEND

DCR	DADE COUNTY RECORDS
BLDG.	BUILDING
CBS	CONCRETE BLOCK STRUCTURE
CONC.	CONCRETE
ELEV.	ELEVATION
FF	FINISH FLOOR
FPL	FLORIDA POWER & LIGHT
K&S	KEITH AND SCHNARS
MW	MONITORING WELL
OH	OVERHEAD WIRE
P.L.S.	PROFESSIONAL LAND SURVEYOR
P.O.B.	POINT OF BEGINNING
P.O.C.	POINT OF COMMENCEMENT
x6.59	ELEVATION AT "X"
KBS	KEITH AND SCHNARS
O.R.B.	OFFICIAL RECORDS BOOK
PG.	PAGE
PCP	PERMANENT CONTROL POINT
R/W	RIGHT OF WAY

PROJECT NO.
15218C-

SHEET NO. 3
OF 3 SHEETS

TENTATIVE PLAT
BOUNDARY AND TOPOGRAPHIC SURVEY

A PORTION OF SECTION 34, TOWNSHIP 53 SOUTH, RANGE 39 EAST
DADE COUNTY FLORIDA

DATE DECEMBER 2, 1995
SCALE AS SHOWN
FIELD BK. 850, 862
DWNG. BY M.R.
CHECKED BY J.P.W.

DATE	REVISIONS
1-12-96	REVISE BOUNDARY, SHEET LAYOUT, R/W DEDICATION AND SCALE

KEITH and SCHNARS, P.A.
ENGINEERS - PLANNERS - SURVEYORS
6500 N. ANDREWS AVE, Ft. LAUDERDALE, FL. 33309-2132 (305) 776-1616

Form #871

SECTION E

INFORMATION FOR STANDARD GENERAL, INDIVIDUAL AND CONCEPTUAL ENVIRONMENTAL RESOURCE PERMITS FOR PROJECTS NOT RELATED TO A SINGLE FAMILY DWELLING UNIT

Please provide the information requested below if the proposed project requires either a standard general, individual, or conceptual approval environmental resource permit and is not related to an individual, single family dwelling unit, duplex or quadraplex. The information listed below represents the level of information that is usually required to evaluate an application. The level of information required for a specific project will vary depending on the nature and location of the site and the activity proposed. Conceptual approvals generally do not require the same level of detail as a construction permit. However, providing a greater level of detail will reduce the need to submit additional information at a later date. If an item does not apply to your project, proceed to the next item. <u>**PLEASE SUBMIT ALL INFORMATION ON PAPER NO LARGER THAN 24" X 36".**</u>

I. Site Information

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

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

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

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

II. Environmental Considerations

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

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

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

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

E. Impact Summary Tables:

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

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

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

III. Plans

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

A. Project area boundary and total land area, including distances and orientation from roads or other land marks;

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

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

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

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

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

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

H. Proposed buffer zones;

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

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

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

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

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

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

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

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

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

R. Site grading details, including perimeter site grading;

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

T. Dewatering plan details;

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

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

W. For phased projects, provide a master development plan.

IV. Construction Schedule and Techniques

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

A. Method for installing any pilings or seawall slabs;

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

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

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

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

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

G. Demolition plan for any existing structures to be removed;

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

V. Drainage Information

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

1. Runoff characteristics, including area, runoff curve number or runoff coefficient, and time of concentration for each drainage basin;
2. Water table elevations (normal and seasonal high) including aerial extent and magnitude of any proposed water table drawdown;
3. Receiving water elevations (normal, wet season, design storm);
4. Design storms used including rainfall depth, duration, frequency, and distribution;
5. Runoff hydrograph(s) for each drainage basin, for all required design storm event(s);

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

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

8. Flood routings through on-site conveyance and storage areas;

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

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

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

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

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

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

1. impervious surfaces, excluding wetlands,

2. pervious surfaces (green areas, not including wetlands),

3. lakes, canals, retention areas, other open water areas,

4. wetlands;

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

1. Hydraulic calculations for all proposed traversing works;

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

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

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

E. Provide an analysis of the water quality treatment system including:

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

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

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

VI. Operation and Maintenance and Legal Documentation

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

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

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

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

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

VII. Water Use

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

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

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

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

EXHIBIT #3

RESPONSES TO SECTION "E"
INDIVIDUAL ENVIRONMENTAL RESOURCES PERMIT (ERP)

RINKER MATERIALS CORPORATION
1200 N.W. 137TH AVENUE
MIAMI, FLORIDA 33182

January 1998

I. SITE INFORMATION

A. A map showing the Rinker site and nearby vicinity is provided as **Exhibit #3A**. This map, which was delineates soil types for the area shown and was taken from the *Soil Survey of Dade County Area, Florida* prepared by the USDA.

B. As part of this permit application, an aerial photograph has been provided as **Exhibit #3B**.

C. Refer to Section "C", response No. 2.

D. The project site's wet season water table is 5.0 ft. The datum is mean sea level. The source is the *Metropolitan Dade County Public Works Manual*, Section D4, Part 2, Figure W.C. 2.2 (dated 2/7/83). Refer to **Exhibit #3C**.

II. ENVIRONMENTAL CONSIDERATIONS

A. Letters have been sent to the Florida Game and Fresh Water Fish Commission and the U.S. Fish and Wildlife Service requesting comments pertaining to the site and the proposed project. Response are pending.

B. Refer to Section "C", response No. 2.

C. Refer to Section "C", response No. 2.

D. Refer to Section "C", response No. 2.

E. Refer to Section "C", response No. 2.

III. PLANS

A. Project area boundary and total Plat area of 122 acres, including distances and orientation from roads and other landmarks, are presented on **Exhibit #2E**.

B. The existing land use and cover classification for the entire plat area, in accordance with the FDOT *Florida Land Use, Cover and Forms Classification System*, is Listing 1564 - Cement Plants.

C. Existing topography extending at least 100 ft. off the plat area, is presented in **Exhibit #2A**.

D. The Plat area is not located within a flood plain of a stream or other water course.

E. As previously stated, wetlands determination for this site is pending. Additionally, proposed site work will be located in areas previously developed.

F. The proposed land use and cover classification for the entire plat area, in accordance with the FDOT *Florida Land Use, Cover and Forms Classification System*, is Listing 1564 - Cement Plants.

G. The proposed work will not be occurring on any wetlands or other surface water, and no connections/outfalls to existing wetlands or other surface waters are proposed.

H. Refer to Section "C", response No. 2.

I. Pre and post-development drainage patterns and basin boundaries showing the direction of flows have been included as **Exhibits #3F** and **#3G**, respectively. **Exhibit #3H** is a close-up of **Exhibit #3G**.

J. Locations of all surface water retention areas/swales have been located on **Exhibit #2C**. Proposed retention area/swale sections have been presented as **Exhibits #3J.**

K. Locations of all on-site water control structures (i.e. culverts) have been identified on **Exhibit #2C**.

L. Locations of all proposed buildings and roads have been included in **Exhibit #2C**.

M. No internal water management facilities have been proposed.

N. Existing rights-of-way and easements associated with this site are identified in **Exhibit #2D**.

O. The surface water management system for the new construction will be handled with on-site retention basins to hold on-site run-off within Rinker property. Refer to **Exhibit #2C** for Proposed Grading and Drainage Plan.

P. Preliminary construction plans do not call for control measures. However, should such control measures be required during construction, Best Management Practices (BMPs) will be implemented for erosion and sediment control such as: 1) Bales of Hay around existing catch basins/culvert openings, 2) erosion control mats (i.e filter fabric), and 3) soil wetting for sediment/dust control.

Q. Refer to Section "C", response No. 2.

R. Proposed site grading is included in **Exhibits #3G** and **3H**.

S. A Staging area for excavated material is located on **Exhibits #3G** and **#3H**.

T. N/A

U. N/A

V. Existing off-site features in the nearby vicinity of this facility are indicated in **Exhibit #2D**.

W. N/A

IV. CONSTRUCTION SCHEDULE AND TECHNIQUES

A. N/A

B. Preliminary construction plans do not call for control measures. However, should such control measures be required during construction, Best Management Practices will be implemented for erosion and sediment control such as: 1) Bales of Hay around existing catch basins/culvert openings, 2) erosion control mats (i.e filter fabric), and 3) soil wetting for sediment/dust control.

C. N/A

D. N/A

E. Preliminary construction plans do not call for dewatering. However, should such a construction method be required, specifications for dewatering will be provided to the district for review prior to construction.

F. Equipment and materials for construction will be trucked to and from the work site via N.W. 137th Ave.

G. N/A.

H. The construction schedule has yet to be determined. The party responsible is Holderbank LTD.

V. DRAINAGE INFORMATION

A. Post-development (based on proposed work) drainage calculations, signed and sealed by a Florida-registered Professional Engineer have been provided as **Exhibit #3K**.

B. A geotechnical report including on and nearby off-site soil borings has been included as **Exhibit #3L**. A hydrogeologic study was performed by Dames & Moore in December 1987, including a determination of the vertical conductivity of the aquifer at this site. A copy of this study is included in **Exhibit #3L.**

C. Refer to sheet 1 of the proposed drainage calculations provided as **Exhibit #3K**.

D. N/A.

E. 1. The proposed stormwater treatment methodology is on-site retention. Pollution abatement volumes cover 5 acre-ft. Refer to proposed drainage calculations **(Exhibit #3K)**, page 2, for required retention volumes.

2. Refer to **Exhibit #3K** for proposed drainage calculations, which indicate stage-storage and design elevations in accordance with SFWMD's Volume IV.

F. Engineering methodology for determining values presented in existing and proposed drainage calculations follow SFWMD's Volume IV.

VI. OPERATION AND MAINTENANCE AND LEGAL DOCUMENTATION

A. The owner of the site, Rinker Materials Corporation, will be responsible for maintaining the on-site surface water management system.

B. Maintenance for the proposed surface water management system will be provided by the site owner.

C. Final plat application is currently being reviewed by local Dade County Regulatory agencies.

D. Water Main and Sanitary Force Main extension plans have been submitted to the local regulatory agencies to connect with existing public systems. Approval of these plands is pending.

E. A copy of the existing boundary survey for this facility has been provided as **Exhibit #2E**.

VII. WATER USE

A. The surface water system will not be used for water supply (i.e for landscape irrigation or recreation).

B. A Water Use Permit has been submitted to the SFWMD.

C. A Water Use Permit has been submitted to the SFWMD.

D. Refer to the Water Use Permit application for a detailed explanation.

Exhibit #34

General Soil Map Units

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Soils of the Coastal Ridge and Barrier Islands

Areas of this group consist of Urban land and nearly level to gently sloping, moderately well drained or well drained soils. The soils consist of mixed stony loam fill spread over natural soils that are underlain by marl or limestone.

1. Urban Land-Udorthents Association

Built-up areas and nearly level to very steep, moderately well drained or well drained soils consisting of fill material that is 8 to more than 80 inches deep over limestone bedrock

This association is primarily in the northeastern part of the survey area, along the Atlantic Coastal Ridge south to Black Creek Canal and on the Barrier Islands.

This association makes up about 34.9 percent of the survey area. It is about 70 percent Urban land, 23 percent Udorthents, and 7 percent soils of minor extent.

Urban land is covered by streets, sidewalks, parking lots, buildings, and other structures that so obscure the soils that identification of the soil series is not feasible.

Udorthents are nearly level areas of extremely stony fill material. Typically, the fill material is light gray and white extremely stony loam about 55 inches thick. Below this is hard, porous limestone bedrock. These soils are intricately mixed with areas of Urban land.

Of minor extent in this association are Basinger, Biscayne, Cardsound, Dade, Demory, Hallandale, Krome, Margate, Opalocka, Pennsuco, Perrine, Plantation, St. Augustine, and Terra Ceia soils and Rock outcrop.

Almost all of this association is used for urban or recreational development. Farming is of no importance because of the extensive urban development. Wetness is a limitation affecting most nonfarm uses. Established drainage systems and additions of fill material have helped to overcome this limitation. Udorthents that overlie organic material are severely limited as sites for roads and buildings. The organic material is compressible and cannot support heavy loads. This limitation can be overcome by replacing the organic material with stable fill material or by constructing foundations on pilings.

Soils of the Freshwater and Sawgrass Marsh

These soils are nearly level and are somewhat poorly drained to very poorly drained. They are organic soils that are shallow to deep over limestone bedrock and soils that consist of marl and are very shallow to deep over oolitic limestone bedrock.

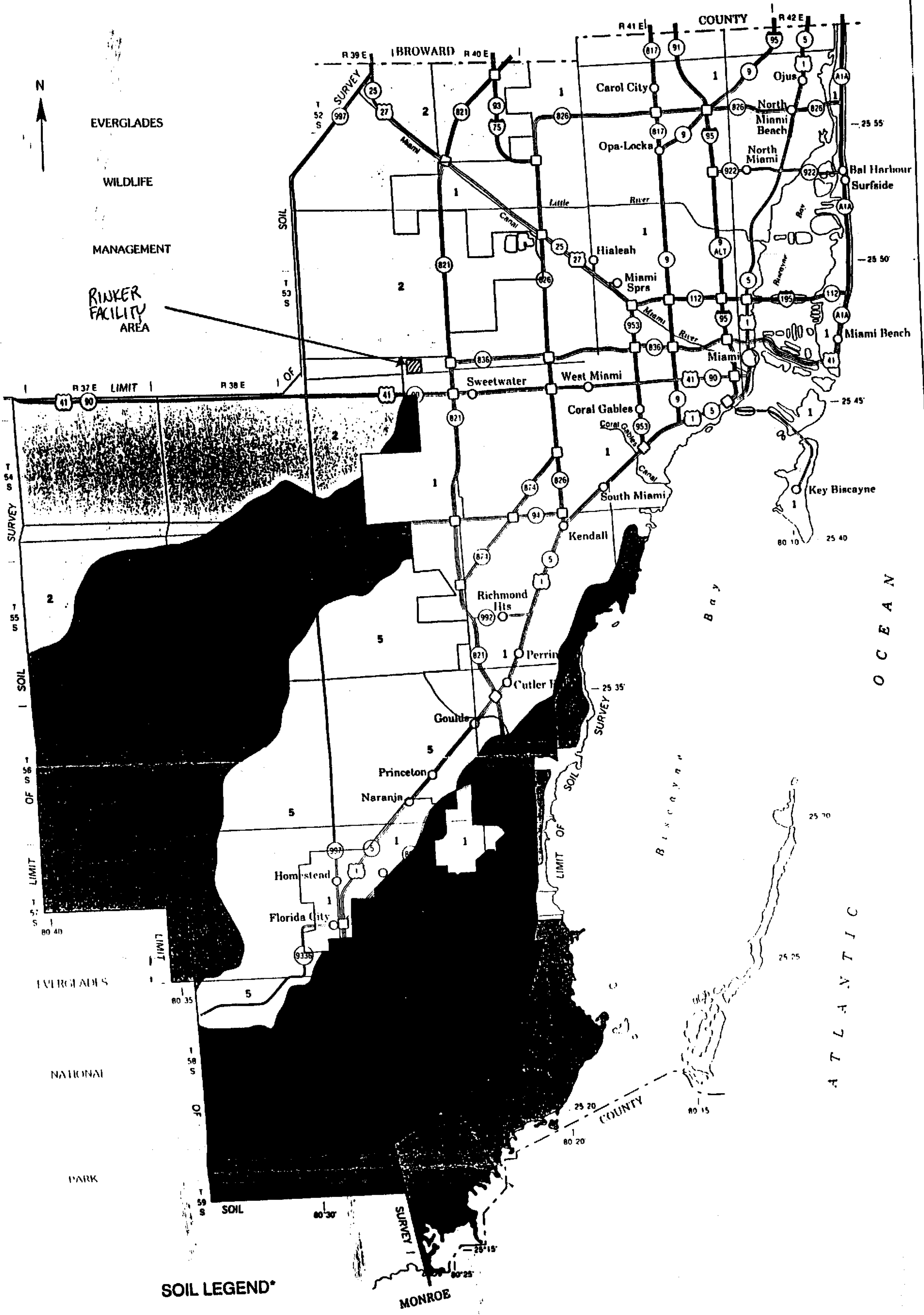
2. Lauderhill-Dania-Pahokee Association

Nearly level, very poorly drained soils consisting of organic material that is 8 to more than 51 inches deep over limestone bedrock

This association consists of shallow to deep, organic soils in sawgrass and freshwater marshes and ponds. These soils extend west from the Atlantic Coastal Ridge into the Everglades.

The native vegetation is sawgrass, willows, and cattails. Melaleuca trees have invaded many areas.

This association makes up about 17 percent of the survey area. It is about 41 percent Lauderhill soils, 34



SOIL LEGEND*

SOILS OF THE COASTAL RIDGE AND BARRIER ISLANDS

1 Urban land-Udorthents association

SOILS OF THE FRESHWATER AND SAWGRASS MARSH

▨ Lauderhill-Dania-Pahokee association

■ Rock outcrop-Biscayne-Chekika association

■ Perrine-Biscayne-Pennsuco association

SOILS OF THE MIAMI RIDGE

▨ Krome association

SOILS OF THE TIDAL SWAMPS

Exhibit #3A

EXHIBIT #3A

EXHIBIT #3B

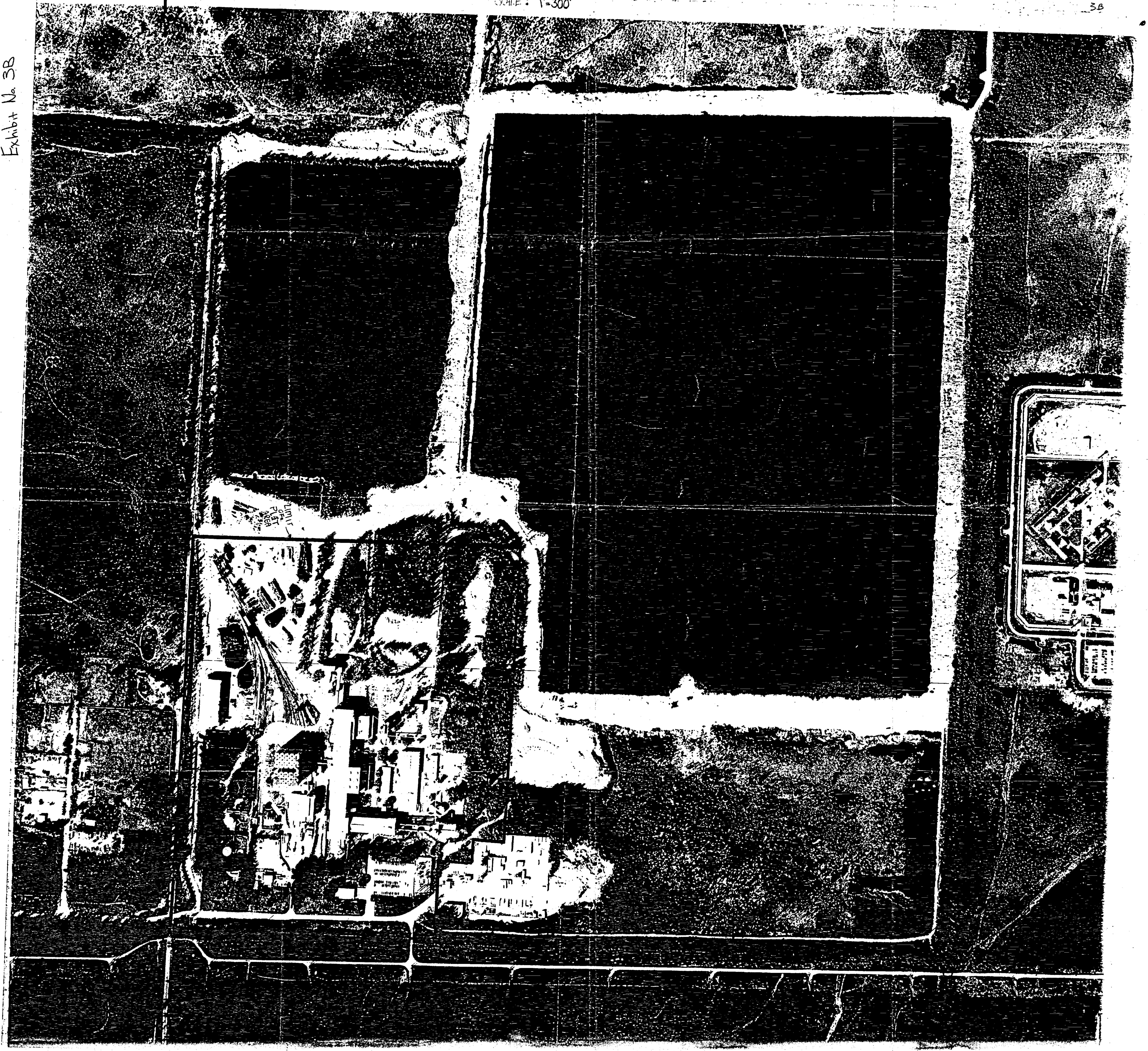
Exhibit No. 3B

SEC 34 T53S R39E FEB 1, 1996

METRO-DADE PREPARED BY PAN AMERICAN SURVEYS INC

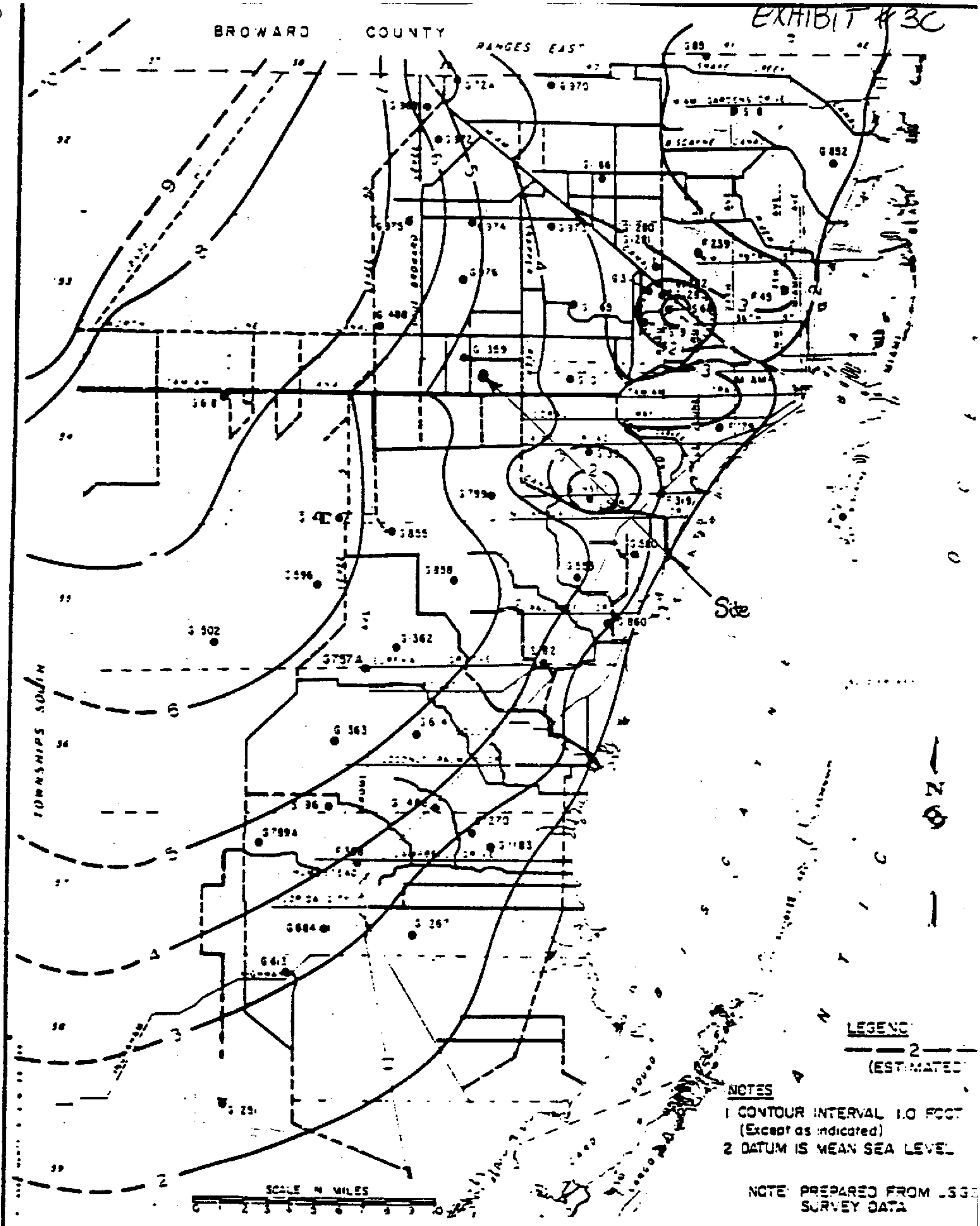
SCALE: 1"=300'

3B



35

EXHIBIT #3C



NOTES
1 CONTOUR INTERVAL 1.0 FOOT (Except as indicated)
2 DATUM IS MEAN SEA LEVEL

NOTE: PREPARED FROM U.S.G.S. SURVEY DATA

METROPOLITAN
DADE COUNTY
PUBLIC WORKS
DEPARTMENT

APPROVED
[illegible]

REVISED
[illegible]
[illegible]

DESIGN STANDARDS

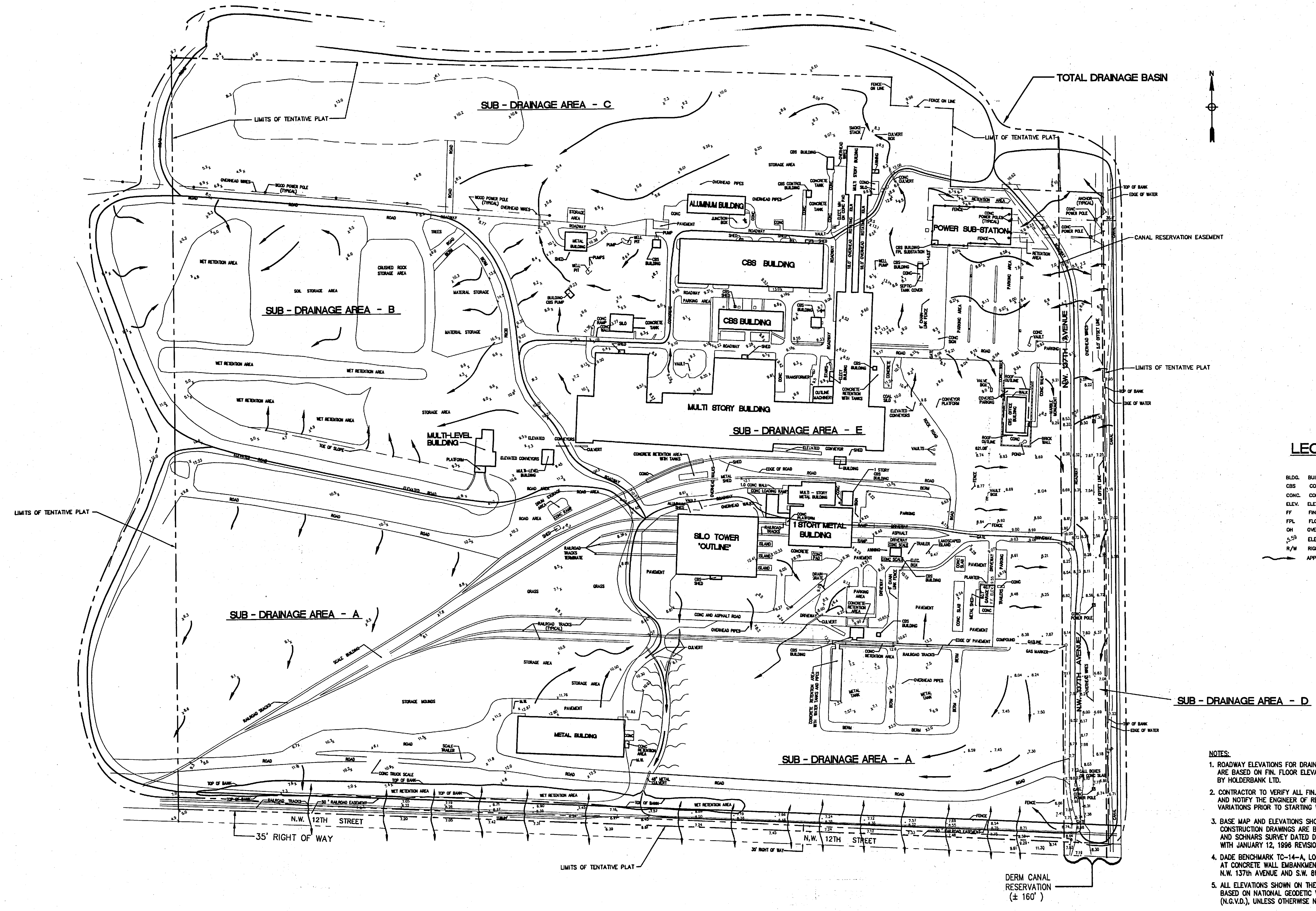
AVERAGE OCTOBER
GROUND WATER LEVEL
1960 – 75

W.C.
2.2

SHEET _ OF

EXHIBIT #3F

3F



LEGEND

BLDG.	BUILDING
CBS	CONCRETE BLOCK STRUCTURE
CONC.	CONCRETE
ELEV.	ELEVATION
FF	FINISH FLOOR
FPL	FLORIDA POWER & LIGHT
OH	OVERHEAD WIRE
x5.59	ELEVATION AT "X" NGVD
R/W	RIGHT OF WAY
⟶	APPARENT DIRECTION OF FLOW

NOTES:

1. ROADWAY ELEVATIONS FOR DRAINAGE PURPOSES ARE BASED ON FIN. FLOOR ELEVATIONS PROVIDED BY HOLDERBANK LTD.
2. CONTRACTOR TO VERIFY ALL FIN. FLOOR ELEVATIONS AND NOTIFY THE ENGINEER OF RECORD OF ANY VARIATIONS PRIOR TO STARTING WORK.
3. BASE MAP AND ELEVATIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE BASED ON KEITH AND SCHNARS SURVEY DATED DECEMBER 12, 1995 WITH JANUARY 12, 1996 REVISIONS.
4. DADE BENCHMARK TC-14-A, LOCATOR INDEX 4921N AT CONCRETE WALL EMBANKMENT ON N.E. CORNER OF N.W. 137th AVENUE AND S.W. 8th STREET
5. ALL ELEVATIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929 (N.G.V.D.), UNLESS OTHERWISE NOTED.

Number	Date	Drawn By	Checked By	Revision Description

L:\RINKER\ENVPERM\FINAL\EX3F MAN/KJH DEC. 9, 1996

Drawn By:
M. NARDELLA

Department Check:
S. DIAMOND

Project Check:
J. PENKOSKY

Metcalf & Eddy
An Air & Water Technologies Company
3740 Executive Way
Miramar, Florida 33025
Phone (954) 450-7770

Date

SCALE:
0 120' 240' 360'
1" = 120'-0"

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

ENVIRONMENTAL RESOURCES PERMIT
RINKER MATERIALS CORPORATION
1200 N.W. 137th AVENUE, MIAMI, FLORIDA

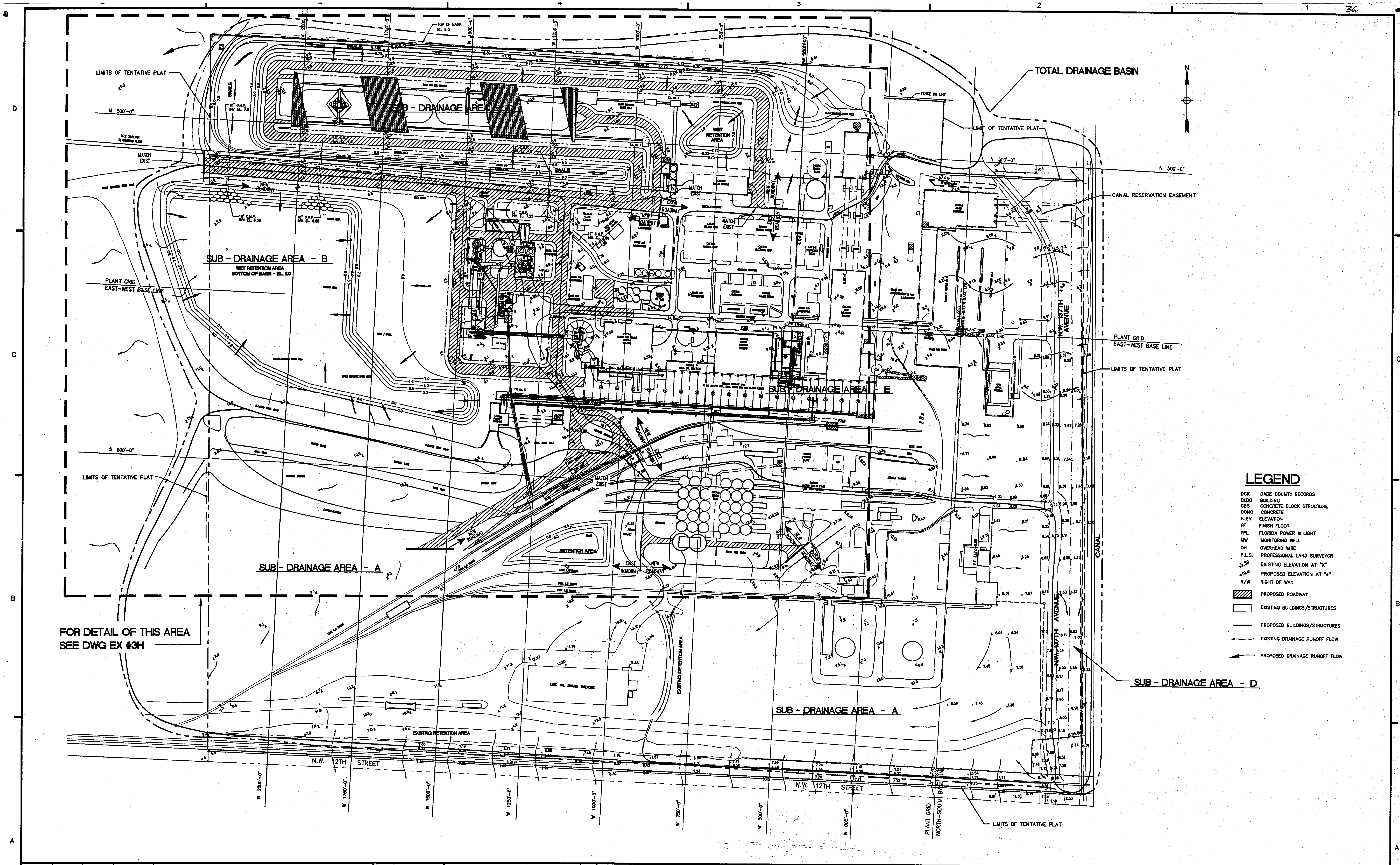
EXISTING SITE DRAINAGE PLAN

Job: 019416

Sheet: EX.#3F

EXHIBIT #3G

36



LEGEND

DCR	DADE COUNTY RECORDS
BLDG	BUILDING
CBS	CONCRETE BLOCK STRUCTURE
CONC	CONCRETE
ELEV	ELEVATION
FF	FINISH FLOOR
FPL	FLORIDA POWER & LIGHT
MW	MONITORING WELL
OH	OVERHEAD WIRE
P.L.S.	PROFESSIONAL LAND SURVEYOR
x5.59	EXISTING ELEVATION AT "X"
•10.8	PROPOSED ELEVATION AT "•"
R/W	RIGHT OF WAY
▨	PROPOSED ROADWAY
☐	EXISTING BUILDINGS/STRUCTURES
▬	PROPOSED BUILDINGS/STRUCTURES
←	EXISTING DRAINAGE RUNOFF FLOW
◄	PROPOSED DRAINAGE RUNOFF FLOW

Number	Date	Drawn By	Checked By	Revision Description

L:\RINKER\ENVPERM\FINAL\EX3GA.DWG MAN DEC 7, 1997

Drawn By: MAN

Department Check: S. DIAMOND

Project Check: J. PENKOSKY

Metcalf & Eddy
An Air & Water Technologies Company
3740 Executive Way
Miramar, Florida 33025
Phone (954) 450-7770

Date

SCALE: 0 120' 240' 360'
1" = 120'-0"

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

ENVIRONMENTAL RESOURCES PERMIT

RINKER MATERIALS CORPORATION
1200 N.W. 137th AVENUE, MIAMI, FLORIDA

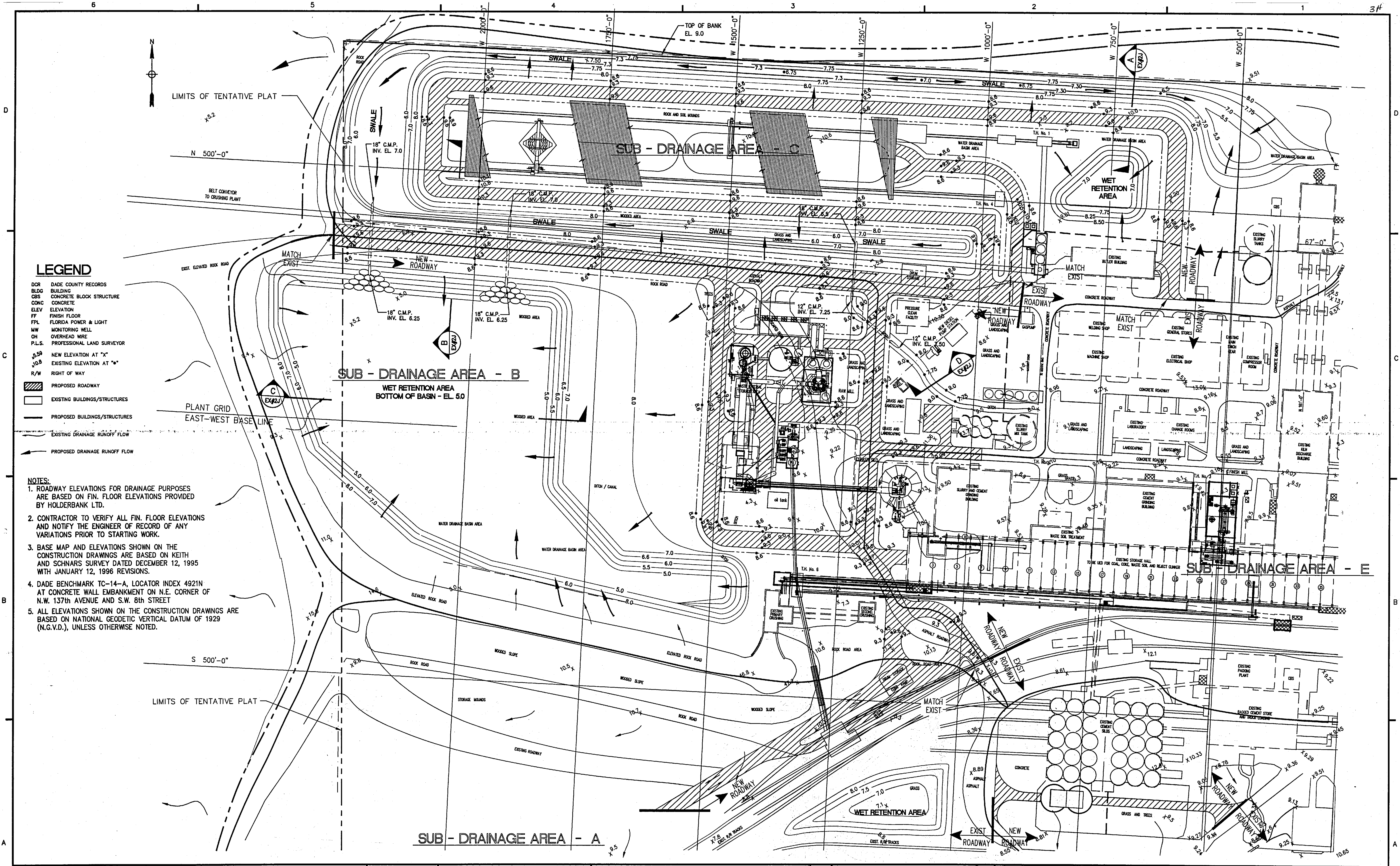
PROPOSED GRADING AND DRAINAGE PLAN

Job: 019416

Sheet: EX.#3G

EXHIBIT #3H

3H



LEGEND

DCR	DADE COUNTY RECORDS
BLDG	BUILDING
CBS	CONCRETE BLOCK STRUCTURE
CONC	CONCRETE
ELEV	ELEVATION
FF	FINISH FLOOR
FPL	FLORIDA POWER & LIGHT
MW	MONITORING WELL
OH	OVERHEAD WIRE
P.L.S.	PROFESSIONAL LAND SURVEYOR
x5.59	NEW ELEVATION AT "X"
•10.8	EXISTING ELEVATION AT "•"
R/W	RIGHT OF WAY
▨	PROPOSED ROADWAY
☐	EXISTING BUILDINGS/STRUCTURES
▬	PROPOSED BUILDINGS/STRUCTURES
←	EXISTING DRAINAGE RUNOFF FLOW
←	PROPOSED DRAINAGE RUNOFF FLOW

NOTES:

1. ROADWAY ELEVATIONS FOR DRAINAGE PURPOSES ARE BASED ON FIN. FLOOR ELEVATIONS PROVIDED BY HOLDERBANK LTD.
2. CONTRACTOR TO VERIFY ALL FIN. FLOOR ELEVATIONS AND NOTIFY THE ENGINEER OF RECORD OF ANY VARIATIONS PRIOR TO STARTING WORK.
3. BASE MAP AND ELEVATIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE BASED ON KEITH AND SCHNARS SURVEY DATED DECEMBER 12, 1995 WITH JANUARY 12, 1996 REVISIONS.
4. DADE BENCHMARK TC-14-A, LOCATOR INDEX 4921N AT CONCRETE WALL EMBANKMENT ON N.E. CORNER OF N.W. 137th AVENUE AND S.W. 8th STREET
5. ALL ELEVATIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929 (N.G.V.D.), UNLESS OTHERWISE NOTED.

Number	Date	Drawn By	Checked By	Revision Description

L:\RINKER\ENVPERM\FINAL\EX.#3H MAN JAN 7, 1998

Drawn By: M. NARDELLA
Department Check: S. DIAMOND
Project Check: J. PENKOSKY

Metcalf & Eddy
An Air & Water Technologies Company
3740 Executive Way
Miramar, Florida 33025
Phone (954) 450-7770

Date

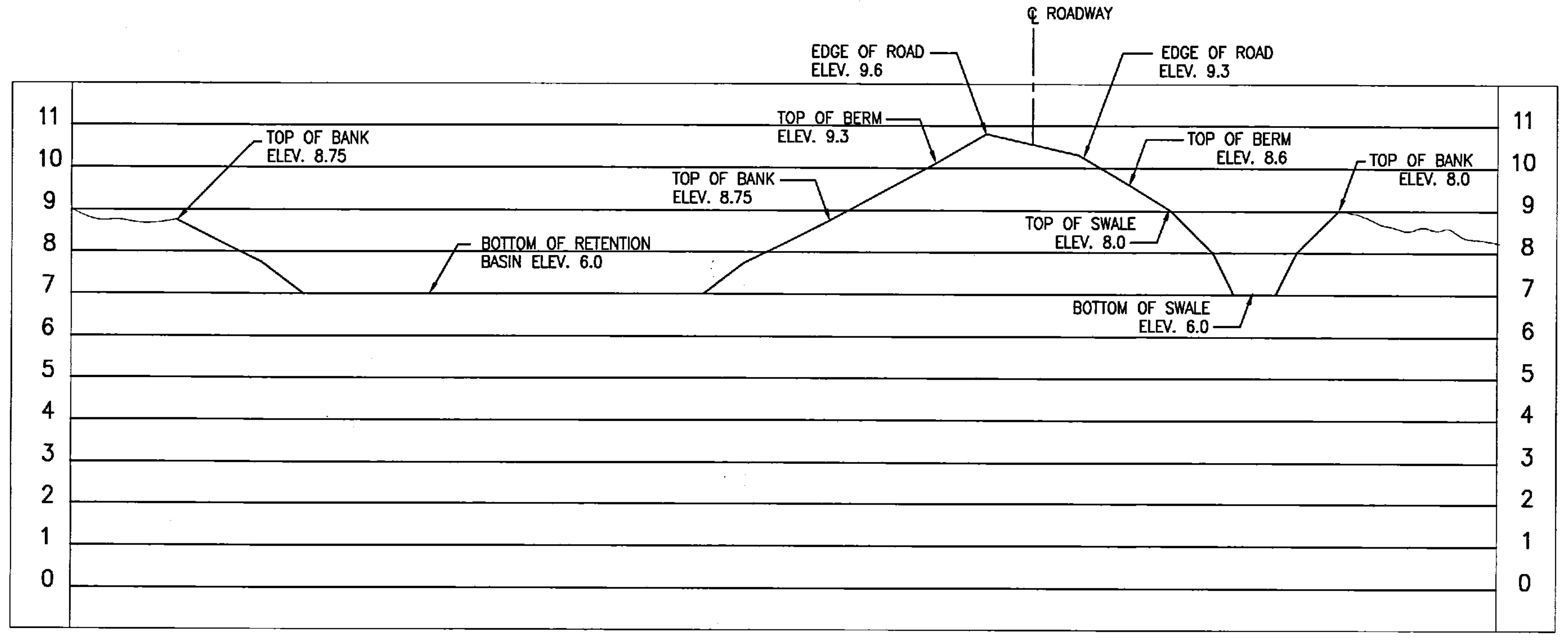
SCALE: 0 80' 160' 240'
1" = 80'-0"
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

ENVIRONMENTAL RESOURCES PERMIT
RINKER MATERIALS CORPORATION
1200 N.W. 137th AVENUE, MIAMI, FLORIDA

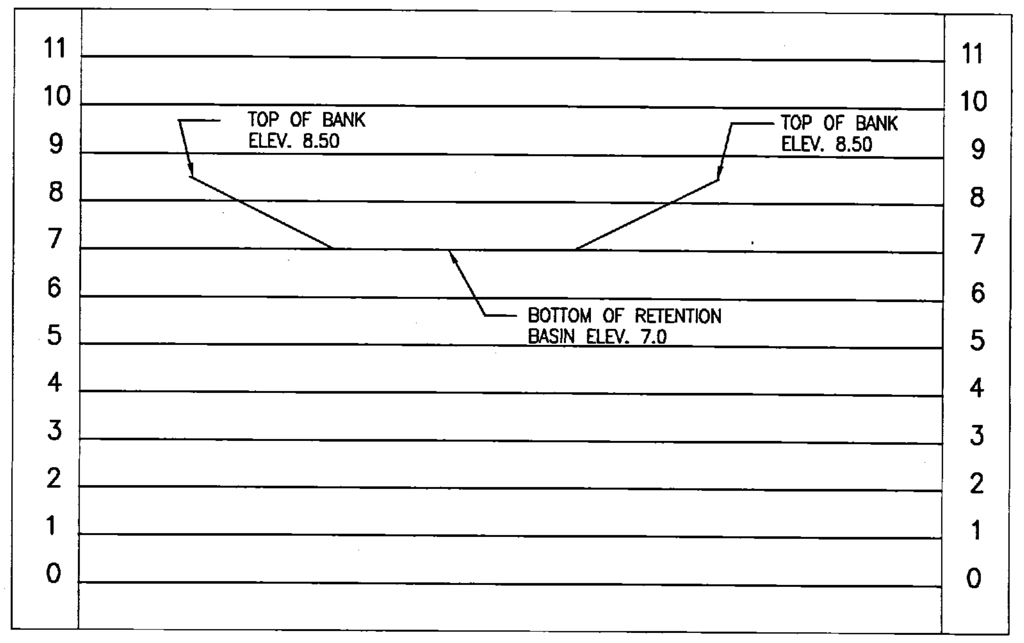
PROPOSED GRADING AND DRAINAGE DETAIL

Job: 019416
Sheet: EX.#3H

EXHIBIT #3J



SECTION A



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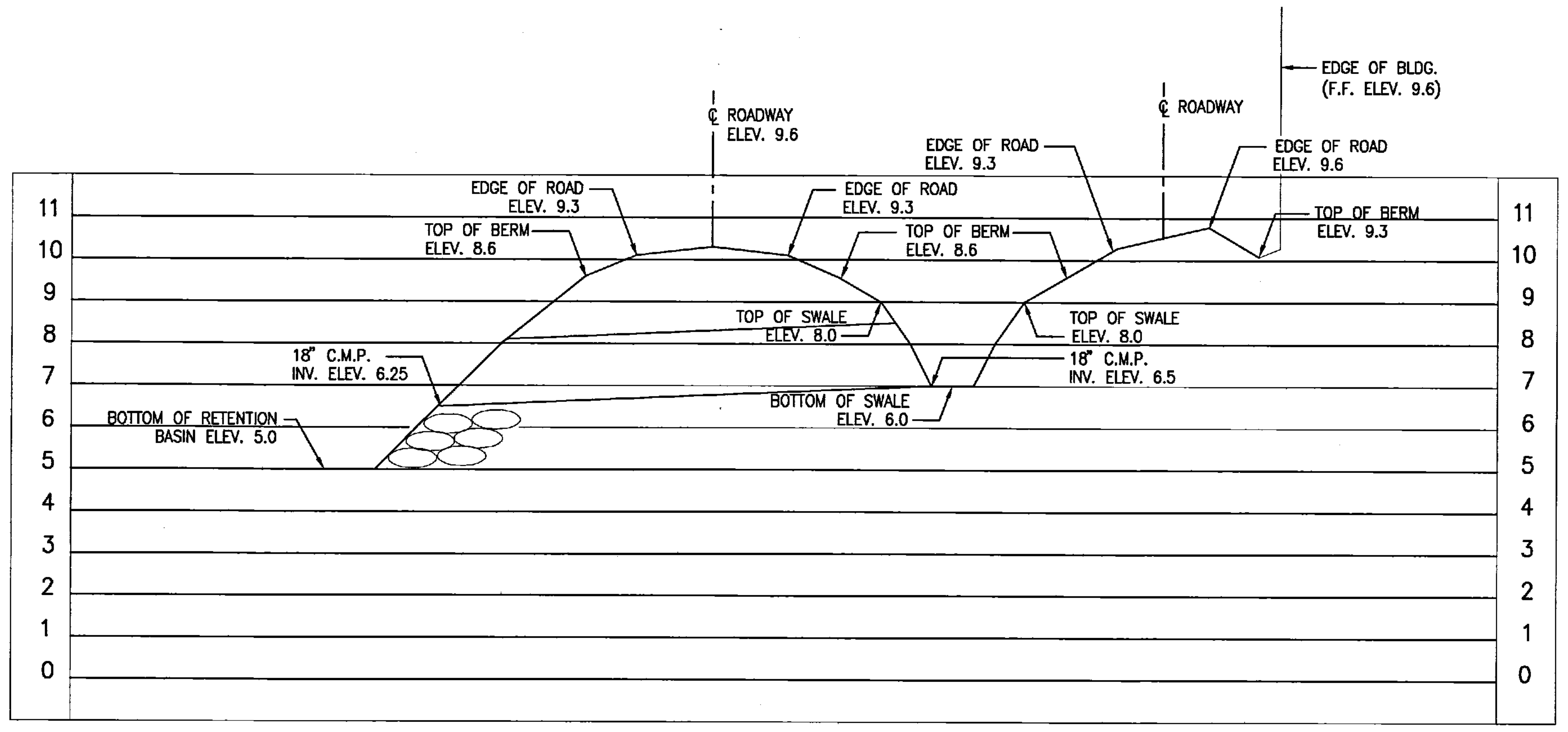
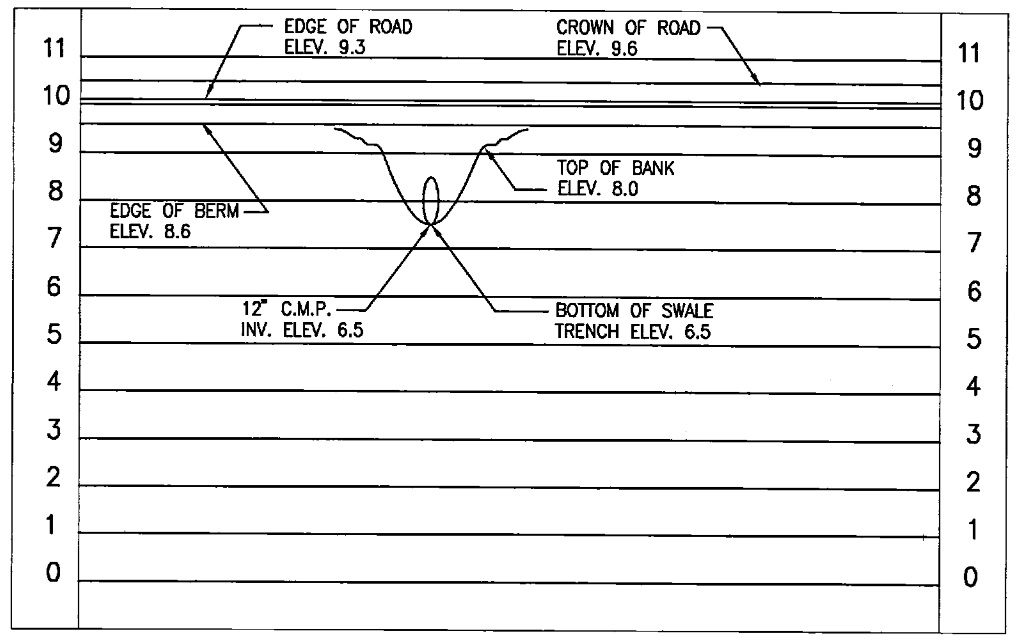
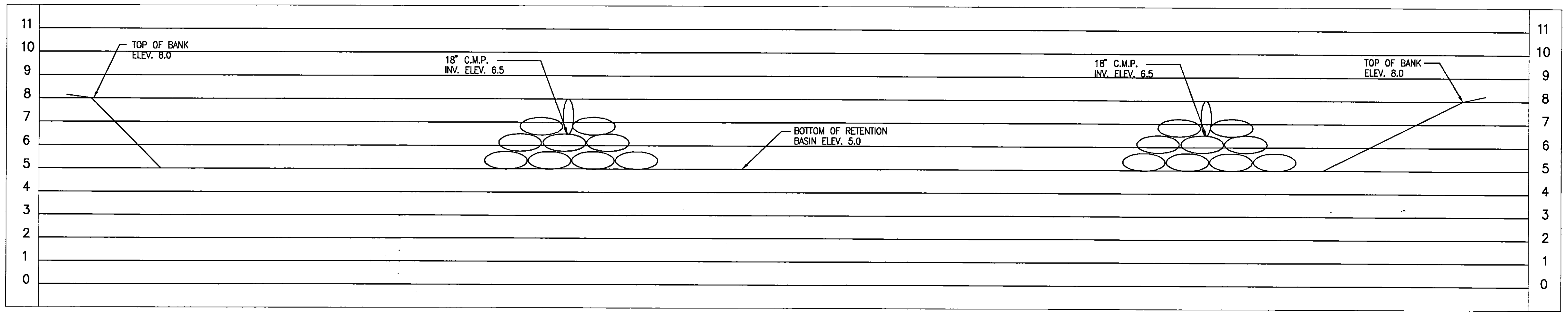


SECTION B



SECTION E



SECTION C

NOTES:

1. ROADWAY ELEVATIONS FOR DRAINAGE PURPOSES ARE BASED ON FIN. FLOOR ELEVATIONS PROVIDED BY HOLDERBANK LTD.
2. ALL ELEVATIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929 (N.G.V.D.), UNLESS OTHERWISE NOTED.

Number	Date	Drawn By	Checked By	Revision Description

L:\RINKER\W&S\CONTRACT\EX.#3J KJH DEC. 09, 1996

Drawn By: K. HUGHES
Department Check: S. DIAMOND
Project Check: J. PENKOSKY

Metcalf & Eddy
An Air & Water Technologies Company
3740 Executive Way
Miramar, Florida 33025
Phone (954) 450-7770

Date

SCALE:
0 30' 60' 120'
1" = 30'-0" (HORIZ.)
1"=3' (VERT.)
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

ENVIRONMENTAL RESOURCES PERMIT
RINKER MATERIALS CORPORATION
1200 N.W. 137th AVENUE, MIAMI, FLORIDA

PROPOSED RETENTION BASIN SECTIONS

Job: 019416
Sheet: EX.#3J

Rinker Portland Cement Corporation
1200 N.W. 137th Ave.
Miami, Florida

Note: Drainage Calculations for proposed Plat area as per SFWMD Volume IV, *Management and Storage of Surface Waters*

I. Given: For PLAT area (Proposed Site)

A. Acreages:

1. Total Plat Area	
a. Land Area	122.0 acres
b. Impervious Area	
1. Buildings/Roof Area (Existing & Proposed)	17.7 acres
2. Paved Roads & Parking Areas	25.4 acres
3. Concrete Containment Areas	2.2 acres
c. Proposed Retention Area/Canals/Quarries (Within drainage basin)	10.6 acres
d. Pervious Area (Within drainage basin)	66.1 acres
2. Drainage Area - A	
a. Land Area	43.6 acres
b. Impervious Area	
1. Buildings/Roof Area (Existing & Proposed)	2.6 acres
2. Paved Roads & Parking Areas	7.3 acres
3. Concrete Containment Areas	2.2 acres
c. Proposed Retention Area/Canals/Quarries (Within drainage basin)	1.5 acres
d. Pervious Area (Within drainage basin)	30.0 acres
3. Drainage Area - B	
a. Land Area	18.0 acres
b. Impervious Area	
1. Buildings/Roof Area (Existing & Proposed)	2.9 acres
2. Paved Roads & Parking Areas	6.7 acres
3. Concrete Containment Areas	0.0 acres
c. Proposed Retention Area/Canals/Quarries (Within drainage basin)	5.4 acres
d. Pervious Area (Within drainage basin)	3.1 acres
4. Drainage Area - C	
a. Land Area	16.4 acres
b. Impervious Area	
1. Buildings/Roof Area (Existing & Proposed)	7.8 acres
2. Paved Roads & Parking Areas	4.7 acres
3. Concrete Containment Areas	0.0 acres
c. Proposed Retention Area/Canals/Quarries (Within drainage basin)	3.5 acres
d. Pervious Area (Within drainage basin)	0.4 acres
5. Drainage Area - D	
a. Land Area	9.0 acres
b. Impervious Area	
1. Buildings/Roof Area (Existing & Proposed)	0.0 acres
2. Paved Roads & Parking Areas	2.5 acres
3. Concrete Containment Areas	0.0 acres
c. Proposed Retention Area/Canals/Quarries (Within drainage basin)	0.3 acres
d. Pervious Area (Within drainage basin)	6.3 acres
6. Drainage Area - E	
a. Land Area	35.0 acres
b. Impervious Area	
1. Buildings/Roof Area (Existing & Proposed)	4.5 acres
2. Paved Roads & Parking Areas	4.2 acres
3. Concrete Containment Areas	0.0 acres
c. Proposed Retention Area/Canals/Quarries (Within drainage basin)	0.0 acres
d. Pervious Area (Within drainage basin)	26.3 acres

B. Minimum Elevations:

1. Roads & parking Lots	7.8 ft. NGVD
2. Finished Floor Elevations	9 ft. NGVD

C. Zoning: GU (Refer to Metropolitan Dade County Public Works Dept's comments)

D. Design for on-site retention

E. Water Table Elevations (WTE):

1. Wet Season WTE*:	5 ft. NGVD
2. Receiving Waters Elev.(refer to site map):	
a. Wet Retention - South	5 ft.
b. Quarry-North	5 ft.
c. Quarry-North	5 ft.

* Refer to Metropolitan Dade County Public Works Dept.'s *Public Works Manual* - Section D4, Part 2, Sheet WC 2.2.

F. Design Storm Rainfall Amts.:

1. Roads* (5-year 24-hour event)	=	6.8 in. (refer to Figure C-I-3 from SFWMD Volume IV)
2. Design* (25-year 72-hour event)	=	12.6 in. (9.3" x 1.359, refer to Figure C-I-5 and Page C-I-8 from SFWMD Volume IV)
3. Floors* (100-year 72-hour event)	=	17.0 in. (12.5" x 1.359, refer to Figure C-I-7 and Page C-I-8 from SFWMD Volume IV)

* Refer to pages 21 & 22 from the SFWMD's *Basis of Review for Surface Water Management Permit Applications*

II. Design Criteria :

A. Quality

1. Calculate 1st-inch of runoff* (V_1):

V_1 = 1 in. x Total Land Area x 1 ft./12 in.
V_1 = 10.17 acre-ft.

2. Calculate 2.5 times percentage of imperviousness* (V_2):

a. Site Area* = (Total Land Area - (Water Surface + Buildings)
= 93.7 acres

b. Impervious Area* = Site Area - Pervious Area
= 27.6 acres

c. Percentage of Imperviousness for Water Quality:
Percentage = Impervious Area/Site Area
= 0.29
= 29 %

d. Calculate 2.5 inches Times Percentage of Imperviousness:
= 0.74 in.

e. Volume for 2.5 times % of imperviousness
V_2 = 1.44 in. x (Total Land Area - Water Surface) x 1ft./12 in.
V_2 = 6.84 acre-ft.

* For water quality pervious/impervious calculations only.

Volume required for quality detention ($V_{detention}$) = Greater of V_1 or V_2
$V_{detention}$ = 10.17 acre-ft.

3. For Retention System: 50% Required Volume for Wet Retention (SFWMD *Basis of Review for Surface Water Management* 5.2.1.A.3)

$V_{Retention}$* = V_1 x 50%
$V_{Retention}$ = 5.08 acre-ft.

* For total Plat Area

Sub-Drainage Area - A

B. Surface Storage

1. Assumptions
   - a. Retention area storage begins at wet season water table elevation = 5.0 ft.
   - b. Lake storage is vertical over the surface area of the retention areas
   - c. Site storage is linear, starting with some reaches of roadside swales which will be 1 ft. lower than the road centerline. The min. road centerline elev. is 7.8 ft. NGVD, therefore, the min. elev. for computing site storage will be 1 ft. lower, or 6.8 ft. NGVD.

2. Develop project stage-storage curve:

Surface Area of Proposed & Existing Retention Are	1.7 acres
Existing Rete	0.7 acres (wet retention area, top of bank = 8.0 feet NGVD)
Proposed Retent	1.02 acres (dry retention area, bottom of basin = 7.0 feet NGVD, top of bank = 9.0 feet NGVD)

Stage (ft. NGVD)	Retention Area (Acre-ft.)	Site (Acre-ft.)	Project (Acre-ft.)
5	0.00		0
5.5	0.34		0.34
6	0.68		0.68
6.5	1.02		1.02
7	1.36		1.36
7.5	2.21		2.21
8	3.06	0	3.06
8.5	3.91	4	7.54
9	4.76	15	19.29
9.5	5.61	33	38.31

Sub-Drainage Area - A

C. Check peak runoff

1. Determine soil storage for the developed site

a. Compute impervious area for soil storage

Existing Wet Drainage Areas = 1.47 acres
Buildings (roofs) = 2.6 acres
Roads and Other Paved Areas = 9.5 acres
TOTAL = 13.6 acres of impervious area

b. Compute pervious acreage

Pervious Acreage = Total Drainage Area - Impervious Area
Pervious Acreage = 30.0 acres

c. Water Table Elev. = 5 ft. (avg wet season.)

d. Determine available soil moisture storage
i. From Fig. C-III-1 of the SFWMD Volume IV, storage = 8.18 inches available under pervious areas as cumulative available storage

e. Compute composite soil moisture storage (S)
Soil Moisture Storage, S = (pervious acres/total site acres) x soil storage available under impervious areas
Soil Moisture Storage, S = 5.63 in. available over the total site area

2. Determine the maximum possible stage (zero discharge) during a design storm (25-year 72-hour event)

a. Total rainfall (P) is 9.3 in. x 135.9% (3-days) = 12.6 in.

b. Calculate total runoff, Q
Q = $(P - 0.2S)^2/(P + .8S)$
Q = 7.73 in. of total runoff (Q)

c. Calculate the total runoff volume, V
V = Q x Drainage Area
V = 28.10 acre-ft. of runoff

d. Zero discharge stage of the design storm = 8.7 ft. NGVD (from stage-storage curve)

D. Check minimum bldg. finished floor elev.

1. By definition, the min. building floor elev. shall be at least as high as the 100-yr. 72-hour storm zero discharge runoff.

2. Compute the 100-yr. 72-hour zero discharge runoff volume
a. Total rainfall (P) is 12.6 in. x 135.9% (3-days) = 17.1 in.
b. Calculate total runoff, Q
Q = $(P - 0.2S)^2/(P + .8S)$
Q = 11.8 in. of total runoff (Q)

c. Calculate the total runoff volume, V
V = Q x Drainage Area
V = 43.0 acre-ft. of runoff

d. Zero discharge stage of the design storm = 8.9 ft. NGVD (from stage-storage curve)

e. Since the proposed min. floor elev. is 9.5' NGVD,
the proposed minimum floor elev. is adequate

E. Check proposed minimum road elev.

1. By definition, the min. road elev. shall be at least as high as the 10-yr. 24-hour storm zero discharge runoff.

2. Compute the 10 -yr. 24-hour zero discharge runoff volume

a. Total rainfall (P) is 7.5 in. x 100% (1-day) = 7.5 in.

b. Calculate total runoff, Q

Q = $(P - 0.2S)^2/(P + .8S)$

Q = 3.4 in. of total runoff (Q)

c. Calculate the total runoff volume, V

V = Q x Drainage Area

V = 12.3 acre-ft. of runoff

d. Zero discharge stage of the design storm = 8.2 ft. NGVD (from stage-storage curve)

e. Since the proposed min. road elev. is 9.5 NGVD,

the proposed minimum road elev. is adequate

Sub-Drainage Area - B

B. Surface Storage

1. Assumptions

a. Retention area storage begins at wet season water table elevation

b. Lake storage is vertical over the surface area of the retention areas

c. Site storage is linear, starting with some reaches of roadside swales which will be 1 ft. lower than the road centerline. The min. road centerline elev. is 7.8 ft. NGVD, therefore, the min. elev. for computing site storage will be 1 ft. lower, or 6.8 ft. NGVD.

2. Develop project stage-storage curve:

Surface Area of Proposed & Existing Retention Are	8.0 acres
Existing Rete	4.3 acres (wet retention area, top of bank =9.0 feet NGVD)
Proposed Retent	3.7 acres (wet retention area, top of bank = 9.0 feet NGVD)

Stage (ft. NGVD)	Retention Area (Acre-ft.)	Site (Acre-ft.)	Project (Acre-ft.)
5	0.00		0
5.5	4.00		4.00
6	8.00		8.00
6.5	12.00		12.00
7	16.00		16.00
7.5	20.00		20.00
8	24.00	0	24.00
8.5	28.00	2	30.25
9	32.00	9	41.00
9.5	32.00	20	52.25
10	32.00	36	68.00

Sub-Drainage Area - B

C. Check peak runoff

1. Determine soil storage for the developed site

a. Compute impervious area for soil storage

Existing Wet Drainage Areas = 5.35 acres
Buildings (roofs) = 2.9 acres
Roads and Parking = 6.7 acres
Concrete Retention = 0.0 acres
TOTAL = 14.89 acres of impervious area

b. Compute pervious acreage

Pervious Acreage = Total Site Area - Impervious Area
Pervious Acreage = 3.1 acres

c. Water Table Elev. = 5 ft. (avg wet season.)

d. Determine available soil moisture storage

i. From Fig. C-III-1 of the SFWMD Volume IV, storage = 8.18 inches will be available under impervious areas.

e. Compute composite soil moisture storage (S)

Soil Moisture Storage, S = (pervious acres/total site acres) x soil storage available under impervious areas
Soil Moisture Storage, S = 1.41 in. available over the total site area

2. Determine the maximum possible stage (zero discharge) during a design storm (25-year 72-hour event)

a. Total rainfall (P) is 9.3 in. x 135.9% (3-days) = 12.6 in.

b. Calculate total runoff, Q

Q = $(P - 0.2S)^2/(P + .8S)$
Q = 11.09 in. of total runoff (Q)

c. Calculate the total runoff volume, V

V = Q x Drainage Area
V = 16.63 acre-ft. of runoff

d. Zero discharge stage of the design storm = 7.4 ft. NGVD (from stage-storage curve)

D. Check minimum bldg. finished floor elev.

1. By definition, the min. building floor elev. shall be at least as high as the 100-yr. 72-hour storm zero discharge runoff.

2. Compute the 100-yr. 72-hour zero discharge runoff volume

a. Total rainfall (P) is 12.6 in. x 135.9% (3-days) = 17.1 in.

b. Calculate total runoff, Q

Q = $(P - 0.2S)^2/(P + .8S)$

Q = 15.54 in. of total runoff (Q)

c. Calculate the total runoff volume, V

V = Q x Drainage Area

V = 23.3 acre-ft. of runoff

d. Zero discharge stage of the design storm = 9.1 ft. NGVD (from stage-storage curve)

e. Since the proposed min. floor elev. is 9.5' NGVD,

the proposed minimum floor elev. is adequate

E. Check proposed minimum road elev.

1. By definition, the min. road elev. shall be at least as high as the 10-yr. 24-hour storm zero discharge runoff.

2. Compute the 10 -yr. 24-hour zero discharge runoff volume

a. Total rainfall (P) is 7.5 in. x 100% (1-day) = 7.5 in.

b. Calculate total runoff, Q

Q = $(P - 0.2S)^2/(P + .8S)$

Q = 6.04 in. of total runoff (Q)

c. Calculate the total runoff volume, V

V = Q x Drainage Area

V = 9.05 acre-ft. of runoff

d. Zero discharge stage of the design storm = 6.5 ft. NGVD (from stage-storage curve)

e. Since the proposed min. road elev. is 9.5 NGVD,

the proposed minimum road elev. is adequate

Sub-Drainage Area - C

B. Surface Storage

1. Assumptions

a. Retention area storage begins at wet season water table elevation

b. Lake storage is vertical over the surface area of the retention areas

c. Site storage is linear, starting with some reaches of roadside swales which will be 1 ft. lower than the road centerline. The min. road centerline elev. is 7.8 ft. NGVD, therefore, the min. elev. for computing site storage will be 1 ft. lower, or 6.8 ft. NGVD.

2. Develop project stage-storage curve:

Surface Area of Proposed & Existing Retention Are 2.5 acres
Existing Rete 0.5 acres (wet retention area, top of bank = 9.0 feet NGVD)
Proposed Retent 2.01 acres (wet retention area, top of bank = 9.0 feet NGVD)

Stage (ft. NGVD)	Retention Area (Acre-ft.)	Site (Acre-ft.)	Project (Acre-ft.)
5	0.00		0
5.5	1.01		1.01
6	2.01		2.01
6.5	3.02		3.02
7	4.02		4.02
7.5	5.03		5.03
8	6.03		6.03
8.5	7.04		7.04
9	8.04	0	8.04
9.5	8.04	3	10.77
10	8.04	8	16.24

Drainage Area - C

C. Check peak runoff

1. Determine soil storage for the developed site

a. Compute impervious area for soil storage

Existing Wet Drainage Areas = 3.5 acres
Buildings (roofs) = 7.76 acres
Roads and Parking = 4.71 acres
TOTAL = 16 acres of impervious

b. Compute pervious acreage

Pervious Acreage = Total Site Area - Impervious Area
Pervious Acreage = 0.4 acres

c. Water Table Elev. = 5 ft. (avg wet season.)

d. Determine available soil moisture storage

i. From Fig. C-III-1 of the SFWMD Volume IV, storage = 8.18 inches will be available under impervious areas.

e. Compute composite soil moisture storage (S)

Soil Moisture Storage, S = (pervious acres/total site acres) x soil storage available under impervious areas
Soil Moisture Storage, S = 0.20 in. available over the total site area

2. Determine the maximum possible stage (zero discharge) during a design storm (25-year 72-hour event)

a. Total rainfall (P) is 9.3 in. x 135.9% (3-days) = 12.6 in.

b. Calculate total runoff, Q

Q = $(P - 0.2S)^2/(P + .8S)$
Q = 12.40 in. of total runoff (Q)

c. Calculate the total runoff volume, V

V = Q x Project Acreage
V = 16.95 acre-ft. of runoff

d. Zero discharge stage of the design storm = 6.4 ft. NGVD (from stage-storage curve)

D. Check minimum bldg. finished floor elev.

1. By definition, the min. building floor elev. shall be at least as high as the 100-yr. 72-hour storm zero discharge runoff.

2. Compute the 100-yr. 72-hour zero discharge runoff volume

a. Total rainfall (P) is 12.6 in. x 135.9% (3-days) = 17.1 in.

b. Calculate total runoff, Q

Q = $(P - 0.2S)^2/(P + .8S)$

Q = 16.89 in. of total runoff (Q)

c. Calculate the total runoff volume, V

V = Q x Project Acreage

V = 23.1 acre-ft. of runoff

d. Zero discharge stage of the design storm = 7 ft. NGVD (from stage-storage curve)

e. Since the proposed min. floor elev. is 9.5' NGVD,

the proposed minimum floor elev. is adequate

E. Check proposed minimum road elev.

1. By definition, the min. road elev. shall be at least as high as the 10-yr. 24-hour storm zero discharge runoff.

2. Compute the 10 -yr. 24-hour zero discharge runoff volume

a. Total rainfall (P) is 7.5 in. x 100% (1-day) = 7.5 in.

b. Calculate total runoff, Q

Q = $(P - 0.2S)^2/(P + .8S)$

Q = 7.27 in. of total runoff (Q)

c. Calculate the total runoff volume, V

V = Q x Project Acreage

V = 9.9 acre-ft. of runoff

d. Zero discharge stage of the design storm = 5.6 ft. NGVD (from stage-storage curve)

e. Since the proposed min. road elev. is 9.5 NGVD,
the proposed minimum road elev. is adequate

Sub-Drainage Area - D

B. Surface Storage

1. Assumptions
   a. Retention area storage begins at wet season water table elevation
   b. Lake storage is vertical over the surface area of the retention areas
   c. Site storage is linear, starting with some reaches of roadside swales which will be 1 ft. lower than the road centerline. The min. road centerline elev. is 7.8 ft. NGVD, therefore, the min. elev. for computing site storage will be 1 ft. lower, or 6.8 ft. NGVD.

2. Develop project stage-storage curve:

Total Retention Area = 0.3 acres

Stage (ft. NGVD)	Retention Area (Acre-ft.)	Site (Acre-ft.)	Project (Acre-ft.)
5	0.00		0
5.5	0.13		0.13
6	0.25	0.00	0.25
6.5	0.38	1.88	2.25
7	0.50	7.50	8.00
7.5	0.63	16.88	17.50
8	0.75	30.00	30.75

Sub-Drainage Area - D

C. Check peak runoff

1. Determine soil storage for the developed site

a. Compute impervious area for soil storage

Existing Wet Drainage Areas = 0.3 acres
Buildings (roofs) = 0.0 acres
Roads and Parking = 2.5 acres
TOTAL = 2.75 acres of impervious

b. Compute pervious acreage

Pervious Acreage = Total Site Area - Impervious Area
Pervious Acreage = 6.3 acres

c. Water Table Elev. = 5 ft. (avg wet season.)

d. Determine available soil moisture storage
i. From Fig. C-III-1 of the SFWMD Volume IV, storage = 8.18 inches will be available under impervious areas.

e. Compute composite soil moisture storage (S)
Soil Moisture Storage, S = (pervious acres/total site acres) x soil storage available under impervious areas
Soil Moisture Storage, S = 5.68 in. available over the total site area

2. Determine the maximum possible stage (zero discharge) during a design storm (25-year 72-hour event)

a. Total rainfall (P) is 9.3 in. x 135.9% (3-days) = 12.6 in.

b. Calculate total runoff, Q
Q = $(P - 0.2S)^2/(P + .8S)$
Q = 7.70 in. of total runoff (Q)

c. Calculate the total runoff volume, V
V = Q x Project Acreage
V = 5.77 acre-ft. of runoff

d. Zero discharge stage of the design storm = 7.7 ft. NGVD (from stage-storage curve)

D. Check minimum bldg. finished floor elev.

1. By definition, the min. building floor elev. shall be at least as high as the 100-yr. 72-hour storm zero discharge runoff.

2. Compute the 100-yr. 72-hour zero discharge runoff volume

a. Total rainfall (P) is 12.6 in. x 135.9% (3-days) = 17.1 in.

b. Calculate total runoff, Q

Q = $(P - 0.2S)^2/(P + .8S)$

Q = 11.80 in. of total runoff (Q)

c. Calculate the total runoff volume, V

V = Q x Project Acreage

V = 8.8 acre-ft. of runoff

d. Zero discharge stage of the design storm = 8.2 ft. NGVD (from stage-storage curve)

e. Since the proposed min. floor elev. is 9.5' NGVD,
the proposed minimum floor elev. is adequate

E. Check proposed minimum road elev.

1. By definition, the min. road elev. shall be at least as high as the 10-yr. 24-hour storm zero discharge runoff.

2. Compute the 10 -yr. 24-hour zero discharge runoff volume

a. Total rainfall (P) is 7.5 in. x 100% (1-day) = 7.5 in.

b. Calculate total runoff, Q

Q = $(P - 0.2S)^2/(P + .8S)$

Q = 3.36 in. of total runoff (Q)

c. Calculate the total runoff volume, V

V = Q x Project Acreage

V = 2.5 acre-ft. of runoff

d. Zero discharge stage of the design storm = 7.4 ft. NGVD (from stage-storage curve)

e. Since the proposed min. road elev. is 7.8 NGVD,
the proposed minimum road elev. is adequate

Sub-Drainage Area - E

B. Surface Storage

1. Assumptions
   - a. Retention area storage begins at wet season water table elevation
   - b. Lake storage is vertical over the surface area of the retention areas
   - c. Site storage is linear, starting with some reaches of roadside swales which will be 1 ft. lower than the road centerline. The min. road centerline elev. is 7.8 ft. NGVD, therefore, the min. elev. for computing site storage will be 1 ft. lower, or 6.8 ft. NGVD.

2. Develop project stage-storage curve:

Total Retention Area = 0.0 acres

Stage (ft. NGVD)	Retention Area (Acre-ft.)	Drainage Area (Acre-ft.)	Project (Acre-ft.)
5	0.00		0
5.5	0.00		0.00
6	0.00	0.0	0.00
6.5	0.00	0.5	0.50
7	0.00	2.0	2.00
7.5	0.00	4.5	4.50
8	0.00	8.0	8.00

Drainage Area - E

C. Check peak runoff

1. Determine soil storage for the developed site

a. Compute impervious area for soil storage

Existing Wet Drainage Areas = 0.0 acres
Buildings (roofs) = 4.5 acres
Roads and Parking = 4.2 acres
TOTAL = 8.7 acres of impervious

b. Compute pervious acreage

Pervious Acreage = Total Site Area - Impervious Area
Pervious Acreage = 26.3 acres

c. Water Table Elev. = 5 ft. (avg wet season.)

d. Determine available soil moisture storage
i. From Fig. C-III-1 of the SFWMD Volume IV, storage = 8.18 inches will be available under impervious areas.

e. Compute composite soil moisture storage (S)
Soil Moisture Storage, S = (pervious acres/total site acres) x soil storage available under impervious areas
Soil Moisture Storage, S = 6.15 in. available over the total site area

2. Determine the maximum possible stage (zero discharge) during a design storm (25-year 72-hour event)

a. Total rainfall (P) is 9.3 in. x 135.9% (3-days) = 12.6 in.

b. Calculate total runoff, Q
Q = $(P - 0.2S)^2/(P + .8S)$
Q = 7.41 in. of total runoff (Q)

c. Calculate the total runoff volume, V
V = Q x Project Acreage
V = 21.63 acre-ft. of runoff

d. Zero discharge stage of the design storm = 7.6 ft. NGVD (from stage-storage curve)

D. Check minimum bldg. finished floor elev.

1. By definition, the min. building floor elev. shall be at least as high as the 100-yr. 72-hour storm zero discharge runoff.

2. Compute the 100-yr. 72-hour zero discharge runoff volume

a. Total rainfall (P) is 12.6 in. x 135.9% (3-days) = 17.1 in.

b. Calculate total runoff, Q

Q = $(P - 0.2S)^2/(P + .8S)$

Q = 11.46 in. of total runoff (Q)

c. Calculate the total runoff volume, V

V = Q x Project Acreage

V = 33.4 acre-ft. of runoff

d. Zero discharge stage of the design storm = 8.2 ft. NGVD (from stage-storage curve)

e. Since the proposed min. floor elev. is 9.5' NGVD,
the proposed minimum floor elev. is adequate

E. Check proposed minimum road elev.

1. By definition, the min. road elev. shall be at least as high as the 10-yr. 24-hour storm zero discharge runoff.

2. Compute the 10 -yr. 24-hour zero discharge runoff volume

a. Total rainfall (P) is 7.5 in. x 100% (1-day) = 7.5 in.

b. Calculate total runoff, Q

Q = $(P - 0.2S)^2/(P + .8S)$

Q = 3.17 in. of total runoff (Q)

c. Calculate the total runoff volume, V

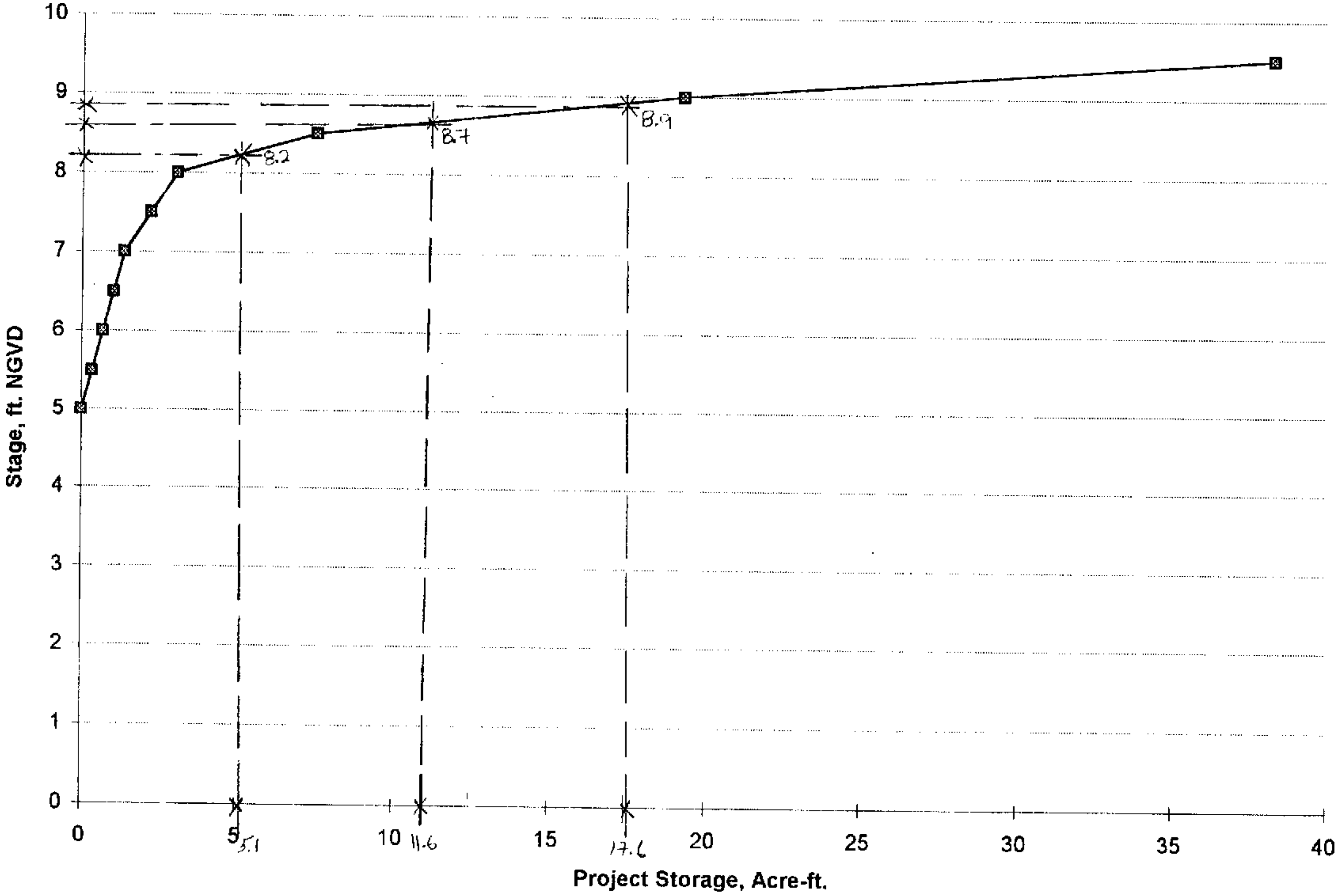
V = Q x Project Acreage

V = 2.4 acre-ft. of runoff

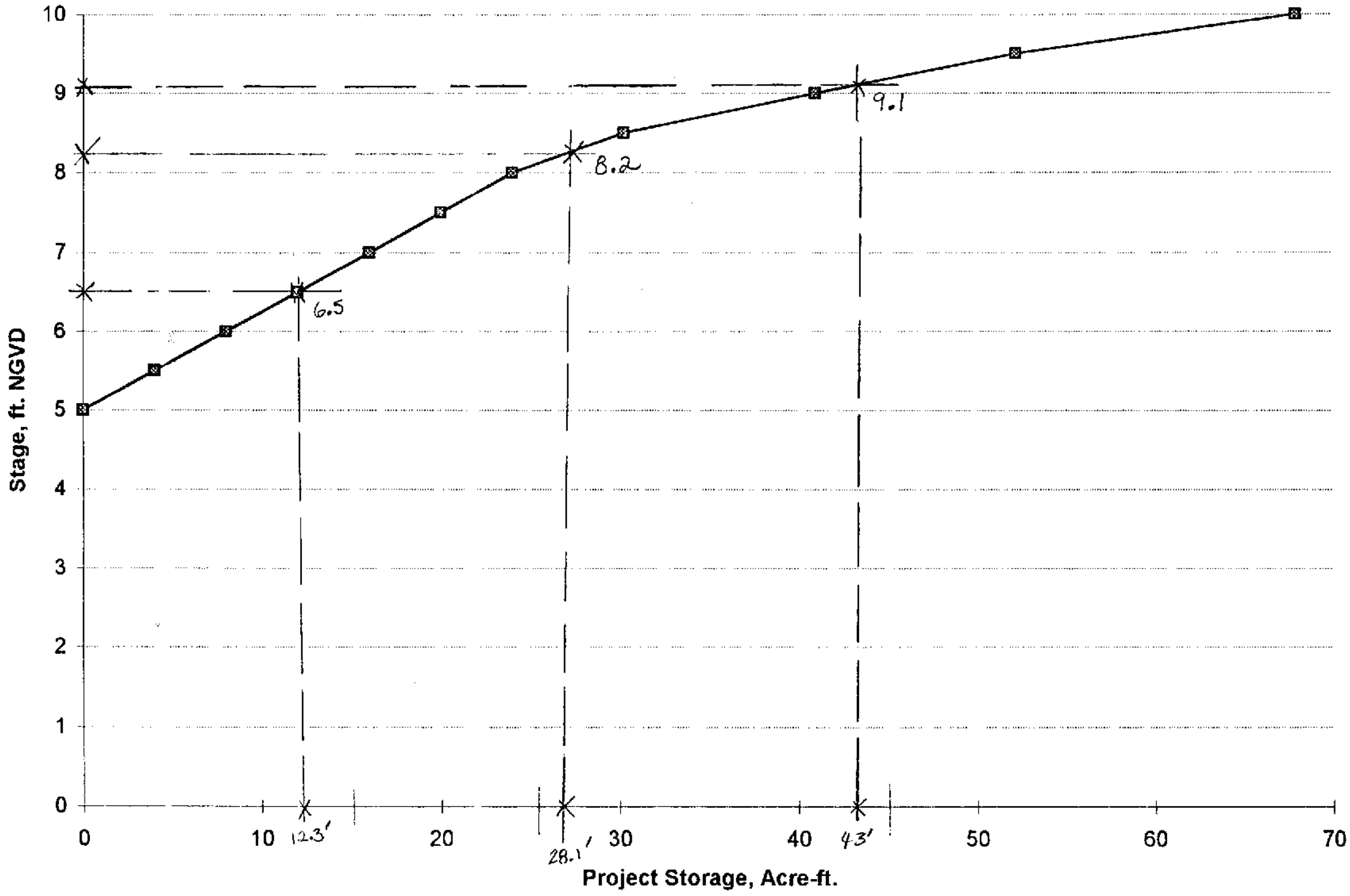
d. Zero discharge stage of the design storm = 7 ft. NGVD (from stage-storage curve)

e. Since the proposed min. road elev. is 7.7 NGVD,
the proposed minimum road elev. is adequate

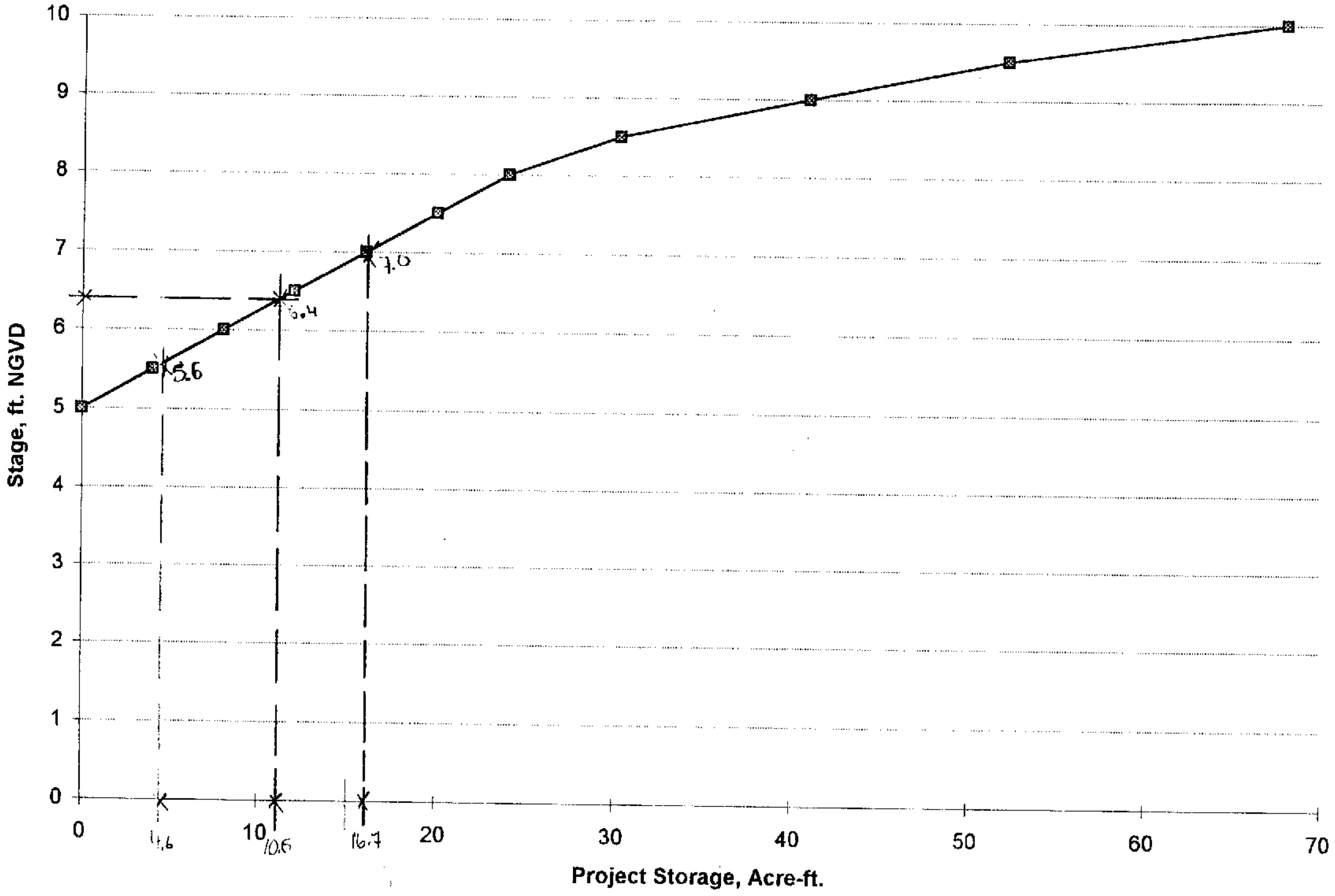
STAGE-STORAGE CURVE
Sub-Drainage Area - A



STAGE-STORAGE CURVE
Sub-Drainage Area - B



STAGE-STORAGE CURVE
Sub-Drainage Area - C



III. Water Storage

A. Ground Storage

1. One of the requirements for dry retention/detention flood protection areas is that each shall have a "mechanism" for returning groundwater levels to control elevation. In such situations, the term "mechanism" is normally interpreted to mean something designed, fabricated, and installed in or on the site. As a result, almost every such project will have something - a V-notch weir, exfiltration trench, key/mosquito ditch, sump, etc. - to provide the required drawdown.

   Such devices may not always be necessary to assure proper groundwater levels. If it can be shown that the soil itself allows the water table to subside in an acceptable length of time, then no "artificial" mechanism need be installed. The burden of proof is on the applicant, and District staff will not approve, or recommend for approval, a dry system which does not provide such mechanisms, be they natural or fabricated.

2. The moisture storage capability of the soil profile has been estimated by the Soil Conservation Service for the normal sandy soils found within the South Florida Water Management District boundaries. The total amount of water which can be stored in the soil profile expressed as a function of the depth to the water table for these soils is:

Depth To Water Table (Feet)	Cumulative Water Storage (Inches)	Compacted Water Storage (Inches)
1	0.60	0.45
2	2.50	1.88
3	6.60	4.95
4	10.90	8.18

The values in the third column represent the estimated amount of water which can be stored under pervious areas after development. These values represent the cumulative water storage values reduced by 25 percent to account for the reduction in void spaces due to the compaction which occurs incidental to earthwork operations. An example of the use of this information is:

Assume the following:

Average Finished Grade = 17.0 feet MSL
Average Ground Water Level = 14.0 feet MSL
Percent of Project in Lakes = 15%
Percent of Project Impervious = 35%

The next step is to compute the project-specific S-value to use for determining the runoff volume which will be discharged from the site. The depth to the water table will be 3 feet (17.0 - 14.0 = 3.0), consequently the total amount of water which can be stored under pervious surfaces will be 4.95 inches. If 15% of the project will be in lakes and 35% will covered by impervious surfaces, then the remainder, or 50% will be pervious areas and the appropriate weighted S-value will be:

$$4.95" \times (1-(.15+.35)) = 2.48" = S$$

Figure C-III-1 is a graphical representation of the cumulative water storage capabilities of the soil profile for the developed and undisturbed conditions versus the depth to the water table for the typical sandy soils found within the South Florida Water Management District boundaries.

The SCS has recently (April, 1993) furnished the District test data for Immokalee and Riviera soils which show less soil storage than the typical soils described above. The following table shows the average values as compared to the typical values (Coastal). Although the lesser storage values result in higher SCS runoff curve numbers, the depressional and flatwoods soils typically are in flat and depressed areas with standing water, thus the areas have low runoff potential.

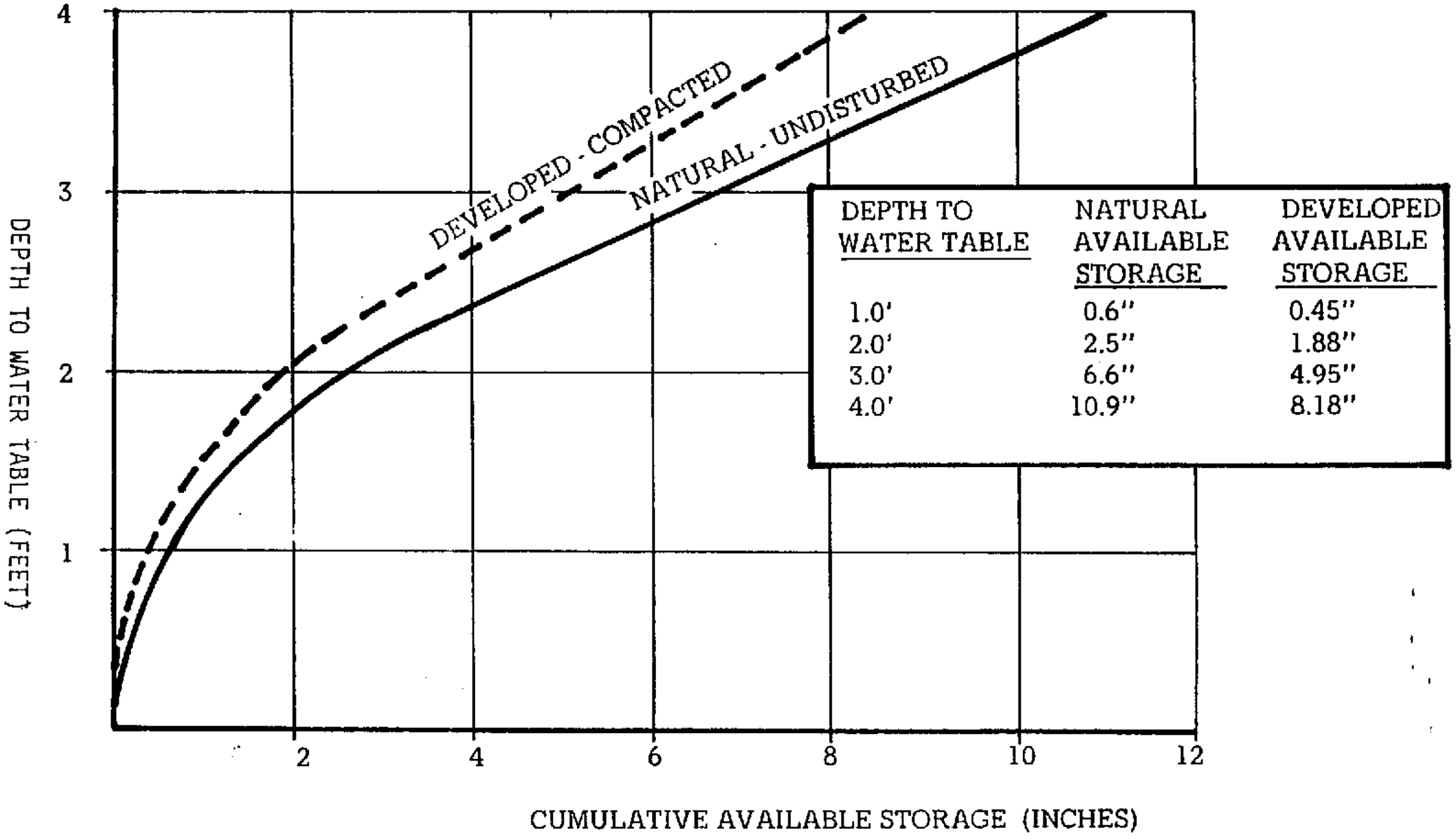
SOIL STORAGE

Depth	Coastal (1)		Flatwoods (2)		Depressional (3)	
to W.T.	Stor. (In.)	CN	Stor. (In.)	CN	Stor. (In.)	CN
1'	0.6	94	0.6	94	0.6	94
2'	2.5	80	2.5	80	2.1	83
3'	6.6	60	5.4	65	4.4	69
4'	10.9	48	9.0	53	6.8	60

(1) Sandy soils 0-40" thick with water tables dropping below 40" - St. Lucie series is representative

(2) Water tables 15"-40" - Immokalee series is representative

(3) Water tables above ground - 15" - Riviera and Pompano series are representative



DEPTH TO WATER TABLE	NATURAL AVAILABLE STORAGE	DEVELOPED AVAILABLE STORAGE
1.0'	0.6"	0.45"
2.0'	2.5"	1.88"
3.0'	6.6"	4.95"
4.0'	10.9"	8.18"

CUMULATIVE SOIL MOISTURE STORAGE

Figure C-III-1

B. Surface Storage

1. Storage in Lakes and Canals

For small projects the amount of water which can be stored within a developed project's lakes and canals can be assumed to extend vertically without variation of surface area. For a project with 5 acres of lakes and canals and an average top of bank elevation 3 feet above the maintained water level within the project, the estimated "bank-full" storage capability is (5 ac x 3 ft) = 15 ac-ft of water storage without overflowing the canal or lake banks. The actual storage volume will be somewhat different due to side slopes and the changing surface area versus elevation; however, it is not felt to be significant enough to substantially affect the calculated values for small projects. It should be noted that in certain projects that have a large number of lakes that compose the total lake acreage, thus creating a high ratio of shoreline to lake acreage, the side slopes may have to be considered when the volume of lake storage is computed.

2. Storage on the Land

The amount of water which can be stored above the land surface in the developed areas can be estimated as shown on Figure C-III-2. The project used for Figure C-III-2 has 360 acres of graded property below the house pad elevation of 17.5' NGVD and above the top of bank of lake elevation of 14.5' NGVD. The calculation is based upon the assumption that the total area with standing water varies linearly with the stage on-site. Based upon 360 acres of landscaped property with a 3 foot difference in grade, the rate of submergence versus rising stage is 360 ac/3 ft or 120 acres of land submerged per foot of rise.

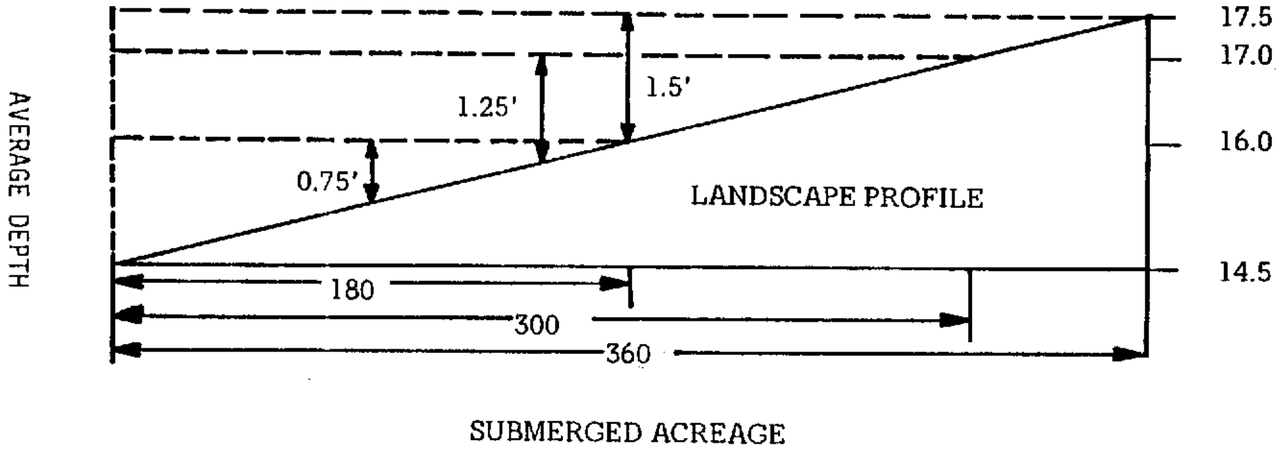
As an example, at elevation 16.0' NGVD, a total of 180 acres has some standing water on it and the depth of standing water varies from 1.5 foot for property at 14.5' NGVD to 0 for property at 16.0' NGVD. Hence, the total volume of water stored on the land is equal to the total acreage with water on it times the average depth of standing water:

180 ac x (1.5 ft + 0 ft)/2 = <u>135 ac-ft stored</u>

3. Stage-Storage Graph

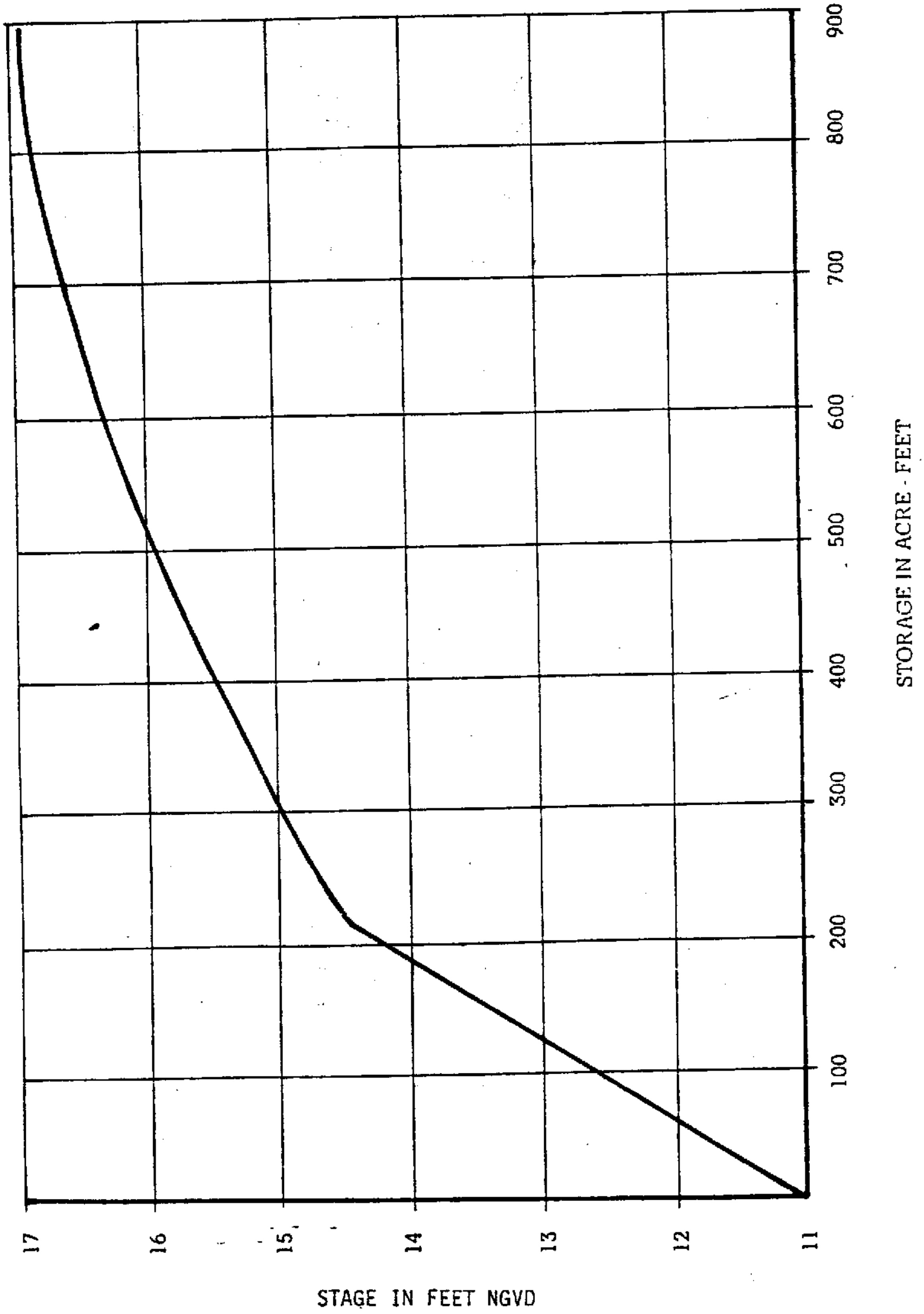
The above calculations can then be represented visually by the construction of a stage-storage curve as shown on Figure C-III-3.

STAGE	STORAGE
14.5	0
16.0	0.75' X 180 = 135 AF
17.0	1.25' X 300 = 375 AF
17.5	1.50' X 360 = 540 AF



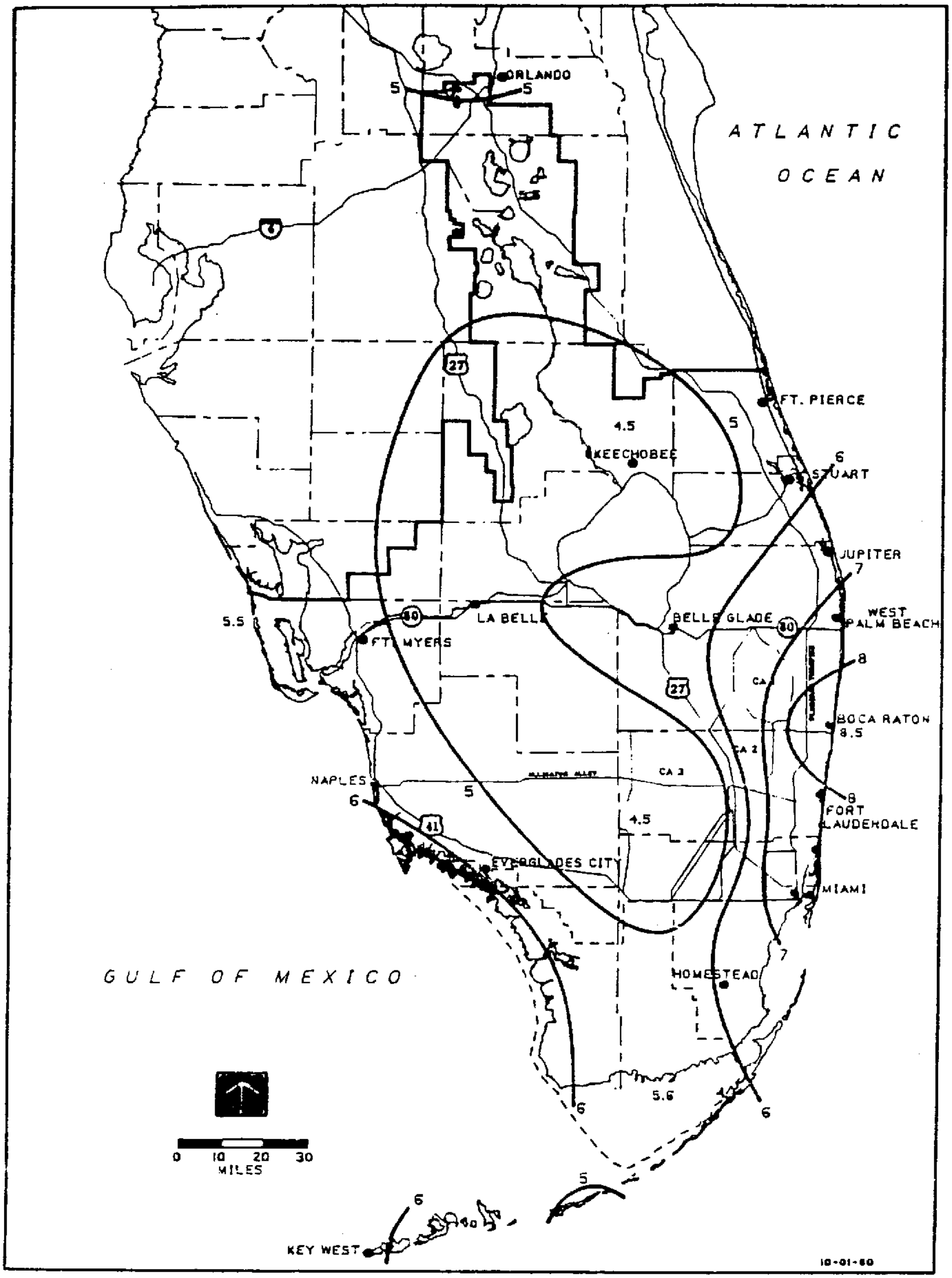
SURFACE STORAGE COMPUTATION SCHEME

Figure C-III-2



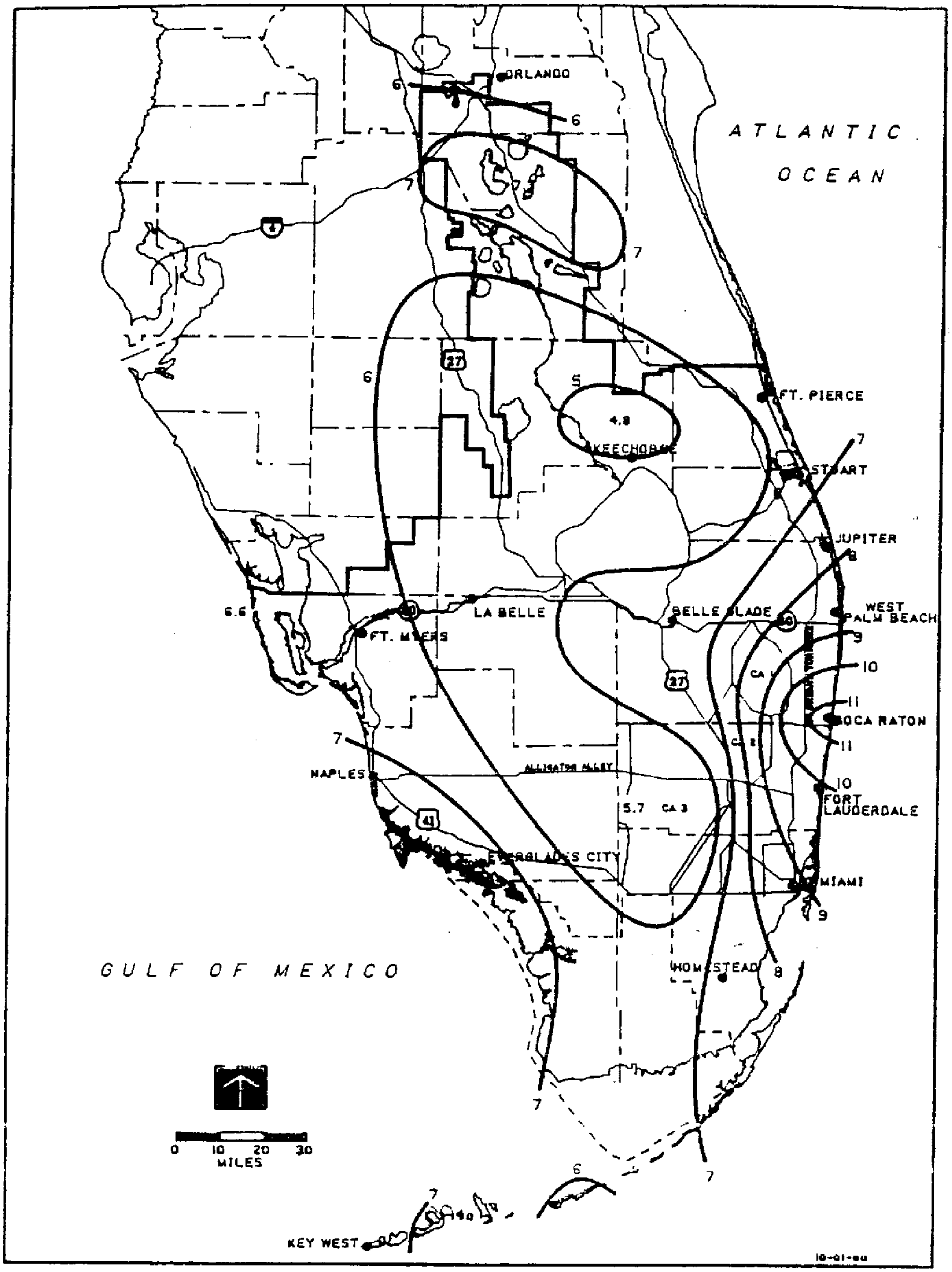
TYPICAL STAGE - STORAGE GRAPH

Figure C-III-3



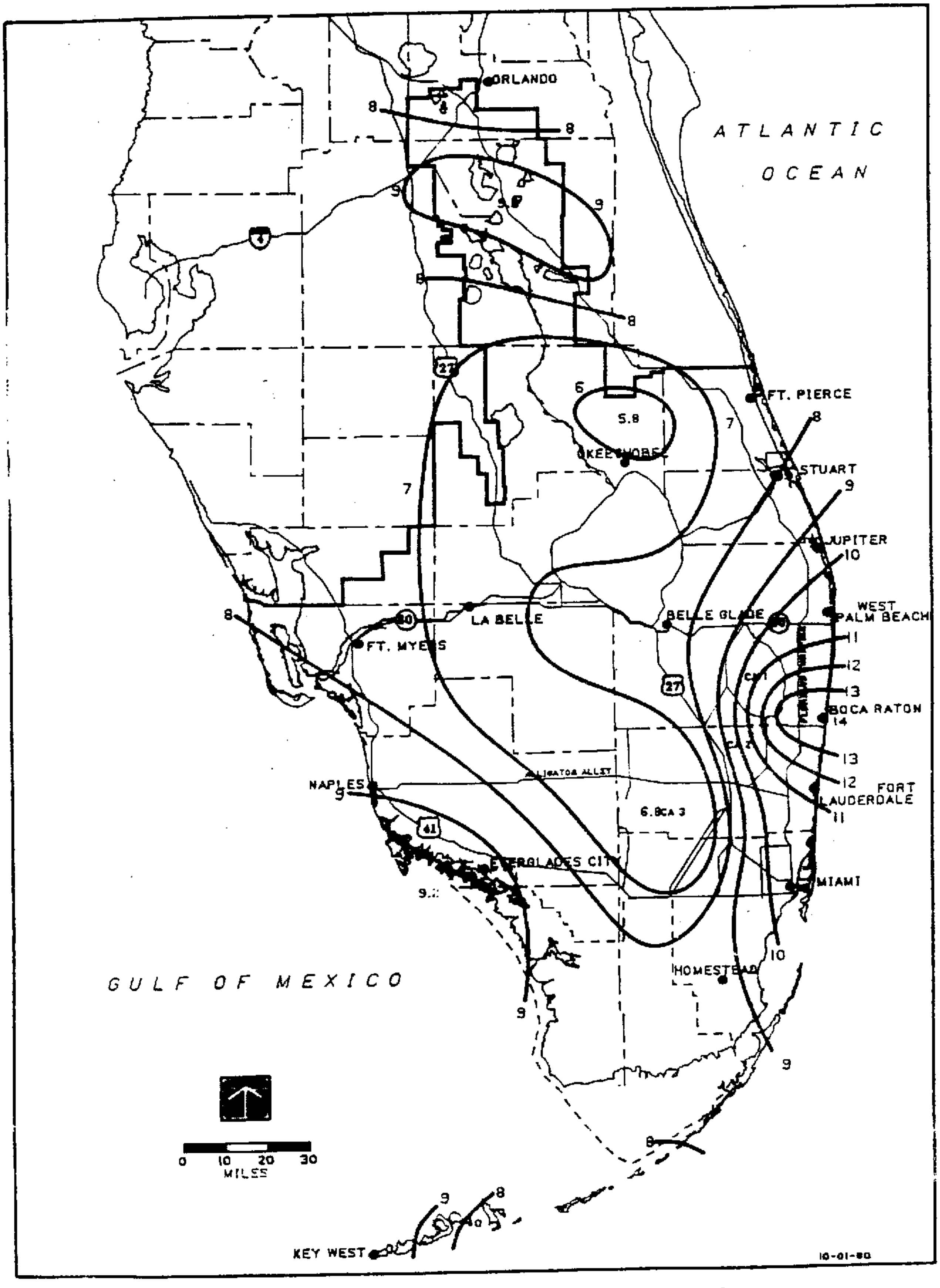
1-DAY RAINFALL: 5 YEAR RETURN PERIOD

Figure C-I-3



1-DAY RAINFALL: 10 YEAR RETURN PERIOD

Figure C-I-4



1-DAY RAINFALL: 25 YEAR RETURN PERIOD

Figure C-I-5

L

SEPTEMBER, 1996

REPORT OF

GEOTECHNICAL INVESTIGATION

RINKER PORTLAND CEMENT FACILITY
DADE COUNTY, FLORIDA

MR. JIM CASSILLO
METCALF AND EDDY
3740 EXECUTIVE WAY
MIRAMAR, FLORIDA 33025

PREPARED BY:

DAN E. WILDE, P.E.
ACTING DIRECTOR OF GEOTECHNICAL DIVISION
FLORIDA REGISTRATION NO. 39678

KEITH AND SCHNARS, P.A.
324 S.W. 13TH AVENUE
POMPANO BEACH, FLORIDA 33069

KEITH AND SCHNARS, P.A. PROJECT NO. 15388.01.13001

TABLE OF CONTENTS

DEPTH (FEET)	RELATIVE DENSITY/ CONSISTENCY	LITHOLOGY
0 - 2	Loose to Medium Loose	Brown Medium-Fine Silica Sand with Limerock
2 - 4	Loose to Medium Dense	Tan Medium-Fine Silica Sand with Organics or Brown to Dark Gray Marl
4 - 35	Soft	Tan to Gray Weathered Limestone with varying percentage of Medium-Fine Silica Sand

For more detailed information pertaining to the boring program see the Test Boring Reports included in the Appendix.

C. GROUNDWATER DEPTH

The depth of the groundwater was found to range from 3.3 to 4.4 feet below the existing ground surface at the time of drilling. The moderate variations in groundwater depths can be attributed to the site having been previously filled. Please note that groundwater levels may fluctuate several feet due to seasonal variations and construction activities.

III. LABORATORY INVESTIGATION

A. OVERVIEW

The laboratory investigation was utilized to help further define the site soil characteristics. Tests were performed on samples from the soil borings. The tests performed help define the strength, organic content, and compaction characteristics of the soils. Specifically, the scope of the laboratory investigation included three (3) soil classification tests and three (3) organic content tests.

B. SOIL CLASSIFICATIONS

Classification tests (ASTM D-2487) were performed on representative samples of the subsurface soils at the site. The classification tests allow the soils physical properties to be estimated by comparing the classification results with published data for similar soils. The samples at this site classify typically as SP (poorly graded sand), SM (silty sand), and GM (silty gravel). Results of the soil classification tests are presented in the Appendix.

C. ORGANIC CONTENT TESTS

Three (3) soil samples at locations B-2, B-3 and B-5 were tested at depth 2'-3', 0'-2', and 2'-4'; respectively, to determine the quantity of organic material present. The tests were performed by determining the organic content loss by ignition (ASTM D 2974, FM 1-T 267). The organic content of these samples were 14.0, 14.4 and 8.02 percent, respectively.

D. SUMMARY

Laboratory testing was performed on samples recovered from the site. The physical properties of the soils were found to be relatively consistent. Most of the materials encountered between 2.0 and 4.0 feet below exiting grade have a fairly high concentration of organic material.

IV. SOIL-STRUCTURE INTERACTION

A. WET WELL

Bearing capacity for a 8 feet diameter and 15 feet deep well was analyzed. The bearing capacity was analyzed at a depth of 15 feet, since the well will be seated at this depth.

The required bearing capacity at this depth (i.e. 15 feet below existing ground surface) can easily be achieved. It is expected that the well, filled with water, will not exert a pressure of more than 1500 psf.

B. CONCRETE SUPPORT FOR CANAL CROSSING

The concrete support for canal crossing of an 8 inch diameter force main and a 12 inch diameter water main will be in the form of concrete pile.

The depth of the canal at places where the pipes cross over the canal, varies between 10 feet and 15 feet. The piles derive their support from surrounding soil and hence the top 15 feet of soil data is discarded for purposes of analysis.

For this project, where the pile expected to stand about 10 to 15 feet in the air, the lateral forces will govern the embedment depth. The axial forces relative to the lateral forces will be negligible.

A 12 inch square concrete pile was analyzed for canal supports. The piles will require a minimum embedment depth of 10 feet. To withstand the lateral forces the pile needs to be driven to the full depth. The top two or three feet can be pre-drilled. However, grouting will be required if more than the top two or three feet is pre-drilled.

V. CONCLUSION

Existing soil conditions were evaluated for wet well and canal crossing. The soil conditions are feasible for the proposed construction.

APPENDIX

Keith and Schnars, P.A.

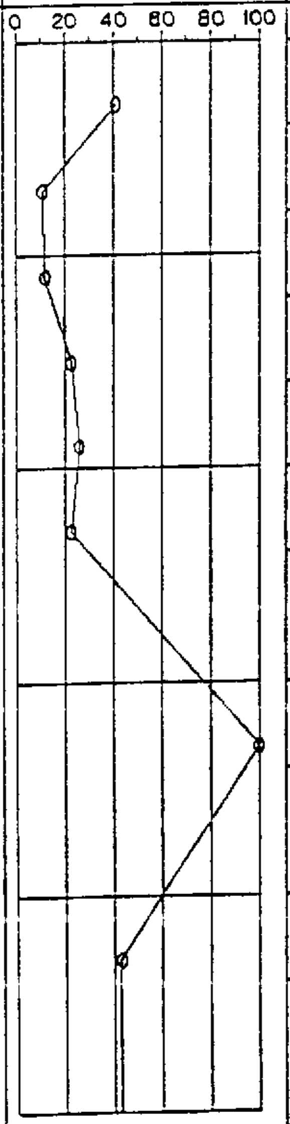
GEOTECHNICAL DIVISION
324 SW 13th Ave. Pompano Beach, FL 33089

TEST BORING REPORT
ASTM D-1586

BORING No.: B-1 DATE: AUGUST 28, 1996
PROJECT No.: 15388.01.13001
PROJECT NAME: RINKER PORTLAND CEMENT PLANT-MIAMI
PROJECT LOCATION: DADE COUNTY, FLORIDA
CLIENT: METCALF AND EDDY, INC.
BORING LOCATION: AS MARKED IN FIELD
GROUND SURFACE ELEVATION (ft): N/A
GROUNDWATER DEPTH (ft): 3.8 TIME MEASURED: 9:51 AM
TIME START DRILLING: 9:30 AM END: 11:40 AM

CREW: PATTERSON/SMITH
WEATHER: 90 DEG. F., SUNNY
TYPE OF DRILLING RIG: MOBILE B-57
BORING ADVANCE METHOD: HOLLOW STEM AUGER AND WASH
BOREHOLE STABILIZATION METHOD: HOLLOW STEM AUGER
SIZE OF AUGER/CASING O.D./I.D.: 8.00 IN/ 3.25 IN
BOTTOM OF CASING DEPTH (ft): 33
SAMPLER DRIVE METHOD: 140 lbs. Hammer - 30 " Drop
SAMPLER TYPE/SIZE: Split Spoon - 2" O.D.
DRILL ROD TYPE/SIZE: 5', 10' AWML

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	CLASSIFICATION
0		Brown Medium-Fine Silcia Sand with Limerock (Fill)	gp
		Muck ▽	org
5		Tan Weathered Limestone	gp
		Gray Weathered Limestone with Shell and Trace of Medium-Fine Silica Sand	gp sp
10			
15		Tan Weathered Limestone	gp
20			
25			



N-VALUE	BLOWS/6in.
41	23/21 20/18
11	7/5 6/3
12	2/2 10/12
23	9/11 12/14
26	9/12 14/12
23	9/11 12/12
*	13/22 /50=3"
43	18/17 26/31

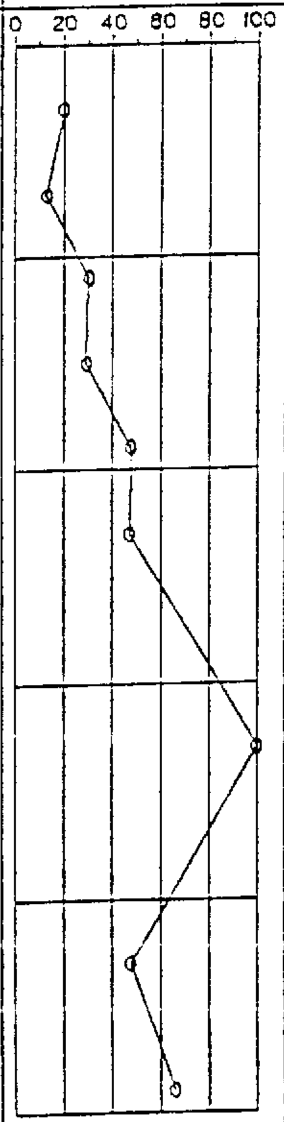
REMARKS:

Keith and Schnars, P.A.
GEOTECHNICAL DIVISION
324 SW 13th Ave. Pompano Beach, FL 33069

TEST BORING REPORT
ASTM D-1586

BORING No.: B-2 DATE: AUGUST 28, 1996
PROJECT No.: 15388.01.13001
PROJECT NAME: RINKER PORTLAND CEMENT PLANT-MIAMI
PROJECT LOCATION: DADE COUNTY, FLORIDA
CLIENT: METCALF AND EDDY, INC.
BORING LOCATION: AS MARKED IN FIELD
GROUND SURFACE ELEVATION (ft): N/A
GROUNDWATER DEPTH (ft): 3.8 TIME MEASURED: 1:02 PM
TIME START DRILLING: 12:33 PM END: 2:39 PM

CREW: PATTERSON/SMITH
WEATHER: 90 DEG. F., SUNNY
TYPE OF DRILLING RIG: MOBILE B-57
BORING ADVANCE METHOD: HOLLOW STEM AUGER AND WASH
BOREHOLE STABILIZATION METHOD: HOLLOW STEM AUGER
SIZE OF AUGER/CASING O.D./I.D.: 8.00 IN/ 3.25 IN
BOTTOM OF CASING DEPTH (ft): 33
SAMPLER DRIVE METHOD: 140 lbs. Hammer - 30 " Drop
SAMPLER TYPE/SIZE: Split Spoon - 2" O.D.
DRILL ROD TYPE/SIZE: 5', 10' AWML



DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	CLASSIFICATION	SAMPLE NO.	NX CORE %REC %RQD	N-VALUE	BLOWS/6in.
0		Limerock with Brown Medium-Fine Silica Sand (Fill)	gp			20	11/10 10/10
	▽	Brown to Dark Gray Marl (Organic Content = 14.0%)	ml			13	3/3 10/10
5		Tan Weathered Limestone with Medium-Fine Silica Sand and Trace of Marl	gp sp			30	12/15 15/15
						29	10/10 19/21
		Tan to Gray Weathered Limestone	gp			48	15/23 25/21
10						47	20/23 24/29
15						*	23/50=3" /
20		Tan to Gray Weathered Limestone with Medium-Fine Silica Sand	gp sp			48	28/23 25/27
						66	19/27 39/48
25		End of Boring					

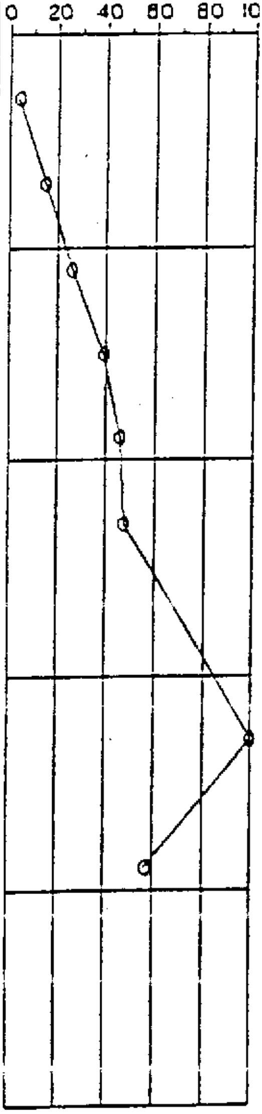
REMARKS:

Keith and Schnars, P.A.
GEOTECHNICAL DIVISION
324 SW 13th Ave. Pompano Beach, FL 33068

TEST BORING REPORT
ASTM D-1586

BORING No.: B-3 DATE: AUGUST 28, 1998
PROJECT No.: 15388.0L13001
PROJECT NAME: RINKER PORTLAND CEMENT PLANT-MIAMI
PROJECT LOCATION: DADE COUNTY, FLORIDA
CLIENT: METCALF AND EDDY, INC.
BORING LOCATION: AS MARKED IN FIELD
GROUND SURFACE ELEVATION (ft): N/A
GROUNDWATER DEPTH (ft): 3.3 TIME MEASURED: 4:26 PM
TIME START DRILLING: 3:52 PM END: 5:03 PM

CREW: PATTERSON/SMITH
WEATHER: 90 DEG. F., SUNNY
TYPE OF DRILLING RIG: MOBILE B-57
BORING ADVANCE METHOD: HOLLOW STEM AUGER AND WASH
BOREHOLE STABILIZATION METHOD: HOLLOW STEM AUGER
SIZE OF AUGER/CASING O.D./I.D.: 8.00 IN/ 3.25 IN
BOTTOM OF CASING DEPTH (ft): 18
SAMPLER DRIVE METHOD: 140 lbs. Hammer - 30 " Drop
SAMPLER TYPE/SIZE: Split Spoon - 2" O.D.
DRILL ROD TYPE/SIZE: 5', 10' AWML



DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	GRAPHIC SYMBOL	CLASSIFICATION	SAMPLE NO.	SAMPLE	NX CORE %REC	NX CORE %RQD	SPT-N	N-VALUE	BLOWS/6in.
0		Brown Marl with Medium-Fine Silcia Sand (Organic Content = 14.0%)		[illegible] SP						4	2/2 2/3
		Tan Weathered Limestone		GP						15	2/5 10/13
5										28	13/13 13/18
										39	15/18 21/20
										48	18/21 25/17
10										48	19/22 28/24
15										*	34/50=3" /
		Gray Medium-Fine Silica Sand with Weathered Limestone		SP GP						57	21/28 31/39
20											
25											

REMARKS:

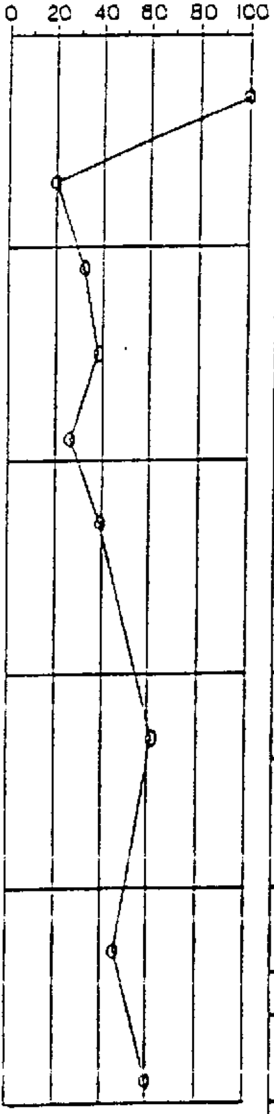
Keith and Schnars, P.A.
GEOTECHNICAL DIVISION
324 SW 13th Ave. Pompano Beach, FL 33088

TEST BORING REPORT
ASTM D-1586

BORING No.: B-4 DATE: AUGUST 28, 1996
PROJECT No.: 15388.01.13001
PROJECT NAME: RINKER PORTLAND CEMENT PLANT-MIAMI
PROJECT LOCATION: DADE COUNTY, FLORIDA
CLIENT: METCALF AND EDDY, INC.
BORING LOCATION: AS MARKED IN FIELD
GROUND SURFACE ELEVATION (ft): N/A
GROUNDWATER DEPTH (ft): 4.4 TIME MEASURED: 3:00 PM
TIME START DRILLING: 2:50 PM END: 3:50 PM

CREW: PATTERSON/SMITH
WEATHER: 90 DEG. F., SUNNY
TYPE OF DRILLING RIG: MOBILE B-57
BORING ADVANCE METHOD: HOLLOW STEM AUGER AND WASH
BOREHOLE STABILIZATION METHOD: HOLLOW STEM AUGER
SIZE OF AUGER/CASING O.D./I.D.: 8.00 IN/ 3.25 IN
BOTTOM OF CASING DEPTH (ft): 25
SAMPLER DRIVE METHOD: 140 lbs. Hammer - 30 " Drop
SAMPLER TYPE/SIZE: Split Spoon - 2" O.D.
DRILL ROD TYPE/SIZE: 5', 10' AWML

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	GRAPHIC SYMBOL	CLASSIFICATION	SAMPLE NO.	SAMPLE	NX CORE %REC	NX CORE %RQD
0		Tan Medium-Fine Silcia Sand with Limerock (Fill)		GP				
		Tan Weathered Limestone ∇		GP				
10		Gray Weathered Limestone		GP				
15		Tan Weathered Limestone		GP				
		Gray Weathered Limestone		GP				
25		End of Boring						



N-VALUE	BLOWS/6in.
*	27/50=2" /
20	38/13 7/15
32	10/14 18/21
38	11/17 21/18
28	12/13 13/15
38	13/19 20/22
62	21/23 39/37
48	11/21 25/28
60	19/29 31/22

REMARKS:

Page: 1 of 1

Keith and Schnars, P.A.
GEOTECHNICAL DIVISION
324 SW 13th Ave. Pompano Beach, FL 33069

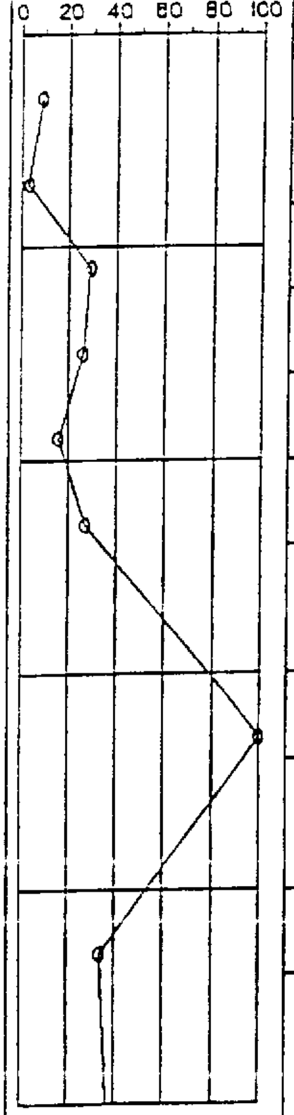
TEST BORING REPORT
ASTM D-1586

BORING No.: B-5 DATE: AUGUST 28, 1998
PROJECT No.: 15388.01.13001
PROJECT NAME: RINKER PORTLAND CEMENT PLANT-MIAMI
PROJECT LOCATION: DADE COUNTY, FLORIDA
CLIENT: METCALF AND EDDY, INC.
BORING LOCATION: AS MARKED IN FIELD
GROUND SURFACE ELEVATION (ft): N/A
GROUNDWATER DEPTH (ft): 4.0 TIME MEASURED: 5:41 PM
TIME START DRILLING: 5:24 PM END: 7:39 PM

CREW: PATTERSON/SMITH
WEATHER: 87 DEG. F., SUNNY
TYPE OF DRILLING RIG: MOBILE B-57
BORING ADVANCE METHOD: HOLLOW STEM AUGER AND WASH
BOREHOLE STABILIZATION METHOD: HOLLOW STEM AUGER
SIZE OF AUGER/CASING O.D./I.D.: 8.00 IN/ 3.25 IN
BOTTOM OF CASING DEPTH (ft): 33
SAMPLER DRIVE METHOD: 140 lbs. Hammer - 30 " Drop
SAMPLER TYPE/SIZE: Split Spoon - 2" O.D.
DRILL ROD TYPE/SIZE: 5', 10' AWML

DEPTH (ft)	ELEVATION (ft)
0	
5	
10	
15	
20	
25	

DESCRIPTION	CLASSIFICATION
Brown Medium-Fine Silcia Sand with Limerock (Fill)	gp
Muck (Organic Content = 8.02%)	org
Tan Weathered Limestone	gp
Gray Weathered Limestone with Shell	gp sp
Gray Weathered Limestone	gp
Tan Weathered Limestone with Medium-Fine Silica Sand	gp sp



N-VALUE	BLOWS/6in.
9	3/8 3/2
3	3/2 1/1
29	3/10 19/12
28	12/13 13/11
18	11/9 7/7
27	12/15 12/12
*	39/50=3" /
34	13/15 19/25

REMARKS:

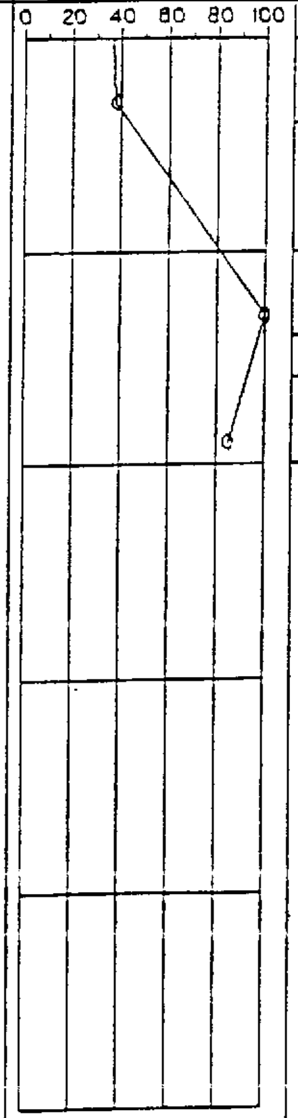
Keith and Schnars, P.A.
GEOTECHNICAL DIVISION
324 SW 13th Ave. Pompano Beach, FL 33069

TEST BORING REPORT
ASTM D-1586

BORING No.: B-5 DATE: AUGUST 28, 1998
PROJECT No.: 15388.0L13001
PROJECT NAME: RINKER PORTLAND CEMENT PLANT-MIAMI
PROJECT LOCATION: DADE COUNTY, FLORIDA
CLIENT: METCALF AND EDDY, INC.
BORING LOCATION: AS MARKED IN FIELD
GROUND SURFACE ELEVATION (ft): N/A
GROUNDWATER DEPTH (ft): 4.0 TIME MEASURED: 5:41 PM
TIME START DRILLING: 5:24 PM END: 7:39 PM

CREW: PATTERSON/SMITH
WEATHER: 87 DEG. F., SUNNY
TYPE OF DRILLING RIG: MOBILE B-57
BORING ADVANCE METHOD: HOLLOW STEM AUGER AND WASH
BOREHOLE STABILIZATION METHOD: HOLLOW STEM AUGER
SIZE OF AUGER/CASING O.D./I.D.: 8.00 IN/ 3.25 IN
BOTTOM OF CASING DEPTH (ft): 33
SAMPLER DRIVE METHOD: 140 lbs. Hammer - 30 " Drop
SAMPLER TYPE/SIZE: Split Spoon - 2" O.D.
DRILL ROD TYPE/SIZE: 5', 10' AWML

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	GRAPHIC SYMBOL	CLASSIFICATION	SAMPLE NO.	SAMPLE	NX CORE %REC %RQD	SPT-N	N-VALUE	BLOWS/6in.
25		Tan Weathered Limestone with Medium-Fine Silica Sand		GP SP					38	15/17 21/19
30									*	24/50=4" /
									85	48/48 37/27
35		End of Boring								
40										
45										
50										



REMARKS:

SOIL CLASSIFICATION TEST REPORT

Project Name: RINKER PORTLAND CEMENT PLANT - MIAMI
Project Number: 15388.01.13001
Client: METCALF AND EDDY, INC.
Date: 09-03-1996

Sample ID Number: 517
Sample Location: B-1
8' - 10'

U.S. Standard Sieve Sizes	Percent Passing
3 inch	100.0
1 inch	95.6
3/4 inch	86.1
1/2 inch	77.9
3/8 inch	72.7
No. 4	62.0
No. 10	50.5
No. 20	41.2
No. 40	35.3
No. 60	30.4
No. 100	23.9
No. 200	18.4

Atterberg Limits

Liquid Limit:	NP
Plastic Limit:	NA
Plasticity Index:	NP
Organics:	N

Soil Classification

AASHTO:	A-1-b
UNIFIED:	SM

Description of Soil

TAN TO GRAY WEATHERED LIMESTONE

SOIL CLASSIFICATION TEST REPORT

Project Name: RINKER PORTLAND CEMENT PLANT - MIAMI
Project Number: 15383.01.13001
Client: METCALF AND EDDY, INC.
Date: 09-03-1996

Sample ID Number: 518
Sample Location: B-3
18' - 20'

U.S. Standard Sieve Sizes	Percent Passing
3 inch	100.0
1 inch	90.1
3/4 inch	90.1
1/2 inch	87.5
3/8 inch	84.5
No. 4	72.1
No. 10	57.9
No. 20	44.7
No. 40	36.2
No. 60	30.3
No. 100	24.5
No. 200	13.9

Atterberg Limits

Liquid Limit:	NP
Plastic Limit:	NA
Plasticity Index:	NP
Organics:	N

Soil Classification

AASHTO:	A-1-b
UNIFIED:	SM

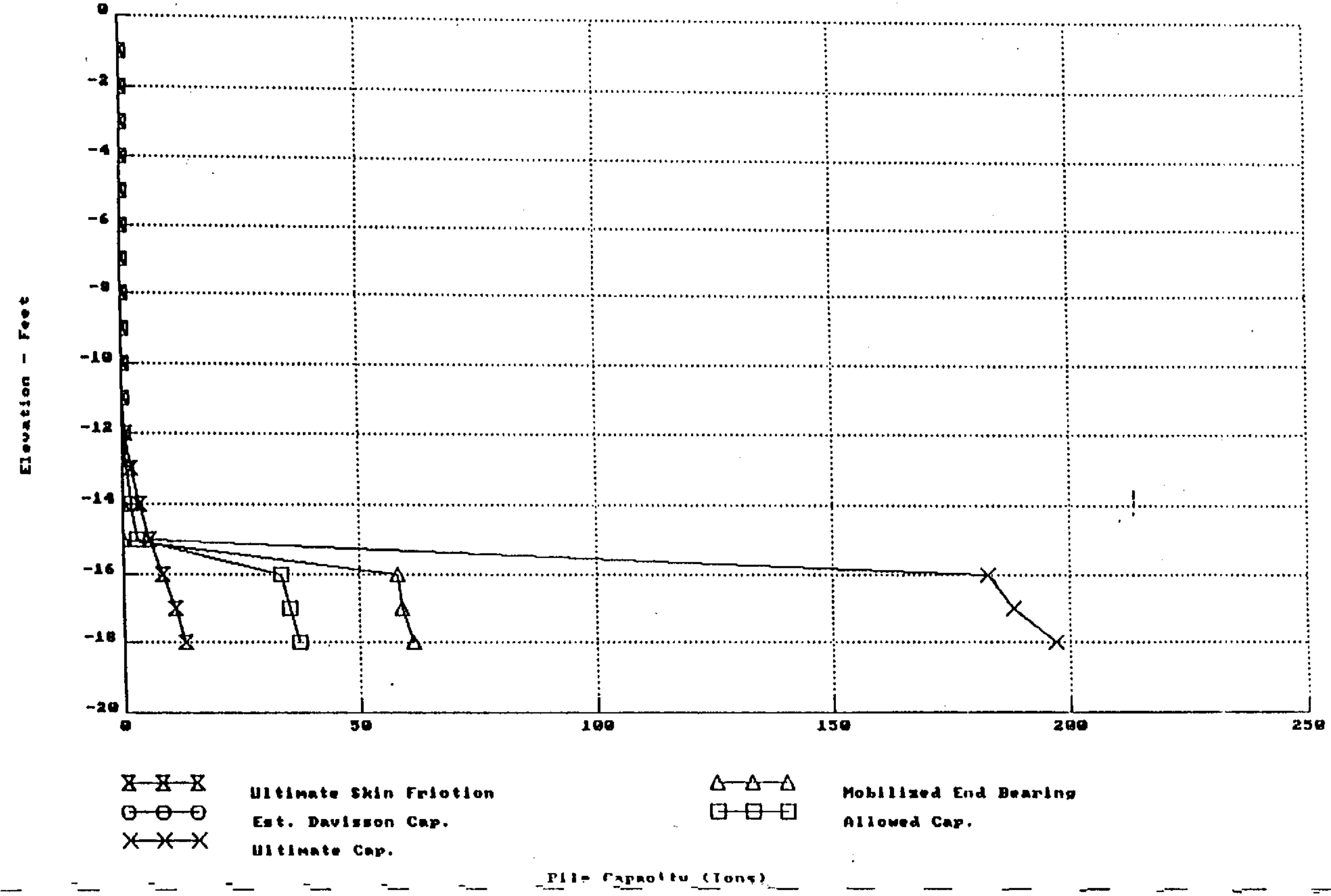
Description of Soil

TAN TO GRAY WEATHERED LIMESTONE
WITH MEDIUM-FINE SILICA SAND

RINKER PLANT MIAMI

Project No: 15388.01.13001
Boring No: B-2
Engineer: KUMAR

Station No: AS MARKED IN FIELD
Pile Size: 14 in.



RINKER PLANT MIAMI

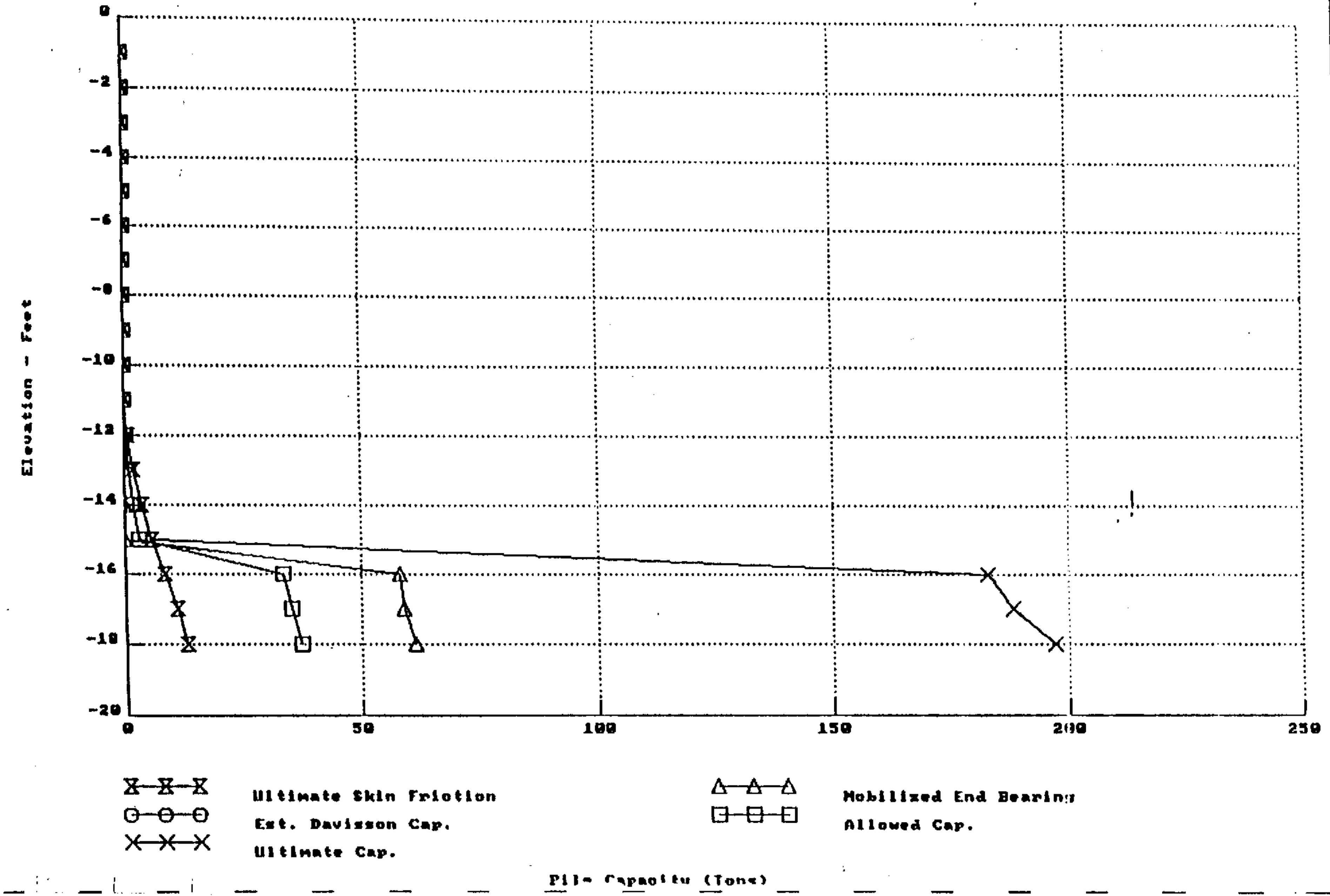
Project No: 15388.01.13001

Boring No: B-2

Engineer: KUMAR

Station No: AS MARKED IN FIELD

Pile Size: 14 in.



RESULTS OF PUMPING/RECOVERY TEST AND SLUG TESTS

On March 26, 1991, a 0.5 hour shut-down of Well PN (northern of two process wells) was effected. Water levels in Wells PN, PS, and Piezometers (also called wells) 15, 16 and 20 were measured during recovery and then drawdown as Well PN was restarted. Wells PN and PS pump 694 gpm each, on a continuous basis. A plan showing the well locations is included on page ADA in this appendix. An analysis of the data and conclusions on aquifer characteristics follow.

Time-recovery data from Wells PN, 15, 16 and 20 are shown on page ADB; plots are shown on page ADC. Based on recoveries measured in Wells 15 and 16 (shallow) and Well 20 (deep), it is clear that the shallow and deep zones are affected by pumping/recovery of Well PN (and PS). A cross section showing the depths of penetration of these wells is included on page ADD (Well PS is identical to Well PN). This diagram shows Wells 15, 16 and 20 as if they were in the same direction from Well PN. Well PN is shown to penetrate about six feet of saturated shallow zone and less than two feet of the deep zone. As determined during the construction of Well 20, about four feet of the saturated shallow zone (between depths of 10 and 14 feet) consists of the bryozoan layer and sandy, shelly limestone of the Miami formation; this lies immediately above the hard, dense limestone confining bed, and is known to be a permeable horizon.

Using the recovery data from the test, the total transmissivity of both zones was determined, then the transmissivity of each zone was estimated. The total transmissivity was determined using the Theis Equation (Walton, 1970, Groundwater Resource Evaluation, McGraw Hill), where:

(1) $s = 114.6\ QW(u)/T$ and
(2) $u = 1.87\ rrS/Tt$

The known (or estimated) parameters are:

s = drawdown/recovery (at t=25 minutes) = 0.92 feet
Q = total pumping rate yielding the recovery = 694 gpm
r = well radius, taken to be 10 feet
S = storage coefficient = 0.20
t = time of recovery = 0.0173 days = 25 minutes

The unknown parameters are T, W(u) and u. The two equations (1 and 2) were subtracted to eliminate T and the unique points in the well function where W(u) and u fit the equation were determined. The results were:

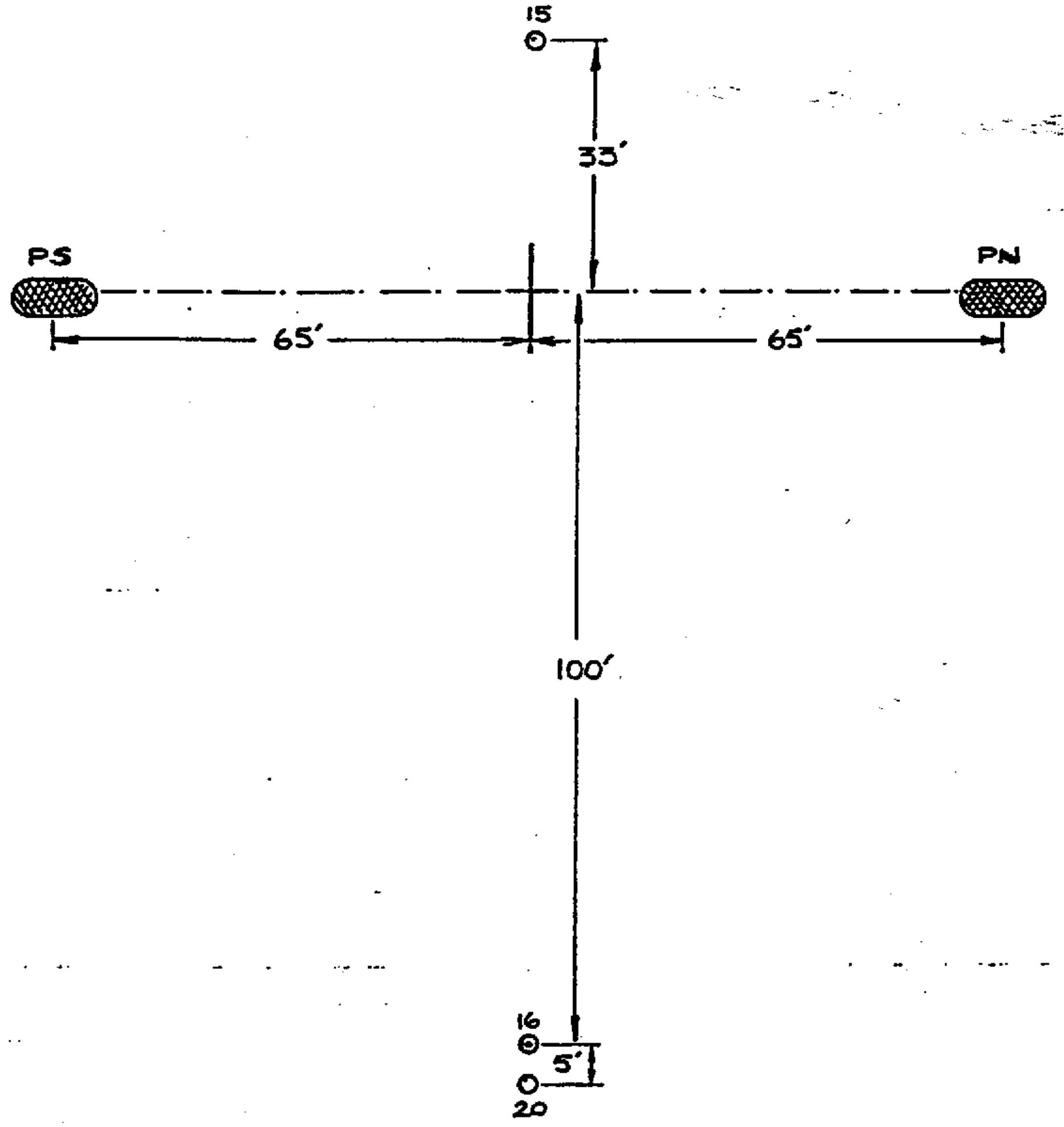
W(u) = 7.41
u = 3.4 X 10EE-4

T was then solved to be 646,000 gpd/ft. This figure matches well with that reported by Dames and Moore in the GWMP of January, 1991. The transmissivity of the shallow and deep zones were then estimated on the basis of the time-recovery drawdowns. At the end of 30 minutes of recovery, the total recoveries in Wells 16 and 20 (equidistant from Well PN) were 0.080 and 0.027 feet. As the transmissivity of each zone is inversely proportional to the drawdown, and transmissivities are additive, the ratio of the shallow zone transmissivity to the total transmissivity is 0.027/(0.027+0.080), or 0.252. Thus the transmissivity of the shallow zone is estimated to be 163,000 gpd/ft and that of the deep zone is 483,000 gpd/ft. These estimates are quite reasonable in light of the small penetration of the deep zone by Well PN and the known high permeability of the bryozoan layer of the shallow zone in more eastern parts of Dade County. The relative flatness of the shallow water levels also indicates the relatively high permeability of the bryozoan layer.

In addition to the test conducted on Well PN, six slug tests were conducted on shallow piezometers. The results of four of the tests are shown on pages ADE through ADL. The tests yielding the highest and lowest hydraulic conductivities were rejected as anomalous. The average of the hydraulic conductivities determined was 12.5 gpd/sq.ft. The average transmissivity determined was 87.5 gpd/ft. These values are very much lower than determined during the recovery test of Well PN because the piezometers tap only the sediments above the bryozoan facies where the hydraulic conductivity is much lower than the bryozoan layer. Thus, the shallow zone is subdivided into two hydraulic units, one of very low permeability above a depth of about 10 feet and another of high permeability approximately between 10 and 14 feet in depth in the area of Piezometer 20.

It is evident from the shallow groundwater levels and surface-water levels that the cooling water ponds have little effect on groundwater levels. Water seeped from these ponds is theorized to enter the bryozoan layer and then flow laterally to the process wells and/or the canal on the east of the property. Because of the high permeability of the bryozoan layer, water entering this layer would not show a significant mounding effect.

LOCATIONS OF WELLS USED IN RECOVERY TEST



LEGEND:

- O SHALLOW-ZONE PIEZOMETER
- ⊙ DEEP-ZONE PIEZOMETER
- ▨ PROCESS WELL

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

PAGE ADB—

GSI PUMPING TEST FORM — HYDROCARBON CA PROJECTS

PROJECT Rinker 2002 PUMPING WELL ________ DATE ____ PAGE 1 OF 2

3-26-91

WELL NUMBER PN

TIME	HELD	WET	DTW	S	Q AND COMMENTS
7:33	8.5	.55	7.95		STATIC
800	START TEST				PN TURNED OFF
8:01	8.5	1.15	7.35	0.6	
8:02	8.5	1.31	7.19	.76	
8:03	8.0	.88	7.12	.83	
8:05	8.0	.95	7.05	.90	
8:06	8.0	.97	7.03	.92	
8:07	8.0	.97	7.03	.92	RECOVERY
8:11	8.0	.97	7.03	.92	
8:16	8.0	.97	7.03	.92	
8:21	8.0	.97	7.03	.92	
8:29	8.0	.97	7.03	.92	
8:30	PUMP TURNED BACK ON "PN"				
8:31	8.5	1.42	7.08	.87	
8:32	8.5	1.32	7.08	.87	
8:33	8.5	1.25	7.25	.70	
8.33	8.5	1.19	7.31	.64	
8:34	8.5	1.15	7.35	.60	
8:35	8.5	1.12	7.38	.57	
8:36	8.6	1.10	7.40	.55	DRAWDOWN
8:37	8.5	1.08	7.42	.53	
8:41	8.5	1.01	7.49	.46	
8:46	8.5	.93	7.57	.38	
8:51	8.5	.82	7.68	.27	
8:56	8.5	.69	7.81	.14	
9:02	8.6	.68	7.82	.13	
					END TEST

WELL NUMBER PS

TIME	HELD	WET	DTW	S	Q AND COMMENTS
7:38	9.0	.72	8.28		STATIC
800	START TEST				
8:00	9.0	.52	8.48	.20	
8:14	9.0	.51	8.49	.21	RECOVERY
8:19	9.0	.51	8.49	.21	
8:25	9.0	.50	8.50	.22	
8:30	PUMP TURNED BACK ON				
8:38	9.5	1.39	8.11	.17	
8:43	9.5	1.37	8.13	.15	
8:46	9.5	1.33	8.17	.11	
8:54	9.5	1.23	8.27	.01	DRAWDOWN
8:59	9.5	1.21	8.29	.0	
					END TEST

WELL #		15	(0)		
7:35	10	.75	9.25		STATIC
8:00	START TEST				
8:03	10	.82	9.18	.07	
8:08	10	.83	9.17	.08	
8:13	10	.84	9.16	.09	RECOVERY
8:18	10	.85	9.15	.10	
8:23	10	.85	9.15	.10	
8:30	TURN PUMP BACK ON				
830	10	.86	9.14	.11	
835	10.5	1.36	9.14	.11	
8:40	10	.85	9.15	.10	
8:47	10	.84	9.16	.09	
8:52	10	.82	9.18	.07	DRAWDOWN
8:58	10	.80	9.20	.05	
9:04	10	.79	9.21	.04	
9:10	10	.77	9.23	.02	

PAGE ADB

GSI PUMPING TEST FORM — HYDROCARBON CA PROJECTS

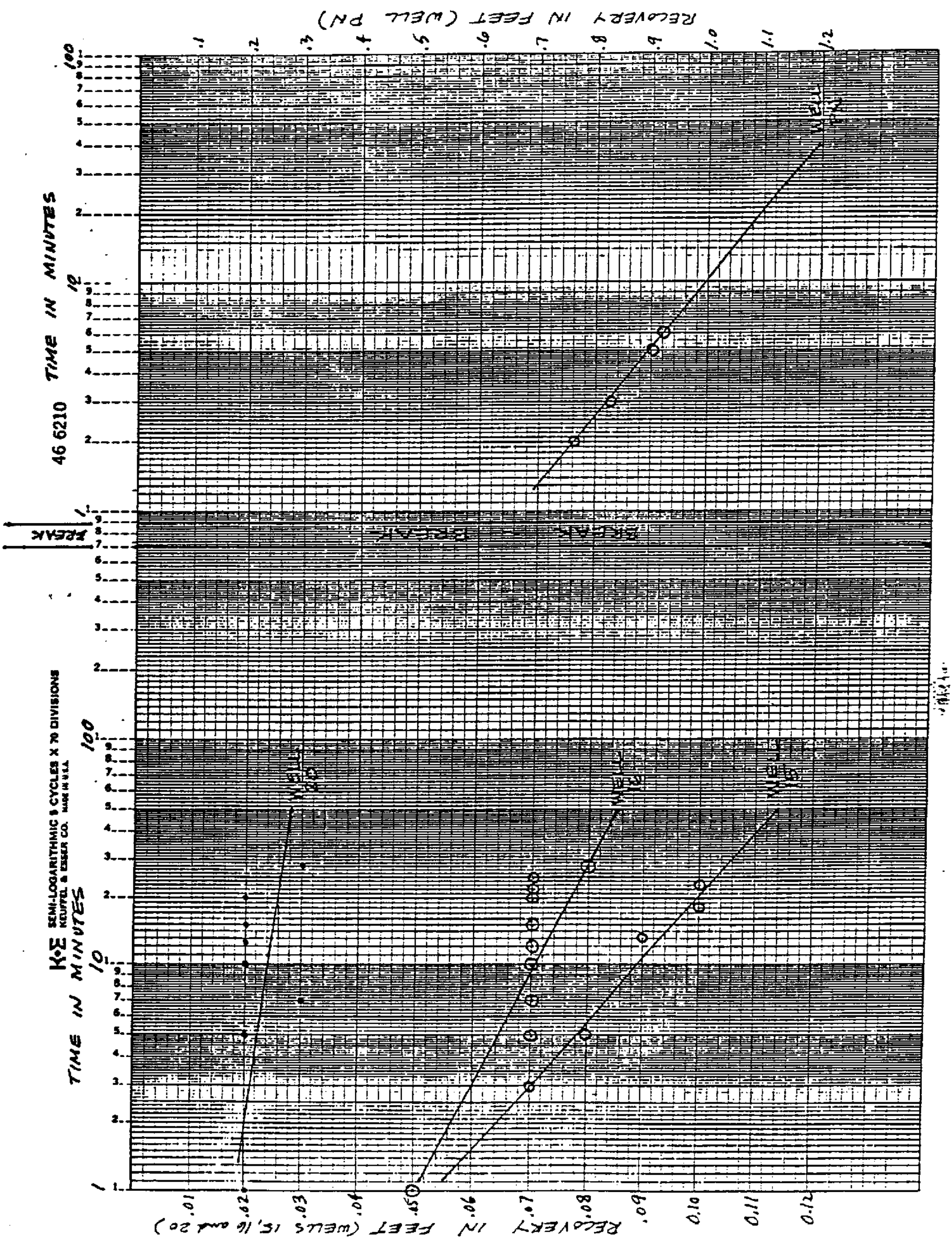
PROJECT RNK 2002 PUMPING WELL PS DATE ____ PAGE 2 OF 2

MEASURED W/"M" SCOPE 3.26.91

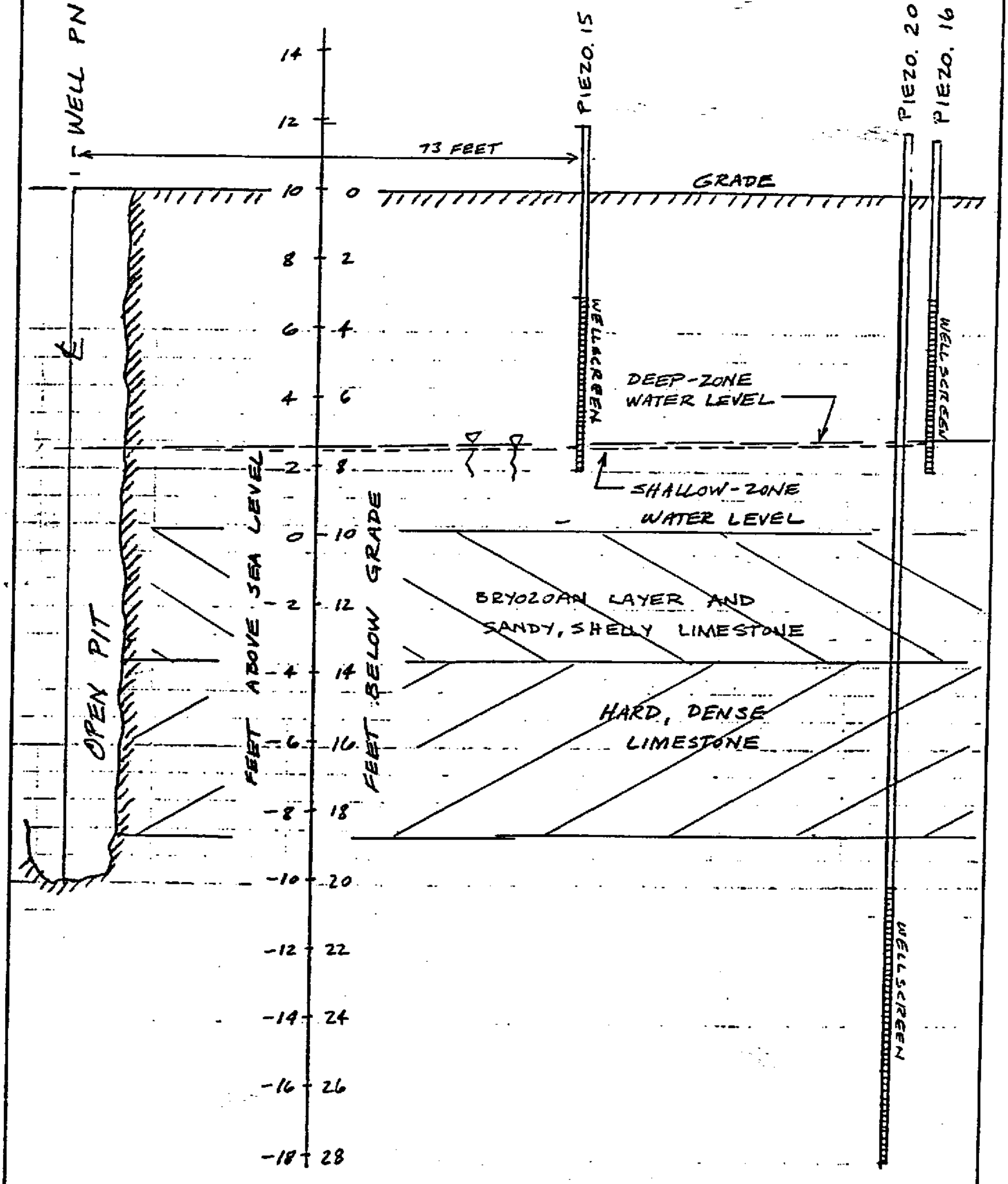
WELL NUMBER 20(T) (DEEP)						WELL NUMBER 16(P) (SHALLOW)					
TIME	HELD	WET	DTW	S	Q AND COMMENTS	TIME	HELD	WET	DTW	S	Q AND COMMENTS
0741			8.88		BACKGROUND W.L.^{s}	0741			8.72		BACKGROUND W.L.^{s}
745			8.88		" "	0745			8.71		" "
0800	START TEST → PN TURNED OFF					0800	START TEST				
801			8.86	0.02		801			8.67	0.05	
805			8.86	0.02		805			8.65	.07	
807			8.85	0.03	RECOVERY	807			8.65	.07	RECOVERY
810			8.86	0.02		810			8.65	.07	
8:12:50			8.86	0.02		8:12:30			8.65	.07	
815			8.86	0.02		815			8.65	.07	
820			8.86	0.02		820			8.65	.07	
822:30			8.86	0.02		8:22:30			8.65	.07	
825			8.86	0.02		825			8.65	.07	
828			8.85	0.03		828			8.64	.08	
830	PUMP "PN" TURNED BACK ON					830		PN TURNED ON			
831			8.87	0.01		831			8.68	.04	
835			8.87	0.01		835			8.88	.04	
840			8.87	0.01	DRAWDOWN	840			8.69	.03	DRAWDOWN
845			8.87	0.01		845			8.69	.03	
850			8.88	0		850			8.71	.01	
855			8.88	0		855			8.72	0	
900 AM			8.88	0		900			8.72	0	
	TEST COMPLETED						TEST COMPLETED				

NOTE: LINEAR DISTANCES MEASURED BETWEEN THE NORTH PROCESS WELL (PN) AND THE PIEZOMETERS USED IN THE PUMP TEST:

PN to #15 ≅ 73'
PN to #16 ≅ 123'
PN to #20 ≅ 119'


RECOVERY IN FEET (WELL PN)
.1
.2
.3
.4
.5
.6
.7
.8
.9
1.0
1.1
1.2
100
10
1
TIME IN MINUTES
46 6210
BREAK
BREAK
WELL PN
WELL 20
WELL 16
WELL 15
K+E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
TIME IN MINUTES
100
10
1
.01
.02
.03
.04
.45
.06
.07
.08
.09
0.10
0.11
0.12
RECOVERY IN FEET (WELLS 15, 16 and 20)

CROSS SECTION SHOWING PUMPING WELL PN AND NEARBY PIEZOMETERS



NOTE: THIS CROSS SECTION SHOWS THE RELATIONSHIP AMOUNG WATER LEVELS IN THE SHALLOW AND DEEP ZONES, THE HARD, DENSE LIMESTONE, AND WELL PN - THE OPEN PIT. WATER LEVES REFLECT PUMPING.

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

pg. ADE

SLUG TEST ANALYSIS (by Bouwer, 1978, Groundwater Hydrology, McGraw-Hill)

WELL "R" (#18) RNK2002 DATE: MARCH 27, 1991

DEFINITIONS:

D = 2 = well diameter (inches)
BH = 8 = borehole diameter (inches)
RI = 0.08 = radius of well (feet)
Rc = 0.20833 = radius of well section where water level is rising (feet)
Re = = effective radial distance over which head difference (y) is dissipated (feet)
Rw = 0.33 = borehole radius (feet)
Le = 7.20 = length of saturated screen (feet) 1.52
yo = 12.00 = y intercept at time 0 (feet)
yt = 0.62 = y intercept at time t (feet)
t = 605.00 = time in seconds after start of test (seconds)
H = 7.00 = saturated thickness of aquifer (feet)
Lw = 6.20 = length from water table to bottom of wellscreen (feet) 1.57
A = 2.00 = dimensionless coefficient
B = 0.60 = dimensionless coefficient
C = 1.40 = dimensionless coefficient

EQUATIONS:

$$\ln(Re/Rw) = \frac{1}{\dfrac{1.1}{\ln(Lw/Rw)} + \dfrac{A + B \times \ln[(H-Lw)/Rw]}{(Le/Rw)}}$$

$$K = \frac{Rc \times Rc \times \ln(Re/Rw) \times (1/t) \times \ln(yo/yt)}{2 \times Le}$$

SOLUTIONS:

Le/Rw = 21.6
Lw/Rw = 18.6
H-Lw = 0.80
Rc*Rc = 0.043
2*Le = 14.4
1/t = 0.002
ln (yo/yt) = 3.0
ln (Re/Rw) = 2.0
ln [(H-Lw)/Rw] = 0.8 (if >6, then 6 is used in equation)

K = 0.00003 = hydraulic conductivity (ft/second)
K = 19 = hydraulic conductivity (gpd/sq ft)
T = 135 = transmissivity (gpd/ft)

SLUG TEST ANALYSIS (by Bouwer, 1978, Groundwater Hydrology, McGraw-Hill)

WELL "R" RNK2002 DATE: MARCH 27, 1991

DEFINITIONS:

D = 2 = well diameter (inches)
BH = 8 = borehole diameter (inches)
Rl = 0.08 = radius of well (feet)
Rc = 0.20833 = radius of well section where water level is rising (feet)
Re = = effective radial distance over which head difference (y) is dissipated (feet)
Rw = 0.33 = borehole radius (feet)
Le = 1.56 = length of saturated screen (feet)
yo = 12.00 = y intercept at time 0 (feet)
yt = 0.62 = y intercept at time t (feet)
t = 605.00 = time in seconds after start of test (seconds)
H = 7.00 = saturated thickness of aquifer (feet)
Lw = 1.56 = length from water table to bottom of wellscreen (feet)
A = 2.00 = dimensionless coefficient
B = 0.60 = dimensionless coefficient
C = 1.40 = dimensionless coefficient

EQUATIONS:

$$\ln(Re/Rw) = \frac{1}{\dfrac{1.1}{\ln(Lw/Rw)} + \dfrac{A + B \times \ln[(H-Lw)/Rw]}{(Le/Rw)}}$$

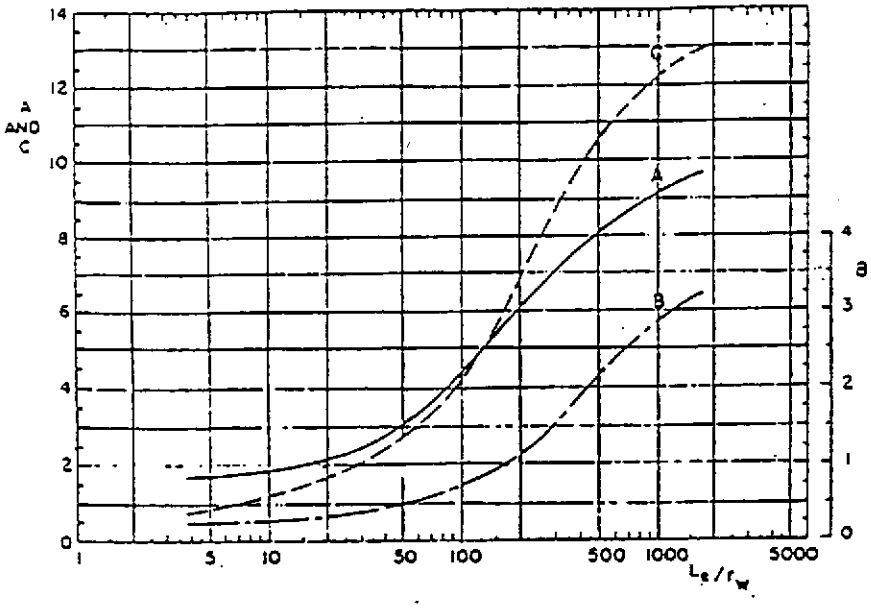
$$K = \frac{Rc \times Rc \times \ln(Re/Rw) \times (1/t) \times \ln(yo/yt)}{2 \times Le}$$

SOLUTIONS:

Le/Rw = 4.7
Lw/Rw = 4.7
H-Lw = 5.44
Rc*Rc = 0.043
2*Le = 3.12
1/t = 0.002
ln (yo/yt) = 3.0
ln (Re/Rw) = 0.7
ln [(H-Lw)/Rw]= 2.7 (if >6, then 6 is used in equation)

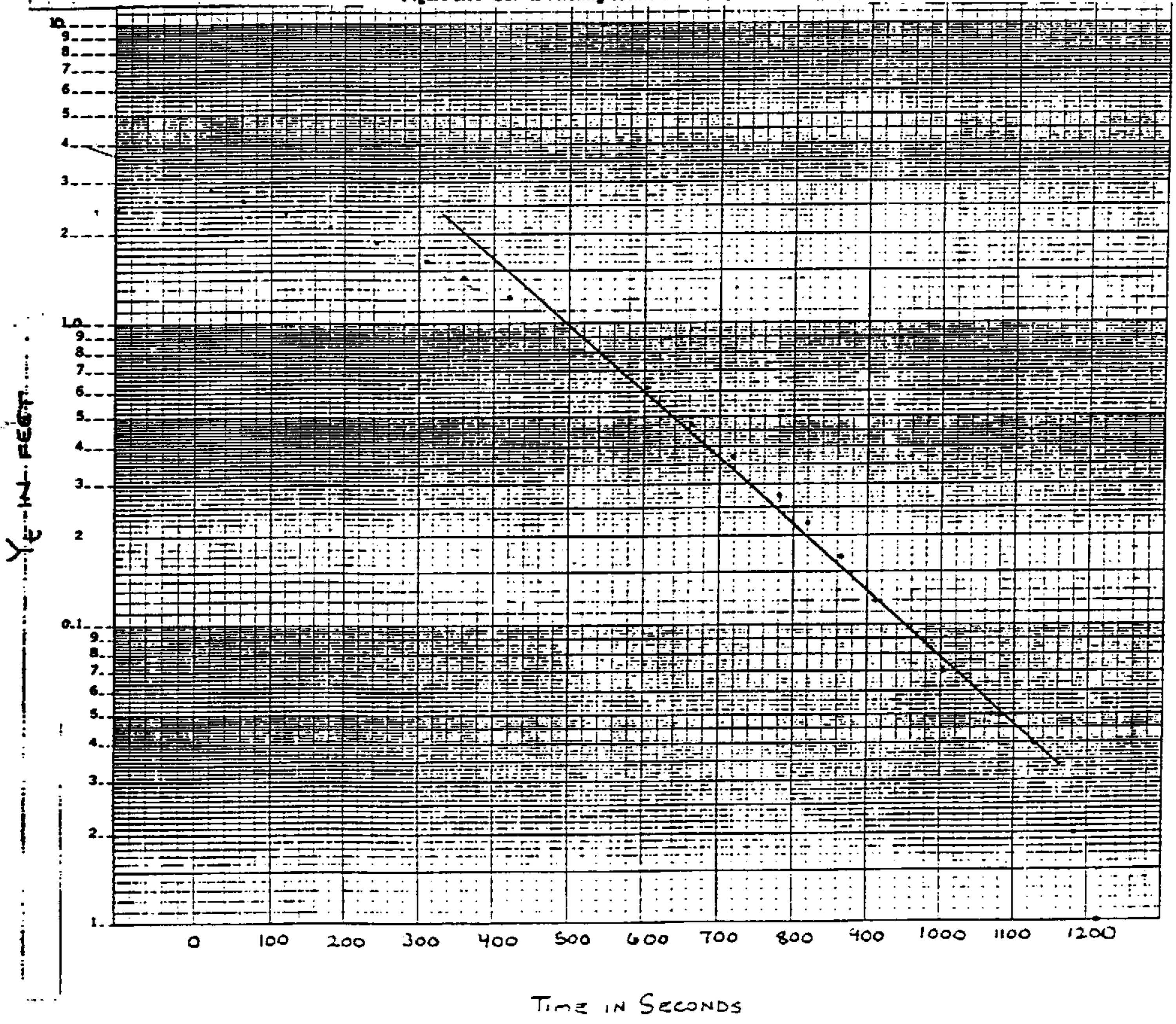
K = 0.00005 = hydraulic conductivity (ft/second)
K = 29 = hydraulic conductivity (gpd/sq ft)
T = 206 = transmissivity (gpd/ft)

Pg. ADF



WELL 18

Figure 5.11 Curves relating coefficients A, B, and C to L_e/r_w.



GROUNDWATER SPECIALISTS, INC

pg. ADG

SLUG TEST ANALYSIS (by Bouwer, 1978, Groundwater Hydrology, McGraw-Hill)

WELL "F" (#6)   RNK2002   DATE: MARCH 27, 1991

DEFINITIONS:

D = 2 = well diameter (inches)
BH = 8 = borehole diameter (inches)
Rl = 0.08 = radius of well (feet)
Rc = 0.20833 = radius of well section where water level is rising (feet)
Re = = effective radial distance over which head difference (y) is dissipated (feet)
Rw = 0.33 = borehole radius (feet)
Le = 2.80 = length of saturated screen (feet)
yo = 1.05 = y intercept at time 0 (feet)
yt = 0.60 = y intercept at time t (feet)
t = 180.00 = time in seconds after start of test (seconds)
H = 7.00 = saturated thickness of aquifer (feet)
Lw = 2.80 = length from water table to bottom of wellscreen (feet)
A = 1.80 = dimensionless coefficient
B = 0.50 = dimensionless coefficient
C = 0.80 = dimensionless coefficient

EQUATIONS:

$$\ln(Ré/Rw) = \frac{1}{\frac{1.1}{\ln(Lw/Rw)} + \frac{A + B \times \ln[(H-Lw)/Rw]}{(Le/Rw)}}$$

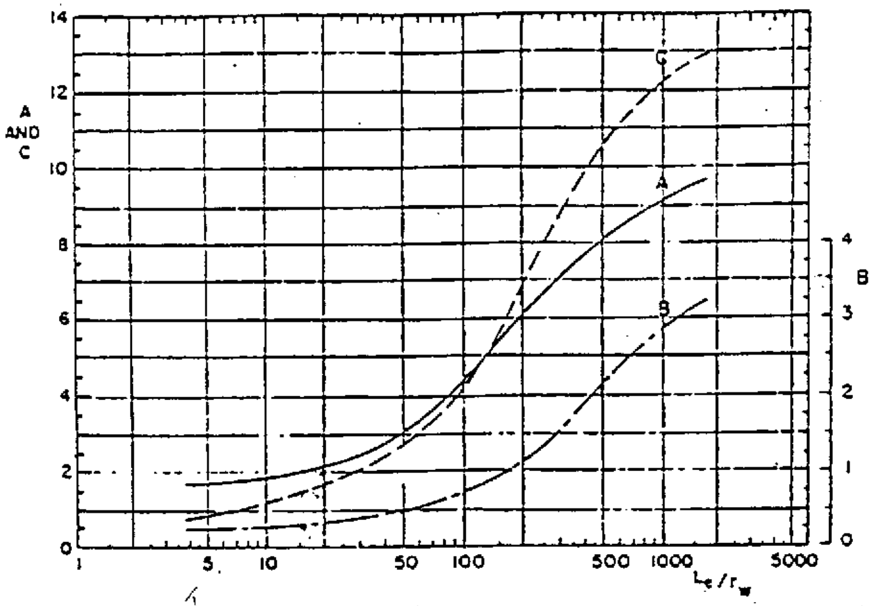
$$K = \frac{Rc \times Rc \times \ln(Re/Rw) \times (1/t) \times \ln(yo/yt)}{2 \times Le}$$

SOLUTIONS:

Le/Rw = 8.4
Lw/Rw = 8.4
H-Lw = 4.20
Rc*Rc = 0.043
2*Le = 5.6
1/t = 0.006
ln (yo/yt) = 0.6
ln (Re/Rw) = 1.1
ln [(H-Lw)/Rw] = 2.5 (if >6, then 6 is used in equation)

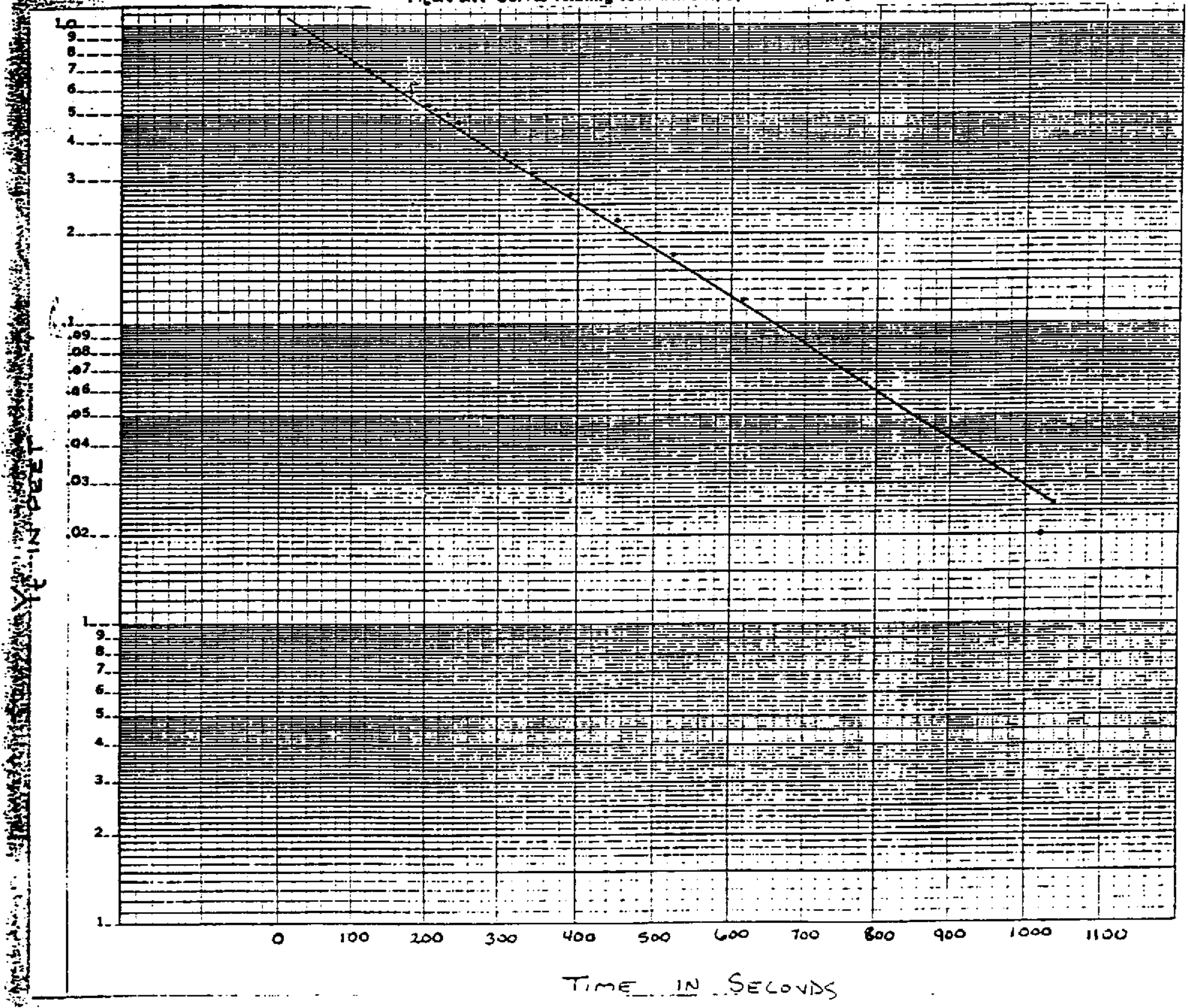
K = 0.00003 = hydraulic conductivity (ft/second)
K = 18 = hydraulic conductivity (gpd/sq ft)
T = 124 = transmissivity (gpd/ft)

Pg. ADH



WELL "6"

Figure 5.11 Curves relating coefficients A, B, and C to L_e/r_w.



GROUNDWATER SPECIALISTS, INC

SLUG TEST ANALYSIS (by Bouwer, 1978, Groundwater Hydrology, McGraw-Hill)

WELL "Q" (#17) RNK2002 DATE: MARCH 27, 1991

DEFINITIONS:

D = 2 = well diameter (inches)
BH = 8 = borehole diameter (inches)
Rl = 0.08 = radius of well (feet)
Rc = 0.20833 = radius of well section where water level is rising (feet)
Re = = effective radial distance over which head difference (y) is dissipated (feet)
Rw = 0.33 = borehole radius (feet)
Le = 2.80 = length of saturated screen (feet)
yo = 2.21 = y intercept at time 0 (feet)
yt = 2.00 = y intercept at time t (feet)
t = 100.00 = time in seconds after start of test (seconds)
H = 9.20 = saturated thickness of aquifer (feet)
Lw = 2.80 = length from water table to bottom of wellscreen (feet)
A = 1.80 = dimensionless coefficient
B = 0.50 = dimensionless coefficient
C = 1.00 = dimensionless coefficient

EQUATIONS:

$$\ln(Re/Rw) = \frac{1}{\dfrac{1.1}{\ln(Lw/Rw)} + \dfrac{A + B \times \ln[(H-Lw)/Rw]}{(Le/Rw)}}$$

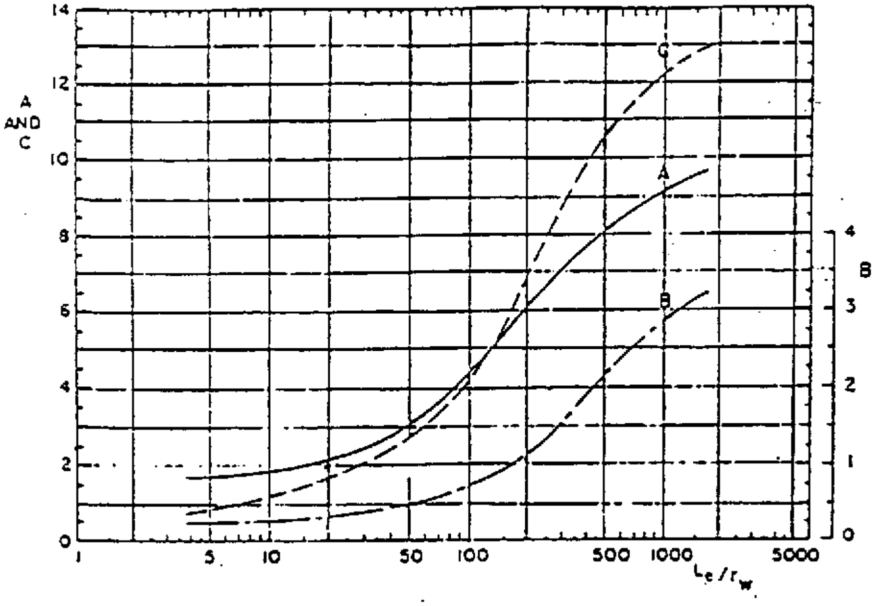
$$K = \frac{Rc \times Rc \times \ln(Re/Rw) \times (1/t) \times \ln(yo/yt)}{2 \times Le}$$

SOLUTIONS:

Le/Rw = 8.4
Lw/Rw = 8.4
H-Lw = 6.40
Rc*Rc = 0.043
2*Le = 5.6
1/t = 0.010
ln (yo/yt) = 0.1
ln (Re/Rw) = 1.1
ln [(H-Lw)/Rw] = 2.9 (if >6, then 6 is used in equation)

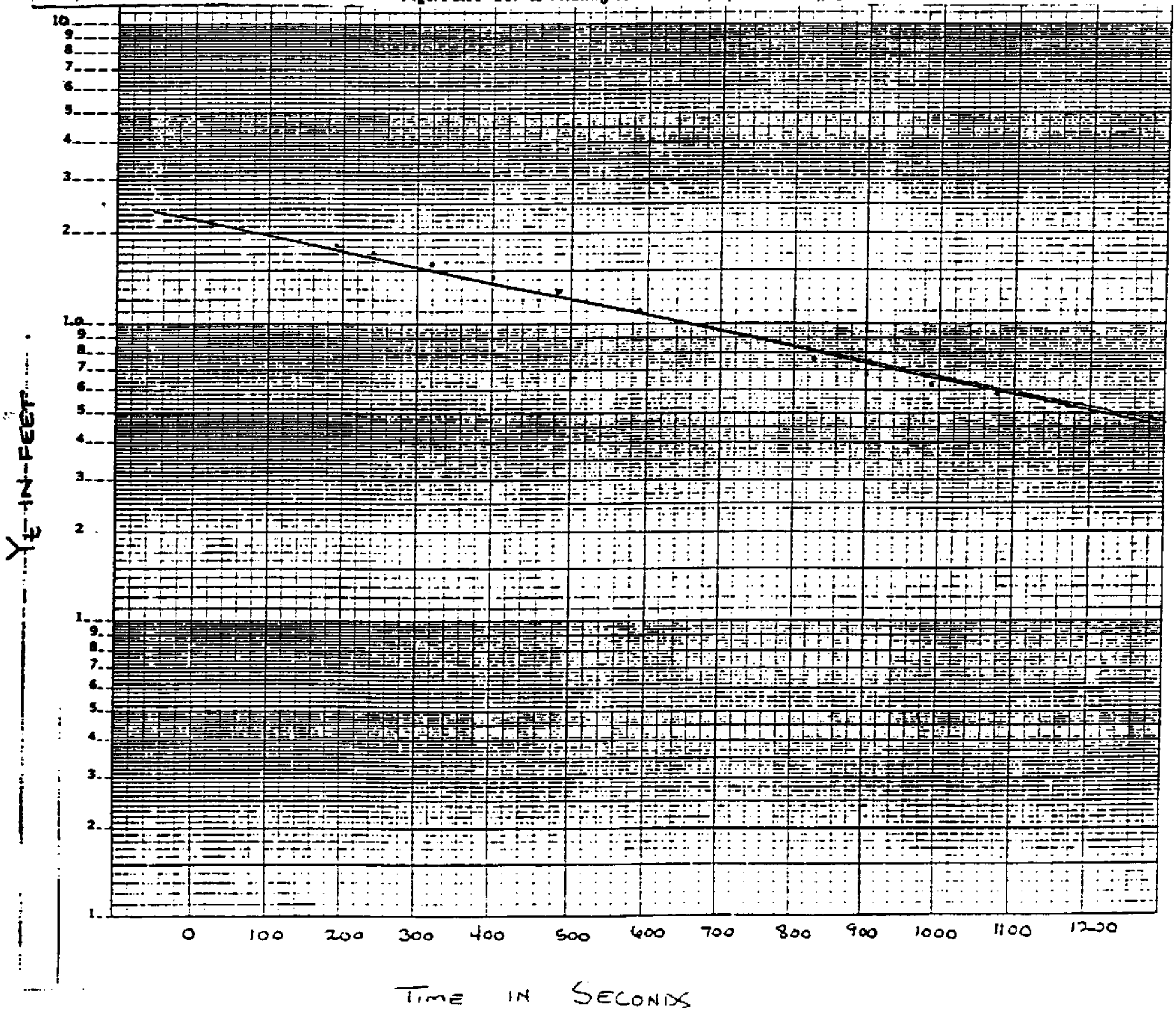
K = 0.00001 = hydraulic conductivity (ft/second)
K = 6 = hydraulic conductivity (gpd/sq ft)
T = 51 = transmissivity (gpd/ft)

pg. ADJ



WELL 17

Figure 5.11 Curves relating coefficients A, B, and C to L_e/r_w.



pg. ADK

SLUG TEST ANALYSIS (by Bouwer, 1978, Groundwater Hydrology, McGraw-Hill)

WELL "E" RNK2002 DATE: MARCH 27, 1991

DEFINITIONS:

D = 2 = well diameter (inches)
BH = 8 = borehole diameter (inches)
Rl = 0.08 = radius of well (feet)
Rc = 0.20833 = radius of well section where water level is rising (feet)
Re = = effective radial distance over which head difference (y) is dissipated (feet)
Rw = 0.33 = borehole radius (feet)
Le = 6.80 = length of saturated screen (feet)
yo = 0.07 = y intercept at time 0 (feet)
yt = 0.06 = y intercept at time t (feet)
t = 122.00 = time in seconds after start of test (seconds)
H = 7.20 = saturated thickness of aquifer (feet)
Lw = 6.80 = length from water table to bottom of wellscreen (feet)
A = 2.00 = dimensionless coefficient
B = 0.60 = dimensionless coefficient
C = 1.40 = dimensionless coefficient

EQUATIONS:

$$\ln(Re/Rw) = \frac{1}{\dfrac{1.1}{\ln(Lw/Rw)} + \dfrac{A + B \times \ln[(H-Lw)/Rw]}{(Le/Rw)}}$$

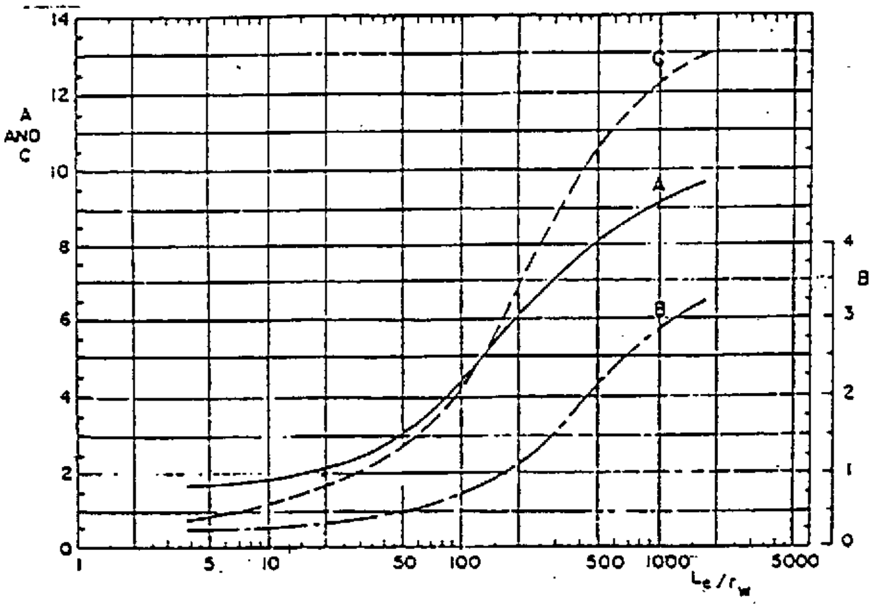
$$K = \frac{Rc \times Rc \times \ln(Re/Rw) \times (1/t) \times \ln(yo/yt)}{2 \times Le}$$

SOLUTIONS:

Le/Rw = 20.4
Lw/Rw = 20.4
H-Lw = 0.40
Rc*Rc = 0.043
2*Le = 13.6
1/t = 0.008
ln (yo/yt) = 0.2
ln (Re/Rw) = 2.1
ln [(H-Lw)/Rw] = 0.1 (if >6, then 6 is used in equation)

K = 0.00001 = hydraulic conductivity (ft/second)
K = 6 = hydraulic conductivity (gpd/sq ft)
T = 40 = transmissivity (gpd/ft)

pg. ADL



WELL "E"

Figure 5.11 Curves relating coefficients *A*, *B*, and *C* to L_e/r_w.

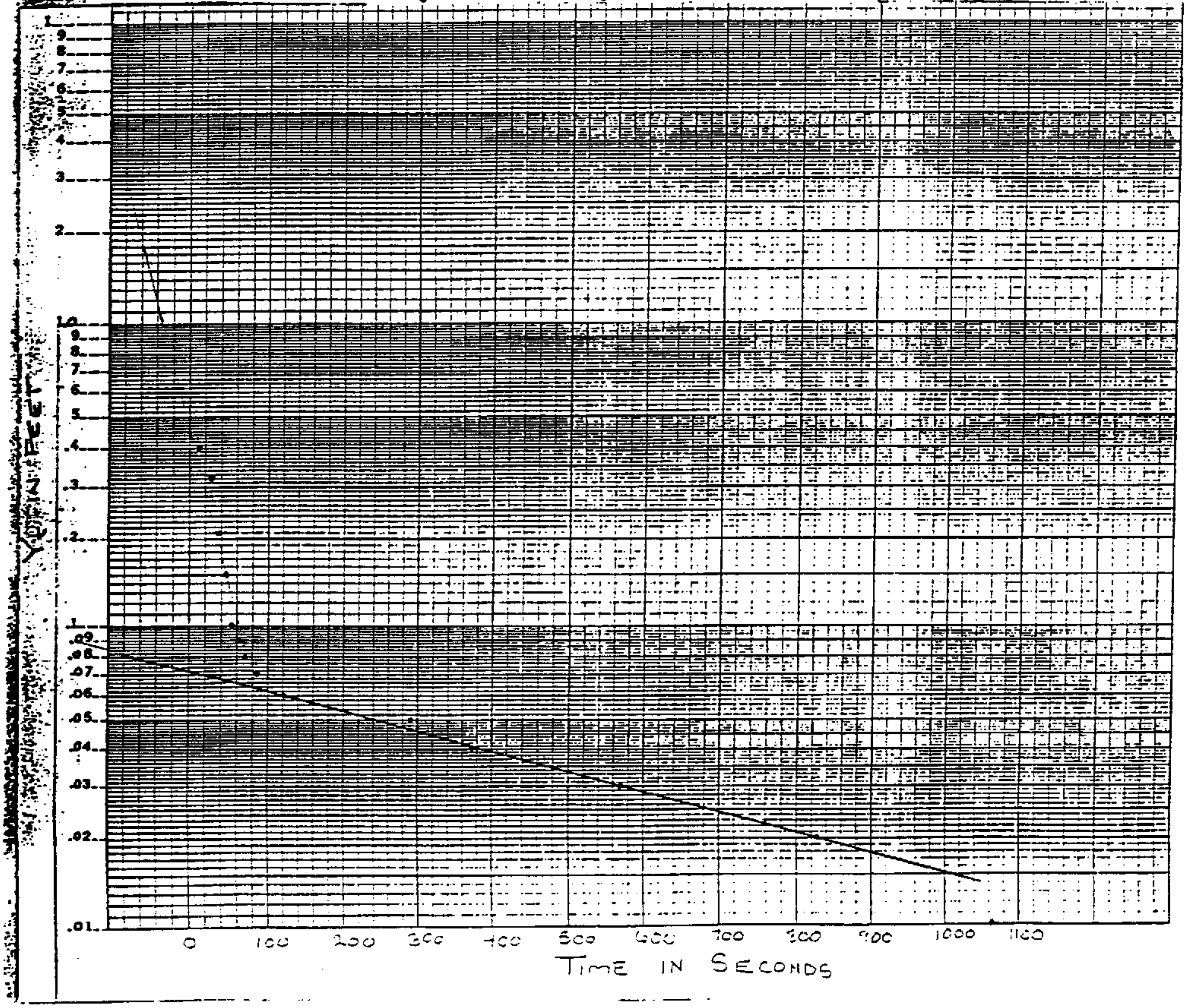


EXHIBIT #3L

M

GROUNDWATER MONITORING PLAN

Rinker Portland Cement Corp.
1200 N.W. 137 Avenue
Miami, Florida

January 1991

prepared for:
Rinker Materials Corp.
P.O. Box 24635
West Palm Beach, Florida

prepared by:
Groundwater Specialists, Inc.
3003 South Congress Ave., Suite 1C
Palm Springs, FL 33461

GROUNDWATER MONITORING PLAN

RINKER PORTLAND CEMENT CORP.
1200 N.W. 137th Avenue, Miami, Florida

INTRODUCTION

The Rinker Portland Cement Corp. operates a Portland Cement manufacturing facility in North-Central Dade County. Because of the materials handled at the facility, various environmental regulations and guidelines require that groundwater monitoring be undertaken. Rinker Portland Cement Corp. authorized Groundwater Specialists, Inc. to prepare this Groundwater Monitoring Plan, in order to meet four separate regulatory requirements and guidelines, including: (1) those outlined in Chapter 17-775, FAC (pending); (2) those outlined in Chapter 17-762, FAC (pending); (3) those resulting from the recent designation of Rinker's wastewater treatment facility to "IW-2" status; and (4) those related to the Dade County Northwest Wellfield Protection Plan. The most prominent concern of this groundwater monitoring plan is the protection of groundwater quality at Dade County's Northwest Wellfield.

FACILITIES DESCRIPTION

The location of the Rinker Portland Cement Corp. facility is shown on Exhibit 1. A site plan is shown as Exhibit 2. The features most pertinent to this Groundwater Monitoring Plan are listed (1-4) below. These features lie outside the Northwest Wellfield Protection Area (see Exhibit 2).

(1) A proposed soils storage area (SW corner). This area will be used to store contaminated soils before thermal treatment in the kilns; it will be covered with a roof.

(2) A 600,000-gallon aboveground tank provides storage for contaminated wastewater (SE corner). This tank lies within a diked area; its contents are piped above ground to the kilns.

(3) A 600,000-gallon aboveground used oil tank (SE corner). This tank lies within a diked area; it stores oil before it is piped to the kilns.

(4) Six 25,000-gallon aboveground oil/water separation tanks (SE corner), two of which are proposed. These tanks supplement used oil and contaminated water storage; they lie within the same diked are as the larger used-oil tank.

Other on-site facilities lie partially or entirely within the Northwest Wellfield Protection Area, as that area was most recently calculated. These include: an eight-inch underground oil pipeline linking the aboveground tanks to the kilns; a four-inch aboveground wastewater pipeline linking the 600,000-gallon aboveground tank, and two 20,000-gallon wastewater tanks to the kilns; four isolated diesel or oil tanks; and a pressure cleaning facility. Of these facilities, only the underground oil pipeline warrants consideration for groundwater monitoring. The other aboveground features, including the isolated diesel or oil tanks, are situated on concrete slabs or under a roof; these are visually accessible for inspection. The pressure cleaning facility is beneath a roof and based on two separated concrete slabs; it includes a monitor well that taps the space between the two separated concrete slabs.

There are four existing wells used to provide water to the plant and two existing monitor wells on site. These are shown on Exhibit 2. Of the water-supply wells, two supply process water. These are fitted with surface pumps and tap the Biscayne Aquifer at total depths less than 20 feet; each is continuously pumped at 1.08 MGD (million gallons per day). A separate potable water well provides water for plant personnel, and another separate well supplies water for fire protection. These later wells also tap the uppermost parts of the Biscayne Aquifer. When compared to the water pumped from the process-supply wells, the potable well and the fire-protection well withdrawals are negligible.

A well at the pressure cleaning facility monitors water derived from cleaning should it penetrate the uppermost of two concrete slabs. The slabs are separated by about eight feet; the lowermost lies at a depth of about nine feet. The monitor well is sampled monthly for visual inspection. The pressure cleaning water is recirculated in an enclosed system with no discharge.

The second existing monitor well is owned and maintained by the Florida Department of Health and Rehabilitative Services. It is sampled monthly for bacteriological and turbidity analyses.

HYDROGEOLOGIC SETTING

The Rinker facility lies 2.7 miles nearly due south of the nearest well in the Northwest Wellfield as shown on Exhibit 1. The wellfield is theorized to cause a northward groundwater flow direction in the region of the Rinker facility. Many of the monitor wells proposed in this document address this fact by their locations on the northern side, downgradient of major Rinker facilities. The groundwater flow direction(s) on the Rinker property, however, could differ significantly from the regional flow direction because of pumping from Rinker's two production wells. These wells pump 1.08 MGD each to support the cement manufacturing process. The installation and testing of the wells proposed herein will determine whether on-site groundwater pumping controls the on-site groundwater gradient as opposed to groundwater pumping from the Northwest Wellfield. Because the major intent of this monitoring plan is to protect the Northwest Wellfield from potential discharges from Rinker facilities, it is most prudent to monitor groundwater between Rinker's facilities and the Northwest Wellfield. Therefore, this plan refers to the north as the "downgradient" direction.

By far the most prolific aquifer in the subject area is the Biscayne Aquifer. It is tapped by both the Northwest Wellfield and Rinker's wells. The top of the Biscayne Aquifer lies at a depth of about eight feet in the subject area; its bottom lies at about 55 feet below grade. The Biscayne is practically equal in its vertical extent to the Fort Thompson Formation. This formation is riddled with solution cavities that lend a very high permeability to the Biscayne Aquifer.

The uppermost six feet of sediments, that lie above the Biscayne Aquifer, are hydrogeologically more complex. Dense limestone, approximately three feet thick, directly overlies the Biscayne; it has very low permeability and prevents or severely impedes the percolation of rainfall into the Biscayne except where breached by quarries or similar manmade features. Above this dense limestone unit is the Miami Limestone (Oolite); it supports a thin, perched water table. A thin layer of muck and marl lies above the Miami Limestone and together with the Miami Limestone, forms the uppermost hydrogeologic unit. The near-surface hydrogeologic relationships are shown in a cross-section on Exhibit 3. [The hydrogeologic scenario described above is from an unpublished report prepared for Rinker by Dames & Moore (December, 1987). That report describes on-site hydrogeologic testing with the purpose of determining the direction of groundwater flow beneath Rinker's property; its conclusions were theoretical, as they were based on groundwater modeling of flow in the Biscayne Aquifer. The pertinent parts of the report are included in Attachment A.]

The uniformity of the more generalized subsurface is shown by cross-sections in Exhibit 4. The Biscayne Aquifer coincides with the strata marked "Qf". Those formations from ground surface to about eight feet in depth coincide with formations marked "Ql" and "Qm". The locations of the Rinker plant and the southernmost well in the Northwest Wellfield are indicated on the cross sections. It is worthy of mention that the dense limestone cited above and shown on Exhibit 3 (approximately between depths of 4.5 and 8 feet), does not appear on the cross sections; this is due to the generalized nature of the cross-sections on Exhibit 4.

PROPOSED MONITOR-WELL DESCRIPTIONS AND SUPPLEMENTAL INFORMATION ON REQUIREMENTS AND GUIDELINES

The following text summarizes each of the four requirements and guidelines for groundwater monitoring and identifies proposed well locations and the rationale for those locations.

Requirements as per Chapter 17-775, FAC

Chapter 17-775, FAC, is entitled "Soil Thermal Treatment Facilities". As drafted, this rule requires groundwater monitoring at unspecified locations to ensure maintenance of groundwater quality potentially affected by the storage of contaminated soils. This rule pertains directly to a proposed under-roof soil storage facility shown on Exhibit 2. As discussed below, four monitor wells are planned at locations around this building/soils storage area.

Chapter 17-775.610(2) outlines the required contents of a groundwater monitoring plan. The requirements are listed below, followed with information intended to meet the requirements.

Requirement (a): Specify locations of the proposed unaffected natural background and downgradient monitoring wells and construction details of the monitoring wells:

A total of ten monitor wells are proposed as indicated on Exhibit 5. Wells 1 through 8 are "shallow" wells that tap the perched water table above the dense limestone cited above. These shallow wells would be the first to signal groundwater degradation because they are adjacent to the facilities of greatest concern and because they tap the uppermost water-bearing zone. Wells 9 and 10 are "deep" wells that tap the upper part of the Biscayne Aquifer. Construction diagrams for the shallow and deep monitor wells are shown on Exhibits 6 and 7, respectively.

As discussed above, the downgradient direction, or direction of groundwater flow, is north. The unaffected natural background wells are Wells 1, 4, 6, and 7; these lie upgradient of the soil storage area and the diked tanks area. The downgradient wells are 2, 3, 5, 8, 9, and 10. Wells 2, 3, 5, and 8 lie downgradient from the soil storage area and the diked tanks area. Wells 9 and 10 are downgradient of the entire Rinker facility and tap the zone that would indicate any potential off-site escape of degraded groundwater in the Biscayne Aquifer.

Requirement (b): Specify hydrogeological, physical and chemical data for the site, including:

(1). <u>The direction and rate of the groundwater flow.</u> The direction of groundwater flow in the Biscayne Aquifer is presently concluded to be north, toward the Northwest Wellfield. The southernmost portion of the cone-of-depression of that wellfield was most recently modeled to lie on the Rinker property, as shown on Exhibit 5.

The rate of groundwater flow in the Biscayne Aquifer is concluded to be approximately 25 feet per day. This flow rate is based on Dade County's "Wellfield Cones of Influence" map that shows travel-time lines of 210 and 100 days around the Northwest Wellfield. Between these lines the flow rate was calculated to be 32 feet per day; this rate was extrapolated southward to the 210 day line to arrive at 25 feet/day.

The direction of groundwater flow in the uppermost water-bearing zone varies locally on site. This zone is thin and has a relatively low permeability; it is not affected significantly by water levels in the underlying Biscayne Aquifer. Groundwater in this shallow zone flows predominantly toward the nearest lateral escape. Such escapes may be quarries, canals or pumping wells. The locations of the aforementioned array of shallow monitor wells address the nonuniform direction of flow in this zone.

The groundwater flow rate in the uppermost zone is judged to vary considerably depending on the specific on-site location. Assuming a hydraulic conductivity of 300 gpd/sq ft in this zone, an average gradient of 0.001, and an effective porosity of 0.20, the average flow rate would be 0.2 feet per day.

(2). Specify background groundwater quality. Aside from the routine bacteriologic and turbidity analyses of samples from one monitor well (cited above), there are no known groundwater quality data available at the Rinker site. Such data will be reported following monitor-well installations and the first round of sampling and analyses.

(3). Specify porosity, horizontal and vertical permeability for the aquifers, and the depth to, and lithology of the first confining bed. The Biscayne Aquifer has vertical and horizontal permeabilities in the many thousands (gpd/sq ft). Likewise, the porosity can be exceptionally high. Because of these conditions, an on-site determination of these factors as they relate to groundwater monitoring is not practical, nor is the information that could be gained likely to be useful. It is certain that degraded groundwater will move at a very high rate and readily disperse horizontally and vertically.

The uppermost "aquifer", or water-bearing zone, is estimated to have an average horizontal hydraulic conductivity of about 300 gpd/sq ft, a vertical hydraulic conductivity of about 100 gpd/sq ft, and a porosity of 0.20. These estimates are based solely on the types of materials in this zone - muck, marl and probably sand-filed oolitic limestone.

The top of the first confining bed, a dense limestone, lies approximately between depths of 4.5 and 8 feet below ground.

(4). Specify vertical permeability, thickness and extent of any confining beds. The vertical hydraulic conductivity of the first confining bed is reported to be about 13 gpd/sq ft. (from the Dames & Moore report, Attachment A). Its thickness ranges between about 2 and 5.5 feet. The extent of this bed is large, it is widely found in the region of the site.

(5). Specify topography, soil information, and surface water drainage systems surrounding the site. Exhibit 1 shows the topography of the site; it is essentially flat except as affected by ponds, quarries and canals. Ground surface elevation is near five feet above sea level and varies generally about 0.5 feet, more or less than five feet.

According to the only available soil survey (Soil Conservation Service, 1947, Soil Survey Series 1947, No. 4, a description of Dade County soils), the soil beneath Rinker's facility is referred to as "Everglades Peat, shallow phase over shallow marl". It is reported to have a peat mantle less than 36 inches thick, separated from the underlying limestone by a thin layer of marl that ranges in thickness from a few inches to 24 inches. It is reported to have medium to slow drainage. This soil type is common to the entire Rinker facility as shown on Exhibit 2. The ponds and quarries in the vicinity of the site receive drainage directly by surface runoff and through the sediments above the dense limestone (Exhibits 1 and 2).

Depending on the relative height of groundwater levels and water levels in adjacent surface-water bodies at any given time, water could seep from sediments to canals and quarries or in the reverse direction. The canals in the vicinity of the site are for land drainage; they are not connected directly to ponds or quarries. Rinker maintains no structures on the nearby canals.

(6). Specify inventory depth, construction details (well drillings logs), and cones of depression of water supply wells located within a one mile radius of the site. Within a one-mile radius of Rinker's facility, there are at least fourteen properties that have or may have wells. Records of the South Florida Water Management District and Dade County DERM were checked to locate and gather data on such wells. In addition, a survey to document private wells was conducted; each property within one mile was visited and where possible, inquiries were made.

Records made available at the agencies were few. The well survey, likewise, produced relatively few facts. The data gathered from these efforts are summarized in Attachment B. Wells that were located tap the Biscayne Aquifer and they pump low volumes of groundwater. There were no wells located within a one-mile radius of the Rinker facility to the north.

In the context of the extremely high transmissivity of the Biscayne Aquifer, the few, low-volume pumping centers have cones of depression that are insignificant. Such cones of depression might be calculated but it is not likely that they could be physically measured. It is possible that pumping-well drawdowns could be measured; they would certainly be minor (< 0.01 foot). Because: (1) private wells would not change even local groundwater contours, (2) the Northwest Wellfield is presently understood to be the dominant influence on the groundwater flow direction, and (3) there are no private wells located within one mile north (downgradient) of the Rinker facility, there is no apparent justification for gathering more information on neighboring wells than is provided in Attachment B.

Requirements as per Chapter 17-762, FAC.

Chapter 17-762, FAC is entitled "Stationary Aboveground Storage Tank Systems". As drafted, this rule requires groundwater monitoring before December 31, 1993, relative to Rinker's operation of an underground oil line. The location of this line is shown on Exhibit 5. Rinker has prepared plans to abandon the subject pipeline and replace it with an aboveground fuel line before the cited rule becomes effective. Because the existing underground fuel line will be abandoned before December 31, 1993, groundwater monitoring specific to this pipeline is not contemplated. However, the proposed monitor wells that tap the top of the Biscayne Aquifer lie downgradient of the pipeline as well as other related features. These are Wells 9 and 10 as shown on Exhibit 5.

Requirements as per "IW-2" status.

The requirement for groundwater monitoring resulting from the recent change in status from "IW-5" to "IW-2" is not specific. Wastewater is pumped to and stored in the aboveground wastewater tank; this tank lies within the diked area. From this storage tank, wastewater is pumped through an aboveground pipeline to the kilns via a smaller aboveground tank (kiln water tank). Groundwater monitoring of the wastewater system will be provided by Wells 5, 6, 7, 8, 9, and 10; these wells are discussed above.

Requirements as per the Northwest Wellfield Protection Plan.

The requirement for groundwater monitoring for water-quality protection of Dade County's Northwest Wellfield also is not specific. The above mentioned monitor wells (Wells 1 through 10) are intended to provide water-quality protection with respect to Dade County's Northwestern Wellfield.

MONITOR WELL SAMPLING FREQUENCY AND ANALYSES

Monitor well sampling and analyses will be performed according to regulations and rationale discussed herein. A summary of sampling frequencies and analyses is shown on Exhibit 8.

Wells 1 through 4 will be sampled quarterly as specified in Chapter 17-775, as these wells surround the only such facility (soil storage area) addressed in this rule.

Wells 5 through 8 also will be sampled quarterly; analyses will include volatile organic aromatics, polynuclear aromatic hydrocarbons, coliform bacteria and metals. Coliform bacteria analyses are included because these wells surround a wastewater tank. Metals are included because these wells surround the used-oil tanks.

Wells 9 and 10 will be sampled quarterly for the parameters required as per Chapter 17-775, minus coliform bacteria and metals; coliform bacteria and metals will be sampled/analyzed annually.

Any release of petroleum products or wastewater should be detected first in the shallow Wells 1 through 8. A relatively high (quarterly) frequency for sampling/analysis is therefore proposed. In the event that a release is not detected by the shallow wells or a detected release migrates to the underlying Biscayne Aquifer, such a release should be detected by deep Wells 9 and 10. Because of the high priority of protecting the Biscayne Aquifer, and because the groundwater flow rate in the Biscayne is so high (25 ft/day), Wells 9 and 10 also will be sampled with a high frequency (quarterly) for the most mobile parameters. Coliform bacteria and metals will be sampled/analyzed in the deep Wells 9 and 10 at a low frequency (annually) because they are relatively immobile and any source concentrations would likely be quite low.

CLOSING

The subject Rinker facility lies in rural Dade County above one of the most prolific aquifers known, the Biscayne Aquifer. Fortunately, the facility is separated from the Biscayne by natural materials (dense limestone) having a low permeability. This physical situation provides a buffer, or partial barrier to any release, offering protection to the Biscayne Aquifer. This groundwater monitoring plan provides for two levels of groundwater protection. Monitoring of groundwater above the dense limestone will provide the earliest possible signal should an otherwise undetected release occur. Monitoring of groundwater in the Biscayne Aquifer on the northern side (downgradient) of the facility will provide a signal should a release affect the water-supply aquifer. On the basis of the plan proposed, the letter and intent of the requirements and guidelines are believed to be satisfied.

SUMMARY

The Rinker Portland Cement Corp. is required to implement a groundwater monitoring plan at its facility on N.W. 137th Avenue, Miami, Florida. The facility contains aboveground wastewater and oil tanks and an underground oil pipeline. Groundwater occurs in a shallow zone above a low-permeability layer, beneath which occurs a very high permeability aquifer that yields water to a municipal wellfield north of the Rinker facility. Eight monitor wells that tap the shallow zone are proposed; these are located at the corners of an under-roof contaminated soils storage area and at the approximate corners of a diked area containing aboveground wastewater and oil tanks. Two monitor wells that tap the water-supply aquifer (the Biscayne Aquifer) are proposed; these are located on the northern or downgradient side of the Rinker facility. The proposed monitor-well sampling includes quarterly sampling for all wells, with groundwater analyses appropriate to the locations of the wells and facilities. Analyses will be made for petroleum-related compounds, metals, and coliform bacteria.

Respectfully submitted
GROUNDWATER SPECIALISTS, INC.

Paul Jakob 5.29.91

Paul G. Jakob
Florida P.G. 245

EXHIBITS

GSI

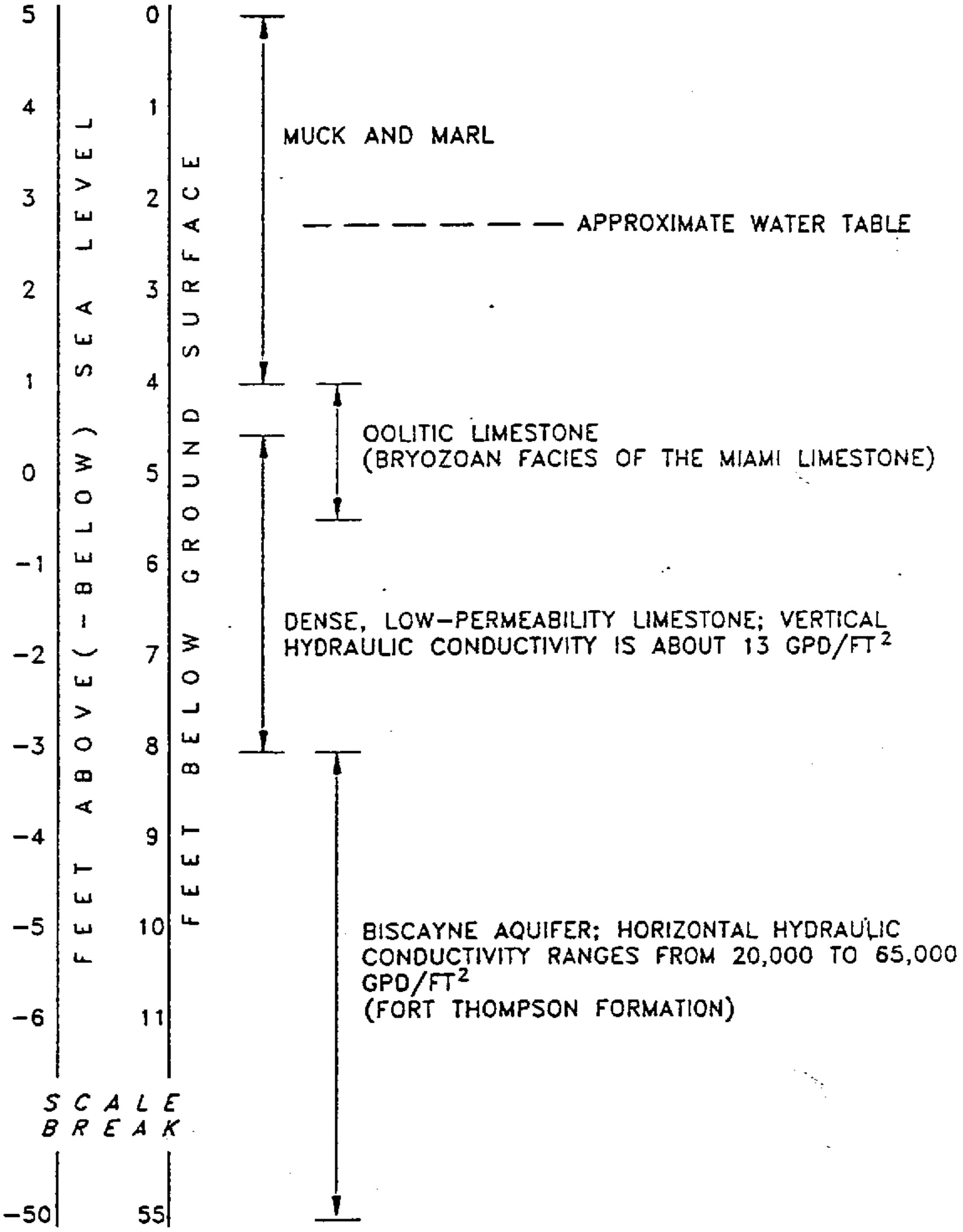
DATE: NOV. 1990

FOR: RINKER PORTLAND CEMENT CORP.

SUBJECT: **LOCAL HYDROGEOLOGIC PROFILE**

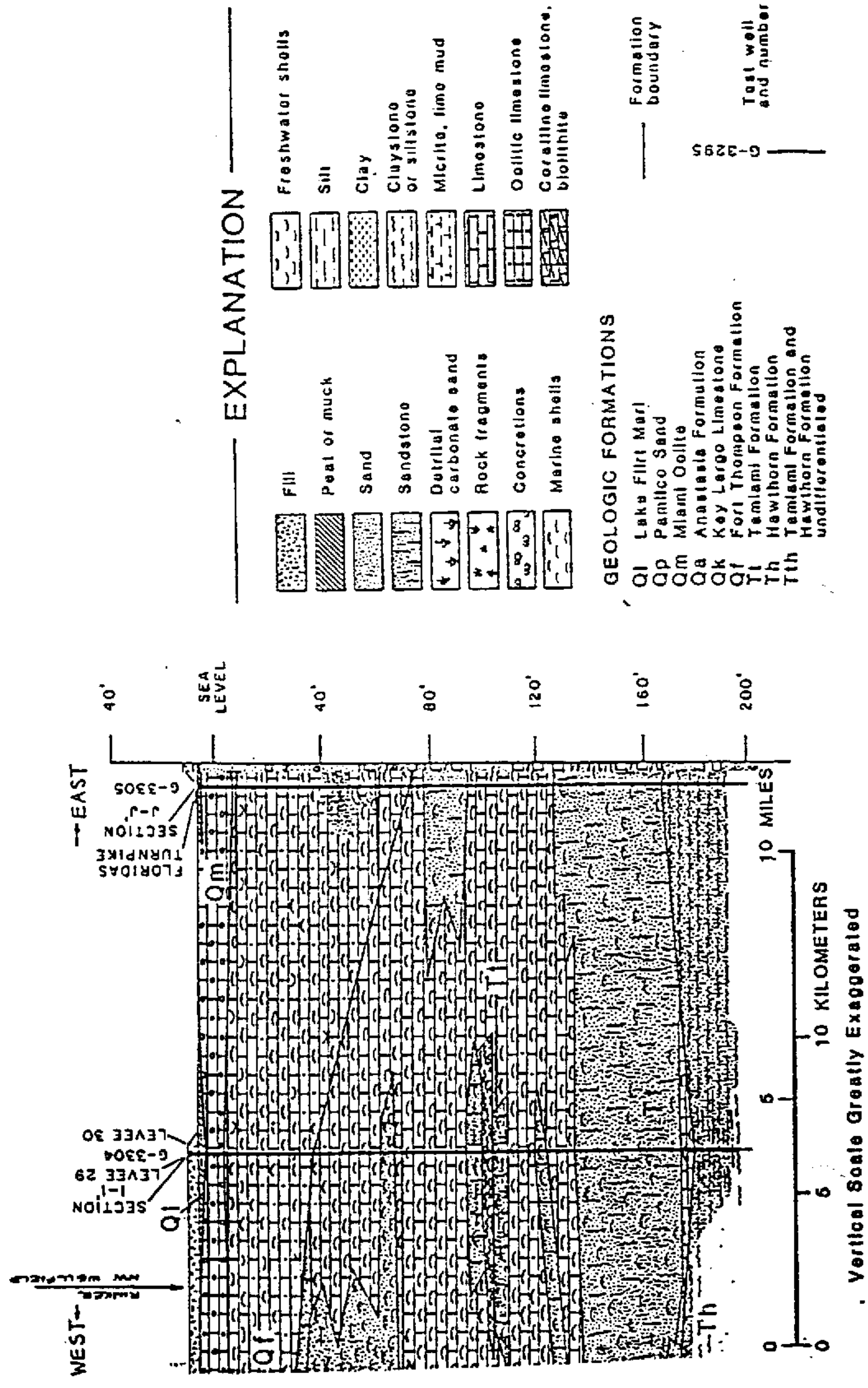
EXHIBIT: 3

LOCATION: 1200 N.W. 137th AVE., MIAMI, FLORIDA



CAD Ref. No. RNK2001
L. 0.7

GSI	DATE: NOV. 1990	FOR: RINKER PORTLAND CEMENT CORP.	SUBJECT: REGIONAL HYDROGEOLOGIC PROFILE, E to W	EXHIBIT: 4.1
LOCATION: 1200 N.W. 137th AVE., MIAMI, FLORIDA				

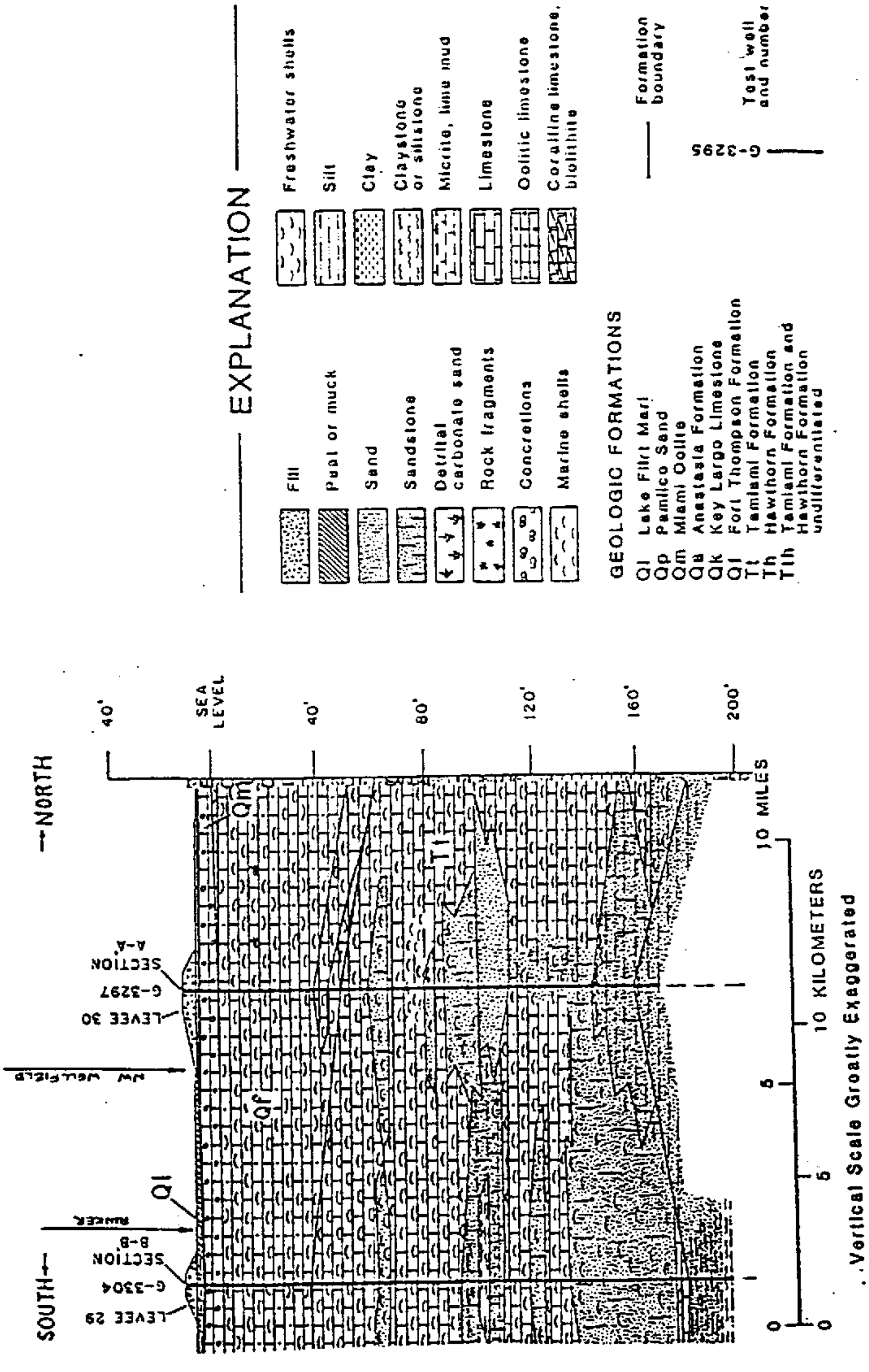


from: Geology of the Surficial Aquifer System,
Dade Co., 1987, USGS WRI Report 864126,
by Carmen R. Causaras.

CAD Ref. No. RNK2001
L 0.13

GSI	DATE: NOV. 1990	FOR: RINKER PORTLAND CEMENT CORP.	SUBJECT: REGIONAL HYDROGEOLOGIC PROFILE, N to S	EXHIBIT: 4.2

LOCATION: 1200 N.W. 137th AVE., MIAMI, FLORIDA

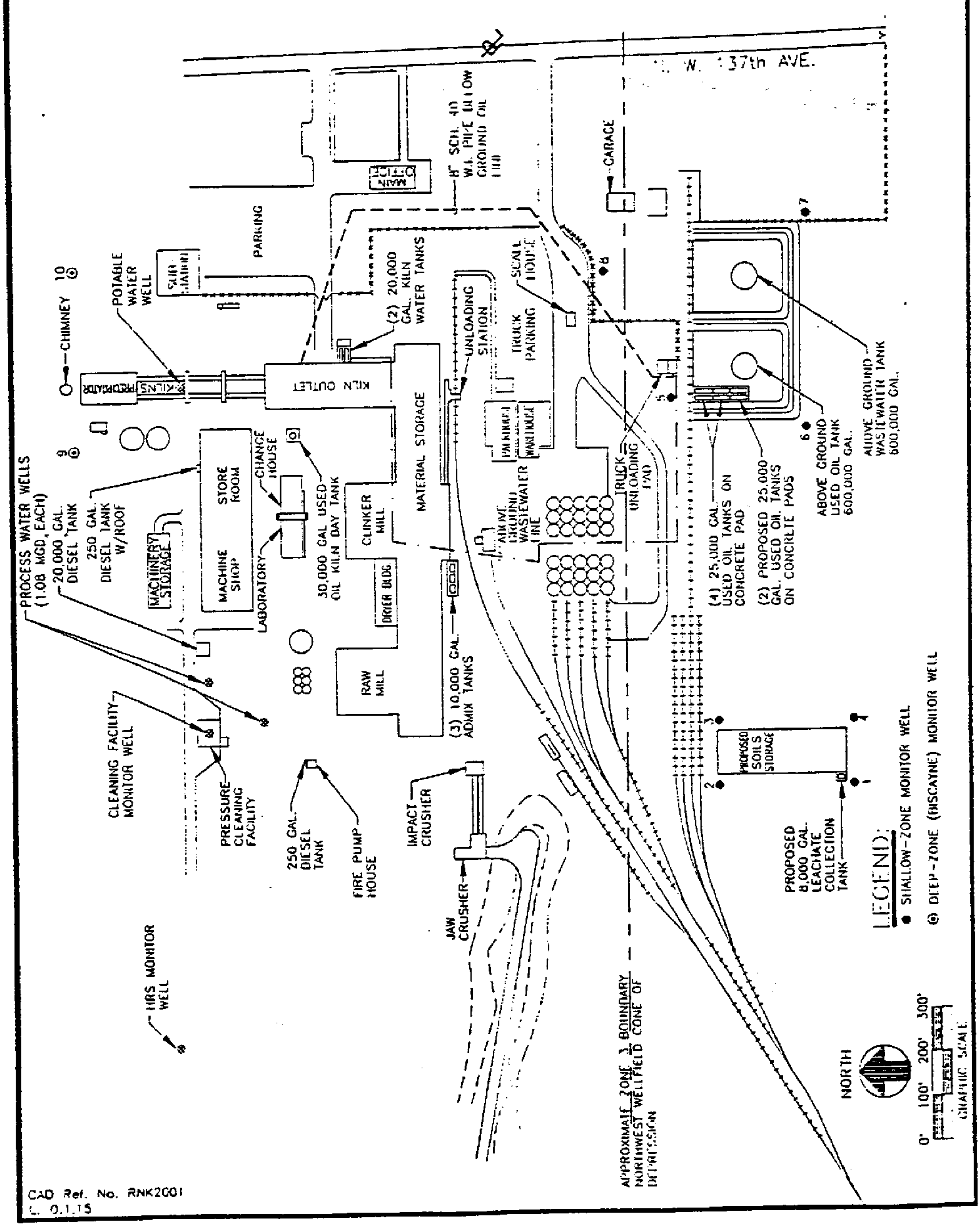


from: Geology of the Surficial Aquifer System, Dade Co., 1987, USGS WRI Report 864126, by Carmen R. Causaras.

CAD Ref. No. RNK2001
L 0.14

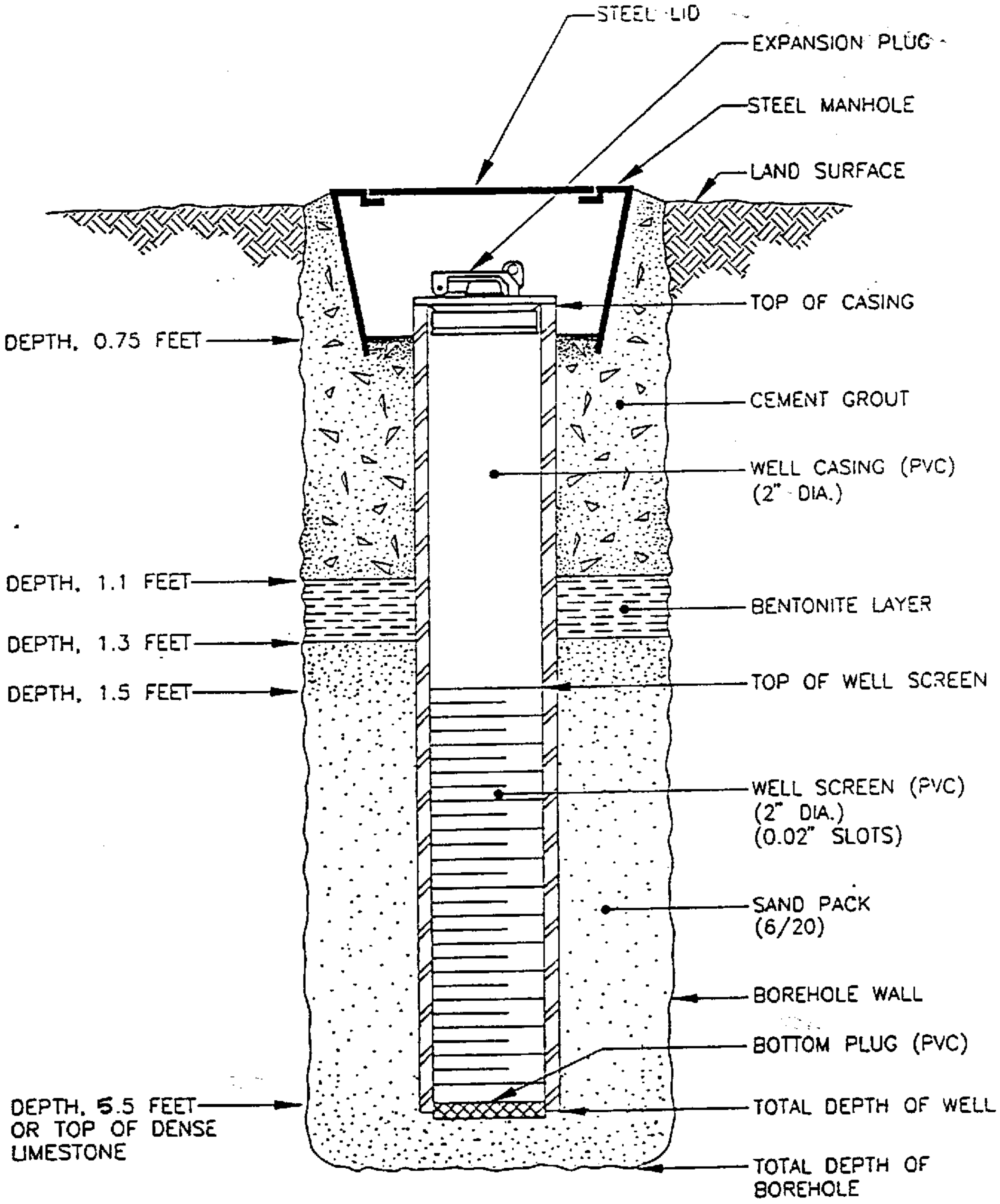
GSI	DATE: NOV. 1990	FOR: RINKER PORTLAND CEMENT CORP.	SUBJECT: MONITOR WELL LOCATIONS	EXHIBIT: 5

LOCATION: 1200 N.W. 137th AVE., MIAMI, FLORIDA



CAD Ref. No. RNK2001
L. 0.1.15

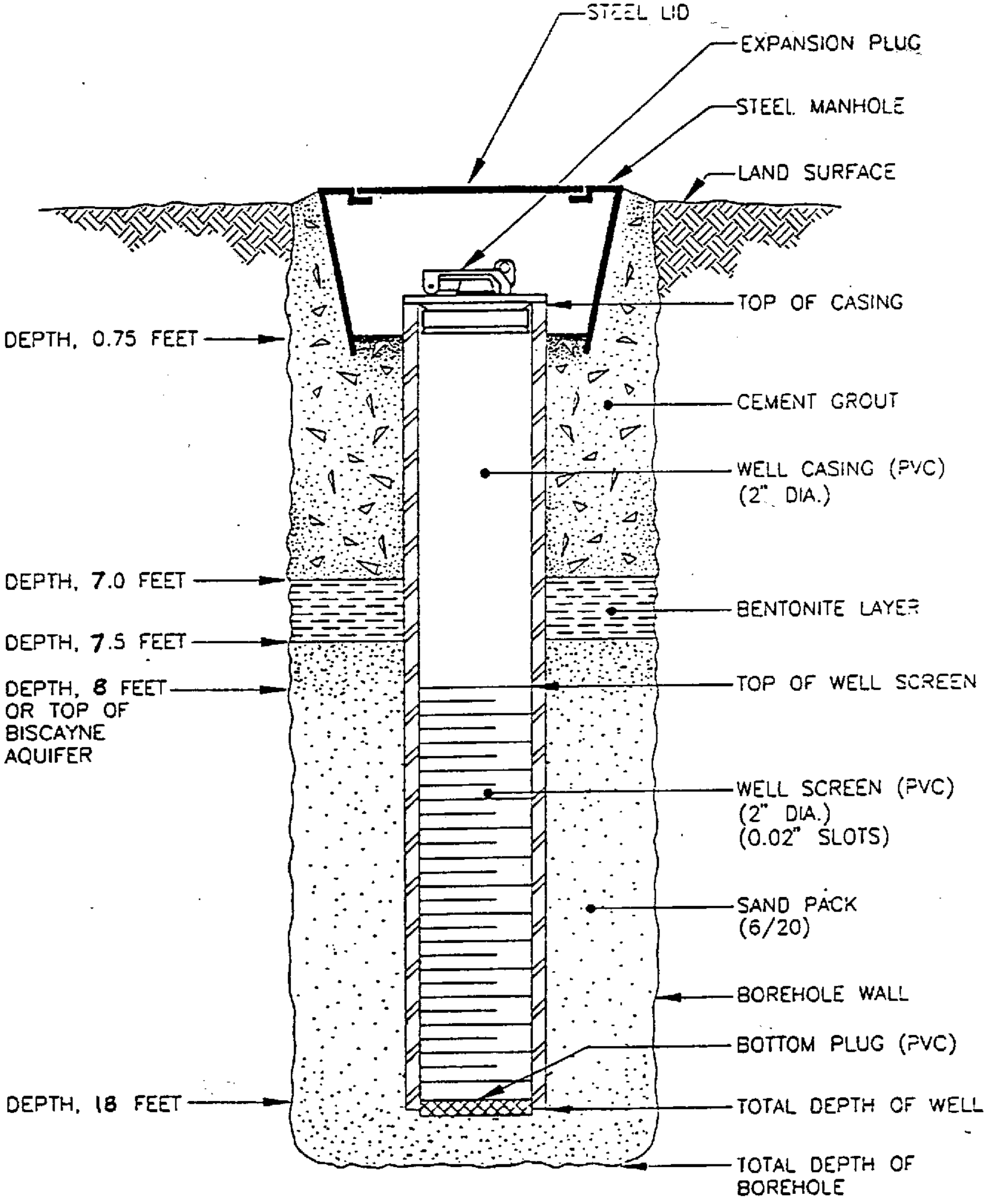
GSI	DATE: 11/90	FOR: RINKER PORTLAND CEMENT CORP.	SUBJECT: SHALLOW-ZONE MONITOR WELLS 1 THROUGH 8	EXHIBIT: 6
LOCATION:				



DRAWING NOT TO SCALE

CAD Ref. = RNK2001A
L 0,1,2
Plotting Scale: 1 = 1

GSI	DATE: 11/90	FOR: Rinker Portland Cement Corp.	SUBJECT: DEEP-ZONE (BISCAYNE) MONITOR WELLS 9 AND 10	EXHIBIT: 7
LOCATION:				



DRAWING NOT TO SCALE

CAD Ref. = RNK2001A
L 0.1.3
Plotting Scale: 1 = 1

EXHIBIT 8

Monitor Well Sampling Frequency and Analyses

	Well Numbers									
	1	2	3	4	5	6	7	8	9	10
Volatile organic aromatics	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Polynuclear aromatic hydrocarbons	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Metals	Q	Q	Q	Q	Q	Q	Q	Q	A	A
Coliform bacteria					Q	Q	Q	Q	A	A

<u>Notes:</u>

(1) Volatile organic aromatics will be analyzed by EPA Method 602, including MTBE.

(2) Polynuclear aromatic hydrocarbons will be analyzed by EPA Method 610.

(3) Metals will include: Arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Analytical methods will be selected from those specified in Chapter 17-775, FAC.

(4) "Q" signifies quarterly; "A" signifies annually.

ATTACHMENT A

DAMES & MOORE A PROFESSIONAL LIMITED PARTNERSHIP
350 WEST CAMINO GARDENS BLVD., BOCA RATON, FLORIDA 33432 (305) 392-9070

December 9, 1987

Rinker Materials Corporation
1501 Belvedere Road
West Palm Beach, FL 33406

Attention: Mr. William Voshell
Environmental Specialist

Report
Hydrogeologic Study
Northwest Dade County Facility
Miami, Florida
For Rinker Materials Corporation

Dear Mr. Voshell:

1.0 INTRODUCTION

Dames & Moore was retained by Rinker Materials Corporation to perform a hydrologic evaluation to evaluate the aquifer's performance, and the radius of influence of the Rinker Material production wells. The Rinker Material Corporation facility is located at 1200 N.W. 137th Avenue, in Miami, Florida.

2.0 REGIONAL GEOLOGY

The area of investigation is comprised of several distinct layers. On the surface, much of the area is covered by mucks and marls extending as far east as Conservation Area No. 3 and diminishing toward the east. This muck/marl combination is present from the ground surface (+5 feet above MSL) to +1 foot above MSL.

Below the organic cover is a one to two foot thick layer of Miami limestone which is composed of the Miami Oolite/Bryozoan facies. This facies plays an important role in the recharge of canals within the area of the Conservation area located to the west.

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Acting as a hydrologic barrier beneath the Oolite/Bryozoan facies is a group of very hard, dense limestone layers. This limestone is present from 0.5 feet above MSL to 3 feet below MSL. In contrast to the highly permeable layer below (the Biscayne Aquifer) these layers appear impermeable; vertical flows of water through them are orders of magnitude less than the horizontal flow through the Biscayne Aquifer. In this respect, they act as an aquitard, restricting surface water recharge into the underlying Biscayne Aquifer. The Biscayne Aquifer is present from 3 feet MSL to 50 feet below MSL.

3.0 REGIONAL HYDROGEOLOGY

Dade County is partially situated on the Atlantic Coastal Ridge, which runs roughly parallel to the coast and diminishes in the south central Everglades in the eastern portion of the County. West of the ridge, the Oolitic Facies gradually taper out and yield to the underlying Bryozoan Facies. It is these facies which carry the ponded waters from the western conservation areas to the canals in the east. Below the Miami Limestone (Oolitic/ Bryozoan Facies) are the dense "impermeable" limestones. Geologic information from test wells and shallow borings indicate these dense limestones are widespread. Additional information obtained in connection with canal excavations, indicate that the harder layers of dense limestone occur throughout most of western and southern Dade County, and that they occur at about the same altitude (Klein and Sherwood 1961). Similar layers were present in wells to the south, therefore it is reasonable to assume that the relatively impermeable zone underlies much of the area and their confining characteristics are widespread.

Recharge to the Biscayne aquifer through the dense limestone happens on a localized scale, the overall continuity and the blanketing effect at these layers in general tend to retard infiltration. In Dade County, the aquifer thickens toward the east (i.e., coastal ridge) and contains much more sand. The thin dense limestones either thin and disappear or they occur deeper in the aquifer near the coast (Klein and Sherwood 1961).

The regional aquifer system is continuous and hydrologically sound. Tests made in the area of Levee 30 indicate aquifer transmissibility of 3,600,000 gallons per day, and a vertical permeability of 1.95 x 10^{-5} ft/sec (6.0 x 10^{-4} cm/sec). Historical records show that permeabilities within the Biscayne Aquifer vary greatly. Permeability values have been reported by Prugh that vary from 0.03 ft/sec (0.91 cm/sec) to 0.10 ft/sec (3.05 cm/sec) for various formations within the Biscayne Aquifer;

others have reported up to 1.31 ft/sec (40 cm/sec) (Shea, 1955) at other sites in the central and southern parts of the state. Schmertmann suggests a reasonable permeability of 0.02 ft/sec (0.61 cm/sec).

4.0 SUBSURFACE CONDITIONS

Field exploratory pits were dug at three points. Two pits were in line with each other and the remaining one was perpendicular to the other two exploratory pits. The axis of each pit intercepted the northernmost well on the property.

After initial water levels stabilized in the pits, a surveying team determined water levels in the pits and in all lakes in the immediate vicinity of the pumps. In addition, all free standing water (i. e., swamps) and canals were also determined. Extra additional points were chosen to help understand the localized water table. These extra points include the quarry water level and several other wells below the kiln area. Figure 1 shows the location of the measuring points within the immediate study area. The elevations for these measuring points are shown below:

		Feet Above Mean Sea Level
A.	Canal Pit	4.70
B.	Lake	4.33
C.	Canal	5.81
D.	Building Pit	3.22
E.	Pump #1	2.27
F.	Pump #2	1.85
G.	Swamp Pit	2.87
H.	Swamp	5.33
	Well #100 (Kiln)	2.85
	Well #200 (Fire Hydrant)	2.88
	Quarry	3.37

The depths of the exploratory pits were limited because of the dense limestone which was encountered approximately at sea level. This layer was present in all three pits, and was the limiting factor in the depth of the holes. This layer is the same dense layer mentioned earlier, which is present throughout much of Dade County.

5.0 DATA ANALYSIS

Through correlation of ground-water levels, it is evident that ground-water mounding occurs in the immediate vicinity of the wells. This mounding is a result of the impermeable dense limestone layer which displays a vertical permeability of roughly 1.95×10^{-5} ft/sec (6.0×10^{-4} cm/sec). The horizontal permeability is several orders of magnitude different than the vertical permeability. The average horizontal permeability of the Biscayne Aquifer is 0.02 ft/sec (0.61 cm/sec).

The mounding occurs as a direct result of the discharge from the plant's cooling water discharge pipe. In the immediate vicinity of the plant, the mound reaches a maximum level of 5.81 feet above sea level. The water level of the surficial aquifer is normally around 2.8 feet above sea level. The difference of 3.0 feet of water is due to the storage in the zone above the impermeable layer.

The drawdown associated with the two wells within the area of study, is not affected by the surficial mound of water. The area of the surficial aquifer immediately adjacent to the wells has no cascading waters into the well pits. Upper surficial aquifer water has been blocked, by fines, from entering the well area.

6.0 INVESTIGATION OF THE WELLFIELD PROTECTION ORDINANCE MODEL

On October 13, 1987, Mr. Steve Krupa of Dames & Moore conferred with Mr. Pete Hernandez of the Dade County Department of Environmental Resource Management (DERM) with regard to the well inventory used as a basis for the wellfield protection ordinance model. He indicated that the existing city wells are 90 feet deep and are cased to only 40 feet below the ground surface, leaving the remaining 50 feet as an open interval. He stated that the two Rinker Material Facility production wells had not been incorporated into the model. At the present time (i.e., October 13, 1987) the northwest wellfield is pumping at 155 million gallons per day, but the projected pumping rate of 220 million gallons per day (approximately by the year 1990) would put the Rinker facility within the 1/4 foot contour drawdown. Mr. Hernandez indicated that he was not aware as to the present location of the 1/4 foot drawdown contour (pumping rate of 155 million gallons per day). Mr. Hernandez indicated that the model did not take into consideration the presence of the thin aquiclude, located on top of the Biscayne Aquifer.

Mr. Krupa inquired upon the level of accuracy of the Dade County aquifer simulation model program (Prickett and Longquist, Two-Dimensional Model). Mr. Hernandez stated, "within a 2000 foot radius of wells, the water profile and the computer program do not correlate. Outside of that, everything matches up."

7.0 COMPUTER ANALYSIS

A computer generated simulation of the aquifer within the immediate vicinity of the Rinker Plant Facility was run. This simulation projected drawdown from a one foot radius from the pump center to a maximum of 2626 feet away. The aquifer thickness in this area has been assumed to be roughly 100 feet. A combined flow rate of both wells of 1500 gallons per minute was used in the analyses. For our analyses Darcy's Law was used, an axisymetrical flow, and constant permeability were assumed. Zangar's (1953) correction method for partially penetrating wells was applied to the observed drawdown data, prior to analysis. Using the known conditions of radial distances and head for the quarry and the wells, we iterated on the permeability values until the drawdowns matched the corrected values of the field measurements. Superposition was used to evaluate the effects of the two well system. This provided an estimate of permeability of 2.82×10^{2} cm/sec, or approximately 13,300 feet/day. The specific capacity of the model was calculated as follows:

$$S_w = Q/1.21 \text{ (model)} = (1500 \text{ gallons/min} \times 7.48 \text{ ft}^3\text{/gal})/1.21 \text{ feet}$$

$$S_{w \text{ (model)}} = 9272 \text{ ft}^2\text{/min}$$

7.1 RESULTS

The output from the computer program is presented as Table 1, and the description of the variables in Figure 2. The model indicates that, for the given pumping rate, the projected drawdown at the well is approximately 0.3 foot. This decreases with distance, being approximately 0.2 foot at a distance of approximately nine feet from the well. The drawdown is reduced to 0.1 foot at a distance of 171 feet from the well. This model provides estimated travel times for different distances from the production wells. Travel time to the well is one day at approximately 24 feet from the well. This becomes two days at approximately 39 feet from the wells, and increases to six days, at 66 feet from the wells. The projected travel times to the well (days) are only a rough estimates and the output can only be verified by actual in-situ testing.

We appreciate this opportunity to have been of service to Rinker Materials Corp., and look forward to continuing to serve you. Please do not hesitate to call, if you have any questions or comments on this report.

Very truly yours,

DAMES & MOORE

Andrew P. Schechter
Andrew P. Schechter, P.E.
Manager, Waste Management/
Geosciences Division-Florida

Carlos F. Garcia
Carlos F. Garcia
Project Hydrogeologist

APS/CFG

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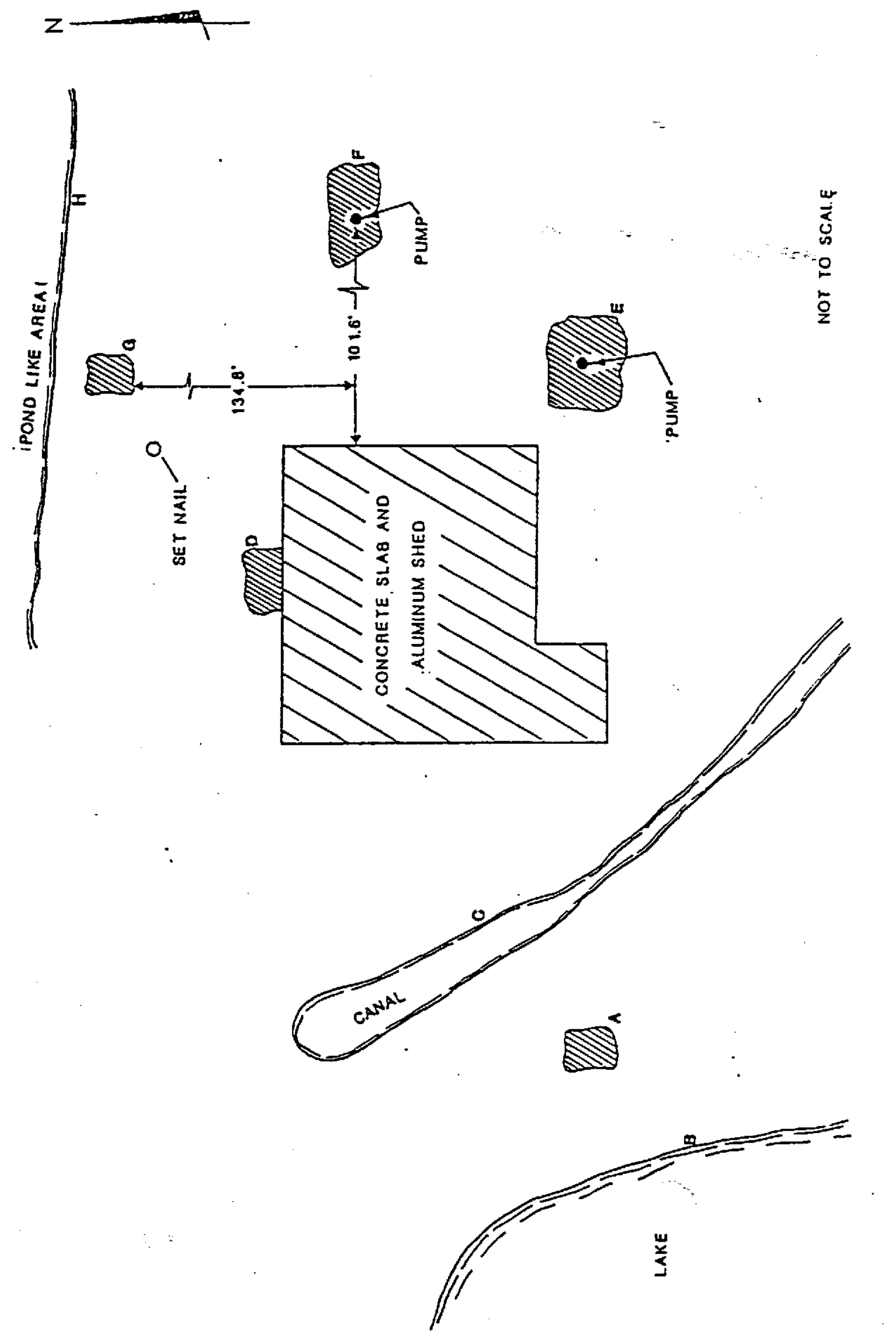
BY ______ DATE 12/87 CHECKED ______ DATE ______ APPROVED ______ DATE ______

JOB No. 16198001024 (12/87)



LOCATION OF THE MEASURING POINTS
FOR THE HYDROGEOLOGIC STUDY

PROJECT: RINKER MATERIALS CORP. LOCATION: MIAMI, FLORIDA	DAMES & MOORE PLATE 1

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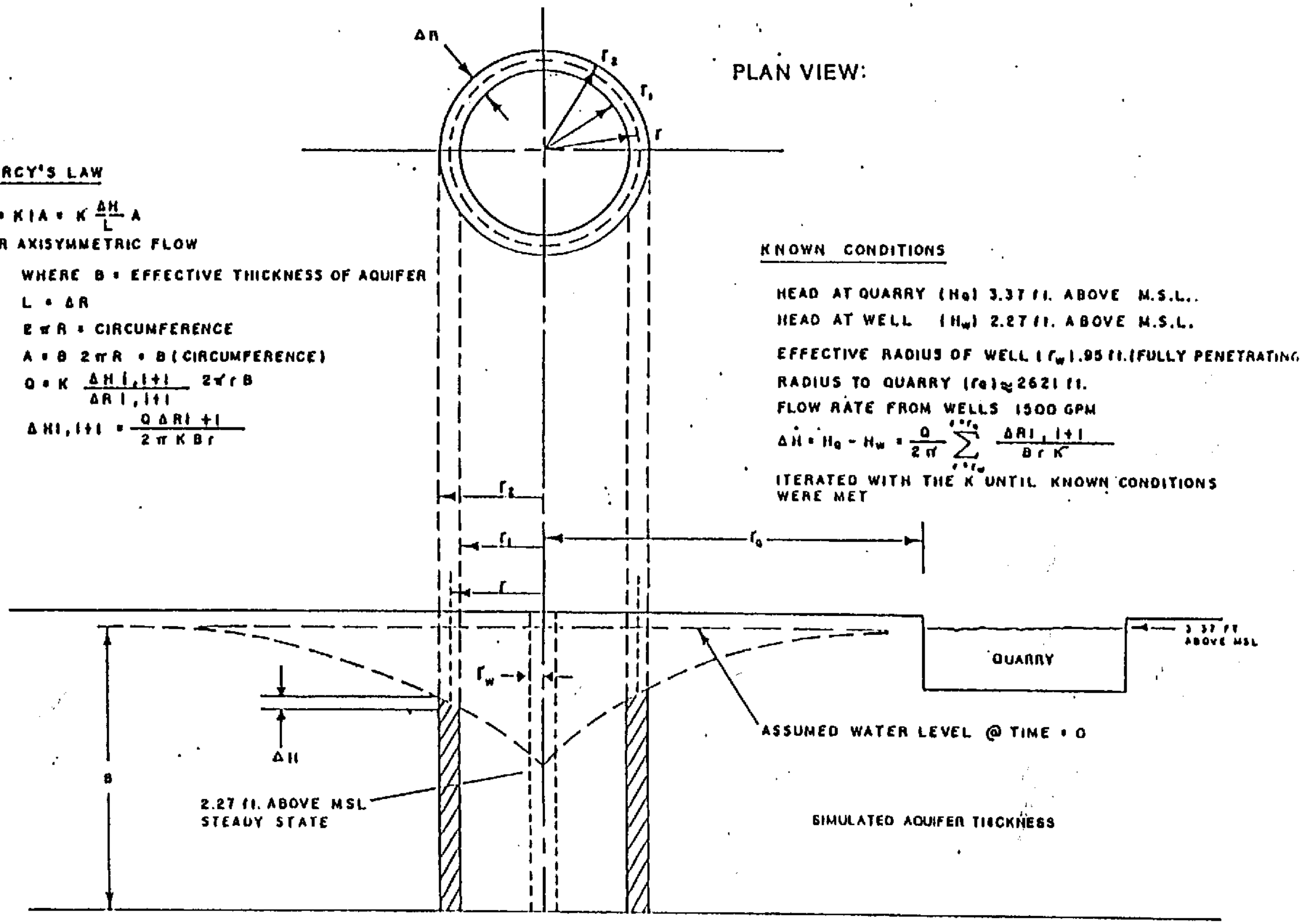
DARCY'S LAW FOR AXISYMMETRIC FLOW



DARCY'S LAW

$Q = KIA = K \frac{\Delta H}{L} A$

FOR AXISYMMETRIC FLOW

WHERE B = EFFECTIVE THICKNESS OF AQUIFER

$L = \Delta R$

$E \pi R$ = CIRCUMFERENCE

$A = B\ 2\pi R = B$ (CIRCUMFERENCE)

$Q = K \frac{\Delta H_{i,i+1}}{\Delta R_{i,i+1}} 2\pi r B$

$\Delta H_{i,i+1} = \frac{Q \Delta R_{i+1}}{2\pi K B r}$

KNOWN CONDITIONS

HEAD AT QUARRY (H_q) 3.37 ft. ABOVE M.S.L..

HEAD AT WELL (H_w) 2.27 ft. ABOVE M.S.L.

EFFECTIVE RADIUS OF WELL (r_w) .95 ft. (FULLY PENETRATING)

RADIUS TO QUARRY (r_q) ≈ 2621 ft.

FLOW RATE FROM WELLS 1500 GPM

$\Delta H = H_q - H_w = \frac{Q}{2\pi} \sum_{i=r_w}^{i=r_q} \frac{\Delta R_{i,i+1}}{B r K}$

ITERATED WITH THE K UNTIL KNOWN CONDITIONS
WERE MET

CROSS-SECTION FOR COMPUTER OUTPUT
EAST-WEST

COMPUTER MODEL
FOR RINKER MATERIALS

PROJECT: RINKER MATERIALS CORP.
LOCATION: MIAMI, FLORIDA

DAMES & MOO
FIGURE 2

Table 1
Projected Drawdown & Travel Times
Binker Materials Corporation Site
Miami, Dade County, Florida

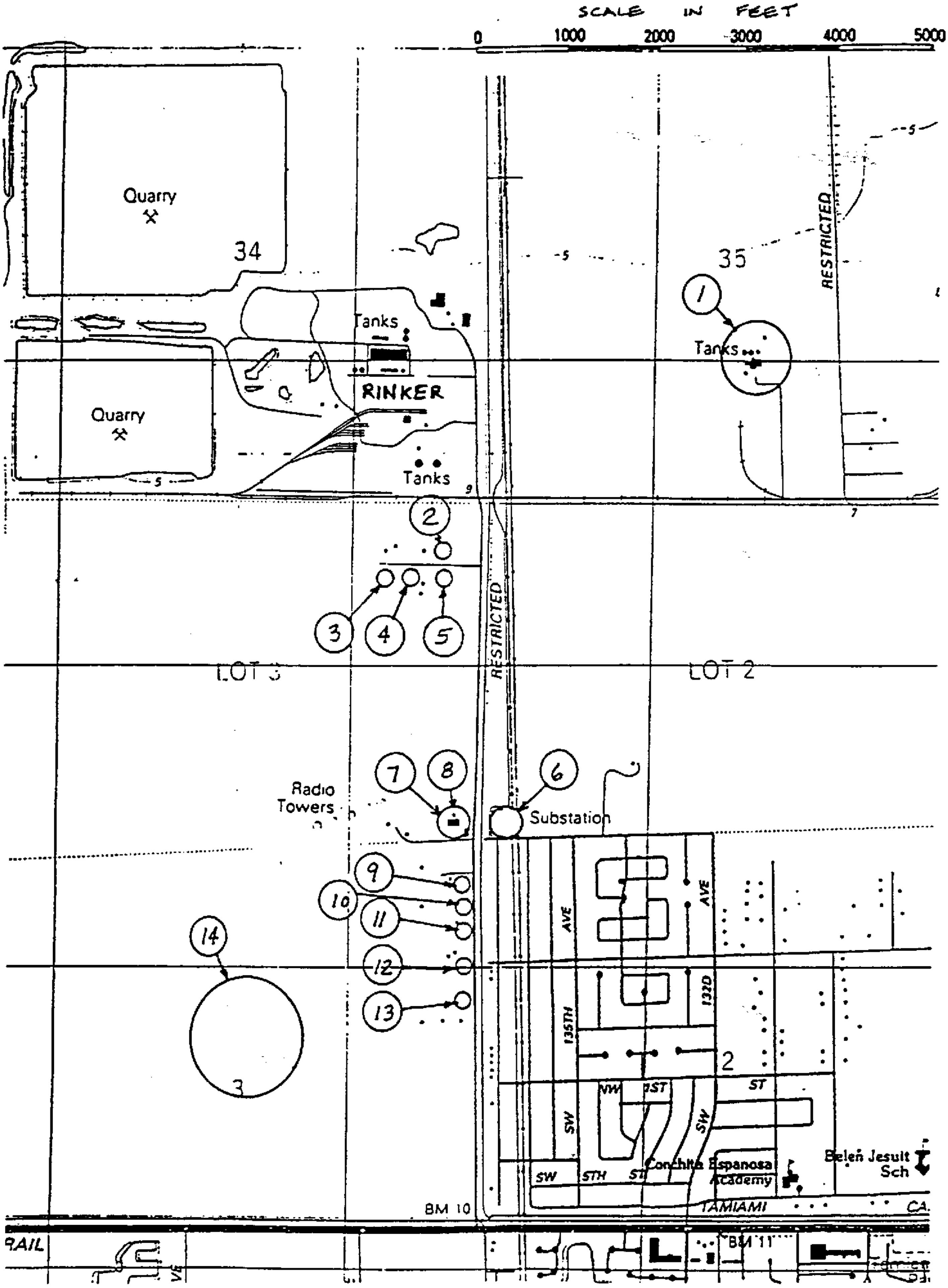
Initial Radius	:	0.67 (feet)
Delta R	:	5.0 (feet)
Flow rate	:	1500.00 (gpm)
Permeability	:	10300.0 (feet/day)
Thickness	:	100.0 (feet)

Inside Radius (feet)	Delta R (feet)	Average Radius (feet)	Average Perimeter (feet)	Thickness Area (feet)	Delta H round (feet)	Slope (-)	Drawdown (feet)	Time to Well (days)
0.7	0.1	0.7	4.4	100.0				
0.7	0.1	0.8	5.0	100.0	0.0039	0.03912	0.29	[illegible]
0.8	0.1	0.9	5.6	100.0	0.0043	0.04338	0.29	[illegible]
0.9	0.1	1.0	6.3	100.0	0.0039	0.02854	0.28	[illegible]
1.0	0.1	1.1	6.9	100.0	0.0035	0.03467	0.27	[illegible]
1.1	0.1	1.2	7.5	100.0	0.0032	0.03151	0.27	[illegible]
1.2	0.2	1.3	8.5	100.0	0.0029	0.01444	0.27	[illegible]
1.4	0.2	1.5	9.7	100.0	0.0051	0.02566	0.26	[illegible]
1.6	0.2	1.7	11.0	100.0	0.0045	0.02224	0.25	[illegible]
1.8	0.2	1.9	12.2	100.0	0.0040	0.01978	0.25	[illegible]
2.0	0.2	2.1	13.5	100.0	0.0036	0.01775	0.25	[illegible]
2.2	0.5	2.5	15.7	100.0	0.0032	0.00644	0.25	[illegible]
2.7	0.5	3.0	18.8	100.0	0.0059	0.01184	0.24	[illegible]
3.2	0.5	3.5	22.0	100.0	0.0058	0.01153	0.24	[illegible]
3.7	0.5	4.0	25.1	100.0	0.0049	0.00988	0.23	[illegible]
4.2	0.5	4.5	28.3	100.0	0.0043	0.00865	0.23	[illegible]
4.7	0.5	5.0	31.4	100.0	0.0038	0.00763	0.22	[illegible]
5.2	1.0	5.7	36.1	100.0	0.0035	0.00346	0.22	[illegible]
6.2	1.0	6.7	42.4	100.0	0.0060	0.00601	0.21	[illegible]
7.2	1.0	7.7	48.7	100.0	0.0051	0.00512	0.21	[illegible]
8.2	1.0	8.7	55.0	100.0	0.0045	0.00445	0.20	[illegible]
9.2	1.0	9.7	61.2	100.0	0.0040	0.00395	0.20	[illegible]
10.2	1.0	10.7	67.5	100.0	0.0035	0.00355	0.19	[illegible]
11.2	2.0	12.2	75.9	100.0	0.0032	0.00151	0.19	[illegible]
13.2	2.0	14.2	89.5	100.0	0.0055	0.00282	0.19	[illegible]
15.2	2.0	16.2	102.1	100.0	0.0049	0.00243	0.18	0.3[illegible]
17.2	2.0	18.2	114.5	100.0	0.0043	0.00213	0.18	0.4[illegible]
19.2	2.0	20.2	127.2	100.0	0.0038	0.00189	0.17	0.4[illegible]
21.2	5.0	23.7	149.2	100.0	0.0034	0.00063	0.17	1.[illegible]
26.2	5.0	28.7	180.6	100.0	0.0073	0.00146	0.17	1.[illegible]
31.2	5.0	33.7	212.0	100.0	0.0060	0.00120	0.15	1.[illegible]
36.2	5.0	38.7	243.5	100.0	0.0051	0.00102	0.15	1.[illegible]
41.2	10.0	46.2	290.5	100.0	0.0045	0.00045	0.15	1.[illegible]
51.2	10.0	56.2	353.4	100.0	0.0075	0.00075	0.14	4.[illegible]
61.2	10.0	66.2	416.2	100.0	0.0061	0.00061	0.14	5.[illegible]
71.2	10.0	76.2	479.1	100.0	0.0052	0.00052	0.13	7.[illegible]
81.2	10.0	86.2	541.9	100.0	0.0045	0.00045	0.12	[illegible]
91.2	10.0	96.2	604.7	100.0	0.0040	0.00040	0.12	10.[illegible]
101.2	20.0	111.2	699.0	100.0	0.0036	0.00011	0.12	13.[illegible]
121.2	20.0	131.2	824.6	100.0	0.0062	0.00031	0.11	[illegible]
141.2	20.0	151.2	950.1	100.0	0.0053	0.00025	0.11	[illegible]
161.2	20.0	171.2	1075.9	100.0	0.0046	0.00023	0.10	[illegible]
181.2	20.0	191.2	1201.5	100.0	0.0040	0.00020	0.10	42.[illegible]
201.2	20.0	211.2	1327.3	100.0	0.0036	0.00018	0.09	[illegible]
221.2	20.0	[illegible]	[illegible]	100.0	[illegible]	[illegible]	[illegible]	[illegible]

271.2	50.0	296.2	1861.4	100.0	0.0070	0.00014	0.39	115.4
321.2	50.0	346.2	2175.5	100.0	0.0058	0.00012	0.38	158.5
371.2	50.0	396.2	2489.7	100.0	0.0050	0.00010	0.37	206.2
421.2	50.0	446.2	2803.9	100.0	0.0044	0.00009	0.37	249.4
471.2	50.0	496.2	3118.0	100.0	0.0039	0.00008	0.36	297.3
521.2	50.0	546.2	3432.2	100.0	0.0035	0.00007	0.35	351.5
571.2	50.0	596.2	3746.3	100.0	0.0032	0.00006	0.35	411.0
621.2	50.0	646.2	4060.5	100.0	0.0029	0.00006	0.35	475.2
671.2	50.0	696.2	4374.6	100.0	0.0027	0.00005	0.35	546.3
721.2	50.0	746.2	4688.8	100.0	0.0025	0.00005	0.35	622.0
771.2	50.0	796.2	5003.0	100.0	0.0023	0.00005	0.34	703.4
821.2	50.0	846.2	5317.1	100.0	0.0022	0.00004	0.34	790.1
871.2	50.0	896.2	5631.3	100.0	0.0020	0.00004	0.34	882.1
921.2	50.0	946.2	5945.4	100.0	0.0019	0.00004	0.34	979.5
971.2	50.0	996.2	6259.5	100.0	0.0018	0.00004	0.34	1082.6
1021.2	50.0	1046.2	6573.8	100.0	0.0017	0.00003	0.33	1191.2
1071.2	50.0	1096.2	6887.9	100.0	0.0017	0.00003	0.33	1304.5
1121.2	50.0	1146.2	7202.1	100.0	0.0016	0.00003	0.33	1424.2
1171.2	50.0	1196.2	7516.2	100.0	0.0015	0.00003	0.32	1548.3
1221.2	50.0	1246.2	7830.4	100.0	0.0014	0.00003	0.33	1678.3
1271.2	50.0	1296.2	8144.5	100.0	0.0014	0.00003	0.33	1814.5
1321.2	50.0	1346.2	8458.7	100.0	0.0013	0.00003	0.33	1955.5
1371.2	50.0	1396.2	8772.9	100.0	0.0013	0.00003	0.32	2102.0
1421.2	50.0	1446.2	9087.0	100.0	0.0012	0.00002	0.32	2253.9
1471.2	50.0	1496.2	9401.2	100.0	0.0012	0.00002	0.32	2411.2
1521.2	50.0	1546.2	9715.4	100.0	0.0012	0.00002	0.32	2574.0
1571.2	50.0	1596.2	10029.5	100.0	0.0011	0.00002	0.32	2742.3
1621.2	50.0	1646.2	10343.7	100.0	0.0011	0.00002	0.32	2915.3
1671.2	50.0	1696.2	10657.8	100.0	0.0010	0.00002	0.32	3095.0
1721.2	50.0	1746.2	10972.0	100.0	0.0010	0.00002	0.32	3279.5
1771.2	50.0	1796.2	11286.2	100.0	0.0010	0.00002	0.31	3468.5
1821.2	50.0	1846.2	11600.3	100.0	0.0010	0.00002	0.31	3664.3
1871.2	50.0	1896.2	11914.5	100.0	0.0009	0.00002	0.31	3865.7
1921.2	50.0	1946.2	12228.6	100.0	0.0009	0.00002	0.31	4073.0
1971.2	50.0	1996.2	12542.8	100.0	0.0009	0.00002	0.31	4285.8
2021.2	50.0	2046.2	12856.9	100.0	0.0009	0.00002	0.31	4504.0
2071.2	50.0	2096.2	13171.1	100.0	0.0008	0.00002	0.31	4727.6
2121.2	50.0	2146.2	13485.3	100.0	0.0008	0.00002	0.31	4951.5
2171.2	50.0	2196.2	13799.4	100.0	0.0008	0.00002	0.31	5185.1
2221.2	50.0	2246.2	14113.6	100.0	0.0008	0.00002	0.31	5424.1
2271.2	50.0	2296.2	14427.7	100.0	0.0008	0.00002	0.31	5668.4
2321.2	50.0	2346.2	14741.9	100.0	0.0008	0.00002	0.30	5919.0
2371.2	50.0	2396.2	15056.1	100.0	0.0007	0.00001	0.30	6173.5
2421.2	50.0	2446.2	15370.2	100.0	0.0007	0.00001	0.30	6434.2
2471.2	50.0	2496.2	15684.4	100.0	0.0007	0.00001	0.30	6700.3
2521.2	50.0	2546.2	15998.5	100.0	0.0007	0.00001	0.30	6971.3
2571.2	50.0	2596.2	16312.7	100.0	0.0007	0.00001	0.30	7248.3
2621.2	50.0	2646.2	16626.8	100.0	0.0007	0.00001	0.30	7531.4

ATTACHMENT B

PRIVATE WELL LOCATIONS
NUMBERED 1 - 14



KNOWN DETAILS OF PRIVATE WELLS, KEYED BY NUMBER TO MAP:

MAP # 1. Owner: Florida Transport
1301 NW 14th ST, Miami
305 592 6927
Operates 1 well; 4-6-inches diameter; depth ±60 feet; pumps 9,000 gallons/day.

MAP # 2. Owner: United Dump Trucks
unnamed road to W. of 137th Ave, Mi
305 822 3831
No known wells; may have well.

MAP # 3. Owner: Unknown
Operates one well on property; details unknown.

MAP # 4. Owner: H & R Land Clearing and Demolition
unnamed road W. of 137th Ave, Miami
305-266-4266
No known wells on property; may have well.

MAP # 5. Owner: Miami Rental Equipment
unnamed rodd W. of 137th Ave, Miami
305 264 3647
No wells on this property

MAP # 6. Owner: F P & L
13675 NW 6TH ST., Miami
305 552 4050
Operates one well; 4-inch diameter, depth unknown; well used to irrigate about 3 acres; max short-term pumping rate is 80 to 100 gpm.

MAP # 7 and 8. Owner: Eagle Crest Storage and
Dade Co. School Bus Storage (Mr. Shelby Strictland,
13775 NW 6TH ST.
305 552 5555
Operates one well; 4-inch diameter; depth 30 feet; pumping rate is unknown

MAP # 9. Owner: Azpetia Trucking
550 NW 137 Ave, Miami
305 226 7484
No known wells; well may exist

MAP # 10. Owner: Walter Lista
450 NW 137TH Ave, Miami
305 551 7888
No known wells; well may exist.

MAP # 11 and 12. Unused properties; no known wells.

MAP # 13. Owner: Volunteer Construction Co.
90 NW 137th Ave
— a "for lease" sign shows 305 593 2071
No known wells; well may exist; site not currently in use.

MAP # 14. Owner: Osprey Agricultural Services
8255 NW 58th St, Miami
305 592 0194
Operates four wells for irrigation; each is 2-inch diameter; depth is 20 feet; max short term pumping rate is 50gpm per well.