HARDEE
POWER
STATION

SITE CERTIFICATION APPLICATION/ ENVIRONMENTAL ASSESSMENT

VOLUME 2

APPENDICES

SUBMITTED BY:

TECO POWER SERVICES

TAMPA ELECTRIC COMPANY

SEMINOLE ELECTRIC
COOPERATIVE, INC.

Please print or type in the unshaded areas only
(fill—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved. OMB No. 2040-0086 Approval expires 7-31-88

FORM 1 GENERAL **EPA**

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F | | T/A C | D

LABEL ITEMS

- I. EPA I.D. NUMBER
- FACILITY NAME
- V. FACILITY MAILING ADDRESS
- VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill—in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill—in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold—faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge to waters of the U.S.**? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge to waters of the U.S.**? (FORM 2B)		X	
C. Is this a facility which currently results in **discharges to waters of the U.S.** other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge to waters of the U.S.**? (FORM 2D)	X		X
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X		J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)	X		X+

III. NAME OF FACILITY

1 SKIP HARDEE POWER STATION-TECO POWER SERVICES

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 JERRY L WILLIAMS, DIRECTOR ENV*	813 228 4111

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 702 N FRANKLIN STREET

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 TAMPA	FL	33602

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 COUNTY ROAD 663

B. COUNTY NAME

RDEE

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 FORT GREEN	FL	33834	

EPA Form 3510-1 (Rev. 10-80)

\+ See Section 11.1.4 of SCA/EA for PSD application.

* See attached authorization form.

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST	**B. SECOND**
C 7 4911 *(specify)* Electric Generation	C 7 *(specify)*
C. THIRD	**D. FOURTH**
(specify)	C 7 *(specify)*

VIII. OPERATOR INFORMATION

A. NAME

C 8 TECO POWER SERVICES CORP

B. Is the name listed in Item VIII-A also the owner? ☐ YES ☐ NO *

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other", specify.)*

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC *(other than federal or state)*
O = OTHER *(specify)*

P *(specify)*

D. PHONE *(area code & no.)*

C A 813 228 4111

E. STREET OR P.O. BOX

702 N FRANKLIN STREET

F. CITY OR TOWN C 8 TAMPA

G. STATE FL

H. ZIP CODE 33602

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*	**D. PSD** *(Air Emissions from Proposed Sources)*
C T I 9 N NONE	C T I 9 P NONE
B. UIC *(Underground Injection of Fluids)*	**E. OTHER** *(specify)*
C T I 9 U NONE	C T I 9 NONE *(specify)*
C. RCRA *(Hazardous Wastes)*	**E. OTHER** *(specify)*
C T I R NONE	C T I 9 NONE *(specify)*

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS *(provide a brief description)*

Proposed 660 MW Combined Cycle Electric Generating Facility. See Section 3.0 of the SCA/EA for project description, including information regarding the cooling reservoir construction and operation.

XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*
Richard E. Ludwig
President, TECO Power Services Corp.

B. SIGNATURE
R E Ludwig

C. DATE SIGNED
7/26/89

COMMENTS FOR OFFICIAL USE ONLY

C

EPA Form 3510-1 (Rev. 10-80) Reverse

* See Section 1.0 of SCA/EA for project ownership description.

☆ U.S. Government Printing Office : 1985 - 486-785/32991

Please type or print in the unshaded areas only	EPA ID Number *(copy from Item 1 of Form 1)*	*Form Approved* *OMB No 2040-0086* *Approval expires 7-31-88*

Form **2D** NPDES

EPA New Sources and New Dischargers Application for Permit to Discharge Process Wastewater

I. Outfall Location

For each outfall, list the latitude and longitude, and the name of the receiving water

Outfall Number *(list)*	Latitude			Longitude			Receiving Water *(name)*
	Deg	Min	Sec	Deg	Min	Sec	
001	27	39	00	81	58	45	Payne Creek
002	27	38	00	81	58	15	Payne Creek

II. Discharge Date *(When do you expect to begin discharging?)*

III. Flows, Sources of Pollution, and Treatment Technologies

A. For each outfall, provide a description of (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary. (See attached outfall descriptions)

Outfall Number	1. Operations Contributing Flow *(list)*	2. Average Flow *(include units)*	3. Treatment *(Description or List Codes from Table 2D-1)*
001	Recirculation Cooling		
	Reservoir with makeup from		
	the following sources:		
	• Rainfall	2,267,000 gpd	---
	• Well water	2,372,000 gpd	---
	• Surface runoff	187,000 gpd	---
	• Seepage	375,000 gpd	---
	• Demineralization		
	Regeneration		
	Basin Effluent	57,000 gpd	Neutralization & Sedmentation
			(2-K & 1-U)
	• Oil Separator Effluent	35,000 gpd	Oil Flotation (1-H)
	• Sanitary Effluent	6,000 gpd	Biological Treatment (3-A)
			Sedimentation (1-U)
			Chlorine Disinfection (2-F)
	Continued on next page.		

Please type or print in the unshaded areas only

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Form Approved
OMB No. 2040-0086
Approval expires 7-31-88

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Outfall Number	1. Operations Contributing Flow *(list)*	2. Average Flow *(include units)*	3. Treatment *(Description or List Codes from Table 2D-1)*
	• Plant Service Water		
	Pretreatment System		
	Backwash	31,000 gpd	---
002	Plant Site Stormwater		
	Retention Pond Discharge	36,000 gpd	Sedimentation (1-U)

Outfall Descriptions

Outfall #001

Outfall #001 is an emergency overflow from the 570 acre recirculating cooling reservoir to be constructed as part of the 660 MW combined cycle power plant. This recirculating cooling reservoir will function as water supply for use in condenser cooling and heating dissipation system for the Heat Recovery Steam Generator portion of the combined cycle plant.

Water makeup to the reservoir includes: rainfall onto the reservoir; surface runoff and surficial aquifer seepage from the upland basin; treated sanitary and plant wastewaters discharged to the reservoir; and makeup water pumped from the lower Floridan Aquifer wells. Water flows out of the reservoir include: evaporation; lateral seepage through the confining berm into the surficial aquifer; leekance down through the confining layers into deeper confined aquifers; and discharges to Payne Creek.

Based on long term water balance modeling (51 years of data analysis) and HEC-1 hydraulic modeling, the proposed cooling reservoir will only discharge in cases caused by extreme or cumulative rainfall in excess of the 10- year 24-hour hydrologic event, where unavoidable to prevent loss of life, severe property damage, or damage to the physical integrity of the cooling reservoir or its structures, and twice each year to test the discharge structure.

Outfall #002

Outfall #002 is the overflow discharge from the plant site stormwater retention pond. This stormwater pond has been designed to meet all applicable Southwest Florida Water Management District and Florida Department of Environmental Regulation stormwater quantity and quality control requirements. Specifically, the pond will provide retention with filtration for runoff from the first 1 inch of rainfall, and post development peak flows will not exceed pre-development peak flows for the 25 year - 24 hour rainfall storm.

Given the proposed fuels for the proposed combined cycle plant (i.e., gas or oil), no fuel related stormwaters (e.g., coal pile runoff) will be directed to this pond. Influent plant site stormwater is expected to be similar to stormwater from other light industrial sites.

B. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item III-A. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures. Water Balance attached.

C. Except for storm runoff, leaks, or spills, will any of the discharges described in item III-A be intermittent or seasonal?

☒ Yes *(complete the following table)* ☐ No *(go to item IV)*

Outfall Number	1. Frequency		2. Flow		
	a. Days Per Week *(specify average)*	b. Months Per Year *(specify average)*	a. Maximum Daily Flow Rate *(in mgd)*	b. Maximum Total Volume *(specify with units)*	c. Duration *(in days)*
001 - Cooling reservoir	Cooling reservoir will will only discharge due to extreme or cummulative rainfall in excess of the 10-year 24-hour storm, where unavoidable to prevent loss of life, severe property damage, or damage to the physical integrity of the cooling reservoir or its structures, and twice each year to test discharge structures.		0.873 M6D (see note 1)	114 acre-feet	30 days (see note 1)

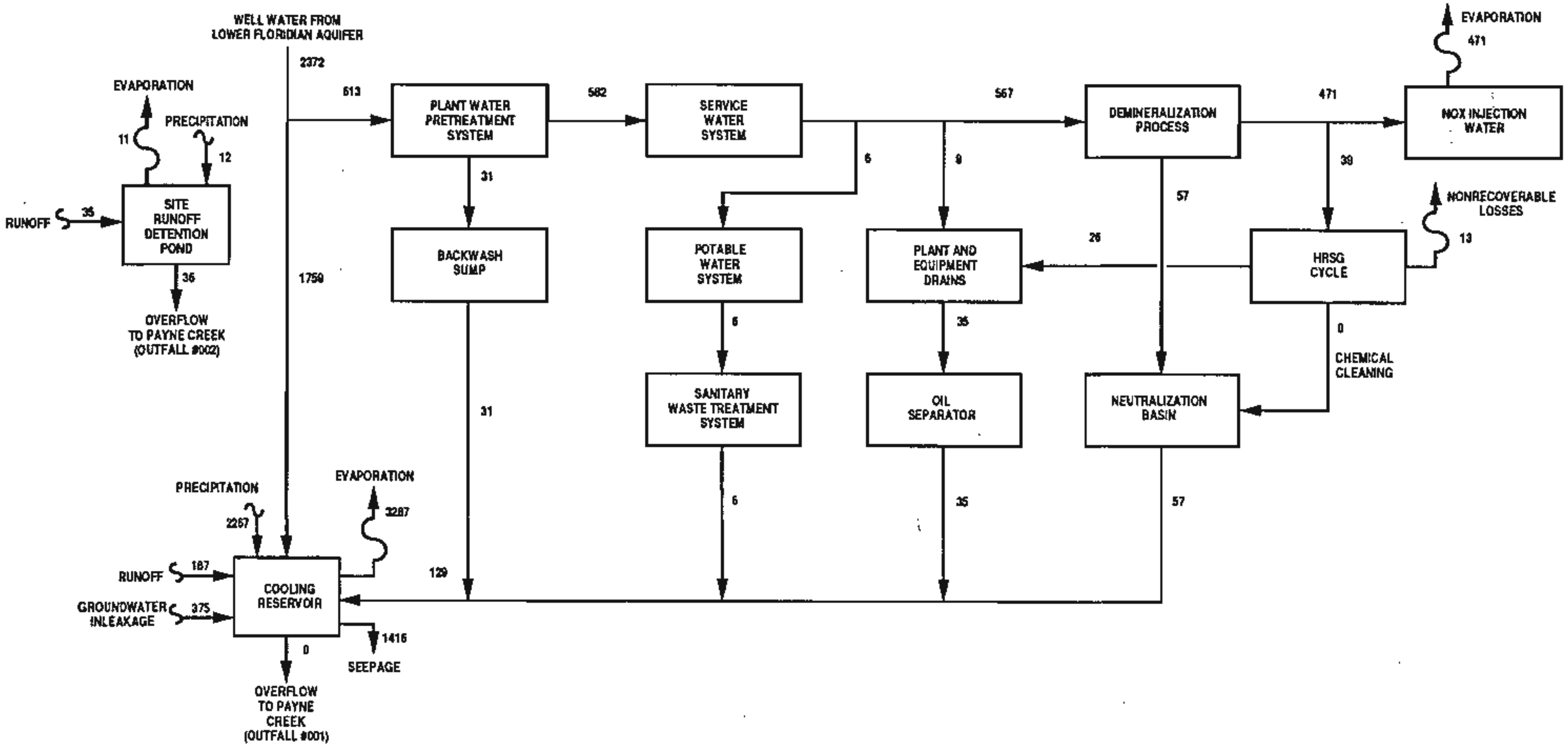
Note 1: Flow estimates are based on the 25-year 24-hour rainfall.

IV. Production

If there is an applicable production-based effluent guideline or NSPS, for each outfall list the estimated level of production (projection of actual production level, not design), expressed in the terms and units used in the applicable effluent guideline or NSPS, for each of the first 3 years of operation. If production is likely to vary, you may also submit alternative estimates (attach a separate sheet).

Year	a. Quantity Per Day	b. Units of Measure	c. Operation, Product, Material, etc *(specify)*

CONTINUE ON NEXT PAGE



NOTES: 1. FLOWS ARE EXPRESSED AS 1000 GALLONS PER DAY.
2. FLOWS ARE FOR 660 MW PLANT.

WATER MASS BALANCE: ANNUAL AVERAGE MAKEUP

Hardee Power Station

CONTINUED FROM THE FRONT	EPA ID Number *(copy from Item 1 of Form 1)*	Outfall Number 001 & 002

V. Effluent Characteristics

A, and B: These items require you to report estimated amounts *(both concentration and mass)* of the pollutants to be discharged from each of your outfalls. Each part of this item addresses a different set of pollutants and should be completed in accordance with the specific instructions for that part. Data for each outfall should be on a separate page. Attach additional sheets of paper if necessary.

General Instructions *(See table 2D-2 for Pollutants)*

Each part of this item requests you to provide an estimated daily maximum and average for certain pollutants and the source of information. Data for all pollutants in Group A, for all outfalls, must be submitted unless waived by the permitting authority. For all outfalls, data for pollutants in Group B should be reported only for pollutants which you believe will be present or are limited directly by an effluent limitations guideline or NSPS or indirectly through limitations on an indicator pollutant.

1. Pollutant	2. Maximum Daily Value *(include units)*	3. Average Daily Value *(include units)*	4. Source *(see instructions)*
See Table V-1 for Outfall	#001		
See Table V-2 for Outfall	#002		

Table V-1. Estimated Cooling Reservoir Discharge (Outfall #001) Effluent Water Quality (Page 1 of 2)

Parameter	Cooling Reservoir Discharge (Outfall #001) Quality[1]	Source
Biochemical Oxygen Demand (5-day), mg/L	<5	See note 2
Chemical Oxygen Demand, mg/L	<40	
Total Organic Carbon, mg/L	NA	
Total Suspended Solids, mg/L	<25	
Flow, cfs	see note 3	
Ammonia Nitrogen, mg/L	0.4	
Temperature, maximum summer, °C	35	
Temperature, average summer, °C	32	
Temperature, maximum winter, °C	23	
Temperature, average winter, °C	18	
pH, units	6-9	
Calcium, mg/L as CaCO3	220	
Magnesium, mg/L as CaCO3	100	
Sodium, mg/L as CaCO3	180	
Potassium, mg/L as CaCO3	10	
Total Hardness, mg/L as CaCO3	320	
Alkalinity, mg/L as CaCO3	230	
Sulfate, mg/L as CaCO3	230	
Chloride, mg/L as CaCO3	50	
Silca, mg/L	50	
Fluoride, mg/L	3.6	
Cyanide, mg/L	0.01	
MBAS, mg/L	0.316	
Oil and Grease, mg/L	<5	
Turbidity, NTU	32	
Total Dissolved Solids, mg/L	798	
Specific Conductivity, umhos/cm	980	
Total Kjeldahl Nitrogen, mg/L	0.8	
Unionized Ammonia, mg/L (4)	0.014	
Organic Nitrogen, mg/L	0.4	
Nitrate+Nitrite-Nitrogen, mg/L	0.1	
Total Nitrogen, mg/L	0.9	
Orthophosphorus, mg/L	0.7	
Total Phosphorus, mg/L	1.1	

Table V-1. Estimated Cooling Reservoir Discharge (Outfall #001) Effluent Water Quality (Page 2 of 2)

Parameter	Cooling Reservoir Discharge (Outfall #001) Quality[1]	Source
Arsenic, ug/L	20	See note 2
Barium, ug/L	130	
Beryllium, ug/L	4.5	
Cadmium, ug/L	2.8	
Chromium, ug/L	26	
Copper, ug/L	30	
Iron, ug/L	1200	
Lead, ug/L	26	
Manganese, ug/L	44	
Mercury, ug/L	0.4	
Nickel, ug/L	45	
Selenium, ug/L	29	
Silver, ug/L	0.7	
Strontium, ug/L	540	
Zinc, ug/L	250	
Alpha, Gross (pC/L)	22.1	
Radium 226 (pC/L)	5.6	

Notes: 1. Reservoir effluent estimates are based on mass balances and do not take into account any chemical reaction, precipitation, sedimentation, deposition or biological activity which may occur in the reservoir and act to remove material from the water column and thus reduce reservoir concentrations. Estimated values are average values unless otherwise noted.

2. All parameter concentrations were estimated based on engineering studies (Source Code 1) and Best Professional Estimates (Source Code 4).

3. Discharge will only occur in cases caused by extreme or cumulative rainfall in excess of the 10-year 24-hour hydrologic event, where unavoidable to prevent loss of life, severe property damage, or damage to the physical integrity of the cooling reservoir or its structures, and twice each year to test the discharge structure.

4. Unionized ammonia concentrations are based on a worst case reservoir water temperature of 95°F (35°C).

Table V-2. Estimated Stormwater Detention Pond Discharge (Outfall #002) Water Quality (Page 1 of 2)

Parameter	Stormwater Detention Pond Discharge (Outfall #002) Quality	Source
Biochemical Oxygen Demand (5-day), mg/L	<5	
Chemical Oxygen Demand, mg/L	<50	
Total Organic Carbon, mg/L	NA	
Total Suspended Solids, mg/L	<25	
Ammonia N, mg/L	0.5	
Flow, gallons/day	36,000	
Temperature, Average Winter, °C	18	
Temperature, Average Summer, °C	32	
pH	6-9	
Calcium, mg/L as CaCO3	63	See note 1
Magnesium, mg/L as CaCO3	39	
Sodium, mg/L as CaCO3	17	
Potassium, mg/L as CaCO3	0	
Alkalinity, mg/L as CaCO3	61	
Sulfate, mg/L as CaCO3	37	
Chloride, mg/L as CaCO3	21	
Silca, mg/L	5.4	
Fluoride, mg/L	1.0	
Cyanide, mg/L	<0.004	
Methylene Blue Active Substances, mg/L	0.040	
Oil and Grease, mg/L	<5	

Table V-2. Estimated Stormwater Detention Pond Discharge (Outfall #002) Water Quality (Page 2 of 2)

Parameter	Stormwater Detention Pond Discharge (Outfall #002) Quality	Source
pH, units	7	See note 1
Total Dissolved Solids, mg/L	190	
Specific Conductivity, umhos/cm	173	
Total Kjeldahl Nitrogen, mg/L	0.74	
Ammonia Nitrogen, mg/L	0.11	
Orgainic Nitrogen, mg/L	0.65	
Nitrate+Nitrite-Nitrogen, mg/L	0.50	
Total Nitrogen, mg/L	1.24	
Orthophosphorus, mg/L	0.41	
Total Phosphorus, mg/L	0.44	
Arsenic, ug/L	<5	
Barium, ug/L	<10	
Beryllium, ug/L	<3	
Cadmium, ug/L	<0.4	
Chromium, ug/L	<10	
Copper, ug/L	7	
Iron, ug/L	293	
Lead, ug/L	6.1	
Manganese, mg/L	7.9	
Mercury, ug/L	0.24	
Nickel, ug/L	16	
Selenium, ug/L	<5	
Silver, ug/L	<0.08	
Strontium, ug/L	100	
Zinc, ug/L	7.4	
Alpha, Gross (pC/L)	1.7	
Radium 226 (pC/L)	0.7	

Note: 1. All parameter concentrations were estimated based on engineering studies of Payne Creek water quality (Source Code 1) and Best Professional Estimates (Source Code 4).

CONTINUED FROM THE FRONT	EPA ID Number *(copy from Item 1 of Form 1)*	

C. Use the space below to list any of the pollutants listed in Table 2D-3 of the instructions which you know or have reason to believe will be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it will be present.

1. Pollutant	2. Reason for Discharge
Outfall #001 Strontium	Trace amounts of naturally occuring strontium have been detected in upland surface runoff (100/ug/L) and Lower Floridan aquifer well makeup water (300 ug/L). Therefore, similar trace levels can be expected in the recirculation cooling reservoir. No strontium will be used in the operation of the proposed combined cycle power plant.

VI. Engineering Report on Wastewater Treatment

A If there is any technical evaluation concerning your wastewater treatment, including engineering reports or pilot plant studies, check the appropriate box below.

☒ Report Available ☐ No Report

Engineering studies and evaluations are included as part of the Site Certification Application to the State of Florida.

B. Provide the name and location of any existing plant(s) which, to the best of your knowledge, resembles this production facility with respect to production processes, wastewater constituents, or wastewater treatments.

Name	Location
No power plant cooling reservoirs have been built on reclaimed phoshate mines.	

EPA ID Number *(copy from item one of Form 1)*

VII. Other Information *(Optional)*

Use the space below to expand upon any of the above questions or to bring to the attention of the reviewer any other information you feel should be considered in establishing permit limitations for the proposed facility. Attach additional sheets if necessary.

VIII. Certification

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

A. Name and Official Title *(type or print)*

Richard E. Ludwig
President, TECO Power Services Corp.

B. Phone No.

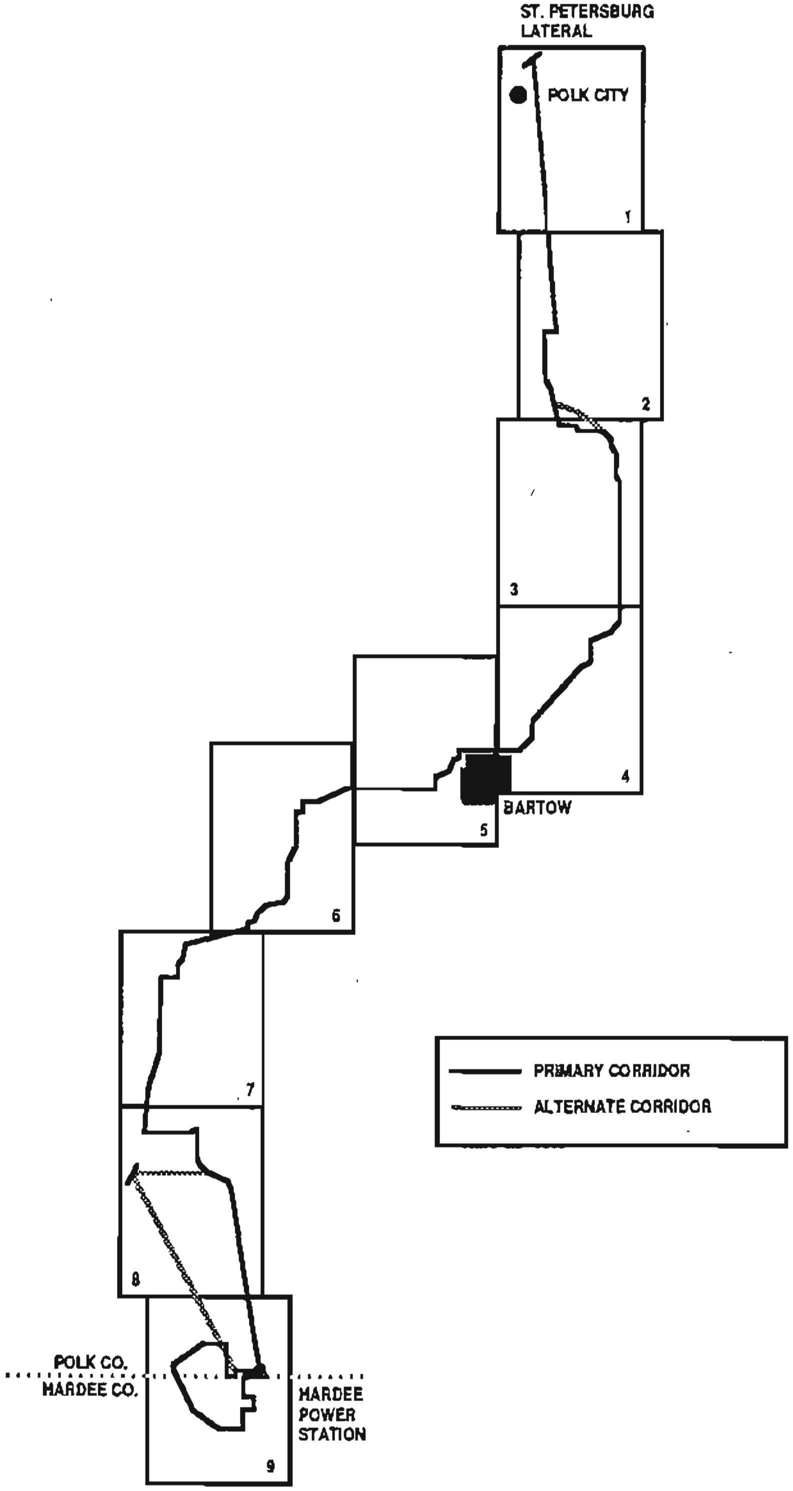
(813) 228-4111

C. Signature

D. Date Signed

7/26/89

6.2 ASSOCIATED NATURAL GAS PIPELINE ADDENDUM



INDEX TO AERIAL PHOTOS OF ASSOCIATED NATURAL GAS PIPELINE CORRIDORS

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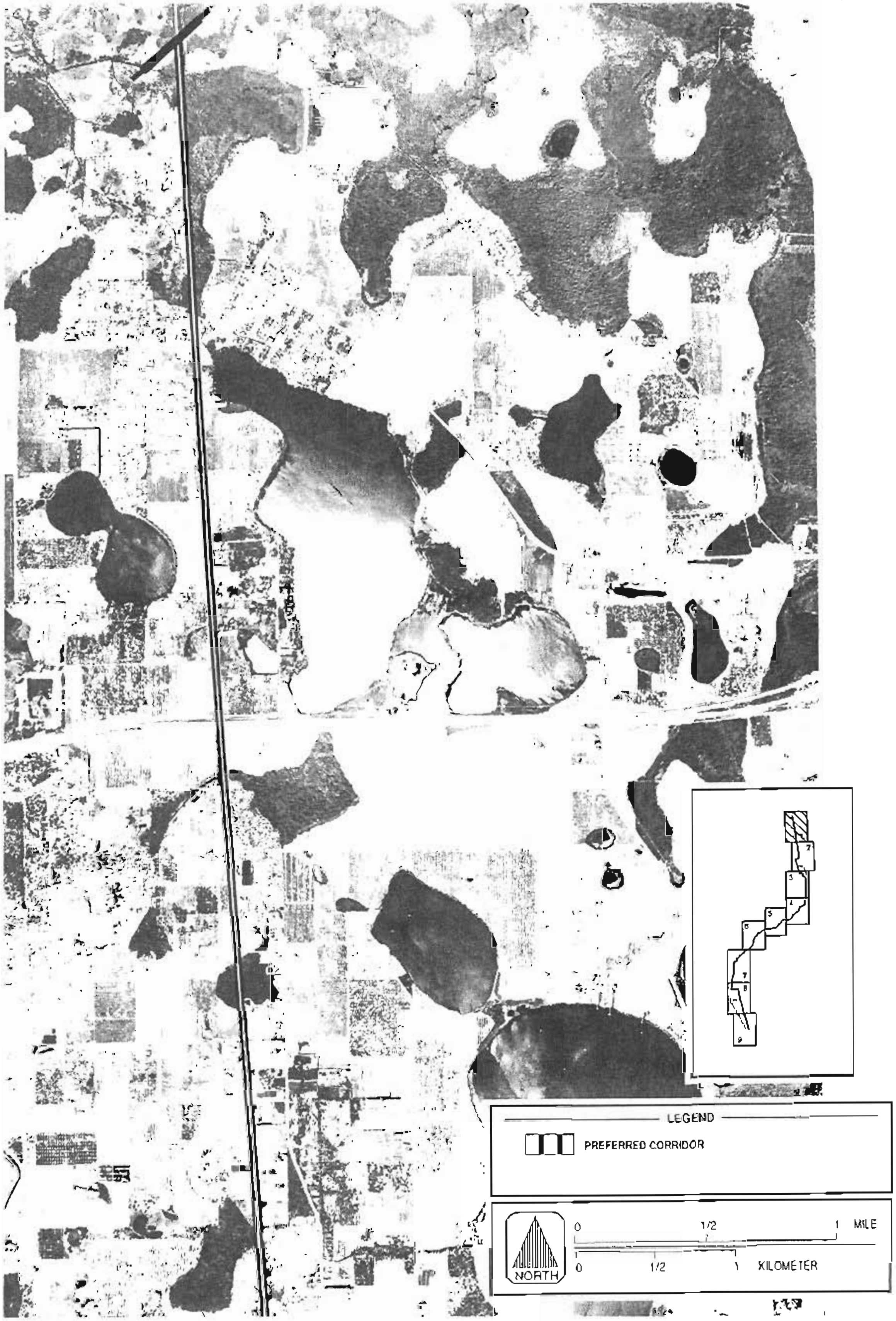
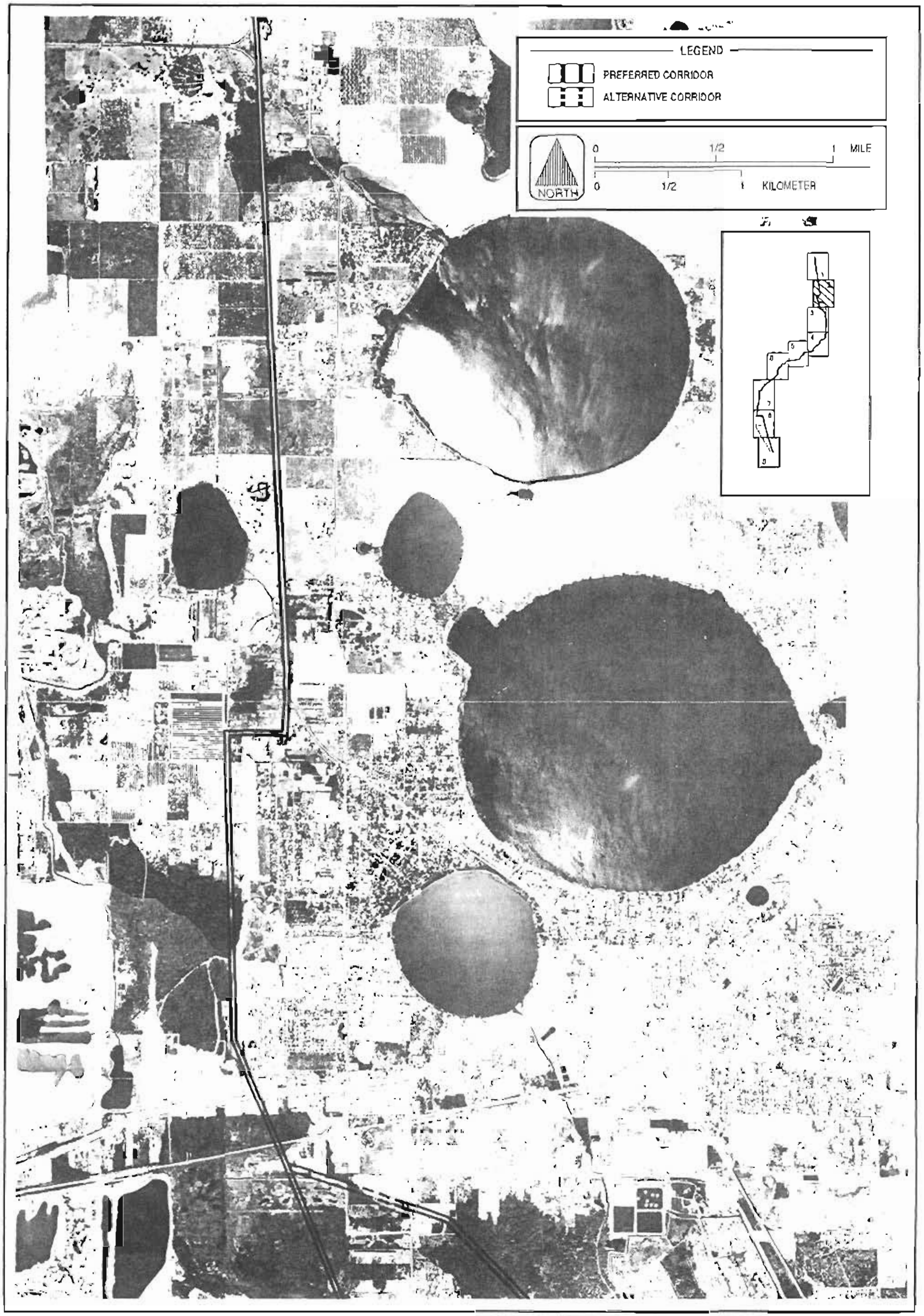


AERIAL PHOTOGRAPHS OF PROPOSED GAS PIPELINE CORRIDOR:
HARDEE POWER STATION LATERAL BEGINNING AT THE ST. PETERSBURG LATERAL
AND CONTINUING SOUTH TO PLANT SITE
(PAGE 1 OF 9)

Hardee Power Station



AERIAL PHOTOGRAPHS OF PROPOSED GAS PIPELINE CORRIDOR:
HARDEE POWER STATION LATERAL SOUTH TO PLANT SITE
(PAGE 2 OF 9)

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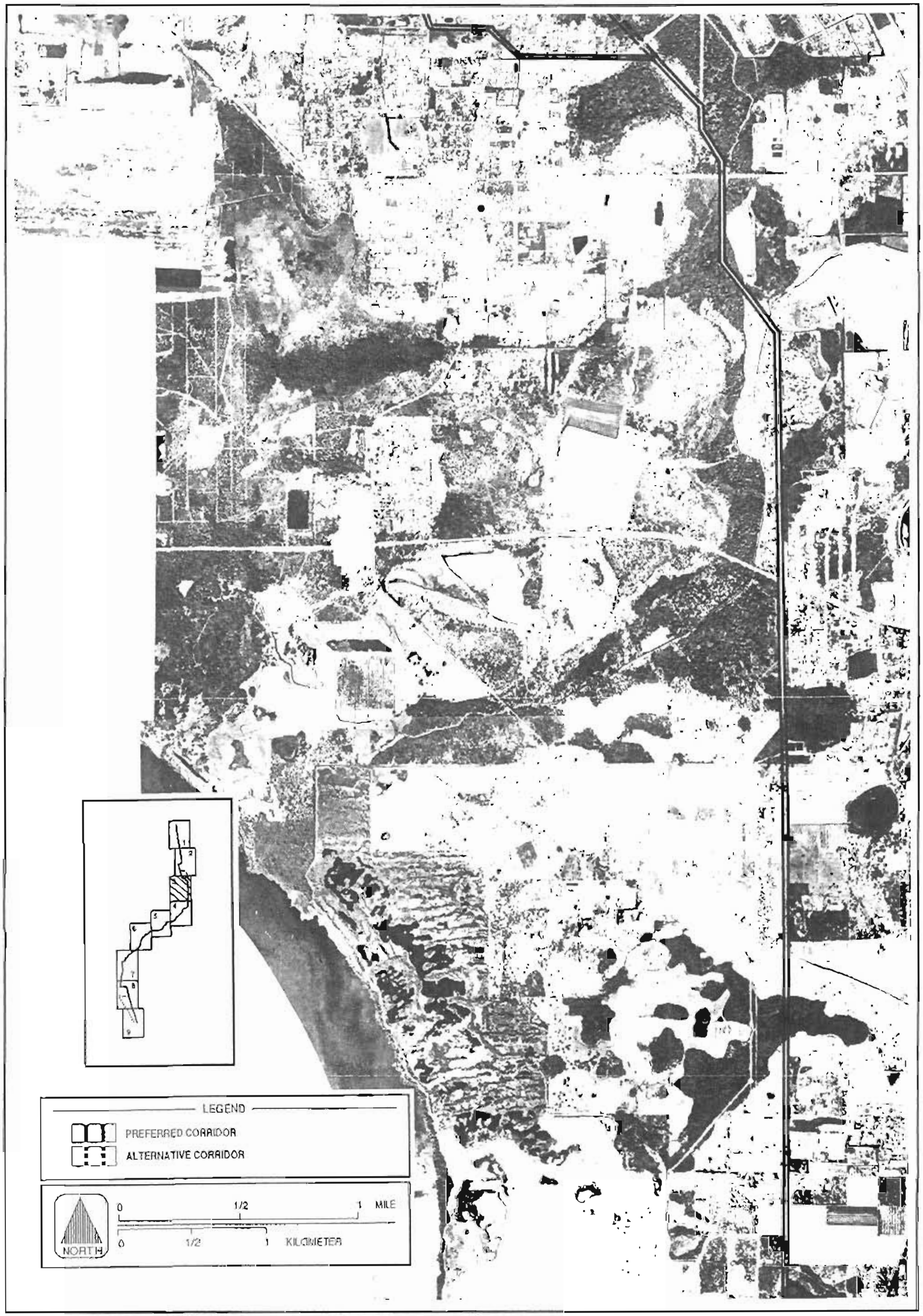
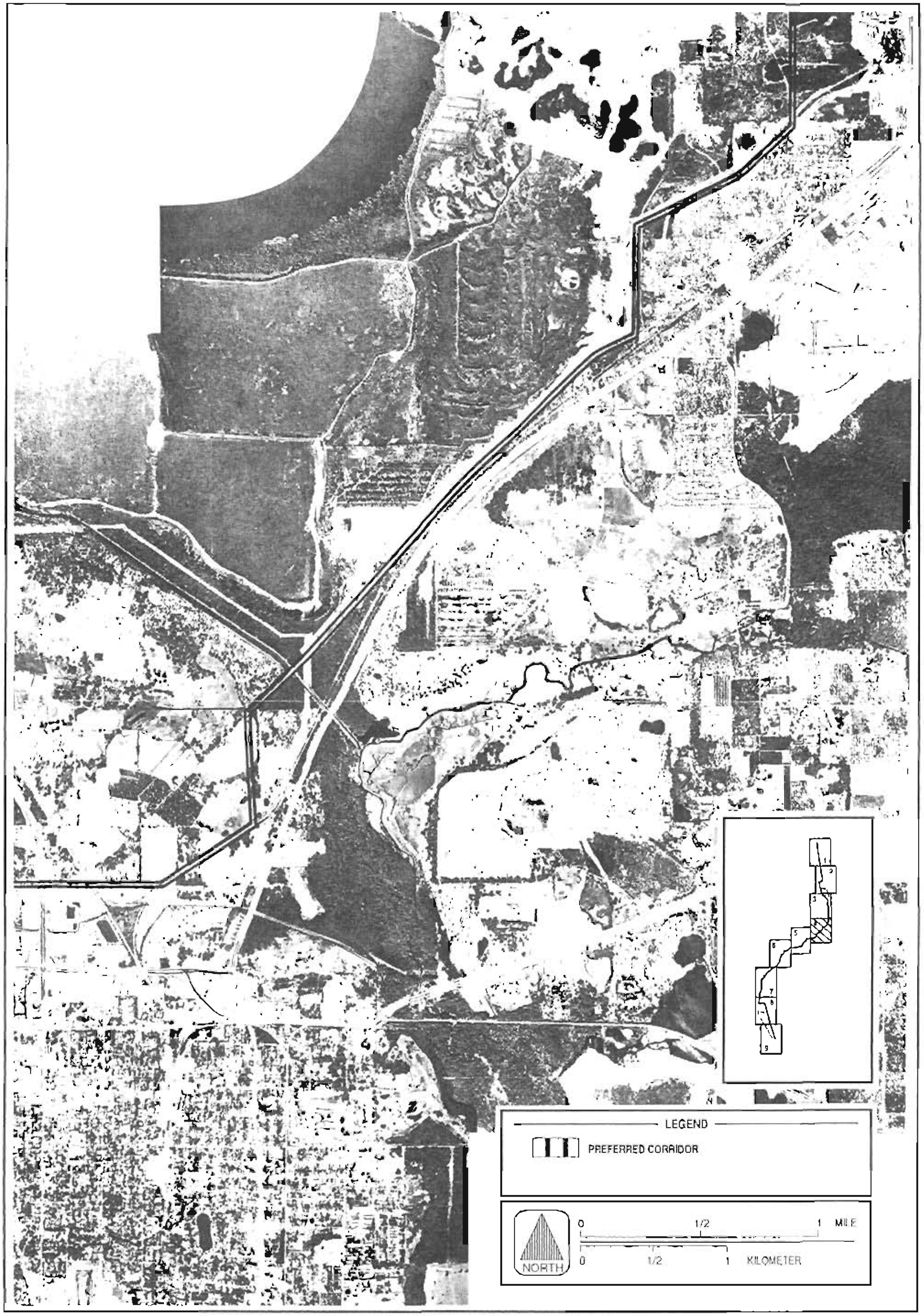
Power Station



AERIAL PHOTOGRAPHS OF PROPOSED GAS PIPELINE CORRIDOR:
HARDEE POWER STATION LATERAL SOUTH TO PLANT SITE
(PAGE 3 OF 9)

Hardee
Power Station



AERIAL PHOTOGRAPHS OF PROPOSED GAS PIPELINE CORRIDOR:
HARDEE POWER STATION LATERAL SOUTH TO PLANT SITE
(PAGE 4 OF 9)

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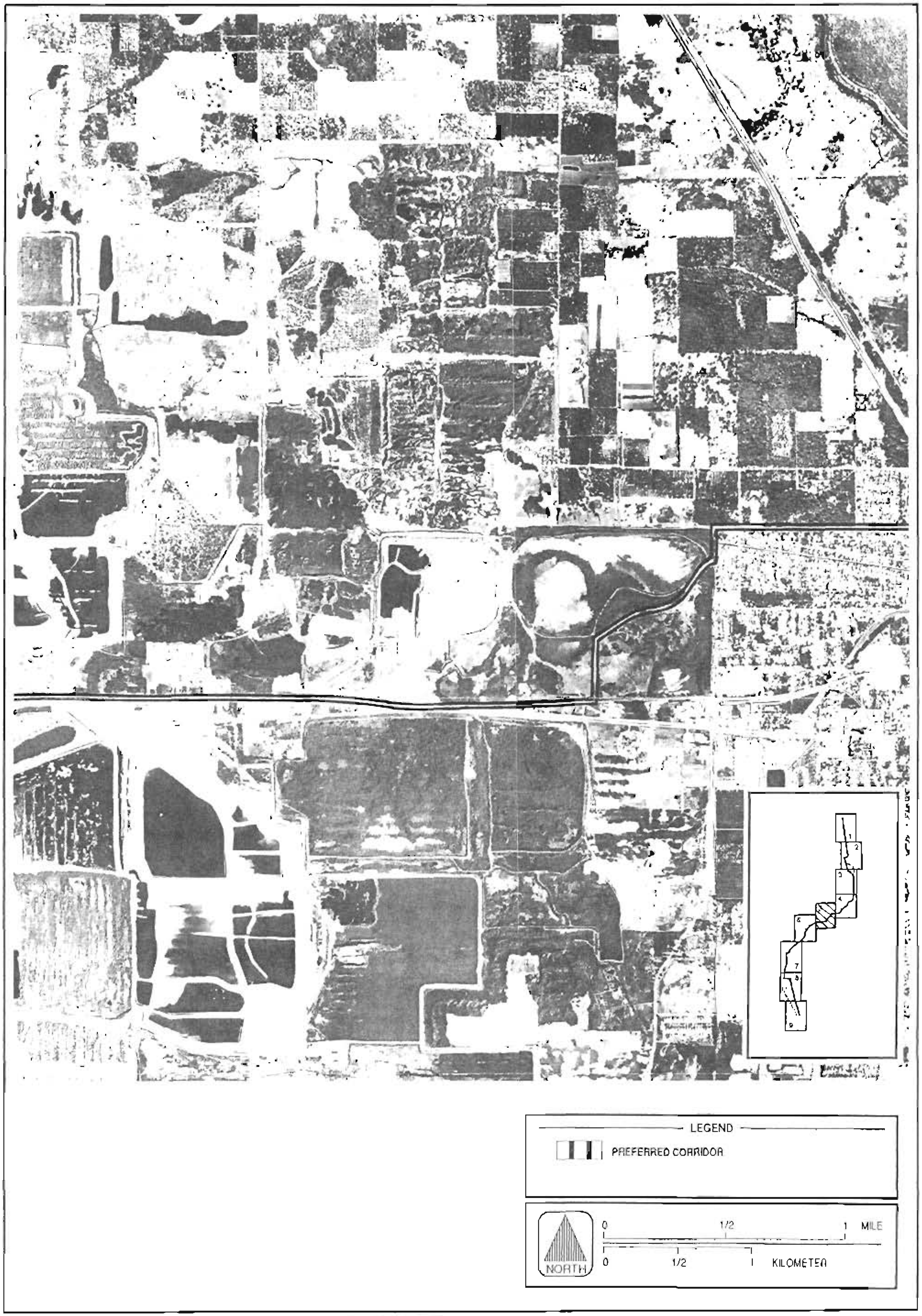

AERIAL PHOTOGRAPHS OF PROPOSED GAS PIPELINE CORRIDOR:
HARDEE POWER STATION LATERAL SOUTH TO PLANT SITE
(PAGE 5 OF 9)

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AERIAL PHOTOGRAPHS OF PROPOSED GAS PIPELINE CORRIDOR:
HARDEE POWER STATION LATERAL SOUTH TO PLANT SITE
(PAGE 6 OF 9)

Hardee
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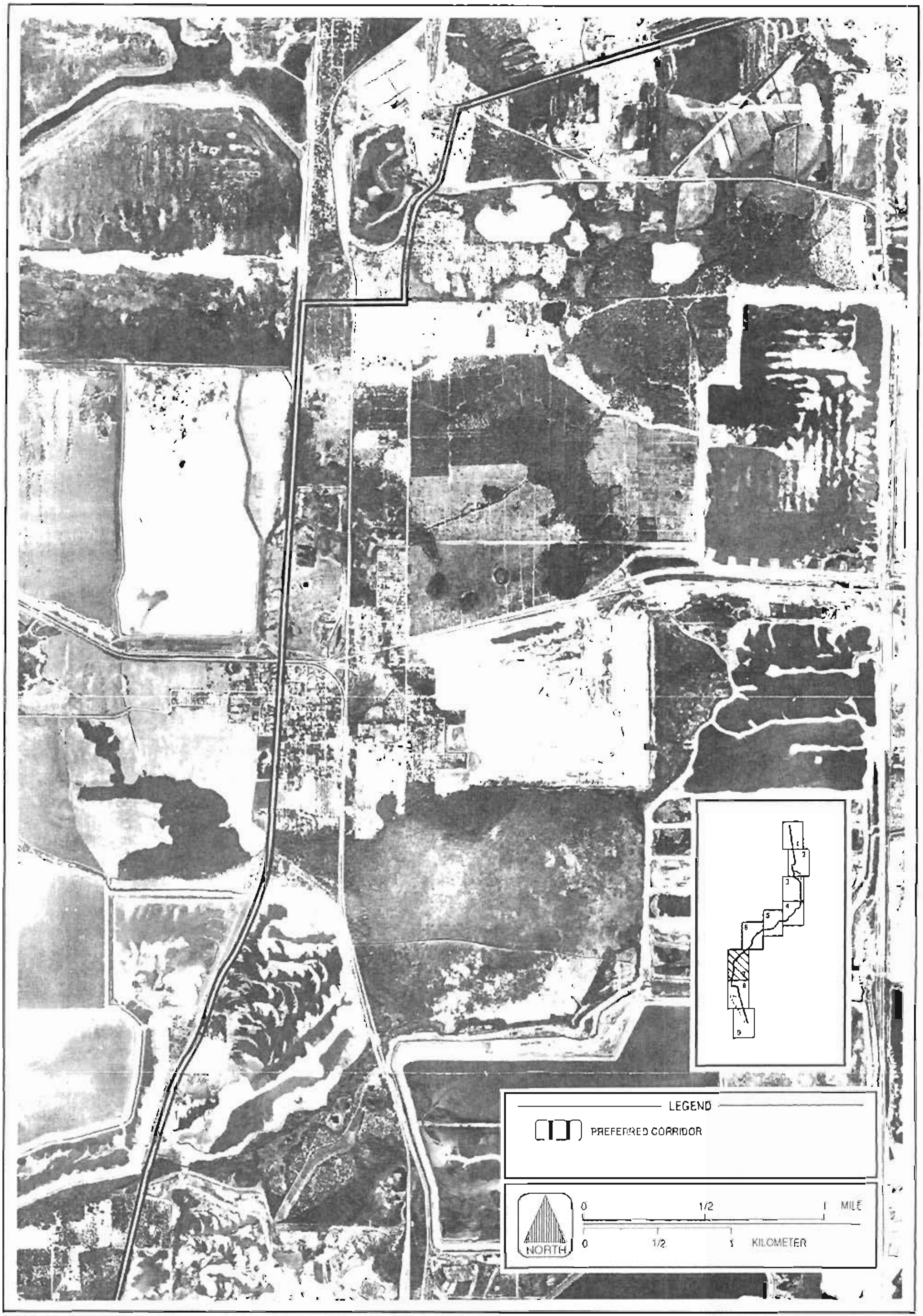
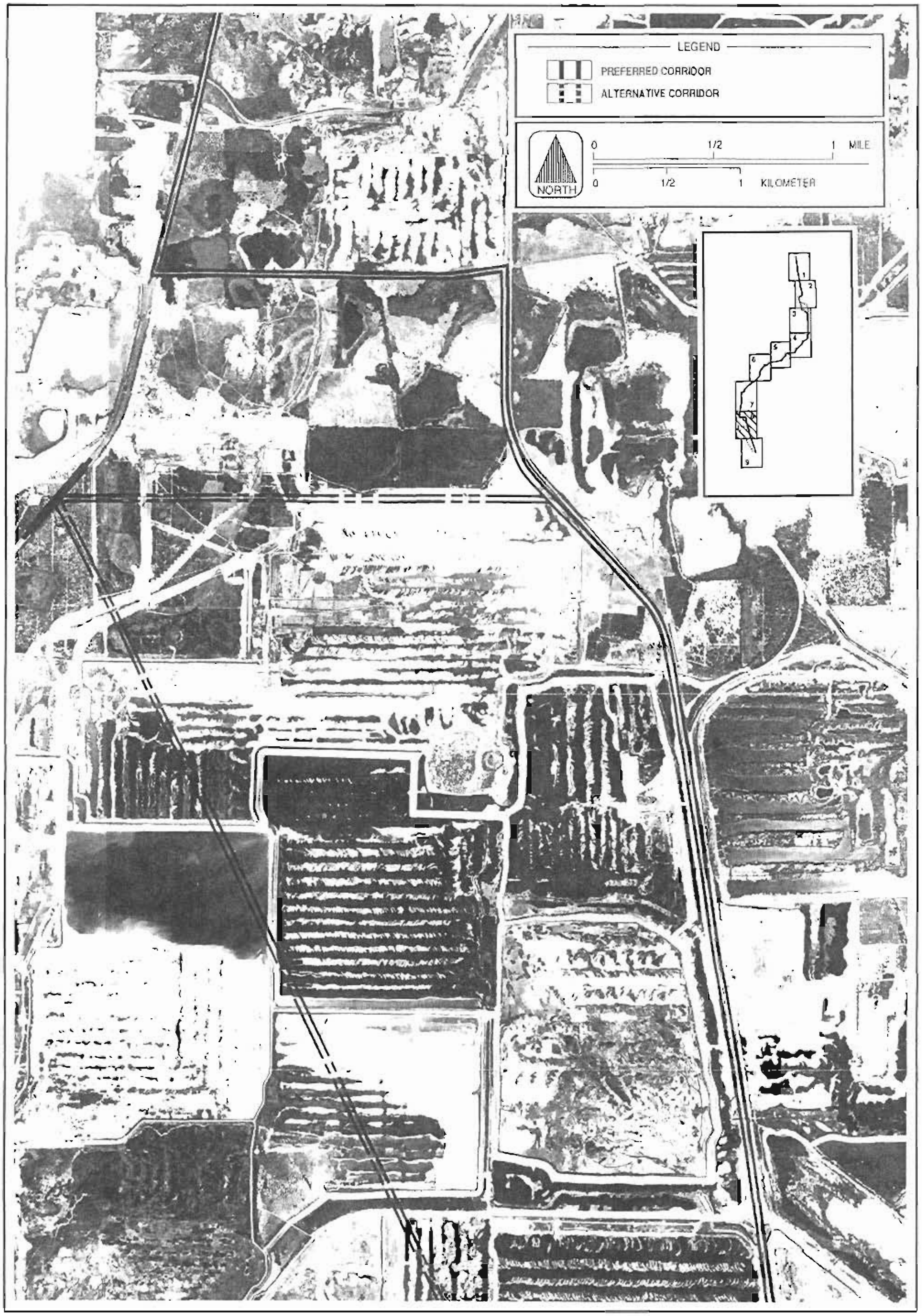


AERIAL PHOTOGRAPHS OF PROPOSED GAS PIPELINE CORRIDOR:
HARDEE POWER STATION LATERAL SOUTH TO PLANT SITE
(PAGE 7 OF 9)

Hardee
Power Station



AERIAL PHOTOGRAPHS OF PROPOSED GAS PIPELINE CORRIDOR:
HARDEE POWER STATION LATERAL SOUTH TO PLANT SITE
(PAGE 8 OF 9)

**Hardee
Power Station**

AERIAL PHOTOGRAPHS OF PROPOSED GAS PIPELINE CORRIDOR:
HARDEE POWER STATION LATERAL SOUTH TO PLANT SITE
(PAGE 9 OF 9)

**Hardee
Power Station**

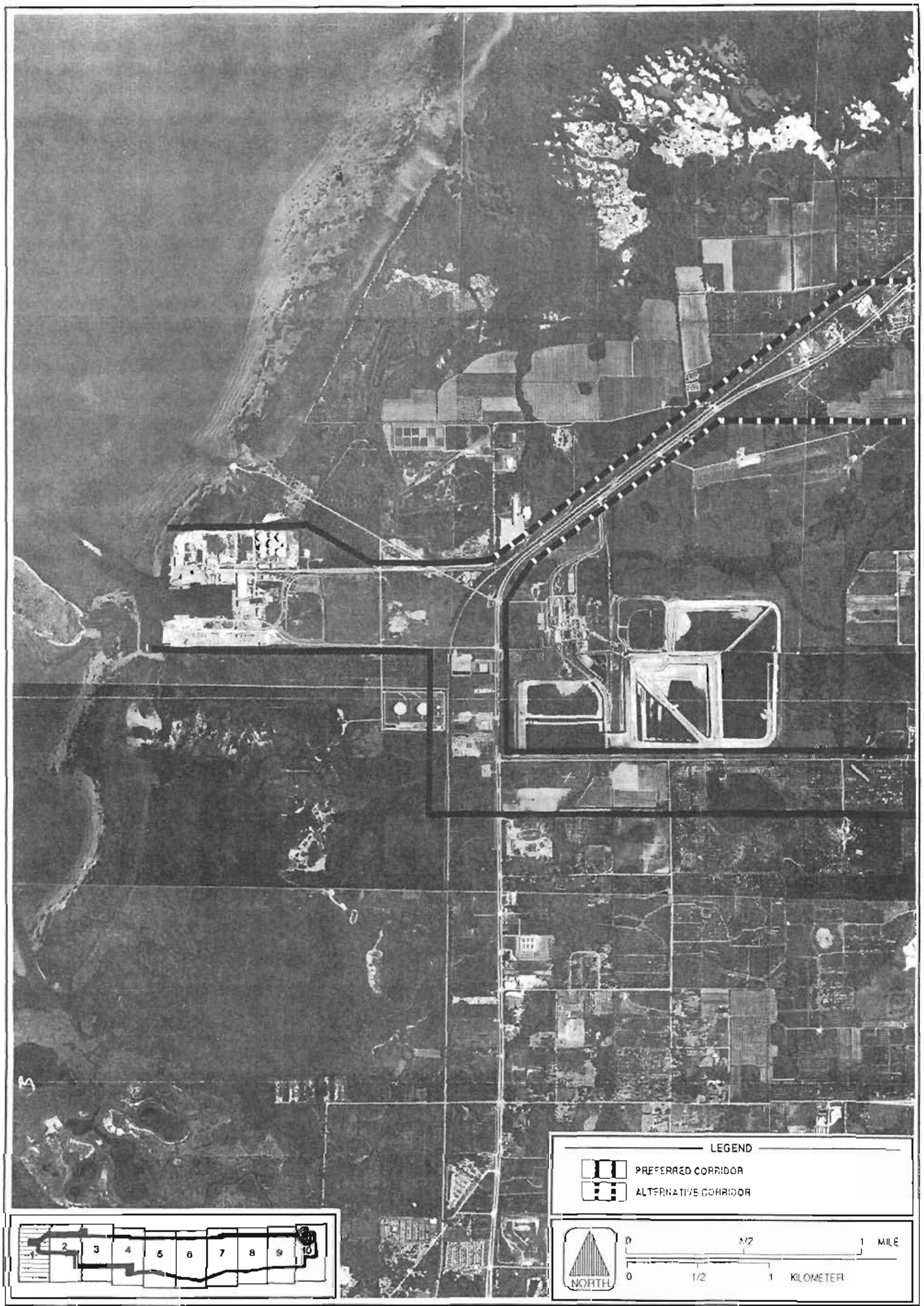


Figure 6.3.2–2 AERIAL PHOTOGRAPHS (1 OF 10)

Hardee Power Station

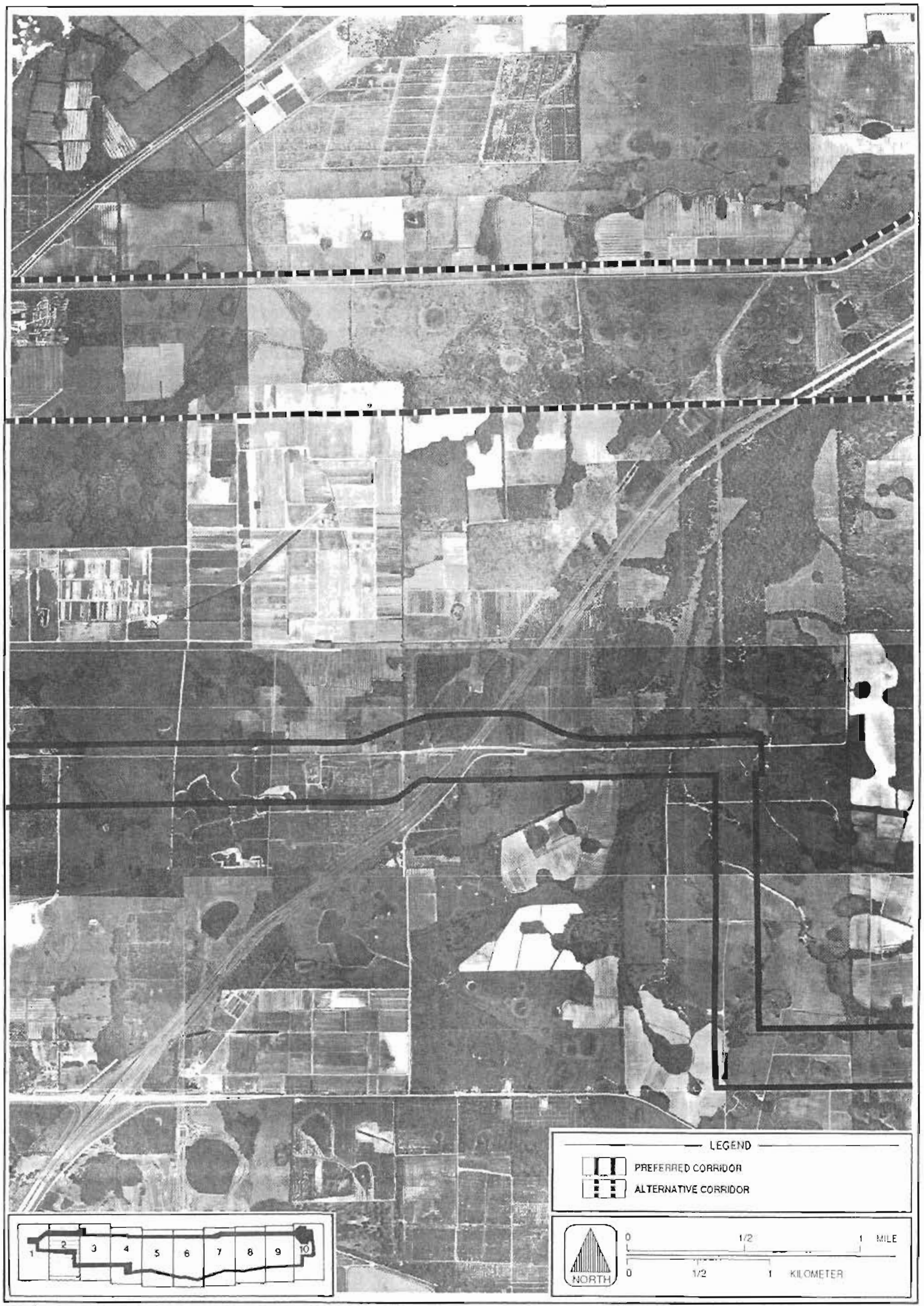


Figure 6.3.2-2 AERIAL PHOTOGRAPHS
(2 OF 10)

**Hardee
Power Station**

Figure 6.3.2-2 AERIAL PHOTOGRAPHS (3 OF 10)

Hardee Power Station

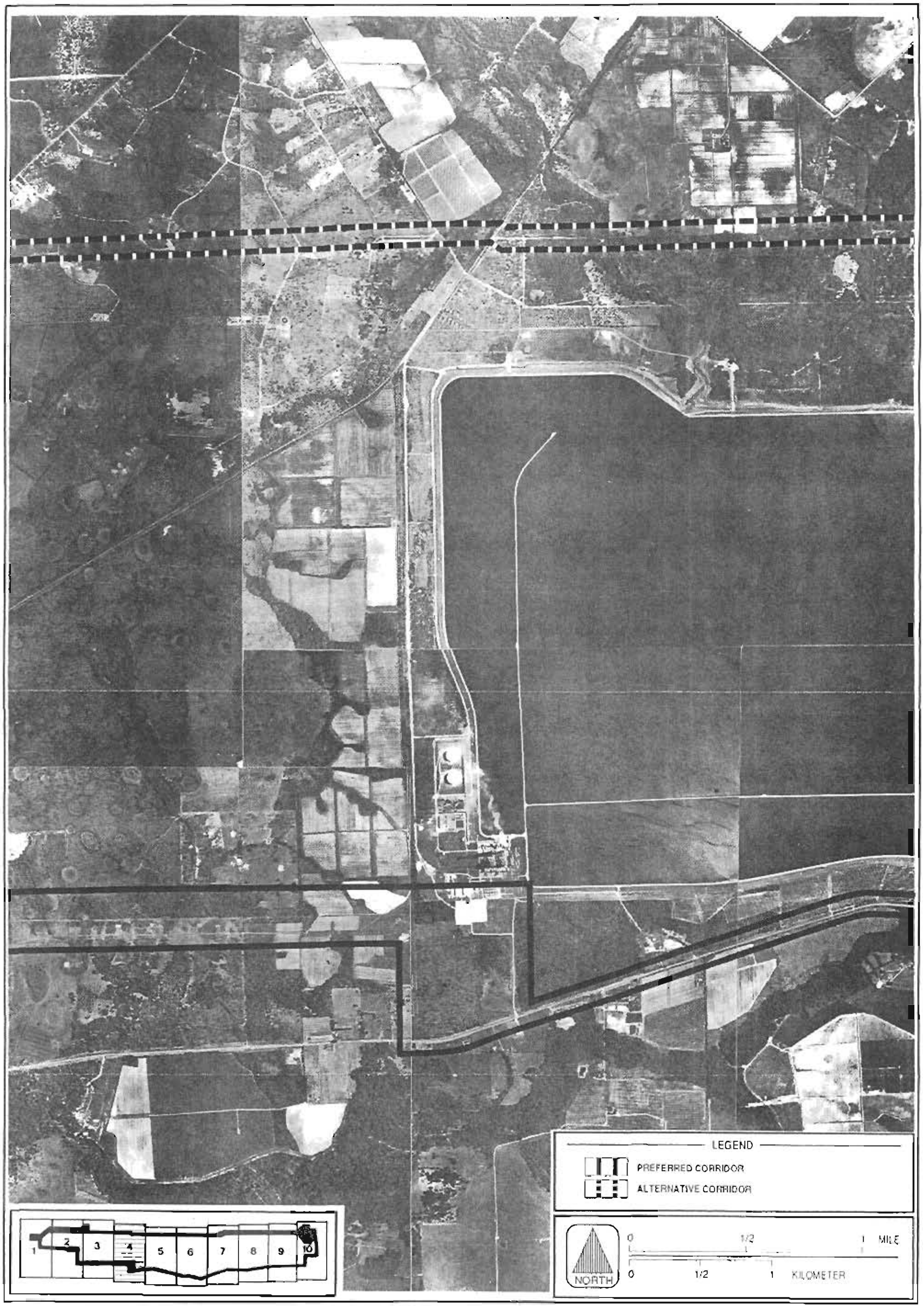


Figure 6.3.2-2 AERIAL PHOTOGRAPHS
(4 OF 10)

Hardee
Power Station

Figure 6.3.2-2 AERIAL PHOTOGRAPHS
(5 OF 10)

**Hardee
Power Station**

Figure 6.3.2-2 AERIAL PHOTOGRAPHS
(6 OF 10)

**Hardee
Power Station**

Figure 6.3.2-2 AERIAL PHOTOGRAPHS
(7 OF 10)

Hardee
Power Station

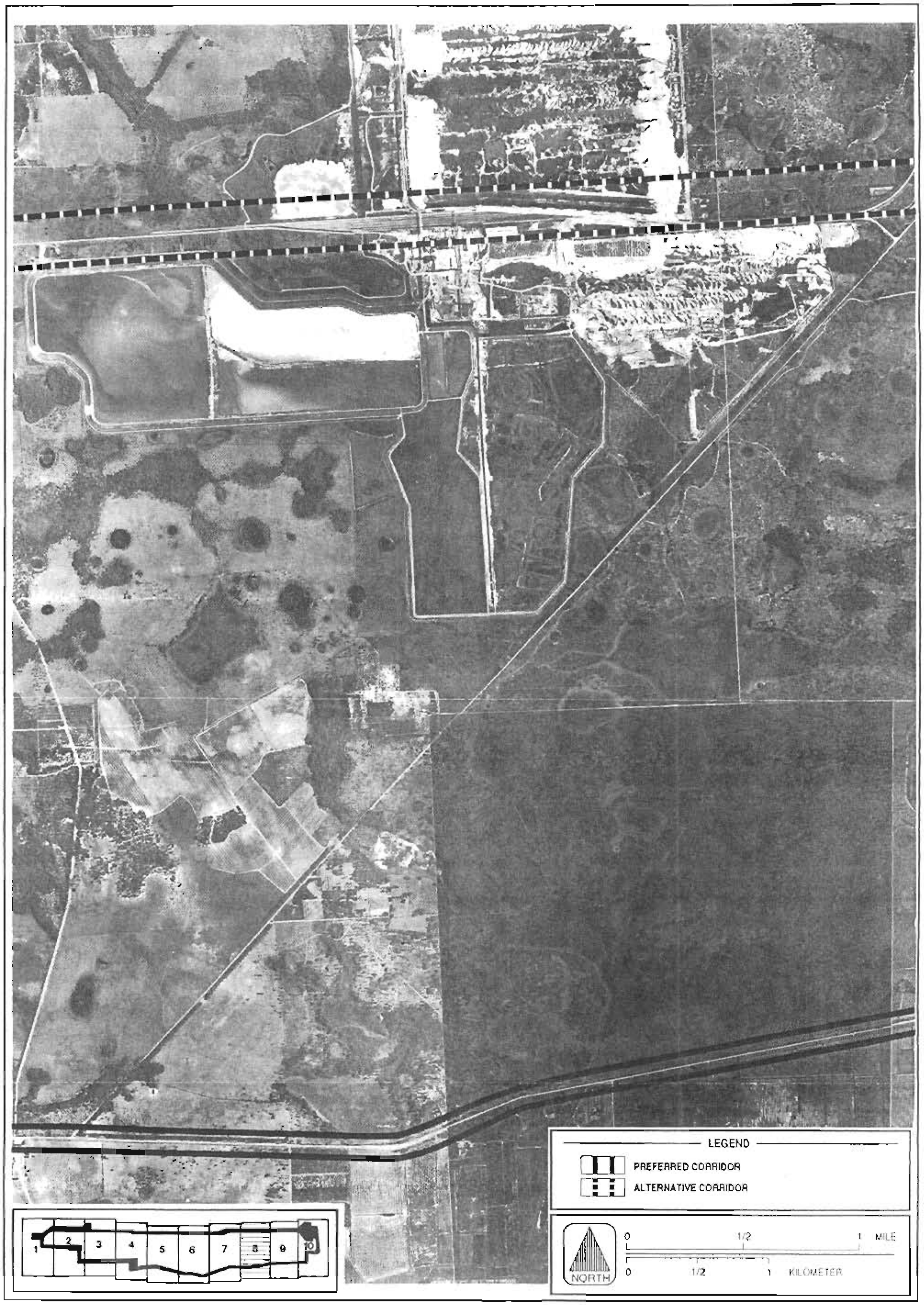


Figure 6.3.2-2 AERIAL PHOTOGRAPHS (8 OF 10)

Hardee Power Station

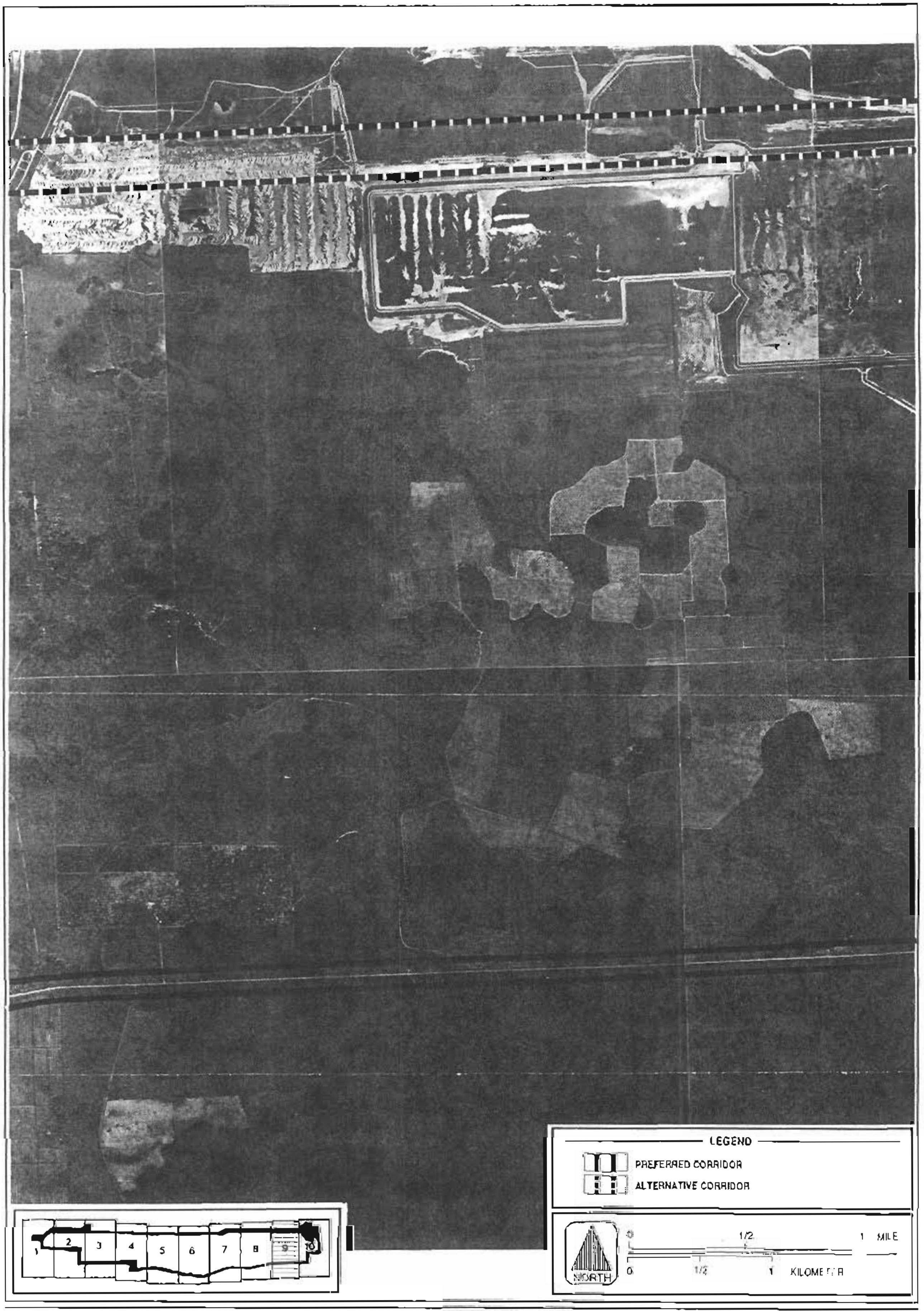


Figure 6.3.2-2 AERIAL PHOTOGRAPHS
(9 OF 10)

**Hardee
Power Station**

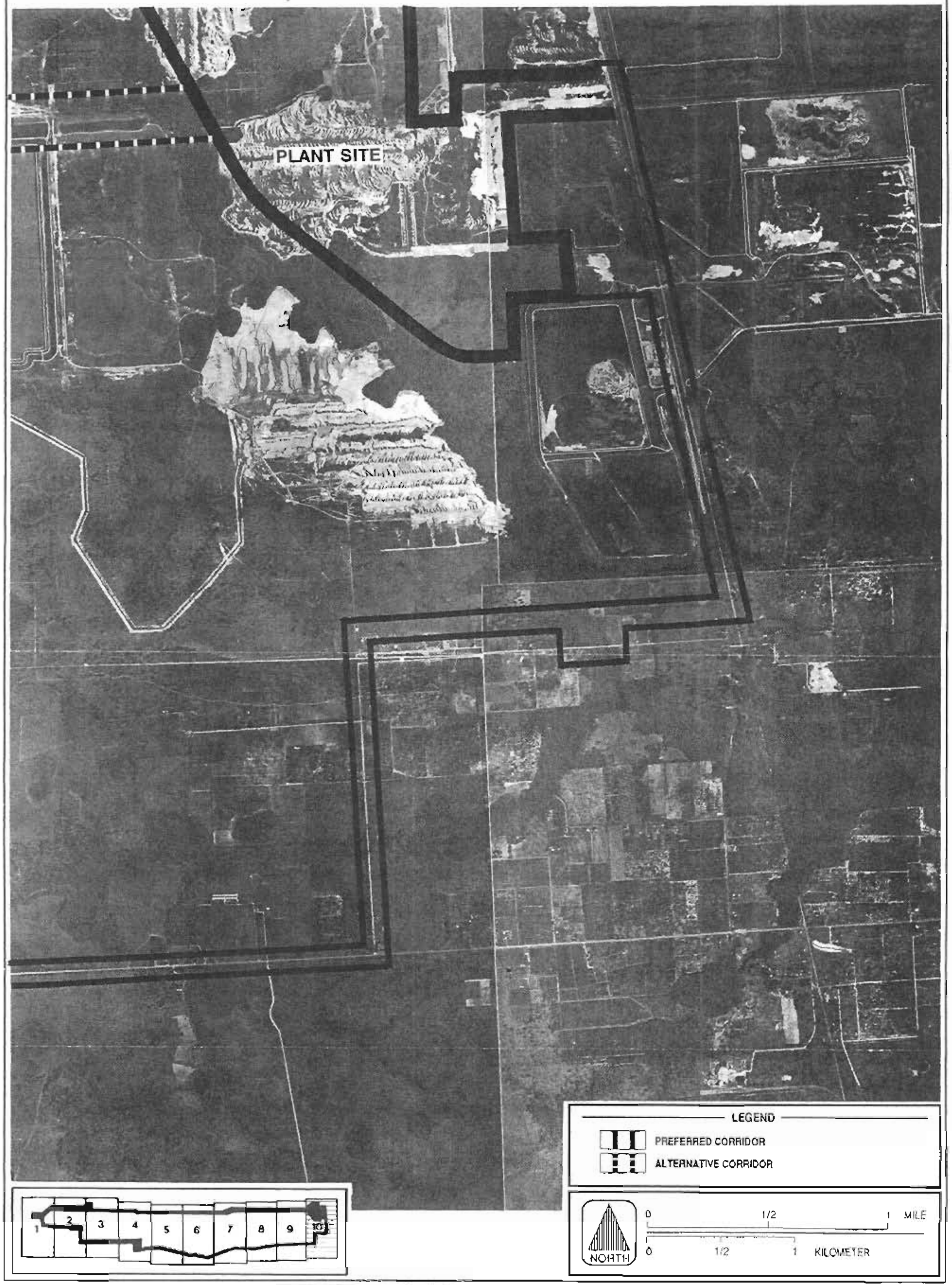


Figure 6.3.2-2 AERIAL PHOTOGRAPHS
(10 OF 10)

**Hardee
Power Station**

HARDEE POWER STATION

SITE CERTIFICATION APPLICATION/ ENVIRONMENTAL ASSESSMENT

VOLUME 2

APPENDICES

SUBMITTED BY:

TECO POWER SERVICES

TAMPA ELECTRIC COMPANY

SEMINOLE ELECTRIC
COOPERATIVE, INC.

TABLE OF CONTENTS
APPENDIX

11.1 STATE AND FEDERAL PERMIT APPLICATIONS

11.1.1 NPDES APPLICATION/PERMIT

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved. OMB No. 2040-0086 Approval expires 7-31-88

FORM **1** GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program
(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F D

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill—in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill—in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of **bold—faced terms**.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge to waters of the U.S.**? (FORM 2B)		X	
C. Is this a facility which **currently** results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)	X		X
E. Does or will this facility **treat, store, or dispose** of **hazardous wastes**? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air **pollutant regulated** under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X		J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)	X		

III. NAME OF FACILITY

1 SKIP HARDEE POWER STATION

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 TECO POWER SERVICES	813 228 4111

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 PO BOX 111

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 TAMPA	FL	33601

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 COUNTY ROAD 663

B. COUNTY NAME

HARDEE COUNTY

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6	FL		

EPA Form 3510-1 (Rev. 10-80)

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST	**B. SECOND**
C 7 4911 *(specify)* Electric Generation	C 7 *(specify)*
C. THIRD	**D. FOURTH**
C 7 *(specify)*	C 7 *(specify)*

VIII. OPERATOR INFORMATION

A. NAME
C 8

B. Is the name listed in Item VIII-A also the owner?
☐ YES ☐ NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other", specify.)*

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC *(other than federal or state)*
O = OTHER *(specify)*

(specify)

D. PHONE *(area code & no.)*
C A

E. STREET OR P.O. BOX

F. CITY OR TOWN
C B

G. STATE

H. ZIP CODE

IX. INDIAN LAND

Is the facility located on Indian lands?
☒ YES ☐ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*	**D. PSD** *(Air Emissions from Proposed Sources)*
C T I 9 N NONE	C T I 9 P NONE
B. UIC *(Underground Injection of Fluids)*	**E. OTHER** *(specify)*
C T I 9 U NONE	C T I 9 NONE *(specify)*
C. RCRA *(Hazardous Wastes)*	**E. OTHER** *(specify)*
C T I 9 R NONE	C T I 9 NONE *(specify)*

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS *(provide a brief description)*

Proposed 660MW Combined Cycle Electric Generating Facility
See Section 3.0 of the SCA/EA for Project Description including information regarding the cooling reservoir construction operation.

XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*	B. SIGNATURE	C. DATE SIGNED

COMMENTS FOR OFFICIAL USE ONLY

C C

☆ U.S. Government Printing Office : 1985 - 486-285/32991

Please type or print in the unshaded areas only

EPA ID Number *(copy from Item 1 of Form 1)*

Form Approved
OMB No. 2040-0086
Approval expires 7-31-88

Form
2D
NPDES

EPA

New Sources and New Dischargers Application for Permit to Discharge Process Wastewater

I. Outfall Location

For each outfall, list the latitude and longitude, and the name of the receiving water.

Outfall Number *(list)*	Latitude Deg	Latitude Min	Latitude Sec	Longitude Deg	Longitude Min	Longitude Sec	Receiving Water *(name)*
001	27	39	00	81	58	45	Payne Creek
002	27	38	00	81	58	15	Payne Creek

II. Discharge Date *(When do you expect to begin discharging?)*

III. Flows, Sources of Pollution, and Treatment Technologies

A. For each outfall, provide a description of (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary. (See attached outfall descriptions)

Outfall Number	1. Operations Contributing Flow *(list)*	2. Average Flow *(include units)*	3. Treatment *(Description or List Codes from Table 2D-1)*
001	Recirculation Cooling		
	Reservoir with makeup from		
	the following sources:		
	• Rainfall	2,267,000 gpd	---
	• Well water	2,372,000 gpd	---
	• Surface runoff	187,000 gpd	---
	• Seepage	375,000 gpd	---
	• Demineralization		
	Regeneration		
	Basin Effluent	57,000 gpd	Neutralization & Sedmentation
			(2-K & 1-U)
	• Oil Separator Effluent	35,000 gpd	Oil Flotation (1-H)
	• Sanitary Effluent	6,000 gpd	Biological Treatment (3-A)
			Sedimentation (1-U)
			Chlorine Disinfection (2-F)
	Continued on next page.		

Please type or print in the unshaded areas only

EPA ID Number *(copy from Item 1 of Form 1)*

Form Approved
OMB No. 2040-0086
Approval expires 7-31-88

Form **2D** NPDES

EPA New Sources and New Dischargers Application for Permit to Discharge Process Wastewater

I. Outfall Location

For each outfall, list the latitude and longitude, and the name of the receiving water

Outfall Number *(list)*	Latitude			Longitude			Receiving Water *(name)*
	Deg	Min	Sec	Deg	Min	Sec	

II. Discharge Date *(When do you expect to begin discharging?)*

III. Flows, Sources of Pollution, and Treatment Technologies

A For each outfall, provide a description of (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary. (See attached outfall descriptions)

Outfall Number	1. Operations Contributing Flow *(list)*	2. Average Flow *(include units)*	3. Treatment *(Description or List Codes from Table 2D-1)*
	• Plant Service Water		
	Pretreatment System		
	Backwash	31,000 gpd	---
	• Temporary Construction Dewatering	1,102,000 gpd	Sedimentation (1-U)
002	Plant Site Stormwater		
	Retention Pond Discharge	36,000 gpd	Sedimentation (1-U)
	Including Temporary		
	Construction Dewatering	526,000 gpd	Sedimentation (1-U)

Rev. 2 10/30/89

Outfall Descriptions

Outfall #001

Outfall #001 is an emergency overflow from the 570 acre recirculating cooling reservoir to be constructed as part of the 660 MW combined cycle power plant. This recirculating cooling reservoir will function as water supply for use in condenser cooling and heating dissipation system for the Heat Recovery Steam Generator portion of the combined cycle plant.

Water makeup to the reservoir includes: rainfall onto the reservoir; surface runoff and surficial aquifer seepage from the upland basin; treated sanitary and plant wastewaters discharged to the reservoir; and makeup water pumped from the lower Floridan Aquifer wells. The reservoir will also receive discharge from temporary construction dewatering activities during plant construction. This water will be similar in quality to surficial aquifer quality. Water flows out of the reservoir include: evaporation; lateral seepage through the confining berm into the surficial aquifer; leekance down through the confining layers into deeper confined aquifers; and discharges to Payne Creek.

Based on long term water balance modeling (51 years of data analysis) and HEC-1 hydraulic modeling, the proposed cooling reservoir will only discharge in cases caused by extreme or cumulative rainfall in excess of the 10- year 24-hour hydrologic event, where unavoidable to prevent loss of life, severe property damage, or damage to the physical integrity of the cooling reservoir or its structures, and twice each year to test the discharge structure.

Outfall #002

Outfall #002 is the overflow discharge from the plant site stormwater retention pond. This stormwater pond has been designed to meet all applicable Southwest Florida Water Management District and Florida Department of Environmental Regulation stormwater quantity and quality control requirements. Specifically, the pond will provide retention with filtration for runoff from the first 1 inch of rainfall, and post development peak flows will not exceed pre-development peak flows for the 25 year - 24 hour rainfall storm.

The pond will also receive discharge from temporary construction dewatering activities during construction. After removal of suspended materials through sedimentation, this water will be similar in quality to surficial aquifer water quality.

Given the proposed fuels for the proposed combined cycle plant (i.e., gas or oil), no fuel related stormwaters (e.g., coal pile runoff) will be directed to this pond. Influent plant site stormwater is expected to be similar to stormwater from other light industrial sites.

B. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item III-A. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures. Water Balance attached.

C. Except for storm runoff, leaks, or spills, will any of the discharges described in item III-A be intermittent or seasonal?

☒ Yes *(complete the following table)* ☐ No *(go to item IV)*

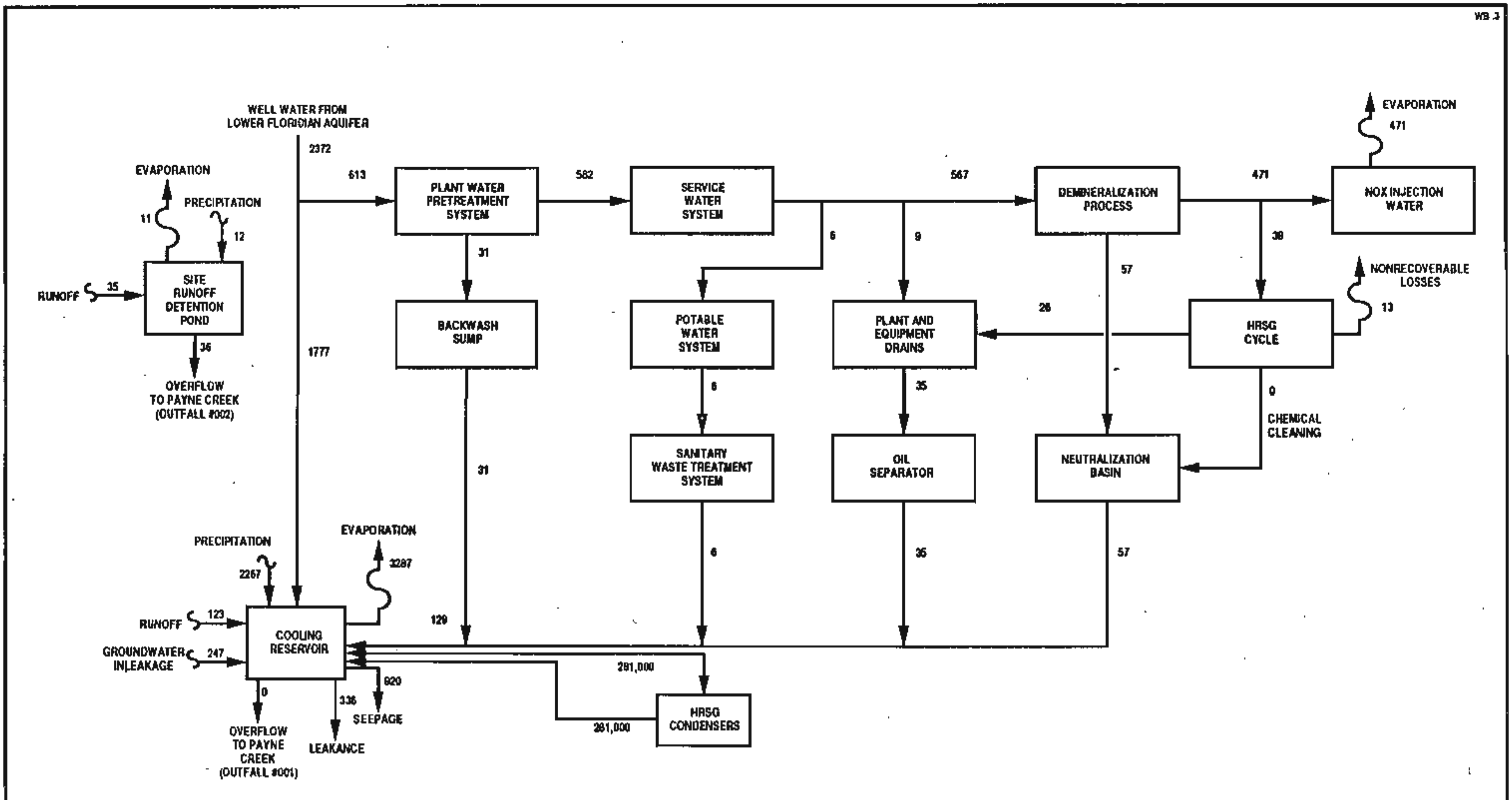
Outfall Number	1. Frequency		2. Flow		
	a. Days Per Week *(specify average)*	b. Months Per Year *(specify average)*	a. Maximum Daily Flow Rate *(in mgd)*	b. Maximum Total Volume *(specify with units)*	c. Duration *(in days)*
001 - Cooling reservoir	Cooling reservoir will will only discharge due to extreme or cummulative rainfall in excess of the 10-year 24-hour storm, where unavoidable to prevent loss of life, severe property damage, or damage to the physical integrity of the cooling reservoir or its structures, and twice each year to test discharge structures.		0.213 MGD- (see note 1)	2.3 acre-feet	7 days. (see note 1)
			Note 1: Flow estimates are based on the 25-year 24-hour rainfall.		
002 - Stormwater Retention Pond Including Temporary Construction Dewatering	Temporary Activity During Construction; 7 Days per Week for 6 Months during Construction		0.526 MGD	291 acre-ft	180 days during construction

IV. Production

If there is an applicable production-based effluent guideline or NSPS, for each outfall list the estimated level of production (projection of actual production level, not design), expressed in the terms and units used in the applicable effluent guideline or NSPS, for each of the first 3 years of operation. If production is likely to vary, you may also submit alternative estimates (attach a separate sheet).

Year	a. Quantity Per Day	b. Units of Measure	c. Operation, Product, Material, etc *(specify)*

CONTINUE ON NEXT PAGE



NOTES: 1. FLOWS ARE EXPRESSED AS 1000 GALLONS PER DAY.

2. FLOWS ARE FOR 660 MW PLANT.

WATER MASS BALANCE:
ANNUAL AVERAGE MAKEUP

Hardee Power Station

Rev. 2 10/30/89

CONTINUED FROM THE FRONT	EPA ID Number *(copy from Item 1 of Form 1)*	Outfall Number 001 & 002

V. Effluent Characteristics

A, and B: These items require you to report estimated amounts *(both concentration and mass)* of the pollutants to be discharged from each of your outfalls. Each part of this item addresses a different set of pollutants and should be completed in accordance with the specific instructions for that part. Data for each outfall should be on a separate page. Attach additional sheets of paper if necessary.

General Instructions *(See table 2D-2 for Pollutants)*

Each part of this item requests you to provide an estimated daily maximum and average for certain pollutants and the source of information. Data for all pollutants in Group A, for all outfalls, must be submitted unless waived by the permitting authority. For all outfalls, data for pollutants in Group B should be reported only for pollutants which you believe will be present or are limited directly by an effluent limitations guideline or NSPS or indirectly through limitations on an indicator pollutant.

1. Pollutant	2. Maximum Daily Value *(include units)*	3. Average Daily Value *(include units)*	4. Source *(see instructions)*
See Table V-1 for Outfall	#001		
See Table V-2 for Outfall	#002		

Table V-1. Estimated Cooling Reservoir Discharge (Outfall #001) Effluent Water Quality (Page 1 of 2)

Parameter	Cooling Reservoir Discharge (Outfall #001) Quality[1]	Source
Biochemical Oxygen Demand (5-day), mg/L	<5	See note 2
Chemical Oxygen Demand, mg/L	<40	
Total Organic Carbon, mg/L	NA	
Total Suspended Solids, mg/L	<25	
Flow, cfs see note	3	
Ammonia Nitrogen, mg/L	0.4	
Temperature, maximum summer, °C	35	
Temperature, average summer, °C	32	
Temperature, maximum winter, °C	23	
Temperature, average winter, °C	18	
pH, units	6-9	
Calcium, mg/L as CaCO3	240	
Magnesium, mg/L as CaCO3	100	
Sodium, mg/L as CaCO3	200	
Potassium, mg/L as CaCO3	16	
Total Hardness, mg/L as CaCO3	340	
Alkalinity, mg/L as CaCO3	260	
Sulfate, mg/L as CaCO3	250	
Chloride, mg/L as CaCO3	50	
Silca, mg/L	60	
Fluoride, mg/L	4.1	
Cyanide, mg/L	0.01	
MBAS, mg/L	0.36	
Oil and Grease, mg/L	<5	
Turbidity, NTU	31	
Total Dissolved Solids, mg/L	860	
Specific Conductivity, umhos/cm	1080	
Total Kjeldahl Nitrogen, mg/L	0.9	
Unionized Ammonia, mg/L (4)	0.014	
Organic Nitrogen, mg/L	0.4	
Nitrate+Nitrite-Nitrogen, mg/L	0.1	
Total Nitrogen, mg/L	1.0	
Orthophosphorus, mg/L	0.5	
Total Phosphorus, mg/L	0.8	

Table V-1. Estimated Cooling Reservoir Discharge (Outfall #001) Effluent Water Quality (Page 2 of 2)

Parameter	Cooling Reservoir Discharge (Outfall #001) Quality[1]	Source
Arsenic, ug/L	20	See note 2
Barium, ug/L	150	
Beryllium, ug/L	4.0	
Cadmium, ug/L	2.6	
Chromium, ug/L	28	
Copper, ug/L	27	
Iron, ug/L	980	
Lead, ug/L	29	
Manganese, ug/L	47	
Mercury, ug/L	0.5	
Nickel, ug/L	49	
Selenium, ug/L	32	
Silver, ug/L	0.8	
Strontium, ug/L	610	
Zinc, ug/L	280	
Alpha, Gross (pC/L)	22.2	
Radium 226 (pC/L)	6.2	

Note:

1. Reservoir effluent estimates are based on mass balances and do not take into account any chemical reaction, precipitation, sedimentation, deposition or biological activity which may occur in the reservoir and act to remove material from the water column and thus reduce reservoir concentrations. Estimated values are average values unless otherwise noted.

2. All parameter concentrations were estimated based on engineering studies (Source Code 1) and Best Professional Estimates (Source Code 4).

3. Discharge will only occur in cases caused by extreme or cumulative rainfall in excess of the 10-year 24-hour hydrologic event, where unavoidable to prevent loss of life, severe property damage, or damage to the physical integrity of the cooling reservoir or its structures, and twice each year to test the discharge structure.

4. Unionized ammonia concentrations are based on a worst case reservoir water temperature of 95°F (35°C).

Table V-2. Estimated Stormwater Detention Pond Discharge (Outfall #002) Water Quality (Page 1 of 2)

Parameter	Stormwater Detention Pond Discharge (Outfall #002) Quality	Source
Biochemical Oxygen Demand (5-day), mg/L	<5	
Chemical Oxygen Demand, mg/L	<50	
Total Organic Carbon, mg/L	NA	
Total Suspended Solids, mg/L	<25	
Ammonia N, mg/L	0.5	
Flow, gallons/day	36,000	
Temperature, Average Winter, °C	18	
Temperature, Average Summer, °C	32	
pH	6-9	
Calcium, mg/L as CaCO3	63	See note 1
Magnesium, mg/L as CaCO3	39	
Sodium, mg/L as CaCO3	17	
Potassium, mg/L as CaCO3	0	
Alkalinity, mg/L as CaCO3	61	
Sulfate, mg/L as CaCO3	37	
Chloride, mg/L as CaCO3	21	
Silca, mg/L	5.4	
Fluoride, mg/L	1.0	
Cyanide, mg/L	<0.004	
Methylene Blue Active Substances, mg/L	0.040	
Oil and Grease, mg/L	<5	

Table V-2. Estimated Stormwater Detention Pond Discharge (Outfall #002) Water Quality (Page 2 of 2)

Parameter	Stormwater Detention Pond Discharge (Outfall #002) Quality	Source
pH, units	7	See note 1
Total Dissolved Solids, mg/L	190	
Specific Conductivity, umhos/cm	173	
Total Kjeldahl Nitrogen, mg/L	0.74	
Ammonia Nitrogen, mg/L	0.11	
Orgainic Nitrogen, mg/L	0.65	
Nitrate+Nitrite-Nitrogen, mg/L	0.50	
Total Nitrogen, mg/L	1.24	
Orthophosphorus, mg/L	0.41	
Total Phosphorus, mg/L	0.44	
Arsenic, ug/L	<5	
Barium, ug/L	<10	
Beryllium, ug/L	<3	
Cadmium, ug/L	<0.4	
Chromium, ug/L	<10	
Copper, ug/L	7	
Iron, ug/L	293	
Lead, ug/L	6.1	
Manganese, mg/L	7.9	
Mercury, ug/L	0.24	
Nickel, ug/L	16	
Selenium, ug/L	<5	
Silver, ug/L	<0.08	
Strontium, ug/L	100	
Zinc, ug/L	7.4	
Alpha, Gross (pC/L)	1.7	
Radium 226 (pC/L)	0.7	

Note: 1. All parameter concentrations were estimated based on engineering studies of Payne Creek water quality (Source Code 1) and Best Professional Estimates (Source Code 4).

CONTINUED FROM THE FRONT	EPA ID Number *(copy from Item 1 of Form 1)*	

C. Use the space below to list any of the pollutants listed in Table 2D-3 of the instructions which you know or have reason to believe will be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it will be present.

1. Pollutant	2. Reason for Discharge
Outfall #001 Strontium	Trace amounts of naturally occuring strontium have been detected in upland surface runoff (100/ug/L) and Lower Floridan aquifer well makeup water (300 ug/L). Therefore, similar trace levels can be expected in the recirculation cooling reservoir. No strontium will be used in the operation of the proposed combined cycle power plant.

VI. Engineering Report on Wastewater Treatment

A. If there is any technical evaluation concerning your wastewater treatment, including engineering reports or pilot plant studies, check the appropriate box below

☒ Report Available ☐ No Report

Engineering studies and evaluations are included as part of the Site Certification Application to the State of Florida.

B. Provide the name and location of any existing plant(s) which, to the best of your knowledge, resembles this production facility with respect to production processes, wastewater constituents, or wastewater treatments.

Name	Location

No power plant cooling reservoirs have been built on reclaimed phoshate mines.

EPA ID Number *(copy from item one of Form 1)*

VII. Other Information *(Optional)*

Use the space below to expand upon any of the above questions or to bring to the attention of the reviewer any other information you feel should be considered in establishing permit limitations for the proposed facility. Attach additional sheets if necessary.

VIII. Certification

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

A. Name and Official Title *(type or print)*
JERRY L. WILLIAMS
DIRECTOR ENVIRONMENTAL

B. Phone No.
(813) 228-4837

C. Signature
Jerry L. Williams

D. Date Signed
6/25/89

11.1.2 CONSUMPTIVE USE PERMIT APPLICATION

This application has been prepared for information purposes only as required by FDER Form 17-1.211(1).
Refer to Applicant Information in the SCA.

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
CONSUMPTIVE USE PERMIT APPLICATION
2379 Broad Street
Brooksville, Florida 34609-6899

GENERAL INSTRUCTIONS, PLEASE READ BEFORE PROCEEDING

PURPOSE:	This application is for obtaining a permit, permit modification, or permit renewal from the Southwest Florida Water Management District (SWFWMD) for the consumptive use of ground or surface water, or both, and is required in accordance with Chapter 40D-2, Florida Administrative Code. This application and attached supplemental form(s) are to be completed in detail in order to facilitate a comprehensive evaluation of your water requirements. Insufficient information will delay application processing. Supplemental form(s) are a part of this application. Assistance with this application can be obtained by calling (904) 796-7211, Brooksville, Florida; (813) 985-7481, Tampa, Florida; (813) 533-6972, Bartow, Florida or (813) 488-4666, Venice, Florida. There is no permit fee.
APPLICANT:	Enter the name in which the Consumptive Use Permit (CUP) will be issued. Identify applicant as an individual, partnership, corporation or other legal entity. If there is more than one owner, name the one on whose property the withdrawal point(s) are located. A permit may be issued to a lessee if a copy of the lease is furnished. In the case of a verbal lease agreement, the owner's signature on the application will be sufficient.
LOCAL CONTACT:	Enter the name and address of an individual who has knowledge of the property and the application and who may be contacted for any additional information needed, if other than the applicant.
OWNER:	Enter the name and address of the owner(s) of the property if other than the applicant.
PROPERTY:	Include only the contiguous acreage covered by this application. A SEPARATE APPLICATION MUST BE COMPLETED FOR EACH NON-CONTIGUOUS TRACT OF LAND.

ANSWER ALL QUESTIONS, DO NOT USE PENCIL Date ____________

1. APPLICANT Refer to Applicant Information in SCA

Address, City, State, Zip Code Telephone w/area code

2. LOCAL CONTACT Refer to Applicant Information in SCA

Address, City, State, Zip Code Telephone w/area code

3. OWNER Refer to Applicant Information in SCA

Address, City, State, Zip Code Telephone w/area code

4. PROPERTY 35 and 36 32S 23E Polk & Hardee
Section(s), Township(s), Range(s) County

Acres: owned ________ leased ________ serviced* ________ total ________

* An applicant (other than Public Supply) delivering water to another property owner must include a signed statement of that arrangement. Copies of all written agreements and/or contracts must be attached.

5. TYPE OF APPLICATION: new X renewal ____ modification ____ current CUP No. ________

6. COMPLETE SUPPLEMENTAL INFORMATION FORM(S): Complete the enclosed form(s) applicable to your water use category: Public Supply, Industrial, Agricultural. Attach as part of this application.

7. CLASSIFICATION OF USE: (Estimate percentages of total supply).

Attractions (public parks, etc.)	%
Public Supply	%
Essential services (fires, hospitals, etc.)	%
Industrial	%
Irrigation	%
Lawns	%
Livestock	%
Mining	%
Perishable food processing	%
Power	100 %
Recreational	%
Total	100 %

8. LIST OF ADJACENT PROPERTY OWNERS FOR GROUND WATER WITHDRAWALS:

a. If the total average daily withdrawal (pumpage) for all wells on the property will not exceed 100,000 gallons per day (gpd) and if the withdrawal during any single day for all wells on the property will not exceed 1,000,000 gallons it is not necessary to list adjacent property owners.

b. Complete part c. below if your average daily withdrawal is to exceed 100,000 gpd or if the withdrawal during any single day is to exceed 1,000,000 gallons, and this application is for a (1) new use, (2) modification or renewal of a permit which requests an increase of water withdrawals from what is currently permitted.

c. List below the name and mailing address of all current owners of real property whose property is located within the distances prescribed below, according to withdrawal quantities:

FOR WITHDRAWALS OF:

Average GPD on an Annual Basis	OR	Maximum GPD During Any Single Day	
More than 100,000 but not more than 500,000		More than 1,000,000 but not more than 5,000,000	All property owners within 660' of the well, or within 100' of your property boundary.
More than 500,000 but not more than 1,000,000		More than 5,000,000 but not more than 10,000,000	All property owners within 1,320' of the well, or within 200' of your property boundary.
More than 1,000,000		More than 10,000,000	All property owners within 2,640' of the well, or within 400' of your property boundary.

Name Address

CF Industries P.O. Box 1549, Wauchula, FL 33873

Agrico Chemical Co., P.O. Box 110, Mulberry, FL 33860

All Notices will be made by SWFWMD. If additional space is needed, add a separate sheet.

9. LIST OF ADJACENT PROPERTY OWNERS FOR SURFACE WATER WITHDRAWALS:

a. Complete parts b. and/or c. below, if the described situation applies, and this application is for a (1) new use, (2) modification or renewal of a permit which requests an increase of water withdrawals from what is currently permitted.

b. If your withdrawal is from a lake or other impoundment with a surface area of:

80 acres or less	List below all riparian owners on the lake or impoundment.
Over 80 acres	List below all riparian owners in either direction 660' from point where applicant's property intersects the shoreline.

c. If your withdrawal is from a stream and if the total daily average pumpage is:

Not more than 5,000,000 gallons during a single day	List below all riparian owners 660' upstream and 1,320' downstream from your property boundaries at the shoreline.
More than 5,000,000 gallons during a single day	List below all riparian owners 1,320' upstream and 2,640' downstream from your property boundaries at the shoreline.

Name	Address
N/A	

All Notices will be made by SWFWMD. If additional space is needed, add a separate sheet.

10. PROPERTY LOCATION MAPS: Property location maps are contained on pages 4 and 5 of this application. Instructions for completing the maps are on each page. If your property cannot be located on either attached map, submit a separate map locating (1) property boundaries, (2) all wells (active and inactive), (3) all surface withdrawals, and (4) all discharge points. Boundary lines, withdrawal and discharge points should be referenced to Section, Township, and Range, or Latitude and Longitude. Use a scale of not less than 1 inch to 2,000 feet. Special requirements for industrial applications are contained in paragraph 4 of the Industrial Supplemental Form.

I hereby certify that the information as contained in this application including all attachments is true and accurate and based upon the best information available and further that the undersigned has the legal authority to execute this application.

SIGNATURE OF APPLICANT ______________________________

SIGNATURE OF OWNER ______________________________

THANK YOU

CONSERVE WATER TODAY FOR TOMORROW

R-10/1/88

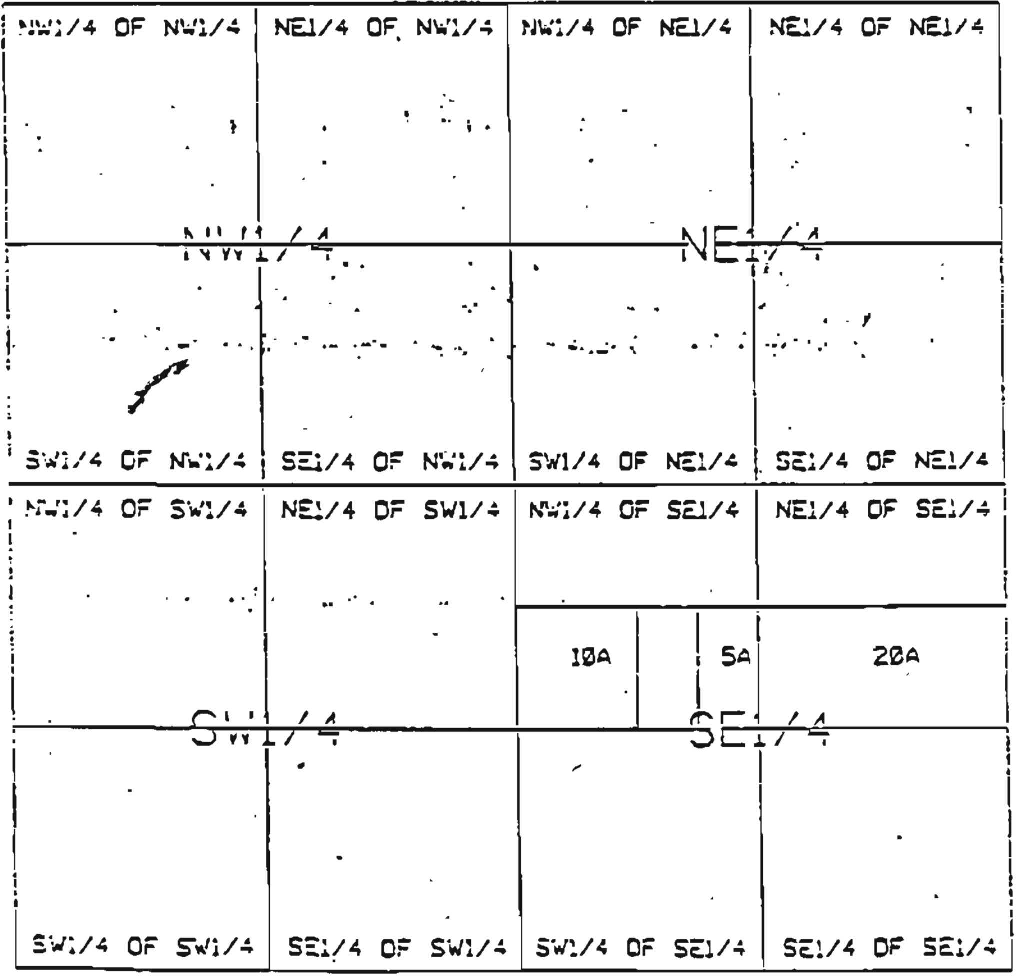
N/A

PROPERTY LOCATION MAP
ONE SECTION

*See SCA/EA Sections 2.1 for property boundaries and Section 2.3.3 for description of active and inactive wells.

INSTRUCTIONS: THE MAP BELOW REPRESENTS ONE SECTION OF LAND. IF YOUR PROPERTY IS LOCATED ENTIRELY WITHIN ONE SECTION, DRAW THE PROPERTY BOUNDARIES ON THIS MAP. LOCATE ALL WELLS (ACTIVE AND INACTIVE), SURFACE WITHDRAWALS, AND DISCHARGE POINTS, IF APPLICABLE, ON YOUR PROPERTY.

SECTION ____ TOWNSHIP ____ RANGE ____



1000 FT

INDUSTRIAL
Supplemental Information Form

Answer all questions. If a question is not applicable, state N/A. If there are public supply or agriculture wells located on your property, complete the appropriate supplemental form. This form must be completed for an initial permit, permit modification, or permit renewal. This form provides the basic information for evaluation of your application.

1. APPLICANT ______________________
(same as shown on CUP application form)

2. OPERATION The well field will make up water for the cooling water reservoir which
(brief description of operation and product produced)
in turn is used as a heat rejection system for combined cycle electric generating facilities.

3. ATTACH A WATER BALANCE, based on requested average daily withdrawals, showing the amount of water going into and coming out of each step in your process. Include all causes of water loss, and final disposition of water. See SCA/EA Chapter 3.0 for project description and water balance.

4. PROPERTY LOCATION MAP: The appropriate property location map on pages 4 or 5 may be used to locate your property. Locate all (1) wells (active and inactive), (2) surface withdrawals, (3) meters/gauges, (4) monitor sites, and (5) final discharge points, as applicable. If application is for water use in (1) phosphate mining, (2) beneficiation, (3) chemical processing, (4) rock mining, (5) sand mining, (6) power generation, this information should also be plotted on aerial photography, with a minimum scale of 1 inch to 2,000 feet. Aerial maps will be requested separately for any other industrial uses, if required. See SCA/EA Section 2.1 for property map and Section 2.3.3-1 for well locations.

5. TOTAL REQUESTED WITHDRAWAL:
average daily (gpd) 3,800,000 maximum daily (gpd) 8,640,000 .

6. WATER SUPPLY: Withdrawal points must agree with those shown on property location map. See Figure 3.2-1 in the SCA

a. GROUND WATER WITHDRAWALS: Include all wells both active and inactive (existing and proposed, standby, capped, etc.). 3 wells proposed - See SCA/EA Section 5.3.2 for impact discussion

Well ID number	Well Dia. size	Well depth casing/total	Beg. W/D Date	Pump Cap. (gpm)	Withdrawal (gpd) x 1,000 average	maximum	Metered Yes/No	Use if more than one, list percent each
	22"	surface to 160'		2,000	3,800	8,640	No	50%
each	18"	160' to 480'		Proposed for full 660 MW				
well	16"	480' to 1300'		build out; 1500 gpm pump capacity				
				will be required for Phase 1-A, the				
				295 MW capacity facility (see SCA/EA				
				Section 3.1 for project description)				

b. SURFACE WITHDRAWALS:

Source Name and Intake Diameter	Beg. W/D Date	Pump Cap. (gpm)	Withdrawal Information		Metered Yes/No	Use if more than one, list percent each
			average	maximum		
N/A						

7. WITHDRAWAL DATE: (to be) initiated N/A most recent date of use N/A.

8. PRODUCTION RATE: Presently N/A Projected 3,800,000 gpm (average daily) as of 1991.

9. SOURCE OF POTABLE WATER SUPPLY well water Daily Work Population: *

* 225 workers for 26-month construction period and approximately 80 workers for operation of 295MW facility.

10. METHOD OF DISPOSAL:

Individual septic tank ____ %
Spray irrigation ____ %
Percolation and ponding 100 % Pond acreage: 570 acres
Off-site discharge ____ % discharges to: Payne Creek
Total 100 %

Are there any DER/NPDES discharge permits? yes
Number and type of Permit one
NPDES/DER permits applied for as part of the SCA/EA Application.

11. LIST OF ADJACENT PROPERTY OWNERS: If applicable, complete Items 8 and/or 9, Pages 2 and 3 of the CUP application form.

Agrico Chemical Co., P. O. Box 110, Mulberry, FL 33860

CF Industries, P.O. Box 1549, Wauchula, FL 33873

11.1.3 JOINT APPLICATION - DEPARTMENT OF THE ARMY/ FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

JOINT APPLICATION
DEPARTMENT OF THE ARMY/FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
For Activities in the Waters of the State of Florida

CORPS APPLICATION NUMBER (official use only)

DER APPLICATION NUMBER (official use only)

1. APPLICANT'S NAME AND ADDRESS

SEMINOLE ELECTRIC COOPERATIVE
NAME

16313 N. DALE MABRY HIGHWAY
STREET

TAMPA
CITY

FL
STATE

336882000
ZIP

TELEPHONE NUMBER (Day) (813) 963-0994 (Night) ( ) Same

2. Name, address, zip code and title of applicant's authorized agent for permit application coordination

W. Micheal Roddy
Seminole Electric Company
16313 N. Dale Mabry Highway
Tampa, FL 33688-2000

Telephone Number (813) 963-0994

3. NAME OF WATERWAY AT LOCATION OF THE ACTIVITY.

Wetlands with intermittent drainage to Payne Creek

DER Code ________
W/W Code ________

4. LOCATION WHERE PROPOSED ACTIVITY EXISTS OR WILL OCCUR.

Hardee Power Station Site
Street, road or other descriptive location

35 & 36 Section
32S Township
23E Range

N/A
Incorporated city or town

Latitude ________ Longitude ________

Polk
County

Tax Assessors Description: (if known)

Map No. ________ Subdiv. No. ________ Lot No. ________

5. NAME AND ADDRESS INCLUDING ZIP CODE OF ADJOINING PROPERTY OWNERS WHOSE PROPERTY ALSO ADJOINS THE WATERWAY.

CF Industries, P.O. Box 1549, Wauchula, FL 33873
Agrico Chemical Co., P.O. Box 1110, Mulberry, FL 33860

6. PROPOSED USE

Private Single Dwelling [ ] Private Multi-dwelling [ ] Public [ ]
Commercial [ ] Other [X] (Explain in remarks) energy facility

7. DESCRIPTION OF PROJECT (Use additional sheets, if necessary)

A. Structures: 1. New work [X] Maintenance of existing structure [ ]

COE Work Code
|__|__|

2. Piers, docks and use: Commercial [ ] Private [ ] Public [ ]

a. Single pier [ ] length ______ width ______

b. Number of piers [ ] length ______ width ______

c. Number of boat slips [ ] length ______ width ______

d. Number of finger piers [ ] length ______ width ______

e. Other (please describe) ______

3. Seawalls, revetments, bulkheads: length ______

a. Type: Vertical [ ] Riprap [ ] Slope: ______Horizontal:______Vertical

b. Material to be used ______

4. Other type of structure Cooling water reservoir, See SCA/EA Section 3.5

B. Excavation or Dredging: New Work [X] Maintenance work [ ] Total acreage involved 570 (12.3 acres below O.H.W.)

1. Access Channel [ ] or Canal [ ] Length ______ft. Width ______ft. Depth ______ft.

2. Boat Basin [ ] or Boat Slip [ ] Length ______ft. Width ______ft. Depth ______ft.

3. Other Cooling water reservoir Length 730 ft. Width 4500 (max) ft. Depth >10 ft.

4. Cubic yards: Total for project 24,830,000 cyd

a. 536,000 cyd. waterward/ 24,294,000 cyd. landward of ordinary/mean high water

b. Type of material to be excavated/dredged overburden, see SCA/EA Section 2.3.6.1, and 4.2.1.2

C. Fill:

1. Amount of material

DER Code
___253
___403

a. Cubic yards placed waterward of ordinary/mean high water 0

b. Cubic yards placed landward of ordinary/mean high water 0

c. Total acreage to be filled 10 Total acreage of wetlands involved 0

2. Containment for fill

a. Dikes [ ] b. Seawall, etc. [ ] c. Other (please explain) berms

See SCA/EA Section 3.5.1, 4.1

3. Type of fill material to be used none

4. Source of fill material to be used ______ ______

8. Date activity is proposed to commence October 1990 ; to be completed February 1991 .

9. Previous permits for this project have been DER #53112 0329 Polk County Corps #

A. Denied (date) ______

B. Issued (date) ______

C. Other (please explain) Agrico has applied for a permit under permit Application No. 531120329

Differentiate between existing work and proposed work on the drawings.

10. Remarks (See Instruction Pamphlet for additional information required for all applications and certain activities. Use additional sheets if necessary.)

See SCA/EA 1.0 and 3.0 for descriptions and need of the projections, Section 8.2 for alternatives and Sections 4.1, 4.2, 4.4, 5.1 and 5.8 for impacts.

11. AFFIDAVIT OF OWNERSHIP OR CONTROL of the property on which the proposed project is to be undertaken

I CERTIFY THAT: (please check appropriate space)

[ ] I am the record owner, lessee, or record easement holder of the property described below.

[X] I am not the record owner, lessee, or record easement holder of the property described below, but I will have before undertaking the proposed work the requisite property interest. (Please explain what the interest will be and how it will be acquired.)

LEGAL DESCRIPTION OF PROPERTY SITUATED IN Polk COUNTY, FLORIDA
(Use additional sheets if necessary)

The west 1400.00 feet of east 2700.00 feet of the south 3300.00 feet of Section 36, Township 32 south, Range 23 east, Polk County, Florida

Michael P. [illegible]
Signature

Sworn and subscribed before me at HILLSBOROUGH County, FLORIDA, this 27TH day of JUNE, 1989.

Kenneth [illegible]
NOTARY PUBLIC

My commission expires: Notary Public, State of Florida
My Commission Expires Dec. 3, 1989
Bonded Thru Troy Fain Insurance Inc.

12. Application is made for a permit(s) to authorize the activities described herein.

A. I authorize the agent listed in Item #2 to negotiate modifications or revisions, when necessary, and accept or assent to any stipulations on my behalf.

B. I understand I may have to provide any additional information/data that may be necessary to provide reasonable assurance or evidence to show that the proposed project will comply with the applicable State Water Quality Standards or other environmental standards both before construction and after the project is completed.

C. In addition, I agree to provide entry to the project site for inspectors with proper identification or documents as required by law from the environmental agencies for the purpose of making preliminary analyses of the site. Further, I agree to provide entry to the project site for such inspectors to monitor permitted work if a permit is granted.

D. Further, I hereby acknowledge the obligation and responsibility for obtaining <u>all</u> of the required state, federal or local permits <u>before</u> commencement of construction activities I also understand that before commencement of this proposed project I must be granted separate permits or authorizations from the U.S. Corps of Engineers, the U.S. Coast Guard, the Department of Environmental Regulation, and the Department of Natural Resources, as necessary.

I CERTIFY that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities.

Signature of Applicant:

Date: 6-25-89

<u>NOTE</u>: THIS APPLICATION MUST BE SIGNED by the person who desires to undertake the proposed activity or by an authorized agent. If an agent is applying on behalf of the applicant, attach proof of authority for the agent to sign and bind the applicant.

18 U.S.C. Section 1001 provides that: Whoever in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

NOTICE TO PERMIT APPLICANTS

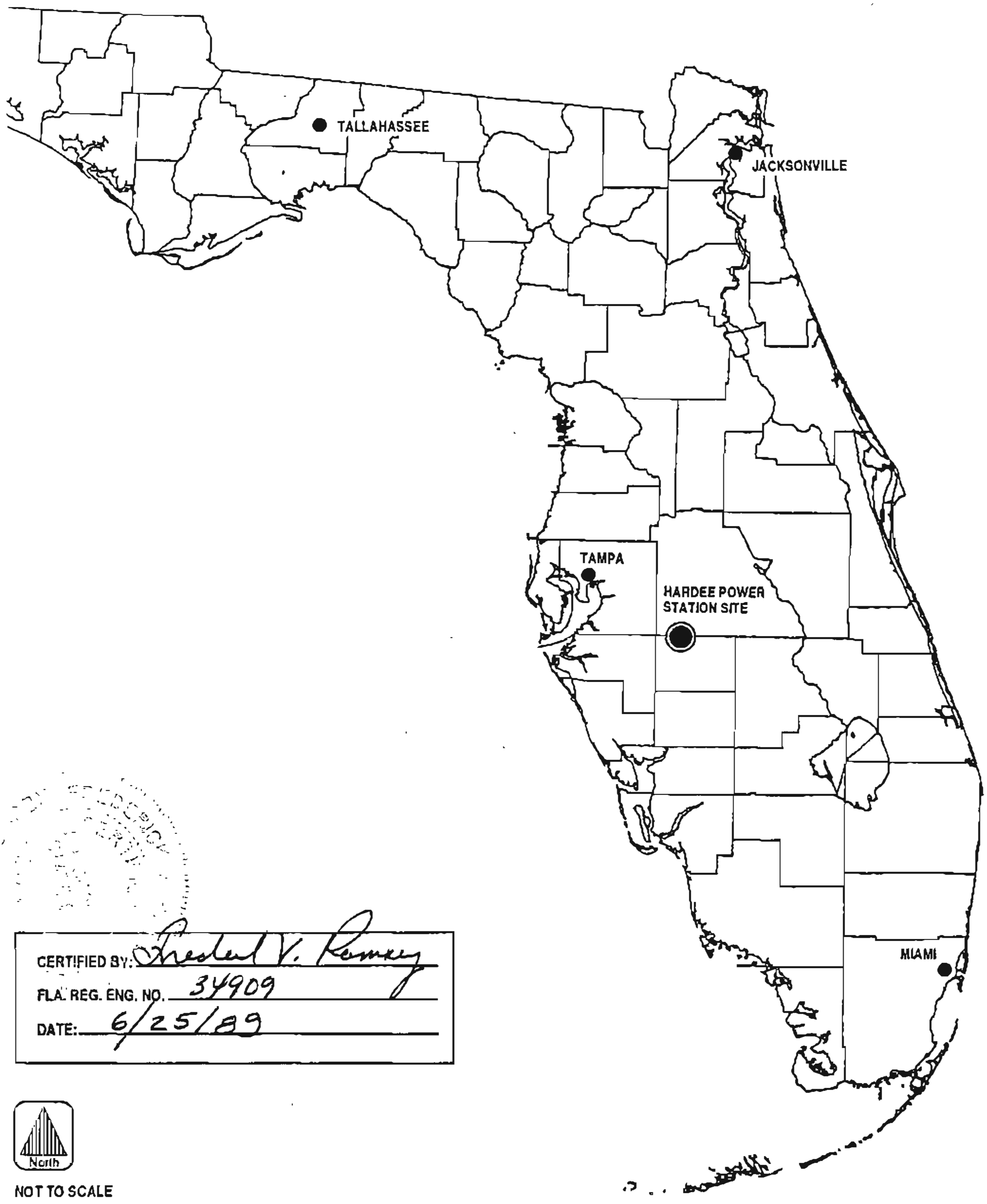
This is a Joint Application; it is <u>NOT</u> a Joint Permit!

You Must Obtain <u>All</u> Required Local, State, and Federal

Authorizations or Permits <u>Before</u> Commencing Work!!

<u>For your information:</u> Section 370.034, Florida Statutes, requires that all dredge and fill equipment owned, used, leased, rented or operated in the state shall be registered with the Department of Natural Resources. Before selecting your contractor or equipment you may wish to determine if this requirement has been met. For further information, contact the Chief of the Bureau of Licenses and Motorboat Registration, Department of Natural Resources, 3900 Commonwealth Boulevard, Tallahassee, Florida 32303. Telephone Number 904/488-1195. THIS IS NOT A REQUIREMENT FOR A PERMIT FROM THE DEPARTMENT OF ENVIRONMENTAL REGULATION.

BEST AVAILABLE COPY



CERTIFIED BY: Frederick V. Ramsey

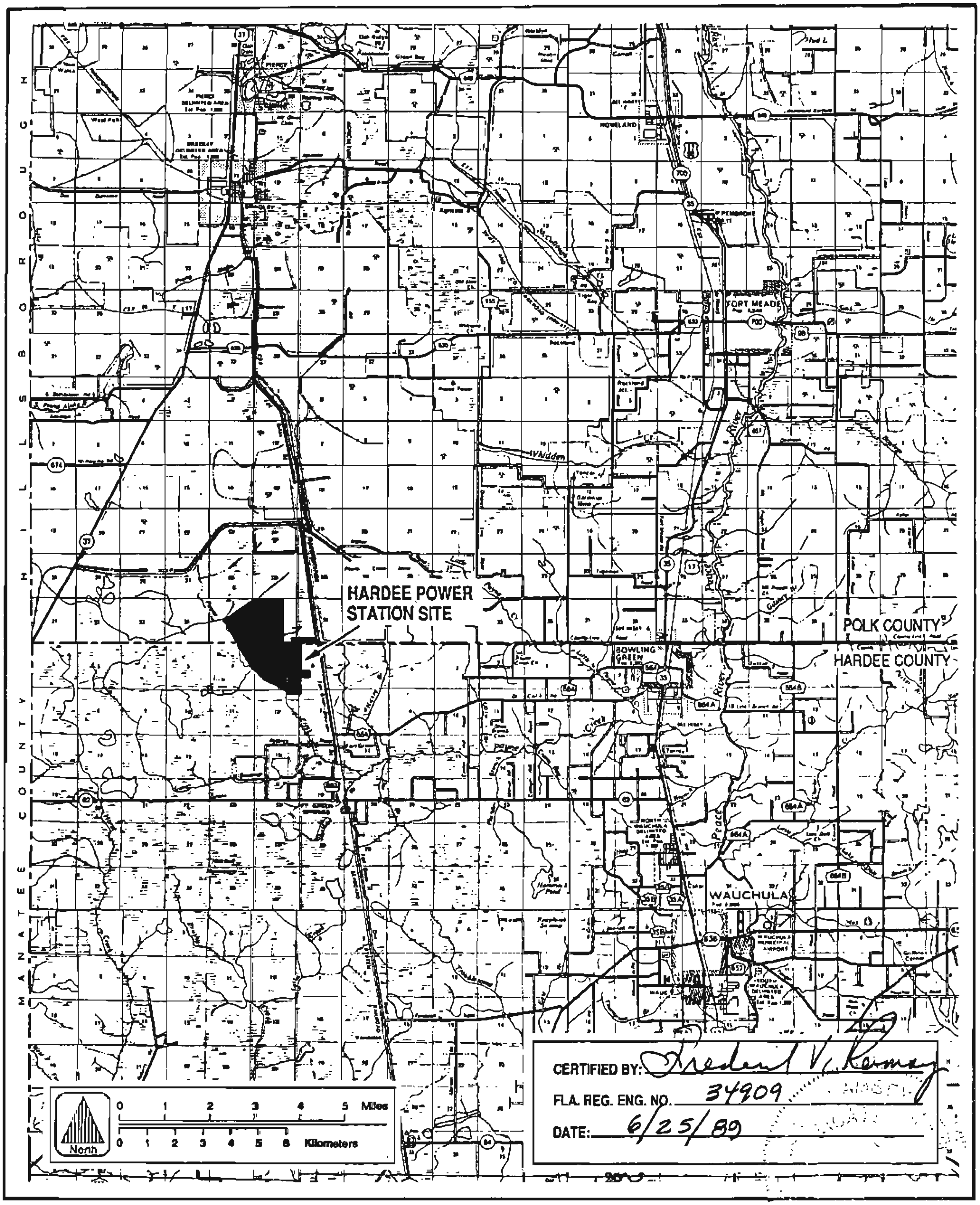
FLA. REG. ENG. NO. 34909

DATE: 6/25/89

Figure 1 GENERAL LOCATION OF HARDEE POWER STATION

Hardee Power Station

BEST AVAILABLE COPY



CERTIFIED BY:

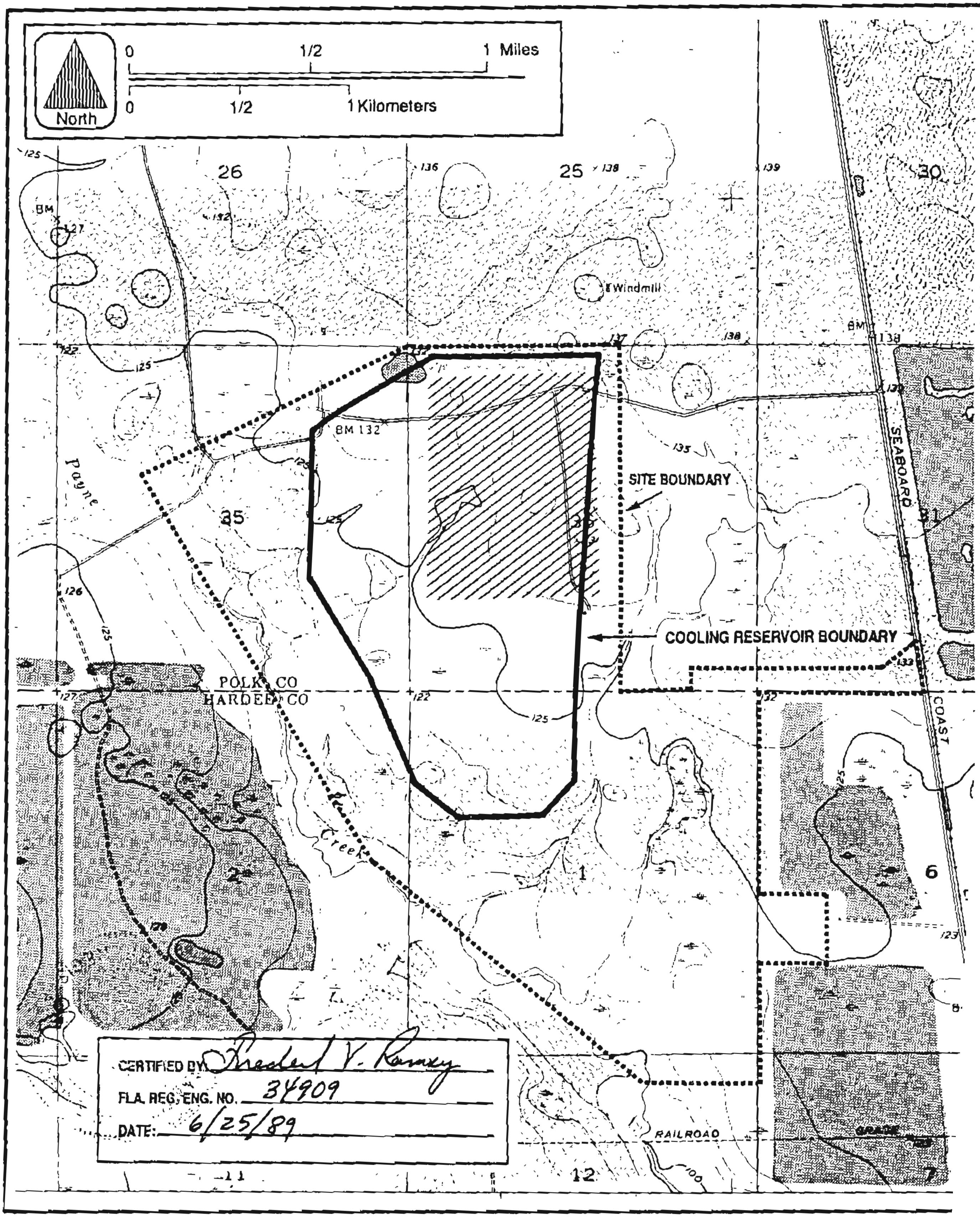
FLA. REG. ENG. NO. 34909

DATE: 6/25/89

Figure 2 HARDEE POWER STATION SITE LOCATION

Hardee Power Station

BEST AVAILABLE COPY



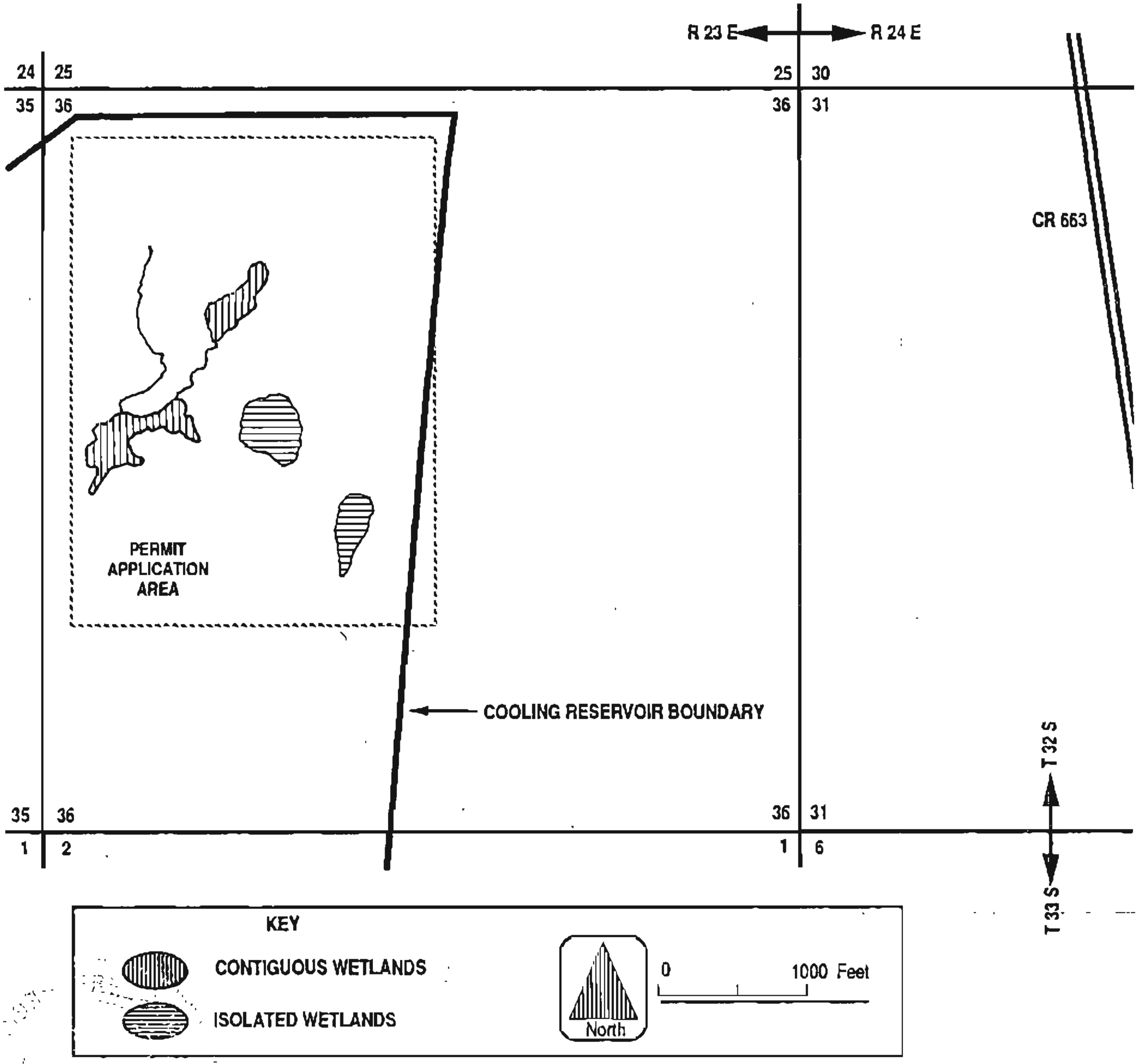
CERTIFIED BY: Fredert V. Ramey

FLA. REG. ENG. NO. 34909

DATE: 6/25/89

Figure 3 LOCATIONS OF SITE BOUNDARY (PERIMETERS) AND PERMIT APPLICATION AREA

Hardee
Power Station



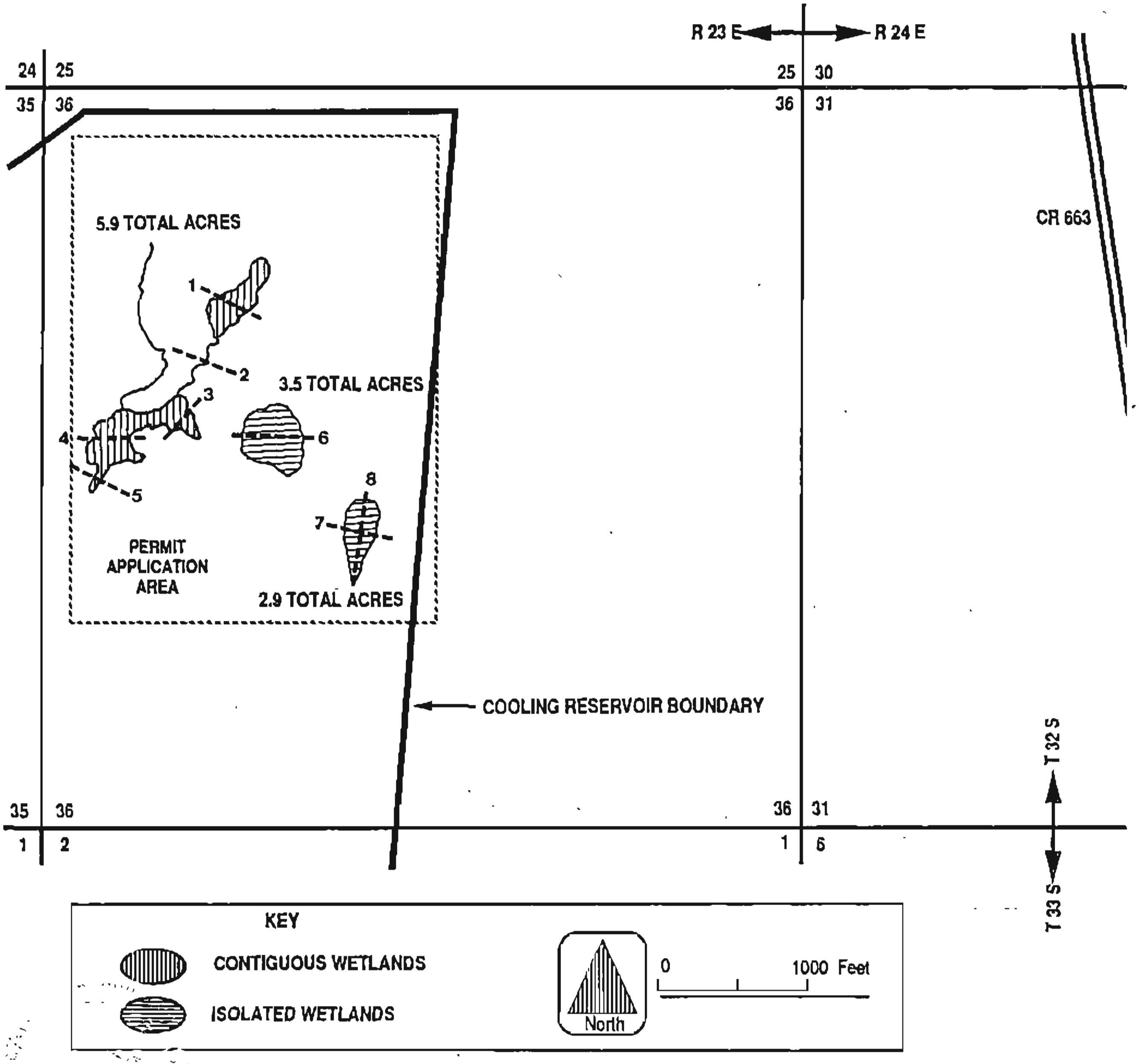
CERTIFIED BY: Fred V. Ramsey

FLA. REG. ENG. NO. 34909

DATE: 6/25/89

Figure 4 PLAN VIEW

Hardee Power Station



CERTIFIED BY: Fredel V. Ramsey

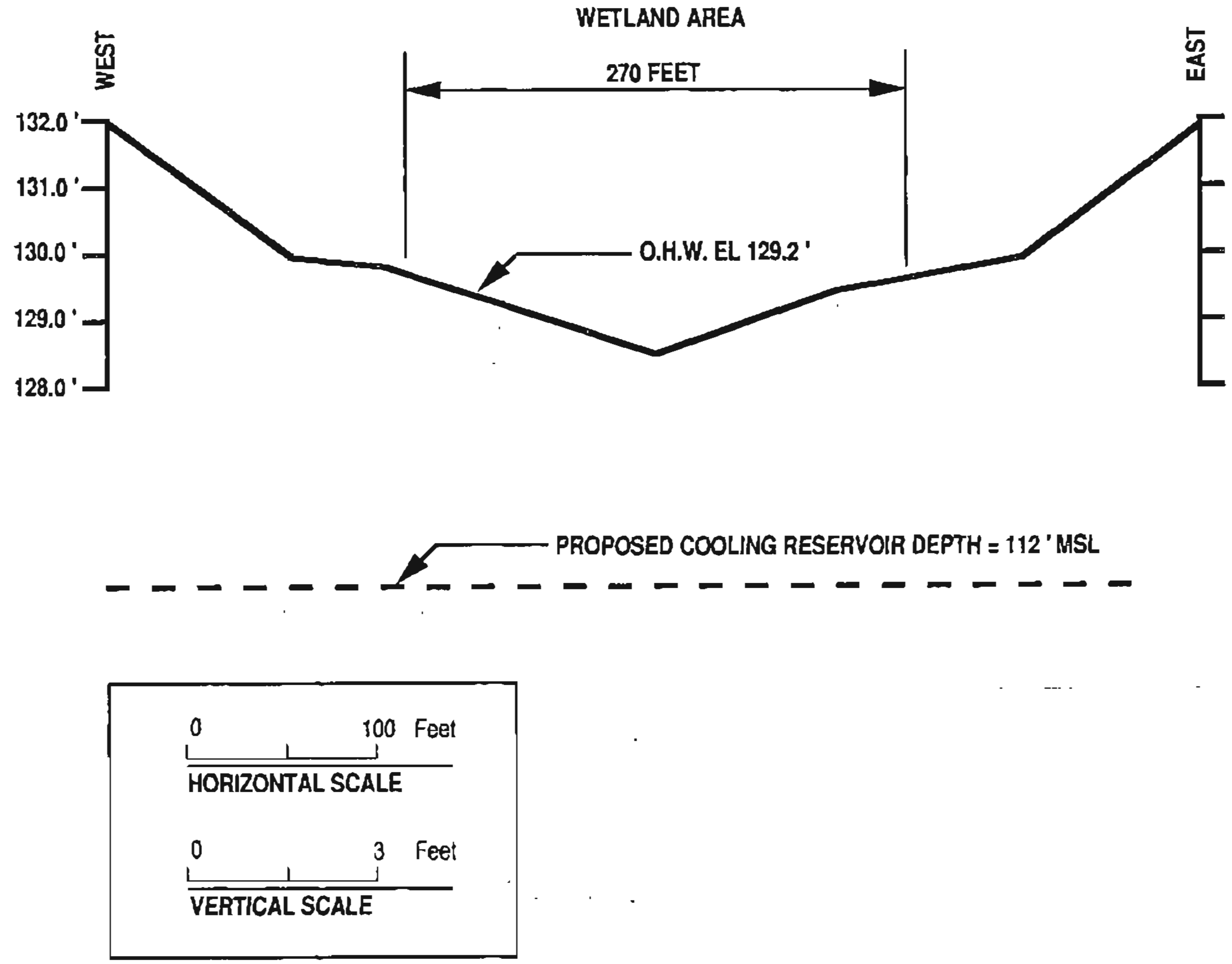
FLA. REG. ENG. NO. 34909

DATE: 6/25/89

Figure 5 PLAN VIEW - LOCATION OF CROSS SECTIONS

Hardee Power Station

BEST AVAILABLE COPY



CERTIFIED BY: Fred V. Ramsey

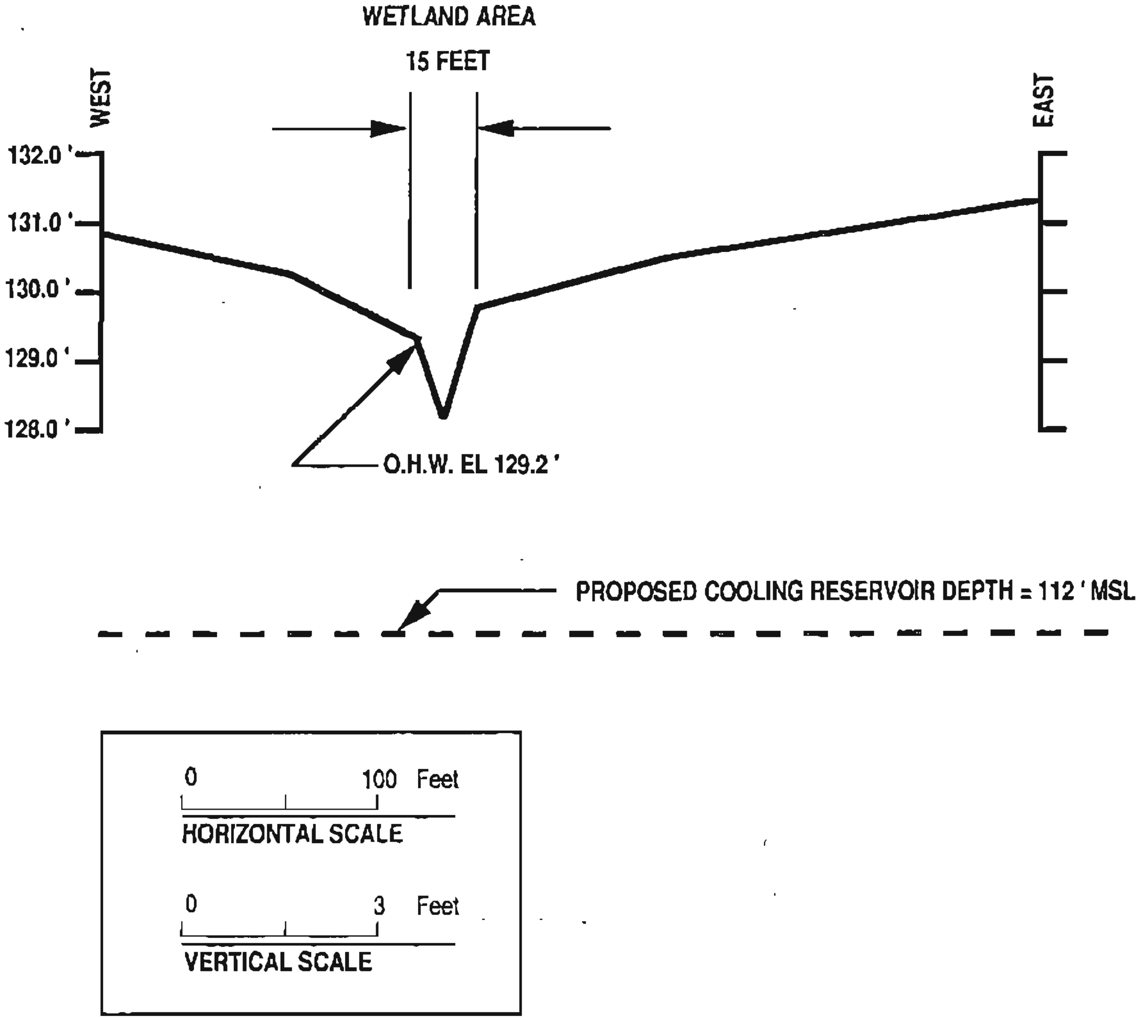
FLA. REG. ENG. NO. 34909

DATE: 6/25/89

Figure 6 CROSS SECTION NO. 1 - LOOKING NORTH
(SEC. 36, T. 32S, R. 23E)

Hardee Power Station

BEST AVAILABLE COPY



CERTIFIED BY: Frederick V. Ramsey

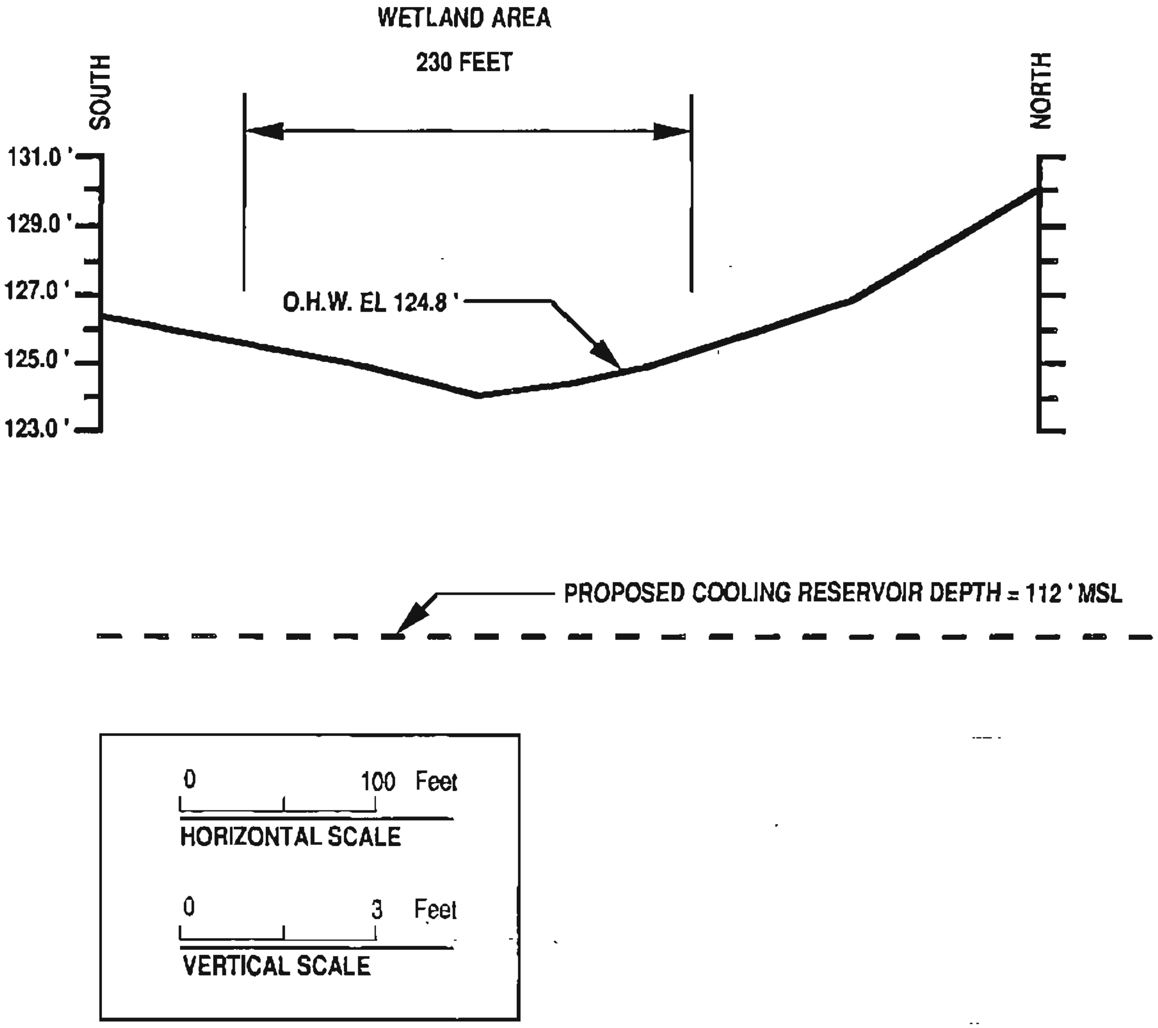
FLA. REG. ENG. NO. 34909

DATE: 6/25/89

Figure 7 CROSS SECTION NO. 2 - LOOKING NORTH
(SEC. 36, T. 32S, R. 23E)

Hardee
Power Station

BEST AVAILABLE COPY



CERTIFIED BY: Fredrick V. Ramsey

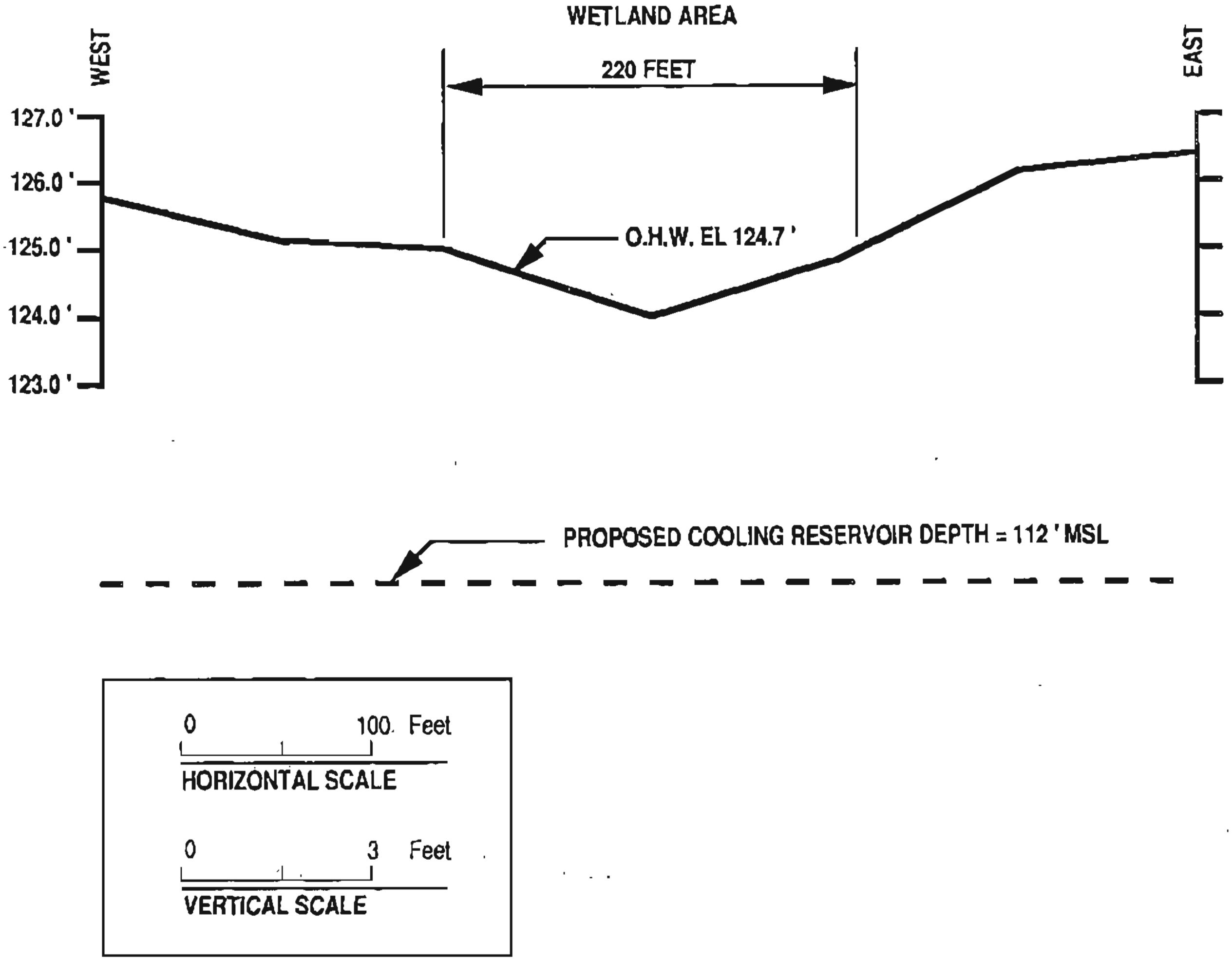
FLA. REG. ENG. NO. 34909

DATE: 6/25/89

Figure 8 CROSS SECTION NO. 3 - LOOKING WEST
(SEC. 36, T. 32S, R. 23E)

Hardee Power Station

BEST AVAILABLE COPY



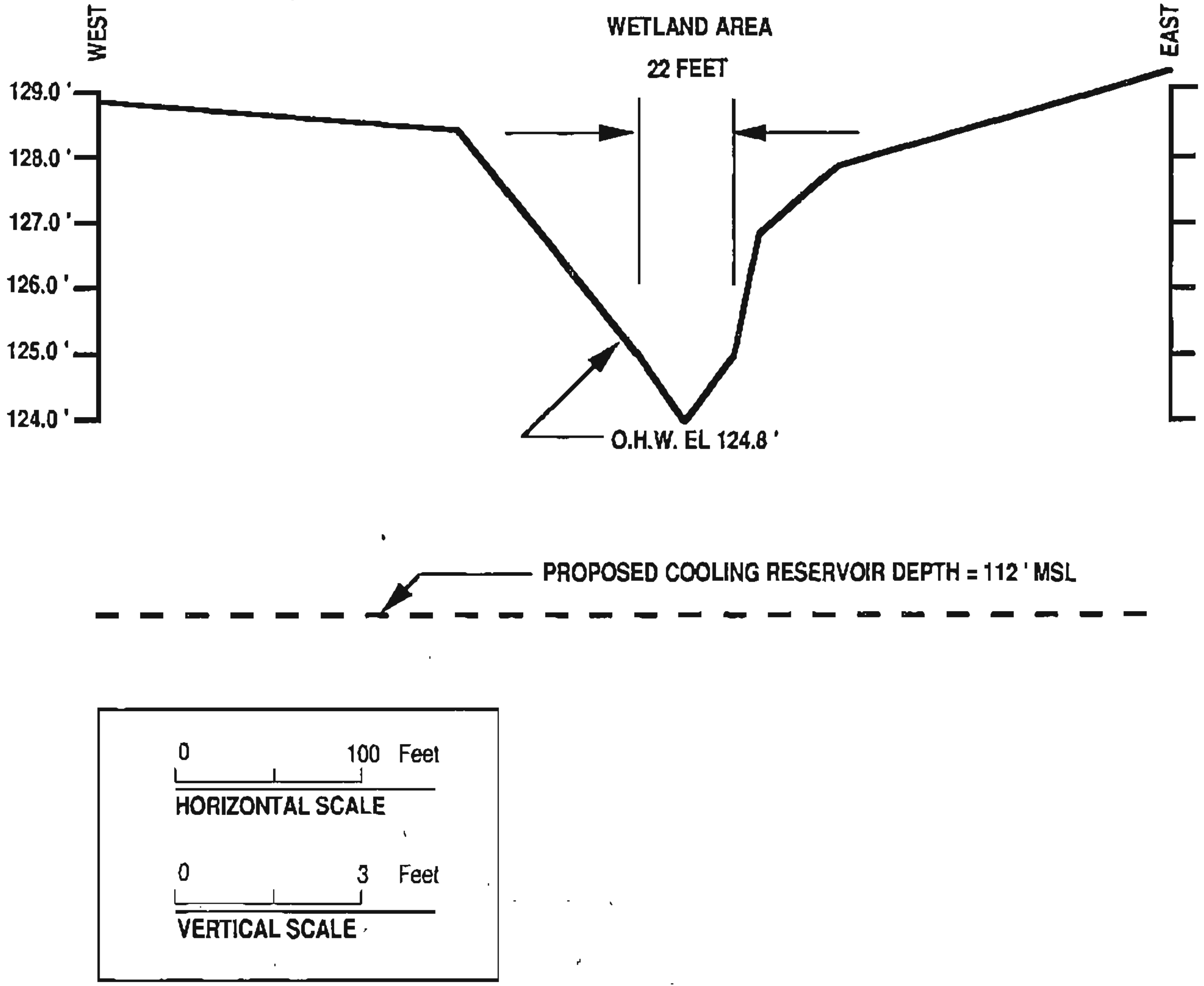
CERTIFIED BY: Fredl V. Ramsey

FLA. REG. ENG. NO. 34909

DATE: 6/25/89

Figure 9 CROSS SECTION NO. 4 - LOOKING NORTH (SEC. 36, T. 32S, R. 23E)

Hardee Power Station



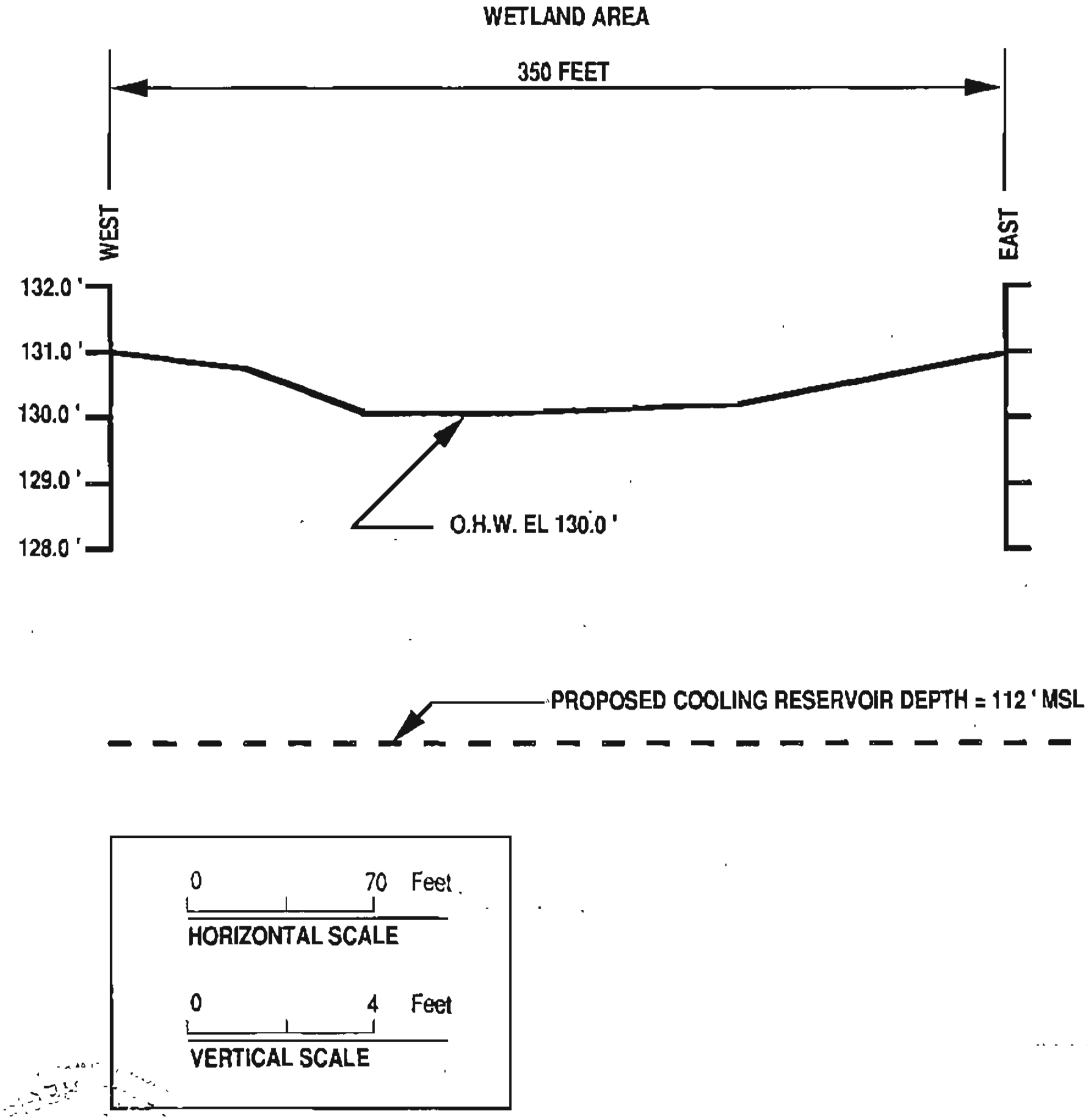
CERTIFIED BY: Fred V. Ramsey

FLA. REG. ENG. NO. 34909

DATE: 6/25/89

Figure 10 CROSS SECTION NO. 5 - LOOKING NORTH (SEC. 36, T. 32S, R. 23E)

Hardee Power Station



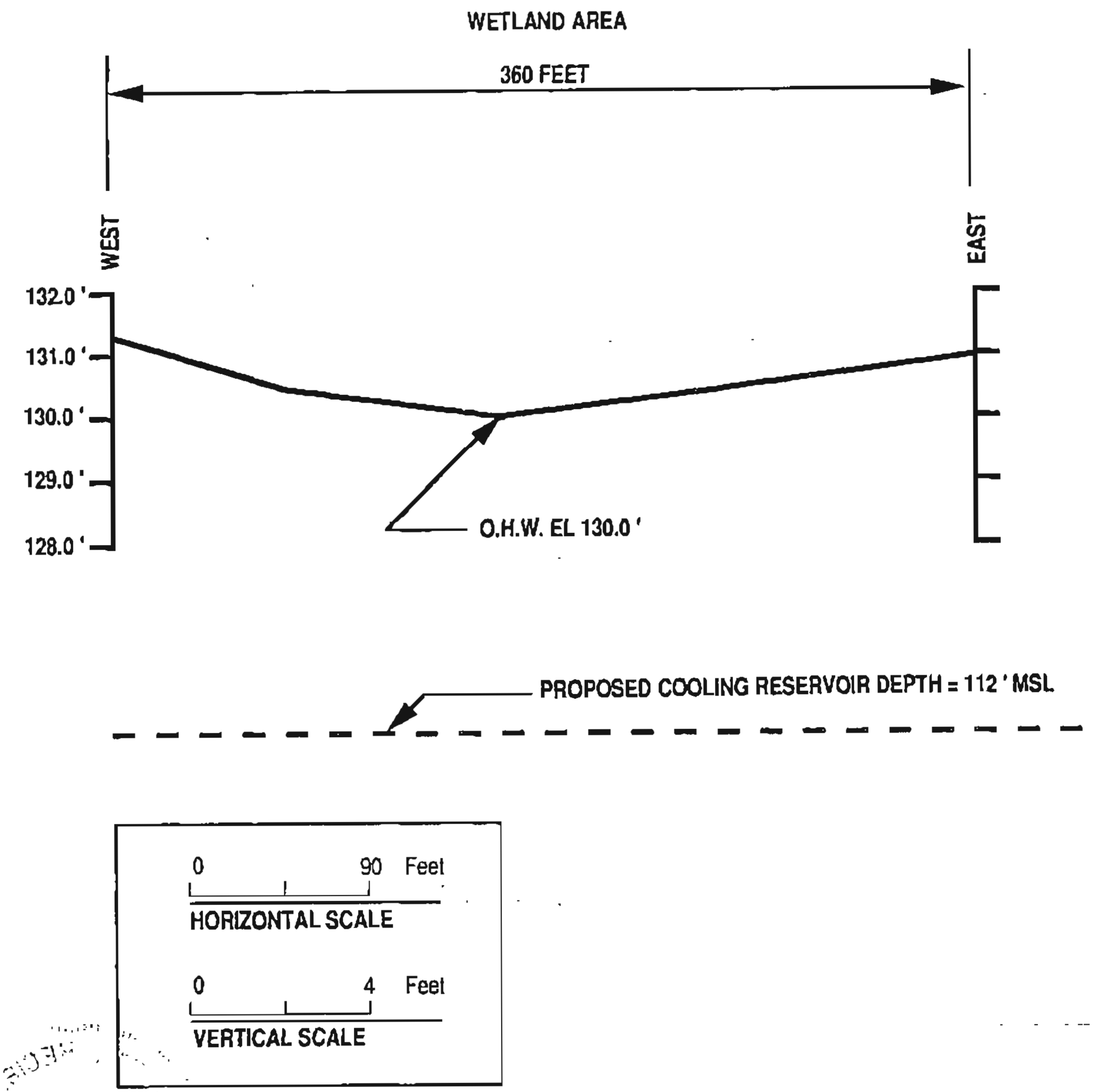
CERTIFIED BY: Fredl V. Rumsey

FLA. REG. ENG. NO. 34909

DATE: 6/25/89

Figure 11 CROSS SECTION NO. 6 - LOOKING NORTH (SEC. 36, T. 32S, R. 23E)

Hardee Power Station



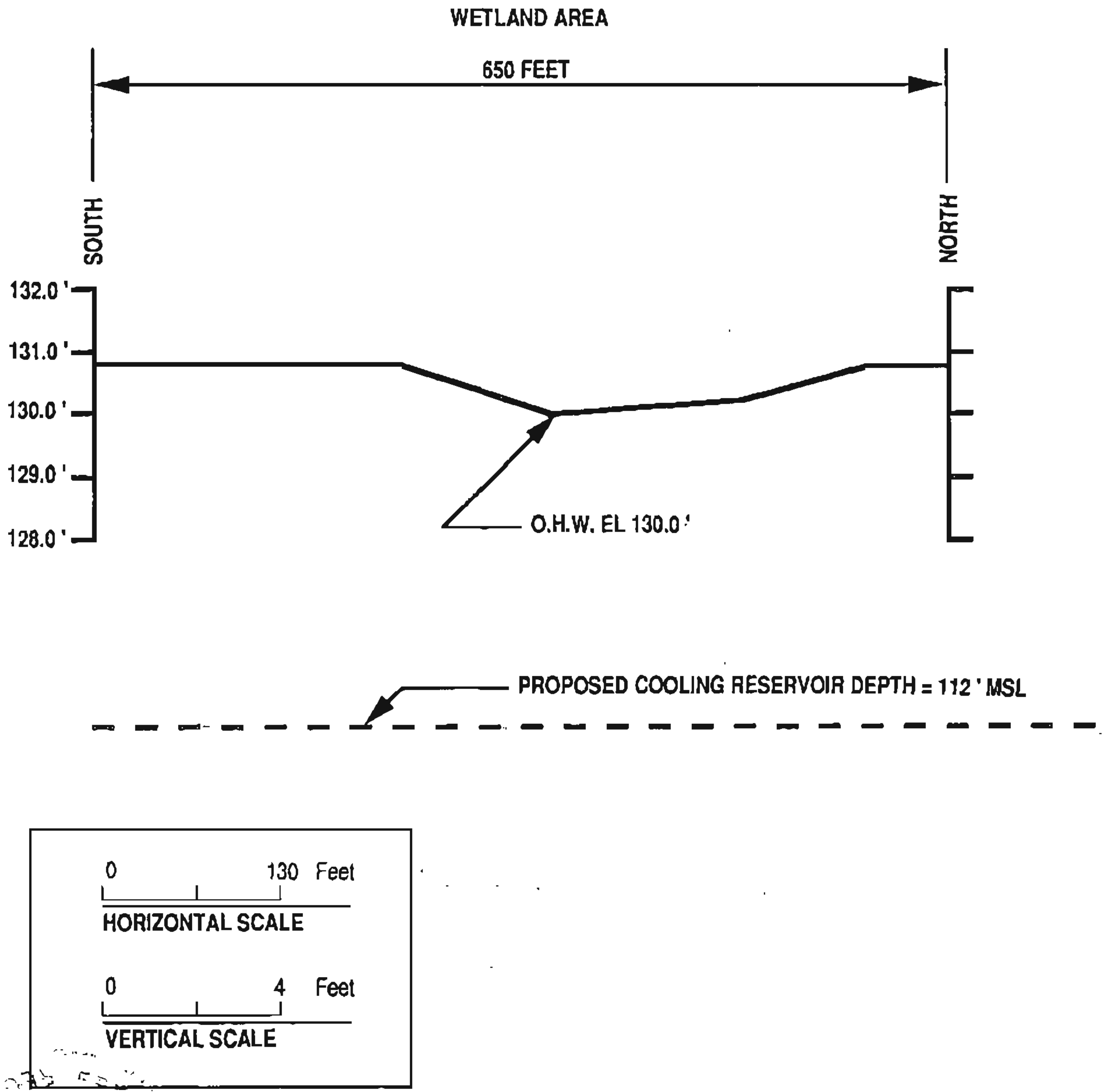
CERTIFIED BY: Frederick V. Ramsey

FLA. REG. ENG. NO. 34909

DATE: 6/25/89

Figure 12 CROSS SECTION NO. 7 - LOOKING NORTH
(SEC. 36, T. 32S, R. 23E)

**Hardee
Power Station**



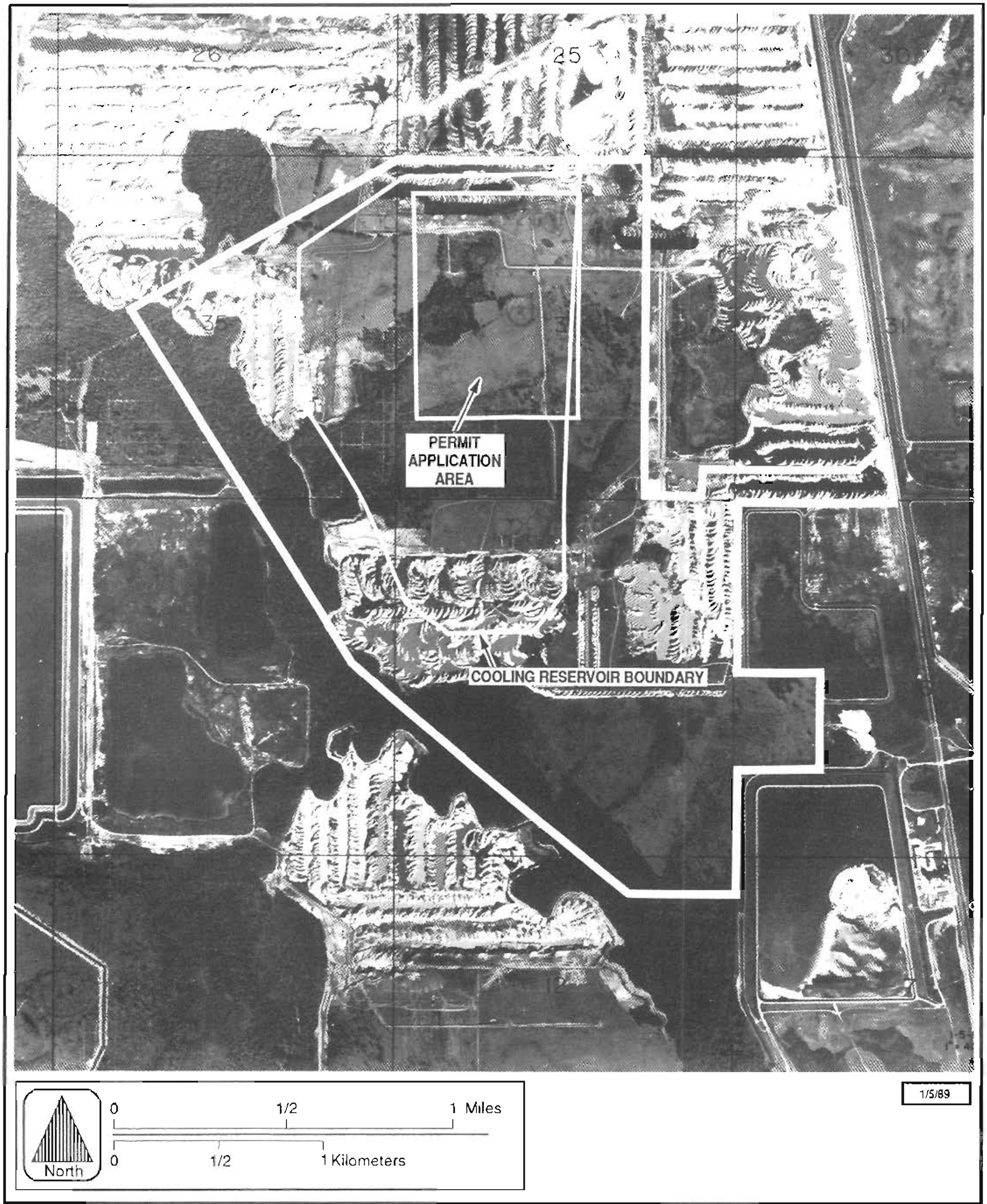
CERTIFIED BY: Frederick V. Romney

FLA. REG. ENG. NO. 34809

DATE: 6/28/89

Figure 13 CROSS SECTION NO. 8 - LOOKING WEST
(SEC. 36, T. 32S, R. 23E)

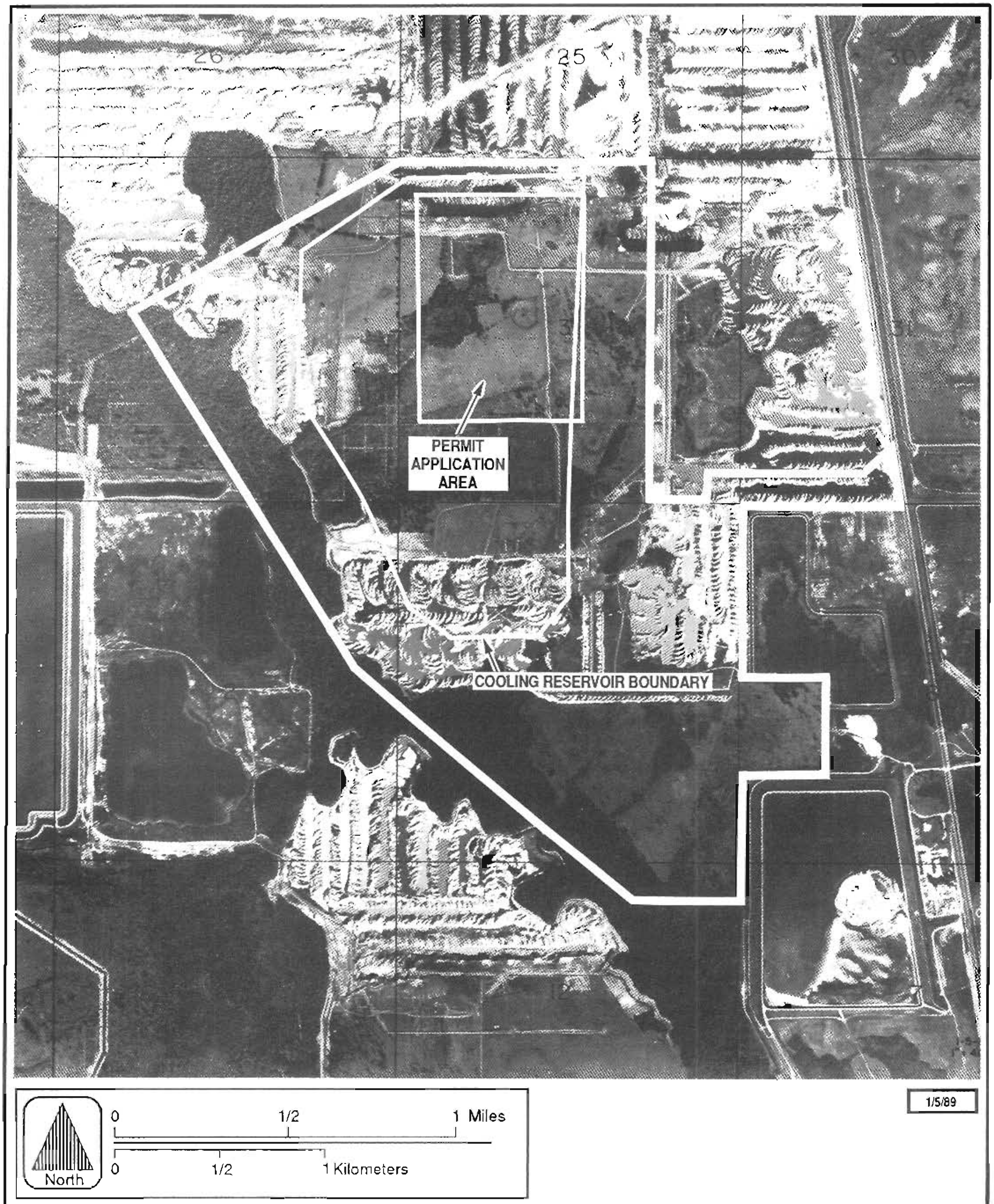
Hardee
Power Station



1/5/89

AERIAL PHOTO OF PERMIT APPLICATION AREA

Hardee Power Station



AERIAL PHOTO OF PERMIT APPLICATION AREA

Hardee Power Station

11.1.4 PREVENTION OF SIGNIFICANT DETERIORATION

11.2 ZONING CONSISTENCY

[illegible]
JAN [illegible] 1989
FILE COPY

IMPERIAL

POLK COUNTY

DEPARTMENT OF DEVELOPMENT COORDINATION

ZONING DIVISION

GERALD C. MARTIN
Zoning Administrator

MERLE H. BISHOP
Director

January 24, 1989

Mr. Mike Opalinski
Environmental Affairs
Seminole Electric Cooperative, Incorporated
P. O. Box 272000
Tampa, Florida 33688-2000

RE: Combined Cycle Power Plant - Consistency and Compliance with applicable Comprehensive Plan and Zoning Ordinance

Dear Mr. Opalinski:

As per your request, the Planning Division and I have reviewed the proposal of Seminole Electric Cooperative, Inc. to construct a combined cycle power plant on a site located in Hardee County. It is our understanding that some directly associated plant facilities will be located in Polk County. These directly associated facilities include: (1) a portion of a 570 acre cooling reservoir (2) a 230 KV transmission line to the Pebbledale Substation located 4 miles southwest of Mulberry and (3) a natural gas pipeline connecting the plant to Florida Gas Transmission's main gas line northeast of Lake Hancock.

These facilities are defined in the Polk County Zoning Ordinance (Ord. No. 83-2, as amended) as essential services. Specifically, transmission lines and gas pipelines are Class I essential services; and the power plant's cooling reservoir is a Class II essential service. Class I essential services are permitted in all zoning districts. The site of the proposed cooling reservoir in Polk County is zoned Rural Conservation (RC) which permits Class II essential services. Therefore, these proposed facilities are in compliance with the Polk County Zoning Ordinance. Also, attached is a memorandum from the Planning Division of Polk County which indicates consistency with the current Comprehensive Plan.

I trust this information will assist you.

Sincerely,

Gerald C Martin

Gerald C. Martin
Zoning Administrator

GCM/mlh

cc: Robert D. Anders, Planning Director
Ron Borchers, Chief of Current Planning

enc.

RECEIVED

JAN 20 1989

POLK COUNTY
ZONING DEPARTMENT

BOARD OF COUNTY COMMISSIONERS

IMPERIAL

POLK COUNTY

DEPARTMENT OF DEVELOPMENT COORDINATION

PLANNING DIVISION
Robert D. Anders, AICP
Planning Director

MERLE H. BISHOP
Director

January 20, 1989

MEMORANDUM

TO: Gerald Martin, Zoning Administrator

VIA: RA Robert D. Anders, Planning Director

FROM: Ron Borchers, Chief of Current Planning

SUBJECT: Seminole Electric Cooperative, Inc. Proposed Power Plant and Associated Facilities

Seminole Electric Cooperative, Inc. is proposing a power plant location in Hardee County. The following associated facilities will be located in Polk County: a portion of a 570 acre cooling reservoir, a 230 KV transmission line to the Pebbledale Substation located four (4) miles southwest of Mulberry and a natural gas pipeline connecting the plant to Florida Gas Transmission's main gas line northeast of Lake Hancock. These facilities, considered as essential services, would be in compliance with the Polk County Comprehensive Plan as adopted by the Board of County Commissioners on June 26, 1979.

RB:el

POST OFFICE BOX 1909 • BARTOW, FLORIDA 33830 • PHONE (813) 533-1161

11.3 FLORIDA DIVISION OF HISTORIC RESOURCES OPINION

FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State
DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
Tallahassee, Florida 32399-0250
(904) 488-1480

April 4, 1989

In Reply Refer To:
Laura A. Kammerer
Historic Sites Specialist
(904) 487-2333
Project File No. 890750

Dr. J. Raymond Williams
Department of Anthropology
University of South Florida
Tampa, Florida 33620-8177

RE: Cultural Resource Assessment Request
Seminole Electric Cooperative, Inc.
Preliminary Transmission Line Corridors
Polk, Hardee, DeSoto, Charlotte and Lee Counties, Florida

Dear Dr. Williams:

We have compared the plotting of the proposed transmission line corridors provided by Seminole Electric with Mark Hurd aerial photographs in the Florida Master Site File. It is the opinion of this agency that the majority of the proposed corridor siting study areas have a low likelihood to contain significant archaeological or historical sites. We have plotted in red hatching on the USGS quadrangle maps, those portions of the study corridors that appear to be archaeologically sensitive. However, we cannot identify all potential locations using this method because some potential site locales are simply not visible on the USGS quadrangle maps or the Mark Hurd aerials.

Since potentially significant archaeological and historic sites may be present, it is our recommendation that, once the final corridor selection has been made, those areas of the corridor hatched in red on the maps be subjected to a professional archaeological and historical survey prior to any project related land clearing or ground disturbing activities within the project area. The purpose of this survey will be to locate and assess the significance of cultural resources present. The resultant survey report must be forwarded to this agency in order to complete the process of reviewing the impact of this project on archaeological and historic resources.

Please note that it is ultimately the survey archaeologist who is responsible for locating and assessing the cultural resources within these areas, regardless of this agency's recommendations. However, this agency is willing to work with the survey archaeologist in determining appropriate field methodology.

Finally, if sites determined to be potentially eligible for listing in the National Register of Historic Places are encountered within the corridor siting by the archaeologist, it will be the recommendation of this office that those sites be avoided during the construction of the transmission line, and subsequently during all line maintenance activities to insure preservation. If avoidance is not feasible, it will be our recommendation that project impacts be mitigated through archaeological salvage excavation, conducted by a professional archaeologist. The resulting mitigative salvage excavation report should be submitted to this agency in order to complete the process of reviewing the impact of this of this project on archaeological and historical resources.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest and cooperation in helping to protect Florida's archaeological and historical resources are appreciated.

Sincerely,

for George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/lak
xc: Joseph M. Norton

FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State
DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough
Tallahassee, Florida 32399-0250
Director's Office (904) 488-1480
Telecopier Number (FAX) (904) 488-3353

April 14, 1989

Dr. J. Raymond Williams
Department of Anthropology
University of South Florida
Tampa, Florida 33620-8177

In Reply Refer To:
Laura A. Kammerer
Historic Sites Specialist
(904) 487-2333
Project File No. 890751

RE: Cultural Resource Assessment Request
Seminole Electric Cooperative, Inc.
Gas Pipeline Corridor
Polk County, Florida

Dear Dr. Williams:

We have compared the plotting of the proposed gasline corridor provided by Seminole Electric, with USGS quadrangle maps in the Florida Master Site File. It is the opinion of this agency that the majority of the proposed corridor siting study areas have a low likelihood to contain significant archaeological or historical sites. We have plotted in red hatching on USGS quadrangle maps, those portions of the study corridor that appear to be archaeologically sensitive. However, we cannot identify all potential locations using this method because some potential site locales are simply not visible on the USGS quadrangle maps.

Since potentially significant archaeological and historic sites may be present, it is our recommendation that those areas of the corridor hatched in red on the maps be subjected to a professional archaeological and historical survey prior to any project related land clearing or ground disturbing activities within the project area. The purpose of this survey will be to locate and assess the significance of cultural resources present. The resultant survey report must be forwarded to this agency in order to complete the process of reviewing the impact of this project on archaeological and historic resources.

Please note that it is ultimately the survey archaeologist who is responsible for locating and assessing the cultural resources within these areas, regardless of this agency's recommendations. However, this agency is willing to work with the survey archaeologist in determining appropriate field methodology.

Finally, if sites determined to be potentially eligible for listing in the National Register of Historic Places are encountered within the corridor siting by the archaeologist, it will be the recommendation of this office that those sites be avoided during the construction of the transmission line, and subsequently during all line maintenance activities to insure preservation. If avoidance is not feasible, it will be our recommendation that project impacts be mitigated through archaeological salvage excavation, conducted by a professional archaeologist. The resulting mitigative salvage excavation report should be submitted to this agency in order to complete the process of reviewing the impact of this of this project on archaeological and historical resources.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest and cooperation in helping to protect Florida's archaeological and historical resources are appreciated.

Sincerely,

Louis D Tesar
for George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/lak
xc: Joseph M. Norton

FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State
DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough
Tallahassee, Florida 32399-0250
Director's Office (904) 488-1480
Telecopier Number (FAX) (904) 488-3353

June 22, 1989

Mr. Roy Zwolak
Hunter Services, Inc.
1715 N. Westshore Blvd., Suite 500
Tampa, Florida 33607-3999

In Reply Refer To:
Laura A. Kammerer
Historic Sites Specialist
(904) 487-2333
Project File No. 891460

RE: Cultural Resource Assessment Request
Liquid Fuel Pipeline Corridor
Hardee, Hillsbourgh, Manatee and Polk Counties

Dear Roy Zwolak:

We have compared the plotting of the proposed liquid fuel line corridor provided by Hunter Services, Inc. with USGS quadrangle maps in the Florida Master Site File. It is the opinion of this agency that the majority of the proposed corridor siting study areas have a low likelihood to contain significant archaeological or historical sites. We have plotted in black hatching on your aerial maps, those portions of the study corridor that appear to be archaeologically sensitive. However, we cannot identify all potential locations using this method because some potential site locales are simply not visible on the aerials or the USGS quadrangle maps. However, because of environmental change, the unpredictability of special use sites such as burial mounds, cemeteries, quarries and other site types, it is possible that sites may be found in unidentified locales which are not indicated in the black hatched areas, but which the survey archaeologist may investigate at his or her own discretion. This agency is willing to work with the survey archaeologist in determining appropriate field methodology.

Since potentially significant archaeological and historic sites may be present, it is our recommendation that those areas of the corridor hatched in black on the maps be subjected to a professional archaeological and historical survey prior to any project related land clearing or ground disturbing activities within the project area. The purpose of this survey will be to locate and assess the significance of cultural resources present. The resultant survey report must be forwarded to this agency in order to complete the process of reviewing the impact of this project on archaeological and historic resources.

Finally, if sites determined to be potentially eligible for listing in the National Register of Historic Places are encountered within the corridor siting by the archaeologist, it will be the recommendation of this office that those sites be avoided during the construction of the liquid fuel line, and subsequently during all line maintenance activities to insure preservation. If avoidance is not feasible, it will be our recommendation that project impacts be mitigated through archaeological salvage excavation, conducted by a professional archaeologist. The resulting mitigative salvage excavation report should be submitted to this agency in order to complete the process of reviewing the impact of this of this project on archaeological and historical resources.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest and cooperation in helping to protect Florida's archaeological and historical resources are appreciated.

Sincerely,

Louis D. Tesar

for George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/lak

11.4 SUPPORTING GEOHYDROLOGICAL INFORMATION

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-1
SHEET 1 of 4

CLIENT Seminole Electric Cooperative, Inc.	PROJECT Combined Cycle	PROJECT NO. 14845

PROJECT LOCATION Agrico South	COORDINATES N 1200 E 750	ELEVATION (DATUM) 122.3	TOTAL DEPTH 100.3	DATE START 11/4/88

SURFACE CONDITIONS Level, grass	INSPECTOR P. L. Nelson	DATE FINISH 11/7/88
CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh	

SAMPLING									
SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV			
CORING									
CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	1	1	1	2	3	1.3	1	SAND; dark grey grading to light grey; loose; poorly graded; fine grained; rounded; moist; trace of silt	Boring advanced by continuous driving of SPT to 6.5'.
							2		
SPT	2	3	4	9	13	1.5	3		
							4	Grading to brown	
							5		
SPT	3	8	10	10	20	1.5	6	Clayey SAND; greenish-white; medium dense; well graded; fine grained; rounded; moist	At 6.5' boring advanced by rotary wash w/3 7/8" wing bit and bentonite as drilling fluid. Water encountered at 7.5'.
							7		
TW	4					2.0	8		
							9		
							10		Pushed w/750 psi.
SPT	5	8	10	12	22	1.5	1	Grading coarser sand	
							2		
							3		
							4		
							15	SAND; white; medium dense; poorly graded; fine grained; rounded; moist; trace of clay	Pushed w/400 psi
TW	6					2.0	6		
							7		
							8		
							9		
							20		
SPT	7	1	1	2	3	1.1	1	SAND; brown; loose; well graded; fine to coarse grained; angular; wet; trace of silt	Lost circulation at 21'-25'
							2		
							3		
							4		
							25		Switched to 2 7/8" roller bit at 25'. Tube sunk first foot by rod weight. Harder at 26.5'.
TW	8					1.7	6		
							7		
							8	6" cemented zone (bent tube at 27')	
							9		Pushed 4" casing to 29'.
							30		

P-ST-036D

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

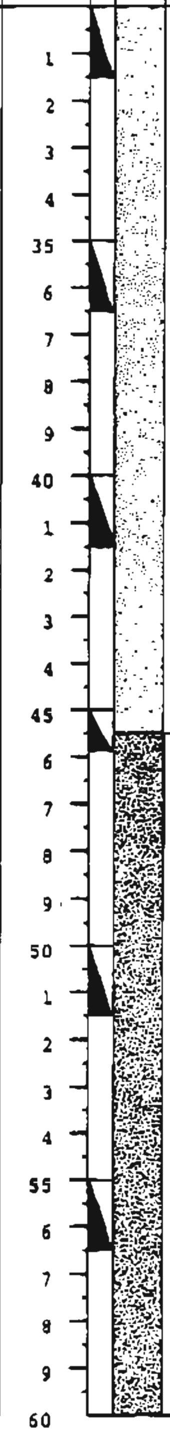
BORING NO. B-1
SHEET 2 of 4

CLIENT	PROJECT	PROJECT NO.
Seminole Electric Cooperative, Inc.	Combined Cycle	14845

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
Agrico South	N 1200 E 750	122.3	100.3	11/4/88

SURFACE CONDITIONS	INSPECTOR	DATE FINISH
Level, grass	P. L. Nelson	11/7/88

CHECKED BY	APPROVED BY
M. R. Osbourn	L. J. Almaleh



SAMPLING										
SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV				
CORING										
CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD	DEPTH IN FEET	SAMPLE TYPE GRAPHICS LOG	CLASSIFICATION OF MATERIAL	REMARKS
SPT	9	6	7	50 5.5"	57+	1.4			Clayey SAND; light grey w/mottled tan; medium dense; poorly graded; fine grained; rounded; wet	Chattering 31'-32.5'
SPT	10	6	11	13	24	1.5	35		Grading finer sand	
SPT	11	8	11	16	27	1.5	40			Stopped at 40' on 11/4/88 Water observed at 2.3' on 11/7/88 a.m.
SPT	12	10	50 4"		50+	0.8	45		Silty SAND; light grey w/black specs; medium dense; poorly graded; fine grained; rounded; moderate cementation; wet	Hard drilling 45.5'-47.5'
SPT	13	14	13	12	25	1.5	50		Grading no cementation	
SPT	14	11	10	10	20	1.5	55			

P-ST-0036D

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-1
SHEET 3 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle		PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES N 1200 E 750	ELEVATION (DATUM) 122.3	TOTAL DEPTH 100.3	DATE START 11/4/88
SURFACE CONDITIONS Level, grass		INSPECTOR P. L. Nelson		DATE FINISH 11/7/88
CHECKED BY M. R. Osbourn		APPROVED BY L. J. Almaleh		

SAMPLING							DEPTH IN FEET	SAMPLE TYPE / GRAPHICS LOG	CLASSIFICATION OF MATERIAL	REMARKS
SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV				
CORING										
CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD				
SPT	15	4	5	10	15	1.5				
							1			
							2			
							3			
							4			Hard drilling 63.5'-67.5'
SPT	16	50/5"			50+	0.2	65		Grading moderate cementation	
							6			
							7			
							8			
							9			
SPT	17	4	5	48	53	1.5	70		SAND; black w/mottled light grey; very dense; poorly graded; fine grained; rounded; moist; some clay	Hard drilling 71'-71.5'
							1			
							2			
							3			
							4			
SPT	18	15	15	37	52	0.8	75		Thin cemented layers	
							6			
							7			
							8			Chattering 78'-79'
							9			
SPT	19	9	11	32	43	1.5	80		Sandy SILT; light grey; hard; plastic; moist; trace clay	
							1			
							2			
							3			Chattering 82.5'-84'
							4			
SPT	20	35	50/4.5"		50+	0.3	85			
							6			Chattering between 86'-96'.
							7			
							8			
							9			
							90			

LOG OF BORING

BORING NO. B-1
SHEET 4 of 4

CLIENT: Seminole Electric Cooperative, Inc.
PROJECT: Combined Cycle
PROJECT NO.: 14845
PROJECT LOCATION: Agrico South
COORDINATES: N 1200 E 750
ELEVATION (DATUM): 122.3
TOTAL DEPTH: 100.3
DATE START: 11/4/88
SURFACE CONDITIONS: Level, grass
INSPECTOR: P. L. Nelson
DATE FINISH: 11/7/88
CHECKED BY: M. R. Osbourn
APPROVED BY: L. J. Almaleh

SAMPLING SAMP TYPE CORING CORE SIZE	SAMP NO. RUN NO.	SET 6" RUN LENG	2ND 6" RUN RECV	3RD 6" RQD RECV	N VAL % RECV	SAMP RECV RQD	DEPTH IN FEET	SAMPLE TYPE GRAPHICS LOG	CLASSIFICATION OF MATERIAL	REMARKS
SPT	21	50/4"			50+	0.3			Chert nodule in sample	
							1			
							2			
							3			
							4			
SPT	22	19	50/3"		50+	0.7	95			
							6			Drilling easier 96-97.5'.
							7			
							8			
							9			
SPT	23	50/4"			50+	0	100			
							1			Bottom of boring at 100.3'. Backfilled w/cement grout. Water level not recorded.
							2			
							3			
							4			
							105			
							6			
							7			
							8			
							9			
							110			
							1			
							2			
							3			
							4			
							115			
							6			
							7			
							8			
							9			
							120			

BLACK & VEATCH
ENGINEERS-ARCHITECTS

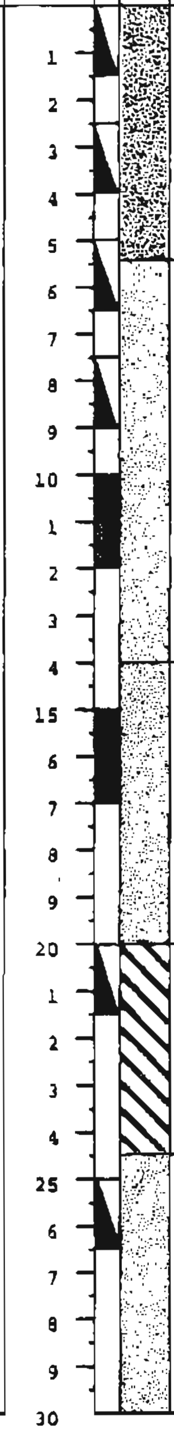
LOG OF BORING

BORING NO. B-2
SHEET 1 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle	PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 535 W 185	ELEVATION (DATUM) 114.2	TOTAL DEPTH 101.5
			DATE START 11/2/88
SURFACE CONDITIONS 8" long grass, level		INSPECTOR P. L. Nelson	DATE FINISH 11/2/88
CHECKED BY M. R. Osbourn		APPROVED BY L. J. Almaleh	

SAMPLING SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV
CORING CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD
SPT	1	1	0	2	3	1.4
SPT	2	4	6	4	10	1.5
SPT	3	2	2	4	6	1.5
SPT	4	3	3	6	9	1.0
TW	5					1.25
TW	6					2.0
SPT	7	20	50 3"		50+	0.7
SPT	8	16	8	9	17	0.7

DEPTH IN FEET — SAMPLE TYPE — GRAPHICS LOG



CLASSIFICATION OF MATERIAL

Silty SAND; dark grey grading light grey; very loose; poorly graded; fine grained; rounded; dry; trace of organics

Grading brown, no organics

Clayey SAND; tan; loose; poorly graded; fine grained; rounded; moist

Grading finer

Clayey SAND; tan; dense; poorly graded; fine grained; rounded; moist

Sandy CLAY; light brown; hard; plastic; moist; moderate cementation; trace of coarse sand and gravel

Clayey SAND; light brown; dense; well graded; medium to coarse grained; angular; moist; weak cementation; some gravel

REMARKS

Boring advanced to 6.5' by continuous driving and cleaning out of split spoon.

At 6.5' switched to rotary wash w/3 7/8" roller bit, using bentonite as drilling fluid.

Water encountered at 5'.

Chattering 20.5'-24' in 3"-6" increments.

Drilling easier.

P-ST-036D

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

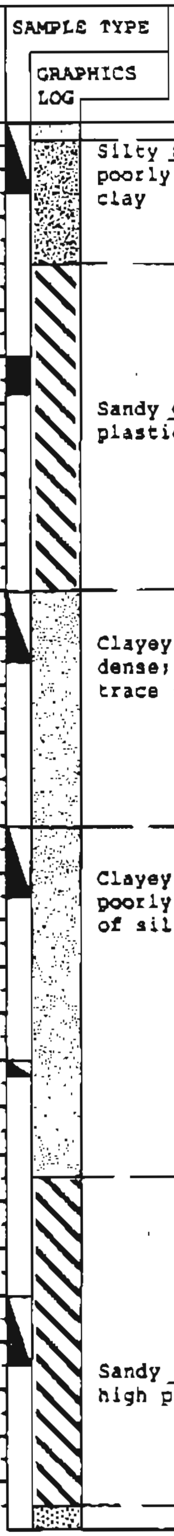
BORING NO. B-2
SHEET 2 of 4

CLIENT Seminole Electric Cooperative, Inc.	PROJECT Combined Cycle	PROJECT NO. 14845

PROJECT LOCATION Agrico South	COORDINATES S 535 W 185	ELEVATION (DATUM) 114.2	TOTAL DEPTH 101.5	DATE START 11/2/88

SURFACE CONDITIONS 8" long grass, level	INSPECTOR P. L. Nelson	DATE FINISH 11/2/88
	CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh

SAMPLING SAMP TYPE CORING CORE SIZE	SAMP NO. RUN NO.	SET 6" RUN LENG	2ND 6" RUN RECV	3RD 6" RQD RECV	N VAL % RECV	SAMP RECV RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	9	9	17	23	40	1.5		Silty SAND; brown mottled tan; dense; poorly graded; fine grained; moist; trace clay	
							1		
							2		
							3		Drilling easier at 33'.
							4		
TW	10					0.75	35		
							6	Sandy CLAY; grey mottled brown; high plasticity; moist; trace silt	
							7		
							8		
							9		Chattering, 39'-40'
SPT	11	28	12	8	20	1.5	40		
							1	Clayey SAND; grey mottled brown; medium dense; poorly graded; fine grained; moist; trace silt	
							2		
							3		
							4		
SPT	12	3	6	50	56	1.5	45		Switched to 2 7/8" roller bit at 45'
							6	Clayey SAND; dark grey; very dense; poorly graded; fine grained; moist; trace of silt	
							7		
							8		
							9		
SPT	13	50 2.5"			50+	0	50		Chattering 50'-52.5'
							1		
							2		
							3		
							4		
SPT	14	37	18	21	39	1.5	55		
							6		
							7	Sandy CLAY; light grey w/black specs; high plasticity; wet; trace of silt	
							8		
							9		Drilling easier 58.5'-59.7'.
							60		



LOG OF BORING

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle	PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 535 W 185	ELEVATION (DATUM) 114.2	TOTAL DEPTH 101.5
			DATE START 11/2/88
SURFACE CONDITIONS 8" long grass, level		INSPECTOR P. L. Nelson	DATE FINISH 11/2/88
CHECKED BY M. R. Osbourn		APPROVED BY L. J. Almaleh	

SAMPLING: SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
CORING: CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD			
SPT	15	50 1"			50+	0	60		Chattering 59.7'-62.0'
SPT	16	7	8	16	24	1.5	65	SAND; black; medium dense; poorly graded; rounded; fine grained; moist; trace of silt	
SPT	17	14	8	19	27	1.5	70		
							72		Chattering 72'-72.5'
SPT	18	12	6	5	11	1.5	75	Intermittent 2"-4" sandy clay layers	
							77.5		Drilling hard 77.5'-83'
							79		
SPT	19	10	18	16	34	1.5	80	Sandy CLAY; tan w/black specs; hard; high plasticity; wet; weak cementation; trace of silt	
							83		Drilling hard w/chattering 83'-93'
SPT	20	50 1"			50+	0	85		
							90		

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-2
SHEET 4 of 4

CLIENT Seminole Electric Cooperative, Inc.	PROJECT Combined Cycle	PROJECT NO. 14845

PROJECT LOCATION Agrico South	COORDINATES S 535 W 185	ELEVATION (DATUM) 114.2	TOTAL DEPTH 101.5	DATE START 11/2/88

SURFACE CONDITIONS 8" long grass, level	INSPECTOR P. L. Nelson	DATE FINISH 11/2/88

CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh

SAMPLING SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
CORING CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD			
SPT	21	50 2"			50+	0	1 2 3 4		Intermittent hard drilling 93'-95'.
SPT	22	50 0.2'			50+	0.2	95 6 7 8 9	Clayey SAND; light grey w/black specs; very dense; well graded; fine grained; round; moist; weak cementation	Drilling easier 95.5'-100'.
SPT	23	14	18	37	55	1.5	100 1	Sandy SILT; light grey w/black specs; hard; plastic; moist; trace clay	
							2 3 4 105 6 7 8 9 110 1 2 3 4 115 6 7 8 9 120		Bottom of boring at 101.5'. Water level not recorded. Backfilled hole to surface with cement grout.

SAMPLE TYPE

GRAPHICS LOG

P-ST-036D

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-3
SHEET 1 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle	PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 900 E 1800	ELEVATION (DATUM) 121.7	TOTAL DEPTH 100.7
			DATE START 10/31/88
SURFACE CONDITIONS Flat, heavy surface vegetation		INSPECTOR M. R. Osbourn	DATE FINISH 11/1/88
	CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh	

SAMPLING SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	1	1	1	2	3	1.0	1	Silty SAND; grey; very loose; poorly graded; fine grained; dry; trace of topsoil; w/organics	Boring advanced to 5' by continuous driving and cleaning out of split spoon. Boring then advanced with 3 7/8" wing bit, using bentonite as drilling fluid.
							2		
SPT	2	3	4	4	8	1.5	3	SAND; light grey; very loose; poorly graded; fine grained; dry	
							4		
							5		
SPT	3	17	21	31	52	1.5	6	Silty SAND; dark brown; loose to very dense; poorly graded; fine grained; dry; w/iron nodules	
							7		
SPT	4	7	10	15	25	1.4	8	SAND; light tan; very dense; poorly graded; very fine grained; dry; trace silt	
							9		
SPT	5	20	18	16	34	1.2	10	Clayey SAND; light grey; medium dense; poorly graded; fine grained; slight cementation; moist; w/iron staining	At 10' attempted TW
							1	Grading coarser	
							2		
							3		
							4		
TW	6					2.0	15		
							6	Sandy CLAY; light gray; very stiff; high plasticity; moist	
							7		
							8		
							9		
TW	7					2.0	20		At 20' 600 psi down pressure required to push TW
							1	CLAY; light gray; stiff; plastic; moist; trace sand	
							2		
							3		
							4		
SPT	8	3	4	5	9	1.5	25	Becoming varved w/sand stringers	
							6		
							7		
							8		
							9		
							30		

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-3
SHEET 2 of 4

CLIENT: Seminole Electric Cooperative Inc.
PROJECT: Combined Cycle
PROJECT NO.: 14845
PROJECT LOCATION: Agrico South
COORDINATES: S 900 E 1800
ELEVATION (DATUM): 121.7
TOTAL DEPTH: 100.7
DATE START: 10/31/88
SURFACE CONDITIONS: Flat, heavy surface vegetation
INSPECTOR: M. R. Osbourn
DATE FINISH: 11/1/88
CHECKED BY: M. R. Osbourn
APPROVED BY: L. J. Almaleh

SAMPLING SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
CORING CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD			
TW	9					1.7		Encountered fragments of cemented material	Too stiff to push below 31.8'. Cemented layer determined from hard drilling. At 33' began drilling with a 2 7/8" tricone roller bit.
							1		
							2		
							3	Cemented stringer	
							4		
SPT	10	21	9	11	20	1.0	35	SAND; light brown; dense; well graded; medium-fine grained; wet; w/phosphate nodules and some silt	Terminated drill on 10/31/88 at 36.5'
							6		
							7		Resumed drilling on 11/01/88.
							8		
							9		
SPT	11	10	41	50 3"	+91	1.3	40	Sandy CLAY; light grey mottled brown; hard; plastic; weak cementation; moist; w/phosphate nodules and trace of silt	
							1		
							2		
							3		
							4	At 44'-45.5' signs of cementation	
SPT	12	16	9	10	19	1.2	45	Clayey SAND; grey; medium dense; poorly graded; fine grained; rounded; moist	
							6		
							7		
							8		
							9		At 49.0' to 51.5' drill became very difficult (signs of cementation)
SPT	13	50 0			+50	0	50		
							1		
							2		
							3		
							4		
SPT	14	5	4	6	10	1.5	55	Clayey SAND; grey to light grey; medium dense; poorly graded; fine grained; moist; w/clayey silt seams	
							6		
							7		
							8		
							9		
							60		

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-3
SHEET 3 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle		PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 900 E 1800	ELEVATION (DATUM) 121.7	TOTAL DEPTH 100.7	DATE START 10/31/88
SURFACE CONDITIONS Flat, heavy surface vegetation		INSPECTOR M. R. Osbourn		DATE FINISH 11/1/88
	CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh		

SAMPLING SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
CORING CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD			
SPT	15	5	6	6	12	1.0	1 2 3 4	Silty SAND; grey to dark grey; medium dense; poorly graded; fine grained; wet	
TW	16					1.3	65 6 7 8 9	Sandy CLAY; dark brown; stiff; high plasticity; moist; w/trace peat at 67'	
SPT	17	10	7	7	14	1.5	70 1 2 3 4	SAND; light grey; medium dense; poorly graded; fine grained; wet; w/some clay Grading grey at 70.5'	Drilling became harder from 73'-75'
SPT	18	10	32	15	47	1.4	75 6 7 8 9	Grading coarser Cemented seam at 75.9'	
SPT	19	8	8	28	36	1.5	80 1 2 3 4	Sandy SILT; light grey; stiff; high plasticity; moist; w/cemented pieces	Drilling became hard at 81.5' to 84.0'
SPT	20	50 1"	-	-	+50	0.1	85 6 7 8 9 90		

P-ST-036D

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-3
SHEET 4 of 4

CLIENT: Seminole Electric Cooperative, Inc.
PROJECT: Combined Cycle
PROJECT NO.: 14845
PROJECT LOCATION: Agrico South
COORDINATES: S 900 E 1800
ELEVATION (DATUM): 121.7
TOTAL DEPTH: 100.7
DATE START: 10/31/88
SURFACE CONDITIONS: Flat, heavy surface vegetation
INSPECTOR: M. R. Osbourn
DATE FINISH: 11/1/88
CHECKED BY: M. R. Osbourn
APPROVED BY: L. J. Almaleh

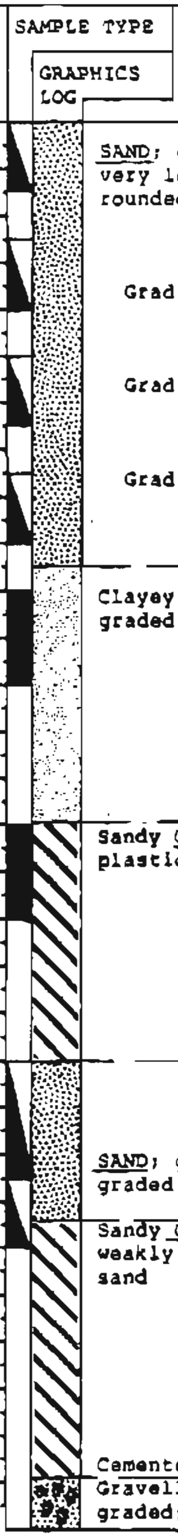
SAMPLING SAMP TYPE CORING CORE SIZE	SAMP NO. RUN NO.	SET 6" RUN LENG	2ND 6" RUN RECV	3RD 6" RQD RECV	N VAL % RECV	SAMP RECV RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	21	50 3"	-	-	+50	0.3		Clayey SAND; grey to light grey; very dense; poorly graded; fine grained; rounded; moist	Drilling showed interbedding layers of hard and soft material
							1		
							2		
							3		
							4		
SPT	22	50 4"	-	-	+50	0	95	Sandy SILT; light grey; hard; plastic; moist; moderate cementation	
							6		
							7		
							8		
							9		
SPT	23	22	50 4"	-	+50	0.7	100		Bottom of boring at 100.7 Water level not recorded Boring backfilled to surface with cement grout
							1		
							2		
							3		
							4		
							105		
							6		
							7		
							8		
							9		
							110		
							1		
							2		
							3		
							4		
							115		
							6		
							7		
							8		
							9		
							120		

P-ST-036D

LOG OF BORING

BORING NO. B-4
SHEET 1 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle	PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 80 E 570	ELEVATION (DATUM) 120.5	TOTAL DEPTH 101.5
			DATE START 11/3/88
SURFACE CONDITIONS 8" long grass, level		INSPECTOR P. L. Nelson	DATE FINISH 11/4/88
CHECKED BY M. R. Osbourn		APPROVED BY L. J. Almaleh	



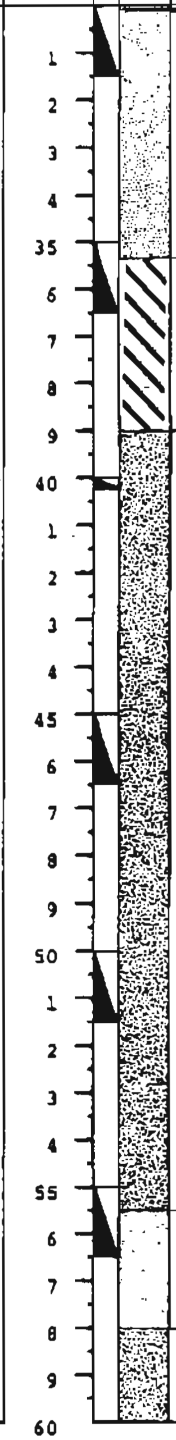
SAMPLING							DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV			
CORING									
CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD			
SPT	1	2	1	2	3	1.5	1	SAND; dark grey grading to light grey; very loose; uniform; fine grained; rounded; dry; trace silt; little organics	Boring advanced to 6.5' by continuous driving and cleaning out of split spoon. Boring then advanced with 4" wing bit using bentonite as drilling fluid.
SPT	2	3	4	3	7	0.8	3		
							4	Grading to dark brown	
SPT	3	6	7	8	15	1.5	6	Grading to light grey	Water encountered at 5'
SPT	4	3	3	4	7	1.1	8	Grading finer	
TW	5					2.0	10	Clayey SAND; light tan; medium dense; well graded; fine grained; rounded; moist	Pushed TW w/500 psi.
TW	6					2.0	15	Sandy CLAY; greenish-tan; stiff; high plasticity; moist	Pushed w/400 psi.
SPT	7	1	0	1	1	0	20		First blow 1', next blow 1.7'. Lost mud after driving spoon. Spoon showed traces of coarse sand at 21'.
							2	SAND; greenish-white; very loose; poorly graded; medium grained; rounded; wet	
SPT	8	1	2	8	10	1.5	4	Sandy CLAY; tan; stiff; plastic; moist; weakly cemented; trace gravel and coarse sand	Set 4" casing to 24.5'.
							7		Harder at 27.5'.
							8	Cemented stringer	
							9	Gravelly SAND; tan; medium dense; poorly graded; angular; wet; trace of clay	Lost mud at 29'.
							30		

P-ST-036D

LOG OF BORING

CLIENT: Seminole Electric Cooperative, Inc.
PROJECT: Combined Cycle
PROJECT NO.: 14845
PROJECT LOCATION: Agrico South
COORDINATES: S 80 E 570
ELEVATION (DATUM): 120.5
TOTAL DEPTH: 101.5
DATE START: 11/3/88
SURFACE CONDITIONS: 8" long grass, level
INSPECTOR: P. L. Nelson
DATE FINISH: 11/4/88
CHECKED BY: M. R. Osbourn
APPROVED BY: L. J. Almaleh

SAMPLING SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV
CORING CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD
SPT	9	26	6	9	15	1.5
SPT	10	6	32	25	57	1.5
SPT	11	50/3"			50+	0.25
SPT	12	10	31	15	46	1.5
SPT	13	38	9	13	22	1.5
SPT	14	36	9	16	25	1.5



CLASSIFICATION OF MATERIAL

Clayey SAND; grey mottled tan; medium dense; poorly graded; medium-fine grained; rounded; moist; trace gravel

Silty CLAY; dark grey; hard; dry; low plastic; trace fine sand

Sandy SILT; light grey w/black specs; hard; plasticity; moist; trace clay

Weakly cemented

Clayey SAND; black; medium dense; poorly graded; rounded; fine grained; moist

REMARKS

Installed 5' more casing to 29.5'. Drilling easier 30'-35'.

Drilling harder 40'-41'.

BLACK & VEATCH
ENGINEERS-ARCHITECTS

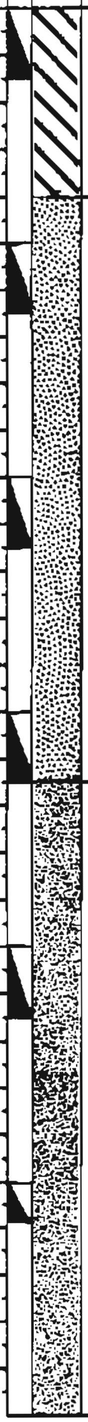
LOG OF BORING

BORING NO. B-4
SHEET 3 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle		PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 80 E 570	ELEVATION (DATUM) 120.5	TOTAL DEPTH 101.5	DATE START 11/3/88
SURFACE CONDITIONS 8" long grass, level		INSPECTOR P. L. Nelson		DATE FINISH 11/4/88
	CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh		

SAMPLING SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
CORING CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD			
SPT	15	4	4	5	9	1.5	1	Sandy CLAY; black grey mottled; stiff; plastic; moist	
							2		
							3		
							4		Chattering 64'-64.5'.
							65		
SPT	16	21	19	21	40	1.5	6	SAND; black; medium dense; poorly graded; fine grained; rounded; moist; trace clay	
							7		
							8		
							9		
							70		
SPT	17	7	7	21	28	1.5	1		
							2		
							3		
							4		
							75		
SPT	18	8	9	10	19	1.5	6	Grading clayier	
							7		Chattering 76.5'-79'.
							8		
							9		Drilling easier 79'-82'.
							80		
SPT	19	5	7	22	29	1.5	1	Silty SAND; light grey w/dark grey marl; medium dense; well graded; coarse to fine grained; rounded; moist; trace gravel	
							2		Drilling harder 82'-86'.
							3		
							4		
SPT	20	22	50 5.5"		50+	0.9	85	Grading coarser, weakly cemented	
							6		
							7		
							8		
							9		
							90		

SAMPLE TYPE
GRAPHICS LOG



P-ST-036D

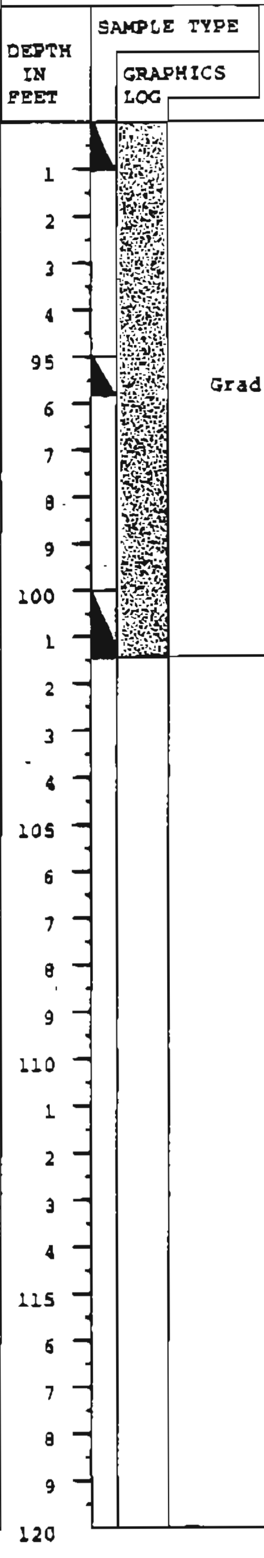
BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-4
SHEET 4 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle	PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 80 E 570	ELEVATION (DATUM) 120.5 TOTAL DEPTH 101.5	DATE START 11/3/88
SURFACE CONDITIONS 8" Long grass, level		INSPECTOR P. L. Nelson	DATE FINISH 11/4/88
	CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh	

SAMPLING									
SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV			
CORING									
CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	21	26	50		50+	0.6			Firm drilling 86'-100'.
SPT	22	16	50 3"		50+	0.7	95	Grading clayier	
SPT	23	14	14	29	43	1.0	100		Bottom of boring at 101.5'. Water level not recorded. Boring backfilled to surface with cement grout.



P-ST-036D

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-5
SHEET 1 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle		PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 530 E 385	ELEVATION (DATUM) 119.1'	TOTAL DEPTH 101.5'	DATE START 11/02/88
SURFACE CONDITIONS Flat (next to spoil pile) grass vegetation		INSPECTOR M. R. Osbourn		DATE FINISH 11/02/88
		CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh	

SAMPLING									
SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
CORING									
CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD			
SPT	1	1	1	3	4	1.2		TOPSOIL; black; w/organics	Boring advanced w/3 7/8" diameter wing bit; using bentonite as drilling fluid.
							1	SAND; grey; very loose; poorly graded; fine grained; moist	
							2		
SPT	2	4	4	4	8	1.0	3	Silty SAND; greyish-brown; loose; poorly graded; fine grained; moist	
							4		
SPT	3	4	4	7	11	1.4	5	Clayey SAND; light grey; medium dense; poorly graded; fine grained; rounded; moist	
							6		
							7		
TW	4					2.0	8		
							9		
SPT	5	5	5	7	12	1.3	10	Lens w/increasing sand content	
							1		
							2		
							3		
							4		
TW	6					2.0	15	Sandy CLAY; light grey; stiff; high plasticity; moist	
							6		
							7		
							8		
							9		
SPT	7	3	5	12	17	1.5	20	Clayey SAND; light grey mottled tan; medium dense; poorly graded; fine grained; rounded; moist Light grey sand lense; 0.5' thick	
							1		
							2		
							3		
							4		
SPT	8	50/4"	-	-	50+	0.3	25	Trace of gravel	Attempted to push shelby tube.
							6		
							7		Hard drilling at 27.5'.
							8		
							9		
							30		

P-ST-036D

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-5
SHEET 2 of 4

CLIENT Seminole Electric Cooperative, Inc.	PROJECT Combined Cycle	PROJECT NO. 14845

PROJECT LOCATION Agrico South	COORDINATES S 530 E 385	ELEVATION (DATUM) 119.1'	TOTAL DEPTH 101.5'	DATE START 11/02/88

SURFACE CONDITIONS Flat (next to spoil pile) grass vegetation	INSPECTOR M. R. Osbourn	DATE FINISH 11/02/88

CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh

SAMPLING SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV	DEPTH IN FEET	SAMPLE TYPE	CLASSIFICATION OF MATERIAL	REMARKS
CORING CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD		GRAPHICS LOG		
SPT	9	50 6"	-	-	50+	0.0				
							1			
							2			
							3			
							4			
SPT	10	50 5"	-	-	50+	0.4	35		SAND; grey w/traces of brown; very dense; well graded; medium to fine grained; occasional strong cementation; moist; w/phosphate nodules and traces of clay	At 35' switched to 2 7/8" tricone roller bit. Hard drilling to 37', then becomes softer.
							6			
							7			
							8			
							9			
SPT	11	5	6	30	36	1.5	40		SAND; dark grey; dense; poorly graded; fine grained; moist; marled w/light grey clayey silt	
							1			
							2			
							3			
							4			
SPT	12	8	14	50	64	1.4	45			
							6		Minor cementation	
							7			
							8			
							9			
SPT	13	6	7	11	18	1.5	50		Increasing silt content	
							1		Silty SAND; light grey; medium dense; well graded; coarse to fine grained; rounded, weak cementation; moist; occasionally strongly cemented; nodules; trace clay	
							2			
							3			
							4			
SPT	14	50 5"	-	-	50+	0.4	55		Fragments of strongly cemented material	
							6			
							7			
							8			
							9			
							60			

P-ST-036D

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-5
SHEET 3 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle		PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 530 E 385	ELEVATION (DATUM) 119.1'	TOTAL DEPTH 101.5'	DATE START 11/02/88
SURFACE CONDITIONS Flat (next to spoil pile) grass vegetation		INSPECTOR M. R. Osbourn		DATE FINISH 11/02/88
	CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh		

SAMPLING SAMP TYPE	 SAMP NO.	 SET 6"	 2ND 6"	 3RD 6"	 N VAL	 SAMP RECV			
CORING CORE SIZE	 RUN NO.	 RUN LENG	 RUN RECV	 RQD RECV	 % RECV	 RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	15	50	-	-	50+	0.5		Increasing sand content	
SPT	16	21	11	50/4"	50+	1.4	65		
SPT	17	5	50/2"	-	50+	0.0	70		
SPT	18	50/5"	-	-	50+	0.4	75	Silty SAND; grey; very dense; poorly graded; fine grained; moist; w/seams of strong cementation; trace clay	
SPT	19	50/1"	-	-	50+	0.0	80		
SPT	20	38	17	12	29	1.5	85	Silty SAND; light grey; medium dense; poorly graded; fine grained; rounded; moist; trace clay	
							90		

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-5
SHEET 4 of 4

CLIENT Seminole Electric Cooperative		PROJECT Combined Cycle	PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 530 E 385	ELEVATION (DATUM) 119.1'	TOTAL DEPTH 101.5'
			DATE START 11/02/88
SURFACE CONDITIONS Flat (next to spoil pile) grass vegetation		INSPECTOR M. R. Osbourn	DATE FINISH 11/02/88
	CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh	

SAMPLING: SAMP TYPE CORING: CORE SIZE	SAMP NO. RUN NO.	SET 6" RUN LENG	2ND 6" RUN RECV	3RD 6" RQD RECV	N VAL % RECV	SAMP RECV RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	21	50/3"			50+	0.3		Fragments of strongly cemented material	91' to 92' strongly cemented layer.
							1		
							2		
							3		
							4	Minor cementation	
SPT	22	50/2"			50+	0.2	95		
							6		
							7		
							8		
							9		
							100	Sandy SILT; light grey; very stiff; plastic; moist	
SPT	23	6	10	12	22	0.4	1		Bottom of boring at 101.5'. Water level not recorded. Boring backfilled w/cement grout to surface.
							2		
							3		
							4		
							105		
							6		
							7		
							8		
							9		
							110		
							1		
							2		
							3		
							4		
							115		
							6		
							7		
							8		
							9		
							120		

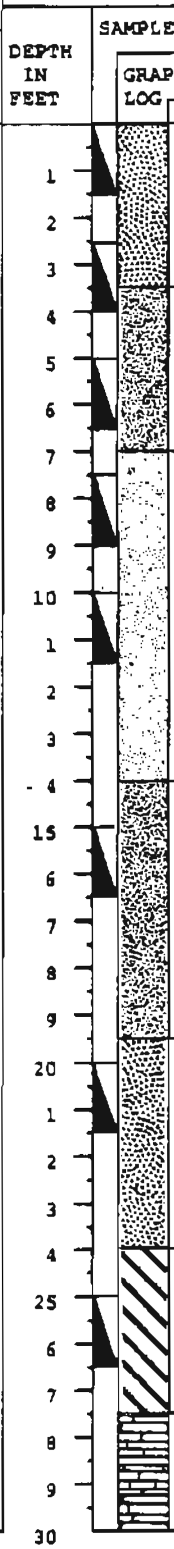
BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-6
SHEET 1 of 2

CLIENT: Seminole Electric Cooperative, Inc.
PROJECT: Combined Cycle
PROJECT NO.: 14845
PROJECT LOCATION: Agrico South
COORDINATES: S 1100 E 350
ELEVATION (DATUM): 115.05
TOTAL DEPTH: 41.0'
DATE START: 10/31/88
SURFACE CONDITIONS: Level w/8" grass and 5' woody bushes
INSPECTOR: P. L. Nelson
DATE FINISH: 11/1/88
CHECKED BY: M. R. Osbourn
APPROVED BY: L. J. Almaleh

SAMPLING SAMP TYPE CORING CORE SIZE	SAMP NO. RUN NO.	SET 6" RUN LENG	2ND 6" RUN RECV	3RD 6" RQD RECV	N VAL % RECV	SAMP RECV RQD
SPT	1	2	3	5	8	1.2
SPT	2	8	9	8	17	1.0
SPT	3	2	1	4	5	1.5
SPT	4	6	8	9	17	1.4
SPT	5	7	6	5	11	1.5
SPT	6	1	1	2	3	1.5
SPT	7	8	5	5	10	1.5
SPT	8	4	5	8	13	1.5



CLASSIFICATION OF MATERIAL

SAND; dark grey grading to light grey; loose; well graded; fine grained; rounded; dry; trace silt

Silty SAND; brown; loose; well graded; fine grained; rounded; wet

Clayey SAND; grey; medium dense; poorly graded; fine grained; rounded; moist

Silty SAND; grey; very loose; well graded; fine grained; angular; wet; trace clay

Gravel seam
SAND; grey w/black specs; medium dense; well graded; medium to fine grained; angular; wet; trace silt

Sandy CLAY; tan mottled grey; stiff; plastic; moist; trace silt

REMARKS

Boring advanced with 3 7/8" wing bit, using bentonite as drilling fluid.

Water encountered at 5'.

Set 4" casing to 27.5'

P-ST-036D

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-6
SHEET 2 of 2

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle	PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 1100 E 350	ELEVATION (DATUM) 115.05	TOTAL DEPTH 41.0'
			DATE START 10/31/88
SURFACE CONDITIONS Level w/8" grass and 5' woody bushes		INSPECTOR P. L. Nelson	DATE FINISH 11/1/88
	CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh	

SAMPLING: SAMP TYPE / CORING: CORE SIZE	SAMP NO. / RUN NO.	SET 6" / RUN LENG	2ND 6" / RUN RECV	3RD 6" / RQD RECV	N VAL / % RECV	SAMP RECV / RQD
1 5/8"	1	2.5	1.4 32.5	0.5	56	20
SPT	9	8	12	15	27	1.5
TW	10					1.0

DEPTH IN FEET: 1 2 3 4 35 6 7 8 9 40 1 2 3 4 45 6 7 8 9 50 1 2 3 4 55 6 7 8 9 60

SAMPLE TYPE / GRAPHICS LOG

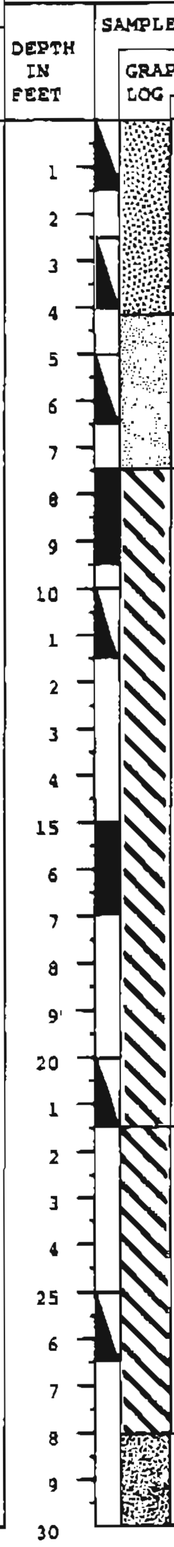
CLASSIFICATION OF MATERIAL	REMARKS
LIMESTONE; argillaceous; tannish-white; medium bedded; fine grained; partially consolidated (limerock)	Stopped at 32.5' on 10/31. Resumed drilling on 11/1/88.
Clayey **SAND**; light grey mottled brown; medium dense; well graded; fine grained; rounded; wet	Pulled casing and finished boring w/2 7/8" roller bit.
	Bottom of boring at 41.0'. Water level not recorded at conclusion of boring. Backfilled boring to surface with cement grout.

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-7
SHEET 1 of 2

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle	PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 150 E 850	ELEVATION (DATUM) 118.5	TOTAL DEPTH 51.5'
DATE START 11/7/88			
SURFACE CONDITIONS Grass, small bushes		INSPECTOR P. L. Nelson	DATE FINISH 11/8/88
CHECKED BY M. R. Osbourn		APPROVED BY L. J. Almaleh	



SAMPLING: SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV	CLASSIFICATION OF MATERIAL	REMARKS
CORING: CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD		
SPT	1	1	2	3	5	1.5	SAND; dark grey grading to light brown; loose; poorly graded; fine; rounded; moist; trace silt; little organics	Boring advanced to 6.5' by continuous driving and cleaning out of split spoon.
SPT	2	4	4	3	7	1.5	Grading to dark brown	
SPT	3	8	9	10	19	1.5	Clayey SAND; grey; medium dense; well graded; fine; rounded; moist; trace of silt	Boring advanced with 3 7/8" wing bit using bentonite as drilling fluid.
TW	4					2.0	Sandy CLAY; greenish-white; high plasticity; moist; trace of silt	Pushed w/500 psi.
SPT	5	2	2	2	4	1.5		
TW	6					2.0		Pushed w/500 psi.
SPT	7	3	4	5	9	1.5	Grading tan	Stiff drilling at 21.5'.
SPT	8	25	22	16	38	1.1	Sandy <u>CLAY</u>; tan mottled light grey; hard; high plasticity; moist; trace silt	Switched to 2 7/8" roller bit at 25'. TW bent at 25', no recovery.
								Chattering 28'-31'.

LOG OF BORING

BORING NO. B-7
SHEET 2 of 2

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle	PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 150 E 850	ELEVATION (DATUM) 118.5	TOTAL DEPTH 51.5'
DATE START 11/7/88			
SURFACE CONDITIONS Grass, small bushes		INSPECTOR P. L. Nelson	DATE FINISH 11/8/88
CHECKED BY M. R. Osbourn		APPROVED BY L. J. Almaleh	

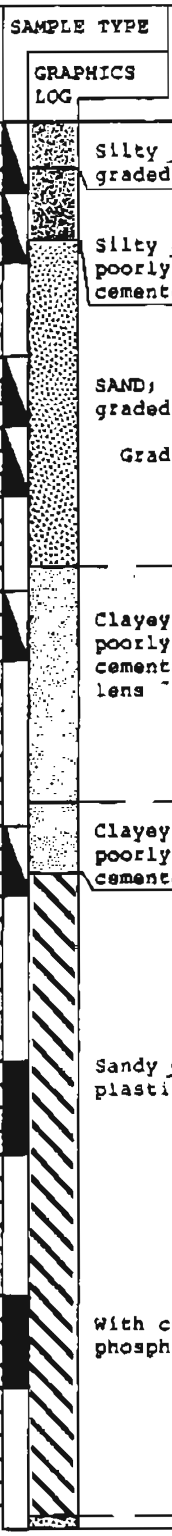
SAMPLING: SAMP TYPE CORING: CORE SIZE	SAMP NO. RUN NO.	SET 6" RUN LENG	2ND 6" RUN RECV	3RD 6" RQD RECV	N VAL % RECV	SAMP RECV RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	9	50/2"			50+	0			Drilling easier 31'-32.5'.
							1		
							2		
							3		
							4		
SPT	10	50/5"			50+	0.4	35	Silty SAND; tan mottled grey; very dense; well graded; coarse to fine grained; rounded; moderate cementation; moist	
							6		
							7		
							8		
							9		
SPT	11	50/5"			50+	0.4	40		Chattering 40.5'-41.5'.
							1		Drilling easier 41.5'-42.5'.
							2		
							3		Drilling harder 42.5'-46'.
							4		
SPT	12	23	50/4"		50+	0.7	45	Increasing plasticity	
							6		Drilling easier 46'-47'.
							7		Drilling harder 47'-47.5'.
							8		
							9	Sandy CLAY; light grey mottled brown; stiff; plastic; moist	
SPT	13	2	5	13	18	1.5	50		
							1		Bottom of boring at 51.5'.
							2		
							3		Water level not recorded at conclusion of boring.
							4		
							55		Backfilled boring to surface with cement grout.
							6		
							7		
							8		
							9		
							60		

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-8
SHEET 1 of 4

CLIENT: Seminole Electric Cooperative, Inc.
PROJECT: Combined Cycle
PROJECT NO.: 14845
PROJECT LOCATION: Agrico South
COORDINATES: S 525 E 1420
ELEVATION (DATUM): 121.4
TOTAL DEPTH: 100.0
DATE START: 11/2/88
SURFACE CONDITIONS: Flat (next to spoil pile) heavy vegetation
INSPECTOR: M. R. Osbourn
DATE FINISH: 11/7/88
CHECKED BY: M. R. Osbourn
APPROVED BY: L. J. Almaleh



SAMPLING									
SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV			
CORING									
CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	1	1	3	4	7	1.5	1	Silty <u>SAND</u>; light grey; loose; well graded; fine grained; dry; w/organics	Boring advanced by continuous driving of SPT to 11.5'.
SPT	2	10	8	10	18	1.2	2	Silty <u>SAND</u>; dark brown; medium dense; poorly graded; fine grained; weakly cemented; dry	
							3		
							4		
SPT	3	6	6	6	12	1.4	5	SAND; light brown; medium dense; poorly graded; fine grained; dry; trace of silt	
							6		
SPT	4	5	3	6	9	1.5	7	Grading lighter brown	
							8		
							9		
SPT	5	25	13	10	23	1.5	10	Clayey <u>SAND</u>; light tan; medium dense; poorly graded; fine grained; occasional cementation; moist; at 11' very cemented lens ˜.2' thick.	N value at 10' may not be exactly accurate. On 11/4/88 boring advanced to 15' w/3 /8" wing bit and water as drilling fluid. On 11/7/88 water level reported at 10'. Boring advanced from 15' w/3 7/8" wing bit and bentonite as drilling fluid.
							1		
							2		
							3		
							4		
SPT	6	5	9	9	18	1.5	15	Clayey <u>SAND</u>; light grey; medium dense; poorly graded; fine grained; occasional cementation; moist	
							6		
							7		
							8		
							9		
TW	7					0.3	20	Sandy <u>CLAY</u>; light grey; stiff; high plasticity; moist; at 20.5' sand lens	
							1		
							2		
							3		
							4		
TW	8					2.0	25	With cemented light grey clayey silt; and phosphate nodules	
							6		
							7		
							8		
							9		
							30		

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-8
SHEET 2 of 4

CLIENT Seminole Electric Cooperative, Inc.	PROJECT Combined Cycle	PROJECT NO. 14845

PROJECT LOCATION Agrico South	COORDINATES S 525 E 1420	ELEVATION (DATUM) 121.4	TOTAL DEPTH 100.0	DATE START 11/2/88

SURFACE CONDITIONS Flat (next to spoil pile) heavy vegetation	INSPECTOR M. R. Osbourn	DATE FINISH 11/7/88

CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh

SAMPLING SAMP TYPE CORING CORE SIZE	SAMP NO. RUN NO.	SET 6" RUN LENG	2ND 6" RUN RECV	3RD 6" RQD RECV	N VAL % RECV	SAMP RECV RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	9	22	28	21	49	1.5		SAND; greyish-brown mottled tan; dense; poorly graded; fine grained; weak cementation; moist; w/some silt	
							1		
							2		
							3		
							4		
TW	10					1.7	35		
							6		
							7	Increasing grey clayey silt, w/high plasticity	Hard drilling between 37' to 38.5' (cemented layer)
							8		
							9		
SPT	11	22	11	8	19	0.0	40		
							1		
							2		Hard drilling at 42'.
							3		
							4		
SPT	12	50/1"	-	-	50+	0.1	45	Strongly cemented, greyish tan	Switched to 2 7/8" tricone roller bit at 45'.
							6		
							7		
							8		
							9		
SPT	13	50	18	14	32	0.5	50	Silty SAND; grey w/brown sand; dense; well graded; coarse to fine grained; round; moist; cemented nodules	
							1		
							2		
							3		
							4		
SPT	14	7	50/2"	-	50+	0.7	55		
							6	Weak cementation, grading finer sand	Hard drilling at 56'.
							7		
							8		
							9		
							60		

P-ST-036D

LOG OF BORING

CLIENT: Seminole Electric Cooperative, Inc.
PROJECT: Combined Cycle
PROJECT NO.: 14845
PROJECT LOCATION: Agrico South
COORDINATES: S 525 E 1420
ELEVATION (DATUM): 121.4
TOTAL DEPTH: 100.0
DATE START: 11/2/88
SURFACE CONDITIONS: Flat (next to spoil pile) heavy vegetation
INSPECTOR: M. R. Osbourn
DATE FINISH: 11/7/88
CHECKED BY: M. R. Osbourn
APPROVED BY: L. J. Almaleh

SAMPLING: SAMP TYPE / CORING: CORE SIZE	SAMP NO. / RUN NO.	SET 6" / RUN LENG	2ND 6" / RUN RECV	3RD 6" / RQD RECV	N VAL / % RECV	SAMP RECV / RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	15	17	32	20	52	1.4		SAND; dark grey; very dense; poorly graded; fine grained; moist; w/cemented clayey silt layers (strongly cemented at 61')	
							1		
							2		
							3		
							4		
SPT	16	22	42	43	85	1.2	65	Strongly cemented clayey silt lens (~0.1' thick)	
							6		
							7		
							8		
							9		
SPT	17	10	13	50 2"	50+	1.1	70	Increasing moisture Strongly cemented clayey silt lens	
							1		
							2		
							3		
							4		
SPT	18	22	32	50 4"	50+	0.0	75		
							6		
							7		
							8		
							9		
SPT	19	13	30	50 3"	50+	1.2	80	Sandy SILT; light grey; very dense; weak cementation; plastic; moist; trace of clay	Circulation lost at 80'. Intermittent hard drilling from 80' to 90'.
							1		
							2		
							3		
							4		
SPT	20	50 1"	-	-	50+	0.1	85	Very cemented w/chert	
							6		
							7		
							8		
							9		
							90		

P-ST-036D

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-8
SHEET 4 of 4

CLIENT: Seminole Electric Cooperative, Inc.
PROJECT: Combined Cycle
PROJECT NO.: 14845
PROJECT LOCATION: Agrico South
COORDINATES: S 525 E 1420
ELEVATION (DATUM): 121.4
TOTAL DEPTH: 100.0
DATE START: 11/2/88
SURFACE CONDITIONS: Flat (next to spoil pile) heavy vegetation
INSPECTOR: M. R. Osbourn
DATE FINISH: 11/7/88
CHECKED BY: M. R. Osbourn
APPROVED BY: L. J. Almaleh

SAMPLING SAMP TYPE CORING CORE SIZE	SAMP NO. RUN NO.	SET 6" RUN LENG	2ND 6" RUN RECV	3RD 6" RQD RECV	N VAL % RECV	SAMP RECV RQD	DEPTH IN FEET	SAMPLE TYPE / GRAPHICS LOG	CLASSIFICATION OF MATERIAL	REMARKS
SPT	21	50/2"	-	-	50+	0.1			Strongly cemented	Drilling easier at 90'. Drilled to 100' boring collapsed at 70' unable to obtain a sample at 100'.
							1			
							2			
							3			
							4			
SPT	22	50/2"	-	-	50	0.1	95			
							6			
							7			
							8			
							9			Bottom of boring at 100'.
							100			Water level not recorded at conclusion of boring.
							1			
							2			
							3			Grout induced at 45' depth and boring grouted to surface.
							4			
							105			
							6			
							7			
							8			
							9			
							110			
							1			
							2			
							3			
							4			
							115			
							6			
							7			
							8			
							9			
							120			

P-ST-036/D

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-9
SHEET 1 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle		PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 550 E 2050	ELEVATION (DATUM) 123.4	TOTAL DEPTH 100.2	DATE START 11/3/88
SURFACE CONDITIONS Flat (~40' south of spoil pile) grass vegetation		INSPECTOR M. R. Osbourn		DATE FINISH 11/4/88
	CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh		

SAMPLING							DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV			
CORING									
CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD			
SPT	1	1	0	1	1	0.4		Silty SAND; grey; loose; fine grained; dry; w/organics	Boring advanced w/3 7/8" wing bit using bentonite as drilling fluid.
							1		
							2		
							3	Silty SAND; brown to dark brown; medium dense; poorly graded; fine grained; weakly cemented; moist	
SPT	2	1	4	8	12	1.2			
							4		
							5	At 5' grading to dark brown; very dense	
SPT	3	25	35	50/4"	50+	1.1			
							6		
							7	At 7.5' grading brown; slightly coarser	
SPT	4	50/5"	-	-	50+	0.5	8		
							9		
							10	Clayey SAND; light tan; very dense; fine grained; occasional cementation; moist	
SPT	5	21	32	33	65	1.2			
							1		
							2		Easier drilling at ~12.5'.
							3		
							4		
							15	Sandy CLAY; light grey; stiff; high plasticity; moist; trace of silt	
TW	6					2.0			
							6		
							7		
							8		
							9		
							20		
SPT	7	3	2	3	5	1.5			
							1		
							2		
							3		
							4		
							25		
TW	8					2.0			
							6		
							7	Reduction in sand content	
							8		
							9		
							30		

BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-9
SHEET 2 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle	PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES S 550 E 2050	ELEVATION (DATUM) 123.4	TOTAL DEPTH 100.2
			DATE START 11/3/88
SURFACE CONDITIONS Flat (~40' south of spoil pile) grass vegetation		INSPECTOR M. R. Osbourn	DATE FINISH 11/4/88
		CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh

SAMPLING: SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV	DEPTH IN FEET	SAMPLE TYPE / GRAPHICS LOG	CLASSIFICATION OF MATERIAL	REMARKS
CORING: CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD				
SPT	9	4	5	6	11	1.5			Becoming mottled w/tan clay	
							1			
							2			
							3			
							4			Switched to 2 7/8" tricone roller bit at 35'.
							35			
TW	10					2.0				
							6			
							7		Grading grey	
							8			
							9			
							40			
SPT	11	12	12	10	22	1.0				
							1			
							2			
							3			
							4			
							45			
SPT	12	7	7	10	17	0.8			Becoming mottled w/tan clay; increasing plasticity	
							6			
							7			Hard drilling at 47' (cemented layer).
							8			
							9			Lost circulation at 48.5'.
							50			
SPT	13	50 0"			+50	0.1			Limestone fragments	
							1			
							2			Drilling easier at 52' reamed boring with 3 7/8" tricone roller bit.
							3			
							4			
							55			
SPT	14	8	9	11	20	1.5			Sandy CLAY; light grey mottled brown (sand); stiff; plastic; moist; trace of silt	At 55' discontinued drill on 11/3/88. Resumed drilling on 11/4/88. Set casing to 57'.
							6			
							7			
							8			
							9			
							60			

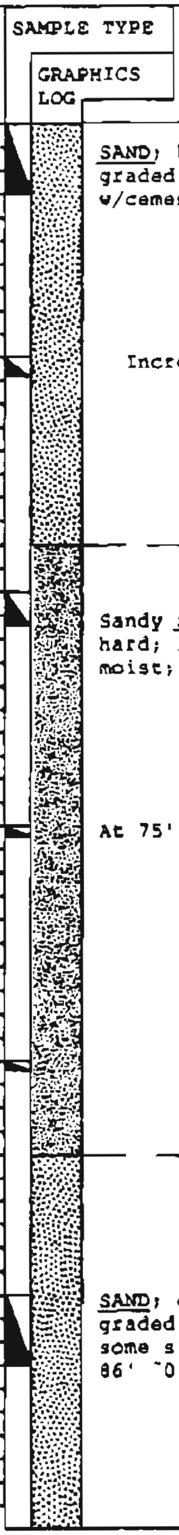
BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-9
SHEET 3 of 4

CLIENT Seminole Electric Cooperative, Inc.	PROJECT Combined Cycle	PROJECT NO. 14845

PROJECT LOCATION Agrico South	COORDINATES S 550 E 2050	ELEVATION (DATUM) 123.4	TOTAL DEPTH 100.2	DATE START 11/3/88
SURFACE CONDITIONS Flat (~40' south of spoil pile) grass vegetation		INSPECTOR M. R. Osbourn		DATE FINISH 11/4/88
	CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh		



SAMPLING									
SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV			
CORING									
CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	15	5	6	50/5"	50+	1.5		SAND; brownish-grey; very dense; well graded; medium to fine grained; wet; w/cementation at 61.4'	
							1		
							2		
							3		
							4		
SPT	16	50/3"	-	-	50+	0.3	65	Increasing cemented fragments	
							6		
							7		
							8		
							9		
							70		
SPT	17	50	50/4"	-	50+	0.8	1	Sandy SILT; light grey w/black specs; hard; low plasticity; strong cementation; moist; marled w/light grey clayey silt	
							2		
							3		
							4		
SPT	18	50/0"	-	-	50+	0.2	75	At 75' strongly cemented	
							6		
							7		
							8		
							9		
SPT	19	50/1"	-	-	50+	0.1	80		Hard drilling ~80.5'- ~82.0'
							1		
							2		
							3		
							4		
SPT	20	34	17	16	33	1.5	85	SAND; dark grey; medium dense; poorly graded; medium to fine grained; moist; some silt; w/cemented clayey silt seam at 86' ~0.2' thick	
							6		
							7		Hard drilling 87'-88'.
							8		
							9		
							90		

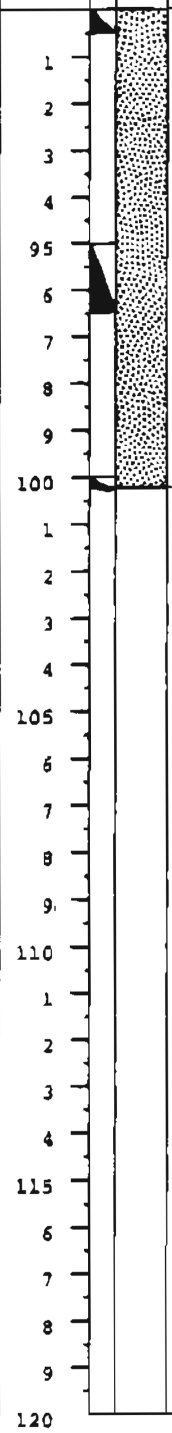
BLACK & VEATCH
ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-9
SHEET 4 of 4

CLIENT: Seminole Electric Cooperative, Inc.
PROJECT: Combined Cycle
PROJECT NO.: 14845
PROJECT LOCATION: Agrico South
COORDINATES: S 550 E 2050
ELEVATION (DATUM): 123.4
TOTAL DEPTH: 100.2
DATE START: 11/3/88
SURFACE CONDITIONS: Flat (~40' south of spoil pile) grass vegetation
INSPECTOR: M. R. Osbourn
DATE FINISH: 11/4/88
CHECKED BY: M. R. Osbourn
APPROVED BY: L. J. Almaleh

SAMPLING SAMP TYPE CORING CORE SIZE	SAMP NO. RUN NO.	SET 6" RUN LENG	2ND 6" RUN RECV	3RD 6" RQD RECV	N VAL % RECV	SAMP RECV RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	21	50	-	-	50+	0.0			Hard drilling ~92.0' - ~93.0' Hard drilling at 94'.
SPT	22	26	42	35	77	1.5	95	Marled w/cemented clayey silt	
SPT	23	50 0"	-	-	50+	0.2	100		Bottom of boring at 100.2'. Water level not recorded at conclusion of boring. Boring backfilled to surface w/cement grout.



BLACK & VEATCH
ENGINEERS-ARCHITECTS

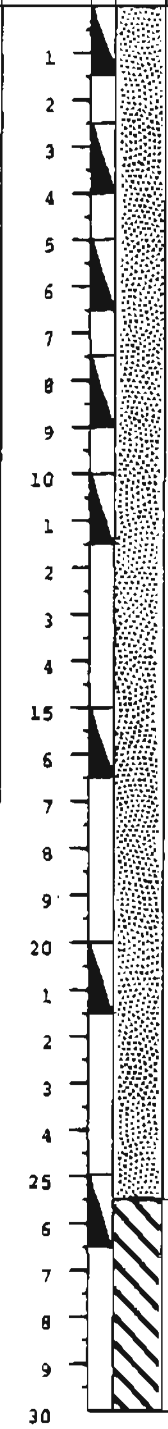
LOG OF BORING

BORING NO. B-10
SHEET 1 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle		PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES N 2110 E 4575	ELEVATION (DATUM) 127.4	TOTAL DEPTH 100.1	DATE START 11/8/88
SURFACE CONDITIONS Flat minor vegetation (reclaimed area)		INSPECTOR M. R. Osbourn		DATE FINISH 11/8/88
	CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh		

SAMPLING						
SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV
CORING						
CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD
SPT	1	2	3	3	6	1.5
SPT	2	4	3	5	8	0.5
SPT	3	7	8	8	16	1.5
SPT	4	6	5	6	11	1.5
SPT	5	8	9	11	20	1.5
SPT	6	8	3	4	7	0.5
SPT	7	2	3	5	8	1.5
SPT	8	5	3	5	8	1.5

DEPTH IN FEET | SAMPLE TYPE | GRAPHICS LOG



CLASSIFICATION OF MATERIAL

SAND; light grey; loose; poorly graded; fine grained; moist; some silt, w/topsoil and organics (fill)

TAILINGS; composed of sand; light grey; loose; poorly graded; fine grained; wet (reclaimed fill)
Grading medium dense

Grading loose

Sandy **CLAY**; greyish-tan to mottled tan; firm; high plastic; moist; w/some silt

REMARKS

Boring advanced w/3 7/8" wing bit using bentonite as drilling fluid.

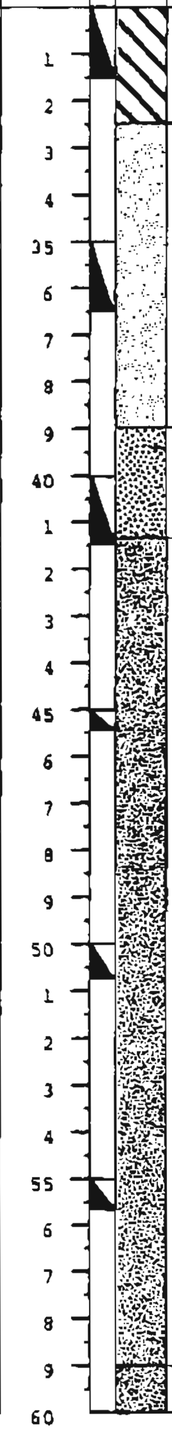
CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle		PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES N 2110 E 4575	ELEVATION (DATUM) 127.4	TOTAL DEPTH 100.1	DATE START 11/8/88
SURFACE CONDITIONS Flat minor vegetation (reclaimed area)		INSPECTOR M. R. Osbourn		DATE FINISH 11/8/88
	CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh		

SAMPLING						
SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV
CORING						
CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD
SPT	9	19	13	46	59	1.1
SPT	10	3	6	9	15	0.5
SPT	11	9	12	31	43	1.3
SPT	12	50/5"	-	-	50+	0.5
SPT	13	14	50/2"	-	50+	0.6
SPT	14	25	50/5"	-	50+	0.0

DEPTH IN FEET

SAMPLE TYPE

GRAPHICS LOG



CLASSIFICATION OF MATERIAL	REMARKS
Grading light tan w/occasional cementation	At 30' switched to 2 7/8" tricone roller bit. At 32' drilling became harder.
Clayey SAND; tannish-grey; medium dense; well graded; medium to fine grained; weak cementation; moist; mottled w/brown sand; w/phosphate nodules	
SAND; greyish-brown; dense; poorly graded; fine grained; moist; marled w/some grey silty clay	
Sandy SILT; tannish-grey; very dense; weak cementation; w/occasional strongly cemented lens; moist	Drilling easier at 59'.

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ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-10
SHEET 3 of 4

CLIENT	PROJECT	PROJECT NO.
Seminole Electric Cooperative, Inc.	Combined Cycle	14845

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
Agrico South	N 2110 E 4575	127.4	100.1	11/8/88

SURFACE CONDITIONS	INSPECTOR	DATE FINISH
Flat minor vegetation (reclaimed area)	M. R. Osbourn	11/8/88

CHECKED BY	APPROVED BY
M. R. Osbourn	L. J. Almaleh

SAMPLING SAMP TYPE	SAMP NO.	SET 6"	2ND 6"	3RD 6"	N VAL	SAMP RECV	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
CORING CORE SIZE	RUN NO.	RUN LENG	RUN RECV	RQD RECV	% RECV	RQD			
SPT	15	9	8	11	19	0.6	1	Sandy SILT; grey; very stiff; high plasticity; moist; w/traces of light grey clay	
							2		
							3		
							4		
SPT	16	50/5"	-	-	50+	0.5	65	Becoming cemented; no plasticity; w/increasing sand content; and traces of peat	
							6		
							7		
							8		
							9		
							70		
SPT	17	7	6	5	11	0.0	1		Hard drilling at 71.5'.
							2		
							3		Hard drilling at 73.5'.
							4		
SPT	18	50/5"	-	-	50+	0.5	75	Silty SAND; dark grey; very dense; poorly graded; fine grained; moist; mottled w/light grey cemented clayey silt	Hard drilling at 76'.
							6		
							7		
							8		Hard drilling at 78'.
							9		Hard drilling at 79.5'.
SPT	19	26	17	22	39	1.5	80	Sandy CLAY; light grey; very dense; strongly cemented; moist; trace of silt	
							1		
							2		
							3		
							4		
SPT	20	50/0"	-	-	50+	0.1	85		
							6		
							7		
							8		
							9		
							90		

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ENGINEERS-ARCHITECTS

LOG OF BORING

BORING NO. B-10
SHEET 4 of 4

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle	PROJECT NO. 14845
PROJECT LOCATION Agrico South	COORDINATES N 2110 E 4575	ELEVATION (DATUM) 127.4	TOTAL DEPTH 100.1
DATE START 11/8/88			
SURFACE CONDITIONS Flat minor vegetation (reclaimed area)		INSPECTOR M. R. Osbourn	DATE FINISH 11/8/88
CHECKED BY M. R. Osbourn		APPROVED BY L. J. Almaleh	

SAMPLING SAMP TYPE CORING CORE SIZE	SAMP NO. RUN NO.	SET 6" RUN LENG	2ND 6" RUN RECV	3RD 6" RQD RECV	N VAL % RECV	SAMP RECV RQD	DEPTH IN FEET	SAMPLE TYPE	GRAPHICS LOG	CLASSIFICATION OF MATERIAL	REMARKS
SPT	21	50/4"	-	-	50+	0.3	1		▨		
							2		▨		
							3		▨		
							4		▨		
SPT	22	6	12	50/3"	50+	1.3	95		▨	Lens w/greater sand content	
							6		▨	Strongly cemented lens	
							7		▨		
							8		▨		
							9		▨		
SPT	23	50/1"	-	-	50+	0.1	100				Bottom of boring at 100.1'. Water level not recorded at conclusion of boring. Boring backfilled to surface w/cement grout.
							1				
							2				
							3				
							4				
							105				
							6				
							7				
							8				
							9				
							110				
							1				
							2				
							3				
							4				
							115				
							6				
							7				
							8				
							9				
							120				

P-ST-036D

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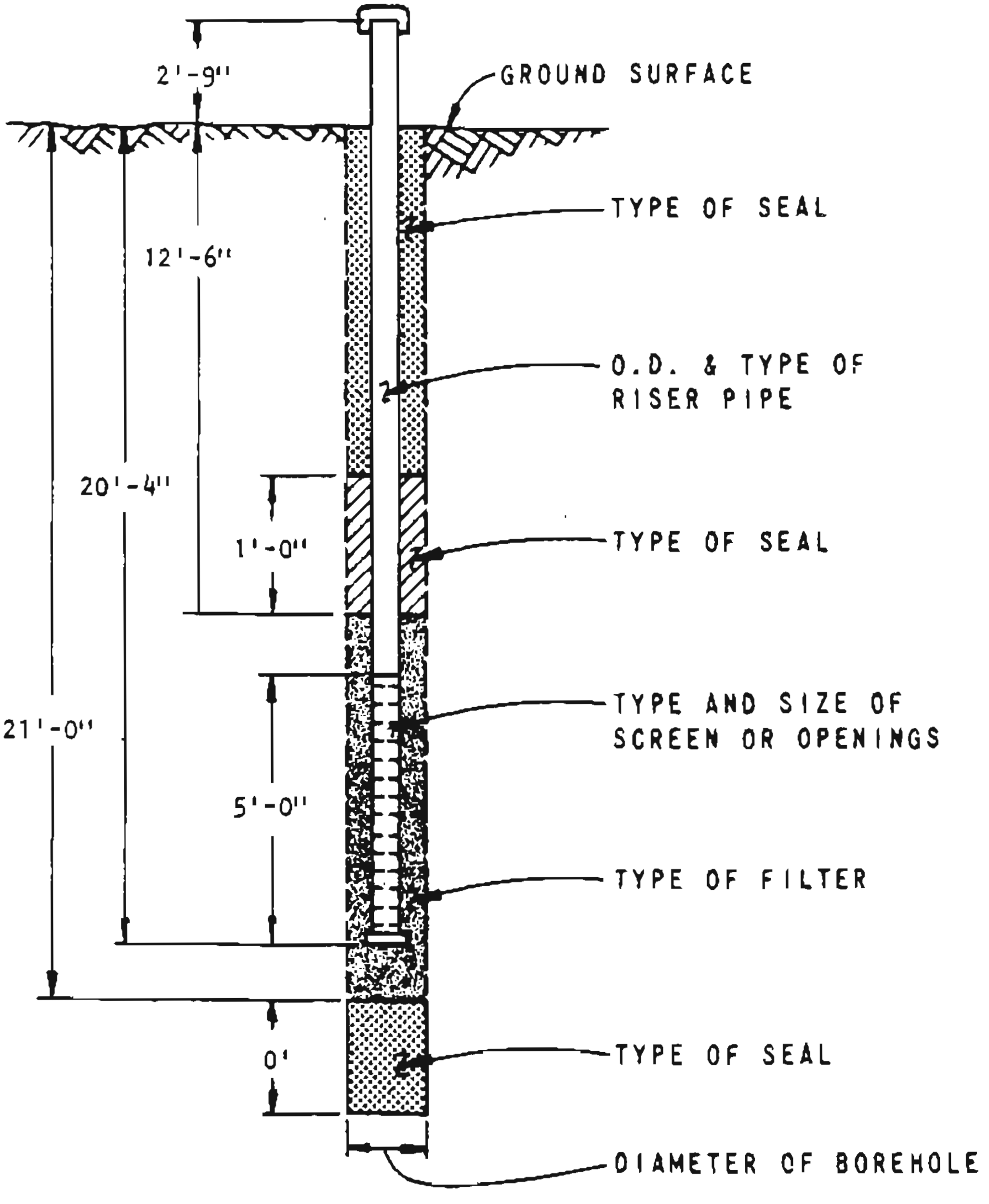
PIEZOMETER INSTALLATION LOG

PIEZOMETER NO. P-1

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle	PROJECT NO 14845
PROJECT LOCATION Agrico South	COORDINATES N 1200 E 750	GROUND ELEVATION 122.3	DATE 11/8/88
STRATUM MONITORED Upper Sands		INSPECTOR P. L. Nelson	
CHECKED BY M. R. Osbourn		APPROVED BY L. J. Almaleh	



TYPE OF SEAL: Water-Cement Grout

O.D. & TYPE OF RISER PIPE: 2 3/8" Sch. 40 PVC

TYPE OF SEAL: Bentonite Pellets

TYPE AND SIZE OF SCREEN OR OPENINGS: .01" Sch. 40 PVC

TYPE OF FILTER: 20/30 Sand

TYPE OF SEAL: N/A

DIAMETER OF BOREHOLE: 9"

METHOD OF INSTALLATION
Bored to 21' w/6" ID HSA, cleaned bottom 3' w/4 3/4" roller bit, placed 8" sand, installed piezometer, alternated placing sand and pulling augers, placed pellets, waited 15 minutes and installed grout.

REMARKS
Grouted to 4.5' below ground surface, as protective casing not on job site. Water level at 6'-11" below ground surface after installation.

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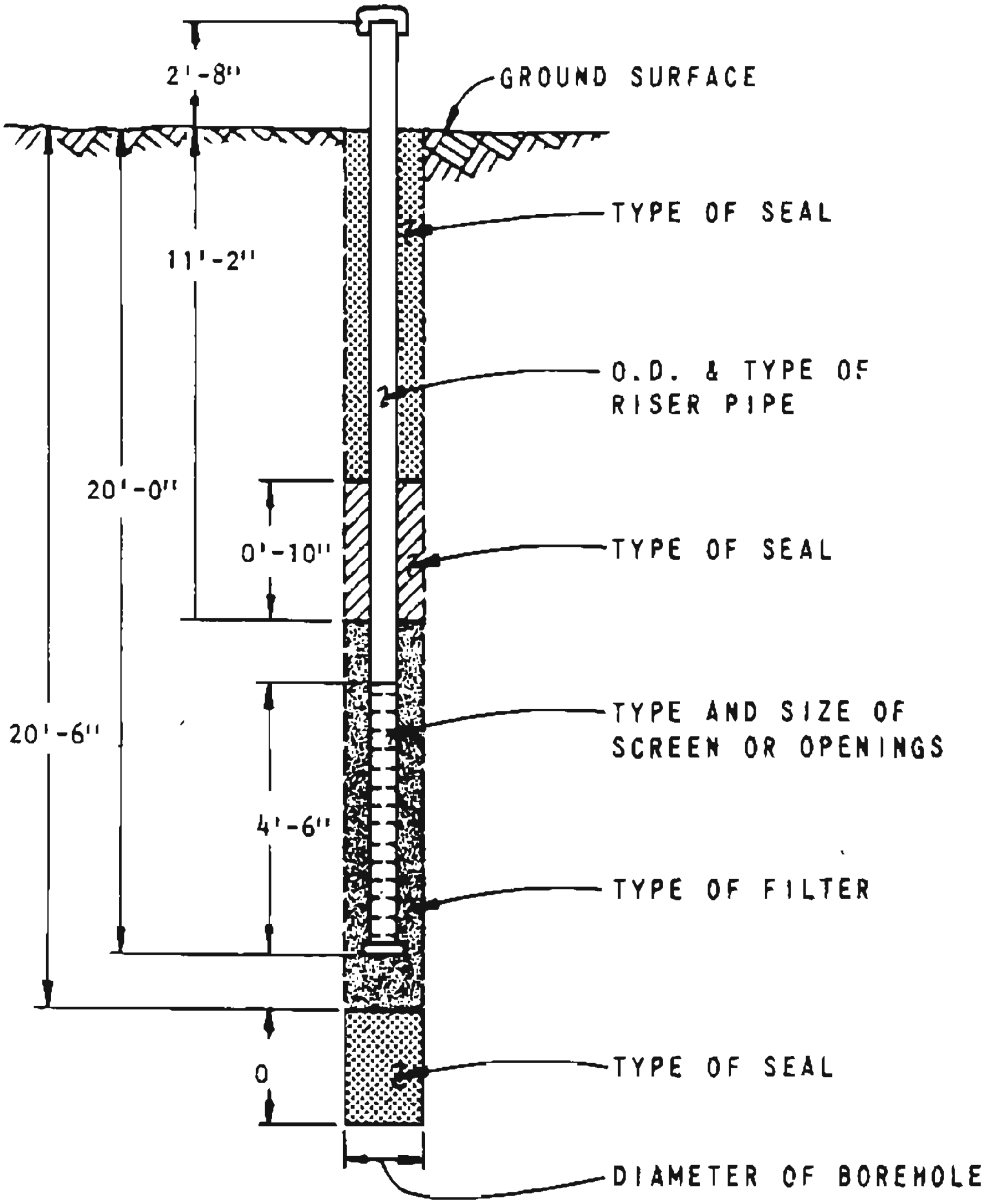
PIEZOMETER INSTALLATION LOG

PIEZOMETER NO. P-2

CLIENT Seminole Electric Cooperative, Inc.	PROJECT Combined Cycle	PROJECT NO 14845

PROJECT LOCATION Agrico South	COORDINATES S 535 W 185	GROUND ELEVATION 114.2	DATE 11/9/88

STRATUM MONITORED Upper Sands	INSPECTOR P. L. Nelson
CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh



TYPE OF SEAL: Water-Cement Grout

O.D. & TYPE OF RISER PIPE: 2 3/8" Sch. 40 PVC

TYPE OF SEAL: Bentonite Pellets

TYPE AND SIZE OF SCREEN OR OPENINGS: .01" Sch. 40 PVC

TYPE OF FILTER: 20/30 Sand

TYPE OF SEAL: N/A

DIAMETER OF BOREHOLE: 9"

METHOD OF INSTALLATION
Augered to 21' w/6" ID HSA, cleaned hole to 20'-6" w/4 3/4" roller bit, placed 6" of sand, installed piezometer, alternated sand and pulling augers, placed pellets, waited 10 minutes, placed grout and pulled augers completely.

REMARKS
Grouted to 2'-0" below ground surface. Protective casing to be installed at a later date. Water level at 3'-10" below ground surface after completing installation.

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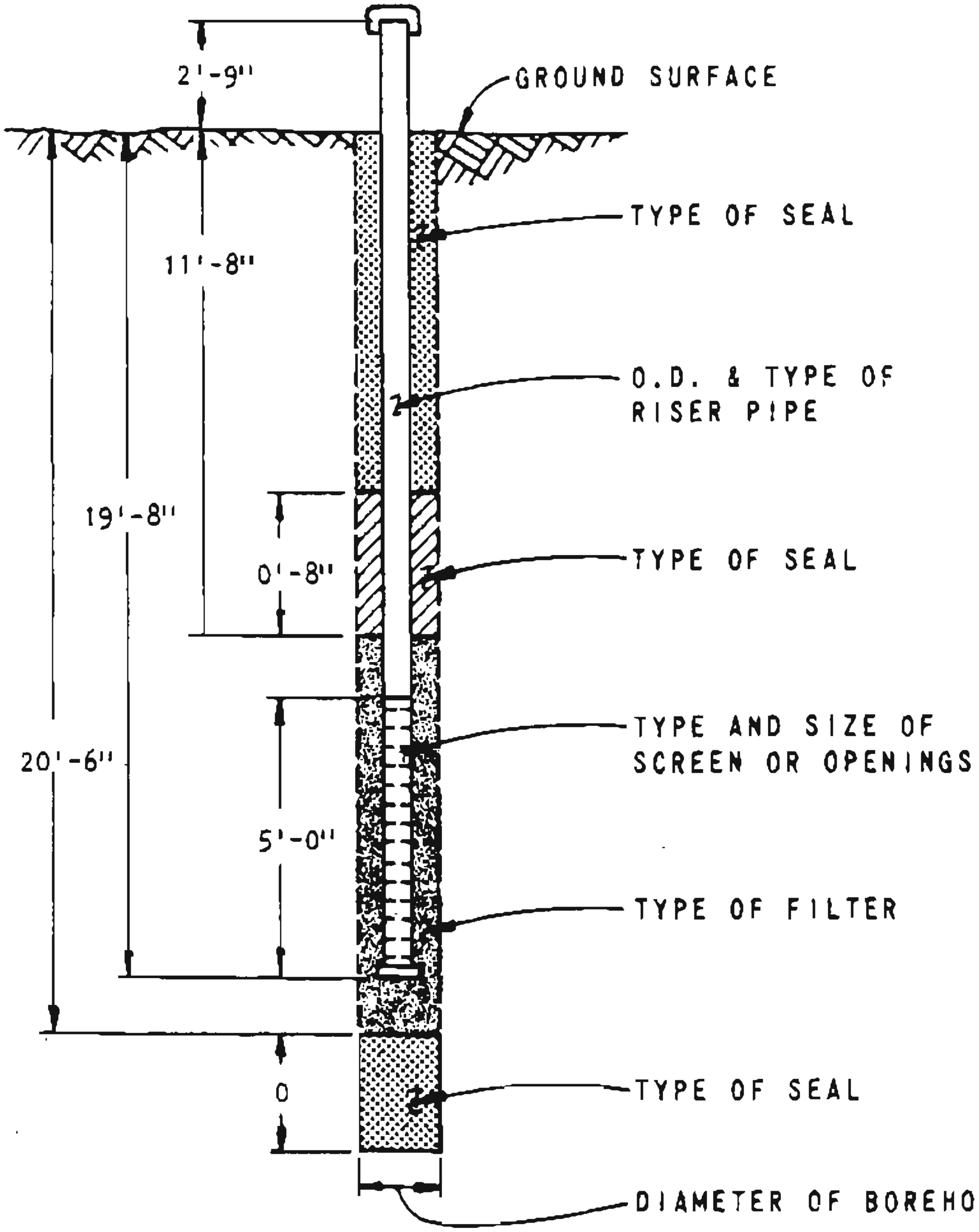
PIEZOMETER INSTALLATION LOG

PIEZOMETER NO. P-3

CLIENT Seminole Electric Cooperative, Inc.	PROJECT Combined Cycle	PROJECT NO 14845

PROJECT LOCATION Agrico South	COORDINATES S 900 E 1800	GROUND ELEVATION 121.7	DATE 11/10/88

STRATUM MONITORED Upper Sands	INSPECTOR P. L. Nelson
CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh



TYPE OF SEAL Water-Cement Grout

O.D. & TYPE OF RISER PIPE 2 3/8" Sch. 40 PVC

TYPE OF SEAL Bentonite Pellets

TYPE AND SIZE OF SCREEN OR OPENINGS .01" Sch. 40 PVC

TYPE OF FILTER 20/30 Sand

TYPE OF SEAL N/A

DIAMETER OF BOREHOLE 9"

METHOD OF INSTALLATION
Augered to 20' w/6" ID HSA, cleaned hole w/4 3/4" roller bit to 20.5', installed 10" of sand, placed piezometer, alternated sand and pulling augers, placed bentonite, placed grout.

REMARKS
Grouted to 1'-1" from ground surface. Protective casing to be installed at a later date.
Water level at 7'-11" below ground surface after piezometer installation.

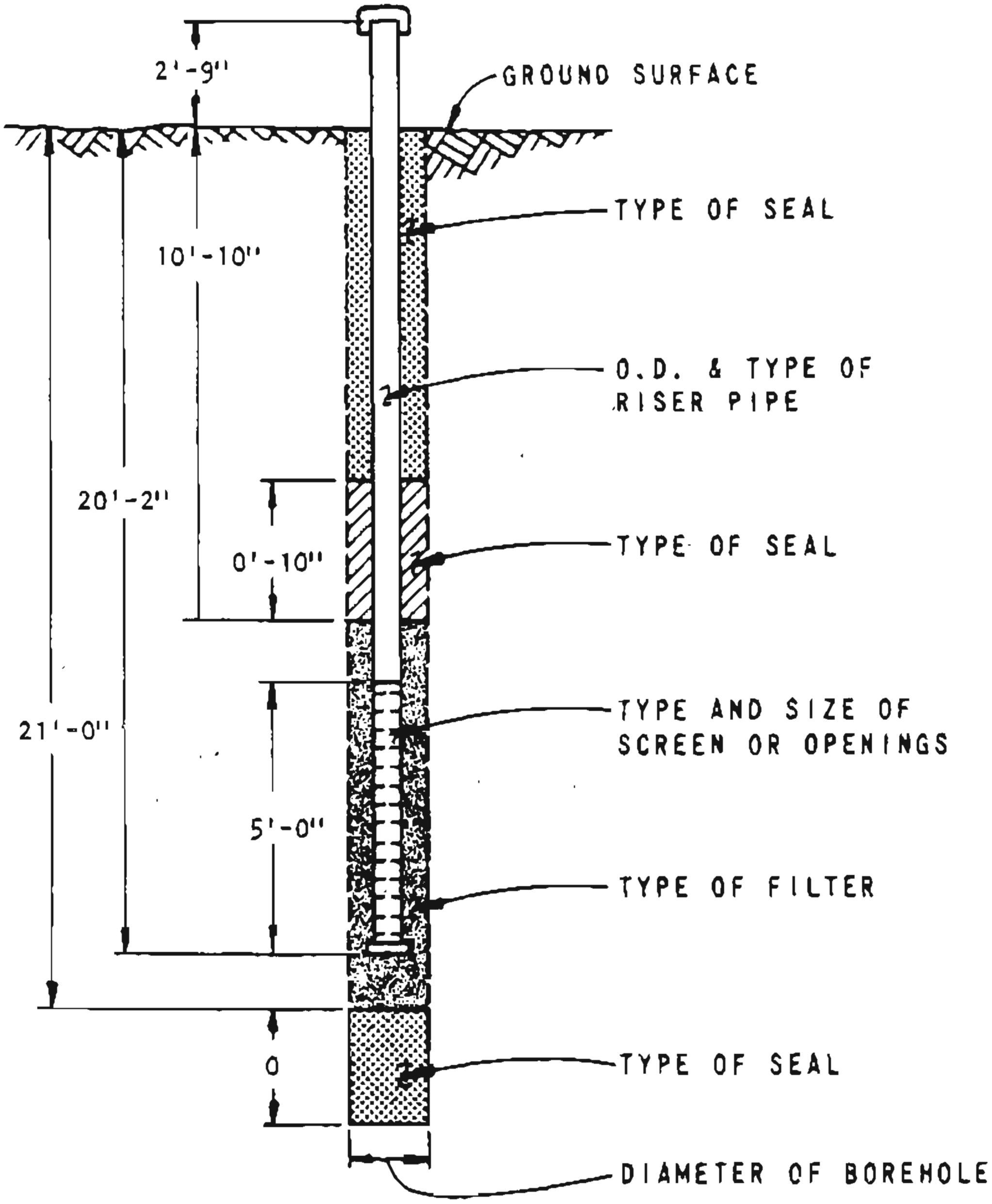
P-ST-021B

BLACK & VEATCH
CONSULTING ENGINEERS

PIEZOMETER INSTALLATION LOG

PIEZOMETER NO. P-10

CLIENT Seminole Electric Cooperative, Inc.		PROJECT Combined Cycle	PROJECT NO 14845
PROJECT LOCATION Agrico South	COORDINATES N 2110 E 4575	GROUND ELEVATION 127.36	DATE 11/10/88
STRATUM MONITORED Upper Sands		INSPECTOR P. L. Nelson	
CHECKED BY M. R. Osbourn		APPROVED BY L. J. Almaleh	



TYPE OF SEAL Water-Cement Grout

O.D. & TYPE OF RISER PIPE 2 3/8" Sch. 40 PVC

TYPE OF SEAL Bentonite Pellets

TYPE AND SIZE OF SCREEN OR OPENINGS .01" Sch. 40 PVC

TYPE OF FILTER 20/30 Sand

TYPE OF SEAL N/A

DIAMETER OF BOREHOLE 9"

METHOD OF INSTALLATION
Augered 21' w/6" ID HSA, cleaned out w/4 3/4" roller bit to 21', install 10" of sand, alternate sand and pulling auger, place pellets, install cement grout and pull remaining augers.

REMARKS
Placed grout to 2'-8" below ground surface. Protective casing to be added later. Water level 3'-3" below ground surface after installing piezometer.

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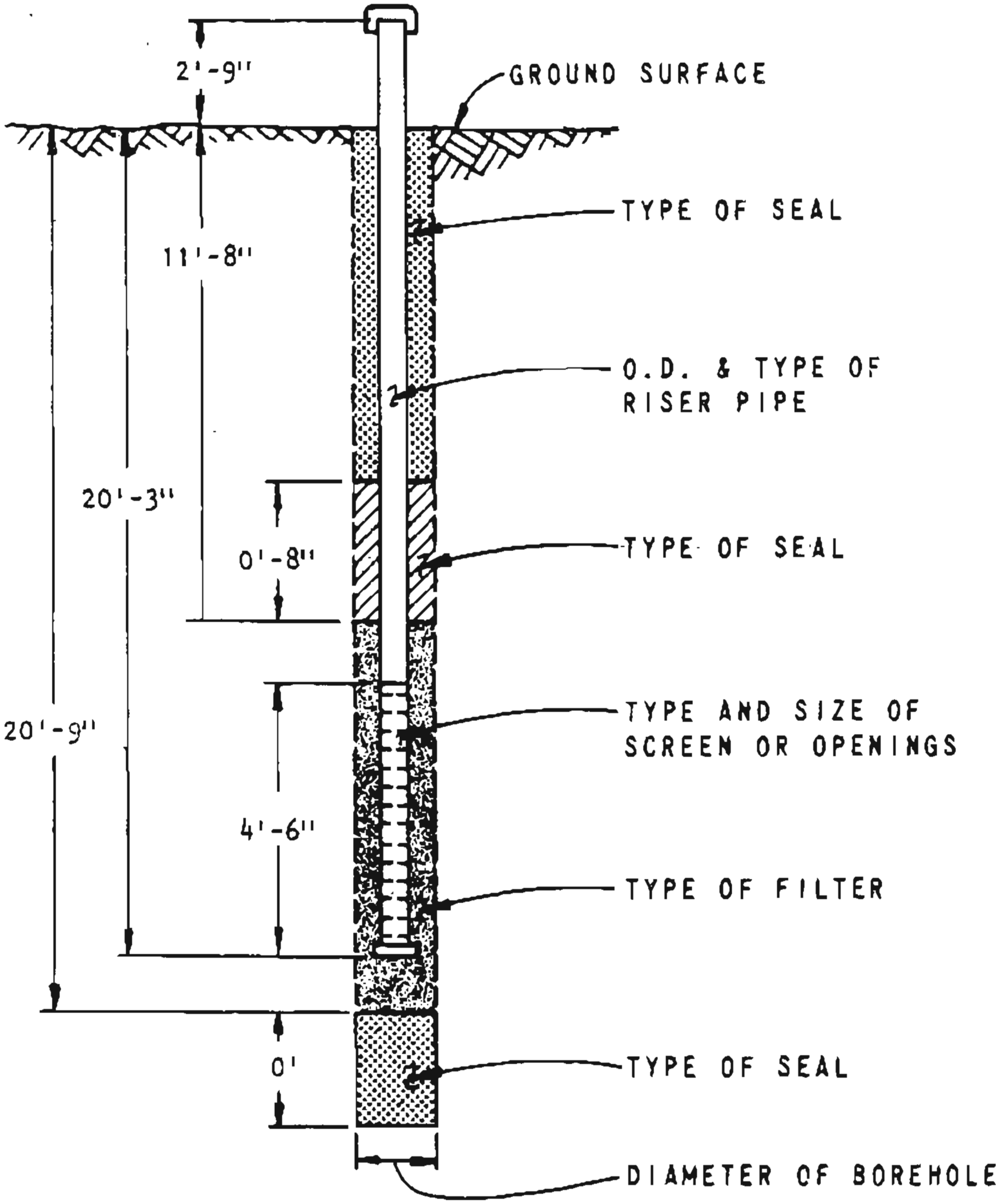
PIEZOMETER INSTALLATION LOG

PIEZOMETER NO. P-11

CLIENT Seminole Electric Cooperative, Inc.	PROJECT Combined Cycle	PROJECT NO 14845

PROJECT LOCATION Agrico South	COORDINATES S 1215 W 200	GROUND ELEVATION 113.1	DATE 11/9/88

STRATUM MONITORED Upper Sands	INSPECTOR P. L. Nelson
CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh



TYPE OF SEAL Water-Cement Grout

O.D. & TYPE OF RISER PIPE 2 3/8" Sch. 40 PVC

TYPE OF SEAL Bentonite Pellets

TYPE AND SIZE OF SCREEN OR OPENINGS .01" Sch. 40 PVC

TYPE OF FILTER 20/30 Sand

TYPE OF SEAL N/A

DIAMETER OF BOREHOLE 9"

METHOD OF INSTALLATION
Augered to 20' w/6" ID HSA, washed boring out to 20'-9" w/4 3/4" roller bit, placed 6" sand, installed piezometer, alternated sand and pulling augers, installed pellets, placed grout.

REMARKS
Grouted to 1'-8" below ground surface. Protection pipe to be installed later. Ground water table was 3'-3" below ground surface after installation of piezometer.

P-ST-021B

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CONSULTING ENGINEERS

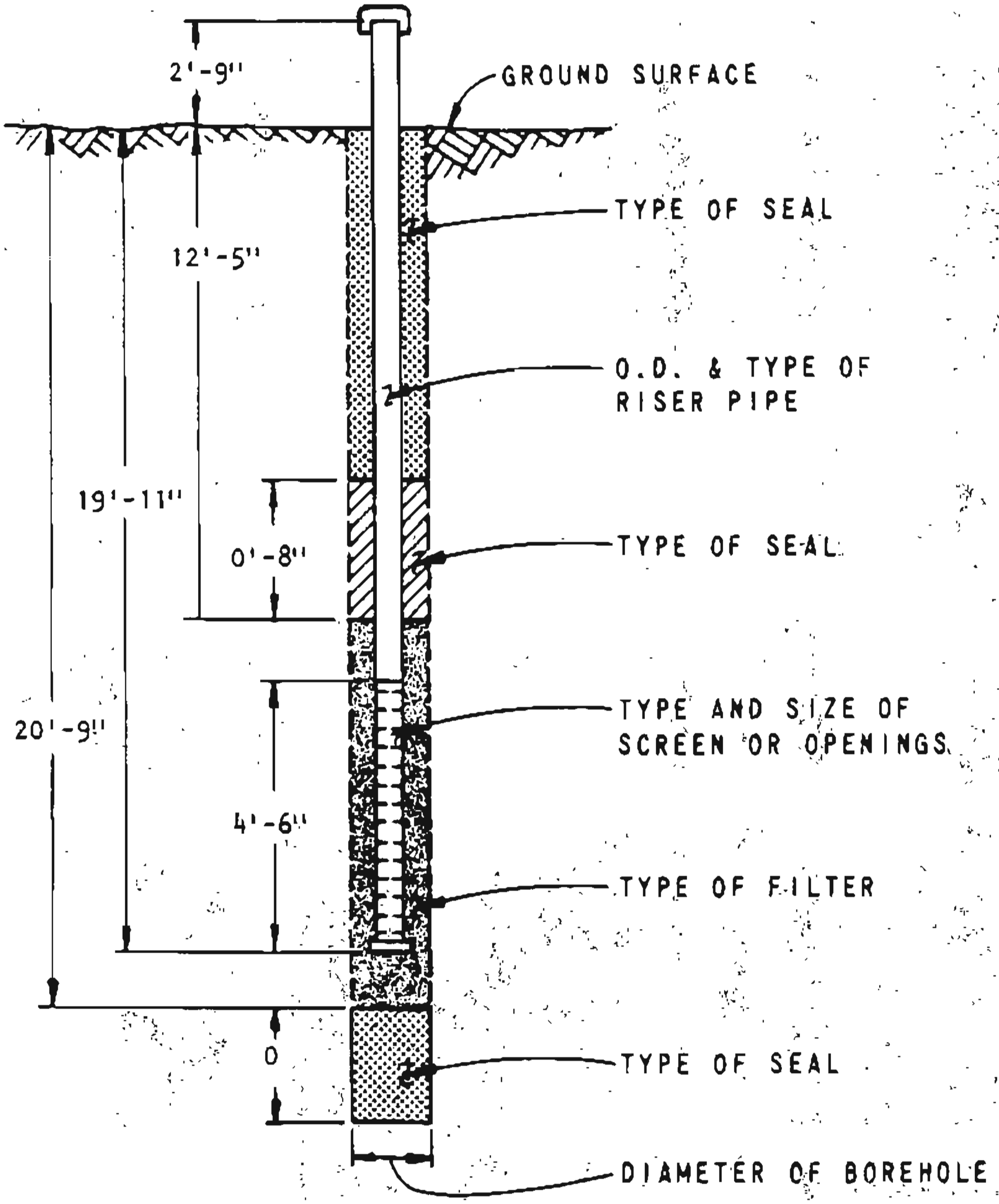
PIEZOMETER INSTALLATION LOG

PIEZOMETER NO. P-12

CLIENT Seminole Electric Cooperative, Inc.	PROJECT Combined Cycle	PROJECT NO 14845

PROJECT LOCATION Agrico South	COORDINATES N 2600 E 755	GROUND ELEVATION 126.30	DATE 11/10/88

STRATUM MONITORED Upper Sands	INSPECTOR P. L. Nelson
CHECKED BY M. R. Osbourn	APPROVED BY L. J. Almaleh



TYPE OF SEAL	Water-Cement Grout
O.D. & TYPE OF RISER PIPE	2 3/8" Sch. 40 PVC
TYPE OF SEAL	Bentonite Pellets
TYPE AND SIZE OF SCREEN OR OPENINGS	.01" Sch. 40 PVC
TYPE OF FILTER	20/30 Sand
TYPE OF SEAL	N/A
DIAMETER OF BOREHOLE	9"

METHOD OF INSTALLATION
Augered to 20' w/6" ID HSA, cleaned out hole w/4 3/4" roller bit to 20'-9", installed sand, put in piezometer, alternated sand and pulling augers, placed bentonite, installed grout and pulled remaining augers.

REMARKS
Grout was 2'-2" below ground surface. Protective casing to be added later. Water level was 4'-4" below ground surface after installing piezometer.

P-ST-021B

FORM 6-6-0

PIEZOMETER INSTALLATION REPORT
STONE & WEBSTER ENGINEERING CORP.

PIEZOMETER NO. P-3A

SITE Seminole Electric Cooperative

J.O. NO. 18191.04

DATE 11/17/88 DRILLER Ardaman/R.P. INSPECTOR D. Cregger

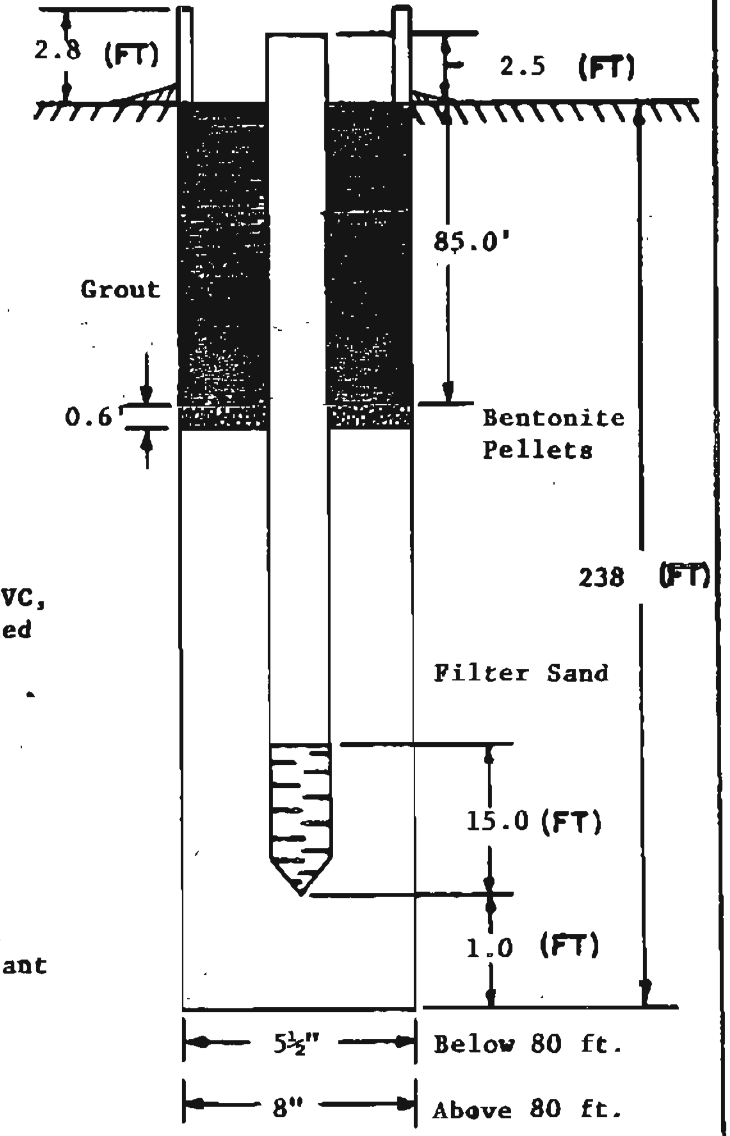
COORDINATES 900 South 1800 East GROUND ELEV. 121.7

INSTALLED IN BORING adjacent to B-3 ELEV. TOP OF LEADS.

RIG & CREW TIME 11/17/88 to

DETAILED INSTALLATION DESCRIPTION:

Hole washed with 2 tanks potable water until clear return. PVC placed in bottom of hole and backfilled with sandblast sand (20-30 size). Bentonite pellets dropped for seal, then bentonite grout to surface and concrete in steel guard pipe.



DESCRIPTION OF PIEZOMETER TIP AND STAND PIPE ASSEMBLY

Nominal 2-inch diameter schedule 40 PVC, threaded flush joint couplings, threaded end cap at base. Length = 239 ft. Screen slot size = 0.001.

DESCRIPTION OF SOIL AT TIP ELEVATION:

White limestone w/some amber coloered flakes; fairly hard rock w/o significant water loss.

NOTE: SKETCH IN ALL COMPONENTS PERTINENT TO THE INSTALLATION WITH APPLICABLE DIMENSIONS EG: FILTER SAND, SEALS, GROUT, CASING, ETC.

FORM G-1-1

FIELD TEST BORING RECORD COVER SHEET
STONE & WEBSTER ENGINEERING CORP.

BORING NO. P-3A

SITE Seminole Electric Coop/Hardee County

J.O. NO. 18191.04

SHEET 1 OF 3

COORDINATES 900 South 1800 East

GROUND ELEV. 121.7

INCLINATION Vert.

BEARING N/A

INSPECTOR D.M. Cregger

DATE START/FINISH 11/17 /88

CONTRACTOR/DRILLER Ardaman & Associates Roger Parker

STATIC G.W. DEPTH/DATE (FT) /

DRILL RIG TYPE Failing 1500

DEPTH TO BEDROCK 32 (FT)

TOTAL DEPTH DRILLED 238.0 (FT)

METHODS:

DRILLING SOIL 8 inch roller bit & 6 inch casing to 80 ft.

SAMPLING SOIL 1½" I.D. Standard Split Spoon, wash samples below 160 ft.

DRILLING ROCK 5 7/8" Tricone roller bit (worn to 5½" Ø)

SPECIAL TESTING OR INSTRUMENTATION Installed piezometer in lower carbonate rock section, screen depth 222-237 ft.

COMMENTS Hawthorn formation monitoring and groundwater sampling well adjacent to test broing B-3.

SUMMARY

SOIL DRILLED 238 (FT) ROCK CORED 0 (FT)

NUMBER SPLIT BARREL SAMPLES 3

NO. & TYPE UNDISTURBED SAMPLES None

DRILL RIG & CREW TIME (HRS.)

LIST ALL TEST, INSPECTION, & CALIBRATION RECORDS ATTACHED:

Piezometer Installation Report.

GROUNDWATER (DEPTH BELOW GROUND SURFACE)

DEPTH	DATE	DEPTH	DATE
33.5	11/17/88		
36.0	11/18/88		

NOTES

1. DATUM IS M.S.L. UNLESS OTHERWISE INDICATED

LEGEND FOR FIELD BORING LOGS

DISTURBED SAMPLES
- W - WASH
- S - SPLIT BARREL (ASTM-D1586 UNLESS OTHERWISE NOTED)
- E - ENVIRONMENTAL
- Z - OTHER, DESCRIBE:

UNDISTURBED SAMPLES
- US - SHELBY TUBE
- UF - STATIONARY (FIXED PISTON)
- UO - OSTERBERG
- UP - PITCHER
- UD - DENISON
- X - OTHER, DESCRIBE:

N - STD PENETRATION RESISTANCE BLOWS/FT (140 LB. HAMMER, UNLESS OTHERWISE NOTED)

REC - RECOVERY

RQD - ROCK QUALITY DESIGNATION

( ) - INCHES OF SAMPLE RECOVERY

NQ - WIRELINE ROCK CORE SAMPLES

APPROVED

DATE

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FORM G-2-1

FIELD BORING LOG
STONE & WEBSTER ENGINEERING CORP.

BORING NO. P-3A

SITE Seminole Electric/Pok-Hardee Site

J.O. NO. 18191.04

SHEET 2 OF 3

DRILLER Ardaman/R.P.

INSPECTOR D. Cregger

ELEV.	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER	BLOWS/OR REC/RQD	SPT N VALUE	GROUP SYMBOL	SAMPLE DESCRIPTION
121.7	0						**Silty Sand:** overburden (See log of test boring B-3)
	20						Top of rock at 32.0 ft.
	40						**Clayey Sand and Silty Sand:** phosphatic sand of upper Hawthorn formation. (see log of test boring B-3)
	60						
	80						Split Spoon Refusal at 85 ft.
							Silty Clay and Clayey Silt: phosphatic sand of upper Hawthorn formation. (see log of test boring B-3)
	100						**Gravelly Phosphatic Silt:** nonplastic, widely graded, 10-30% limestone gravel, 10-20% mostly fine black phosphate sand; buff to light gray occrust w/black speckling; firm; (Hawthorn Formation).
	120	S	24			ML	
	140	S	25	50/2"	50+	ML	**Sandy Phosphatic Silt:** nonplastic, poorly graded, 2-5% phosphate nodule gravel to ½" max; 15-25% coarse to fine, mostly coarse phosphatic sand; buff to light gray; indurafed (very stiff), chaotic internal structure (Hawthorn Formation).
	160						

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FORM G-2-1

FIELD BORING LOG
STONE & WEBSTER ENGINEERING CORP.

BORING NO. P-3A

SITE Seminole Electric/AGRICO

J.O. NO. 18191.04

SHEET 3 OF 3

DRILLER Ardaman/E.

INSPECTOR D. Cregger

ELEV.	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER	BLOWS/OR REC / ROD	SPT N VALUE	GROUP SYMBOL	SAMPLE DESCRIPTION
	160	S	26			CL	Silty Clay: slightly to moderately plastic; 5-10% gravel (limestone) to 3/4" max; 5-10% coarse to fine sand; light gray w/greenish gray inclusions (Lower Hawthorn). Clay disturbed, can't determine consistency.
	180						Hard layer 188-189 ft.
20/ft E.O.D. 11/15/88	200	W	27				Phosphatic sand in wash cuttings, w/few greenish clay balls, also greenish porcellanite chips
							Hard layer 210-211 ft.
	220						Hard layer 220-238 ft.
		W	28				Limestone - white cuttings & also clearish brown (aragonite) cuttings. Mud scraped from bit & placed injar.
238ft E.O.D. 11/16/88	240						Bottom of hole at 238.0 ft.
	260						
	280						
	300						

FORM 6-6-0

PIEZOMETER INSTALLATION REPORT
STONE & WEBSTER ENGINEERING CORP.

PIEZOMETER NO. P-10A

SITE Seminole Electric Coop/Polk-Hardee Site

J.O. NO. 18191.04

DATE 11/28/88 DRILLER R. Parker INSPECTOR D. Cregger

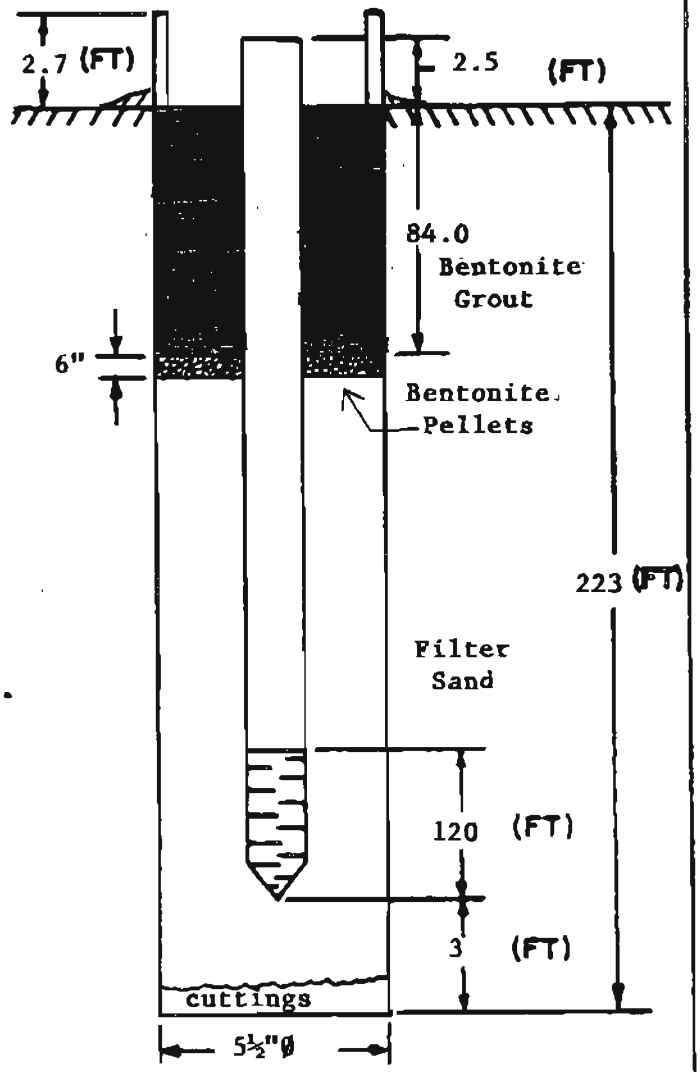
COORDINATES E 4500 N 2190 GROUND ELEV. 127.4

INSTALLED IN BORING P-10A ELEV. TOP OF LEADS.

RIG & CREW TIME full day to install

DETAILED INSTALLATION DESCRIPTION:

Drill out w/5½"0 bit and flush hole, silt coming off wall at 100-ft depth. Set screw joint screen & riser then backfill w/uniform fine sand (20-30 size sandblast sand) - used 2400 lb. Place bentonite pellets one-at-a-time and tamp w/weighted tape - used 12 lb tremie grout with 4 bags & 3 lb super gelx per 55 gallon drum - used 13 bags total. Concrete in steel guard pipe later.



DESCRIPTION OF PIEZOMETER TIP AND STAND PIPE ASSEMBLY

Nominal 2"0 schedule 40 PVC with threaded-flush joint couplers, in 10-ft sections, conical screw-in tip, slot size = 0.010", by Monoflex, Inc.

DESCRIPTION OF SOIL AT TIP ELEVATION:

Phosphatic sand and clay with cemented zones - Hawthorne formation (lower).

NOTE: SKETCH IN ALL COMPONENTS PERTINENT TO THE INSTALLATION WITH APPLICABLE DIMENSIONS EG: FILTER SAND, SEALS, GROUT, CASING, ETC.

FORM G-1-1

FIELD TEST BORING RECORD COVER SHEET
STONE & WEBSTER ENGINEERING CORP.

BORING NO. P-10A

SITE Seminole Electric Coop/Polk-Hardee Site

J.O. NO. 18191.04

SHEET 1 OF 3

COORDINATES E4500 N2190

GROUND ELEV. 127.4

INCLINATION VERT

BEARING N/A

INSPECTOR D. Cregger

DATE: START/FINISH 11/21/88

CONTRACTOR/DRILLER Ardaman/R. Parker

STATIC G.W. DEPTH/DATE (FT) /

DRILL RIG TYPE Failing 1500

DEPTH TO BEDROCK 31.0 (FT)

TOTAL DEPTH DRILLED 223 (FT)

METHODS:

DRILLING SOIL 8-inch roller bit and 6-inch casing to 80 ft.

SAMPLING SOIL Wash samples.

DRILLING ROCK 5 7/8-inch hard rock roller bit to bottom of hole

SPECIAL TESTING OR INSTRUMENTATION Installed Piezometer

COMMENTS Hawthorne formation water quality well.

SUMMARY

8" cased SOIL DRILLED 80 (FT)

5½" uncased ROCK CORED 143 (FT)

NUMBER SPLIT BARREL SAMPLES 0

NO. & TYPE UNDISTURBED SAMPLES 0

DRILL RIG & CREW TIME (HRS.)

LIST ALL TEST, INSPECTION, & CALIBRATION RECORDS ATTACHED:

GROUNDWATER (DEPTH BELOW GROUND SURFACE)

DEPTH	DATE	DEPTH	DATE
8.3	11/28/88		
9.9	11/29/88		

NOTES

1 DATUM IS M.S.L. UNLESS OTHERWISE INDICATED

LEGEND FOR FIELD BORING LOGS

DISTURBED SAMPLES
- W - WASH
- S - SPLIT BARREL (ASTM-D1586 UNLESS OTHERWISE NOTED)
- E - ENVIRONMENTAL
- Z - OTHER, DESCRIBE:

UNDISTURBED SAMPLES
- US - SHELBY TUBE
- UF - STATIONARY (FIXED PISTON)
- UO - OSTERBERG
- UP - PITCHER
- UD - DENISON
- X - OTHER, DESCRIBE:

N - STD PENETRATION RESISTANCE BLOWS/FT (140 LB. HAMMER, UNLESS OTHERWISE NOTED)

REC - RECOVERY

RQD - ROCK QUALITY DESIGNATION

( ) - INCHES OF SAMPLE RECOVERY

NQ - WIRELINE ROCK CORE SAMPLES

APPROVED

DATE

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FORM G-2-1

FIELD BORING LOG
STONE & WEBSTER ENGINEERING CORP.

BORING NO. P-10A

SITE Seminole Electric Coop/Polk- Hardee Site

J.O. NO. 18191.04

SHEET 2 OF 3

DRILLER Ardaman & Assoc/R.P.

INSPECTOR D. Cregger

ELEV.	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER			GROUP SYMBOL	SAMPLE DESCRIPTION
127.4	0						Sand: poorly graded, mostly fine grained; white. Reclaimed mine land.
	20						
				30			Top of "rock" (mine pit bottom) @ 31 ft.
		W	1	35	31' 35'		Cemented Yellow Brown Sandy Clay: Some chips of bone flake.
	40			40			
		W	2	45	42'		Yellow Brown and Gray to White Lime Rock Frags: Some pebbles.
				50			
		W	3	55	53'		Calcareous Clay: Mostly white lime rock fragments w/clay balls. Salt & pepper sand.
	57.0						
	60			60			Dark Gray Clay: dark gray clay w/black sand. Hawthorn Formation.
		W	4	65			
				70	67' 68.5		Cemented clayey sand at 67-68.5 & 78-81 ft.
		W	5		78'		Phosphatic Sandy Clay: dark gray clay in bit for casing seat; cuttings mostly light gray "salt & pepper" limestone & some buff limestone, only occ yellow brown limestone.
81.0	80			80	81'		
	85			85			
	90	W	6	90	89'		Phosphatic Sand: light gray to buff (no clay balls) limestone fragments as above; w/rope-like organics.
	100						
	105			105			Phosphatic Sand: light gray to buff w/black specks; fast drilling
	110	W	7	110			
	120						
	125			125			Dark Gray Clay: greenish gray soft sticky clay w/phosphate sand.
	130	W	8	130			
	140						
	145			145			
	150	W	9	150	147 148 151		Phosphatic Sand: light gray to buff w/black phosphate fragments; cemented at 151-157 ft.
	160				157'		

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FORM G-2-1

FIELD BORING LOG
STONE & WEBSTER ENGINEERING CORP.

BORING NO. P-10A

SITE: Seminole Electric Coop/Polk-Hardee Site

J.O. NO. 18191.04

SHEET 3 OF 3

DRILLER

INSPECTOR

ELEV.	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER			GROUP SYMBOL	SAMPLE DESCRIPTION
	160	W	10	160 165			Clay: mixed buff-gray and dark greenish gray moderately plastic clay with phophatic sand and limestone fragments.
					175	▨	
	180			180	180	▨	Porcellanite marker bed at 180ft (very hard)
		W	11	185			Clay: gray moderately plastic, with phosphate sand. Trace of clearish green porcellanite chips in wash.
					187	▨	
					193	▨	
	200			200	199 201	▨	Clay: light gray w/phosphate. Extremely hard, amber colored chert at 204 underlain by brown clay.
		W	12	205	204	▨	
				215			
	220			220	219.5 221	▨	Cemented Clay: light gray clay and phosphate sand. Hard layer 1½ ft thick.
							Total Depth: 223.0 ft. -127.4 95.6 = -95.6 MSL
	240						
	260						

FORM 6-6-0

PIEZOMETER INSTALLATION REPORT
STONE & WEBSTER ENGINEERING CORP.

PIEZOMETER NO. P-12A

SITE Seminole Electric Coop/Polk-Hardee Site

J.O. NO. 18191.04

DATE 12/2/88 DRILLER R. Parker INSPECTOR D. Cregger

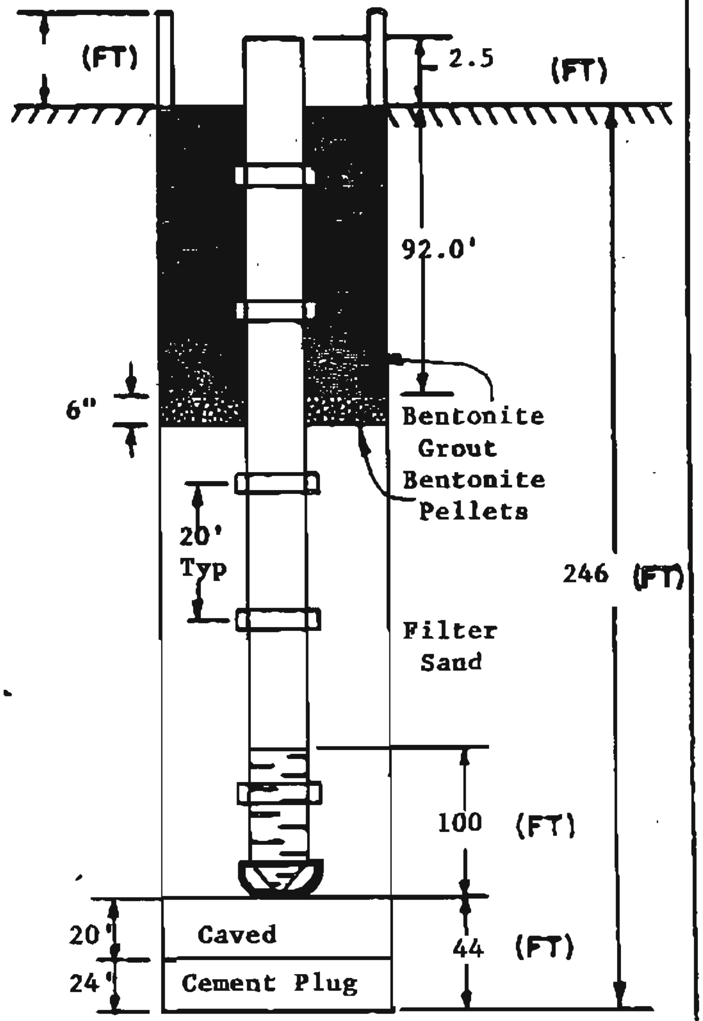
COORDINATES from map E 1070 N2620 GROUND ELEV. 126.3

INSTALLED IN BORING P-12A ELEV. TOP OF LEADS. -

RIG & CREW TIME 7:30 a.m. - 2:00 p.m.

DETAILED INSTALLATION DESCRIPTION :

Tremie grouted cement plug into water loss zone at 241ft and set overnight. Place 1½ bag sand in a.m. and it bridged on laitance layer. Glued couplers on way down and place sand (20-30 size) to 9.5ft above screen - total 2500 lb. Place bentonite and tamped to 6" thick - 12lb. Pulled casing and tremie grout to surface.



DESCRIPTION OF PIEZOMETER TIP AND STAND PIPE ASSEMBLY

Nominal 2"0 schedule 40 PVC with glued couplers, in 20ft sections. PVC end cap for 0.010-inch slot size PVC screen.

DESCRIPTION OF SOIL AT TIP ELEVATION :

Phosphatic Sand:
fine grained gray w/black speckles; w/occ sandy clay interbeds.

NOTE : SKETCH IN ALL COMPONENTS PERTINENT TO THE INSTALLATION WITH APPLICABLE DIMENSIONS EG : FILTER SAND, SEALS, GROUT, CASING, ETC.

FORM G-4-1

BOREHOLE BACKFILL INSPECTION REPORT
STONE & WEBSTER ENGINEERING CORP.

BORING NO. P-12A

SITE Seminole Electric Coop/Polk-Hardee Site

J.O. NO. 18191.04

DATE 12/1/88 DRILLER R. Parker INSPECTOR D. Cregger

METHOD(S) : ☐ SOIL BACKFILL ☒ TREMIE GROUT

HOLE DEPTH 246 (FT) HOLE DIAMETER 6" = 0.5 (FT) = 0.196 ft^3/ft

CASING LEFT IN PLACE (DIA/LENGTH) none (IN./FT)

RIG & CREW TIME 10:30 a.m.-12:30 p.m. ☒ CLEANUP SATISFACTORY

☐ LOCATION MARKED WITH STAKE

GROUT RECORD

20 gallons in pump

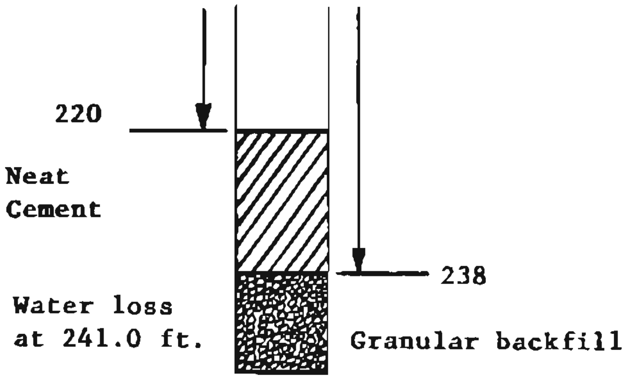
CEMENT TYPE Florida Lafarge BAG WEIGHT 94lb NO. BAGS USED 5

DETAILS OF MIX : WATER 6 gallons CEMENT 1 bag BENTONITE 0 %

1.7' in the barrel x 1.9'0 -> 2.8ft^3/ft -> 4.8 ft^3 = 36 gallons

STAGE NO.	DEPTH (FT.)	GROUT TAKE SACKS
1	239 - ?	0.3' x 2.8 =0.8 ft^3 = 6 gallons
2	? - 220 ft	1.2' x 2.8 = 3.3ft^3 = 25 gallons

COMMENTS : (IF BACKFILL IS BY COMBINATION OF METHODS, SKETCH AND SHOW DEPTHS)



FORM G-1-1

FIELD TEST BORING RECORD COVER SHEET
STONE & WEBSTER ENGINEERING CORP.

BORING NO. P-12A

SITE Seminole Electric Coop/Polk-Hardee

J.O. NO. 18191.04

SHEET 1 OF 3

COORDINATES from map E1070 ± N2620 ±

GROUND ELEV. 126.3

INCLINATION VERT

BEARING N/A

INSPECTOR D. Cregger

DATE: START/FINISH 11/29 /88

CONTRACTOR / DRILLER Ardaman/R. Parker

STATIC G.W. DEPTH/DATE (FT) /

DRILL RIG TYPE Failing 1500

DEPTH TO BEDROCK 29.5 (FT)

TOTAL DEPTH DRILLED (FT)

METHODS:

DRILLING SOIL 4½" pilot hole to 80', then 8"0 + casing to seat at 74'

SAMPLING SOIL wash samples in screen

DRILLING ROCK 5½"0 hard rock bit to bottom of hole.

SPECIAL TESTING OR INSTRUMENTATION Installed piezometer

COMMENTS

SUMMARY

Cased SOIL DRILLED 74 (FT) ROCK CORED (FT)

NUMBER SPLIT BARREL SAMPLES 0

NO. & TYPE UNDISTURBED SAMPLES 0

DRILL RIG & CREW TIME None (HRS.)

LIST ALL TEST, INSPECTION, & CALIBRATION RECORDS ATTACHED:

Piezometer installation report

GROUNDWATER (DEPTH BELOW GROUND SURFACE)

DEPTH	DATE	DEPTH	DATE
71 ft	12/1/88		

NOTES

1. DATUM IS M.S.L. UNLESS OTHERWISE INDICATED

LEGEND FOR FIELD BORING LOGS

DISTURBED SAMPLES
- W - WASH
- S - SPLIT BARREL (ASTM - D1586 UNLESS OTHERWISE NOTED)
- E - ENVIRONMENTAL
- Z - OTHER, DESCRIBE:

UNDISTURBED SAMPLES
- US - SHELBY TUBE
- UF - STATIONARY (FIXED PISTON)
- UO - OSTERBERG
- UP - PITCHER
- UD - DENISON
- X - OTHER, DESCRIBE:

N - STD PENETRATION RESISTANCE BLOWS/FT (140 LB. HAMMER, UNLESS OTHERWISE NOTED)

REC - RECOVERY

RQD - ROCK QUALITY DESIGNATION

( ) - INCHES OF SAMPLE RECOVERY

NQ - WIRELINE ROCK CORE SAMPLES

APPROVED

DATE

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FORM G-2-1

FIELD BORING LOG
STONE & WEBSTER ENGINEERING CORP.

SITE	J.O. NO.	SHEET	BORING NO.
Seminole Electric Coop/Polk-Hardee Site	18191.04	2 OF 3	P-12A

DRILLER	INSPECTOR
R. Parker	D. Cregger

ELEV.	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER			GROUP SYMBOL	SAMPLE DESCRIPTION
126.3	0						Top Soil to 3.0 ft then brown subsoil to 6.0 ft Unmined land (pasture).
		W	1	10 15		SC	Clayey Sand: fine grained w/mod. plastic fines (from bit smaple), white w/occ black coarse sand inclusions.
	20	W	2	20 25		SP	Phosphatic Sand: coarse to fine sand w/trace of silt and clay; light gray w/balck coarse phosphate.
		W	3	30 35	29.5 32	SC	Phosphatic Clayey Sand: coarse to fine sand, gray to yellow-brown w/chips of yellow-brown limestone (pit bottom)
	40	W	4	40 45 50	40.5 41.5 46.5 47.5	SC	Phosphatic Clayey Sand: similar to above except w/occ phosphate gravel to 3/8" max, all tan.
		W	5	55	53.5	SM	Phosphatic Silty Sand: coarse to fine sand, tan w/ phosphate gravel to 3/8" max.
	60	W	6	60 65 70	62.0	ML	Phosphatic Silt: fine sand in dark gray slightly plastic silt.
		W	7	75	74.0 76 SOFT 78 81	ML-	Phosphatic Organic Silt: mostly fine sand in dark gray to dark brownish gray slightly plastic silt. Peat (decomposed) at 68-71 ft.
	80	W	8	80 85 90		ML	Phosphatic Silt: coarse to fine sand and light gray silt, some limestone chips in wash.
		W	9	95		ML	Phosphatic Silt: same as above except whiter and trace cohesive clay.
	100	W	10	100 105 115	105.5 107.5 112 115.5	ML	Phosphatic Silt: mostly fine sand and silt with dark gray cohesive clay on top of hard layer at 105.5'. Slightly cemented clay zone (typ)
	120			125	122 126 132	SP	Phosphatic Sand: fine grained sand w/some silt and occ hard cemented layers, light to medium gray. Fast drilling between hard layers.
	140			135	138.5 140	SC	Phosphatic Clayey Sand: medium to fine grained sand in clayey matrix, light gray.
		W W	12 13	145 150 155		SC	Phosphatic Clayey Sand: same as above, atlernately white clay and medium gray clay in washed cuttings.

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FORM G-2-1

FIELD BORING LOG
STONE & WEBSTER ENGINEERING CORP.

SITE Seminole Electric Coop/Polk-Hardee Site	J.O. NO. 18191.04	BORING NO. P-12A	SHEET 3 OF 3
DRILLER R. Parker	INSPECTOR D. Cregger		

ELEV.	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER			GROUP SYMBOL	SAMPLE DESCRIPTION
	160	W	14	160		CL	Sandy Clay: coarse to fine sand in a greenish-clay; slow drilling.
				170			
	180						
		W	15	185 186		SP	Phosphatic Sand: mostly fine sand, gray w/ black speckles; fast drilling
				195			
	200						
		W	16	210		SP	Phosphatic Sand: mostly fine grained, gray w/ black speckles; fast drilling.
	220			220			
		W	17	224 225		CL-	Phosphatic Sandy Clay: brown and gray clay lumps and chips of buff to white limerock.
		W	18	230 232 233 234 235		LS LS	Limestone: buff limerock chips w/some med. brown clay lumps and the amber chert marker bed.
	240			241			
							Lost circulation at 241'; very soft drilling to 246' total depth.

LABORATORY TEST RESULTS
Agrico - South Site
Seminole Electric Cooperative, Inc.

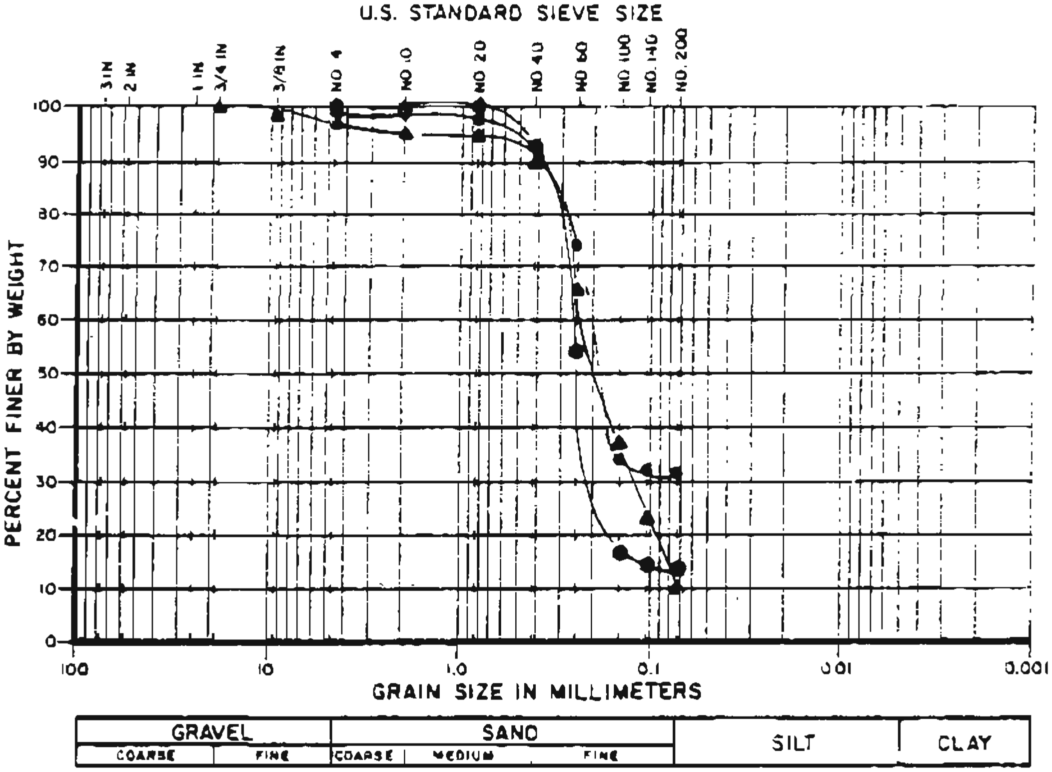
Sample Number	Depth Ft.	Water Content Percent	Dry Density P.C.F.	Liquid Limit Percent	Plastic Limit Percent	Permeability Coefficient cm/sec	Organic Content Percent	Minus 200 Percent
B-1								
2	2.5 - 4.0	15.6	---	---	---	---	2.32	10.5
TW-4	7.5 - 9.5	18.4	113.3	32.4	13.9	---	---	30.0
TW-6	15.0 - 17.0	25.8	98.4	29.4	15.2	---	---	
TW-8	25.0 - 27.0	34.4	86.5	---	---	---	---	3.0
10	35.0 - 36.5	38.3	---	53.3	29.4	---	---	24.0
14	65.0 - 66.5	65.8	---	107.1	41.9	---	---	32.4
17	70.0 - 71.5	39.4	---	---	---	---	---	15.2
22	95.0 - 96.5	27.6	---	32.1	26.6	---	---	50.8
B-2								
2	2.5 - 4.0	15.9	---	---	---	---	1.0	26.7
4	7.5 - 9.0	16.8	---	28.0	11.1	---	---	20.4
TW-5	10.0 - 12.0	24.8	104.0	115.1	21.9	---	---	31.0
TW-6	15.0 - 17.0	46.8	74.5	88.0	16.0	---	---	
8	25.0 - 26.5	29.6	---	---	---	---	---	36.1
TW-10	35.0 - 36.0	44.2	81.4	95.7	41.2	---	---	56.0
12	45.0 - 46.5	63.1	---	71.3	30.5	---	---	34.5
14	55.0 - 56.5	38.5	---	54.0	32.9	---	---	53.7
17	70.0 - 71.5	33.8	---	---	---	---	---	6.1
19	80.0 - 81.5	77.4	---	65.6	40.9	---	---	50.0
23	100.0 - 101.5	37.6	---	53.7	35.8	---	---	63.0
B-3								
2	2.5 - 4.0	7.9	---	---	---	---	0.93	36.0
5	10.0 - 11.5	16.4	---	---	---	---	---	24.3
TW-6	15.0 - 17.0	36.0	86.9	114.0	20.0	---	---	
TW-7	20.0 - 22.0	70.4	59.0	109.7	26.1	---	---	94.0
TW-9	30.0 - 31.5	56.3	69.7	185.2	57.3	---	---	
10	35.5 - 36.5	43.2	---	---	---	---	---	16.6
	40.0 - 41.5	30.4	---	---	---	---	---	64.5
	55.0 - 56.5	67.7	---	---	---	---	---	38.7
	60.0 - 61.5	53.2	---	---	---	---	---	29.8
	65.0 - 67.0	72.9	59.5	179.0	61.0	---	---	73.0

LABORATORY TEST RESULTS
Agrico - South Site
Seminole Electric Cooperative, Inc.

Sample Number	Depth Ft.	Water Content Percent	Dry Density P.C.F.	Liquid Limit Percent	Plastic Limit Percent	Permeability Coefficient cm/sec	Organic Content Percent	Minus 200 Percent
B-3								
17	70.0 - 71.5	44.7	---	---	---	---	---	13.8
19	80.0 - 81.5	40.7	---	46.0	27.8	---	---	52.9
21	90.0 - 91.5	35.9	---	---	---	---	---	33.8
23	100.0 - 101.5	35.8	---	---	---	---	---	60.5
B-4								
TW-5	10.0 - 12.0	19.0	112.3	78.0	16.1	---	---	27.0
TW-6	15.0 - 17.0	---	---	---	---	---	---	
9	30.0 - 31.5	42.2	---	63.3	28.7	---	---	25.3
12	45.0 - 46.5	58.7	---	97.7	43.8	---	---	48.1
16	65.0 - 66.5	35.3	---	---	---	---	---	8.0
21	90.0 - 91.5	30.3	---	34.6	30.5	---	---	28.9
B-5								
2	2.5 - 4.0	20.2	---	---	---	---	1.22	39.4
TW-4	7.5 - 9.5	18.0	110.6	28.0	12.1	$6.7x10^{-6}$	---	33.0
TW-6	15.0 - 17.0	51.0	71.4	123.2	25.7	$1.2x10^{-7}$	---	48.0
10	35.0 - 36.5	19.4	---	---	---	---	---	9.7
12	45.0 - 46.5	25.3	---	---	---	---	---	14.9
16	65.0 - 66.5	29.1	---	---	---	---	---	36.9
18	75.0 - 76.5	28.7	---	---	---	---	---	36.9
20	85.0 - 86.5	53.5	---	64.2	28.3	---	---	31.5
23	100.0 - 101.5	37.0	---	---	---	---	---	60.5
B-6								
1	0.0 - 1.5	5.4	---	---	---	---	---	7.2
5	10.0 - 11.5	19.5	---	22.4	10.4	---	---	19.4
7	20.0 - 21.5	24.7	---	---	---	---	---	14.8
9	35.0 - 36.5	41.1	---	---	---	---	---	32.6
B-7								
TW-6	15.0 - 17.0	64.7	60.2	176.5	50.4	---	---	46.0
8	25.0 - 26.5	29.1	---	62.8	24.3	---	---	64.5
12	45.0 - 45.7	34.2	---	55.9	35.0	---	---	33.4

LABORATORY TEST RESULTS
Agrico - South Site
Seminole Electric Cooperative, Inc.

Sample Number	Depth Ft.	Water Content Percent	Dry Density P.C.F.	Liquid Limit Percent	Plastic Limit Percent	Permeability Coefficient cm/sec	Organic Content Percent	Minus 200 Percent
B-8								
2	1.5 - 3.0	5.9	---	---	---	---	2.3	32.3
3	5.0 - 6.5	5.7	---	---	---	---	---	10.0
5	10.0 - 11.5	15.6	---	---	---	---	---	21.6
TW-7	20.0 - 22.0	41.8	77.0	86.4	18.6	---	---	
TW-8	25.0 - 27.0	47.5	74.4	152.9	28.0	---	---	
TW-10	35.0 - 37.0	39.9	80.2	92.7	46.6	---	---	18.0
13	50.0 - 51.5	26.2	---	---	---	---	---	44.3
14	55.0 - 56.5	40.4	---	---	---	---	---	30.9
15	60.0 - 66.5	26.7	---	---	---	---	---	14.3
17	70.0 - 71.5	46.8	---	---	---	---	---	13.6
19	80.0 - 81.5	54.9	---	---	---	---	---	46.8
B-9								
4	7.5 - 7.9	19.4	---	---	---	---	8.2	46.4
TW-6	15.0 - 17.0	35.4	89.2	111.0	24.1	$7.4x10^{-9}$	---	51.0
TW-8	25.0 - 27.0	72.7	57.4	105.2	43.8	---	---	54.0
TW-10	35.0 - 37.0	85.7	50.3	197.8	80.9	---	---	
11	40.0 - 41.5	72.2	---	124.4	40.5	---	---	71.0
15	60.0 - 61.5	39.1	---	---	---	---	---	13.0
18	75.0 - 75.1	47.8	---	---	---	---	---	54.9
22	95.0 - 96.5	25.2	---	non-plastic		---	---	13.2
B-10								
1	0.0 - 1.5	12.4	---	---	---	---	---	14.3
2	2.5 - 3.0	24.4	---	---	---	---	---	3.8
5	10.0 - 11.5	28.5	---	---	---	---	---	2.1
7	20.0 - 21.5	25.9	---	---	---	---	---	2.2
8	25.0 - 26.5	56.8	---	83.1	26.9	---	---	79.6
10	35.0 - 36.5	39.6	---	---	---	---	---	40.1
11	40.0 - 41.5	37.6	---	---	---	---	---	14.3
13	50.0 - 51.5	53.4	---	---	---	---	---	55.9
15	60.0 - 61.5	44.8	---	55.5	34.3	---	---	48.6
18	75.0 - 76.5	13.1	---	---	---	---	---	33.3
19	80.0 - 81.5	42.0	---	---	---	---	---	52.4
22	95.5 - 96.5	53.1	---	---	---	---	---	55.6



TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
1	2	2.5-4'	▲		
1	17	70-71.5'	●		
1	14	65-66.5'	●		

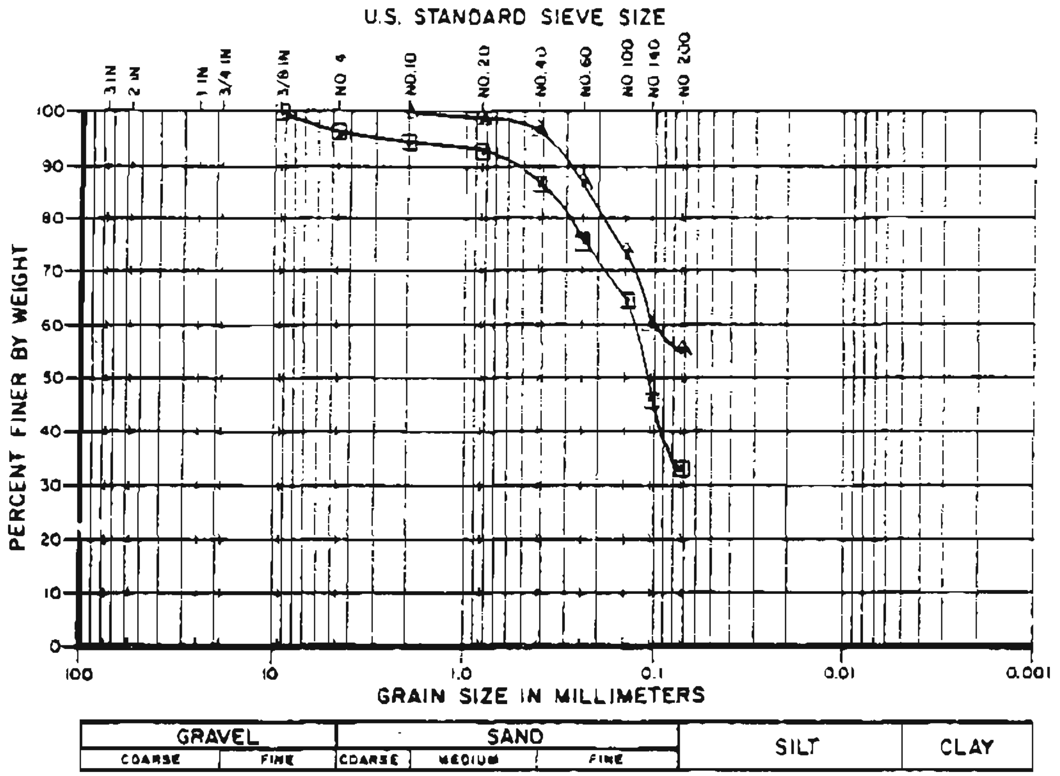
FORM NO 1509 7/80

GRAIN SIZE DISTRIBUTION

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

SEMINOLE ELECTRIC CO-OP. INC.
440 MV COMBUSTION TURBINE
AGRICO
SOUTH SITE

DRAWN BY:	CHECKED BY:	DATE:
FILE NO 88-9155A	APPROVED BY	



TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
2	TW-10	35-36'	▲		
2	TW-5	10-12'	▣		

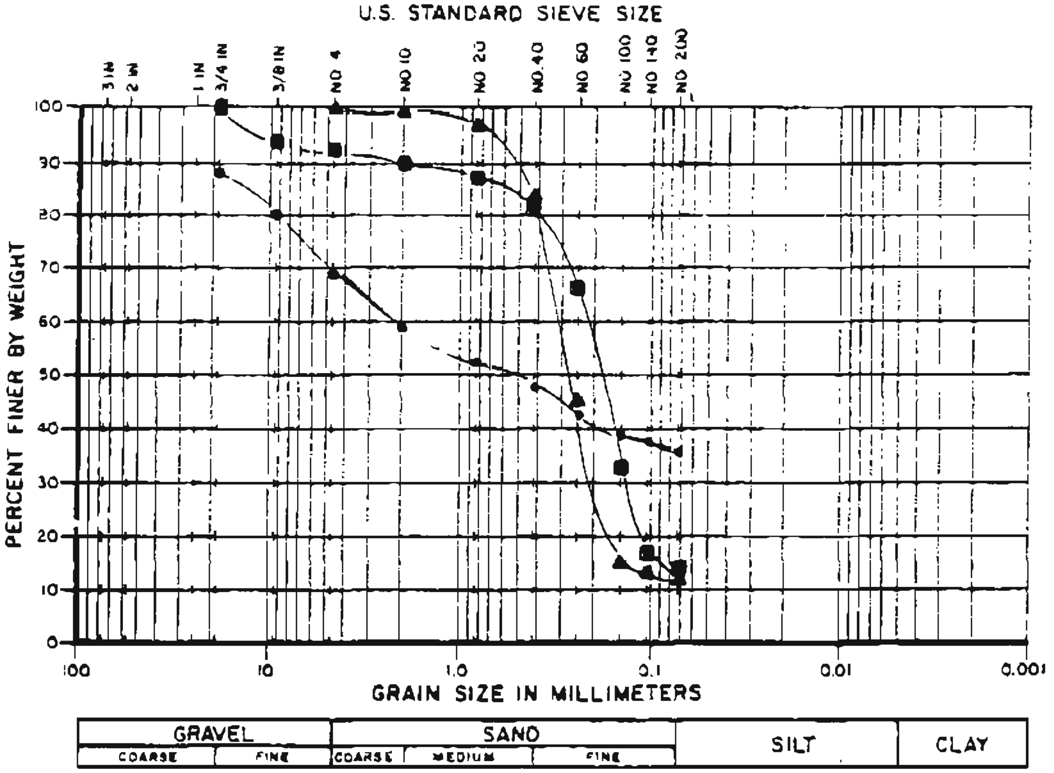
GRAIN SIZE DISTRIBUTION

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

SEMINOLE ELECTRIC CO-OP. INC.
440 MV COMBUSTION TURBINE
AGRICO
SOUTH SITE

DRAWN BY:	CHECKED BY:	DATE:
FILE NO. 88-9155A	APPROVED BY:	

FORM NO 1509 7/80



TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
2	8	25-26.5'	●		
3	17	70-71.5'	▲		
10	11	40-41.5'	■		

GRAIN SIZE DISTRIBUTION

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440 MV COMBUSTION TURBINE
AGRICO
SOUTH SITE

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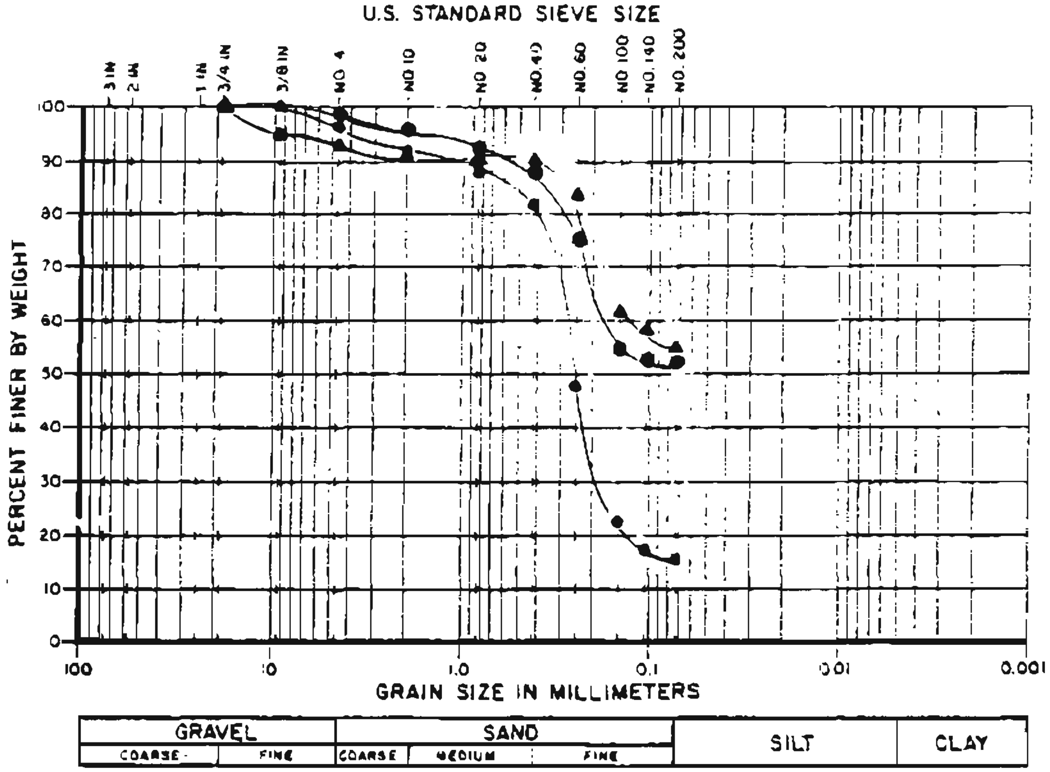

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
3	10	35-36.5'	●		
2	14	55-56.5'	●		
9	18	75-76.5'	▲		

GRAIN SIZE DISTRIBUTION

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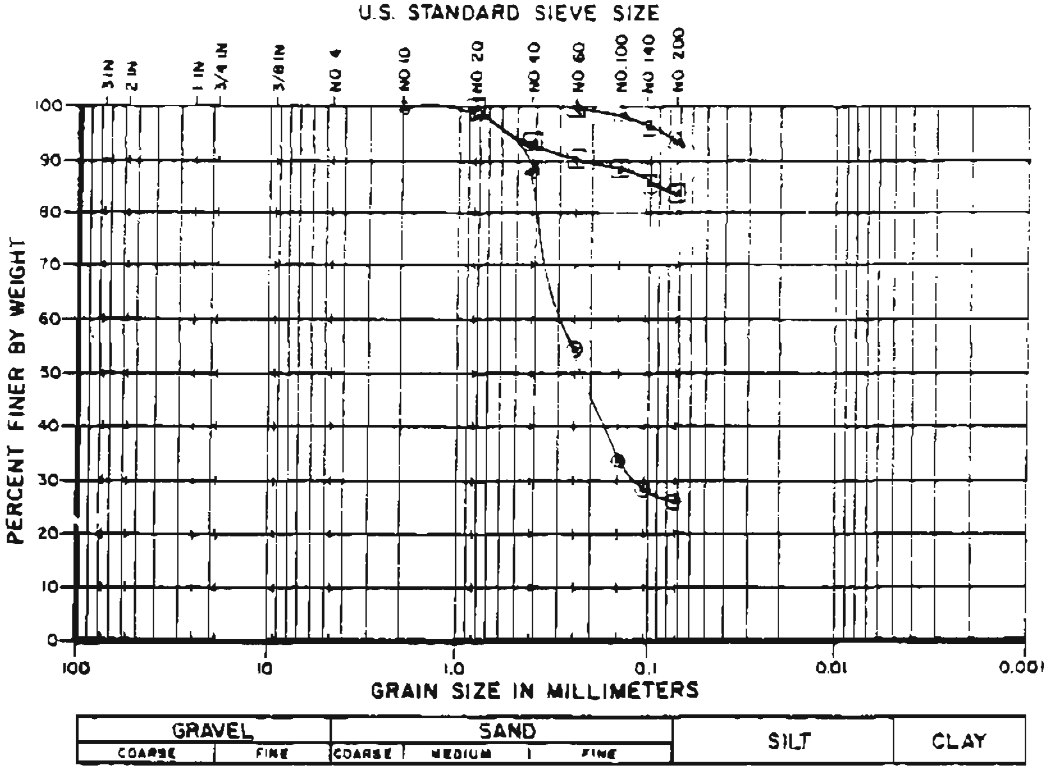

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
3	TW-6	20-22'	△		
3	TW-16	65-67'	□		
4	TW-5	10-12'	○		

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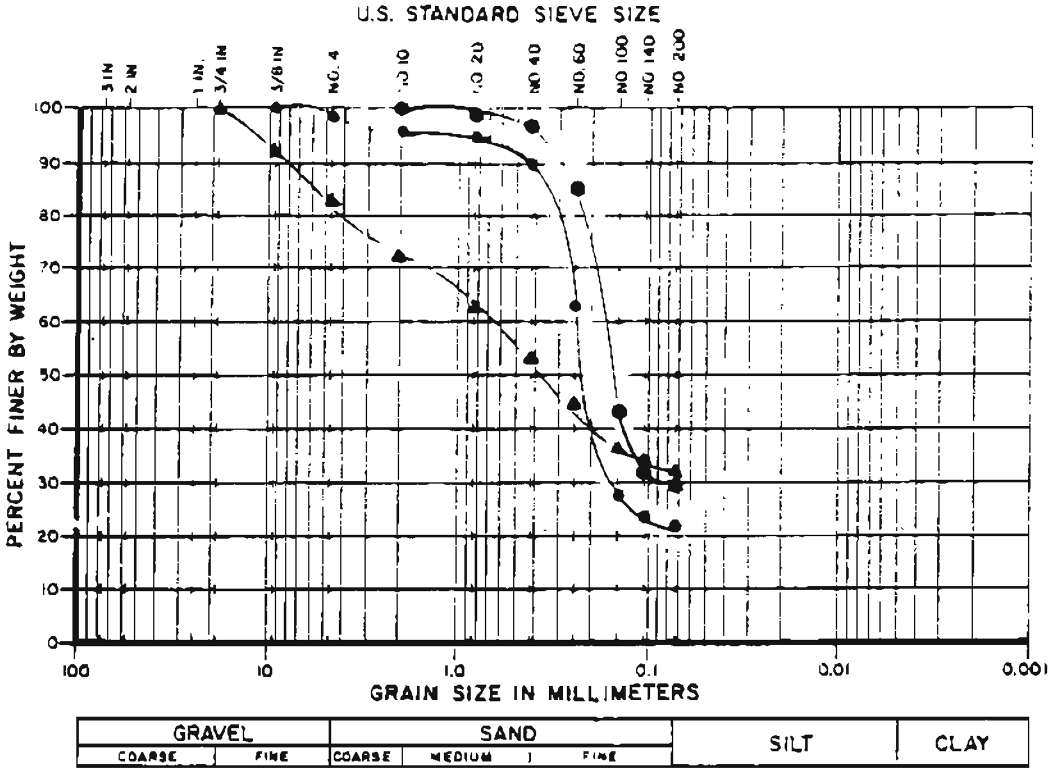

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
8	5	10-11.5'	●		
3	21	90-91.5'	▲		
3	15	60-61.5'	●		

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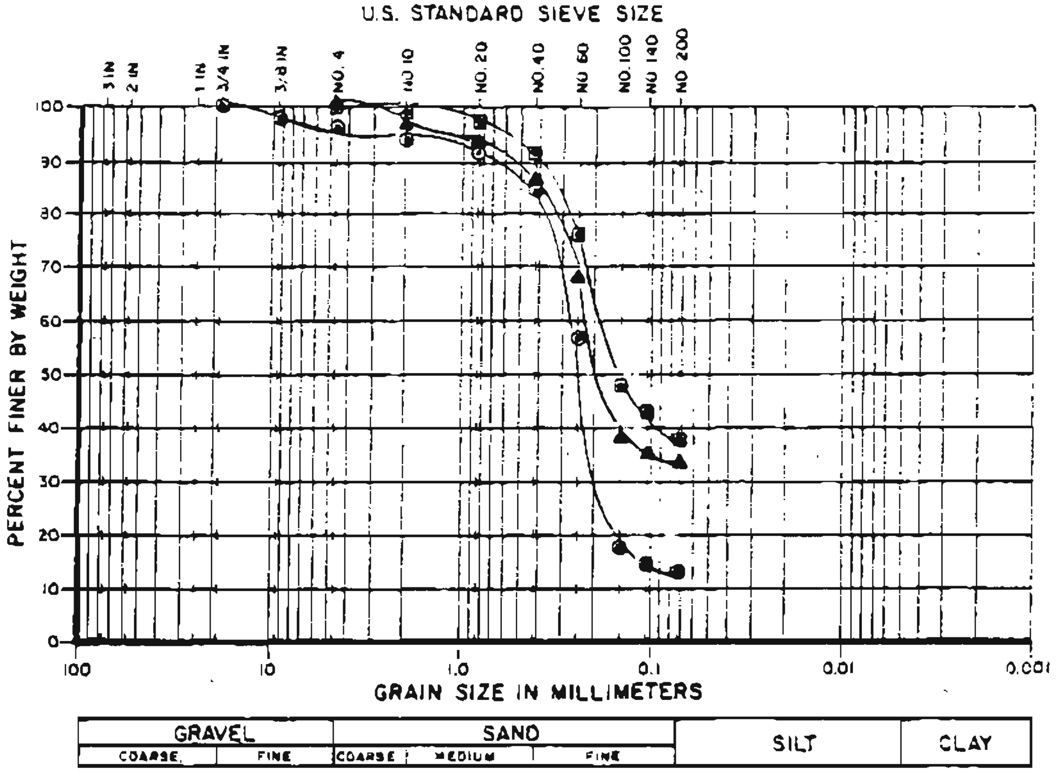

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
3	14	55-56.5'	⊡		
2	12	45-46.5'	▲		
8	15	60-61.5'	◉		

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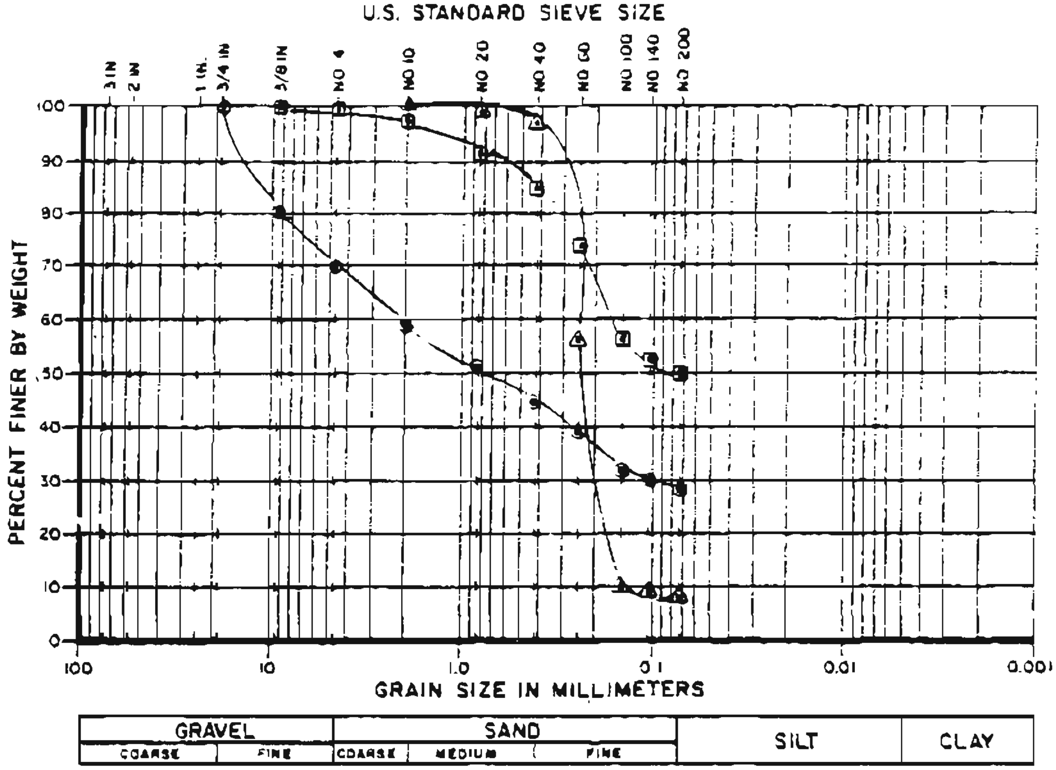

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
4	21	45-46.5'	⊙		
4	16	65-66.5'	△		
1	22	95-96.5'	⊡		

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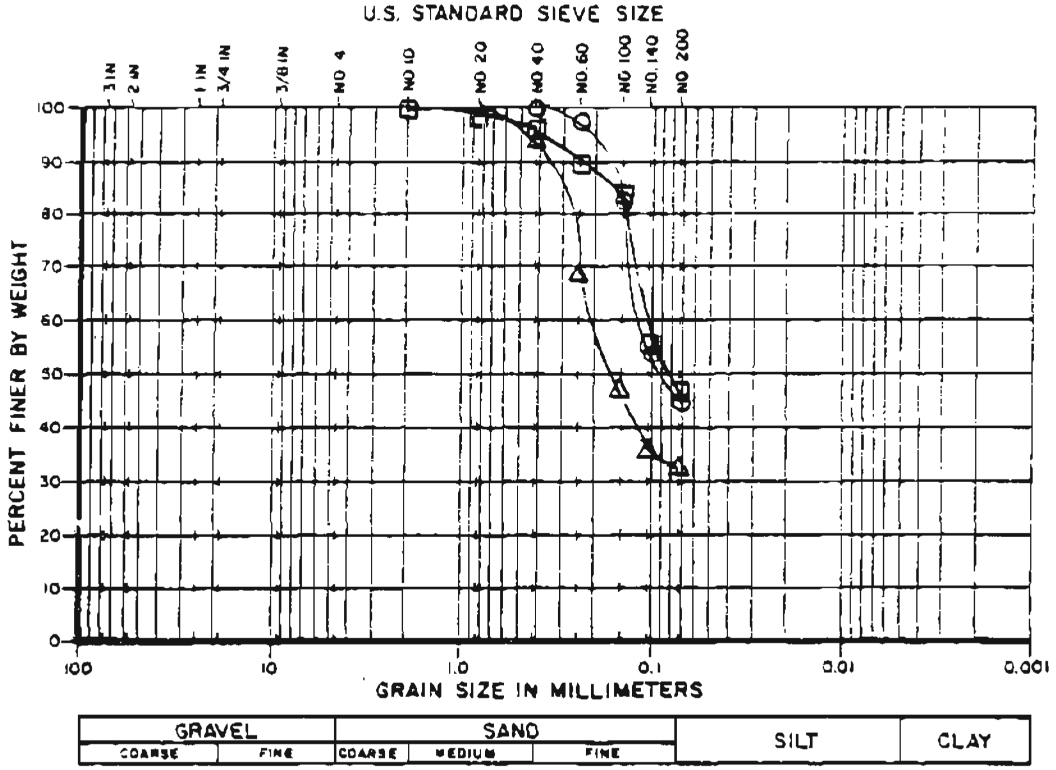

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
5	TW-4	7.5-9.5'	△		
5	TW-6	15-17'	⊡		
7	TW-6	15-17'	⊘		

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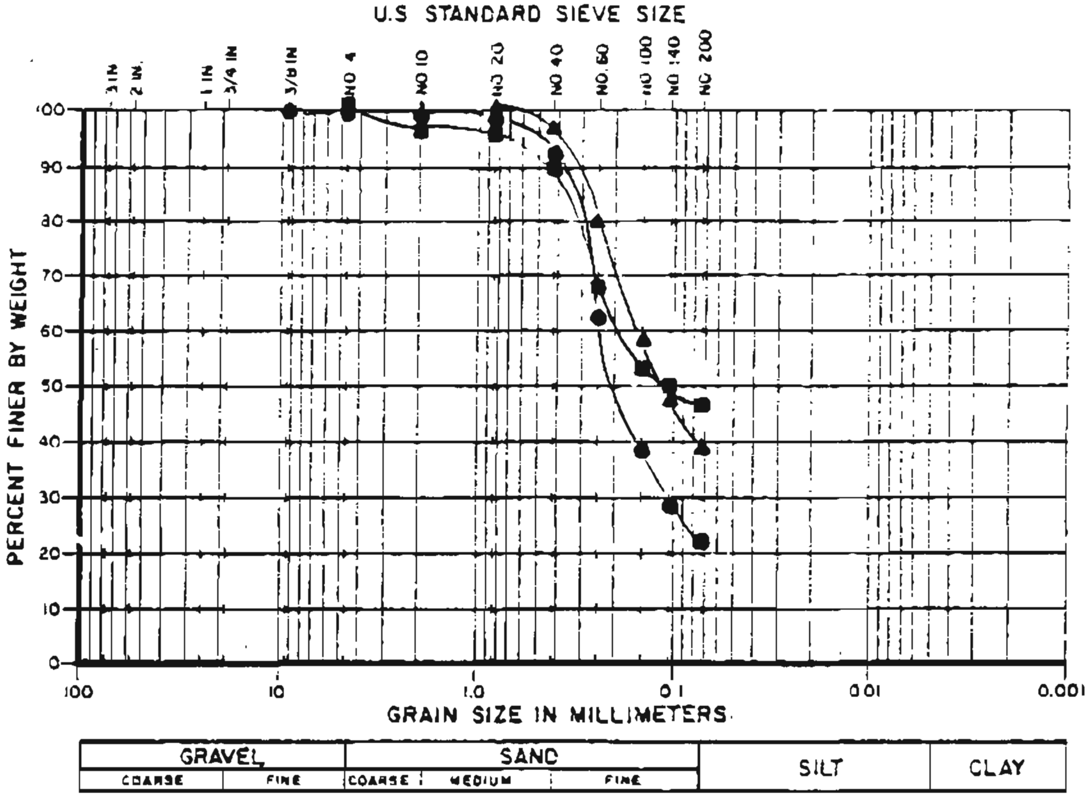

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
2	4	7.5-9.0'	●		
9	4	7.5-9.0'	■		
5	2	2.5-4.0'	▲		

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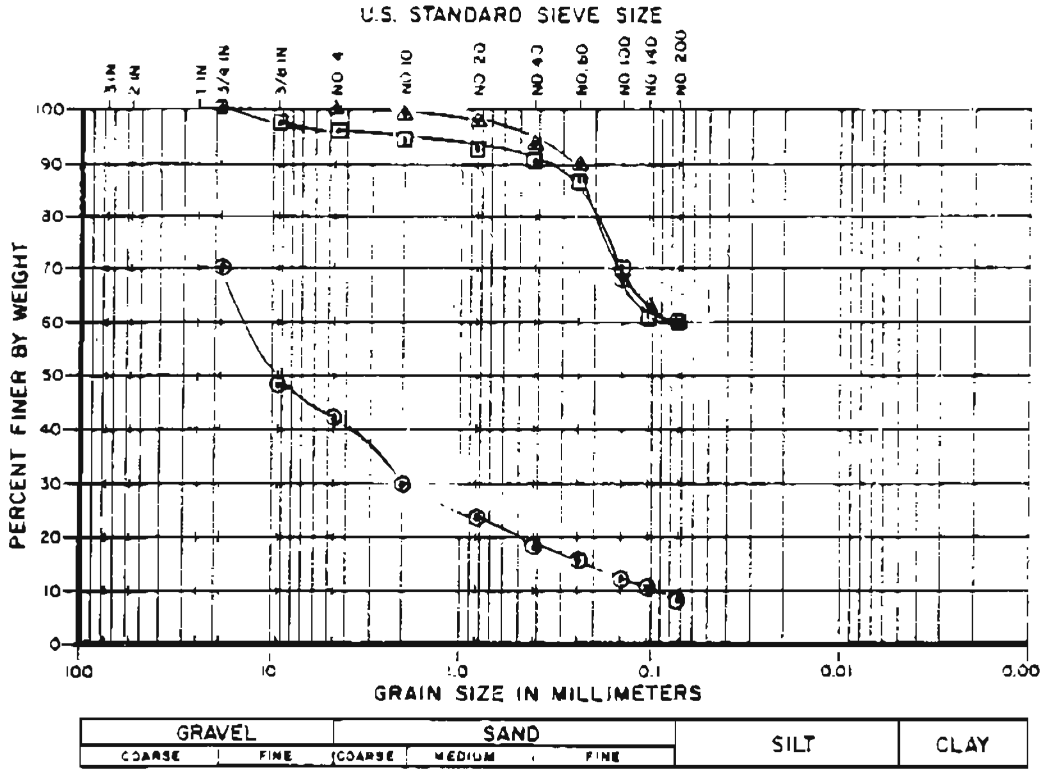

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
5	10	35-36.5'	⊙		
5	23	100-101.5'	△		
3	23	100-101.7'	⊡		

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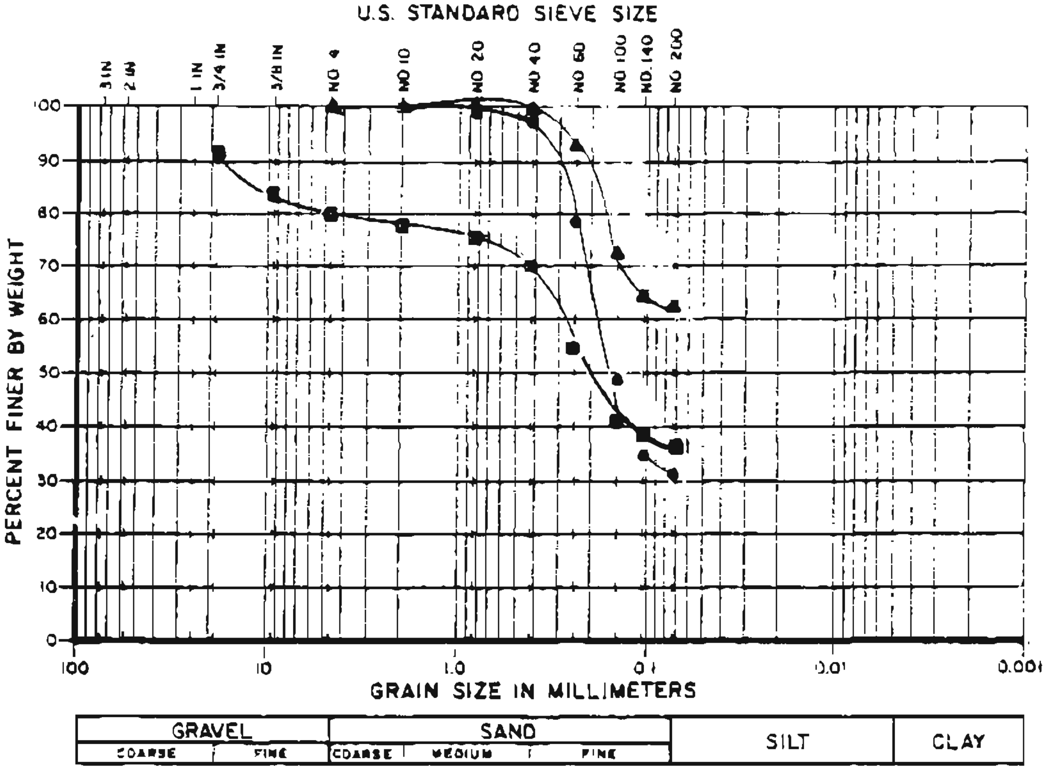

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
5	20	85-86.5'	●		
5	16	65-66.5'	■		
2	23	100-101.5'	▲		

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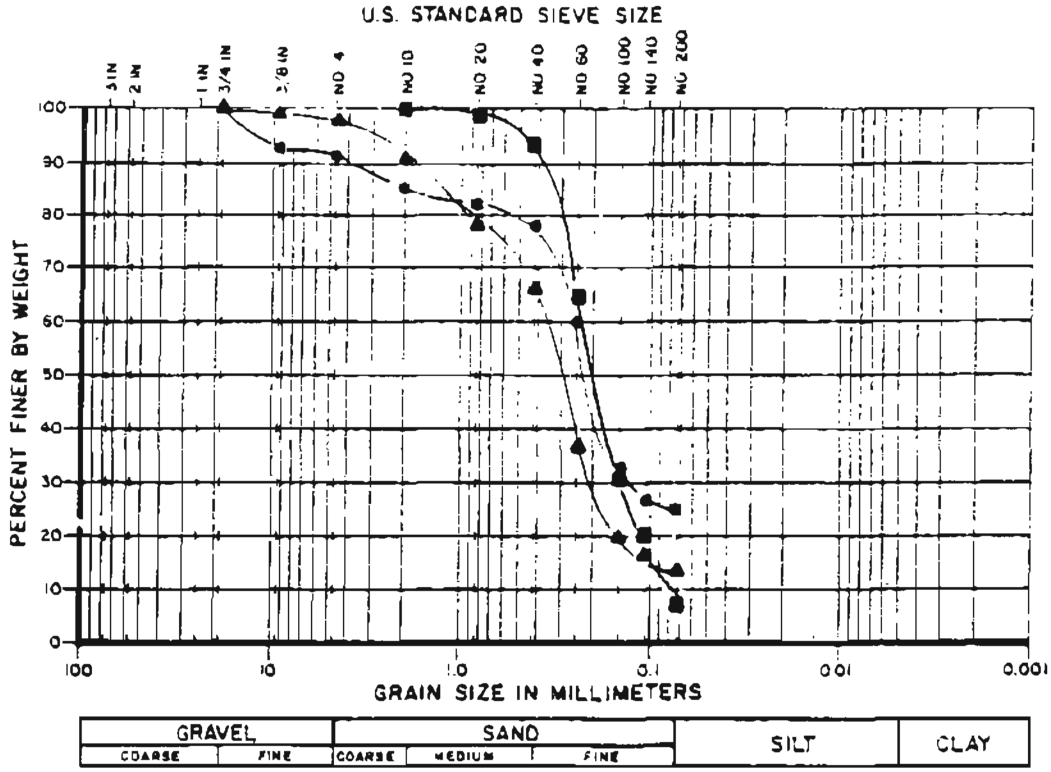

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
4	9	30-31.5'	●		
6	7	20-21.5'	▲		
6	1	0-1.5'	■		

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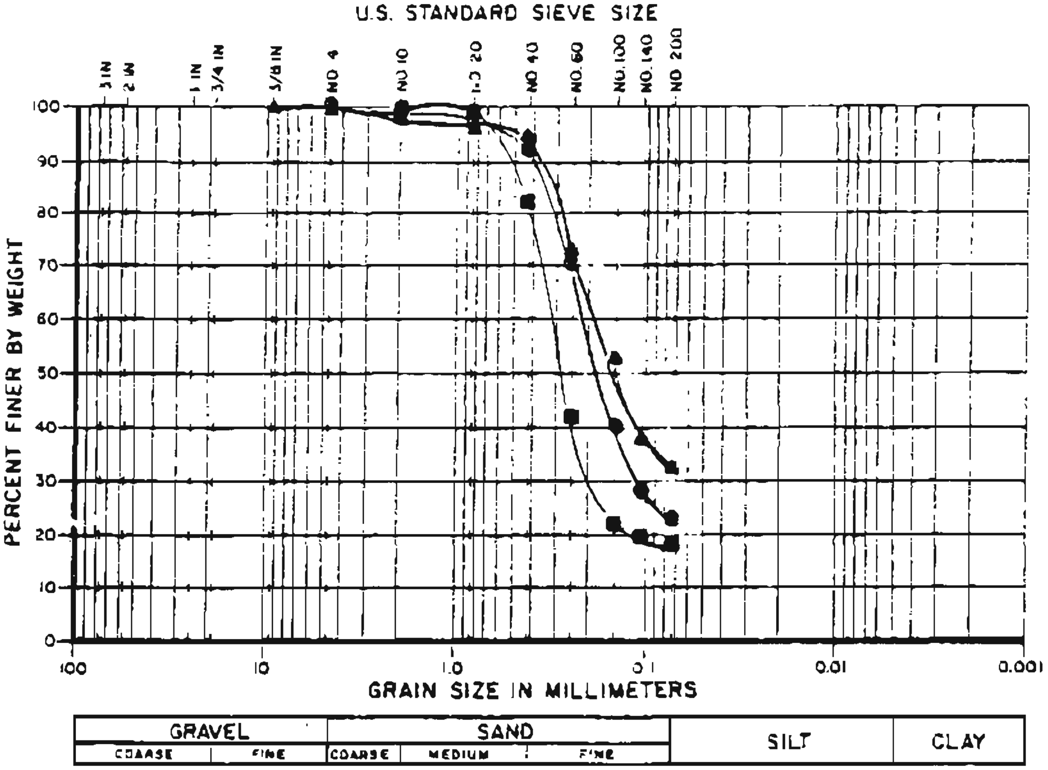

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
6	5	10-11.5'	■		
6	9	35-36.5'	▲		
1	10	35-36.5'	●		

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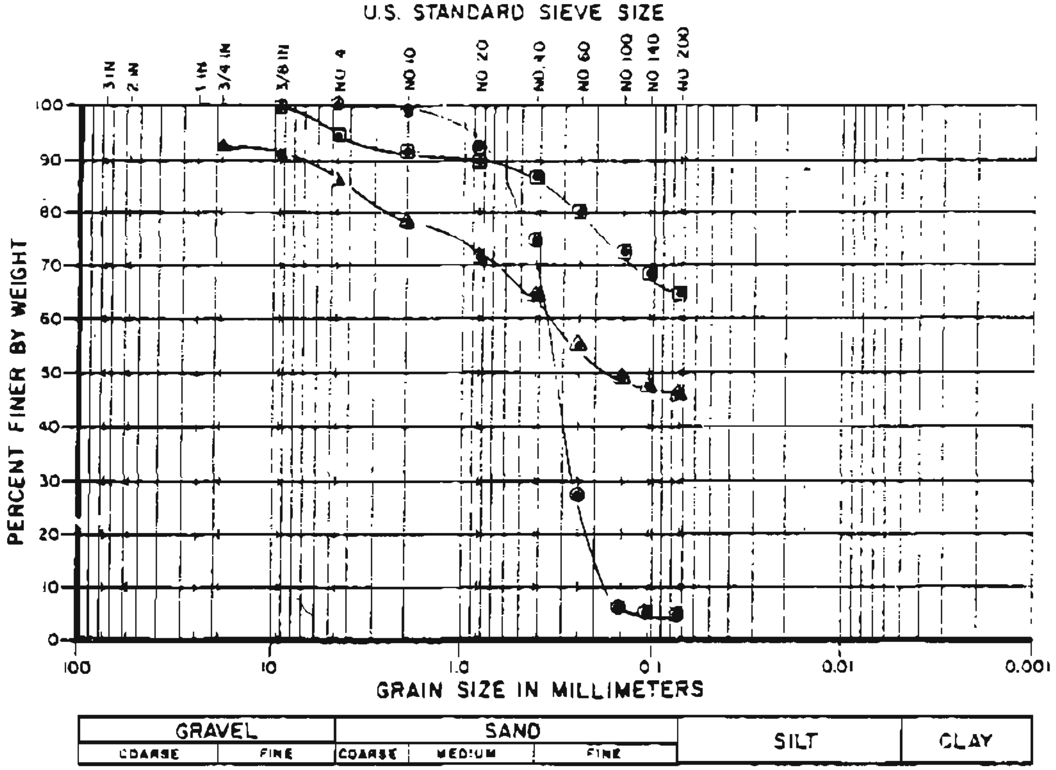

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
2	17	70-71.5'	⊙		
8	19	80-81.5'	▲		
7	8	25-26.5'	⊡		

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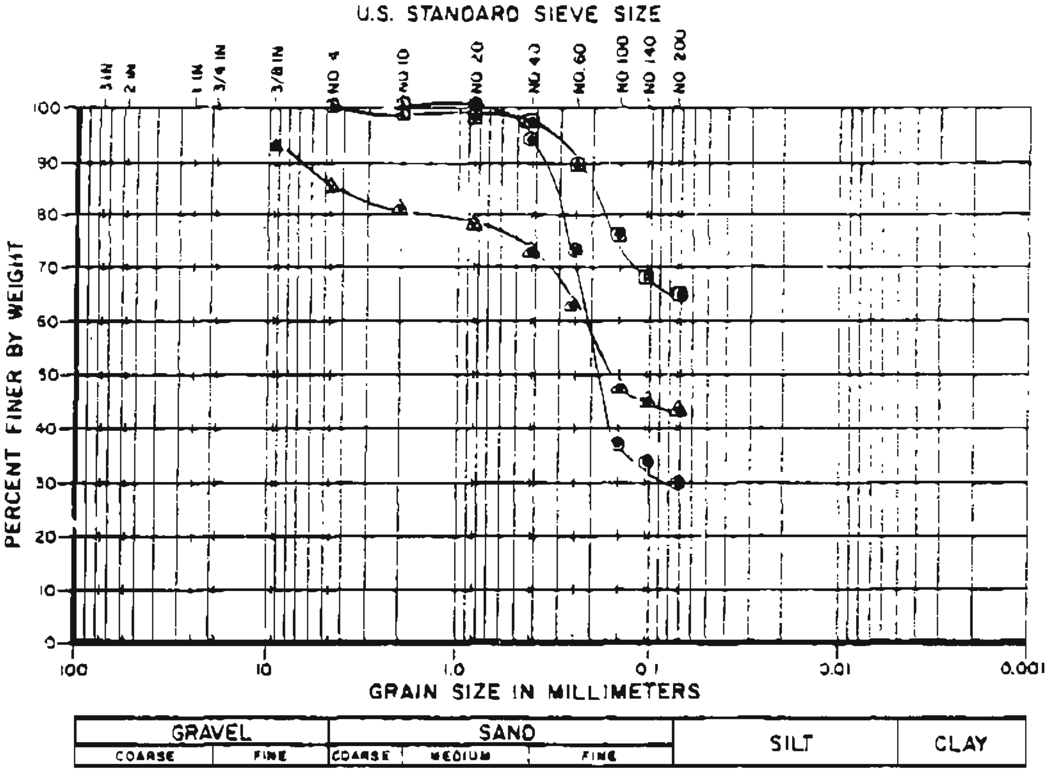

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
3	11	10-11.5'	⊡		
8	13	50-51.5'	▲		
8	14	55-56.5'	⊙		

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SOUTH SITE

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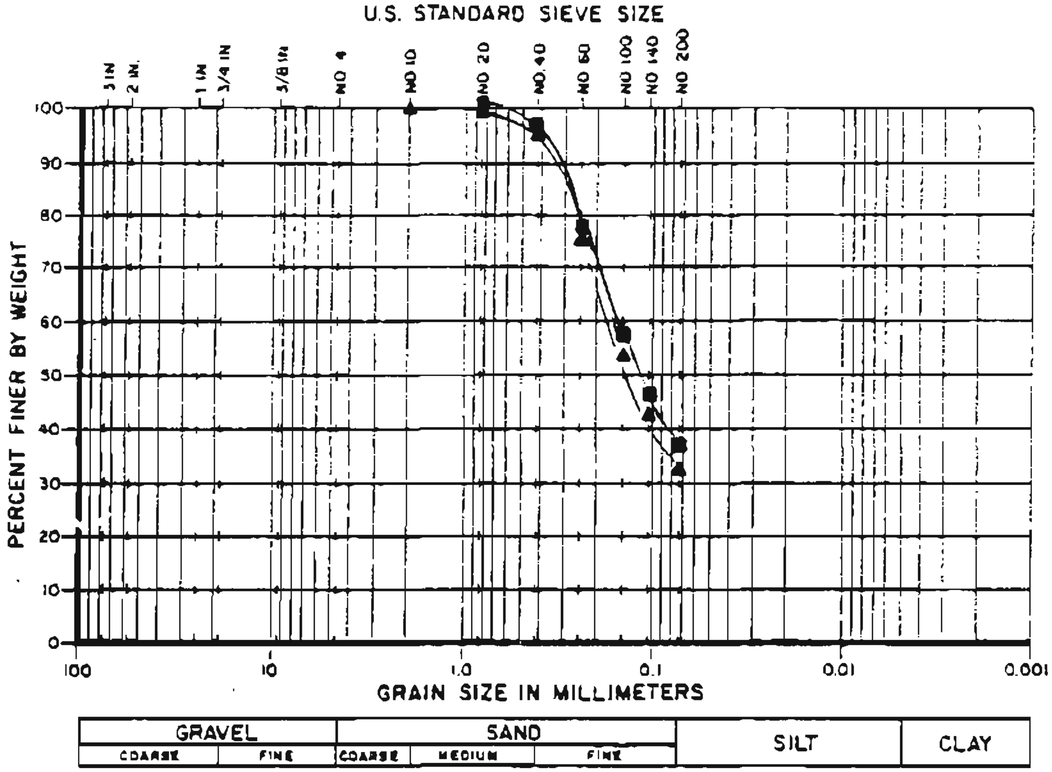

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
8	2	1.5-3'	▲		
3	2	2.5-4'	■		

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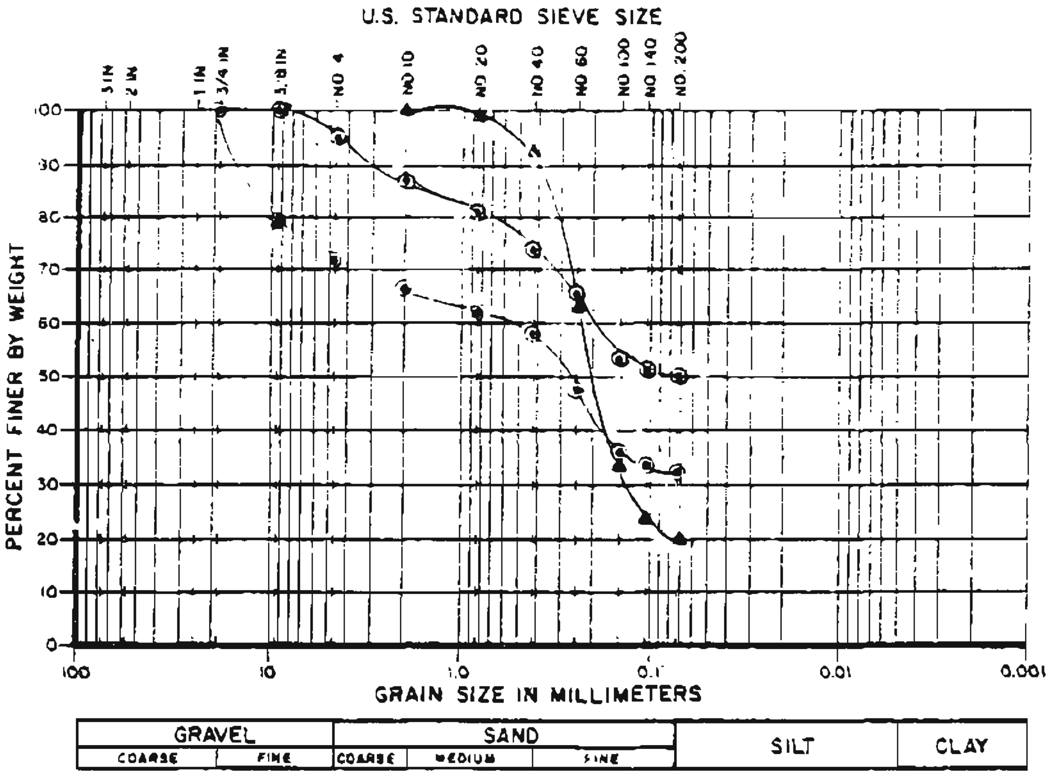

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
7	12	45-45.8'	●		
8	3	5-6.5'	▲		
2	19	80-81.5	●		

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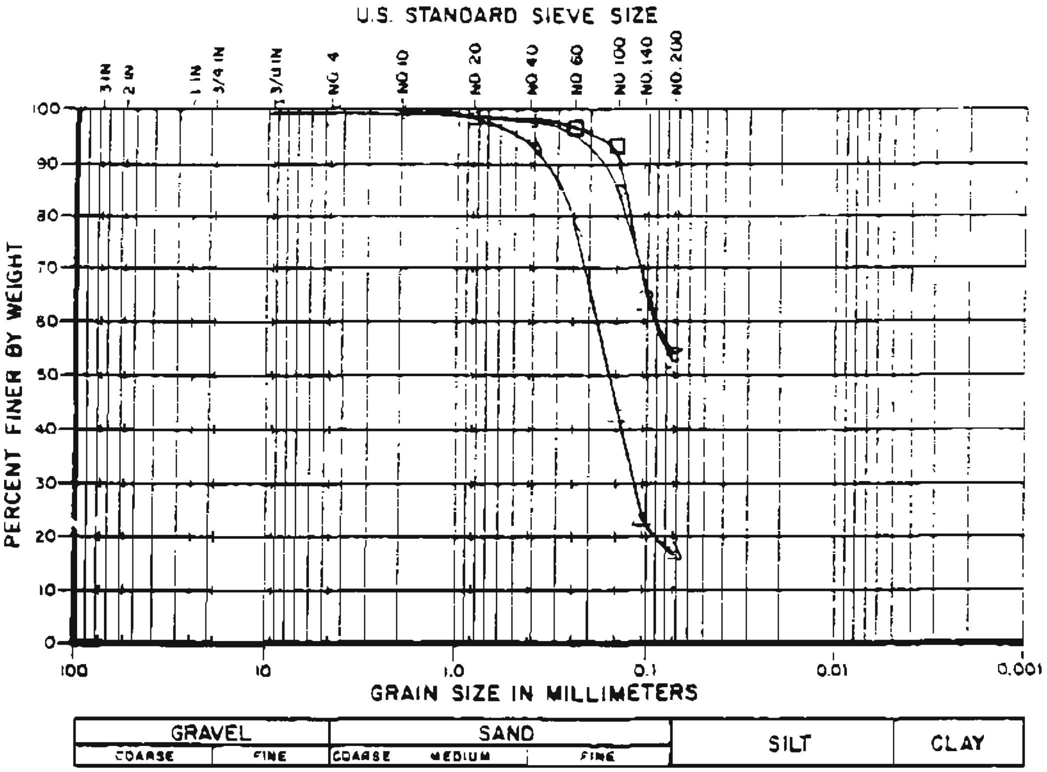

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
8	TW-10	35-37'	△		
9	TW-6	15-17'	□		
9	TW-8	25-27'	○		

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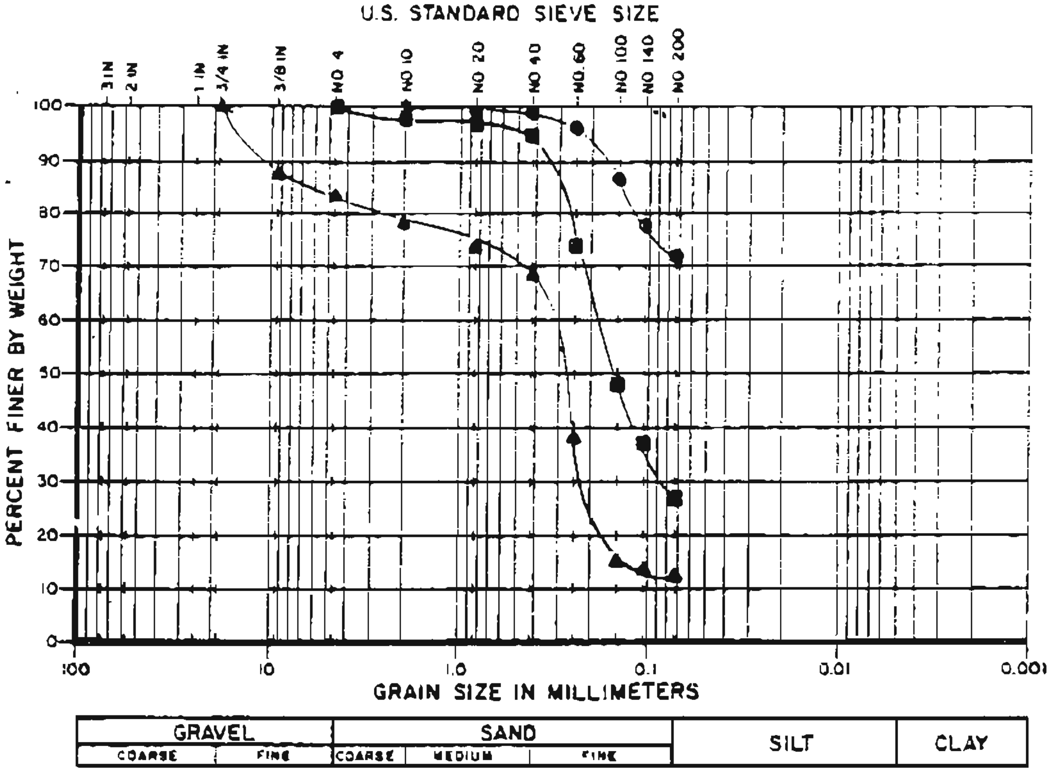

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
9	22	90'	▲		
9	11	40-41.5'	●		
2	2	2.5-4'	■		

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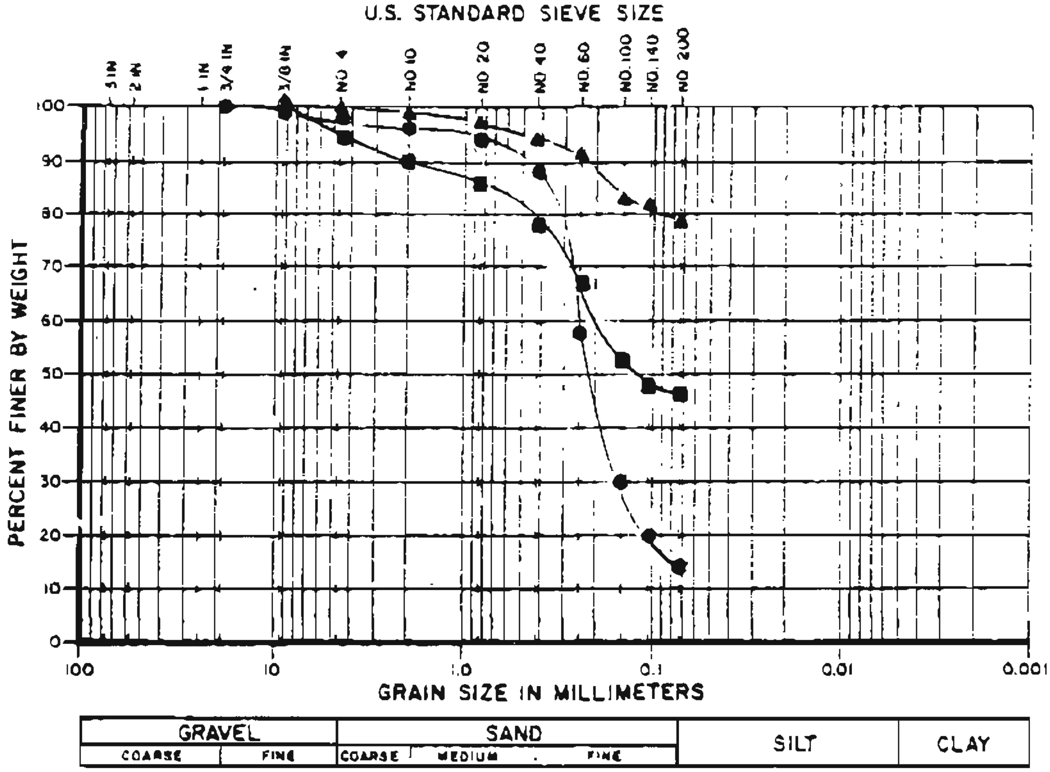

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
10	1	0-1.5'	●		
10	8	25-26.5'	▲		
4	12	45-46.5'	■		

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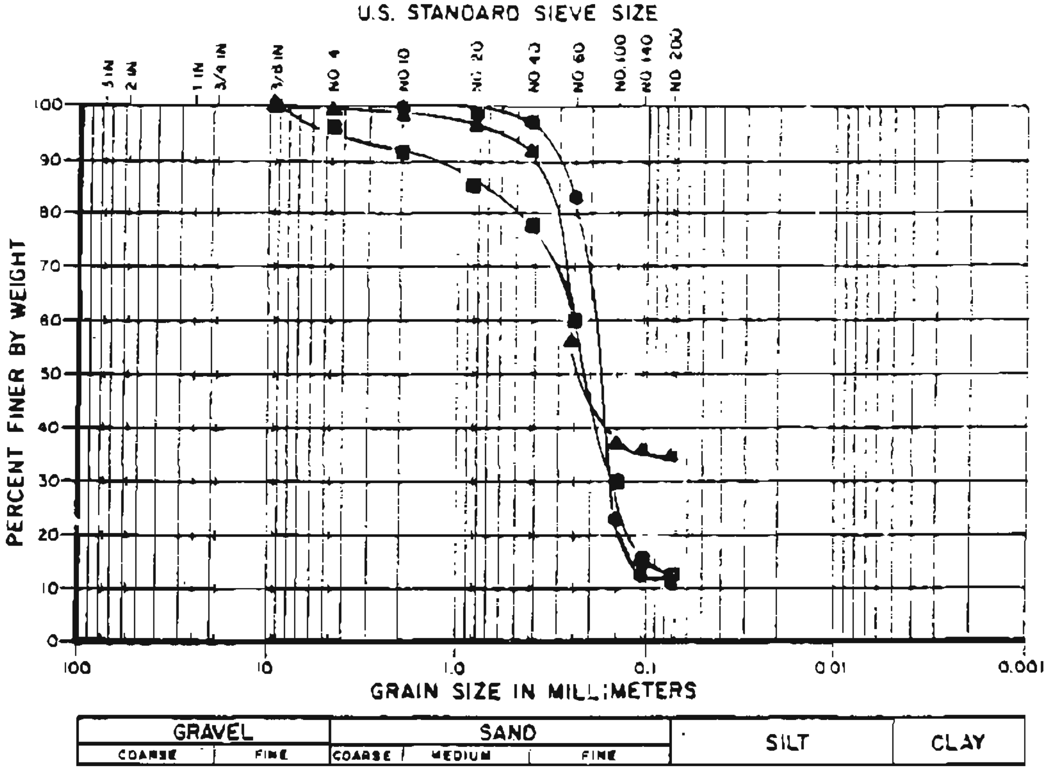

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
9	15	60-61.5'	■		
8	17	70-71.5'	●		
5	18	75-76.5'	▲		

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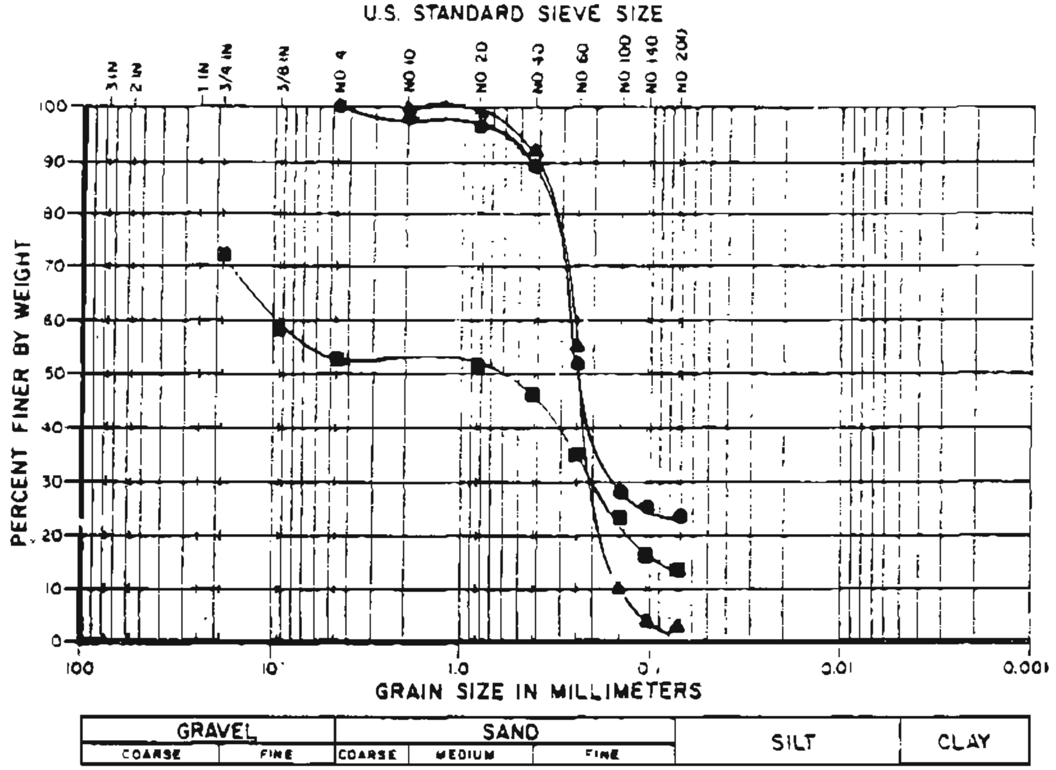

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
10	5	10-11.5'	▲		
3	5	10-11.5'	●		
5	12	45-46.5'	■		

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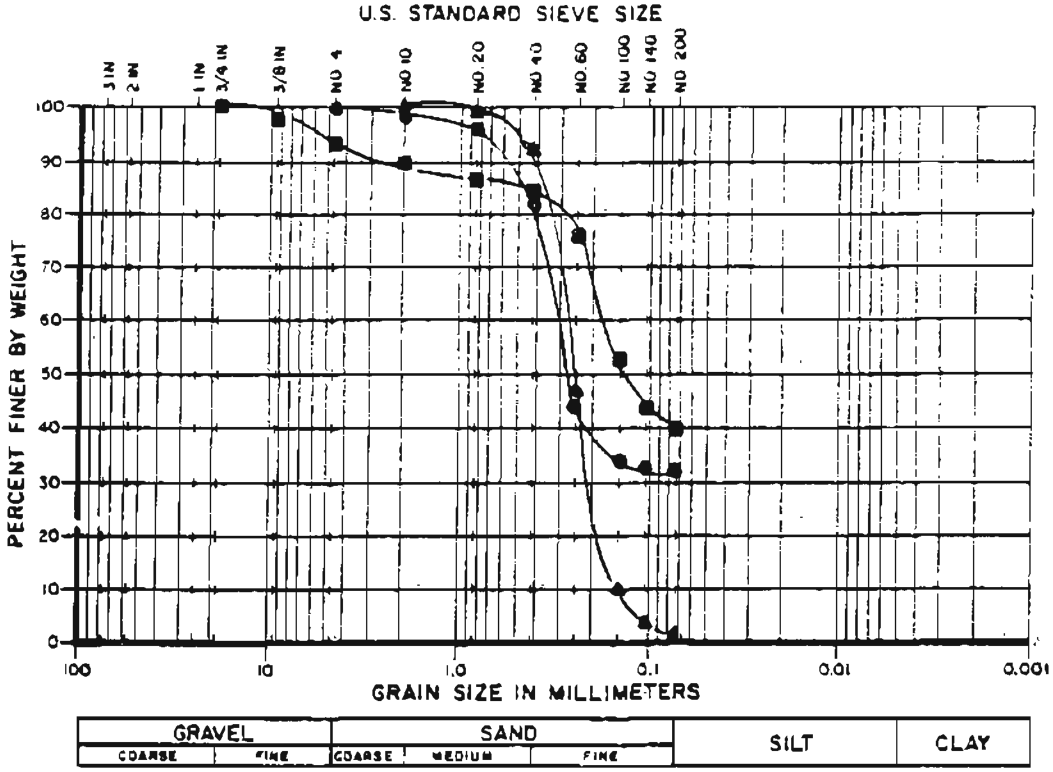

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
10	7	20-21.5'	▲		
10	10	35-36.5'	■		
10	18	75-76.5'	●		

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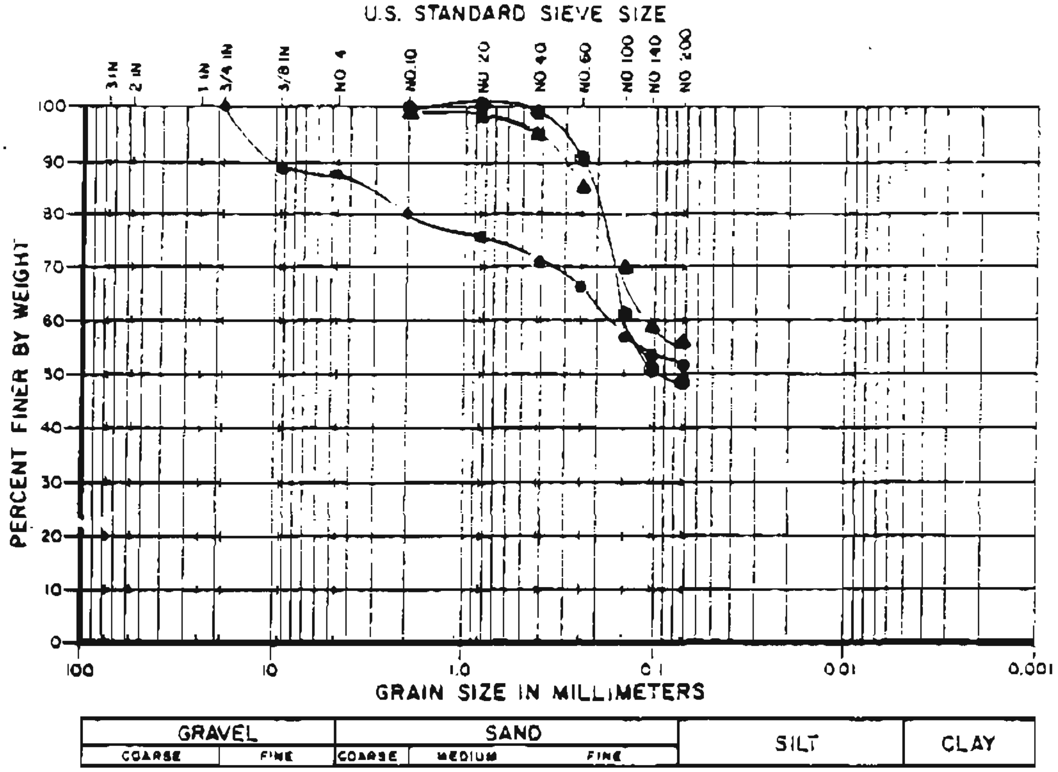

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
3	19	80'	●		
10	22	95-96.5'	▲		
10	15	60-61.5'	⬤		

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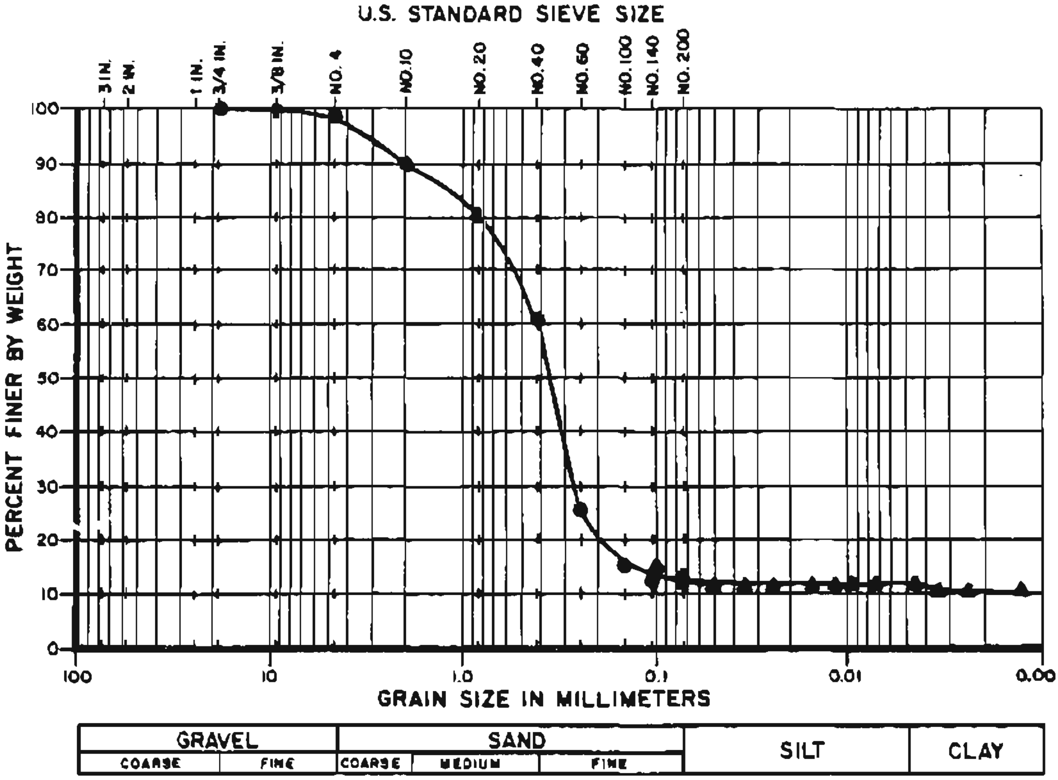

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-1	US-6	15.0'-17.0'		GRAYISH BROWN SLIGHTLY CLAYEY FINE SAND	SC
			●	SIEVE ANALYSIS	
			▲	HYDROMETER	

GRAIN SIZE DISTRIBUTION

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SEMINOLE ELECTRIC COOPERATIVE INC.
4040 MEGAWATT COMBUSTION GENERATOR
AGRICO-SOUTH SITE

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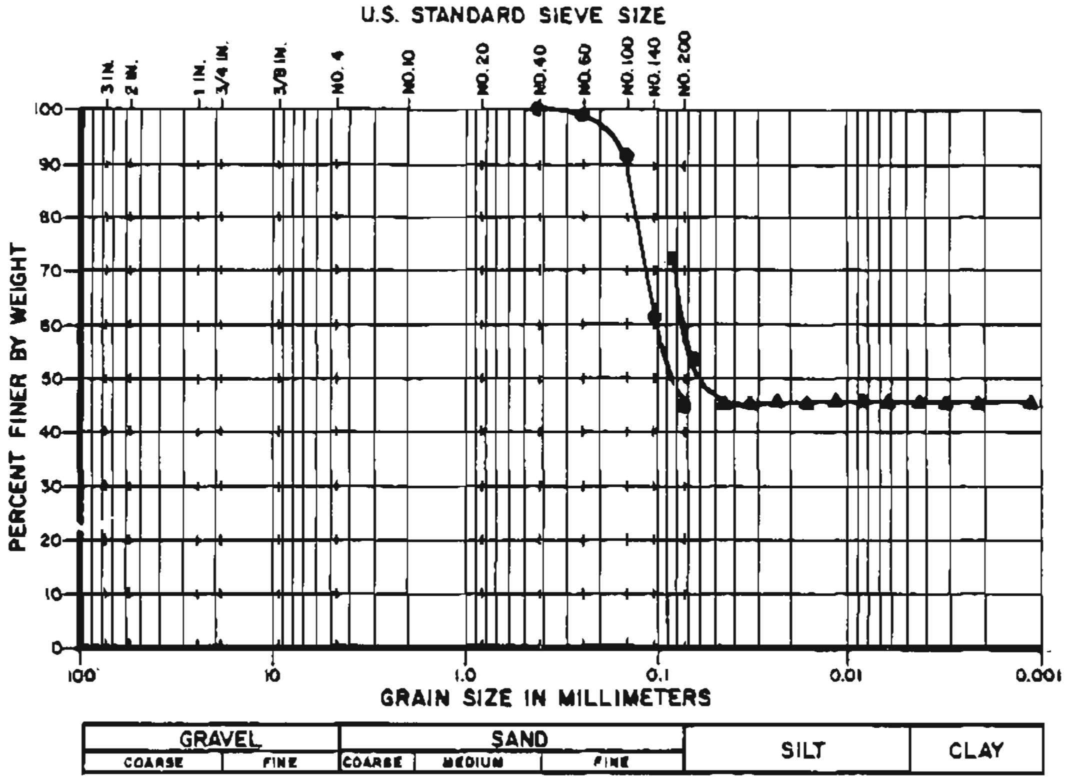

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-2	US-6'	15.0'-17.0'		BROWNISH GRAY CLAYEY FINE SAND	SC
			●	SIEVE ANALYSIS	
			▲	HYDROMETER	

GRAIN SIZE DISTRIBUTION

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4040 MEGAWATT COMBUSTION GENERATOR
AGRICO-SOUTH SITE

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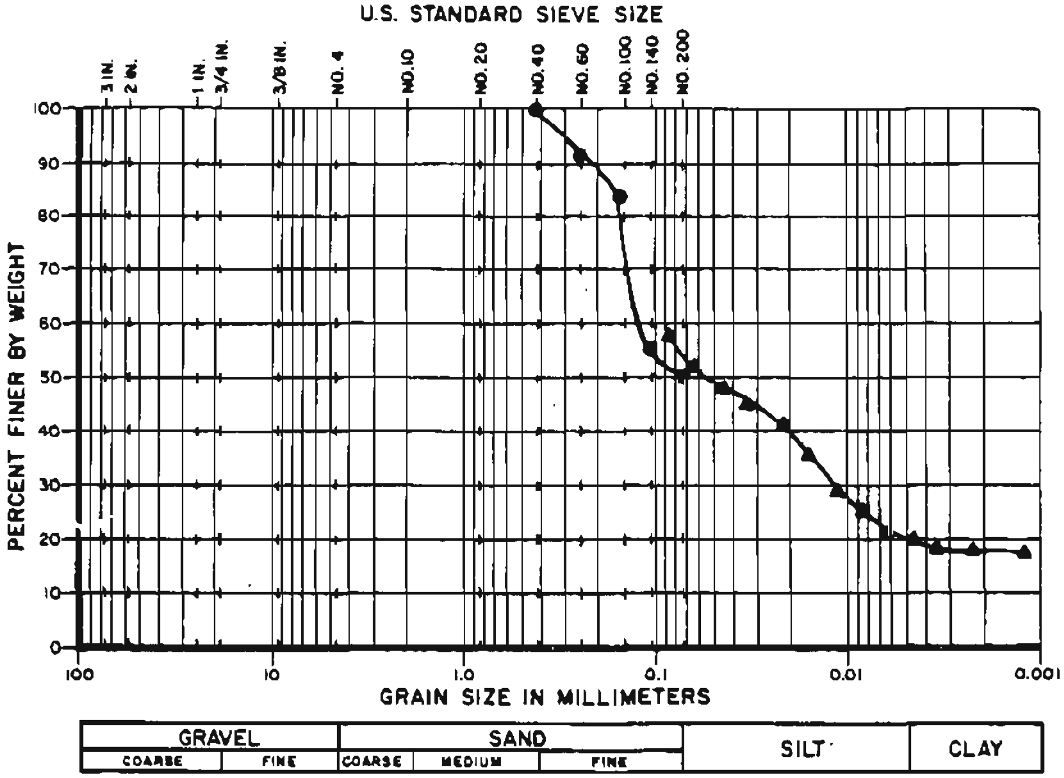

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-2	US-10'	35.0'-36.0'		BROWNISH YELLOW SANDY CLAY	CH
			●	SIEVE ANALYSIS	
			▲	HYDROMETER	

GRAIN SIZE DISTRIBUTION

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AGRICO-SOUTH SITE

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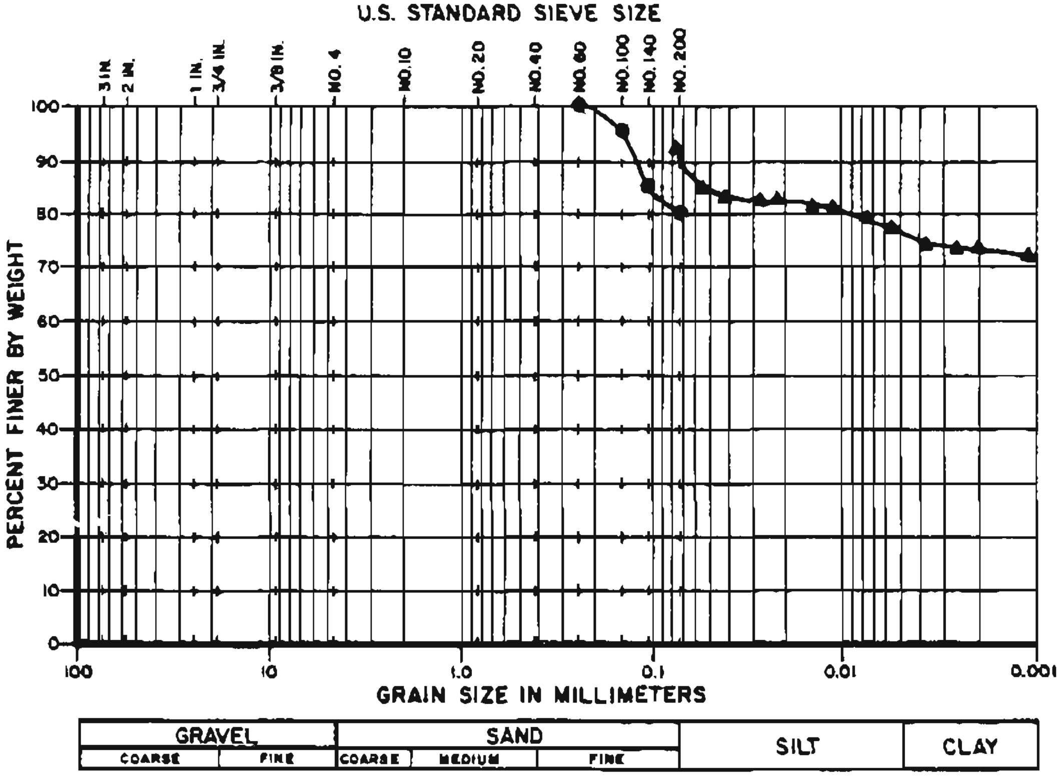

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-3	US-6	15.0'-17.0'		GRAY CLAY WITH SEAMS OF GRAY FINE SAND	CH
			●	SIEVE ANALYSIS	
			▲	HYDROMETER	

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FILE NO. 88-9155A
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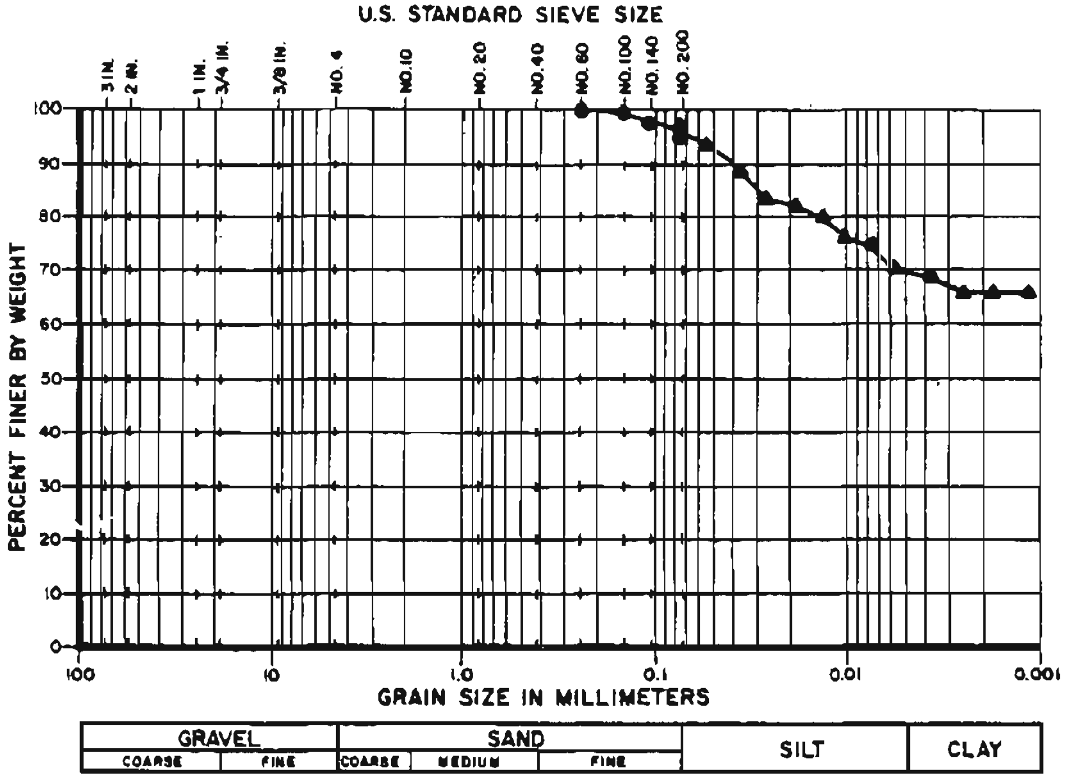

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-3	US-9	30.0'-31.5'		BROWN CLAY	CH
			●	SIEVE ANALYSIS	
			▲	HYDROMETER	

GRAIN SIZE DISTRIBUTION

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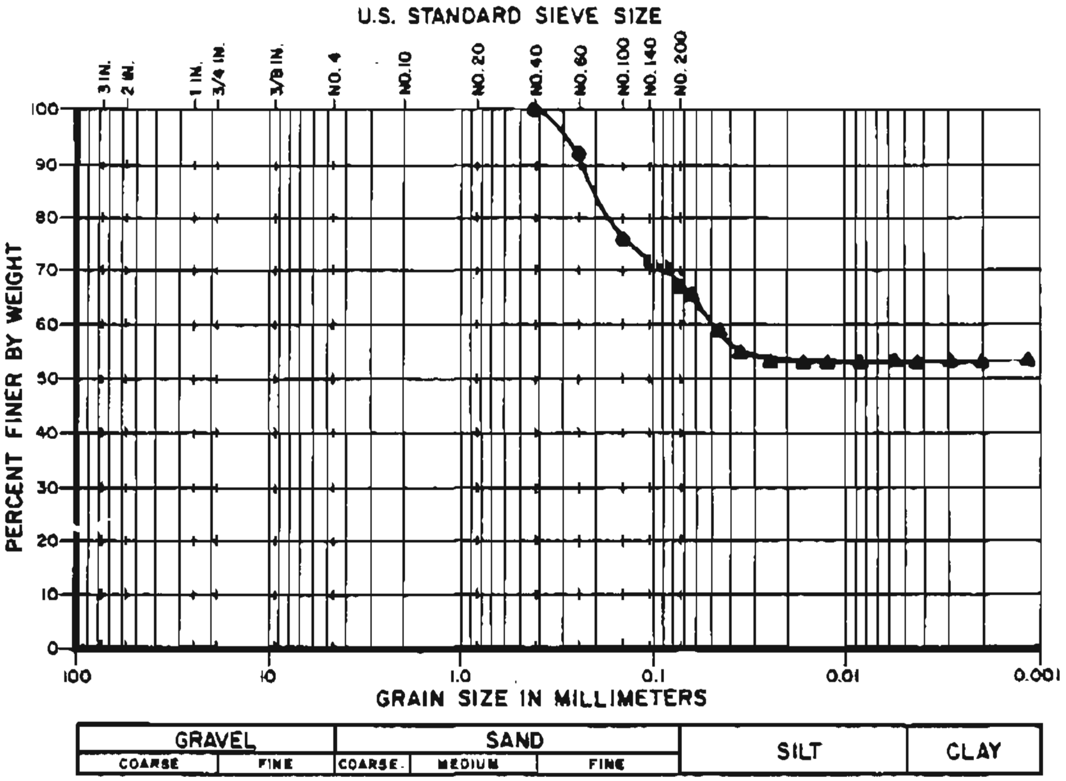

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-3	US-16	65.0'-66.3'		DARK GRAY SANDY CLAY	CH
			●	SIEVE ANALYSIS	
			▲	HYDROMETER	

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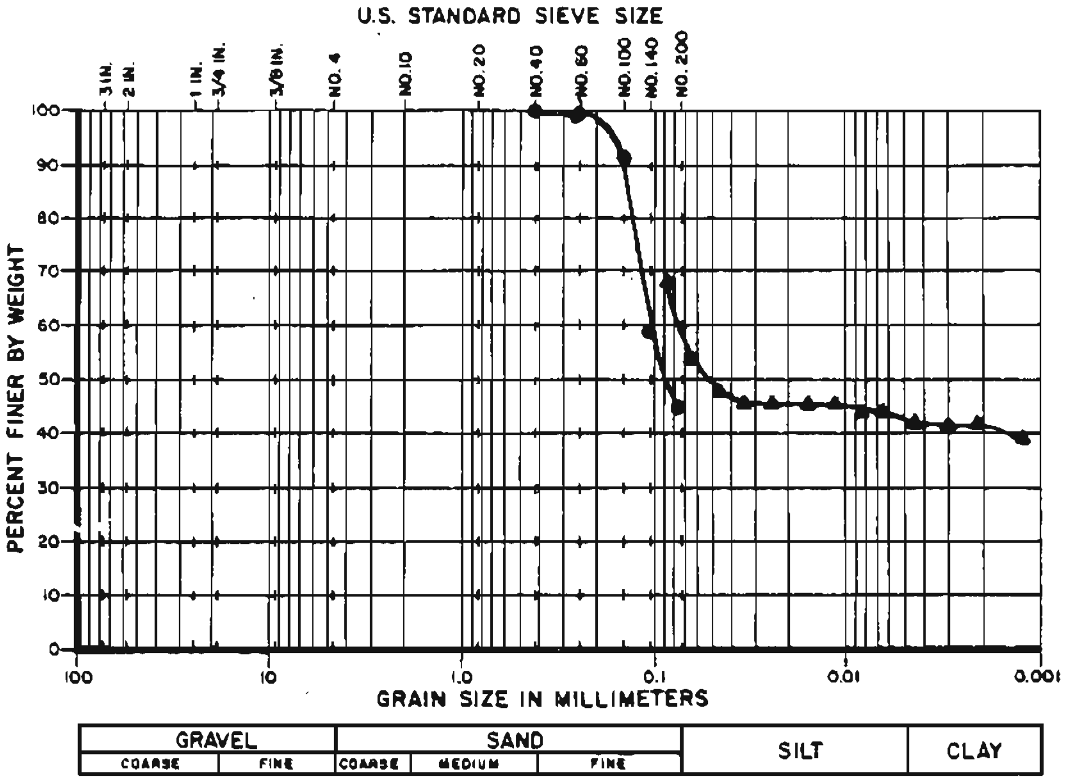

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-4	US-6	15.0'-17.0'		GRAY CLAY WITH SEAMS OF GRAY FINE SAND	CH
			●	SIEVE ANALYSIS	
			▲	HYDROMETER	

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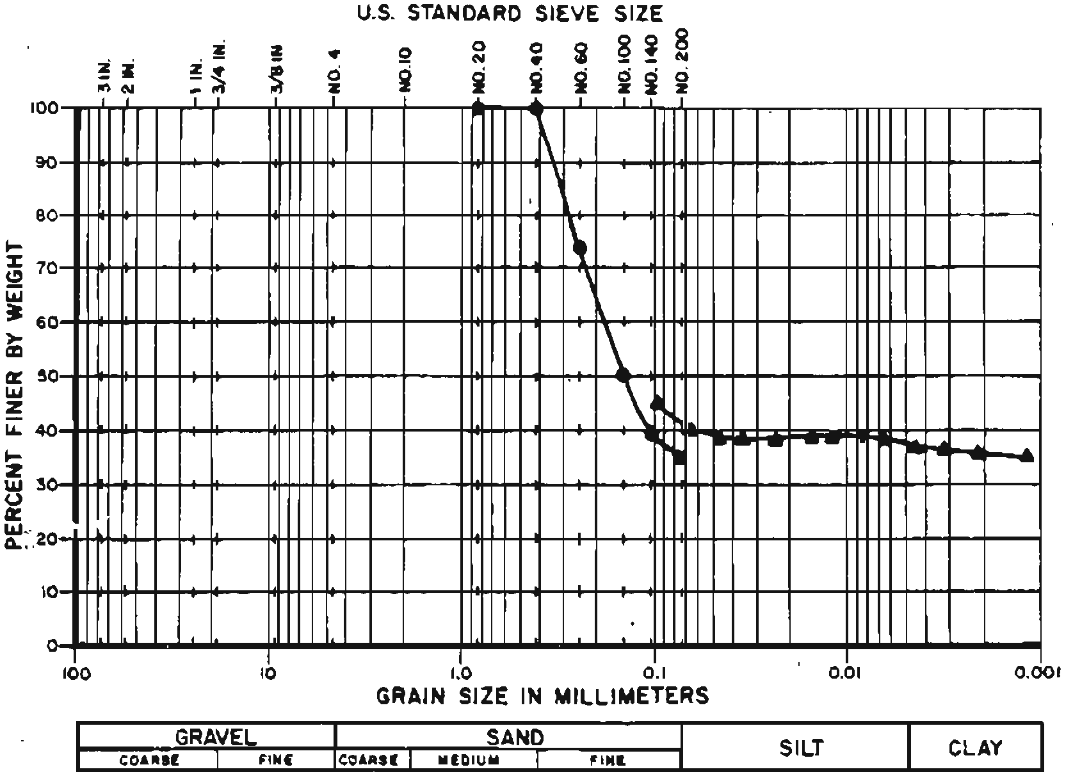

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-5	US-4	7.5'-9.5'		GRAY CLAYEY FINE SAND	SC
			●	SIEVE ANALYSIS	
			▲	HYDROMETER	

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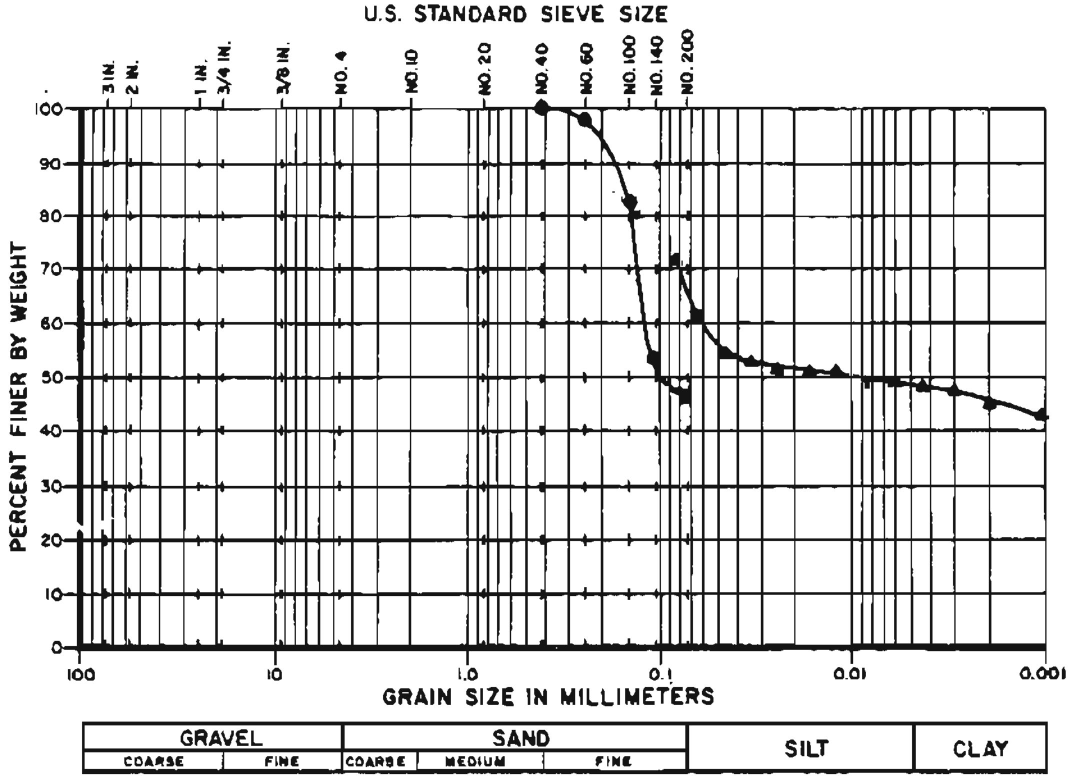

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-7	US-6	15.0'-17.0'		GREENISH GRAY SANDY CLAY	CH
			●	SIEVE ANALYSIS	
			▲	HYDROMETER	

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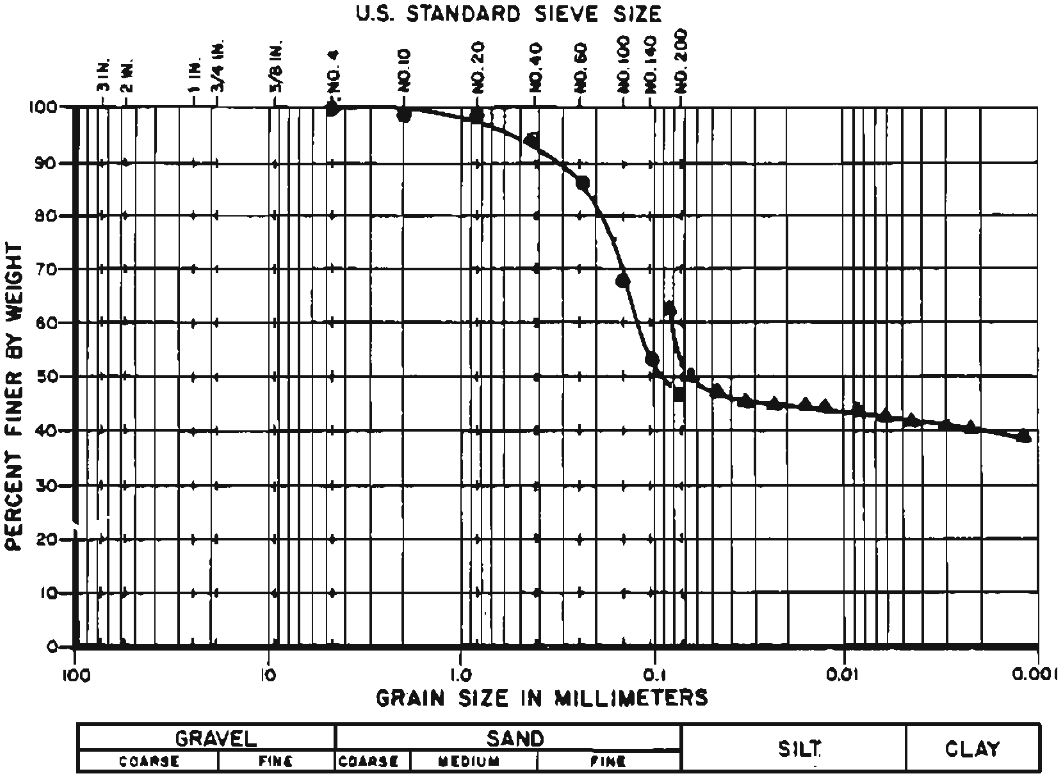

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-8	US-7	20.0'-22.0'		BROWNISH GRAY SANDY CLAY	CH
			●	SIEVE ANALYSIS	
			▲	HYDROMETER	

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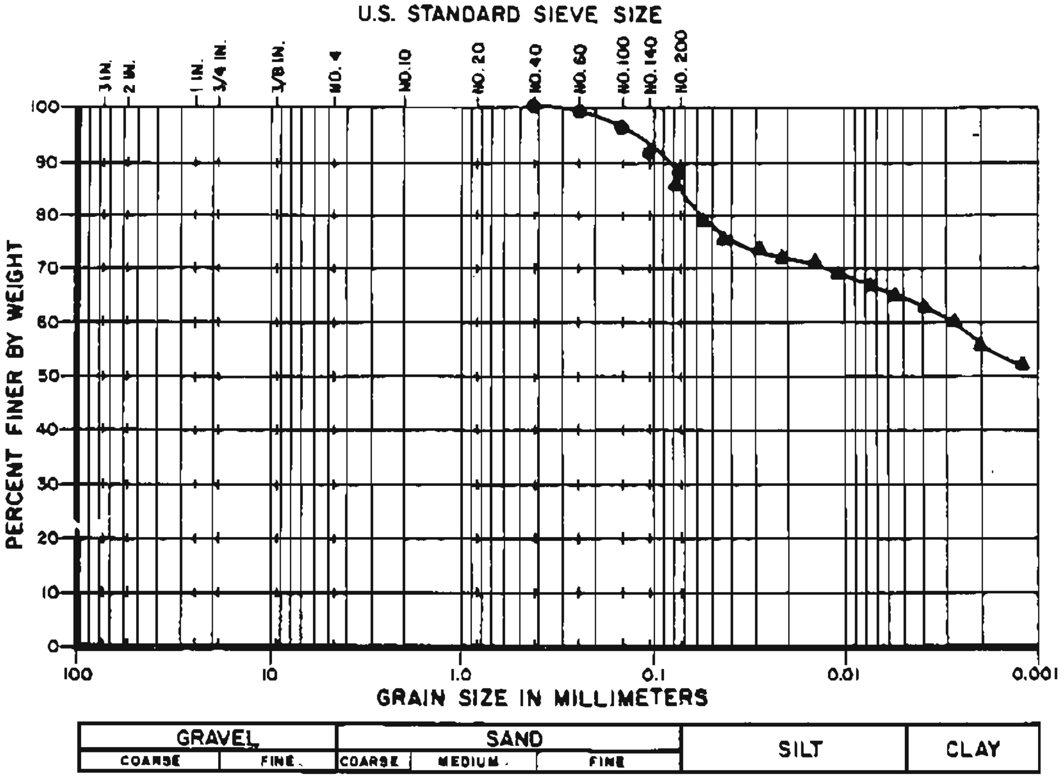

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-8	US-8	25.0'-27.0'		BROWNISH GRAY SILTY CLAY	CH
			●	SIEVE ANALYSIS	
			▲	HYDROMETER	

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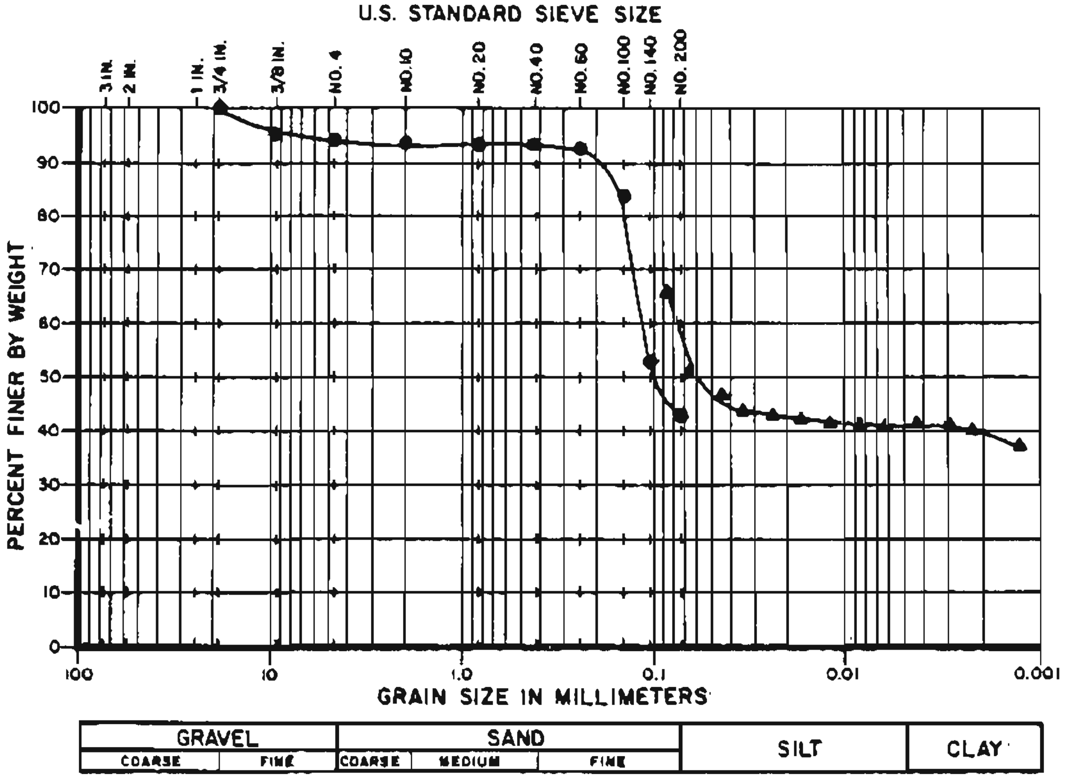

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-9	US-6	15.0'-17.0'		GREENISH BROWN SANDY CLAY	CH
			●	SLEVE ANALYSIS	
			▲	HYDROMETER	

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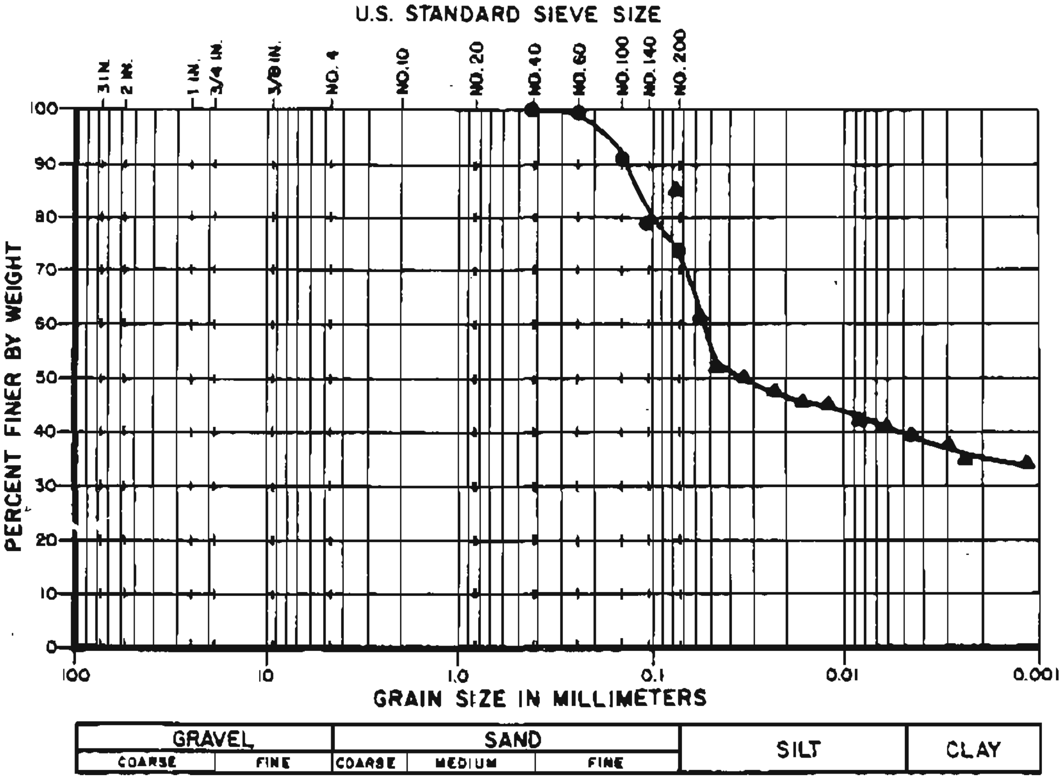

TEST HOLE NO.	SAMPLE NO.	DEPTH	SYMBOL	SAMPLE DESCRIPTION	UNIFIED CLASS.
B-9	US-10	35.0'-37.0'		GRAY SANDY CLAY	CH
			●	SIEVE ANALYSIS	
			▲	HYDROMETER	

GRAIN SIZE DISTRIBUTION

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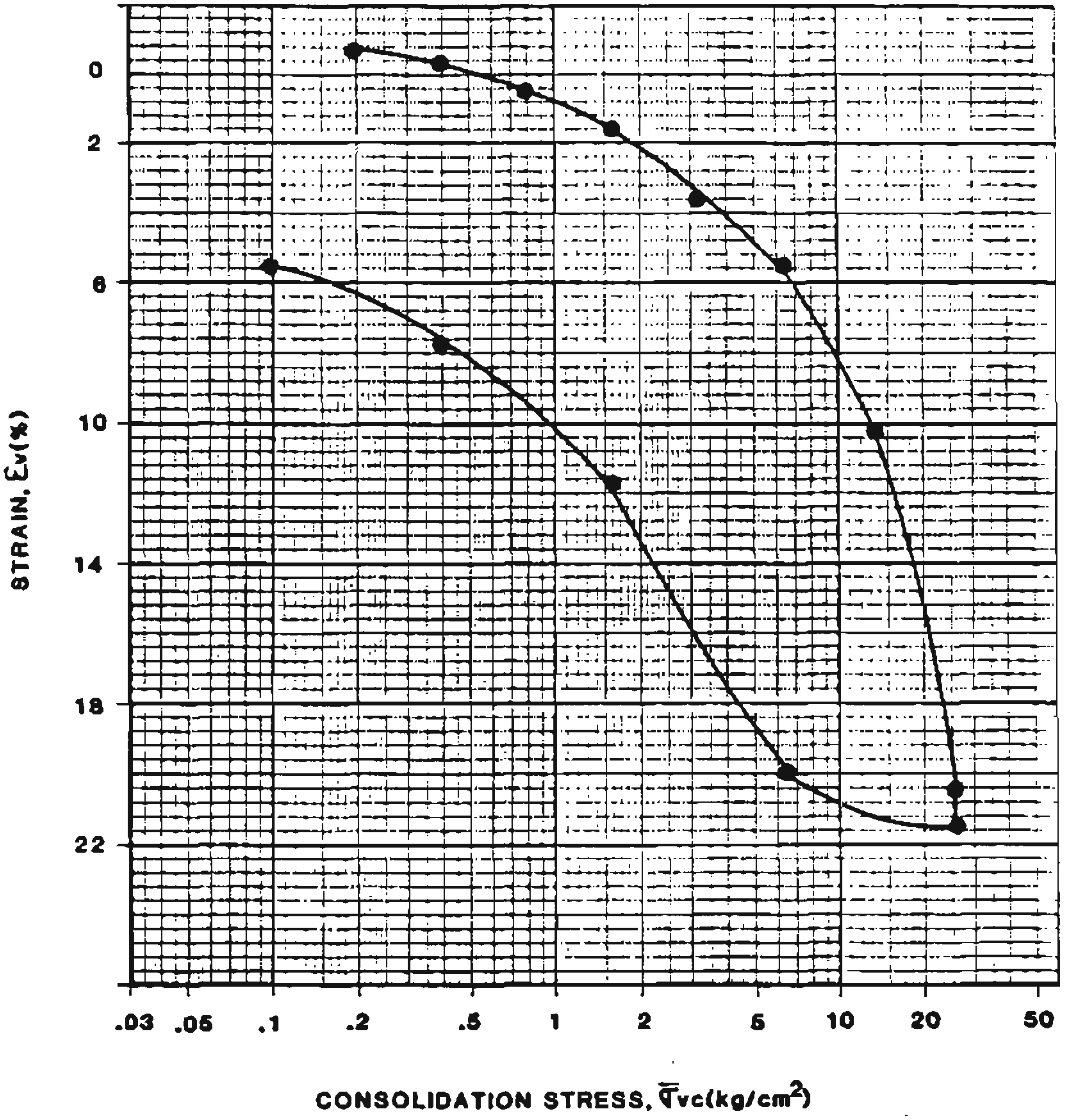

TEST DATA

BORING NUMBER B-2
SAMPLE NUMBER US-5
DEPTH (FEET) 10.0'-12.0' ,BLOCK #2
CLASSIFICATION
HEIGHT (INCHES) .74625
DIAMETER (INCHES) 1.9685
INITIAL MOISTURE CONTENT(%) 39.9
INITIAL DRY DENSITY(LB/FT^3) 81.2
SPECIFIC GRAVITY 2.72
FINAL MOISTURE CONTENT(%) 40.0
LIQUID LIMIT(%)
PLASTIC LIMIT(%)

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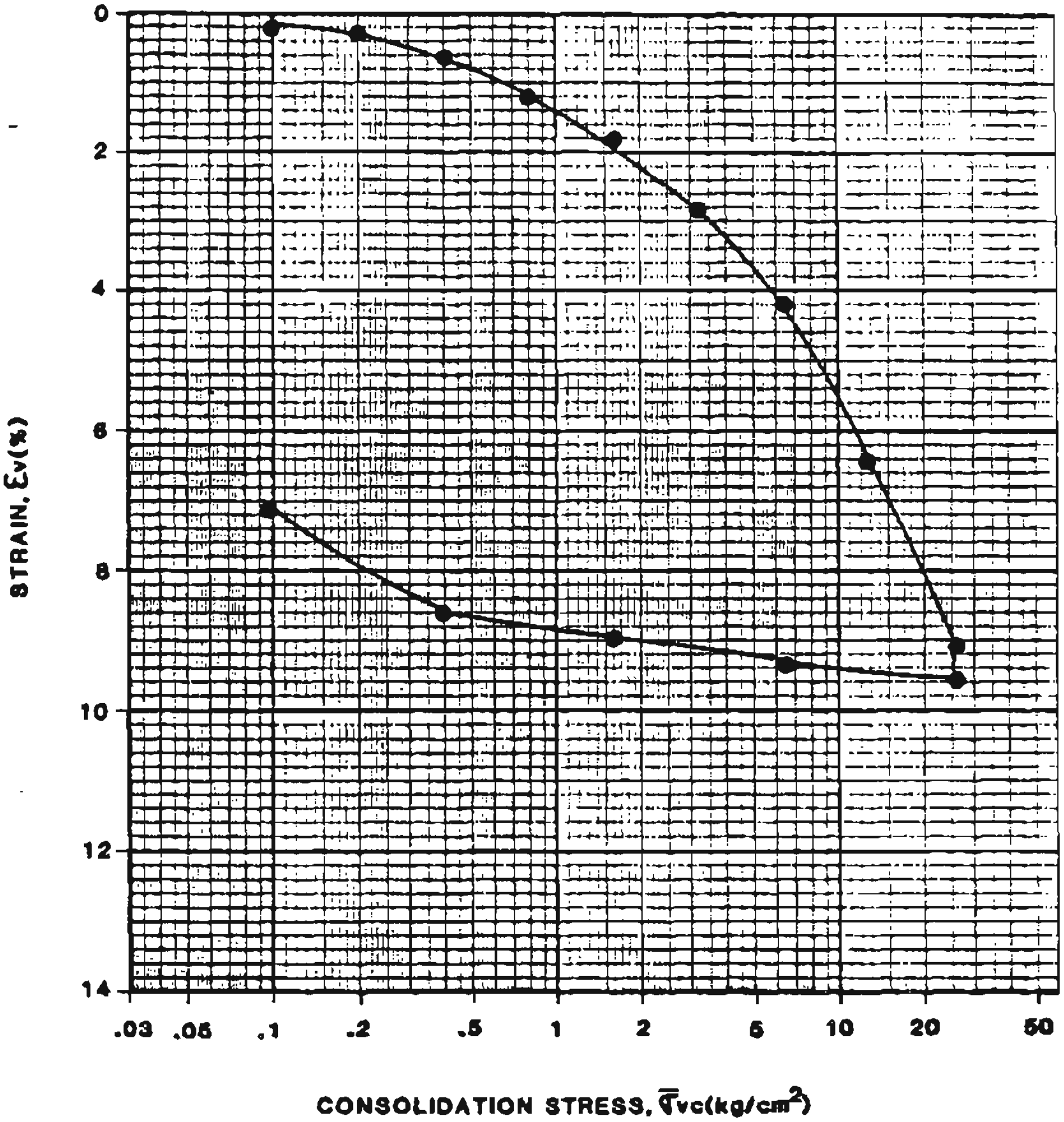

TEST DATA

BORING NUMBER B-1
SAMPLE NUMBER US-4
DEPTH (FEET) 7.5'-9.5' CON #1
CLASSIFICATION
HEIGHT (INCHES) .74550
DIAMETER (INCHES) 1.9685
INITIAL MOISTURE CONTENT(%) 16.9
INITIAL DRY DENSITY(LB/FT^3) 108.9
SPECIFIC GRAVITY 2.68
FINAL MOISTURE CONTENT(%) 15.5
LIQUID LIMIT(%)
PLASTIC LIMIT(%)

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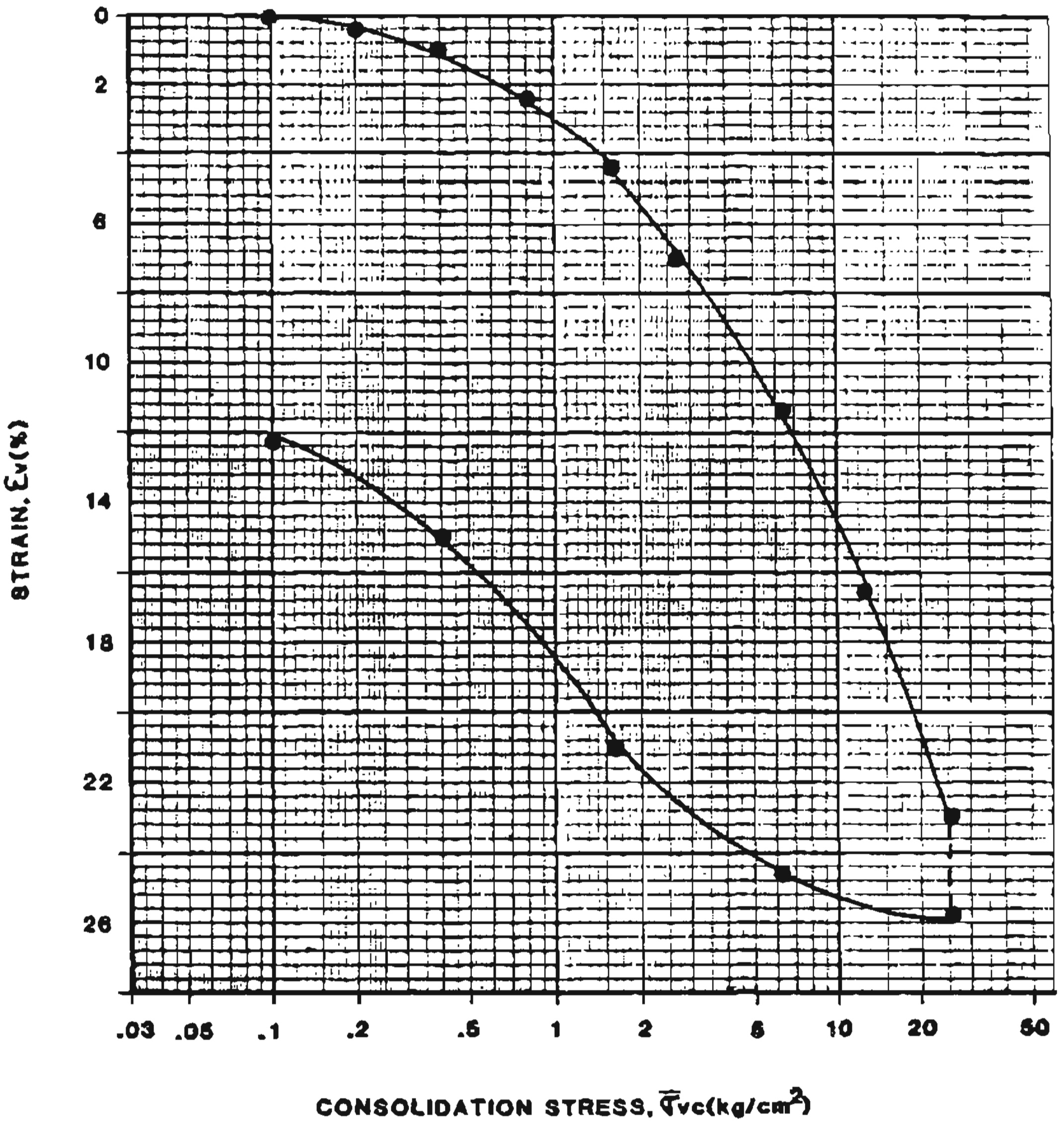
N82070



TEST DATA

BORING NUMBER B-5
SAMPLE NUMBER US-6
DEPTH (FEET) 15.0'-17.0', CON #1
CLASSIFICATION --
HEIGHT (INCHES) .75025
DIAMETER (INCHES) 1.9685
INITIAL MOISTURE CONTENT(%) 44.8
INITIAL DRY DENSITY(LB/FT^3) 72.4
SPECIFIC GRAVITY 2.70
FINAL MOISTURE CONTENT(%) 42.3
LIQUID LIMIT(%)
PLASTIC LIMIT(%)

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FILE NO 88-9155A
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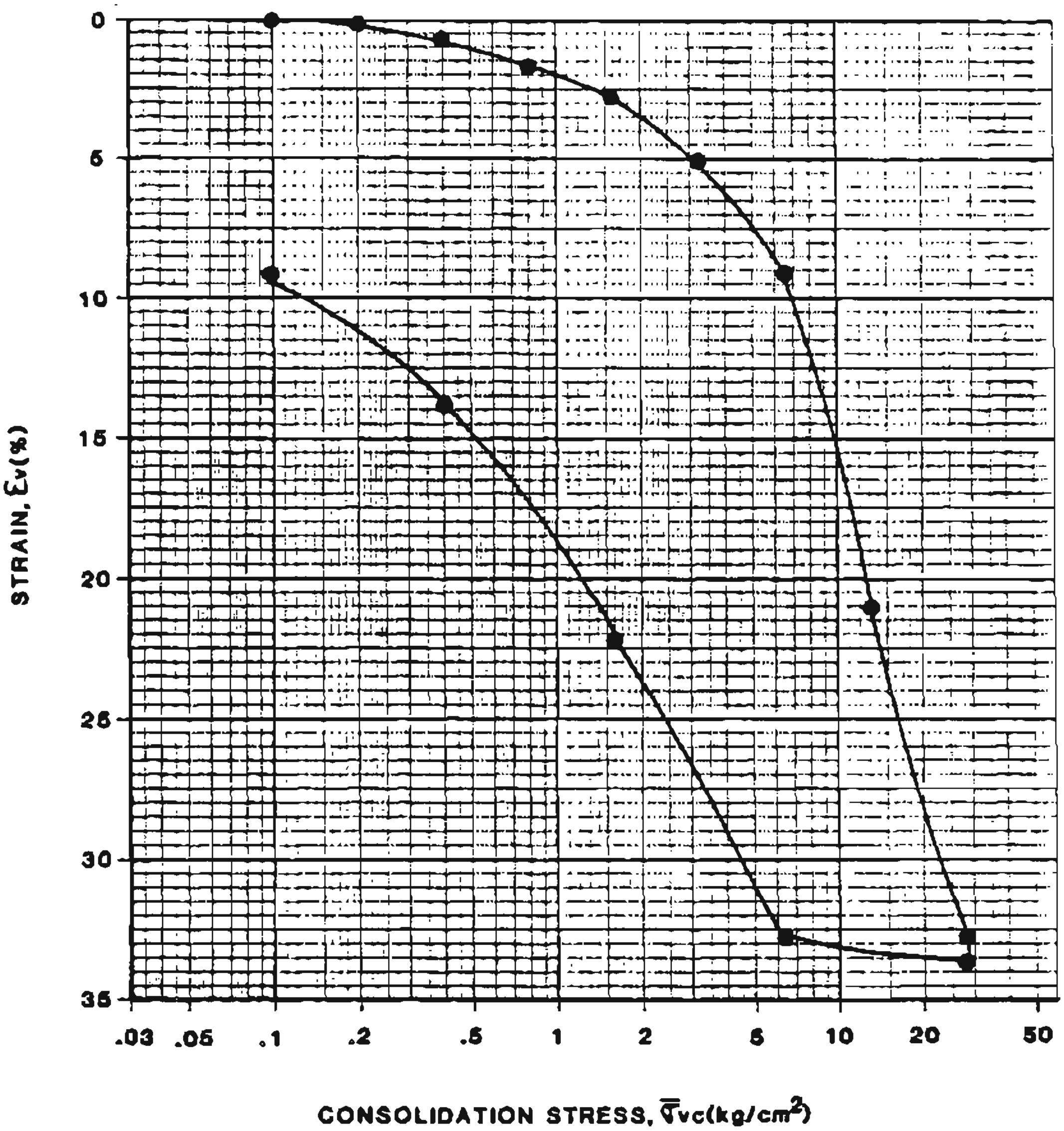

TEST DATA

BORING NUMBER B-9
SAMPLE NUMBER US-8
DEPTH (FEET) 25.0'-27.0', CON #2
CLASSIFICATION
HEIGHT (INCHES) .77550
DIAMETER (INCHES) 1.9865
INITIAL MOISTURE CONTENT(%) 80.5
INITIAL DRY DENSITY(LB/FT^3) 51.6
SPECIFIC GRAVITY 2.73
FINAL MOISTURE CONTENT(%) 52.9
LIQUID LIMIT(%)
PLASTIC LIMIT(%)

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FILE NO 88-9155A
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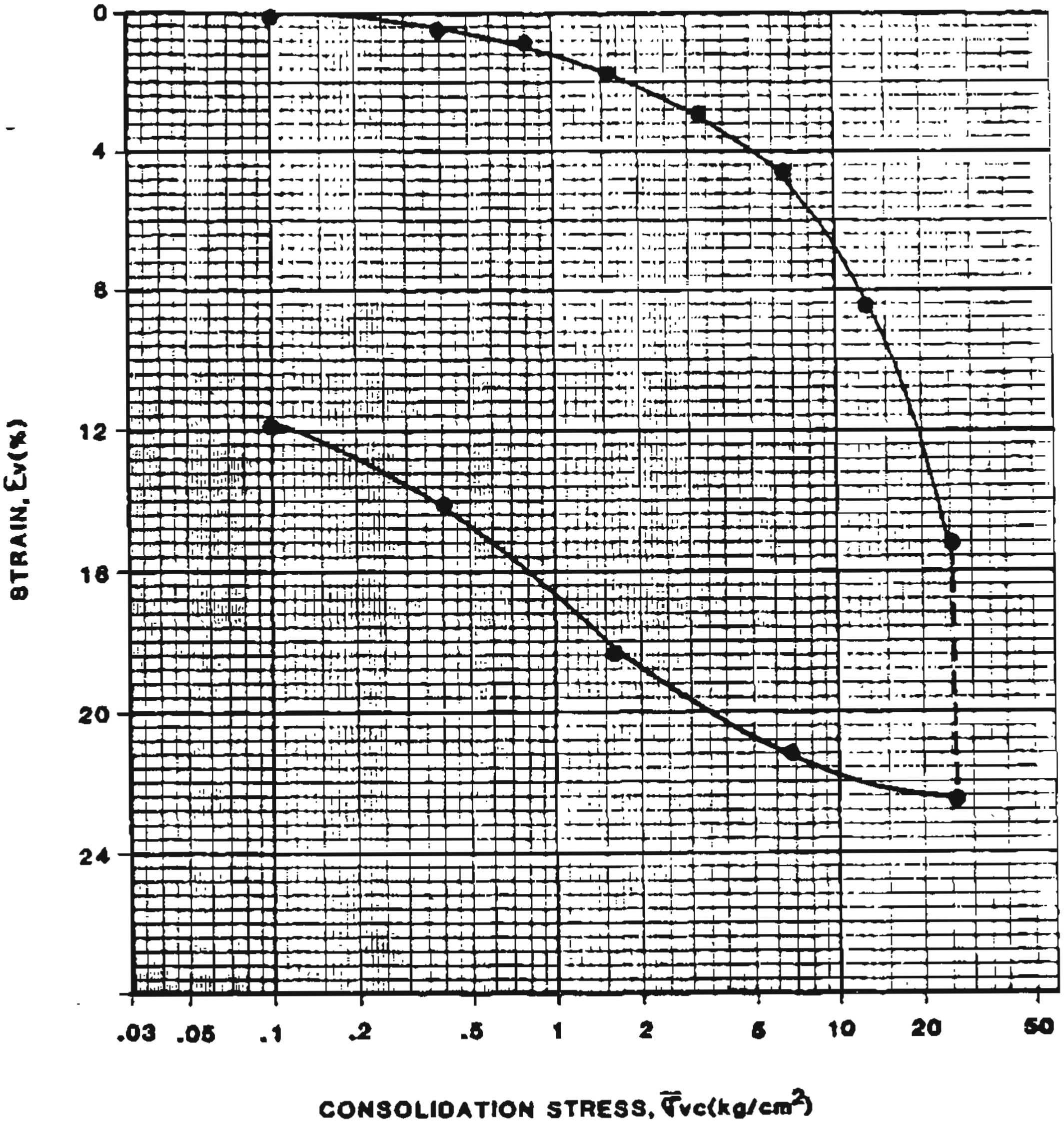

TEST DATA

BORING NUMBER B-3
SAMPLE NUMBER US-16
DEPTH (FEET) 65.0'-67.0', CON #1
CLASSIFICATION
HEIGHT (INCHES) .74800
DIAMETER (INCHES) 1.9685
INITIAL MOISTURE CONTENT(%) 63.2
INITIAL DRY DENSITY(LB/FT^3). 59.9
SPECIFIC GRAVITY 2.69
FINAL MOISTURE CONTENT(%) 56.5
LIQUID LIMIT(%)
PLASTIC LIMIT(%)

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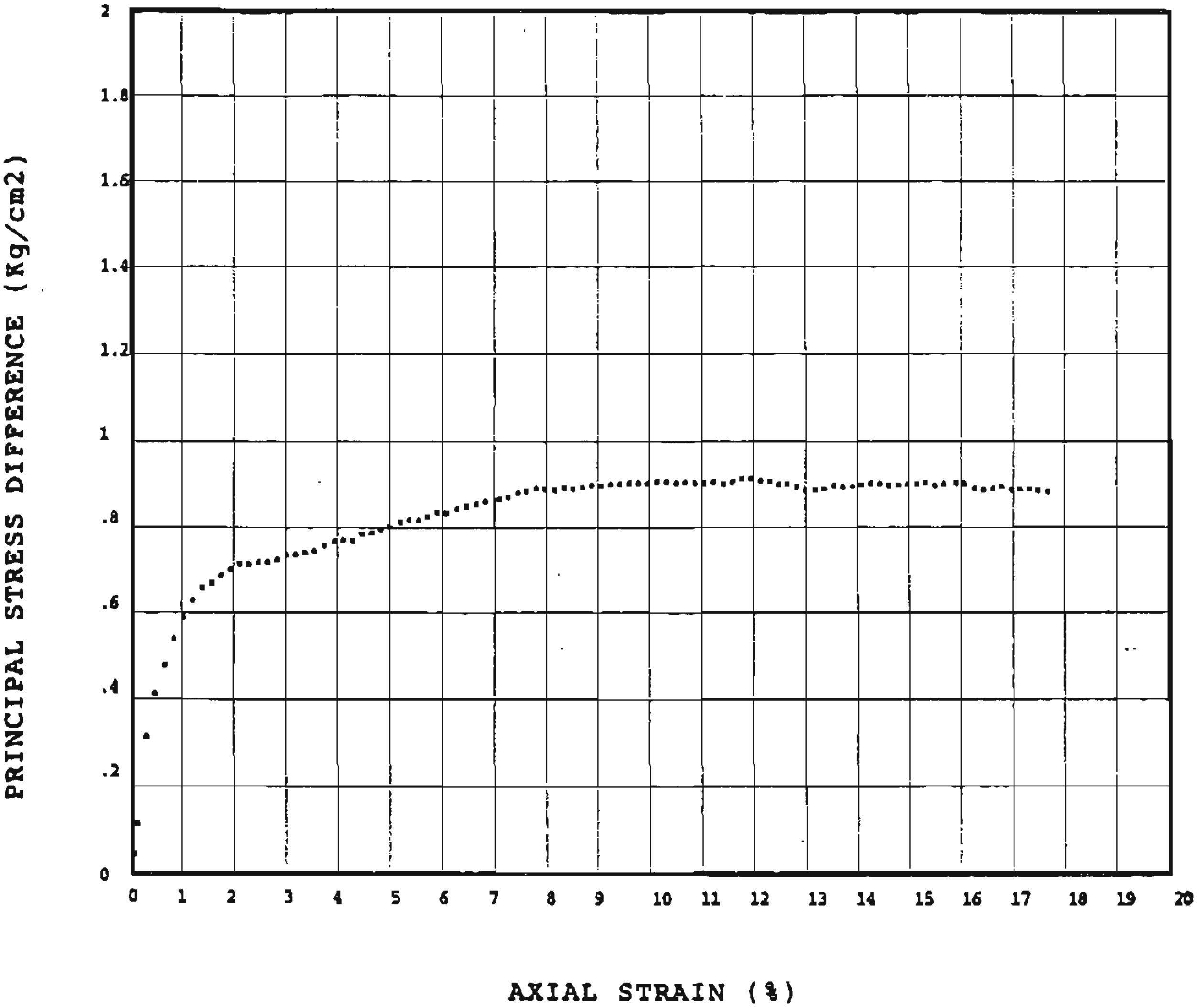
AGRICO-SOUTH SITE

DRAWN BY HAD
CHECKED BY JW
DATE 12/16/88
FILE NO. 88-9155A
APPROVED BY

Sample Name : B-1, US-4, 7.5'-9.5', BLOCK #2



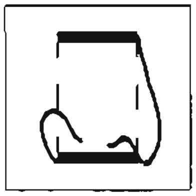
Dry density :108.40 pcf

Water content : 15.80 %

Saturation : 78.04 %

Cell pressure : 0.30 kg/cm2

Strain rate : 1.00%/min



TYPE OF FAILURE

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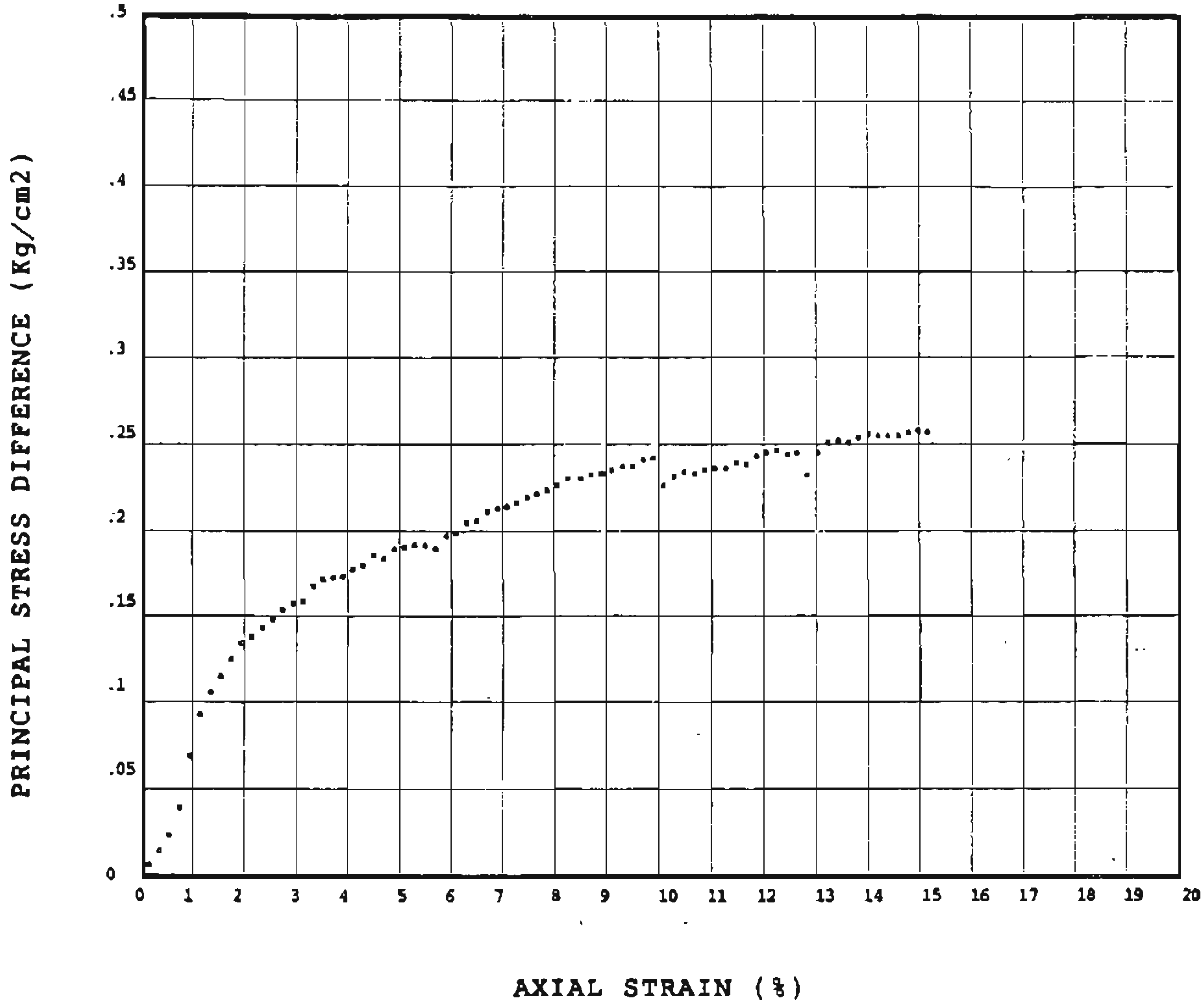
Sample Name : B-1, US-8, 25.0'-27.0', SS#1



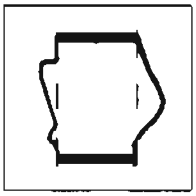
Dry density : 90.03 pcf

Water content : 29.71 %

Saturation : 94.07 %

Cell pressure : 0.73 kg/cm2

Strain rate : 1.00%/min



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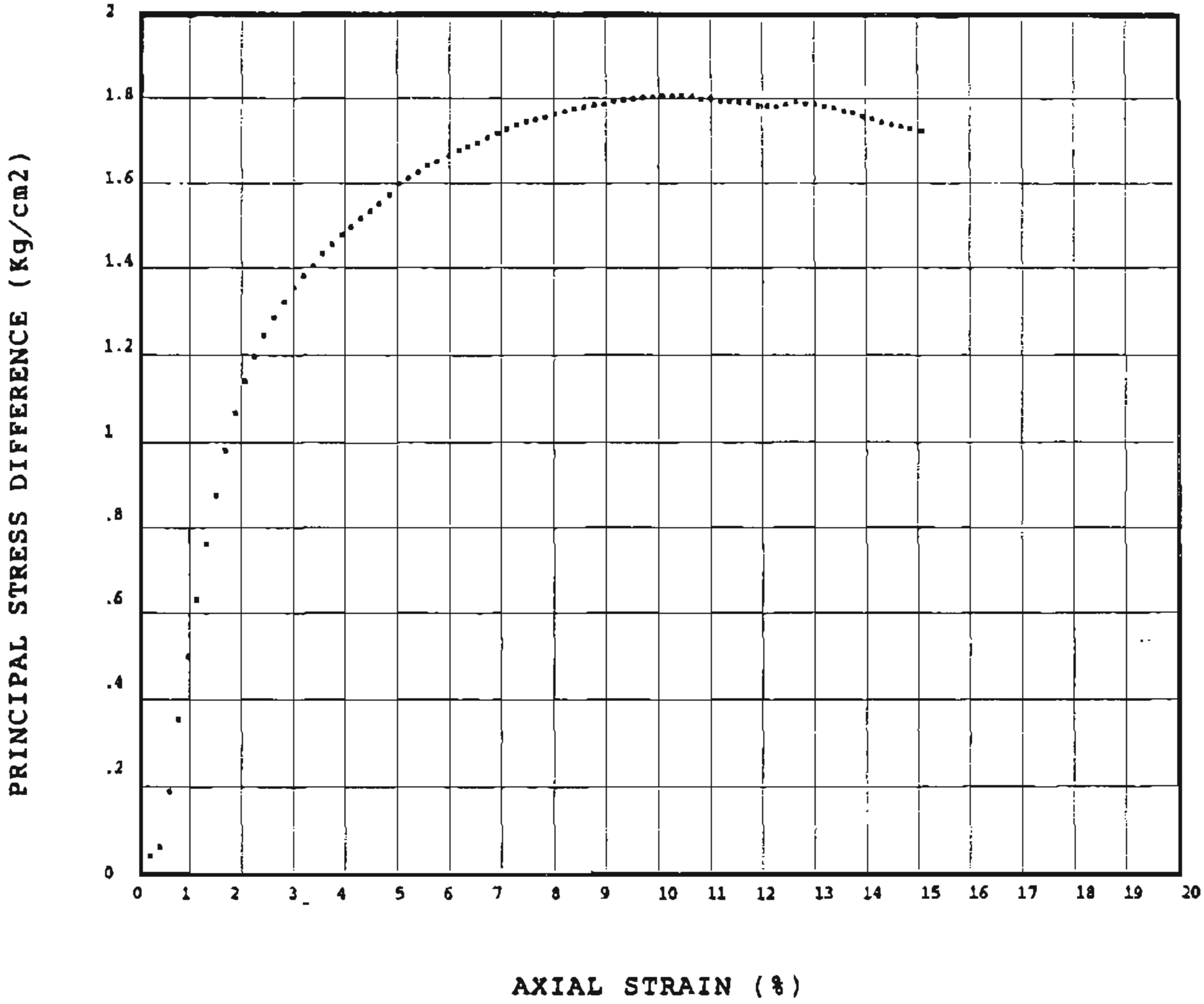
Sample Name : B-2, US-5, 10.0'-12.0', SS#2



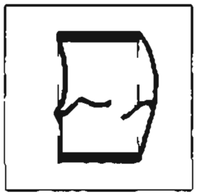
Dry density :101.49 pcf

Water content : 21.96 %

Saturation : 90.85 %

Cell pressure : 0.37 kg/cm2

Strain rate : 1.00%/min



TYPE OF FAILURE

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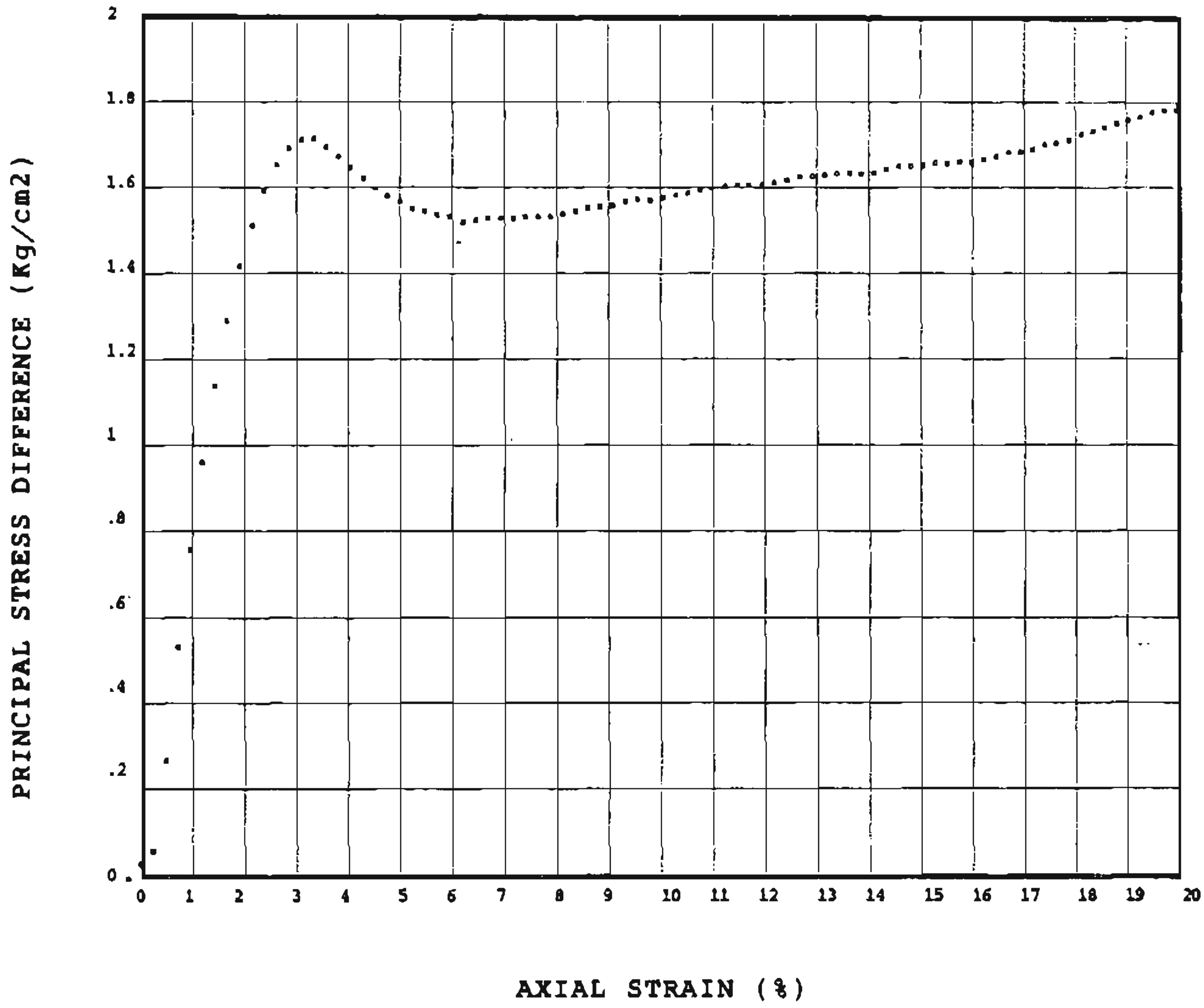
Sample Name : B-2, US-10, 35.0'-36..0', SS#1



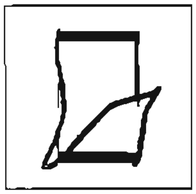
Dry density : 80.86 pcf

Water content : 39.77 %

Saturation : 98.77 %

Cell pressure : 0.90 kg/cm2

Strain rate : 1.00%/min



TYPE OF FAILURE

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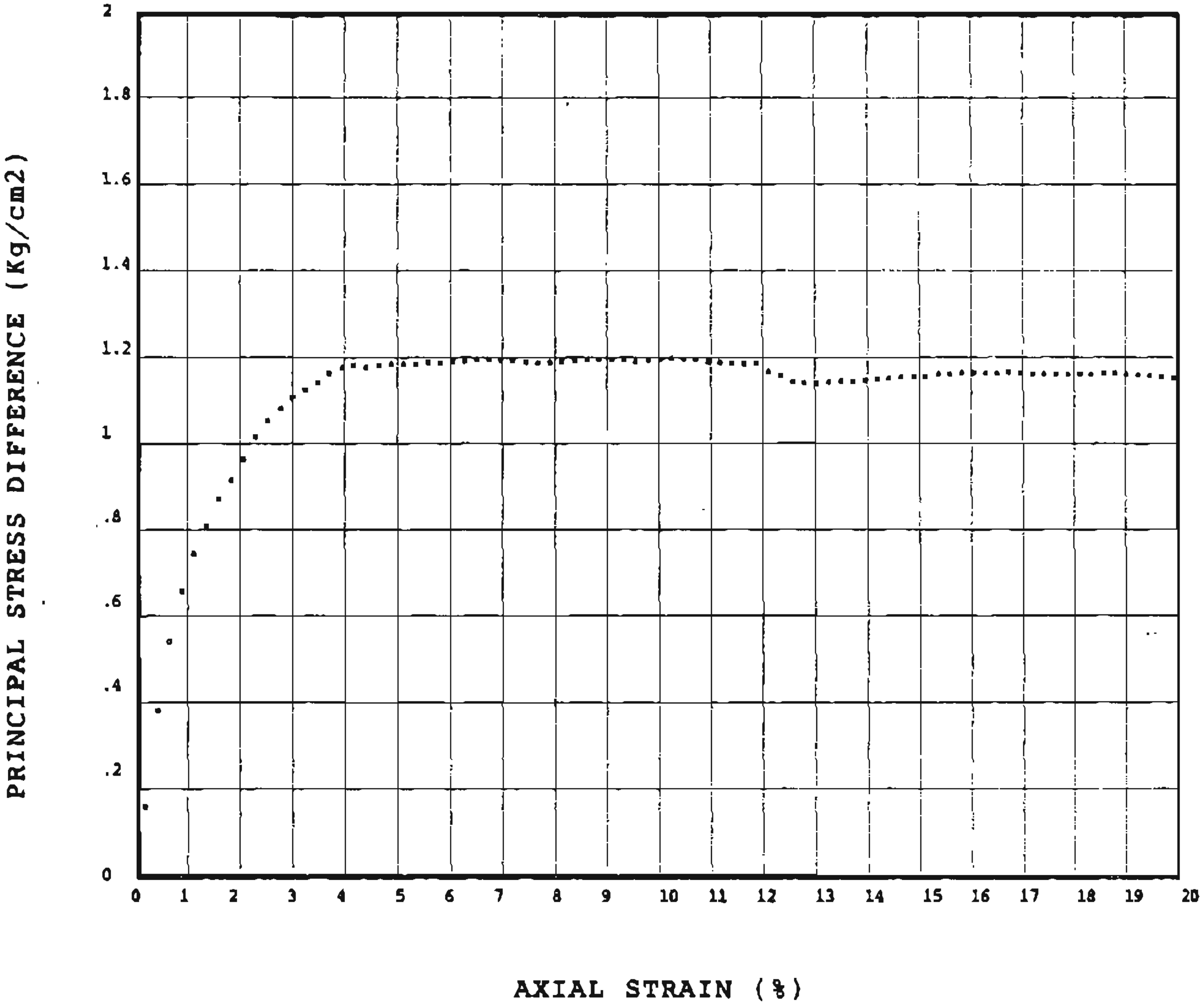
Sample Name : B-3, US-7, 20.0'-21.5', SS#1



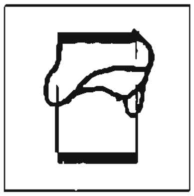
Dry density : 54.40 pcf

Water content : 75.55 %

Saturation : 96.60 %

Cell pressure : 0.58 kg/cm2

Strain rate : 1.00%/min



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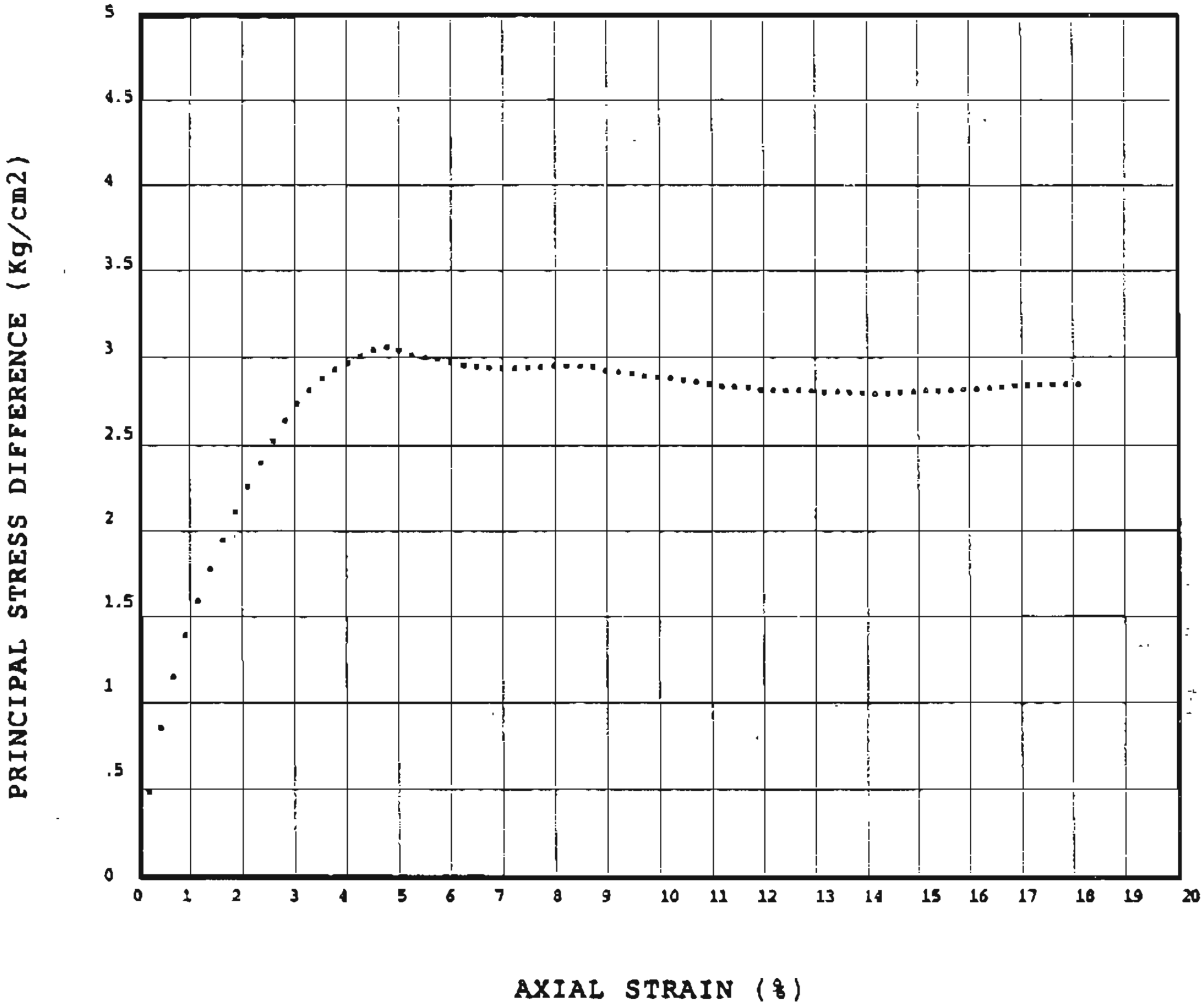
Sample Name : B-3, US-16, 65.0'-67.0', SS#1



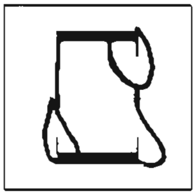
Dry density : 38.50 pcf

Water content :119.91 %

Saturation : 95.70 %

Cell pressure : 1.61 kg/cm2

Strain rate : 1.00%/min



TYPE OF FAILURE

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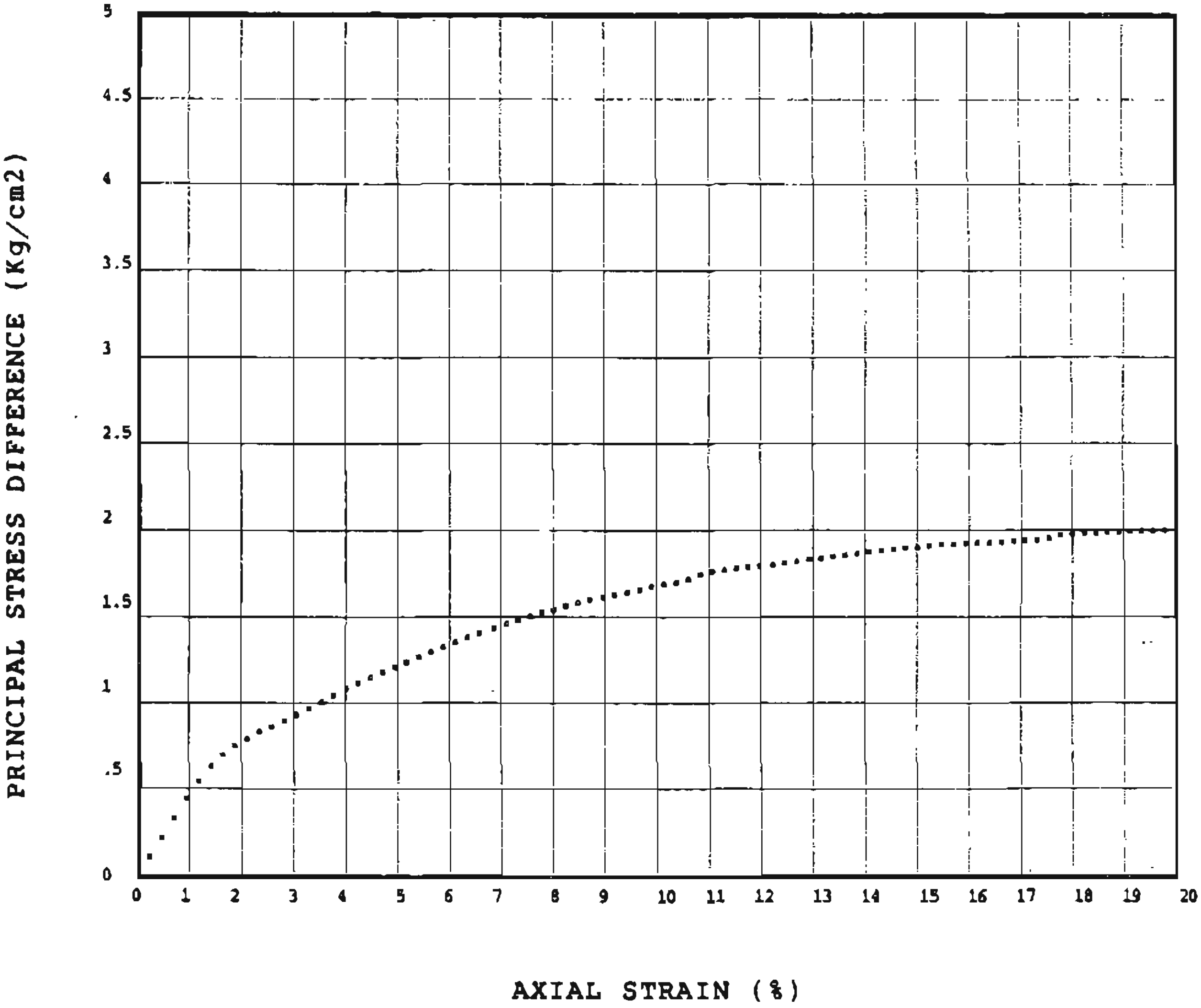
Sample Name : B-4, US-5, 10.0'-12.0', SS#1



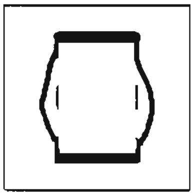
Dry density :116.46 pcf

Water content : 15.25 %

Saturation : 93.76 %

Cell pressure : 0.39 kg/cm2

Strain rate : 1.00%/min



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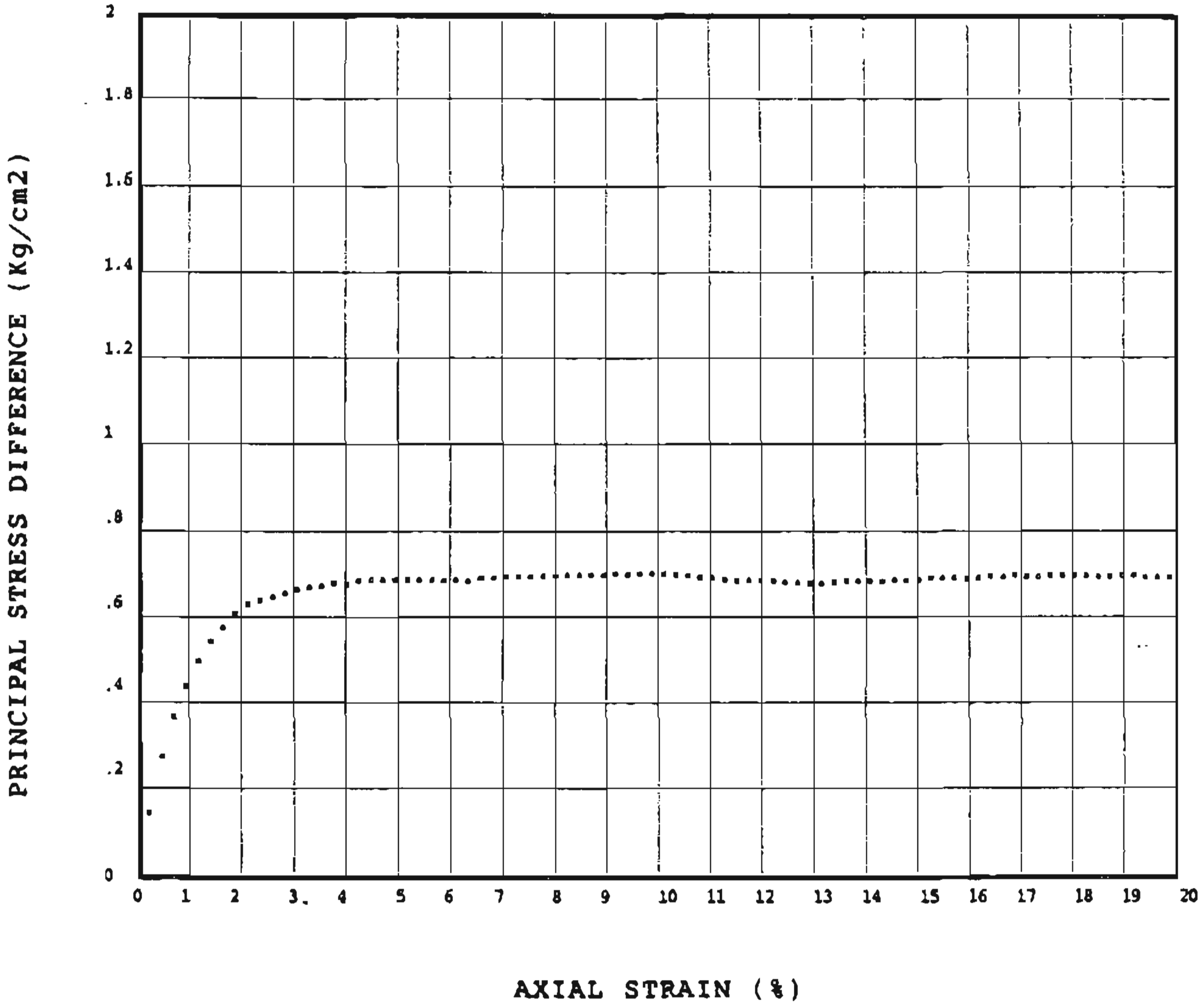
FILE NO. 88-9155A	APPROVED BY:	

Sample Name : B-4, US-6, 15.0'-17.0', SS#1



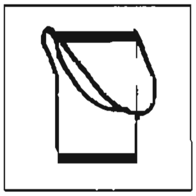
Dry density : 78.66 pcf

Water content : 38.86 %

Saturation : 91.58 %

Cell pressure : 0.63 kg/cm2

Strain rate : 1.00%/min



TYPE OF FAILURE

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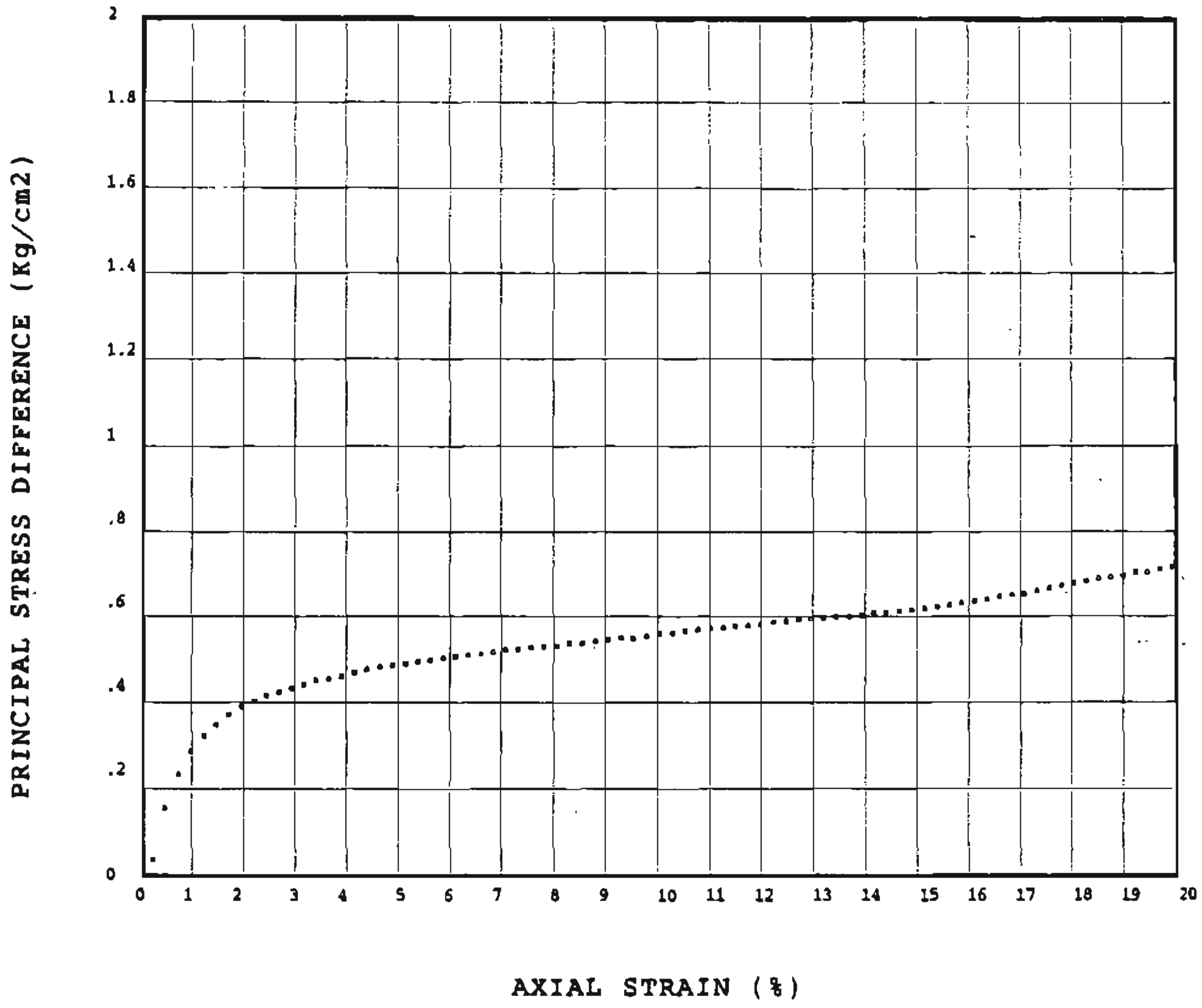
Sample Name : B-5, US-6, 15.0'-17.0', SS#1



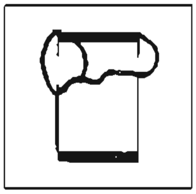
Dry density : 71.49 pcf

Water content : 49.34 %

Saturation : 98.19 %

Cell pressure : 0.49 kg/cm2

Strain rate : 1.00%/min



TYPE OF FAILURE

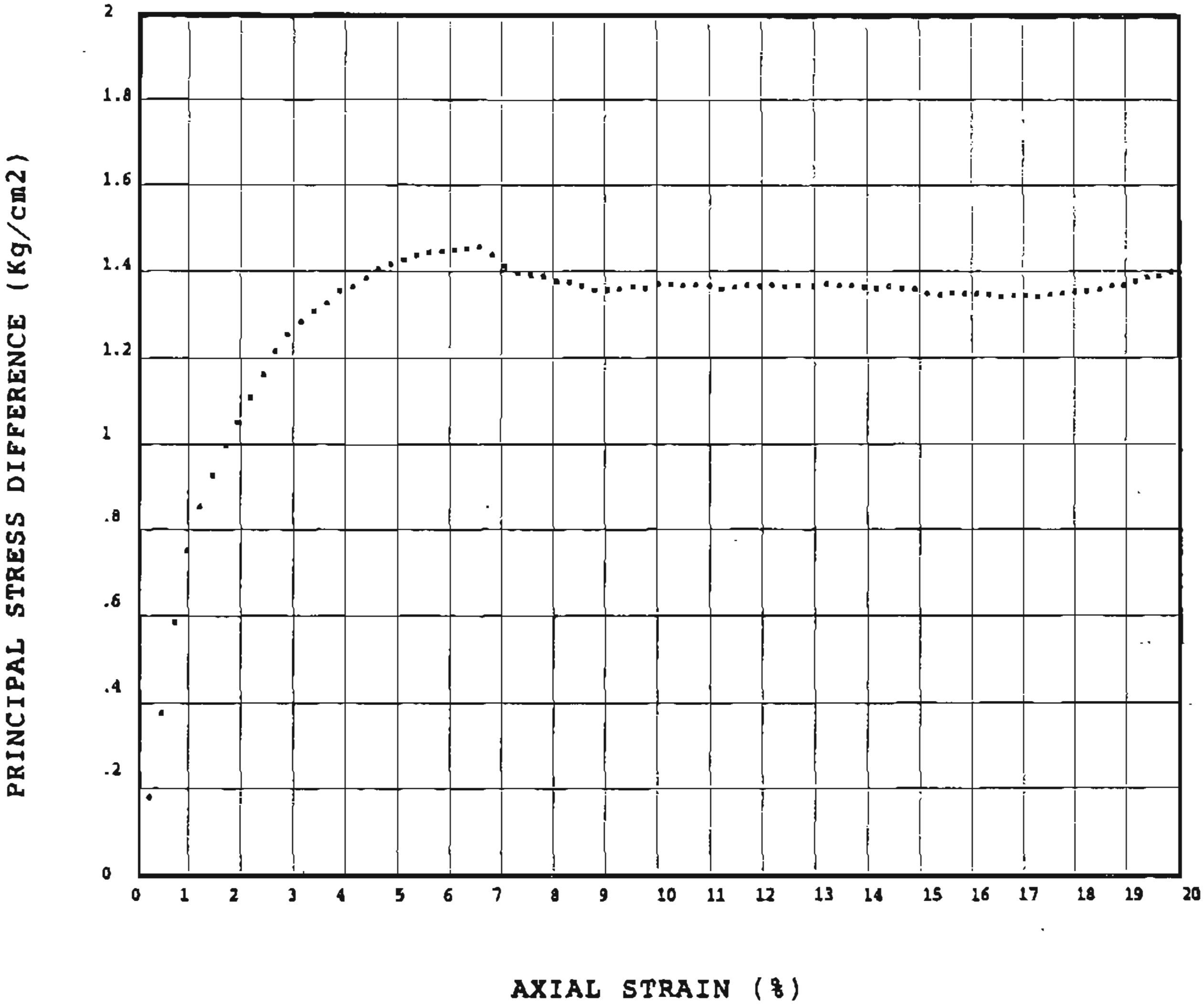
UNCONSOLIDATED - UNDRAINED
TRIAXIAL COMPRESSION TEST

Ardaman & Associates Inc.

SEMINOLE ELECTRIC COOPERATIVE INC.
4040 MEGAWATT COMBUSTION GENERATOR
AGRICO-SOUTH SITE

DRAWN BY:HAD	CHECKED BY:	DATE:12/16/88
FILE NO. 88-9155A	APPROVED BY:	

Sample Name : B-7, US-6, 15.0'-17.0', SS#1



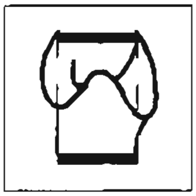
Dry density : 60.44 pcf

Water content : 62.53 %

Saturation : 94.44 %

Cell pressure : 0.49 kg/cm2

Strain rate : 1.00%/min



TYPE OF FAILURE

UNCONSOLIDATED - UNDRAINED
TRIAXIAL COMPRESSION TEST

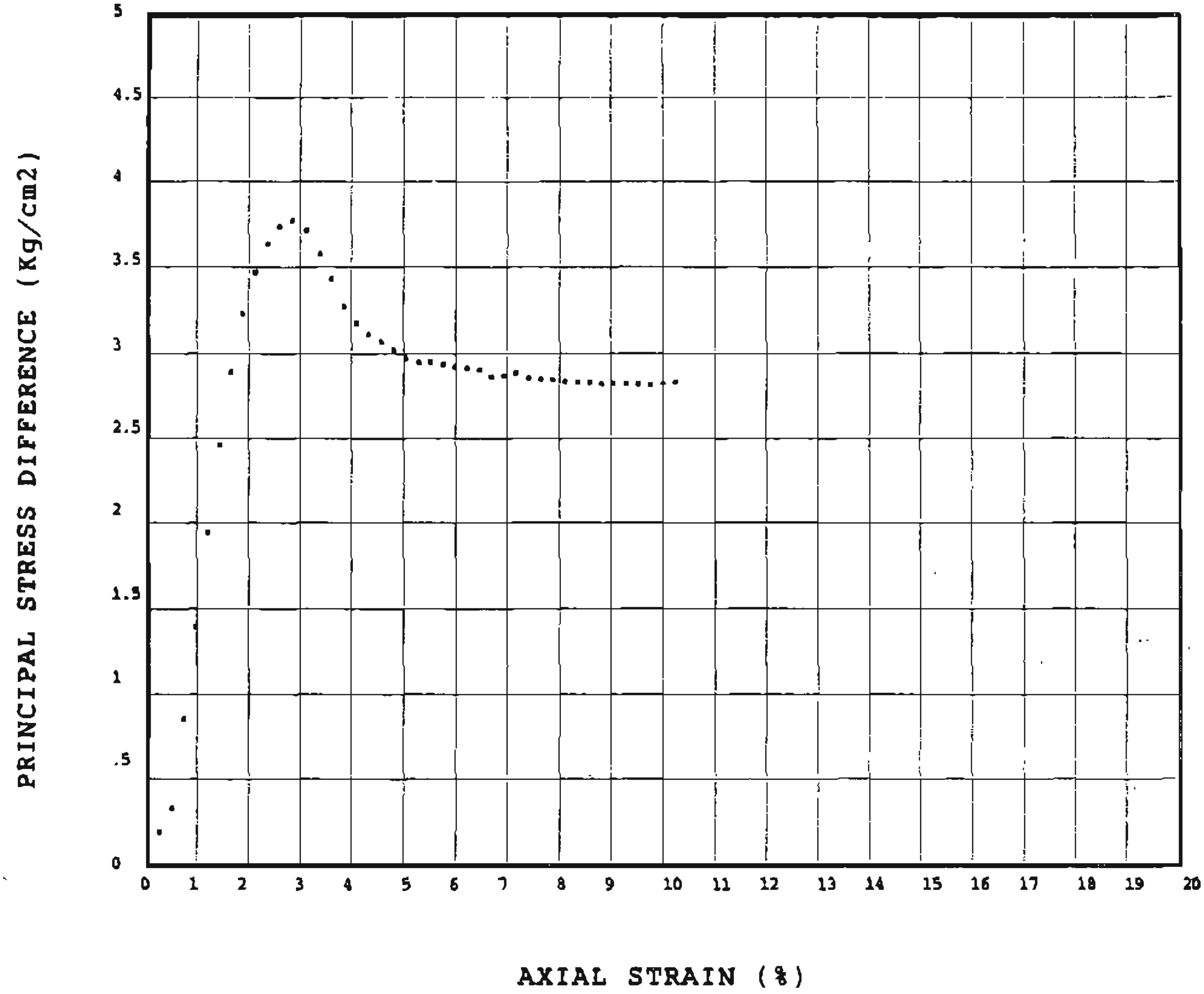
Ardaman & Associates Inc.

SEMINOLE ELECTRIC COOPERATIVE INC.
4040 MEGAWATT COMBUSTION GENERATOR
AGRICO-SOUTH SITE

DRAWN BY: HAO | CHECKED BY: | DATE: 12/16/8

FILE NO. 88-9155A | APPROVED BY:

Sample Name : B-8, US-10, 35.0'-37.0', SS#1



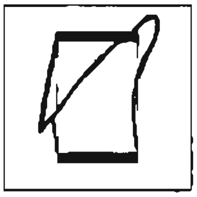
Dry density : 81.63 pcf

Water content : 35.30 %

Saturation : 90.55 %

Cell pressure : 0.93 kg/cm2

Strain rate : 1.00%/min



TYPE OF FAILURE

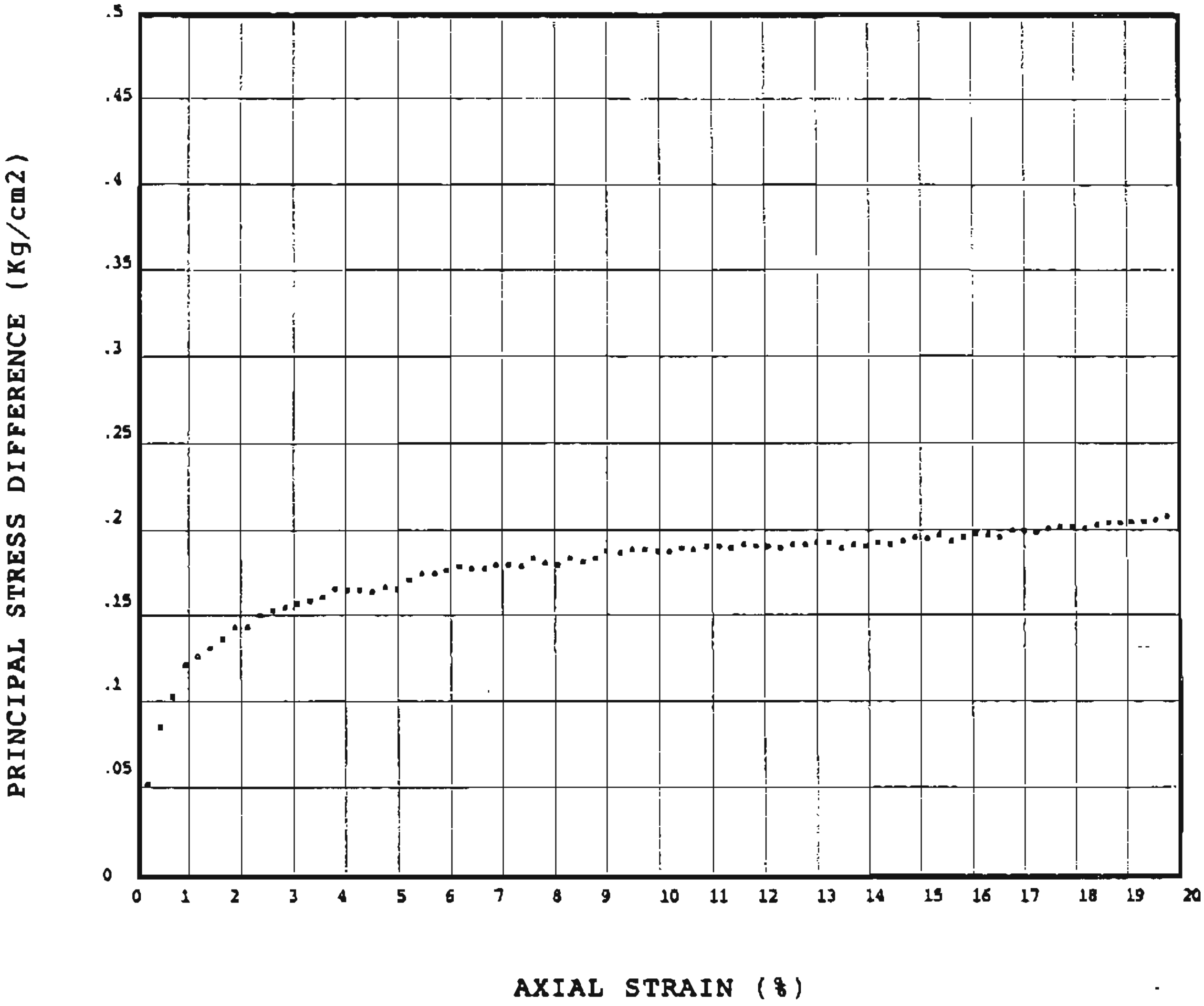
UNCONSOLIDATED - UNDRAINED
TRIAXIAL COMPRESSION TEST

Ardaman & Associates Inc.

SEMINOLE ELECTRIC COOPERATIVE INC.
4040 MEGAWATT COMBUSTION GENERATOR
AGRICO-SOUTH SITE

DRAWN BY: HAD
CHECKED BY:
DATE: 12/16/88
FILE NO. 88-9155A
APPROVED BY:

Sample Name : B-9, US-8, 25.0'-27.0', SS#1



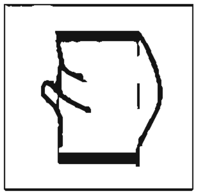
Dry density : 60.61 pcf

Water content : 69.90 %

Saturation :106.05 %

Cell pressure : 0.73 kg/cm2

Strain rate : 1.00%/min



TYPE OF FAILURE

UNCONSOLIDATED - UNDRAINED
TRIAXIAL COMPRESSION TEST

Ardaman & Associates Inc.

SEMINOLE ELECTRIC COOPERATIVE INC.
4040 MEGAWATT COMBUSTION GENERATOR
AGRICO-SOUTH SITE

DRAWN BY: HAD	CHECKED BY: JCW	DATE: 12/16/8
FILE NO. 88-9155A	APPROVED BY:	

Response to KBN/SECI-88-052 per B&V-SECI-89-145

Item: Section 2.3.1.4

(The following text can be used as an introduction to the SCA appendix that will contain the boring logs--logs previously transmitted direct to KBN by B&V).

The field investigation and laboratory test program were performed in accordance with the following ASTM standards unless otherwise noted.

Field Testing

1.	Split Barrel Sampling	D1586
2.	Tin Walled Tube Sampling	D1587
3.	Dilatometer Tests	ASTM Subcommittee D18.02.10, June 1986

Laboratory Testing

1.	Moisture Content	D2216
2.	Density	D653
3.	Atterbery Limits	D4318
4.	Sieve Analysis	D2217
5.	Hydrometer	D422
6.	Permeability	US Department of the Army EM 1110-2-1906
7.	Organic Content	D2974
8.	Triaxial Compression	D2850
9.	Consolidation	D2435

DESCRIPTION OF GROUND-TRUTHING FEATURES

1. Depression, 2-3 feet deep. Vegetation: dead water hyacinths; and grasses; very soggy center.

2. Depression, 1 foot deep. Vegetation: dead water hyacinths; dry; hog wallows nearby.

3. Depression, 1-2 feet deep. Vegetation: water hyacinth with a reed like grass in the center. I was expecting this depression to have standing water in the center but is it located close to the mining operations and may have been dewatered. Power lines to the east and pipe on ground near east edge of sink. Very small area which looks like a possible sink near the east edge of orange grove an west of this depression.

4. Depression, 3-4 feet deep. Vegetation: water hyacinth with cattails in center. Standing water in center.

5. Depression, 4 feet deep. Vegetation: mature water oaks and other lowland vegetation, marijuana.

6. Could not verify due to mining operations.

7. Depression, 10-12 feet deep. Vegetation: water lillies and other water vegetation. Standing water in bottom.

8. Depression, 4 feet deep. Vegetation: dead water hyacinth, standing water in center.

9. Depression, 6+ feet deep. Vegetation: unidentified reeds and water grasses. Standing water. Wetland.

10. Depression, 4+ feet deep. Vegetation: unidentified; some water lillies; standing water, wetland. Alligator droppings.

11. Depression, continuation of 10, not as deep.

12. Depression, 1-2 feet deep. Vegetation: dead water hyacinths.

13. Depression, 4 feet deep.

14. Depression, 2+ feet deep.

15. Depression, unknown depth, northwest side has scarp could not tell if this was depression rim or just drainage. Drainage developed within trees to a marsh area in center. Center very wet. Vegetation: mature trees, with some wetland vegetation in center. Hard to tell extent of marshy area due to thick vegetation.

16. Depression, 1/2-1 foot in drainage area. Dry possibly due to mine dewatering. Hog wallows nearby.

17. Could not verify due to mining operations.

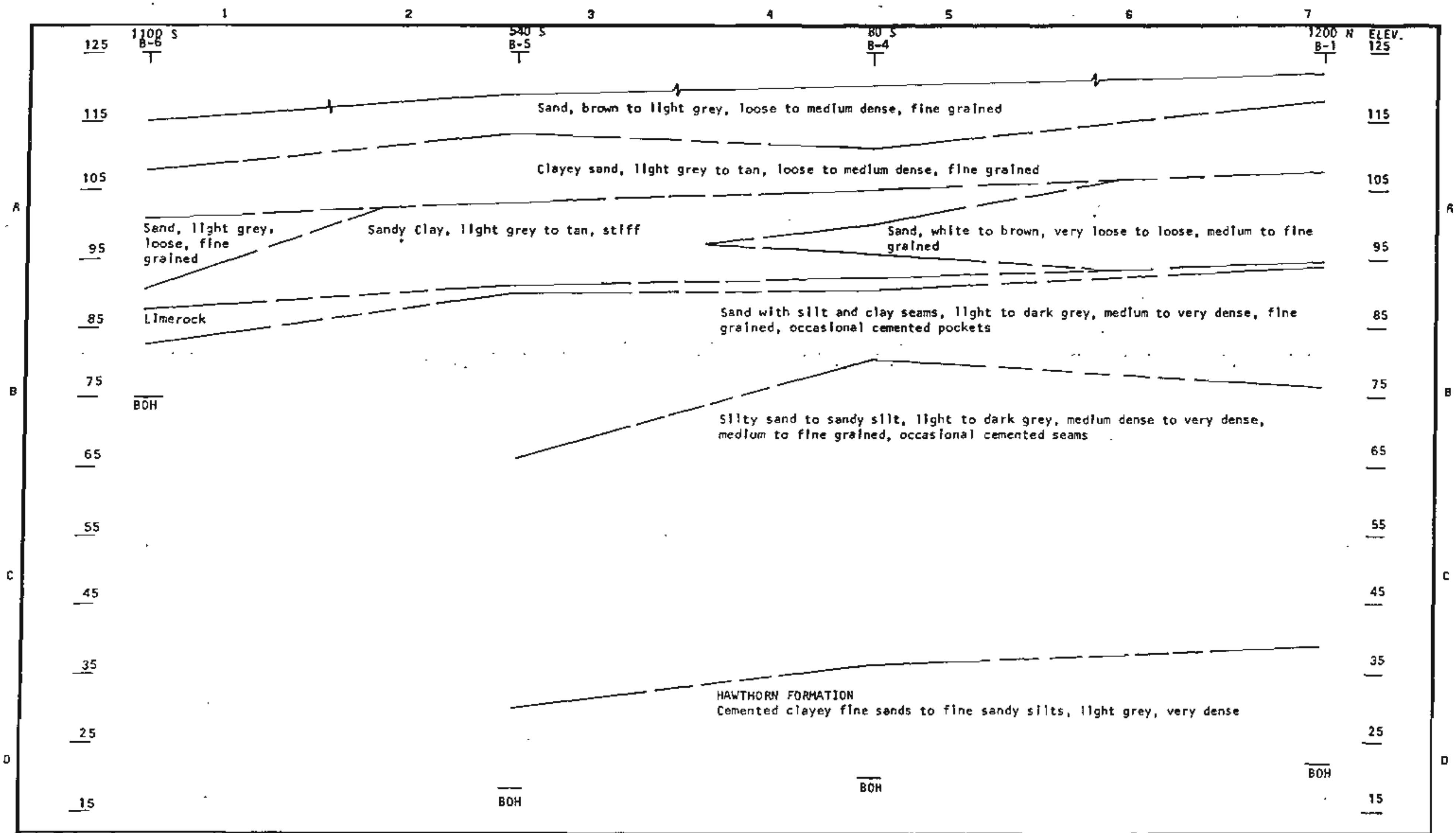
18. Could not verify because inaccessible.

19. Depression, 1-2 feet deep. Vegetation: mature trees and underbrush, dry.

20. Depression, 2-3 feet deep. Vegetation: mature trees and underbrush, dry.

21. Dragline Pit - man made.

22. Depression, part of it is very disturbed and there is evidence that this was used as a dragline pit. Other parts look like a natural depression. The only way to tell is to obtain old photography (pre-mining) and see if a depression was there originally.



P-GN-2628

NO	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP	FLM

BLACK & VEATCH
ENGINEERS-ARCHITECTS

SEMINOLE ELECTRIC COOPERATIVE INC.
COMBUSTION TURBINE PROJECT

PROJECT DRAWING NUMBER REV
14845-SK-122088-01

ENGINEER PLN
DRAWN MRJ
CHECKED
DATE

SOIL STATIGRAPHY
FIGURE

CODE
AREA

FIGURE 3-1

11.5 SUPPORTING HYDROLOGICAL INFORMATION

11.5.1 PRECIPITATION DATA

Table A-1. Monthly and Annual Precipitation at Wauchula, Florida (Page 1 of 2)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1933	0.85	2.23	1.95	5.44	2.54	7.64	11.60	4.52	12.19	1.08	1.74	0.14	51.92
1934	1.09	2.23	1.71	6.36	7.53	12.98	4.00	5.52	7.28	0.77	1.07	0.21	50.75
1935	0.27	1.65	0.20	2.79	4.71	8.11	7.66	7.92	6.83	2.93	0.79	3.16	47.02
1936	4.53	8.92	3.17	1.21	2.09	9.23	5.77	8.46	8.31	4.02	2.76	1.89	60.36
1937	1.99	5.26	4.20	3.77	4.38	12.22	8.02	6.34	6.40	3.03	3.91	0.63	60.15
1938	1.02	1.11	1.17	0.55	3.99	10.82	11.32	2.97	5.73	9.38	1.79	0.11	49.96
1939	0.96	1.04	0.57	4.21	7.17	18.42	10.78	13.99	7.18	2.13	0.61	1.17	68.23
1940	3.61	4.46	3.43	1.53	2.41	8.17	7.84	7.25	8.54	0.00	0.02	4.20	51.46
1941	3.44	2.55	2.45	4.19	0.55	10.78	7.82	4.59	4.24	2.50	3.13	2.21	48.45
1942	3.46	5.34	4.50	3.29	2.34	8.98	6.19	6.77	7.04	0.62	0.25	2.04	50.82
1943	1.27	0.63	4.52	1.48	6.08	15.11	11.74	12.54	4.72	3.36	0.66	0.87	62.98
1944	0.92	0.63	4.30	1.79	2.23	9.29	7.91	6.16	4.35	1.52	0.23	0.39	39.72
1945	2.85	0.19	0.18	0.22	0.29	15.24	13.62	5.58	7.99	5.55	0.42	1.77	53.90
1946	1.08	3.03	0.60	0.68	3.54	7.22	15.54	4.95	6.90	1.74	0.43	0.33	46.04
1947	1.75	3.64	6.76	7.75	6.86	10.63	9.86	9.52	18.06	2.64	2.78	1.85	82.10
1948	4.19	0.80	2.26	2.38	1.65	3.02	13.29	10.02	13.91	0.82	0.38	1.29	54.01
1949	0.26	0.45	0.75	3.41	0.56	10.40	12.29	15.53	7.88	2.69	3.29	0.00	57.51
1950	0.08	0.33	3.43	1.09	3.01	4.97	4.06	9.89	5.22	6.85	0.52	4.13	43.58
1951	0.45	1.90	1.10	8.26	2.28	5.04	8.84	4.21	8.37	4.10	2.48	0.96	47.99
1952	1.29	5.24	4.16	1.16	6.72	2.40	6.44	6.29	7.43	9.67	3.02	1.54	55.36
1953	2.98	2.46	3.30	6.55	0.43	16.03	8.89	12.46	14.38	6.21	6.43	3.36	83.48
1954	1.62	2.77	1.19	4.14	11.32	11.87	6.61	8.08	6.00	2.87	2.23	2.10	60.80
1955	2.57	1.32	2.10	2.14	1.49	10.62	7.35	8.64	6.87	1.39	0.83	1.11	46.43
1956	0.54	1.25	0.94	4.25	5.65	3.69	5.63	12.11	6.99	2.79	0.24	0.12	44.20
1957	3.42	4.47	5.28	4.14	11.31	5.39	7.83	3.75	9.41	2.96	1.71	2.70	62.37
1958	7.20	4.26	7.72	2.95	5.11	3.48	7.87	3.30	7.09	2.82	2.99	4.77	59.56
1959	2.33	2.54	9.22	2.49	3.43	13.97	12.12	8.08	8.97	3.86	0.80	1.32	69.13
1960	0.62	5.46	4.47	3.39	2.86	3.72	14.60	8.40	13.83	5.11	0.08	1.37	63.91
1961	2.19	3.35	2.21	1.96	5.30	4.27	5.57	8.20	1.19	0.57	0.36	1.76	36.93
1962	1.07	0.58	3.77	6.94	6.27	14.77	2.80	7.93	11.41	0.96	2.30	0.43	59.23
1963	2.24	7.37	0.90	0.03	10.61	9.91	7.29	5.86	8.62	0.27	5.89	2.58	61.57
1964	3.13	5.04	4.34	3.39	2.68	3.26	6.20	4.84	8.17	2.78	0.86	1.16	45.85
1965	1.51	3.86	6.85	0.96	0.01	8.92	13.76	4.17	6.03	3.96	1.20	2.77	54.00
1966	6.49	4.95	0.84	2.52	1.82	5.37	7.16	5.48	6.70	1.33	0.24	0.76	43.66
1967	0.52	2.98	0.08	0.00	0.77	11.87	10.91	7.51	3.79	0.93	0.03	2.67	42.06
1968	0.73	1.79	1.16	0.65	7.82	15.85	10.18	6.50	5.01	3.43	2.32	0.37	55.81
1969	2.91	2.05	6.53	2.05	1.65	7.88	6.40	8.67	9.77	5.14	1.97	2.70	57.72
1970	2.89	2.60	5.80	0.13	5.01	5.91	12.31	4.24	5.96	2.16	0.84	0.89	48.74
1971	0.35	4.01	1.46	0.05	5.80	5.65	8.24	7.86	7.09	4.08	1.23	0.94	46.76
1972	0.67	4.70	4.41	2.11	7.42	9.05	5.40	8.83	1.44	1.65	4.75	2.68	53.11
1973	7.26	2.64	5.09	3.49	1.27	4.81	10.91	4.76	8.44	0.59	0.76	1.78	51.80

Table A-1. Monthly and Annual Precipitation at Wauchula, Florida (Page 2 of 2)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1974	0.03	1.12	0.30	1.56	2.74	14.97	10.05	7.92	3.58	0.10	0.16	2.32	44.85
1975	0.50	1.62	0.88	0.23	6.87	7.02	8.45	5.41	9.41	10.36	0.36	0.60	51.71
1976	1.04	0.69	0.35	1.60	8.39	10.74	9.09	6.33	3.26	1.57	1.26	2.56	46.88
1977	2.41	1.77	0.84	0.28	4.05	8.06	12.46	5.34	5.38	1.55	2.66	4.83	49.63
1978	2.93	3.59	2.09	0.00	5.68	7.25	10.40	6.41	2.70	1.43	0.97	2.90	46.35
1979	7.84	1.41	1.52	1.72	7.08	8.00	7.16	8.62	11.56	0.45	0.72	1.91	57.99
1980	2.25	2.37	1.70	4.66	6.39	10.05	4.17	6.02	2.00	1.24	3.08	0.78	44.71
1981	0.58	4.37	1.35	0.08	2.91	8.09	2.21	6.91	8.12	0.22	0.44	1.38	36.66
1982	1.13	3.08	5.35	4.32	6.50	15.96	9.08	2.66	10.95	1.73	0.82	0.98	62.56
1983	4.29	7.99	7.45	2.75	1.79	8.25	9.66	9.49	7.42	3.14	2.22	3.79	68.24
1984	0.72	2.44	3.45	1.73	6.13	3.82	7.70	6.85	5.10	0.36	1.30	0.47	40.07
1985	0.96	0.84	2.08	2.63	4.95	7.33	3.63	10.27	7.51	2.81	1.25	0.75	45.01
1986	2.66	1.88	5.78	0.73	2.22	11.65	9.08	7.06	4.79	3.84	0.82	5.51	56.02
1987	2.96	1.99	7.03	0.16	3.02	4.47	8.56	5.16	3.35	4.51	11.18	0.74	53.13
1988	1.77	2.56	5.55	0.70	3.24	4.48	12.45	8.06	7.16				45.97
AVG	2.15	2.85	3.12	2.48	4.30	8.88	8.69	7.24	7.29	2.81	1.74	1.76	53.33
MAX	7.84	8.92	9.22	8.26	11.32	18.42	15.54	15.53	18.06	10.36	11.18	5.51	83.48
MIN	0.03	0.19	0.08	0.00	0.01	2.40	2.21	2.66	1.19	0.00	0.02	0.00	36.66

Sources: Southwest Florida Water Management District, 1988
NOAA, 1988

11.5.2 STREAMFLOW DATA

Table B. Water Level on Payne Creek (Station PC-2): Daily Averages

Date	Level (ft)	Discharge (cfs)	Date	Level (ft)	Discharge (cfs)
11-Oct-88	2.55	11.35	24-Nov-88	2.52	10.85
12-Oct-88	2.45	9.76	25-Nov-88	2.54	11.18
13-Oct-88	2.31	7.81	26-Nov-88	2.47	10.06
14-Oct-88	2.21	6.61	27-Nov-88	2.37	8.61
15-Oct-88	2.15	5.95	28-Nov-88	2.31	7.81
16-Oct-88	2.19	6.38	29-Nov-88	2.25	7.07
17-Oct-88	2.39	8.88	30-Nov-88	2.15	5.95
18-Oct-88	2.25	7.07	01-Dec-88	2.08	5.25
19-Oct-88	2.06	5.06	02-Dec-88	2.02	4.70
20-Oct-88	1.99	4.44	03-Dec-88	1.98	4.36
21-Oct-88	1.96	4.20	04-Dec-88	1.95	4.11
22-Oct-88	1.94	4.04	05-Dec-88	1.94	4.04
23-Oct-88	1.93	3.96	06-Dec-88	2.04	4.88
24-Oct-88	1.93	3.96	08-Dec-88	1.99	4.44
25-Oct-88	1.92	3.88	09-Dec-88	1.96	4.20
26-Oct-88	1.91	3.80	10-Dec-88	1.94	4.04
27-Oct-88	1.88	3.58	11-Dec-88	1.92	3.88
28-Oct-88	1.86	3.44	12-Dec-88	2.04	4.88
29-Oct-88	1.84	3.30	13-Dec-88	2.04	4.88
31-Oct-88	1.83	3.24	14-Dec-88	2.00	4.53
01-Nov-88	1.83	3.24	15-Dec-88	1.97	4.28
02-Nov-88	1.84	3.30	16-Dec-88	1.96	4.20
03-Nov-88	1.82	3.17	17-Dec-88	1.94	4.04
04-Nov-88	2.19	6.38	18-Dec-88	1.92	3.88
05-Nov-88	2.49	10.37	19-Dec-88	1.91	3.80
06-Nov-88	2.52	10.85	20-Dec-88	1.91	3.80
07-Nov-88	2.56	11.52	21-Dec-88	1.91	3.80
08-Nov-88	2.45	9.76	22-Dec-88	1.90	3.73
08-Nov-88	2.35	8.33	23-Dec-88	1.90	3.73
09-Nov-88	2.27	7.31	24-Dec-88	1.90	3.73
10-Nov-88	2.21	6.61	25-Dec-88	1.90	3.73
11-Nov-88	2.14	5.85	26-Dec-88	1.90	3.73
12-Nov-88	2.08	5.25	27-Dec-88	1.89	3.66
13-Nov-88	2.06	5.06	28-Dec-88	1.89	3.66
14-Nov-88	2.03	4.79	29-Dec-88	1.90	3.73
15-Nov-88	2.01	4.61	30-Dec-88	1.91	3.80
16-Nov-88	1.98	4.36	31-Dec-88	1.90	3.73
17-Nov-88	1.96	4.20	01-Jan-89	1.89	3.66
18-Nov-88	1.95	4.11	02-Jan-89	1.88	3.58
19-Nov-88	1.94	4.04	03-Jan-89	1.87	3.51
20-Nov-88	1.93	3.96	04-Jan-89	1.76	2.79
21-Nov-88	1.92	3.88	05-Jan-89	1.74	2.67
22-Nov-88	2.18	6.27	06-Jan-89	1.77	2.85

Table B. Water Level on Payne Creek (Station PC-2): Daily Averages

Date	Level (ft)	Discharge (cfs)	Date	Level (ft)	Discharge (cfs)
07-Jan-89	1.79	2.98	19-Feb-89	1.78	2.91
08-Jan-89	1.79	2.98	20-Feb-89	1.76	2.79
09-Jan-89	1.79	2.98	21-Feb-89	1.74	2.67
10-Jan-89	1.79	2.98	22-Feb-89	1.72	2.56
11-Jan-89	1.79	2.98	23-Feb-89	1.70	2.45
12-Jan-89	1.78	2.91	24-Feb-89	1.69	2.39
13-Jan-89	1.74	2.67	25-Feb-89	1.68	2.34
14-Jan-89	1.69	2.39	26-Feb-89	1.67	2.29
15-Jan-89	2.03	4.79	27-Feb-89	1.67	2.29
16-Jan-89	2.37	8.61	28-Feb-89	1.66	2.24
17-Jan-89	2.35	8.33	01-Mar-89	1.66	2.24
18-Jan-89	2.21	6.61	02-Mar-89	1.73	2.62
19-Jan-89	2.15	5.95	03-Mar-89	2.11	5.54
20-Jan-89	2.17	6.17	04-Mar-89	2.36	8.47
21-Jan-89	2.28	7.43	05-Mar-89	2.26	7.19
22-Jan-89	2.76	15.31	06-Mar-89	2.16	6.06
23-Jan-89	3.18	26.16	07-Mar-89	2.09	5.35
24-Jan-89	3.49	37.19	08-Mar-89	2.13	5.75
25-Jan-89	3.50	37.60	09-Mar-89	2.05	4.97
26-Jan-89	3.25	28.41	10-Mar-89	1.96	4.20
27-Jan-89	3.06	22.62	11-Mar-89	1.88	3.58
28-Jan-89	2.88	17.98	12-Mar-89	1.82	3.17
29-Jan-89	2.97	20.20	13-Mar-89	1.77	2.85
30-Jan-89	2.92	18.95	14-Mar-89	1.74	2.67
31-Jan-89	2.72	14.49	15-Mar-89	1.80	3.04
01-Feb-89	2.67	13.51	16-Mar-89	1.80	3.04
02-Feb-89	2.61	12.39	17-Mar-89	1.91	3.80
03-Feb-89	2.55	11.35	18-Mar-89	1.74	2.67
04-Feb-89	2.49	10.37	19-Mar-89	1.69	2.39
05-Feb-89	2.43	9.46	20-Mar-89	1.72	2.56
06-Feb-89	2.37	8.61	21-Mar-89	1.69	2.39
07-Feb-89	2.31	7.81	22-Mar-89	1.68	2.34
08-Feb-89	2.26	7.19	23-Mar-89	1.67	2.29
09-Feb-89	2.20	6.49	24-Mar-89	1.66	2.24
10-Feb-89	2.14	5.85	25-Mar-89	1.64	2.14
11-Feb-89	2.08	5.25	26-Mar-89	1.61	1.99
12-Feb-89	2.02	4.70	27-Mar-89	1.69	2.39
13-Feb-89	1.96	4.20	28-Mar-89	1.85	3.37
14-Feb-89	1.90	3.73	29-Mar-89	1.80	3.04
15-Feb-89	1.83	3.24	30-Mar-89	1.70	2.45
16-Feb-89	1.80	3.04	31-Mar-89	1.66	2.24
17-Feb-89	1.79	2.98	01-Apr-89	1.63	2.09
18-Feb-89	1.79	2.98	02-Apr-89	1.64	2.14

Table B. Water Level on Payne Creek (Station PC-2): Daily Averages

Date	Level (ft)	Discharge (cfs)
03-Apr-89	1.98	4.36
04-Apr-89	1.85	3.37
05-Apr-89	1.72	2.56
06-Apr-89	1.65	2.19
07-Apr-89	1.61	1.99
08-Apr-89	1.57	1.81
09-Apr-89	1.55	1.73
10-Apr-89	1.53	1.64
11-Apr-89	1.52	1.60
12-Apr-89	1.52	1.60
13-Apr-89	1.52	1.60

Table C-1. Discharge of Payne Creek (station 2): 11-October-1988 @ 17:30

Distance from Initial Point (ft)	Total Depth (ft)	Observation Depth (ft)	Velocity (fps)		Area (ft^2)	Discharge (cfs)
			Point	Vert. Mean		
1	0.9	0.54	0.00	0.00	1.8	0.00
			0.00			
3	1.5	0.9	0.00	0.00	3	0.00
			0.00			
5	2.4	1.44	0.07	0.07	4.8	0.32
			0.07			
7	2.5	1.5	0.50	0.50	5	2.50
			0.50			
9	2	1.2	0.87	0.87	4	3.47
			0.87			
11	1.65	0.99	0.90	0.90	3.3	2.97
			0.90			
13	1.5	0.9	0.83	0.83	3	2.50
			0.83			
15	0.9	0.54	0.27	0.27	1.8	0.48
			0.27			
16	0	0	0.00	0.00	0	0.00
			0.00			
				Total	26.7	12.2

Source: Applied Technology and Management, Inc., 1989

Table C-2. Discharge of Payne Creek (station 2): 8-November-1988 @ 15:21

Distance from Initial Point (ft)	Total Depth (ft)	Observation Depth (ft)	Velocity (fps)		Area (ft^2)	Discharge (cfs)
			Point	Vert. Mean		
1	0	0	0.03	0.03	0	0.00
			0.03			
3	1	0.6	0.40	0.40	2	0.79
		0	0.40			
5	2	1.2	0.62	0.62	4	2.47
		0	0.62			
7	2.25	1.35	0.91	0.91	4.5	4.10
		0	0.91			
9	2.25	1.35	0.54	0.54	4.5	2.45
		0	0.54			
1	2	1.2	0.25	0.25	4	0.99
		0	0.25			
13	1.5	0.9	0.17	0.17	3	0.52
		0	0.17			
15	1.25	0.75	0.10	0.10	2.5	0.25
		0	0.10			
17	0	0	0.03	0.03	0	0.00
		0	0.03			
19	0	0	0.03	0.03	0	0.00
		0	0.03			
20.5	0	0	0.03	0.03	0	0.00
		0	0.03			
				Total	24.5	11.6

Source: Applied Technology and Management, Inc., 1989

Table C-3. Discharge of Payne Creek (station 2): 12-December-1988 @ 8:40

Distance from Initial Point (ft)	Total Depth (ft)	Observation Depth (ft)	Velocity (fps)		Area (ft^2)	Discharge (cfs)
			Point	Vert. Mean		
1	0	0	0.03	0.03	0	0.00
			0.03			
3	1	0.6	0.32	0.32	2	0.64
		0	0.32			
5	1.7	1.02	0.47	0.47	3.4	1.60
		0	0.47			
7	1.9	1.14	0.47	0.47	3.8	1.78
		0	0.47			
9	1.5	0.9	0.14	0.14	3	0.41
		0	0.14			
11	1	0.6	0.10	0.10	2	0.20
		0	0.10			
13	0.5	0.3	0.10	0.10	1	0.10
		0	0.10			
15	0	0	0.03	0.03	0	0.00
		0	0.03			
17	0	0	0.03	0.03	0	0.00
		0	0.03			
19	0	0	0.03	0.03	0	0.00
		0	0.03			
20.5	0	0	0.03	0.03	0	0.00
		0	0.03			
				Total	15.2	4.7

Source: Applied Technology and Management, Inc., 1989

Table C-4. Discharge of Payne Creek (station 2): 11-January-1989 @ 17:05

Distance from Initial Point (ft)	Total Depth (ft)	Observation Depth (ft)	Velocity (fps)		Area (ft^2)	Discharge (cfs)
			Point	Vert. Mean		
2	0.5	0.3	0.00	0.00	1.25	0.00
			0.00			
3	0.7	0.42	0.07	0.07	0.7	0.05
		0	0.07			
4	0.9	0.54	0.03	0.03	0.9	0.03
		0	0.03			
5	1.1	0.66	0.20	0.20	1.1	0.22
		0	0.20			
6	1.2	0.72	0.32	0.32	1.2	0.38
		0	0.32			
7	1	0.6	0.33	0.33	1	0.33
		0	0.33			
8	0.8	0.48	0.45	0.45	0.8	0.36
		0	0.45			
9	0.8	0.48	0.45	0.45	0.8	0.36
		0	0.45			
10	0.5	0.3	0.48	0.48	0.5	0.24
		0	0.48			
11	0.25	0.15	0.50	0.50	0.25	0.13
		0	0.50			
12	0.15	0.09	0.50	0.50	0.375	0.19
		0	0.50			
14	0	0	0.00	0.00	0	0.00
		0	0.00			
				Total	8.9	2.3

Source: Applied Technology and Management, Inc., 1989

Table C-5. Discharge of Payne Creek (station 4): 8-December-1988 @ 12:20

Distance from Initial Point (ft)	Total Depth (ft)	Observation Depth (ft)	Velocity (fps) Point	Vert. Mean	Area (ft^2)	Discharge (cfs)
6.5	0.75	0.45	0.99	0.99	1.125	1.11
			0.99			
9.5	1.5	0.9	1.21	1.21	2.25	2.72
		0	1.21			
12.5	1.8	1.08	1.50	1.50	2.7	4.06
		0	1.50			
15.5	2	1.2	1.43	1.43	3	4.28
		0	1.43			
18.5	2	1.2	1.43	1.43	3	4.28
		0	1.43			
21.5	2	1.2	1.32	1.32	3	3.95
		0	1.32			
24.5	2.2	1.32	1.32	1.32	3.3	4.35
		0	1.32			
27.5	2.2	1.32	1.21	1.21	3.3	3.98
		0	1.21			
30.5	1	0.6	1.21	1.21	1.5	1.81
		0	1.21			
32	0	0	0.03	0.03	0	0.00
		0	0.03			
				Total	23.2	30.5

Source: Applied Technology and Management, Inc., 1989

Table C-6. Discharge of Payne Creek (station 4):   11-January-1988 @ 10:25

Distance from Initial Point (ft)	Total Depth (ft)	Observation Depth (ft)	Velocity (fps)		Area (ft^2)	Discharge (cfs)
			Point	Vert. Mean		
1	0.45	0.27	0.63	0.63	0.9	0.57
			0.63			
3	0.8	0.48	0.63	0.63	1.6	1.01
		0	0.63			
5	1.47	0.88	0.77	0.77	2.94	2.25
		0	0.77			
7	1.8	1.08	0.80	0.80	3.6	2.88
		0	0.80			
9	1.92	1.15	0.90	0.90	3.84	3.46
		0	0.90			
11	2.1	1.26	0.87	0.87	4.2	3.64
		0	0.87			
13	2.1	1.26	0.83	0.83	4.2	3.50
		0	0.83			
15	2.2	1.32	0.77	0.77	4.4	3.37
		0	0.77			
17	2.2	1.32	0.70	0.70	4.4	3.08
		0	0.70			
19	2.35	1.41	0.60	0.60	4.7	2.82
		0	0.60			
21	2.25	1.35	0.63	0.63	4.5	2.85
		0	0.63			
23	2.3	1.38	0.57	0.57	4.6	2.61
		0	0.57			
25	1.1	0.66	0.63	0.63	2.2	1.39
		0	0.63			
26	0	0	0.00	0.00	0	0.0
			Total		46.1	33.4

Source: Applied Technology and Management, Inc., 1989

Table C-7. Discharge of Peace River (station 1): 13-October-1988 @ 11:00

Distance from Initial Point (ft)	Total Depth (ft)	Observation Depth (ft)	Velocity (fps) Point	Vert. Mean	Area (ft^2)	Discharge (cfs)
2	1	0.6	0.17	0.17	4	0.70
			0.17			
6	2	1.2	0.32	0.32	8	2.58
		0	0.32			
10	2.75	1.65	0.62	0.62	11	6.79
		0	0.62			
14	4	0.8	0.47	0.54	16	8.69
		3.2	0.62			
18	5	1	0.62	0.64	20	12.71
		4	0.65			
22	5.5	1.1	0.99	0.95	22	20.88
		4.4	0.91			
26	5.5	1.1	1.21	1.21	22	26.55
		4.4	1.21			
30	3.5	2.1	1.21	1.21	14	16.90
		0	1.21			
34	3.5	2.1	1.43	1.43	14	20.00
		0	1.43			
38	3.5	2.1	1.35	1.35	14	18.96
		0	1.35			
42	3	1.8	1.21	1.21	12	14.48
			1.21			
46	2.5	1.5	1.28	1.28	10	12.81
			1.28			
50	2	1.2	1.06	1.06	8	8.48
			1.06			
54	1	0.6	0.84	0.84	4	3.35
			0.84			
56	0	0	0.00	0.00	0	0.00
				Total	179.0	173.9

Source: Applied Technology and Management, Inc., 1989

Table C-8. Discharge of Peace River (station 1): 8-November-1988 @ 17:25

Distance from Initial Point (ft)	Total Depth (ft)	Observation Depth (ft)	Velocity (fps)		Area (ft^2)	Discharge (cfs)
			Point	Vert. Mean		
2.5	1.25	0.75	0.25	0.25	6.25	1.55
			0.25			
7.5	2	1.2	0.25	0.25	10	2.48
		0	0.25			
12.5	4	0.8	0.69	0.69	20	13.82
		3.2	0.69			
17.5	5	1	0.84	0.76	25	19.11
		4	0.69			
22.5	5.1	1	1.06	1.17	25.5	29.84
		4	1.28			
27.5	5.1	1	1.43	1.50	25.5	38.30
		4	1.58			
32.5	3.8	0.76	1.72	1.61	19	30.64
		3	1.50			
37.5	3.2	0.6	1.87	1.83	16	29.34
		2.6	1.80			
42.5	3	1.8	1.80	1.80	15	26.95
		0	1.80			
47.5	1.9	1.15	1.43	1.43	9.5	13.57
		0	1.43			
52.5	1.2	0.7	0.91	0.91	3	2.74
			0.91			
54.5	0.75	0.45	0.76	0.76	1.875	1.43
			0.76			
57	0	0	0.00	0.00	0	0.00
			Total		176.6	209.8

Source: Applied Technology and Management, Inc., 1989

Table C-9. Discharge of Peace River (station 1): 7-December-1988 @ 17:59

Distance from Initial Point (ft)	Total Depth (ft)	Observation Depth (ft)	Velocity (fps)		Area (ft^2)	Discharge (cfs)
			Point	Vert. Mean		
3	1	0.6	0.84	0.84	6	5.03
			0.84			
9	1.9	1.14	1.43	1.43	11.4	16.28
		0	1.43			
15	3	1.8	1.87	1.87	18	33.67
		0	1.87			
21	3.2	1.9	2.09	2.09	19.2	40.17
		0	2.09			
27	3.5	2.1	1.94	1.94	21	40.83
		0	1.94			
33	4	2.4	1.65	1.65	24	39.59
		0	1.65			
39	5	3	0.91	0.91	30	27.36
		0	0.91			
45	4.2	2.5	0.58	0.58	25.2	14.62
		0	0.58			
51	2	1.2	0.65	0.65	12	7.85
		0	0.65			
57	1.2	0.9	0.40	0.40	7.2	2.85
		0	0.40			
				Total	174.0	228.3

Source: Applied Technology and Management, Inc., 1989

Table C-10. Discharge of Peace River (station 1): 11-January-1989 @ 13:00

Distance from Initial Point (ft)	Total Depth (ft)	Observation Depth (ft)	Velocity (fps) Point	Velocity (fps) Vert. Mean	Area (ft^2)	Discharge (cfs)
2.5	0.5	0	0.03	0.03	2.5	0.00
			0.03			
7.5	1.5	0.9	0.76	0.76	7.5	5.73
		0	0.76			
12.5	2.5	1.5	0.99	0.99	12.5	12.32
		0	0.99			
17.5	2.6	1.5	1.13	1.13	13	14.73
		0	1.13			
22.5	3.1	1.9	1.13	1.13	15.5	17.57
		0	1.13			
27.5	3.5	2.1	1.06	1.06	17.5	18.54
		0	1.06			
32.5	3.7	2.96	0.80	0.86	18.5	15.85
		0.74	0.91			
37.5	4.4	3.52	0.51	0.62	22	13.58
		0.88	0.73			
42.5	3.5	2.1	0.43	0.43	17.5	7.57
		1.2	0.43			
47.5	2	0.9	0.40	0.40	10	3.96
		0	0.40			
52.5	1.5	0	0.21	0.21	7.5	1.59
		0	0.21			
55	0	0	0.00	0	0	0.00
				Total	144.0	111.4

Source: Applied Technology and Management, Inc., 1989

Table C-11. Discharge of Peace River (station 4): 7-December-1988 @ 15:40

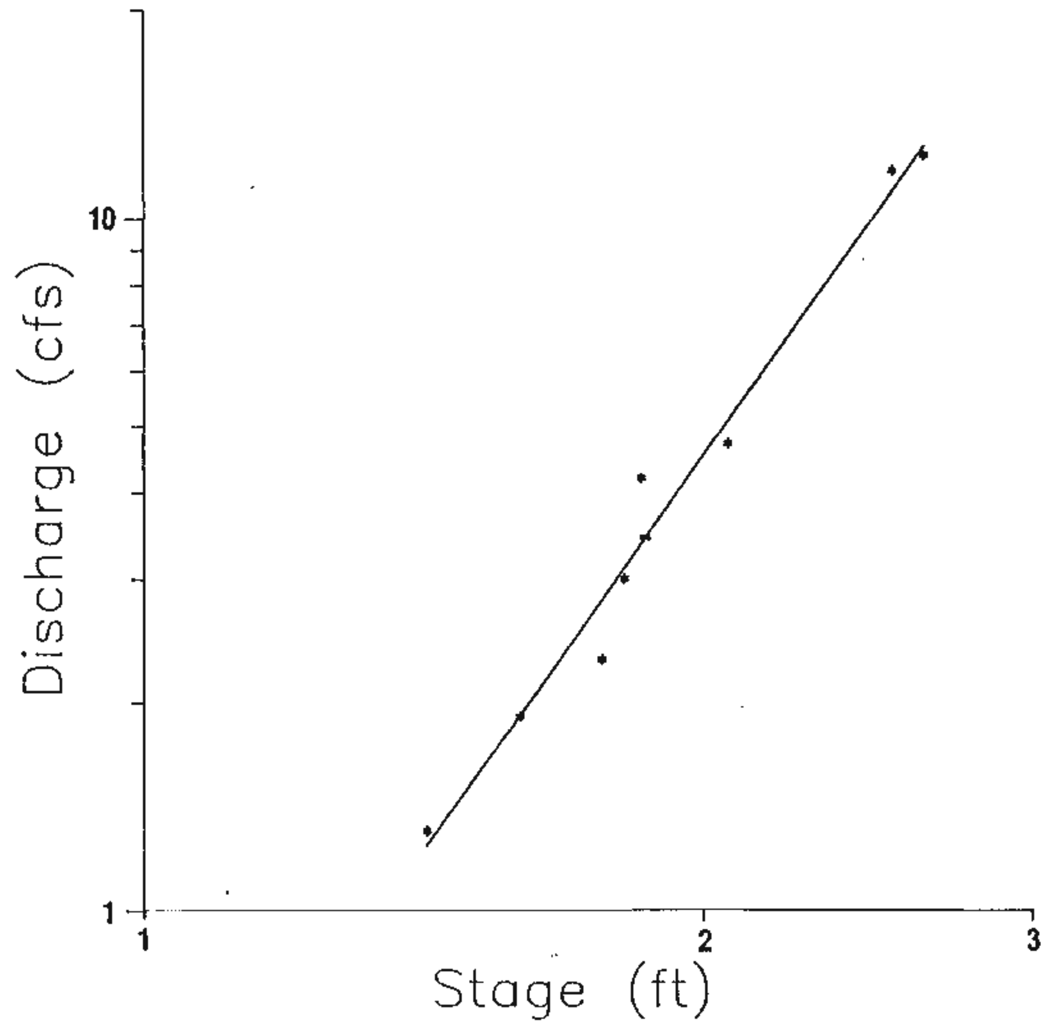
Distance from Initial Point (ft)	Total Depth (ft)	Observation Depth (ft)	Velocity (fps) Point	Vert. Mean	Area (ft^2)	Discharge (cfs)
3	1.5	0.9	0.21	0.21	9	1.90
			0.21			
9	3	1.8	0.25	0.25	18	4.47
		0	0.25			
15	4	2.4	0.69	0.69	24	16.58
		0	0.69			
21	5	3	0.99	0.99	30	29.57
		0	0.99			
27	5.8	3.5	1.28	1.28	34.8	44.57
		0	1.28			
33	6.3	3.8	1.28	1.28	37.8	48.41
		0	1.28			
39	7	4.2	1.17	1.17	42	49.15
		0	1.17			
45	7	4.2	1.06	1.06	42	44.50
		0	1.06			
51	7	4.2	1.32	1.32	42	55.34
		0	1.32			
57	6.2	3.7	1.21	1.21	37.2	44.90
		0	1.21			
62.5	5.4	3.2	0.91	0.91	27	24.63
		0	0.91			
65	0	0	0.00	0	0	0
				Total	343.8	364.0

Source: Applied Technology and Management, Inc., 1989

Table C-12. Discharge of Peace River (station 4):   11-January-1989 @ 08:16

Distance from Initial Point (ft)	Total Depth (ft)	Observation Depth (ft)	Velocity (fps) Point	Velocity (fps) Vert. Mean	Area (ft^2)	Discharge (cfs)
3	4	3.2	0.32	0.29	24	6.85
		0.8	0.25			
9	5.5	4.4	0.65	0.52	33	17.32
		1.1	0.40			
15	6	4.8	0.54	0.47	36	16.91
		1.2	0.40			
21	6	4.8	0.76	0.58	36	20.89
		1.2	0.40			
27	5.6	4.5	0.69	0.73	33.6	24.45
		1.1	0.76			
33	5.1	4.1	0.69	0.76	30.6	23.40
		1	0.84			
39	4.5	3.6	0.54	0.64	27	17.16
		0.9	0.73			
45	3.6	2.9	0.40	0.51	21.6	10.94
		0.7	0.62			
51	3.1	1.9	0.40	0.40	18.6	7.36
		0	0.40			
57	2.4	1.4	0.40	0.40	19.2	7.60
		0	0.40			
				Total	279.6	152.9

Source: Applied Technology and Management, Inc., 1989



STAGE DISCHARGE CURVE FOR PAYNE CREEK NEAR THE HARDEE POWER STATION

SOURCE: APPLIED TECHNOLOGY AND MANAGEMENT, 1989.

Hardee Power Station

11.5.3 HISTORICAL WATER QUALITY DATA

Table D-1. Payne Creek - Agrico Ft. Green Reclamation Report - 1975 through 1982

Parameter/Location	9/75	1/76	7/82	8/82	9/82	10/82	11/82	12/82
Silicon								
AG-1	- -	- -	- -	- -	2.36	- -	- -	1.20
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	3.84	- -	- -	2.60
Total Suspended Solids								
AG-1	- -	- -	- -	- -	4.34	- -	- -	4.12
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	2.54	- -	- -	3.22
Flouride (Mg/L)								
AG-1	- -	- -	- -	- -	1.18	- -	- -	1.79
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	1.03	- -	- -	1.45
Turbidity (NTU)								
AG-1	- -	- -	- -	- -	2.12	- -	- -	2.32
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	10	9	- -	- -	1.84	- -	- -	1.72
pH								
AG-1	- -	- -	- -	- -	7.10	- -	- -	7.41
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	7.38	- -	- -	7.68
Flow (cfs)								
AG-1	- -	- -	- -	- -	7.27	- -	- -	2.01
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	73.68	- -	- -	10.58
Dissolved Oxygen								
AG-1	- -	- -	0.68	0.56	1.16	0.63	1.07	1.08
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	5.20	6.23	7.01	7.70	7.92	7.92
Temperature (F)								
AG-1	- -	- -	83.0	81.1	78.4	75.2	74.3	72.6
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	78.8	76.6	75.0	73.4	72.8	70.0

Table D-1. Payne Creek - Agrico Ft. Green Reclamation Report - 1975 through 1982

Parameter/Location	9/75	1/76	7/82	8/82	9/82	10/82	11/82	12/82
Alkalinity								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Ammonia (NH3)								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Arsenic								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	0.002	<0.001	- -	- -	- -	- -	- -	- -
Barium								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Berylium								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Bicarbonate (HCO3)								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Biological Oxygen Demand								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	1.4	7.1	- -	- -	- -	- -	- -	- -

Table D-1. Payne Creek - Agrico Ft. Green Reclamation Report - 1975 through 1982

Parameter/Location	9/75	1/76	7/82	8/82	9/82	10/82	11/82	12/82
Cadmium								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	0.003	<0.002	- -	- -	- -	- -	- -	- -
Carbonate (CO3)								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Chromium								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	0.03	<0.02	- -	- -	- -	- -	- -	- -
Copper								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	0.01	0.03	- -	- -	- -	- -	- -	- -
Total Dissolved Solids								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	170	190	- -	- -	- -	- -	- -	- -
Gross Alpha (AGi/l)								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Iron								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	0.32	0.26	- -	- -	- -	- -	- -	- -

Table D-1. Payne Creek - Agrico Ft. Green Reclamation Report - 1975 through 1982

Parameter/Location	9/75	1/76	7/82	8/82	9/82	10/82	11/82	12/82
Kjeidahl Nitrogen								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	2.7	0.28	- -	- -	- -	- -	- -	- -
Lead								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	0.008	0.01	- -	- -	- -	- -	- -	- -
Manganese								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Nitrate (NO3)								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Nitrite (NO2)								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Specific Conductivity (UMHOS)								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Sulfate								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -

Table D-1. Payne Creek - Agrico Ft. Green Reclamation Report - 1975 through 1982

Parameter/Location	9/75	1/76	7/82	8/82	9/82	10/82	11/82	12/82
Total Nitrogen								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Total Phosphate								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Total Phosphorus								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -
Zinc								
AG-1	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	0.1	0.04	- -	- -	- -	- -	- -	- -
Total Hardness								
AG-4	65	134	- -	- -	- -	- -	- -	- -
Sulfide								
AG-4	0.04	0	- -	- -	- -	- -	- -	- -
Chloride								
AG-4	13	17	- -	- -	- -	- -	- -	- -
Chemical Oxygen Demand								
AG-4	47	12	- -	- -	- -	- -	- -	- -
Calcium								
AG-4	15	34	- -	- -	- -	- -	- -	- -
Magnesium								
AG-4	6.9	12	- -	- -	- -	- -	- -	- -
Nickel								
AG-4	0.01	<0.002	- -	- -	- -	- -	- -	- -

Table D-1. Payne Creek - Agrico Ft. Green Reclamation Report - 1975 through 1982

Parameter/Location	9/75	1/76	7/82	8/82	9/82	10/82	11/82	12/82
Sodium								
AG-4	7.1	<9	- -	- -	- -	- -	- -	- -
Selenium								
AG-4	0.014	5	- -	- -	- -	- -	- -	- -
Phenols								
AG-4	0.03	0	- -	- -	- -	- -	- -	- -
MBAS								
AG-4	<0.25	0.01	- -	- -	- -	- -	- -	- -
Fecal Strep (per 100 ml)								
AG-4	360	5	- -	- -	- -	- -	- -	- -
Hexane Solubles								
AG-4	20	24	- -	- -	- -	- -	- -	-

Table D-2. Payne Creek - Agrico Ft. Green Reclamation Report -
January 1983 through November 1983

Parameter/Location	1/83	2/83	3/83	4/83	5/83	6/83	7/83	8/83	11/83
Silicon									
AG-1	- -	- -	2.02	- -	- -	3.30	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	2.72	- -	- -	2.92	- -	- -	- -
Total Suspended Solids									
AG-1	- -	- -	5.26	- -	- -	5.36	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -		- -	- -	- -	- -	- -	- -
AG-4	- -	- -	3.56	- -	- -	2.86	- -	- -	- -
Flouride (Mg/L)									
AG-1	- -	- -	0.85	- -	- -	1.74	- -	1.76	1.78
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -		- -	- -	- -	- -	- -	0.59
AG-4	- -	- -	0.80	- -	- -	1.50	- -	1.75	1.52
Turbidity (NTU)									
AG-1	- -	- -	4.04	- -	- -	3.04	- -	3.5	0.5
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -		- -	- -	- -	- -	- -	0.8
AG-4	- -	- -	2.40	- -	- -	0.80	- -	1.5	0.5
pH									
AG-1	- -	- -	6.76	- -	- -	7.00	- -	7.2	7.4
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	7.2
AG-4	- -	- -	6.90	- -	- -	7.38	- -	7.5	7.5
Flow (cfs)									
AG-1	- -	- -	12.47	- -	- -	6.22	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	105.21	- -	- -	33.67	- -	- -	- -
Dissolved Oxygen									
AG-1	2.18	3.33	3.49	2.60	1.95	1.22	1.00	1.80	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	5.5
AG-4	8.26	8.66	8.39	7.53	7.40	6.55	6.60	7.20	- -
Temperature (F)									
AG-1	66.6	64.4	65.2	71.3	76.1	81.8	84.2	82.4	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	58
AG-4	64.4	61.6	63.0	69.8	74.6	80.0	80.6	78.8	

Table D-2. Payne Creek - Agrico Ft. Green Reclamation Report -
January 1983 through November 1983

Parameter/Location	1/83	2/83	3/83	4/83	5/83	6/83	7/83	8/83	11/83
Alkalinity									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	57
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Ammonia (NH3)									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Arsenic									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Barium									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	<0.01
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Berylium									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	0.69
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Bicarbonate (HCO3)									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Biological Oxygen Demand									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	0.4
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table D-2. Payne Creek - Agrico Ft. Green Reclamation Report -
January 1983 through November 1983

Parameter/Location	1/83	2/83	3/83	4/83	5/83	6/83	7/83	8/83	11/83
Cadmium									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Carbonate (CO3)									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Chromium									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	<0.10
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Copper									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	<0.01
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total Dissolved Solids									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	252
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Gross Alpha (AGi/l)									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	4.4
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Iron									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	0.05
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table D-2. Payne Creek - Agrico Ft. Green Reclamation Report -
January 1983 through November 1983

Parameter/Location	1/83	2/83	3/83	4/83	5/83	6/83	7/83	8/83	11/83
Kjeidahl Nitrogen									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Lead									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	<0.20
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Manganese									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Nitrate (NO3)									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	0.43
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	0.9
AG-4	- -	- -	- -	- -	- -	- -	- -	0.05	0.23
Nitrite (NO2)									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Specific Conductivity (UMHOS)									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	860
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Sulfate									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table D-2. Payne Creek - Agrico Ft. Green Reclamation Report -
January 1983 through November 1983

Parameter/Location	1/83	2/83	3/83	4/83	5/83	6/83	7/83	8/83	11/83
Total Nitrogen									
AG-1	- -	- -	- -	- -	- -	- -	- -	3.5	2.12
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	0.69
AG-4	- -	- -	- -	- -	- -	- -	- -	0.7	0.11
Total Phosphate									
AG-1	- -	- -	- -	- -	- -	- -	- -	0.52	0.6
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	0.18
AG-4	- -	- -	- -	- -	- -	- -	- -	0.45	0.28
Total Phosphorus									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Zinc									
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	<0.05
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total Hardness									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Sulfide									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Chloride									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Chemical Oxygen Demand									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Calcium									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Magnesium									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Nickel									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table D-2. Payne Creek - Agrico Ft. Green Reclamation Report -
January 1983 through November 1983

Parameter/Location	1/83	2/83	3/83	4/83	5/83	6/83	7/83	8/83	11/83
Sodium									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Selenium									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Phenols									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
MBAS									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Fecal Strep (per 100 ml)									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -
Hexane Solubles									
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table D-3. Payne Creek - Agrico Ft. Green Reclamation Report -
1984 through 1986

Parameter/Location	2/84	6/84	8/84	10/84	2/85	5/85	8/85	11/85	2/86	5/86
Silicon										
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total Suspended Solids										
AG-1	- -	- -	8	3.4	3.7	4.6	4.9	3.6	10.4	9.8
AG-2	- -	- -	5.1	2.6	4.9	26.3	3.2	1.2	4.3	3.6
AG-3	- -	- -	1.8	1.3	2	28.3	2.2	1	2.6	1.5
AG-4	- -	- -	4.2	3.3	1	1	2.2	1	2.6	1.5
Flouride (Mg/L)										
AG-1	1.69	1.88	0.74	1.17	1.31	1.21	1.01	1.01	0.93	1.07
AG-2	- -	- -	0.53	0.61	0.58	0.76	1.88	1.2	0.5	0.46
AG-3	1.67	1.18	0.58	0.62	0.64	0.76	1.91	1.21	0.64	0.56
AG-4	1.78	0.37	0.65	1.16	0.93	1.11	1.64	1.33	0.95	0.6
Turbidity (NTU)										
AG-1	1.1	4	2.5	2.2	1.5	3	2.4	4.4	4	6.2
AG-2	- -	- -	2.5	1.2	1	15	1.3	1.3	2	4.5
AG-3	1.1	2.8	1	1	1	18	0.9	2.5	0.8	2.5
AG-4	1.2	1.8	1.8	1.5	0.8	0.5	1.6	1	1.2	1.5
pH										
AG-1	6.8	6.9	6.8	7.8	7.2	7.1	6.6	7.2	7.1	7.1
AG-2	- -	- -	6.8	6.8	6.7	6.3	7.1	6.9	6.6	7.1
AG-3	7.2	7.1	7	6.9	7.2	7	7.1	6.9	6.9	6.5
AG-4	7.6	7.8	6.9	7.7	7.7	7.4	7.2	7.6	7.3	7.6
Flow (cfs)										
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Dissolved Oxygen										
AG-1	- -	- -	0.1	2	2.2	4.2	0.1	1.5	3	0.5
AG-2	- -	- -	1	4.2	5	0.4	1.8	2	1.5	1.1
AG-3	9.5	1.7	1	4	5.7	0.1	1.8	2.2	2.6	1
AG-4	- -	- -	4.5	9	8.8	6.2	4.4	5.6	7.2	7.4
Temperature (F)										
AG-1	- -	- -	78	60	68	78	80	72	66	70
AG-2	- -	- -	82	63	59	80	85	75	66	73
AG-3	65	80	81	63	59	80	85	76	66	72
AG-4	- -	- -	77	63	58	80	82	73	64	70

Table D-3. Payne Creek - Agrico Ft. Green Reclamation Report -
1984 through 1986

Parameter/Location	2/84	6/84	8/84	10/84	2/85	5/85	8/85	11/85	2/86	5/86
Alkalinity										
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	46	50	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Ammonia (NH3)										
AG-1	- -	- -	0.07	0.16	0.51	0.17	0.1	0.11	<0.02	0.17
AG-2	- -	- -	0.51	0.34	0.03	0.28	0.2	0.03	0.03	0.9
AG-3	- -	- -	0.36	0.24	0.23	0.12	0.18	0.04	0.02	0.03
AG-4	- -	- -	0.09	0.02	0.03	0.04	0.02	0.04	0.02	0.05
Arsenic										
AG-1	- -	- -	<0.002	<0.001	<0.001	<0.03	- -	- -	- -	- -
AG-2	- -	- -	<0.002	<0.001	<0.001	<0.03	- -	- -	- -	- -
AG-3	- -	- -	<0.002	<0.001	<0.001	<0.03	- -	- -	- -	- -
AG-4	- -	- -	<0.002	<0.001	<0.001	<0.03	- -	- -	- -	- -
Barium										
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	<0.01	<0.01	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Berylium										
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	<0.01	<0.01	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Bicarbonate (HCO3)										
AG-1	- -	- -	71	283	81	160	56	191	191	203
AG-2	- -	- -	52	62	70	72	60	63	57	50
AG-3	- -	- -	56	65	72	90	52	64	64	62
AG-4	- -	- -	29	75	69	98	52	69	50	61
Biological Oxygen Demand										
AG-1	- -	- -	6.7	3.9	2.8	5.0	4.9	3.6	6.7	5.4
AG-2	- -	- -	1.5	1.1	1.1	4.0	1.1	1.7	0.9	1.5
AG-3	1.2	3	0.5	0.6	0.8	2.0	1.5	1.6	0.6	1.3
AG-4	- -	- -	1.6	1.8	1.1	2.0	0.8	5.8	1.5	1.5

Table D-3. Payne Creek - Agrico Ft. Green Reclamation Report - 1984 through 1986

Parameter/Location	2/84	6/84	8/84	10/84	2/85	5/85	8/85	11/85	2/86	5/86
Cadmium										
AG-1	- -	- -	0.02	<0.005	<0.01	<0.005	- -	- -	- -	- -
AG-2	- -	- -	0.02	<0.005	<0.01	<0.005	- -	- -	- -	- -
AG-3	- -	- -	0.01	<0.005	<0.01	<0.005	- -	- -	- -	- -
AG-4	- -	- -	0.01	<0.005	<0.01	<0.005	- -	- -	- -	- -
Carbonate (CO3)										
AG-1	- -	- -	0.0	0.0	0.0	0.0	- -	- -	- -	- -
AG-2	- -	- -	0.0	0.0	0.0	0.0	- -	- -	- -	- -
AG-3	- -	- -	0.0	0.0	0.0	0.0	- -	- -	- -	- -
AG-4	- -	- -	0.0	0.0	0.0	0.0	- -	- -	- -	- -
Chromium										
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	<0.10	<0.01	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Copper										
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	<0.01	<0.01	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total Dissolved Solids										
AG-1	- -	- -	188.0	374.0	278.6	248.3	201.0	273.0	291.8	331.4
AG-2	- -	- -	141.0	164.0	148.5	205.0	248.0	179.0	252.0	191.0
AG-3	284	202	154.0	176.0	182.0	185.0	214.0	170.0	120.0	192.9
AG-4	- -	- -	177.0	181.0	171.4	186.3	244.0	190.0	125.7	221.4
Gross Alpha (AGi/l)										
AG-1	- -	- -	0.30	14.00	0.50	<0.10	8.20	2.60	<0.10	11.60
AG-2	- -	- -	0.10	<0.10	<0.10	1.20	1.00	1.50	0.70	7.50
AG-3	0.7	1.3	0.60	0.40	0.10	0.10	0.80	3.40	2.90	8.40
AG-4	- -	- -	1.10	2.40	0.70	0.10	8.20	2.60	0.10	10.20
Iron										
AG-1	- -	- -	1.51	0.22	0.67	0.94	2.94	0.92	1.02	1.48
AG-2	- -	- -	1.63	0.40	0.73	5.60	0.32	0.38	0.48	0.85
AG-3	0.19	1.56	0.50	0.32	0.20	4.77	0.16	0.36	0.18	0.65
AG-4	- -	- -	1.01	0.10	0.20	0.20	0.48	0.14	0.28	0.26

Table D-3. Payne Creek - Agrico Ft. Green Reclamation Report -
1984 through 1986

Parameter/Location	2/84	6/84	8/84	10/84	2/85	5/85	8/85	11/85	2/86	5/86
Kjeidahl Nitrogen										
AG-1	- -	- -	0.37	0.81	1.06	0.37	1.14	0.76	0.73	1.06
AG-2	- -	- -	0.69	0.56	1.44	0.53	0.31	0.29	0.17	0.95
AG-3	- -	- -	0.38	0.63	0.42	0.2	0.22	0.28	0.16	0.42
AG-4	- -	- -	0.5	0.29	0.59	0.22	0.41	0.28	0.31	0.31
Lead										
AG-1	- -	- -	<0.01	<0.03	<0.05	0.01	- -	- -	- -	- -
AG-2	- -	- -	<0.01	<0.03	<0.05	<0.01	- -	- -	- -	- -
AG-3	<0.20	<0.01	<0.01	<0.03	<0.05	<0.01	- -	- -	- -	- -
AG-4	- -	- -	<0.01	<0.03	<0.05	0.01	- -	- -	- -	- -
Manganese										
AG-1	- -	- -	0.05	0.02	0.02	<0.05	0.02	0.03	0.03	0.05
AG-2	- -	- -	0.06	0.01	0.02	<0.05	<0.02	0.01	0.02	0.02
AG-3	- -	- -	0.03	0.01	0.01	0.05	0.02	0.02	0.02	0.02
AG-4	- -	- -	0.02	0.01	0.01	0.05	0.02	0.01	0.02	0.01
Nitrate (NO3)										
AG-1	1.61	5.9	1.1	<0.01	0.75	<0.02	<0.02	<0.02	<0.02	<0.02
AG-2	- -	- -	0.36	<0.01	0.31	<0.02	0.15	0.15	0.19	<0.02
AG-3	0.39	1.25	0.65	<0.01	0.22	<0.02	0.05	0.05	0.12	0.02
AG-4	0.03	0.5	<0.02	<0.01	0.08	<0.02	1	0.02	0.13	0.02
Nitrite (NO2)										
AG-1	- -	- -	<0.01	0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
AG-2	- -	- -	0.39	0.02	<0.01	0.05	<0.01	<0.01	<0.01	<0.01
AG-3	- -	- -	0.05	0.03	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
AG-4	- -	- -	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Specific Conductivity (UMHOS)										
AG-1	- -	- -	206	577	343	318	191	398	431	314
AG-2	- -	- -	177	219	217	232	256	258	216	142
AG-3	302	244	180	218	225	232	262	259	228	156
AG-4	- -	- -	135	255	243	247	246	271	264	162
Sulfate										
AG-1	- -	- -	12	5	68	<1	- -	- -	- -	- -
AG-2	- -	- -	18	30	32	59	- -	- -	- -	- -
AG-3	- -	- -	17	28	33	50	- -	- -	- -	- -
AG-4	- -	- -	15	38	35	61	- -	- -	- -	- -

Table D-3. Payne Creek - Agrico Ft. Green Reclamation Report -
1984 through 1986

Parameter/Location	2/84	6/84	8/84	10/84	2/85	5/85	8/85	11/85	2/86	5/86
Total Nitrogen										
AG-1	0.48	12.7	1.47	0.83	1.82	0.41	1.77	0.79	0.76	1.09
AG-2	- -	- -	1.44	0.59	1.76	0.6	0.47	0.45	0.37	0.98
AG-3	0.45	2.65	1.08	0.67	0.65	0.23	0.28	0.34	0.29	0.45
AG-4	0.02	0.92	0.53	0.32	0.68	0.25	1.42	0.31	0.46	0.34
Total Phosphate										
AG-1	0.42	0.5	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	0.41	0.5	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	0.5	0.58	- -	- -	- -	- -	- -	- -	- -	- -
Total Phosphorus										
AG-1	- -	- -	0.92	0.42	1.11	1.12	1	0.35	0.6	0.43
AG-2	- -	- -	0.77	0.34	0.29	1.8	0.59	0.45	0.35	0.35
AG-3	- -	- -	0.62	0.25	0.36	0.72	0.57	0.58	0.35	0.15
AG-4	- -	- -	0.79	0.29	0.35	0.25	0.69	0.49	0.51	0.35
Zinc										
AG-1	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-2	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
AG-3	<0.05	<0.01	- -	- -	- -	- -	- -	- -	- -	- -
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total Hardness										
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Sulfide										
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Chloride										
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Chemical Oxygen Demand										
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Calcium										
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Magnesium										
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Nickel										
AG-4	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table D-3. Payne Creek - Agrico Ft. Green Reclamation Report - 1984 through 1986

Parameter/Location	2/84	6/84	8/84	10/84	2/85	5/85	8/85	11/85	2/86	5/86
Sodium										
AG-4	--	--	--	--	--	--	--	--	--	--
Selenium										
AG-4	--	--	--	--	--	--	--	--	--	--
Phenols										
AG-4	--	--	--	--	--	--	--	--	--	--
MBAS										
AG-4	--	--	--	--	--	--	--	--	--	--
Fecal Strep (per 100 ml)										
AG-4	--	--	--	--	--	--	--	--	--	--
Hexane Solubles										
AG-4	--	--	--	--	--	--	--	--	--	--

11.5.4 PAYNE CREEK WATER QUALITY DATA OCTOBER 1988 - MARCH 1989

DECEMBER 1988

ppb
ENVIRONMENTAL LABORATORIES, INC.

January 19, 1989

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607

Dear John:

Enclosed are the results of our analyses of your samples which we received on December 9, 1988.

All data were determined in accordance with published procedures (EPA-600/4-79-020, Methods for Chemical Analysis of Water and Wastes, Revised March 1983). Our laboratory is certified by the Florida DHRS (Lab Nos. 82282 and E82001). Please note the coliform analyses were performed by P.E. LaMoreaux and Associates, Inc., of Lakeland, Florida (Lab Nos. 84183 and E84098). The chlorophyll analyses were performed by CH2M Hill of Gainesville, Florida (Lab Nos. 82112 and E82124). The gross alpha, gross beta, radium 228, and radium 226 analyses were performed by ESE, Inc. of Gainesville, Florida (Lab Nos. 82138 and E82067). The strontium 90 analyses were performed by CEP, Inc. of Santa Fe, New Mexico (Lab No. 87239).

If you have any questions concerning this report, please do not hesitate to give me a call.

Sincerely,

Tom Park

Tom Park
Project Manager

TP:jlm

Enclosure

cc: Dr. Jim Newman
KBN Engineering & Applied Sciences
P.O. Box 14288
Gainesville, FL 32604

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: John Good

PROJECT NO.: 87-008 ATM
DATE: 1/19/89
YOUR REF/PO#: Verbal

Table 1. Water Quality Data (Page 1 of 2)

Station ID:	PC-1	PC-2	PC-3
PPB #:	31083	31084	31085
Alkalinity, mg/L as $CaCO_3$	50	60	58
Cyanide, mg/L	<0.004	<0.004	<0.004
Fluoride, mg/L	0.8	0.8	0.8
Methylene Blue Active Substances, mg/L	<0.025	<0.025	<0.025
Total Kjeldahl Nitrogen, mg/L	0.809	0.883	1.22
Ammonia Nitrogen, mg/L	0.345	0.325	0.486
Organic Nitrogen, mg/L	0.464	0.558	0.734
Nitrate+Nitrite-Nitrogen, mg/L	0.608	0.845	0.951
Total Nitrogen, mg/L	1.42	1.73	2.17
Oil and Grease, mg/L	<5	<5	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	<1	<1	<1
Chemical Oxygen Demand, mg/L	66	75	78
Orthophosphorus, mg/L	0.308	0.307	0.392
Total Phosphorus, mg/L	0.318	0.311	0.430
Sulfate, mg/L	21.5	22.3	23.2
Turbidity, NTU	1.6	1.6	2.3
Aluminum, ug/L	70	81	96
Antimony, ug/L	<10	<10	<10
Arsenic, ug/L	<5	<5	<5
Beryllium, ug/L	<3	<3	<3
Cadmium, ug/L	<0.4	<0.4	<0.4
Chromium, ug/L	<10	<10	<10
Copper, ug/L	<6	<6	<6
Iron, ug/L	181	164	192
Lead, ug/L	<5	<5	<5
Mercury, ug/L	0.5	0.5	0.4
Nickel, ug/L	<15	<15	<15
Selenium, ug/L	<5	<5	<5
Silver, ug/L	<0.08	<0.08	<0.08
Sodium, mg/L	7.9	7.9	8.5
Zinc, ug/L	<5	<5	<5
Total Coliforms, colonies/100 ml	109	164	291
Fecal Coliforms, colonies/100 ml	36	164	182

Tom Park
PROJECT MANAGER

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: John Good

PROJECT NO.: 87-008 ATM

DATE: 1/31/89

YOUR REF/PO#: Verbal

Table 1. Water Quality Data (Page 2 of 2)

	Station ID: PC-4 PPB #: 30735
Alkalinity, mg/L as $CaCO_3$	66
Cyanide, mg/L	<0.004
Fluoride, mg/L	1.3
Methylene Blue Active Substances, mg/L	<0.025
Total Kjeldahl Nitrogen, mg/L	0.702
Ammonia Nitrogen, mg/L	0.006
Organic Nitrogen, mg/L	0.696
Nitrate+Nitrite-Nitrogen, mg/L	1.03
Total Nitrogen, mg/L	1.73
Oil and Grease, mg/L	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	<1
Chemical Oxygen Demand, mg/L	<10
Orthophosphorus, mg/L	0.510
Total Phosphorus, mg/L	0.465
Sulfate, mg/L	50.1
Turbidity, NTU	1.9
Aluminum, ug/L	214
Antimony, ug/L	<10
Arsenic, ug/L	<5
Beryllium, ug/L	<3
Cadmium, ug/L	<0.4
Chromium, ug/L	<10
Copper, ug/L	<6
Iron, ug/L	133
Lead, ug/L	5.9
Mercury, ug/L	<0.2
Nickel, ug/L	<15
Selenium, ug/L	<5
Silver, ug/L	<0.08
Sodium, mg/L	9.4
Zinc, ug/L	<5
Total Coliforms, colonies/100 ml	700
Fecal Coliforms, colonies/100 ml	73

PROJECT MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: Fred Ramsey

PROJECT NO.: 87-008 ATM

DATE: 4/13/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 2. November 1988 Sampling Trip

Station ID: PPB #:	PC-1 30732	PC-2 30733	PC-3 30734	PC-4 30735
Calcium, mg/L	14.6	15.3	16.0	25.8
Magnesium, mg/L	8.3	8.5	8.8	13.2
Manganese, ug/L	5.0	5.6	7.9	8.5
Potassium, mg/L	0.9	0.9	2.3	2.1
Hardness, mg equiv. CaCO3/L	70.6	73.2	76.2	119
Bicarbonate alkalinity, as mg CaCO3/L	42	44	36	66
Carbonate alkalinity, as mg CaCO3/L	<0.5	<0.5	<0.5	<0.5

PROJECT MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 1/31/89

YOUR REF/PO#: Verbal

Table 2. Radiation and Chlorophyll Data

ID No.:	PC-1	PC-2	PC-3	PC-4
PPB #:	30732	30733	30734	30735
Alpha, Gross (pC/L)	0.5	3.0	1.2	3.9
Alpha, Gross, Ct. Error +/- (pC/L)	1.2	1.7	1.5	2.3
Beta, Gross (pC/L)	0.8	3.2	2.3	1.2
Beta, Gross, Ct. Error +/- (pC/L)	1.7	2.0	1.8	1.8
Radium 226 (pC/L)	1.0	1.2	0.9	0.7
Radium 226 Ct. Error +/- (pC/L)	0.1	0.1	0.1	0.1
Radium 228 (pC/L)	0.8	0.0	0.8	1.0
Radium 228, Ct. Error (pC/L)	0.7	0.7	0.7	0.6
Strontium-90 (pC/L)	<0.5	<0.5	<0.5	<0.5
Chlorophyll-a, mg/m^3	ND*	ND	ND	ND

*ND=None detected.

Tom Park
Project Manager

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 1/31/89

YOUR REF/PO#: Verbal

Table 3. Organics Data (all results as ug/L, micrograms per liter) (Page 1 of 2)

ID No.: PPB #:	PC-1 30732	PC-2 30733	PC-3 30734	PC-4 30735
Phenols	<5	<5	<5	<5
Aldrin	<0.003	<0.003	<0.003	<0.003
Dieldrin	<0.003	<0.003	<0.003	<0.003
Chlordane	<0.01	<0.01	<0.01	<0.01
4,4'DDT	<0.001	<0.001	<0.001	<0.001
Demeton	<0.1	<0.1	<0.1	<0.1
Endrin	<0.004	<0.004	<0.004	<0.004
Endosulfan	<0.003	<0.003	<0.003	<0.003
Guthion	<0.01	<0.01	<0.01	<0.01
Heptachlor	<0.001	<0.001	<0.001	<0.001
Lindane	<0.01	<0.01	<0.01	<0.01
Malathion	<0.1	<0.1	<0.1	<0.1
Methoxychlor	<0.03	<0.03	<0.03	<0.03
Myrex	<0.001	<0.001	<0.001	<0.001
Parathion	<0.04	<0.04	<0.04	<0.04
2,4-D	<10	<10	<10	<10
Silvex	<20	<20	<20	<20
Toxaphene	<0.005	<0.005	<0.005	<0.005
PCB-1016	<0.001	<0.001	<0.001	<0.001
PCB-12217	<0.001	<0.001	<0.001	<0.001
PCB-1232	<0.001	<0.001	<0.001	<0.001
PCB-1242	<0.001	<0.001	<0.001	<0.001
PCB-1248	<0.001	<0.001	<0.001	<0.001
PCB-1254	<0.001	<0.001	<0.001	<0.001
PCB-1260	<0.001	<0.001	<0.001	<0.001

*ND=None detected.

Tom Park
Project Manager

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 1/31/89

YOUR REF/PO#: Verbal

Table 3. Organics Data (all results as ug/L, micrograms per liter) (Page 2 of 2)

ID No.:	PC-1	PC-2	PC-3	PC-4
PPB #:	30732	30733	30734	30735
Chlorinated Hydrocarbons				
2-Chloronapthalene	<10	<10	<10	<10
1,2-Dichlorobenzene	<10	<10	<10	<10
1,3-Dichlorobenzene	<10	<10	<10	<10
1,4-Dichlorobenzene	<10	<10	<10	<10
Hexachlorobenzene	<10	<10	<10	<10
Hexachlorobutadiene	<10	<10	<10	<10
Hexachlorocyclopentadiene	<10	<10	<10	<10
Hexachloroethane	<10	<10	<10	<10
1,2,4-Trichlorobenzene	<10	<10	<10	<10

*ND=None detected.

Tom Park
Project Manager

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: Fred Ramsey

PROJECT NO.: 87-008 ATM

DATE: 4/13/89

YOUR REF/PO#: Verbal

Table 2. November 1988 Sampling Trip

DHRS#: 82282, E82001

Station ID:	PC-1	PC-2	PC-3	PC-4
PPB #:	30732	30733	30734	30735
Calcium, mg/L	14.6	15.3	16.0	25.8
Magnesium, mg/L	8.3	8.5	8.8	13.2
Manganese, ug/L	5.0	5.6	7.9	8.5
Potassium, mg/L	0.9	0.9	2.3	2.1
Hardness, mg equiv. CaCO3/L	70.6	73.2	76.2	119
Bicarbonate alkalinity, as mg CaCO3/L	42	44	36	66
Carbonate alkalinity, as mg CaCO3/L	<0.5	<0.5	<0.5	<0.5

PROJECT MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 1/31/89

YOUR REF/PO#: Verbal

Table 2. Radiation and Chlorophyll Data

ID No.:	PC-1	PC-2	PC-3	PC-4
PPB #:	30732	30733	30734	30735
Alpha, Gross (pC/L)	0.5	3.0	1.2	3.9
Alpha, Gross, Ct. Error +/- (pC/L)	1.2	1.7	1.5	2.3
Beta, Gross (pC/L)	0.8	3.2	2.3	1.2
Beta, Gross, Ct. Error +/- (pC/L)	1.7	2.0	1.8	1.8
Radium 226 (pC/L)	1.0	1.2	0.9	0.7
Radium 226 Ct. Error +/- (pC/L)	0.1	0.1	0.1	0.1
Radium 228 (pC/L)	0.8	0.0	0.8	1.0
Radium 228, Ct. Error (pC/L)	0.7	0.7	0.7	0.6
Strontium-90 (pC/L)	<0.5	<0.5	<0.5	<0.5
Chlorophyll-a, mg/m^3	ND*	ND	ND	ND

*ND=None detected.

Tom Park
Project Manager

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 1/31/89

YOUR REF/PO#: Verbal

Table 3. Organics Data (all results as ug/L, micrograms per liter) (Page 1 of 2)

ID No.: PPB #:	PC-1 30732	PC-2 30733	PC-3 30734	PC-4 30735
Phenols	<5	<5	<5	<5
Aldrin	<0.003	<0.003	<0.003	<0.003
Dieldrin	<0.003	<0.003	<0.003	<0.003
Chlordane	<0.01	<0.01	<0.01	<0.01
4,4'DDT	<0.001	<0.001	<0.001	<0.001
Demeton	<0.1	<0.1	<0.1	<0.1
Endrin	<0.004	<0.004	<0.004	<0.004
Endosulfan	<0.003	<0.003	<0.003	<0.003
Guthion	<0.01	<0.01	<0.01	<0.01
Heptachlor	<0.001	<0.001	<0.001	<0.001
Lindane	<0.01	<0.01	<0.01	<0.01
Malathion	<0.1	<0.1	<0.1	<0.1
Methoxychlor	<0.03	<0.03	<0.03	<0.03
Myrex	<0.001	<0.001	<0.001	<0.001
Parathion	<0.04	<0.04	<0.04	<0.04
2,4-D	<10	<10	<10	<10
Silvex	<20	<20	<20	<20
Toxaphene	<0.005	<0.005	<0.005	<0.005
PCB-1016	<0.001	<0.001	<0.001	<0.001
PCB-12217	<0.001	<0.001	<0.001	<0.001
PCB-1232	<0.001	<0.001	<0.001	<0.001
PCB-1242	<0.001	<0.001	<0.001	<0.001
PCB-1248	<0.001	<0.001	<0.001	<0.001
PCB-1254	<0.001	<0.001	<0.001	<0.001
PCB-1260	<0.001	<0.001	<0.001	<0.001

*ND=None detected.

Tom Park
Project Manager

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 1/31/89

YOUR REF/PO#: Verbal

Table 3. Organics Data (all results as ug/L, micrograms per liter) (Page 2 of 2)

ID No.:	PC-1	PC-2	PC-3	PC-4
PPB #:	30732	30733	30734	30735
Chlorinated Hydrocarbons				
2-Chloronapthalene	<10	<10	<10	<10
1,2-Dichlorobenzene	<10	<10	<10	<10
1,3-Dichlorobenzene	<10	<10	<10	<10
1,4-Dichlorobenzene	<10	<10	<10	<10
Hexachlorobenzene	<10	<10	<10	<10
Hexachlorobutadiene	<10	<10	<10	<10
Hexachlorocyclopentadiene	<10	<10	<10	<10
Hexachloroethane	<10	<10	<10	<10
1,2,4-Trichlorobenzene	<10	<10	<10	<10

*ND=None detected.

Tom Park
Project Manager

DECEMBER 1988

ppb
ENVIRONMENTAL LABORATORIES, INC.

January 19, 1989

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607

Dear John:

Enclosed are the results of our analyses of your samples which we received on December 9, 1988.

All data were determined in accordance with published procedures (EPA-600/4-79-020, Methods for Chemical Analysis of Water and Wastes, Revised March 1983). Our laboratory is certified by the Florida DHRS (Lab Nos. 82282 and E82001). Please note the coliform analyses were performed by P.E. LaMoreaux and Associates, Inc., of Lakeland, Florida (Lab Nos. 84183 and E84098). The chlorophyll analyses were performed by CH2M Hill of Gainesville, Florida (Lab Nos. 82112 and E82124). The gross alpha, gross beta, radium 228, and radium 226 analyses were performed by ESE, Inc. of Gainesville, Florida (Lab Nos. 82138 and E82067). The strontium 90 analyses were performed by CEP, Inc. of Santa Fe, New Mexico (Lab No. 87239).

If you have any questions concerning this report, please do not hesitate to give me a call.

Sincerely,

Tom Park

Tom Park
Project Manager

TP:jlm

Enclosure

cc: Dr. Jim Newman
KBN Engineering & Applied Sciences
P.O. Box 14288
Gainesville, FL 32604

6821 SW ARCHER ROAD, GAINESVILLE, FLORIDA 32608 Tel. (904) 377-2349

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: John Good

PROJECT NO.: 87-008 ATM

DATE: 1/19/89

YOUR REF/PO#: Verbal

Table 1. Water Quality Data (Page 1 of 2)

Station ID:	PC-1	PC-2	PC-3
PPB #:	31083	31084	31085
Alkalinity, mg/L as $CaCO_3$	50	60	58
Cyanide, mg/L	<0.004	<0.004	<0.004
Fluoride, mg/L	0.8	0.8	0.8
Methylene Blue Active Substances, mg/L	<0.025	<0.025	<0.025
Total Kjeldahl Nitrogen, mg/L	0.809	0.883	1.22
Ammonia Nitrogen, mg/L	0.345	0.325	0.486
Organic Nitrogen, mg/L	0.464	0.558	0.734
Nitrate+Nitrite-Nitrogen, mg/L	0.608	0.845	0.951
Total Nitrogen, mg/L	1.42	1.73	2.17
Oil and Grease, mg/L	<5	<5	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	<1	<1	<1
Chemical Oxygen Demand, mg/L	66	75	78
Orthophosphorus, mg/L	0.308	0.307	0.392
Total Phosphorus, mg/L	0.318	0.311	0.430
Sulfate, mg/L	21.5	22.3	23.2
Turbidity, NTU	1.6	1.6	2.3
Aluminum, ug/L	70	81	96
Antimony, ug/L	<10	<10	<10
Arsenic, ug/L	<5	<5	<5
Beryllium, ug/L	<3	<3	<3
Cadmium, ug/L	<0.4	<0.4	<0.4
Chromium, ug/L	<10	<10	<10
Copper, ug/L	<6	<6	<6
Iron, ug/L	181	164	192
Lead, ug/L	<5	<5	<5
Mercury, ug/L	0.5	0.5	0.4
Nickel, ug/L	<15	<15	<15
Selenium, ug/L	<5	<5	<5
Silver, ug/L	<0.08	<0.08	<0.08
Sodium, mg/L	7.9	7.9	8.5
Zinc, ug/L	<5	<5	<5
Total Coliforms, colonies/100 ml	109	164	291
Fecal Coliforms, colonies/100 ml	36	164	182

Tom Park
PROJECT MANAGER

ppb ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: John Good

PROJECT NO.: 87-008 ATM

DATE: 11/11/88

YOUR REF/PO#: Verbal

Table 1. (Page 1 of 2)

Station ID:	PC-1	PC-2	PC-3
PPB #:	30013	30014	30015
Alkalinity, mg/L as $CaCO_3$	48	44	44
Cyanide, mg/L	<0.004	<0.004	<0.004
Fluoride, mg/L	0.6	0.9	1.2
Methylene Blue Active Substances, mg/L	<0.025	<0.025	<0.025
Total Kjeldahl Nitrogen, mg/L	0.864	0.737	1.53
Ammonia Nitrogen, mg/L	0.121	0.030	<0.005
Organic Nitrogen, mg/L	0.743	0.707	1.53
Nitrate+Nitrite-Nitrogen, mg/L	0.190	0.617	0.625
Total Nitrogen, mg/L	1.05	1.35	2.16
Oil and Grease, mg/L	<5	<5	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	<1	1.0	1.2
Chemical Oxygen Demand, mg/L	31	47	70
Orthophosphorus, mg/L	0.500	0.509	0.572
Total Phosphorus, mg/L	0.573	0.624	0.703
Sulfate, mg/L	9.2	17.4	16.9
Turbidity, NTU	1.5	2.0	6.1
Aluminum, ug/L	137	220	169
Antimony, ug/L	<10	<10	<10
Arsenic, ug/L	<5	<5	<5
Beryllium, ug/L	<3	<3	<3
Cadmium, ug/L	<0.4	<0.4	<0.4
Chromium, ug/L	<10	<10	<10
Copper, ug/L	<6	<6	<6
Iron, ug/L	648	542	440
Lead, ug/L	<5	<5	<5
Mercury, ug/L	<0.2	<0.2	<0.2
Nickel, ug/L	<15	<15	<15
Selenium, ug/L	<5	<5	<5
Silver, ug/L	<0.08	<0.08	<0.08
Sodium, mg/L	6.3	6.8	7.5
Zinc, ug/L	<5	10	<5
Total Coliforms, colonies/100 ml	209	600	2,000
Fecal Coliforms, colonies/100 ml	18	36	118

PROJECT MANAGER

OCTOBER 1988

ppb
ENVIRONMENTAL LABORATORIES, INC.

November 11, 1988

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607

Dear John:

Enclosed are the results of our analyses of your samples which we received on October 7, 1988.

All data were determined in accordance with published procedures (EPA-600/14-79-020, Methods for Chemical Analysis of Water and Wastes, Revised March 1983). Our laboratory is certified by the Florida DHRS (Lab Nos. 82282 and E82001). Please note the coliform analyses were performed by P.E. LaMoreaux and Associates, Inc., of Lakeland, Florida (Lab Nos. 84183 and E84098). The chlorophyll analyses were performed by CH2M Hill of Gainesville, Florida (Lab Nos. 82112 and E82124). The gross alpha, gross beta, radium 228, and radium 226 analyses were performed by ESE, Inc. of Gainesville, Florida (Lab Nos. 82138 and E82067). The strontium 90 analyses were performed by CEP, Inc. of Santa Fe, New Mexico (Lab No. 87239).

If you have any questions concerning this report, please do not hesitate to give me a call.

Sincerely,

Tom Park

Tom Park
Project Manager

TP:jlm

Enclosure

cc: Dr. Jim Newman
KBN Engineering & Applied Sciences
P.O. Box 14288
Gainesville, FL 32604

6821 SW ARCHER ROAD, GAINESVILLE, FLORIDA 32608 Tel. (904) 377-2349

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: John Good

PROJECT NO.: 87-008 ATM

DATE: 11/11/88

YOUR REF/PO#: Verbal

Table 1. (Page 2 of 2)

Station ID:	PC-4
PPB #:	30016
Alkalinity, mg/L as $CaCO_3$	56
Cyanide, mg/L	<0.004
Fluoride, mg/L	1.4
Methylene Blue Active Substances, mg/L	<0.025
Total Kjeldahl Nitrogen, mg/L	0.896
Ammonia Nitrogen, mg/L	<0.005
Organic Nitrogen, mg/L	0.896
Nitrate+Nitrite-Nitrogen, mg/L	0.994
Total Nitrogen, mg/L	1.89
Oil and Grease, mg/L	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	<1
Chemical Oxygen Demand, mg/L	69
Orthophosphorus, mg/L	0.478
Total Phosphorus, mg/L	0.578
Sulfate, mg/L	30.2
Turbidity, NTU	2.9
Aluminum, ug/L	365
Antimony, ug/L	<10
Arsenic, ug/L	<5
Beryllium, ug/L	<3
Cadmium, ug/L	<0.4
Chromium, ug/L	<10
Copper, ug/L	<6
Iron, ug/L	332
Lead, ug/L	<5
Mercury, ug/L	<0.2
Nickel, ug/L	<15
Selenium, ug/L	<5
Silver, ug/L	<0.08
Sodium, mg/L	8.6
Zinc, ug/L	<5
Total Coliforms, colonies/100 ml	400
Fecal Coliforms, colonies/100 ml	146

PROJECT MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: Fred Ramsey

PROJECT NO.: 87-008 ATM

DATE: 4/13/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 1. October 1988 Sampling Trip

Station ID: PPB #:	PC-1 30013	PC-2 30014	PC-3 30015	PC-4 30016
Calcium, mg/L	12.3	14.9	16.1	22.1
Magnesium, mg/L	7.0	7.6	7.7	10.9
Manganese, ug/L	16	16	15	18
Potassium, mg/L	NA*	NA	NA	NA
Hardness, mg equiv. CaCO3/L	59.5	68.5	71.9	100
Bicarbonate alkalinity, as mg CaCO3/L	48	44	44	56
Carbonate alkalinity, as mg CaCO3/L	<0.5	<0.5	<0.5	<0.5

*NA=Not available.

PROJECT MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 11/11/88

YOUR REF/PO#: Verbal

Table 2.

ID No.:	PC-1	PC-2	PC-3	PC-4
PPB #:	30013	30014	30015	30016
Alpha, Gross (pC/L)	0.9	2.5	2.2	0.5
Alpha, Gross, Ct. Error +/- (pC/L)	1.2	1.2	1.6	2.2
Beta, Gross (pC/L)	2.3	5.5	6.1	5.1
Beta, Gross, Ct. Error +/- (pC/L)	1.4	1.5	1.6	1.9
Radium 226 (pC/L)	0.7	0.5	1.1	1.0
Radium 226 Ct. Error +/- (pC/L)	0.1	0.1	0.1	0.1
Radium 228 (pC/L)	0.0	0.0	0.2	0.0
Radium 228, Ct. Error (pC/L)	0.5	0.5	0.4	0.5
Strontium-90 (pC/L)	<0.5	<0.5	<0.5	<0.5
Chlorophyll-a, mg/m^3	ND*	ND	29.9	1.28

*ND=None detected.

Tom Paul
Project Manager

NOVEMBER 1988

ppb
ENVIRONMENTAL LABORATORIES, INC.

January 31, 1989

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607

Dear John:

Enclosed are the results of our analyses of your samples which we received on November 10, 1988.

All data were determined in accordance with published procedures (EPA-600/4-79-020, Methods for Chemical Analysis of Water and Wastes, Revised March 1983). Our laboratory is certified by the Florida DHRS (Lab Nos. 82282 and E82001). Please note the coliform analyses were performed by P.E. LaMoreaux and Associates, Inc., of Lakeland, Florida (Lab Nos. 84183 and E84098). The chlorophyll analyses were performed by CH2M Hill of Gainesville, Florida (Lab Nos. 82112 and E82124). The gross alpha, gross beta, radium 228, and radium 226 analyses were performed by ESE, Inc. of Gainesville, Florida (Lab Nos. 82138 and E82067). The strontium 90 analyses were performed by CEP, Inc. of Santa Fe, New Mexico (Lab No. 87239). The organics analyses were performed by Southeastern Environmental Laboratories, Inc. of Orange Park, Florida (Lab Nos. 82315 and E82179).

If you have any questions concerning this report, please do not hesitate to give me a call.

Sincerely,

Tom Park

Tom Park
Project Manager

TP:jlm

Enclosure

cc: Dr. Jim Newman
KBN Engineering & Applied Sciences
P.O. Box 14288
Gainesville, FL 32604

6821 SW ARCHER ROAD, GAINESVILLE, FLORIDA 32608 Tel. (904) 377-2349

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: John Good

PROJECT NO.: 87-008 ATM

DATE: 1/31/89

YOUR REF/PO#: Verbal

Table 1. Water Quality Data (Page 1 of 2)

Station ID:	PC-1	PC-2	PC-3
PPB #:	30732	30733	30734
Alkalinity, mg/L as $CaCO_3$	42	44	36
Cyanide, mg/L	<0.004	<0.004	<0.004
Fluoride, mg/L	0.6	0.6	0.5
Methylene Blue Active Substances, mg/L	<0.025	<0.025	<0.025
Total Kjeldahl Nitrogen, mg/L	0.770	0.747	0.566
Ammonia Nitrogen, mg/L	<0.005	<0.005	0.019
Organic Nitrogen, mg/L	0.770	0.747	0.547
Nitrate+Nitrite-Nitrogen, mg/L	0.218	0.258	0.516
Total Nitrogen, mg/L	0.988	1.00	1.08
Oil and Grease, mg/L	<5	<5	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	<1	1.7	<1
Chemical Oxygen Demand, mg/L	<10	<10	<10
Orthophosphorus, mg/L	0.404	0.416	0.510
Total Phosphorus, mg/L	0.318	0.332	0.444
Sulfate, mg/L	25.0	25.3	34.4
Turbidity, NTU	1.1	0.8	1.9
Aluminum, ug/L	67	116	157
Antimony, ug/L	<10	<10	<10
Arsenic, ug/L	<5	<5	<5
Beryllium, ug/L	<3	<3	<3
Cadmium, ug/L	<0.4	<0.4	<0.4
Chromium, ug/L	<10	<10	<10
Copper, ug/L	<6	<6	<6
Iron, ug/L	224	210	229
Lead, ug/L	6.7	<5	<5
Mercury, ug/L	<0.2	<0.2	<0.2
Nickel, ug/L	<15	<15	<15
Selenium, ug/L	<5	<5	<5
Silver, ug/L	<0.08	<0.08	<0.08
Sodium, mg/L	7.6	7.8	8.6
Zinc, ug/L	<5	<5	<5
Total Coliforms, colonies/100 ml	364	418	809
Fecal Coliforms, colonies/100 ml	73	64	291

Tom Park
PROJECT MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: John Good

PROJECT NO.: 87-008 ATM

DATE: 1/19/89

YOUR REF/PO#: Verbal

Table 1. Water Quality Data (Page 2 of 2)

Station ID:	PC-4
PPB #:	31086
Alkalinity, mg/L as $CaCO_3$	65
Cyanide, mg/L	<0.004
Fluoride, mg/L	1.7
Methylene Blue Active Substances, mg/L	<0.025
Total Kjeldahl Nitrogen, mg/L	0.698
Ammonia Nitrogen, mg/L	0.034
Organic Nitrogen, mg/L	0.664
Nitrate+Nitrite-Nitrogen, mg/L	2.77
Total Nitrogen, mg/L	3.47
Oil and Grease, mg/L	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	<1
Chemical Oxygen Demand, mg/L	171
Orthophosphorus, mg/L	0.364
Total Phosphorus, mg/L	0.378
Sulfate, mg/L	43.9
Turbidity, NTU	1.6
Aluminum, ug/L	111
Antimony, ug/L	<10
Arsenic, ug/L	<5
Beryllium, ug/L	<3
Cadmium, ug/L	<0.4
Chromium, ug/L	<10
Copper, ug/L	<6
Iron, ug/L	118
Lead, ug/L	<5
Mercury, ug/L	0.3
Nickel, ug/L	<15
Selenium, ug/L	<5
Silver, ug/L	<0.08
Sodium, mg/L	9.1
Zinc, ug/L	<5
Total Coliforms, colonies/100 ml	709
Fecal Coliforms, colonies/100 ml	346

Don Paul
PROJECT MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: Fred Ramsey

PROJECT NO.: 87-008 ATM

DATE: 4/13/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 3. December 1988 Sampling Trip

Station ID: PPB #:	PC-1 31083	PC-2 31084	PC-3 31085	PC-4 31086
Calcium, mg/L	15.4	15.6	15.7	26.3
Magnesium, mg/L	9.1	9.1	8.8	12.8
Manganese, ug/L	4.1	3.2	7.0	6.7
Potassium, mg/L	0.7	0.9	1.7	1.8
Hardness, mg equiv. CaCO3/L	75.9	77.5	75.4	118
Bicarbonate alkalinity, as mg CaCO3/L	50	60	58	65
Carbonate alkalinity, as mg CaCO3/L	<0.5	<0.5	<0.5	<0.5

Tom Park
PROJECT MANAGER

ppb

ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 1/19/89

YOUR REF/PO#: Verbal

Table 2. Radiation and Chlorophyll-a Data

ID No.: PPB #:	PC-1 31083	PC-2 31084	PC-3 31085	PC-4 31086
Alpha, Gross (pC/L)	3.8	0.4	2.0	4.6
Alpha, Gross, Ct. Error +/- (pC/L)	2.1	1.5	1.9	3.0
Beta, Gross (pC/L)	0.2	1.7	4.1	2.8
Beta, Gross, Ct. Error +/- (pC/L)	1.6	1.7	2.6	3.6
Radium 226 (pC/L)	0.6	0.1	0.9	0.6
Radium 226 Ct. Error +/- (pC/L)	0.0	0.0	0.0	0.0
Radium 228 (pC/L)	0.5	0.1	1.1	1.2
Radium 228, Ct. Error (pC/L)	0.9	0.7	0.7	0.7
Strontium-90 (pC/L)	<0.5	<0.5	<0.5	<0.5
Chlorophyll-a, mg/m^3	<1	<1	<1	<1

*ND=None detected.

Project Manager

JANUARY 1989

ppb
ENVIRONMENTAL LABORATORIES, INC.

February 24, 1989

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607

Dear John:

Enclosed are the results of our analyses of your samples which we received on January 13, 1989.

All data were determined in accordance with published procedures (EPA-600/4-79-020, Methods for Chemical Analysis of Water and Wastes, Revised March 1983). Our laboratory is certified by the Florida DHRS (Lab Nos. 82282 and E82001). Please note the coliform analyses were performed by P.E. LaMoreaux and Associates, Inc., of Lakeland, Florida (Lab Nos. 84183 and E84098). The chlorophyll analyses were performed by CH2M Hill of Gainesville, Florida (Lab Nos. 82112 and E82124). The gross alpha, gross beta, radium 228, and radium 226 analyses were performed by ESE, Inc. of Gainesville, Florida (Lab Nos. 82138 and E82067). The strontium 90 analyses were performed by CEP, Inc. of Santa Fe, New Mexico (Lab No. 87239).

If you have any questions concerning this report, please do not hesitate to give me a call.

Sincerely,

Kelly Bugdall for Tom Park
Tom Park
Project Manager

TP:jlm

Enclosure

cc: Dr. Jim Newman
KBN Engineering & Applied Sciences
P.O. Box 14288
Gainesville, FL 32604

6821 SW ARCHER ROAD, GAINESVILLE, FLORIDA 32608 Tel. (904) 377-2349

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: John Good

PROJECT NO.: 87-008 ATM

DATE: 2/24/89

YOUR REF/PO#: Verbal

Table 1. Water Quality Data (Page 1 of 2)

Station ID:	PC-1	PC-2	PC-3
PPB #:	31649	31650	31651
Alkalinity, mg/L as $CaCO_3$	56	52	60
Cyanide, mg/L	<0.004	<0.004	<0.004
Fluoride, mg/L	0.6	0.6	1.3
Methylene Blue Active Substances, mg/L	<0.025	<0.025	<0.025
Total Kjeldahl Nitrogen, mg/L	0.519	0.579	0.647
Ammonia Nitrogen, mg/L	0.013	0.014	0.061
Organic Nitrogen, mg/L	0.506	0.565	0.586
Nitrate+Nitrite-Nitrogen, mg/L	0.441	0.420	0.591
Total Nitrogen, mg/L	0.960	0.999	1.24
Oil and Grease, mg/L	<5	<5	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	<1	<1	<1
Chemical Oxygen Demand, mg/L	36	38	55
Orthophosphorus, mg/L	0.288	0.243	0.378
Total Phosphorus, mg/L	0.352	0.353	0.483
Sulfate, mg/L	22.4	23.3	49.7
Turbidity, NTU	0.95	0.90	1.0
Aluminum, ug/L	78	140	94
Antimony, ug/L	<10	<10	<10
Arsenic, ug/L	<5	<5	<5
Beryllium, ug/L	<3	<3	<3
Cadmium, ug/L	<0.4	<0.4	<0.4
Chromium, ug/L	<10	<10	<10
Copper, ug/L	<6	<6	<6
Iron, ug/L	259	246	240
Lead, ug/L	<5	8.9	9.6
Mercury, ug/L	<0.2	<0.2	<0.2
Nickel, ug/L	<15	<15	<15
Selenium, ug/L	<5	<5	<5
Silver, ug/L	<0.08	<0.08	<0.08
Sodium, mg/L	8.7	8.8	11
Zinc, ug/L	<5	<5	7.1
Total Coliforms, colonies/100 ml	27	55	45
Fecal Coliforms, colonies/100 ml	<1	9	36

Kelly Bendall for Tom Park
PROJECT MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: John Good

PROJECT NO.: 87-008 ATM

DATE: 2/24/89

YOUR REF/PO#: Verbal

Table 1. Water Quality Data (Page 2 of 2)

Station ID:	PC-4
PPB #:	31652
Alkalinity, mg/L as $CaCO_3$	72
Cyanide, mg/L	<0.004
Fluoride, mg/L	1.6
Methylene Blue Active Substances, mg/L	<0.025
Total Kjeldahl Nitrogen, mg/L	0.664
Ammonia Nitrogen, mg/L	0.019
Organic Nitrogen, mg/L	0.645
Nitrate+Nitrite-Nitrogen, mg/L	3.02
Total Nitrogen, mg/L	3.68
Oil and Grease, mg/L	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	<1
Chemical Oxygen Demand, mg/L	55
Orthophosphorus, mg/L	0.378
Total Phosphorus, mg/L	0.469
Sulfate, mg/L	62.6
Turbidity, NTU	0.50
Aluminum, ug/L	63.0
Antimony, ug/L	<10
Arsenic, ug/L	<5
Beryllium, ug/L	<3
Cadmium, ug/L	<0.4
Chromium, ug/L	<10
Copper, ug/L	<6
Iron, ug/L	49.3
Lead, ug/L	<5
Mercury, ug/L	<0.2
Nickel, ug/L	<15
Selenium, ug/L	<5
Silver, ug/L	<0.08
Sodium, mg/L	10.2
Zinc, ug/L	<5
Total Coliforms, colonies/100 ml	55
Fecal Coliforms, colonies/100 ml	18

Kelly Budoll for Tom Park
PROJECT/MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: Fred Ramsey

PROJECT NO.: 87-008 ATM

DATE: 4/13/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 4. January 1989 Sampling Trip

Station ID: PPB #:	PC-1 31649	PC-2 31650	PC-3 31651	PC-4 31652
Calcium, mg/L	16.3	16.2	24.9	28.6
Magnesium, mg/L	9.0	9.0	12.0	13.9
Manganese, ug/L	4.4	6.8	9.9	4.7
Potassium, mg/L	0.7	0.7	2.0	0.1
Hardness, mg equiv. CaCO3/L	77.8	77.5	112	129
Bicarbonate alkalinity, as mg CaCO3/L	56	52	60	72
Carbonate alkalinity, as mg CaCO3/L	<0.5	<0.5	<0.5	<0.5

PROJECT MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 2/24/89

YOUR REF/PO#: Verbal

Table 2. Radiation and Chlorophyll-a Data

ID No.: PPB #:	PC-1 31649	PC-2 31650	PC-3 31651	PC-4 31652
Alpha, Gross (pC/L)	0.8	0.2	0.0	3.9
Alpha, Gross, Ct. Error +/- (pC/L)	1.1	1.3	1.4	2.3
Beta, Gross (pC/L)	2.2	1.0	2.9	3.9
Beta, Gross, Ct. Error +/- (pC/L)	1.6	1.4	1.5	2.9
Radium 226 (pC/L)	0.6	0.4	0.7	1.4
Radium 226 Ct. Error +/- (pC/L)	0.0	0.0	0.0	0.1
Radium 228 (pC/L)	0.0	0.0	0.0	0.0
Radium 228, Ct. Error (pC/L)	1.9	1.6	1.6	1.6
Strontium-90 (pC/L)	<0.5	<0.5	<0.5	1.5 ±1.3
Chlorophyll-a, mg/m^3	<1	<1	<1	<1

*ND=None detected.

Kelly Beardall for
Project Manager
Tom Park

FEBRUARY 1984

ppb
ENVIRONMENTAL LABORATORIES, INC.

March 27, 1989

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607

Dear John:

Enclosed are the results of our analyses of your samples which we received on February 17, 1989.

All data were determined in accordance with published procedures (EPA-600/4-79-020, Methods for Chemical Analysis of Water and Wastes, Revised March 1983). Our laboratory is certified by the Florida DHRS (Lab Nos. 82282 and E82001). Please note the coliform analyses were performed by P.E. LaMoreaux and Associates, Inc., of Lakeland, Florida (Lab Nos. 84183 and E84098). The chlorophyll analyses were performed by CH2M Hill of Gainesville, Florida (Lab Nos. 82112 and E82124). The gross alpha, gross beta, radium 228, and radium 226 analyses were performed by ESE, Inc. of Gainesville, Florida (Lab Nos. 82138 and E82067). The strontium 90 analyses were performed by CEP, Inc. of Santa Fe, New Mexico (Lab No. 87239). The organics analyses were performed by Southeastern Environmental Laboratories, Inc. of Orange Park, Florida (Lab Nos. 82315 and E82179).

If you have any questions concerning this report, please do not hesitate to give me a call.

Sincerely,

Tom Park

Tom Park
Project Manager

TP:jlm

Enclosure

cc: Dr. Jim Newman
KBN Engineering & Applied Sciences
P.O. Box 14288
Gainesville, FL 32604

6821 SW ARCHER ROAD, GAINESVILLE, FLORIDA 32608 Tel. (904) 377-2349

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: John Good

PROJECT NO.: 87-008 ATM

DATE: 3/27/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 1. Water Quality Data (Page 1 of 2)

Station ID: PPB #:	PC-1 32096	PC-2 32097	PC-3 32098
Alkalinity, mg/L as $CaCO_3$	48	68	60
Cyanide, mg/L	<0.004	<0.004	<0.004
Fluoride, mg/L	0.8	0.8	0.7
Methylene Blue Active Substances, mg/L	0.050	0.054	0.033
Total Kjeldahl Nitrogen, mg/L	0.338	0.245	0.657
Ammonia Nitrogen, mg/L	0.015	0.006	<0.005
Organic Nitrogen, mg/L	0.323	0.239	0.657
Nitrate+Nitrite-Nitrogen, mg/L	0.434	0.386	0.400
Total Nitrogen, mg/L	0.772	0.631	1.06
Oil and Grease, mg/L	<5	<5	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	<1	<1	2.4
Chemical Oxygen Demand, mg/L	<10	<10	<10
Orthophosphorus, mg/L	0.326	0.309	0.558
Total Phosphorus, mg/L	0.327	0.342	0.578
Sulfate, mg/L	23.0	23.1	28.2
Turbidity, NTU	0.8	2.3	2.8
Aluminum, ug/L	45	32	74
Antimony, ug/L	<10	<10	<10
Arsenic, ug/L	<5	<5	<5
Beryllium, ug/L	<3	<3	<3
Cadmium, ug/L	<0.4	0.5	<0.4
Chromium, ug/L	<10	<10	<10
Copper, ug/L	<7	12	<7
Iron, ug/L	310	260	215
Lead, ug/L	<5	9.8	<5
Mercury, ug/L	<0.2	<0.2	<0.2
Nickel, ug/L	<17	35	<17
Selenium, ug/L	<5	<5	<5
Silver, ug/L	<0.08	<0.08	<0.08
Sodium, mg/L	7.9	7.9	9.7
Zinc, ug/L	7.0	36	8.8
Total Coliforms, colonies/100 ml	164	182	691
Fecal Coliforms, colonies/100 ml	9	36	327

Tom Park

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: John Good

PROJECT NO.: 87-008 ATM

DATE: 3/27/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 1. Water Quality Data (Page 2 of 2)

Station ID:	PC-4
PPB #:	32099
Alkalinity, mg/L as $CaCO_3$	76
Cyanide, mg/L	<0.004
Fluoride, mg/L	1.8
Methylene Blue Active Substances, mg/L	0.026
Total Kjeldahl Nitrogen, mg/L	0.615
Ammonia Nitrogen, mg/L	<0.005
Organic Nitrogen, mg/L	0.615
Nitrate+Nitrite-Nitrogen, mg/L	1.54
Total Nitrogen, mg/L	2.16
Oil and Grease, mg/L	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	1.4
Chemical Oxygen Demand, mg/L	<10
Orthophosphorus, mg/L	0.629
Total Phosphorus, mg/L	0.670
Sulfate, mg/L	55
Turbidity, NTU	1.9
Aluminum, ug/L	49
Antimony, ug/L	<10
Arsenic, ug/L	<5
Beryllium, ug/L	<3
Cadmium, ug/L	<0.4
Chromium, ug/L	<10
Copper, ug/L	11
Iron, ug/L	157
Lead, ug/L	<5
Mercury, ug/L	<0.2
Nickel, ug/L	<17
Selenium, ug/L	<5
Silver, ug/L	<0.08
Sodium, mg/L	10.3
Zinc, ug/L	<5
Total Coliforms, colonies/100 ml	500
Fecal Coliforms, colonies/100 ml	118

Tom Park
PROJECT MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: Fred Ramsey

PROJECT NO.: 87-008 ATM

DATE: 4/13/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 5. February 1989 Sampling Trip

Station ID: PPB #:	PC-1 32096	PC-2 32097	PC-3 32098	PC-4 32099
Calcium, mg/L	16.2	16.7	19.2	28.1
Magnesium, mg/L	9.8	9.9	10.2	14.3
Manganese, ug/L	3.0	5.5	8.9	5.7
Potassium, mg/L	0.5	0.6	2.6	1.5
Hardness, mg equiv. CaCO3/L	80.8	82.5	89.9	129
Bicarbonate alkalinity, as mg CaCO3/L	48	68	60	76
Carbonate alkalinity, as mg CaCO3/L	<0.5	<0.5	<0.5	<0.5

Tom Park
PROJECT MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 3/27/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 2. Radiation and Chlorophyll Data

ID No.:	PC-1	PC-2	PC-3	PC-4
PPB #:	32096	32097	32098	32099
Alpha, Gross (pC/L)	3.6	2.4	2.5	0.8
Alpha, Gross, Ct. Error +/- (pC/L)	2.1	1.6	2.4	1.7
Beta, Gross (pC/L)	0.0	1.1	3.9	0.1
Beta, Gross, Ct. Error +/- (pC/L)	1.7	1.5	1.8	1.8
Radium 226 (pC/L)	0.3	0.6	0.6	0.5
Radium 226 Ct. Error +/- (pC/L)	0.0	0.0	0.0	0.0
Radium 228 (pC/L)	0.0	0.0	0.0	1.1
Radium 228, Ct. Error (pC/L)	0.8	0.7	0.7	0.9
Strontium-90 (pC/L)	<0.5	<0.5	<0.5	<0.5
Chlorophyll-a, mg/m^3	<1	<1	<1	<1

*ND=None detected.

Tom Park
Project Manager

ppb ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 3/27/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 3. Organics Data (all results as ug/L, micrograms per liter) (Page 1 of 2)

	ID No.: PPB #:	PC-1 32096	PC-2 32097	PC-3 32098	PC-4 32099
Phenols		<5	<5	<5	<5
Aldrin		<0.003	<0.003	<0.003	<0.003
Dieldrin		<0.003	<0.003	<0.003	<0.003
Chlordane		<0.01	<0.01	<0.01	<0.01
4,4'DDT		<0.001	<0.001	<0.001	<0.001
Demeton		<0.1	<0.1	<0.1	<0.1
Endrin		<0.004	<0.004	<0.004	<0.004
Endosulfan		<0.003	<0.003	<0.003	<0.003
Guthion		<0.01	<0.01	<0.01	<0.01
Heptachlor		<0.001	<0.001	<0.001	<0.001
Lindane		<0.01	<0.01	<0.01	<0.01
Malathion		<0.1	<0.1	<0.1	<0.1
Methoxychlor		<0.03	<0.03	<0.03	<0.03
Myrex		<0.001	<0.001	<0.001	<0.001
Parathion		<0.04	<0.04	<0.04	<0.04
2,4-D		<10	<10	<10	<10
Silvex		<20	<20	<20	<20
Toxaphene		<0.005	<0.005	<0.005	<0.005
PCB-1016		<0.001	<0.001	<0.001	<0.001
PCB-12217		<0.001	<0.001	<0.001	<0.001
PCB-1232		<0.001	<0.001	<0.001	<0.001
PCB-1242		<0.001	<0.001	<0.001	<0.001
PCB-1248		<0.001	<0.001	<0.001	<0.001
PCB-1254		<0.001	<0.001	<0.001	<0.001
PCB-1260		<0.001	<0.001	<0.001	<0.001

*ND=None detected.

Tom Park
Project Manager

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 3/27/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 3. Organics Data (all results as ug/L, micrograms per liter) (Page 2 of 2)

ID No.:	PC-1	PC-2	PC-3	PC-4
PPB #:	32096	32097	32098	32099
Chlorinated Hydrocarbons				
2-Chloronapthalene	<10	<10	<10	<10
1,2-Dichlorobenzene	<10	<10	<10	<10
1,3-Dichlorobenzene	<10	<10	<10	<10
1,4-Dichlorobenzene	<10	<10	<10	<10
Hexachlorobenzene	<10	<10	<10	<10
Hexachlorobutadiene	<10	<10	<10	<10
Hexachlorocyclopentadiene	<10	<10	<10	<10
Hexachloroethane	<10	<10	<10	<10
1,2,4-Trichlorobenzene	<10	<10	<10	<10

*ND=None detected.

Tom Park
Project Manager

MARCH 1989

ppb
ENVIRONMENTAL LABORATORIES, INC.

March 28, 1989

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607

Dear John:

Enclosed are the results to date of our analyses of your samples which we received on March 17, 1989.

All data were determined in accordance with published procedures (EPA-600/4-79-020, Methods for Chemical Analysis of Water and Wastes, Revised March 1983). Our laboratory is certified by the Florida DHRS (Lab Nos. 82282 and E82001). The chlorophyll analyses were performed by CH2M Hill of Gainesville, Florida (Lab Nos. 82112 and E82124). A complete report will be issued as soon as all analyses are completed.

If you have any questions concerning this report, please do not hesitate to give me a call.

Sincerely,

Tom Park

Tom Park
Project Manager

TP:jlm

Enclosure

cc: Dr. Jim Newman
KBN Engineering & Applied Sciences
P.O. Box 14288
Gainesville, FL 32604

6821 SW ARCHER ROAD, GAINESVILLE, FLORIDA 32608 Tel. (904) 377-2349

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: Fred Ramsey

PROJECT NO.: 87-008 ATM

DATE: 4/19/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 1. Water Quality Data (Page 1 of 2)

Station ID:	PC-1	PC-2	PC-3
PPB #:	32458	32459	32460
Alkalinity, mg/L as $CaCO_3$	60	60	60
Cyanide, mg/L	<0.004	<0.004	<0.004
Fluoride, mg/L	0.8	0.8	0.7
Methylene Blue Active Substances, mg/L	0.116	0.084	0.090
Total Kjeldahl Nitrogen, mg/L	0.638	0.676	0.599
Ammonia Nitrogen, mg/L	<0.005	0.017	0.057
Organic Nitrogen, mg/L	0.638	0.659	0.542
Nitrate+Nitrite-Nitrogen, mg/L	0.254	0.209	0.628
Total Nitrogen, mg/L	0.892	0.885	1.23
Oil and Grease, mg/L	<5	<5	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	<1	<1	1.2
Chemical Oxygen Demand, mg/L	24	<10	19
Orthophosphorus, mg/L	0.452	0.424	0.480
Total Phosphorus, mg/L	0.464	0.429	0.537
Sulfate, mg/L	18.8	22.1	28.1
Turbidity, NTU	0.9	1.6	1.3
Aluminum, ug/L	102	81	116
Antimony, ug/L	<10	<10	<10
Arsenic, ug/L	<5	<5	<5
Beryllium, ug/L	<3	<3	<3
Cadmium, ug/L	<0.4	<0.4	<0.4
Chromium, ug/L	<10	<10	<10
Copper, ug/L	<7	10	<7
Iron, ug/L	409	254	253
Lead, ug/L	<5	8.9	6.2
Mercury, ug/L	<0.2	<0.2	<0.2
Nickel, ug/L	<12	<12	<12
Selenium, ug/L	<5	<5	<5
Silver, ug/L	<0.08	<0.08	<0.08
Sodium, mg/L	8.3	8.4	9.6
Zinc, ug/L	<5	<5	<5
Total Coliforms, colonies/100 ml	46	<1	355
Fecal Coliforms, colonies/100 ml	36	9	63

Tom Park

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: Fred Ramsey

PROJECT NO.: 87-008 ATM

DATE: 4/19/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 1. Water Quality Data (Page 2 of 2)

Station ID:	PC-4
PPB #:	32461
Alkalinity, mg/L as $CaCO_3$	66
Cyanide, mg/L	<0.004
Fluoride, mg/L	1.6
Methylene Blue Active Substances, mg/L	0.088
Total Kjeldahl Nitrogen, mg/L	0.676
Ammonia Nitrogen, mg/L	0.013
Organic Nitrogen, mg/L	0.663
Nitrate+Nitrite-Nitrogen, mg/L	1.52
Total Nitrogen, mg/L	2.20
Oil and Grease, mg/L	<5
Carbonaceous Biochemical Oxygen Demand, mg/L	<1
Chemical Oxygen Demand, mg/L	<10
Orthophosphorus, mg/L	0.596
Total Phosphorus, mg/L	0.632
Sulfate, mg/L	58
Turbidity, NTU	0.8
Aluminum, ug/L	132
Antimony, ug/L	<10
Arsenic, ug/L	<5
Beryllium, ug/L	<3
Cadmium, ug/L	<0.4
Chromium, ug/L	<10
Copper, ug/L	<7
Iron, ug/L	85
Lead, ug/L	6.4
Mercury, ug/L	<0.2
Nickel, ug/L	<12
Selenium, ug/L	<5
Silver, ug/L	<0.08
Sodium, mg/L	10.3
Zinc, ug/L	<5
Total Coliforms, colonies/100 ml	282
Fecal Coliforms, colonies/100 ml	36

Tom Park

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. Fred Ramsey
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 4/19/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 2. Radiation, Chlorophyll, and Additional Water Quality Data

ID No.:	PC-1	PC-2	PC-3	PC-4
PPB #:	32458	32459	32460	32461
Alpha, Gross (pC/L)	2.2	1.6	1.6	0.0
Alpha, Gross, Ct. Error +/- (pC/L)	1.4	1.6	1.1	1.4
Beta, Gross (pC/L)	0.0	1.9	1.8	2.9
Beta, Gross, Ct. Error +/- (pC/L)	2.1	1.4	1.7	1.8
Radium 226 (pC/L)	0.8	0.3	0.0	0.9
Radium 226 Ct. Error +/- (pC/L)	0.1	0.0	0.0	0.0
Radium 228 (pC/L)	1.3	0.0	1.7	1.4
Radium 228, Ct. Error (pC/L)	1.1	0.9	1.0	1.0
Strontium-90 (pC/L)	NA**	NA	NA	NA
Chlorophyll-a, mg/m^3	<1	<1	<1	<1
Chloride, mg/L	12.6	11.6	15.2	16.1
Total Dissolved Solids, mg/L	126	125	149	199
Silica, dissolved reactive, mg/L	3.1	2.8	4.8	2.3

*ND=None detected.
**NA=Not Available.

Tony Park
Project Manager

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Applied Technology and Management, Inc.
502 N.W. 75th Street
Suite 95
Gainesville, Florida 32607
Attn: Fred Ramsey

PROJECT NO.: 87-008 ATM

DATE: 4/13/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 6. March 1989 Sampling Trip

Station ID: PPB #:	PC-1 32458	PC-2 32459	PC-3 32460	PC-4 32461
Calcium, mg/L	17.4	17.1	20.0	29.7
Magnesium, mg/L	10.2	10.2	10.8	14.2
Manganese, ug/L	6.7	5.7	11	7.1
Potassium, mg/L	0.7	0.8	2.4	1.5
Hardness, mg equiv. CaCO3/L	85.4	84.7	94.4	133
Bicarbonate alkalinity, as mg CaCO3/L	60	60	60	66
Carbonate alkalinity, as mg CaCO3/L	<0.5	<0.5	<0.5	<0.5

Tom Park
PROJECT MANAGER

ppb
ENVIRONMENTAL LABORATORIES, INC.

REPORT OF ANALYSES

Mr. John Good
Applied Technology and Management, Inc.
502 N.W. 75th Street, Suite 95
Gainesville, Florida 32607

PROJECT NO.: 87-008 ATM

DATE: 3/27/89

YOUR REF/PO#: Verbal

DHRS#: 82282, E82001

Table 2. Radiation, Chlorophyll, and Additional Water Quality Data

ID No.: PPB #:	PC-1 32458	PC-2 32459	PC-3 32460	PC-4 32461
Alpha, Gross (pC/L)				
Alpha, Gross, Ct. Error +/- (pC/L)				
Beta, Gross (pC/L)				
Beta, Gross, Ct. Error +/- (pC/L)				
Radium 226 (pC/L)				
Radium 226 Ct. Error +/- (pC/L)				
Radium 228 (pC/L)				
Radium 228, Ct. Error (pC/L)				
Strontium-90 (pC/L)				
Chlorophyll-a, mg/m^3	<1	<1	<1	<1
Chloride, mg/L				
Total Dissolved Solids, mg/L	126	125	149	199
Silica, dissolved reactive, mg/L	3.1	2.8	4.8	2.3

*ND=None detected.

Tom Park
Project Manager

11.5.5 CHEMICAL MIXING ZONE ANALYSES

Table 1. Hardee Power Station Cooling Reservoir Water Discharge and Payne Creek Dispersion Modeling - Cadmium

Payne Creek Conditions	
River Channel Width	20 feet
Average River Depth	2.5 feet
River Discharge	22 feet3/second
Average Flow Velocity	0.500 feet/second
Flow Shear Velocity	0.259 feet/second
Transverse Mixing Coeff.	0.389 feet2/second
Background Water Quality	<0.4 ug/L
Reservoir Water Discharge Conditions	
Discharge Flow Rate	0.33 feet3/second
Discharge Water Quality	2.6 ug/L

Distance Downstream (feet)	Mixed Concentration (ug/L) at Various Distances (feet) Across Payne Creek										
	0	0.5	1	1.5	2	2.5	3	4	5	10	20
0	2.6	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
50	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
100	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
150	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
200	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
250	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
300	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
350	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
400	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
450	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
500	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
550	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
600	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
650	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
700	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
750	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
800	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
850	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
900	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
950	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1,000	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1,050	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1,100	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1,150	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1,200	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1,250	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Table 2. Hardee Power Station Cooling Reservoir Water Discharge and Payne Creek Dispersion Modeling - Cyanide

Payne Creek Conditions	
River Channel Width	20 feet
Average River Depth	2.5 feet
River Discharge	22 feet3/second
Average Flow Velocity	0.500 feet/second
Flow Shear Velocity	0.259 feet/second
Transverse Mixing Coeff.	0.389 feet2/second
Background Water Quality	<4 ug/L
Reservoir Water Discharge Conditions	
Discharge Flow Rate	0.33 feet3/second
Discharge Water Quality	10 ug/L

	Mixed Concentration (ug/L) at Various Distances (feet) Across Payne Creek										
Distance Downstream (feet)	0	0.5	1	1.5	2	2.5	3	4	5	10	20
0	10.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
50	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	<4.0
100	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
150	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
200	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
250	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
300	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
350	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
400	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
450	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
500	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
550	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
600	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
650	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
700	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
750	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
800	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
850	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
900	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
950	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
1,000	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
1,050	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
1,100	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
1,150	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
1,200	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
1,250	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1

Table 3. Hardee Power Station Cooling Reservoir Water Discharge and Payne Creek Dispersion Modeling - Mercury

Payne Creek Conditions	
River Channel Width	20 feet
Average River Depth	2.5 feet
River Discharge	22 feet3/second
Average Flow Velocity	0.500 feet/second
Flow Shear Velocity	0.259 feet/second
Transverse Mixing Coeff.	0.389 feet2/second
Background Water Quality	<0.1 ug/L
Reservoir Water Discharge Conditions	
Discharge Flow Rate	0.33 feet3/second
Discharge Water Quality	0.5 ug/L

Distance Downstream (feet)	Mixed Concentration (ug/L) at Various Distances (feet) Across Payne Creek										
	0	0.5	1	1.5	2	2.5	3	4	5	10	20
0	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
150	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
250	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
300	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
350	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
400	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
450	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
550	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
600	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
650	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
700	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
750	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
800	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
850	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
900	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
950	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
1,000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
1,050	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
1,100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
1,150	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
1,200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
1,250	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1

Table 4. Hardee Power Station Cooling Reservoir Water Discharge and Payne Creek Dispersion Modeling - Selenium

Payne Creek Conditions	
River Channel Width	20 feet
Average River Depth	2.5 feet
River Discharge	22 feet3/second
Average Flow Velocity	0.500 feet/second
Flow Shear Velocity	0.259 feet/second
Transverse Mixing Coeff.	0.389 feet2/second
Background Water Quality	<5.0 ug/L
Reservoir Water Discharge Conditions	
Discharge Flow Rate	0.33 feet3/second
Discharge Water Quality	32.0 ug/L

Distance Downstream (feet)	Mixed Concentration (ug/L) at Various Distances (feet) Across Payne Creek										
	0	0.5	1	1.5	2	2.5	3	4	5	10	20
0	32	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
50	6	6	6	6	6	6	6	5	5	5	5
100	5	5	5	5	5	5	5	5	5	5	5
150	5	5	5	5	5	5	5	5	5	5	5
200	5	5	5	5	5	5	5	5	5	5	5
250	5	5	5	5	5	5	5	5	5	5	5
300	5	5	5	5	5	5	5	5	5	5	5
350	5	5	5	5	5	5	5	5	5	5	5
400	5	5	5	5	5	5	5	5	5	5	5
450	5	5	5	5	5	5	5	5	5	5	5
500	5	5	5	5	5	5	5	5	5	5	5
550	5	5	5	5	5	5	5	5	5	5	5
600	5	5	5	5	5	5	5	5	5	5	5
650	5	5	5	5	5	5	5	5	5	5	5
700	5	5	5	5	5	5	5	5	5	5	5
750	5	5	5	5	5	5	5	5	5	5	5
800	5	5	5	5	5	5	5	5	5	5	5
850	5	5	5	5	5	5	5	5	5	5	5
900	5	5	5	5	5	5	5	5	5	5	5
950	5	5	5	5	5	5	5	5	5	5	5
1,000	5	5	5	5	5	5	5	5	5	5	5
1,050	5	5	5	5	5	5	5	5	5	5	5
1,100	5	5	5	5	5	5	5	5	5	5	5
1,150	5	5	5	5	5	5	5	5	5	5	5
1,200	5	5	5	5	5	5	5	5	5	5	5
1,250	5	5	5	5	5	5	5	5	5	5	5

Table 5. Hardee Power Station Cooling Reservoir Water Discharge and Payne Creek Dispersion Modeling - Silver

Payne Creek Conditions	
River Channel Width	20 feet
Average River Depth	2.5 feet
River Discharge	22 feet3/second
Average Flow Velocity	0.500 feet/second
Flow Shear Velocity	0.259 feet/second
Transverse Mixing Coeff.	0.389 feet2/second
Background Water Quality	<0.04 ug/L
Reservoir Water Discharge Conditions	
Discharge Flow Rate	0.33 feet3/second
Discharge Water Quality	<0.80 ug/L

Distance Downstream (feet)	Mixed Concentration (ug/L) at Various Distances (feet) Across Payne Creek										
	0	0.5	1	1.5	2	2.5	3	4	5	10	20
0	0.80	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
50	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	<0.04
100	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
150	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
200	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
250	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
300	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
350	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
400	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
450	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
500	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
550	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
600	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
650	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
700	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
750	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
800	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
850	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
900	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
950	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
1,000	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
1,050	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
1,100	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
1,150	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
1,200	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
1,250	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Table 6. Hardee Power Station Cooling Reservoir Water Discharge and Payne Creek Dispersion Modeling - Turbidity

Payne Creek Conditions	
River Channel Width	20 feet
Average River Depth	2.5 feet
River Discharge	22 feet3/second
Average Flow Velocity	0.500 feet/second
Flow Shear Velocity	0.259 feet/second
Transverse Mixing Coeff.	0.389 feet2/second
Background Water Quality	1.5 NTU
Reservoir Water Discharge Conditions	
Discharge Flow Rate	0.33 feet3/second
Discharge Water Quality	31 NTU

Distance Downstream (feet)	Mixed Concentration (ug/L) at Various Distances (feet) Across Payne Creek										
	0	0.5	1	1.5	2	2.5	3	4	5	10	20
0	31.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
50	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	1.8	1.6
100	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.7
150	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8
200	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
250	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
300	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
350	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
400	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
450	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
500	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
550	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
600	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
650	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
700	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
750	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
800	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
850	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
900	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
950	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
1,000	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
1,050	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
1,100	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
1,150	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
1,200	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
1,250	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8

Table 7. Hardee Power Station Cooling Reservoir Water Discharge and Payne Creek Dispersion Modeling - Gross Alpha

Payne Creek Conditions	
River Channel Width	20 feet
Average River Depth	2.5 feet
River Discharge	22 feet3/second
Average Flow Velocity	0.500 feet/second
Flow Shear Velocity	0.259 feet/second
Transverse Mixing Coeff.	0.389 feet2/second
Background Water Quality	1.7 ug/L
Reservoir Water Discharge Conditions	
Discharge Flow Rate	0.33 feet3/second
Discharge Water Quality	22.2 ug/L

Distance Downstream (feet)	Mixed Concentration (pC/L) at Various Distances (feet) Across Payne Creek										
	0	0.5	1	1.5	2	2.5	3	4	5	10	20
0	22.2	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
50	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.9	1.8
100	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9
150	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9
200	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
250	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
300	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
350	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
400	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
450	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
500	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
550	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
600	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
650	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
700	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
750	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
800	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
850	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
900	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
950	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
1,000	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
1,050	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
1,100	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
1,150	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
1,200	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
1,250	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9

Table 8. Hardee Power Station Cooling Reservoir Water Discharge and Payne Creek Dispersion Modeling - Radium 226

Payne Creek Conditions	
River Channel Width	20 feet
Average River Depth	2.5 feet
River Discharge	22 feet3/second
Average Flow Velocity	0.500 feet/second
Flow Shear Velocity	0.259 feet/second
Transverse Mixing Coeff.	0.389 feet2/second
Background Water Quality	0.5 ug/L
Reservoir Water Discharge Conditions	
Discharge Flow Rate	0.33 feet3/second
Discharge Water Quality	6.2 ug/L

Distance Downstream (feet)	Mixed Concentration (pC/L) at Various Distances (feet) Across Payne Creek										
	0	0.5	1	1.5	2	2.5	3	4	5	10	20
0	6.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
50	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
100	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
150	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
200	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
250	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
300	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
350	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
400	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
450	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
500	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
550	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
600	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
650	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
700	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
750	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
800	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
850	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
900	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
950	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1,000	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1,050	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1,100	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1,150	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1,200	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1,250	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

11.5.6 SWFWMD PERMIT INFORMATION

This application has been prepared for information purposes only as required by FDER Form 17-1.211(1).
Refer to Applicant Information in the SCA.

APPLICATION TO THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
SURFACE WATER MANAGEMENT PERMIT

TO: SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 Broad Street
Brooksville, Florida 34609-6899
Telephone: (904) 796-7211

(For Use By SWFWMD Only)
Date Rec'd: ________
App. No.: ________

GENERAL INSTRUCTIONS: Please provide complete information below. Attach additional information if necessary. A processing fee of $10.00 is required with this application. Please submit four (4) copies of application, drawings, calculations, etc. Note: Project may also require State or Federal permits.

Please check appropriate box.

APPLICATION FOR: (X) CONCEPTUAL APPROVAL PERMIT
( ) CONSTRUCTION/OPERATION PERMIT
( ) MODIFICATION OF EXISTING PERMIT, NO.: ________

Owner(s) of land upon which surface water management system will be constructed/ operated:

NAME: Refer to Applicant Information in SCA/EA Chapter 1

ADDRESS: ________

TELEPHONE: ( ) ________

Signature of owner or authorized agent

Description of Land: Total Land Area (acres): 1300 Acres

County: Polk & Hardee

Section: see SCA/EA Chapter 1 Township: ____ Range: ____

Person who prepared the plans and specifications of construction:
Conceptual hydrologic/hydraulic analyses only:

Name: Frederick V. Ramsey, P.E. Vice President

Address: Applied Technology & Management, Inc., 502 N.W. 75th St., Suite 95
Gainesville, Florida 32607

Telephone: (904) 375-8700

Construction Plans and Specifications: Submit drawings, calculations and engineering details sufficient to define the nature, scope, intent and functioning of work proposed. Reference Rule 40D-4/40D-40.

Person who will construct the proposed work:

Name: Refer to Applicant Information in SCA/EA Chapter 1

Address: ________

Telephone: ( ) ________

General purpose of proposed work:

Project Name: Hardee Power Station

Project Size (acres): 1300 Acres Zoning: see SCA/EA Chapter 2
(if different from total land area)

Form No. MSW 25.3-15.2-9/87
March 1, 1988

EXHIBIT A

The following information may be required in support of the application. The applicant should submit as much of the information listed as the complexity of the project and the sensitivity of the area necessitates.

If there are any questions or further assistance is required, please contact the Surface Water Permitting Division in vicinity the project.

Note: The application must be signed by the owner or his authorized agent, and submitted to the District with FOUR (4) copies of all information required. However, for conceptual approval, Items A.8., A.10., B.5. and B.6. will not be necessary.

A. SITE INFORMATION:

1.___ Detailed location sketch.

2.___ Topographic map of the site and adjacent hydrologically related areas, which shall include location and description of bench marks (minimum of one per major water control structure).

3.___ Overall map of the area showing existing runoff patterns and size, location, topography, and land use of off-site areas which drain through, onto, and from the project.

4.___ Identification of wet season high water table elevations.

5.___ If the project is in the known floodway of a stream, or other watercourse, the floodway should be identified and approximate flooding elevations determined. The 100 year flood plain elevations and limits should be identified, if applicable.

6.___ Description of vegetative cover, wetland areas in and adjacent to the project area and limits of waters of the state if activities are proposed for these areas.

7.___ Recent areal photography of a scale no smaller than 1" equals 800', encompassing the project area with project boundaries delineated.

8.___ The construction drawings for the paving, grading and drainage plans, with special attention to perimeter site grading.

9.___ Percolation tests, if percolation or exfiltration systems are proposed. Percolation tests shall be representative of design conditions.

10.___ Complete description of measures to be implemented during the construction period to mitigate adverse quantity and quality impacts off-site.

B. MASTER DRAINAGE PLAN:

1.___ Location of all water bodies with details of size, side slopes, elevations and depths.

2.___ Location and details of all major water control structures. Control elevations of the control structures must be included along with any seasonal water level regulation schedules.

3.___ Drainage basin boundaries showing direction of flow, taking into account off-site runoff being routed through or around the project.

4.___ Locations of roads and buildings along with their proposed elevations.

5.___ Right-of-way and easement locations for the drainage system including all areas to be reserved for water management purposes.

6.___ Location and size of internal minor water management facilities.

7.___ Nearby existing off-site water resource facilities which might be affected by the proposed construction or development. The names and addresses of the owners of such facilities should also be submitted.

C. DRAINAGE CALCULATIONS:

1.___ Design storms used including depth, duration and distribution.

2.___ Off-site inflow.

3.___ Stage-storage computations for the project and stage-discharge computations for the outfall structure(s).

4.___ Acreages and percentage of property proposed as:
  - ___ Impervious surfaces (excluding water bodies)
  - ___ Pervious surfaces (green areas)
  - ___ Lakes, canals, retention areas, etc.
  - ___ Total acreage of project

5.___ Runoff calculations showing discharges, elevations, and volumes retained and/or detained during applicable storm events. Mathematical computations may be required to demonstrate that the proposed development will not significantly alter net storage from the project area for events up to the 100 year frequency.

6.___ Calculations required for determination of minimum building flood and road elevations.

D. LEGAL/INSTITUTIONAL INFORMATION:

1.___ Identification of the entity responsible for operation and maintenance of the surface water management system.

2.___ A letter of other evidence of potential, acceptance from the public body, if the operation and maint ance entity is to be a public body such as a city drainage district. Documents verifying the existence of such an organization and its ability to accept operation and maintenance responsibility, if the entity is a homeowners association.

3.___ Indication of how water and wastewater service will be supplied. Letters of commitment from off-site suppliers must be included.

4.___ Identification of agencies and organization contacted in connection with the project. Include meeting summaries and/or responses. Give status of local approvals indicating if site plan and/or subdivisions approval has been granted, final plats recorded and building or construction permits issued.

5.___ Present and proposed zoning: Evidence of current density and classification under local government zoning or comprehensive plan must be submitted; include the status under the DRI process, if applicable. The number of proposed dwelling units and/or square feet of commercial area must be supplied. If the project is an approved DRI then a copy of the final approved development order must be supplied.

6.___ A copy of a boundary survey and evidence of ownership or control; if the Applicant is a contractual buyer then a copy of the executed contract must be provided.

7.___ Documentation of legal and physical availability of receiving water system to receive project discharge if such is not evident.

EXHIBIT A CONTINUED ON FOLLOWING PAGE

EXHIBIT A (CONTINUED)

A. SITE INFORMATION

A.1. Information regarding the site location is presented in Section 1.2.2 of the SCA.

A.2. A topographic map of the site and related topographic information is presented in Section 2.3.4.1 of the SCA.

A.3. Information regarding the site runoff patterns is presented in Section 2.3.4.1 of the SCA. Information regarding the vegetation and land use of adjacent lands is presented in Section 2.3.5 of the SCA.

A.4. A description of the water table (shallow) aquifer system and elevations is presented in Section 2.3.2.1 of the SCA.

A.5. Information regarding the flood plain elevations is presented in Section 2.3.4.1 of the SCA.

A.6. A description of the vegetative cover and wetlands on and near the site is presented in Section 2.3.6 of the SCA.

A.7. Recent aerial photography is provided as part of the SCA.

A.8. This application is for conceptual approval of the proposed surface water management plans; therefore, no construction drawings are provided or required.

A.9. Information on the water table (shallow) aquifer soils and hydraulic properties is presented in Section 2.3.2. of the SCA.

A.10. Information on the measures to be implemented during construction to mitigated or avoid adverse water quality and quality impacts is presented in Section 4.2 of the SCA.

B. MASTER DRAINAGE PLAN

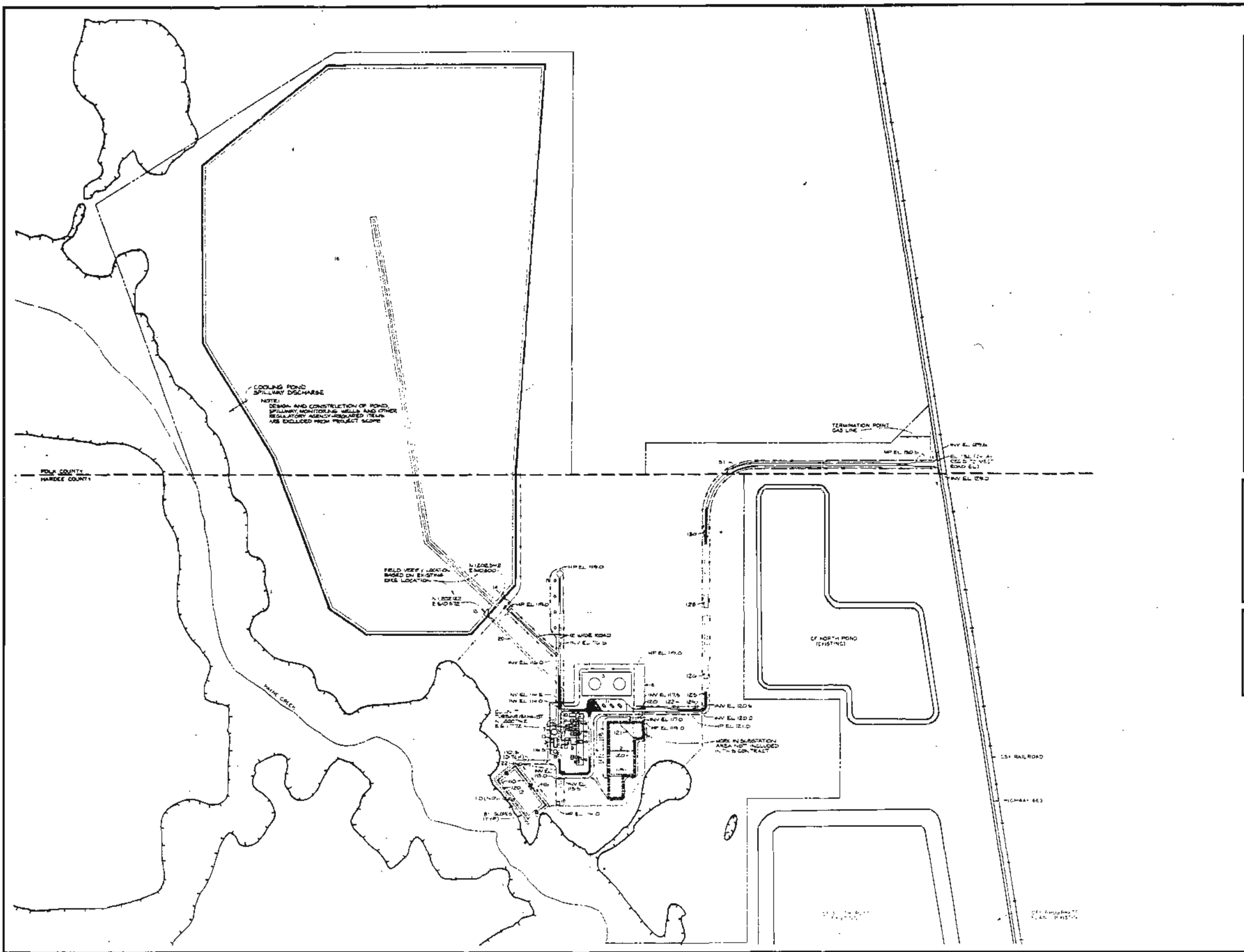
B.1. Relevant details regarding all major water bodies are presented in the Site Drainage Plan, attached as Exhibit B-1.

B.2. Relevant details regarding all major water control structures are presented in the Site Drainage Plan, attached as Exhibit B-1.

B.3. Site drainage basin boundaries and directions of flow are presented in Site Drainage Basin Map, attached as Exhibit B-3.

B.4. Available information regarding road and building locations are presented in Section 3.0 of the SCA and the Site Drainage Plan, attached as Exhibit B-1.

BEST AVAILABLE COPY



NO.	NOMENCLATURE
1	POWER BLOCK
2	SWITCHYARD
3	WATER TREATMENT BUILDING
4	SERVICE BUILDING
5	FUEL OIL STORAGE TANK W/CONTAINMENT WALL
6	SECURITY FENCE
7	DEMINERALIZED WATER STORAGE TANK
8	RAW WATER STORAGE TANK
9	CONTROL BUILDING
10	WAREHOUSE
11	FUEL OIL UNLOADING STATION
12	SITE RUNOFF DETENTION POND
13	NEUTRALIZATION BASIN
14	DISCHARGE STRUCTURE
15	INTAKE STRUCTURE
16	COOLING RESERVOIR
17	PLANT WASTEWATER SUMP/OIL SEPARATOR
18	SEWAGE TREATMENT PLANT
19	WATER SUPPLY WELL
20	PIPING CORRIDOR
21	MOTORIZED GATE
22	STORMWATER PUMP PIT

BUILDING AND FACILITIES LEGEND

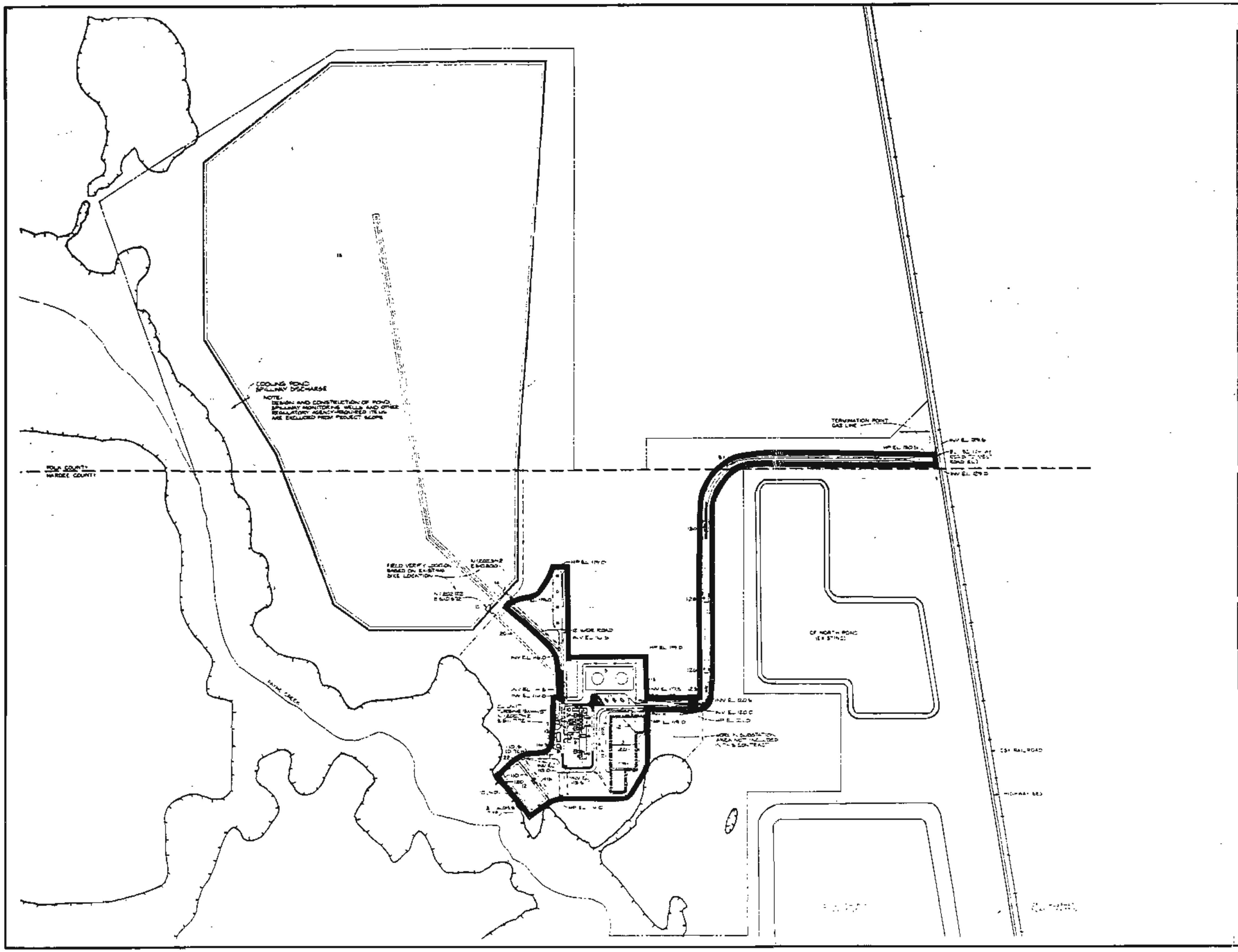
-·-·-	PROPERTY LINE
- - - -	FUTURE
▨	WETLANDS
▬	ASPHALT PAVING (ROADS 20' WIDE)
═	GRAVEL SURFACING

North

0 400 800 1200 Feet

Exhibit B-1

Hardee Power Station



BUILDING AND FACILITIES LEGEND

NO.	NOMENCLATURE
1	POWER BLOCK
2	SWITCHYARD
3	WATER TREATMENT BUILDING
4	SERVICE BUILDING
5	FUEL OIL STORAGE TANK W/CONTAINMENT WALL
6	SECURITY FENCE
7	DEMINERALIZED WATER STORAGE TANK
8	RAW WATER STORAGE TANK
9	CONTROL BUILDING
10	WAREHOUSE
11	FUEL OIL UNLOADING STATION
12	SITE RUNOFF DETENTION POND
13	NEUTRALIZATION BASIN
14	DISCHARGE STRUCTURE
15	INTAKE STRUCTURE
16	COOLING RESERVOIR
17	PLANT WASTEWATER SUMP/OIL SEPARATOR
18	SEWAGE TREATMENT PLANT
19	WATER SUPPLY WELL
20	PIPING CORRIDOR
21	MOTORIZED GATE
22	STORMWATER PUMP PIT

- – · – PROPERTY LINE
- - - - FUTURE
- WETLANDS
- ▬ ASPHALT PAVING (ROADS 20' WIDE)
- ═ GRAVEL SURFACING

North

0 400 800 1200 Feet

Exhibit B-3

Hardee Power Station

B.5. Not required for conceptual approval.

B.6. Not required for conceptual approval.

B.7. A detailed evaluation of off site water resources impacts is presented in Section 5.1 of the SCA.

C. DRAINAGE CALCULATIONS

C.1. Water quantity and discharge evaluations were conducted using a 25-year 24-hour rainfall of 9.0 inches, distributed based on the SCS Type IIa rainfall distribution. Water quality control volumes were calculated based on a 1 inch rainfall.

C.2. As shown in the Site Drainage Basin Map (attached as Exhibit B-2), drainage from areas adjacent to the plant site will be routed around the plant site. Off site areas upstream of the cooling reservoir (i.e. part of the 470 acre watershed to the cooling reservoir) will be routed to the cooling reservoir and have been considered in the analysis.

C.3. Stage storage computations for the site stormwater detention pond and the cooling reservoir are presented in Exhibit C-3. Discharges from the plant site stormwater detention pond and the cooling reservoir were calculated based on the standard rectangular weir formula.

C.4. Post development subbasin #1 is the plant sited and is approximately 72.9 acres. Approximately 75 % of the total plant site area will be paved or otherwise developed. It is estimated that this plant site area will have a SCS runoff curve number of 93. The site stormwater detention pond serving this site will be approximately 3.1 acres.

Post development subbasin #2 is the entrance road and is approximately 14.1 acres. Of this total area of 14.1 acres, 24% or 3.4 acres will be paved road surface and the SCS runoff curve number is estimated to be 98. The remaining 76% of the basin or 10.7 acres will be grassed and will have a SCS runoff curve number of 80.

The cooling reservoir watershed is approximately 470 acres and, after restoration, will be grassed pasture or replanted forested uplands with a curve number of 80. This watershed will contribute to the 570 acre cooling reservoir.

C.5 Runoff calculations for the pre- and post development plant site and entrance road subbasins for the 25-year 24-hour rainfall are summarized in attached Exhibit C-5. Evaluation of detention volumes and side drain filtration calculations for the water quality control for the plant site for the 1 inch rainfall are summarized in attached Exhibit C-5. An evaluation of discharge from the cooling reservoir for the 25-year 24-hour rainfall is presented in Section 5.1 of the SCA.

D. LEGAL/INSTITUTIONAL INFORMATION

D.1. The entity responsible for the operation and maintenance of these surface water management systems is described in Section 1.0 of the SCA.

D.2. Not Applicable.

D.3. Water and wastewater service to the plant site is summarized in Section 3.5 and 3.6 of the SCA

D.4. Coordination with federal, state, regional and local agencies is summarized in detail in Section 9.0 of the SCA.

D.5. Current and future zone of the project site are discussed in Section 2.2.2 of the SCA.

D.6. Information regarding site ownership and control is presented in Section 1.0 of the SCA.

D.7. A detailed evaluation of potential receiving water system impacts is presented in Section 5.1 of the SCA.

Exhibit C-3

Table 1. Stage-Storage and Discharge Information for the Plant Site Detention Pond

Weir Length 2.5 feet
Weir Elevation 113 feet MSL

Elevation (feet MSL)	Total Storage (acre-ft)	Weir Discharge (cfs)
110	0	0
111	3.1	0
112	6.2	0
113	9.3	0
114	12.4	8.3
115	15.5	23.5
116	18.6	43.3
117	21.7	66.6
118	24.8	93.1
119	27.9	122.4

Exhibit C-3

Table 2. Stage-Storage and Discharge Information for the Cooling Reservoir

Reservoir Area	570 acres
Weir Length	10 feet
Weir Elevation	124 feet MSL

Elevation (feet MSL)	Total Storage (acre-ft)	Weir Discharge (cfs)
124.0	0	0
124.1	57	1.1
124.2	114	3.0
124.3	171	5.5
124.4	228	8.4
124.5	285	11.8
124.6	342	15.5
124.7	399	19.5
124.8	456	23.8
124.9	513	28.4
125.0	570	33.3

Exhibit C-5

Table 1. Summary of Runoff Analysis for the 25-Year, 24-Hour Rainfall (9.0 inches) for the Reservoir and Plant Site/Entrance Road

Basin	Total Area (acres)	Total Retention Area (acres)	Peak Discharge (cfs)
PLANT SITE AND ENTRANCE ROAD[1]			
Pre-Development	1040	-	374
Plant Site	72.9	-	79.3
Entrance Road	14.1	-	8.6
Total	87.0	-	87.9
Post Development			
Plant Site	72.9	3.1	68.1
Entrance Road	14.1	-	10.5
Total	87.0	3.1	78.6
COOLING RESERVOIR[2]			
Pre-Development	880	-	317
Post Development	880	570	0.33

Note: 1. Plant site and entrance road runoff analyses were performed using SCS runoff techniques and are attached.

2. Cooling reservoir runoff analyses were conducted using the HEC-1 model, as described in Section 5.1.1 of the SCA. Pre-development basin peak runoff was estimated based on the unit peak runoff (cfs/square mile) for Payne Creek as determined by the HEC-1 modeling analysis.

EXHIBIT C-5 Table 2

```
          HARDEE POWER STATION


      SUBWATERSHED NAME           =  PLANT SITE - PRE-DEVELOPMENT
      TOTAL AREA                  =    72.9  ACRES
      HYDRAULIC LENGTH            =    3312  FEEET
      WATERSHED SLOPE             =    0.26  %
      SOIL STORAGE CAPACITY       =   2.50  INCHES
      CURVE NUMBER                =   80.0
      TIME OF CONCENTRATION       =   2.71  HOURS
      RETURN FREQUENCY            =  25 YEARS
      RAINFALL DURATION           =  24 HOURS
      TOTAL RAINFALL DEPTH        =   9.00 INCHES


    TIME   RAINFALL    RUNOFF      INFLOW    PUMP-OUT   DISCHARGE   STAGE
    (HR)     (IN)      (CFS)       (CFS)      (CFS)       (CFS)      (FT)
    ----   --------  ---------    -------   --------   ---------   ------

     0.00    0.00        0.0         0.0        0.0         0.0      0.00
     4.00    0.49        0.0         0.0        0.0         0.0      0.00
     6.00    0.80        0.6         0.0        0.0         0.6      0.00
     7.00    0.99        1.5         0.0        0.0         1.5      0.00
     8.00    1.21        2.7         0.0        0.0         2.7      0.00
     9.00    1.48        4.4         0.0        0.0         4.4      0.00
    10.00    1.81        6.9         0.0        0.0         6.9      0.00
    10.50    2.03        8.8         0.0        0.0         8.8      0.00
    11.00    2.32       11.6         0.0        0.0        11.6      0.00
    11.50    2.77       16.6         0.0        0.0        16.6      0.00
    12.00    5.46       57.0         0.0        0.0        57.0      0.00
    12.50    6.47       78.2         0.0        0.0        78.2      0.00
    13.00    6.81       76.3         0.0        0.0        76.3      0.00
    14.00    7.26       62.8         0.0        0.0        62.8      0.00
    15.00    7.58       50.3         0.0        0.0        50.3      0.00
    16.00    7.83       40.2         0.0        0.0        40.2      0.00
    17.00    8.04       32.3         0.0        0.0        32.3      0.00
    18.00    8.22       26.2         0.0        0.0        26.2      0.00
    20.00    8.53       18.2         0.0        0.0        18.2      0.00
    22.00    8.78       13.3         0.0        0.0        13.3      0.00
    24.00    9.00       10.3         0.0        0.0        10.3      0.00
    30.00    9.00        1.2         0.0        0.0         1.2      0.00
    36.00    9.00        0.1         0.0        0.0         0.1      0.00
    40.00    9.00        0.0         0.0        0.0         0.0      0.00
    44.00    9.00        0.0         0.0        0.0         0.0      0.00
    48.00    9.00        0.0         0.0        0.0         0.0      0.00



          FLOW ROUTING SUMMARY

    MAXIMUM DISCHARGE WAS     79.3 CFS AT  12.75 HOURS
    TOTAL DISCHARGE VOLUME WAS      0.0 ACRE-FEET
```

EXHIBIT C-5   TABLE 3

HARDEE POWER STATION

SUBWATERSHED NAME = PLANT SITE - POST DEVELOPMENT
TOTAL AREA = 72.9 ACRES
HYDRAULIC LENGTH = 3312 FEEET
WATERSHED SLOPE = 0.27 %
SOIL STORAGE CAPACITY = 0.75 INCHES
CURVE NUMBER = 93.0
TIME OF CONCENTRATION = 1.64 HOURS
RETURN FREQUENCY = 25 YEARS
RAINFALL DURATION = 24 HOURS
TOTAL RAINFALL DEPTH = 9.00 INCHES

TIME (HR)	RAINFALL (IN)	RUNOFF (CFS)	INFLOW (CFS)	PUMP-OUT (CFS)	DISCHARGE (CFS)	STAGE (FT)
0.00	0.00	0.0	0.0	0.0	0.0	110.00
4.00	0.49	2.7	0.0	0.0	0.0	110.07
6.00	0.80	6.0	0.0	0.0	0.0	110.30
7.00	0.99	7.9	0.0	0.0	0.0	110.49
8.00	1.21	10.0	0.0	0.0	0.0	110.73
9.00	1.48	13.0	0.0	0.0	0.0	111.03
10.00	1.81	16.8	0.0	0.0	0.0	111.42
10.50	2.03	19.9	0.0	0.0	0.0	111.67
11.00	2.32	24.4	0.0	0.0	0.0	111.96
11.50	2.77	33.0	0.0	0.0	0.0	112.34
12.00	5.46	105.8	0.0	0.0	0.7	113.20
12.50	6.47	181.1	0.0	0.0	18.9	114.73
13.00	6.81	115.6	0.0	0.0	42.8	115.98
14.00	7.26	78.5	0.0	0.0	66.8	117.01
15.00	7.58	53.4	0.0	0.0	65.4	116.95
16.00	7.83	37.5	0.0	0.0	55.3	116.53
17.00	8.04	27.4	0.0	0.0	44.6	116.06
18.00	8.22	20.9	0.0	0.0	35.6	115.64
20.00	8.53	14.2	0.0	0.0	23.6	115.00
22.00	8.78	10.7	0.0	0.0	16.7	114.59
24.00	9.00	8.6	0.0	0.0	12.8	114.33
30.00	9.00	0.2	0.0	0.0	3.3	113.55
36.00	9.00	0.0	0.0	0.0	1.0	113.25
40.00	9.00	0.0	0.0	0.0	0.6	113.17
44.00	9.00	0.0	0.0	0.0	0.3	113.12
48.00	9.00	0.0	0.0	0.0	0.2	113.09

FLOW ROUTING SUMMARY

MAXIMUM STAGE WAS 117.06 FEET AT 14.25 HOURS
MAXIMUM DISCHARGE WAS 68.1 CFS AT 14.25 HOURS
TOTAL DISCHARGE VOLUME WAS 49.6 ACRE-FEET

EXHIBIT C-5   TABLE 4

```
        HARDEE POWER STATION


SUBWATERSHED NAME           =  ENTRANCE ROAD - PRE-DEVELOPMENT
TOTAL AREA                  =    14.1  ACRES
HYDRAULIC LENGTH            =    6144  FEEET
WATERSHED SLOPE             =    0.15  %
SOIL STORAGE CAPACITY       =   2.50  INCHES
CURVE NUMBER                =   80.0
TIME OF CONCENTRATION       =   5.85  HOURS
RETURN FREQUENCY            =  25 YEARS
RAINFALL DURATION           =  24 HOURS
TOTAL RAINFALL DEPTH        =   9.00 INCHES

TIME   RAINFALL    RUNOFF      INFLOW   PUMP-OUT   DISCHARGE   STAGE
(HR)     (IN)      (CFS)       (CFS)     (CFS)       (CFS)     (FT)
----   --------  ---------    -------   --------   ---------   ------

 0.00    0.00        0.0         0.0        0.0         0.0      0.00
 4.00    0.49        0.0         0.0        0.0         0.0      0.00
 6.00    0.80        0.1         0.0        0.0         0.1      0.00
 7.00    0.99        0.2         0.0        0.0         0.2      0.00
 8.00    1.21        0.3         0.0        0.0         0.3      0.00
 9.00    1.48        0.5         0.0        0.0         0.5      0.00
10.00    1.81        0.8         0.0        0.0         0.8      0.00
10.50    2.03        1.0         0.0        0.0         1.0      0.00
11.00    2.32        1.3         0.0        0.0         1.3      0.00
11.50    2.77        1.9         0.0        0.0         1.9      0.00
12.00    5.46        5.8         0.0        0.0         5.8      0.00
12.50    6.47        8.2         0.0        0.0         8.2      0.00
13.00    6.81        8.6         0.0        0.0         8.6      0.00
14.00    7.26        8.2         0.0        0.0         8.2      0.00
15.00    7.58        7.6         0.0        0.0         7.6      0.00
16.00    7.83        7.0         0.0        0.0         7.0      0.00
17.00    8.04        6.3         0.0        0.0         6.3      0.00
18.00    8.22        5.7         0.0        0.0         5.7      0.00
20.00    8.53        4.7         0.0        0.0         4.7      0.00
22.00    8.78        3.8         0.0        0.0         3.8      0.00
24.00    9.00        3.1         0.0        0.0         3.1      0.00
30.00    9.00        1.1         0.0        0.0         1.1      0.00
36.00    9.00        0.4         0.0        0.0         0.4      0.00
40.00    9.00        0.2         0.0        0.0         0.2      0.00
44.00    9.00        0.1         0.0        0.0         0.1      0.00
48.00    9.00        0.1         0.0        0.0         0.1      0.00


        FLOW ROUTING SUMMARY

MAXIMUM DISCHARGE WAS      8.6 CFS AT  13.00 HOURS
TOTAL DISCHARGE VOLUME WAS      0.0 ACRE-FEET
```

EXHIBIT C-5   TABLE 5

```
          HARDEE POWER STATION

 SUBWATERSHED NAME          =  ENTRANCE ROAD - POST DEVELOPMENT
 TOTAL AREA                 =    14.1  ACRES
 HYDRAULIC LENGTH           =    6144  FEEET
 WATERSHED SLOPE            =    0.15  %
 SOIL STORAGE CAPACITY      =   1.86  INCHES
 CURVE NUMBER               =   84.3
 TIME OF CONCENTRATION      =   5.08  HOURS
 RETURN FREQUENCY           =  25 YEARS
 RAINFALL DURATION          =  24 HOURS
 TOTAL RAINFALL DEPTH       =   9.00 INCHES

TIME    RAINFALL     RUNOFF       INFLOW     PUMP-OUT    DISCHARGE    STAGE
(HR)     (IN)         (CFS)        (CFS)      (CFS)        (CFS)       (FT)
----    --------    ---------    -------    --------    ---------    ------

 0.00     0.00          0.0          0.0         0.0          0.0      0.00
 4.00     0.49          0.0          0.0         0.0          0.0      0.00
 6.00     0.80          0.2          0.0         0.0          0.2      0.00
 7.00     0.99          0.3          0.0         0.0          0.3      0.00
 8.00     1.21          0.5          0.0         0.0          0.5      0.00
 9.00     1.48          0.8          0.0         0.0          0.8      0.00
10.00     1.81          1.2          0.0         0.0          1.2      0.00
10.50     2.03          1.5          0.0         0.0          1.5      0.00
11.00     2.32          1.9          0.0         0.0          1.9      0.00
11.50     2.77          2.5          0.0         0.0          2.5      0.00
12.00     5.46          7.3          0.0         0.0          7.3      0.00
12.50     6.47         10.1          0.0         0.0         10.1      0.00
13.00     6.81         10.4          0.0         0.0         10.4      0.00
14.00     7.26          9.7          0.0         0.0          9.7      0.00
15.00     7.58          8.8          0.0         0.0          8.8      0.00
16.00     7.83          7.8          0.0         0.0          7.8      0.00
17.00     8.04          7.0          0.0         0.0          7.0      0.00
18.00     8.22          6.2          0.0         0.0          6.2      0.00
20.00     8.53          4.9          0.0         0.0          4.9      0.00
22.00     8.78          3.8          0.0         0.0          3.8      0.00
24.00     9.00          3.1          0.0         0.0          3.1      0.00
30.00     9.00          1.0          0.0         0.0          1.0      0.00
36.00     9.00          0.3          0.0         0.0          0.3      0.00
40.00     9.00          0.1          0.0         0.0          0.1      0.00
44.00     9.00          0.1          0.0         0.0          0.1      0.00
48.00     9.00          0.0          0.0         0.0          0.0      0.00


         FLOW ROUTING SUMMARY

MAXIMUM DISCHARGE WAS     10.5 CFS AT  12.75 HOURS
TOTAL DISCHARGE VOLUME WAS      0.0 ACRE-FEET
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EXHIBIT C-5 TABLE 6

STORMWATER DETENTION WITH FILTRATION (FDER CHAPTER 17-25)

SIDE DRAIN FILTER DRAWDOWN ANALYSIS (USING DARCY'S LAW)

BASIN NAME = HARDEE POWER STATION - PLANT SITE
AVERAGE POND AREA = 135000 square feet
CONTROL STRUCTURE CREST ELEVATION = 113 feet MSL
POND BOTTOM OR FILTER DRAIN ELEVATION = 110 feet MSL
TOTAL RETENTION DEPTH = 3 feet
FILTER MEDIA HYDRAULIC CONDUCTIVITY, K = 164 feet/day
REQUIRED DETENTION (WITH FILTRATION) VOLUME = 132300 cubic feet
MAXIMUM ALLOWABLE FILTRATION TIME (TO SATISFY FDER 17-25) = 36 hours
LENGHT OF SIDE DRAIN = 400 feet

WATER LEVEL (MSL)	TOTAL HEAD (ft)	DELTA HEAD (ft)	TOTAL VOLUME (ft^3)	DELTA VOLUME (ft^3)	FLOW LENGHT THRU FILTER (ft)			HYDRAULIC GRADIENT (ft/ft)	FILTER AREA (ft^2)	FLOW (cfh)	AVE FLOW (cfh)	DELTA TIME (hrs)	TOTAL TIME (hrs)	FILTERED VOLUME (ft^3)
					MAX	MIN	AVE							
113.00	3.00		405000		8.2	2.0	4.3	0.693	1200.0	5684.4			0.0	0
		0.38		50625							5018.2	10.1		
112.63	2.63		354375		8.2	2.0	4.3	0.607	1050.0	4352.1			10.1	50625
		0.38		50625							3774.8	13.4		
112.25	2.25		303750		8.2	2.0	4.3	0.520	900.0	3197.5			23.5	101250
		0.38		50625							2644.8	19.1		
111.88	1.88		253125		8.2	2.0	4.6	0.408	750.0	2092.2			42.6	151875
		0.38		50625							1626.3	31.1		
111.50	1.50		202500		8.2	2.7	5.3	0.283	600.0	1160.5			73.8	202500
		0.38		50625							867.4	58.4		
111.13	1.13		151875		8.2	3.9	6.0	0.187	450.0	574.4			132.1	253125
		0.38		50625							401.0	126.3		
110.75	0.75		101250		8.2	5.3	6.8	0.111	300.0	227.6			258.4	303750
		0.38		50625							139.4	363.1		
110.38	0.38		50625		8.2	6.8	7.5	0.050	150.0	51.3			621.5	354375
		0.38		50625							25.6	1975.2		
110.00	0.00		0		8.2	8.2	8.2	0.000	0.0	0.0			2596.8	405000

BASED ON THE ABOVE STORMWATER SYSTEM PARAMETERS, THE REQUIRED DETENTION OF %132300 CUBIC FEET WILL BE RESTORED, BY FILTRATION THROUGH A 400 FOOT SIDE DRAIN, IN APPROXIMATELY 35.2 HOURS

11.6 SUPPORTING AQUATIC ECOLOGY INFORMATION

Table 1. Phylogenetic listing of all Taxa Identified from Payne Creek, October/November 1988 and February/March, 1989.

Phylum Class Order Family		SAMPLE TYPE	
Genus species	Ponar	HesterDendy	DipNet
Coelenterata			
Hydrozoa			
Hydrida			
Hydridae			
Hydra sp.		X	
Turbellaria	X	X	X
Nemertea			
Prostoma rubrum	X		X
Nematoda	X		
Annelida			
Oligochaeta			
Haplotaxida			
Naididae			
Dero flabelliger	X		
D. furcata	X		
D. nivea		X	
Nais communis	X	X	
N. pardalis	X		
N. variabilis	X		
Pristina leidyi	X	X	
P. synclites	X	X	
Slavena appendiculata	X	X	
Opistocystidae			
Trieminentia corderoi			
Tubificidae			X
Aulodrilus piqueti	X		
Limnodrilus hoffmeisteri	X		
Psammoryctides convolutus	X		
Immature with Capil.Setae	X		
Immature w/o Capil. Setae	X		
Lumbriculida			
Lumbriculidae	X		X

Table 2. Macroinvertebrates Collected Using Artificial Substrates from Payne Creek Station PC-1, October-November, 1988

Taxa	Replicates 1	2	3	Total
Turbellaria	92	31	23	146
Pristina leidyi		62		62
P. synclites			8	8
Slavena appendiculata	123			123
Hyalella azteca	92			92
Baetis propinquus	62		31	92
Caenis diminuta	92	154	185	431
Stenacron interpunctatum			31	31
Stenonema exiguum	31	62	62	154
Tricorythodes albilineatus	31			31
Nehallenia sp.	31			31
Cheumatopsyche sp.	1600	923	984	3507
Polycentropus sp.		31		31
Lepidoptera	31		8	38
Heterelmis vulnerata	8			8
Stenelmis fuscata		62		62
Corydalus corneutus			8	8
Ablabesmyia mallochi	62		92	154
Corynoneura taris group	31	62	123	215
Endochironomus group	308	185	1415	1907
Pentaneura inconspicua	554	431	215	1200
Polypedilum convictum	123	646	246	1015
P. fallax		31		31
P. illinoense	62		31	92
P. scalaenum	154	1015	185	1353
Rheocricotopus robacki	31		31	62
Rheotanytarsus exiguus group	185	1169	154	1507
Tanytarsus guerlus group	215		461	677
T. sp. XI Rutter		277		277
Thienemanniella fusca group	31	800	31	861
Simulium sp.		31		31
Hebetancylus excentricus	62			62
TOTAL NUMBER OF SPECIES	23	17	20	32
TOTAL NUMBER OF INDIVIDUALS	4,006	5,967	4,322	14,296
DIVERSITY ($\bar{d}$)	3.27	3.25	3.07	3.62

Table 3. Macroinvertebrates Collected Using Artificial Substrates from Payne Creek Station PC-2, October-November, 1988

	Replicates			
Taxa	1	2	3	Total
Hydra sp.	31			31
Nais communis		62		62
Pristina leidyi			277	277
Slavena appendiculata	308	31	123	461
Hyalella azteca	31	15		46
Neoperla carlsoni	31	8	23	62
Baetis propinquus		23	15	38
Caenis diminuta	62		38	100
Stenacron interpunctatum	92	15	31	138
Stenonema exiguum	92	8	23	123
S. smithae			15	15
Cheumatopsyche sp.	15	177	15	208
Neotrichia sp.	62		8	69
Polycentropus sp.	62		8	69
Neureclipsis sp.		15		15
Nyctiophylax sp.	185	46	38	269
Hydroptilidae	8			8
Drypos sp.		8		8
Stenelmis fuscata	62	62	15	138
Heterelmis vulnerata	92			92
Corydalus cornutus		8		8
Ceratopogonidae			31	31
Ablabesmyia mallochi	215		31	246
Corynoneura celeripes	62	62	31	154
Endochironomus group	1507		1107	2615
Nanocladius minimus?	31			31
Nilotanypus sp.	31		123	154
Pentaneura inconspicua		123	123	246
Polypedilum convictum	4460	3999	1784	10243
P. fallax	277		154	431
P. illinoense		1230		1230
P. scalaenum	646	277	1077	1999
P. simulans	123			123
Rheocricotopus robacki	92	92	123	308
Rheotanytarsus exiguus group	62	92	123	277
Tanytarsus glabrescens group	400	15	246	661
Thienemanniella fusca group	1015	646	554	2215
Hebetancylus excentricus	31	8		38
Physella cubensis		8		8
TOTAL NUMBER OF SPECIES	28	24	26	39
TOTAL NUMBER OF INDIVIDUALS	10,082	7,029	6,137	23,247
DIVERSITY ($\bar{d}$)	2.99	2.23	3.22	3.14

Table 4. Macroinvertebrates Collected Using Artificial Substrates from Payne Creek Station PC-1, February-March, 1989

	Replicates			
Taxa	1	3	4	Total
Batracobdella phalera	8	31		38
Hydracarina			54	54
Hyalella azteca			31	31
Caenis diminuta	54	31	123	208
Stenacron interpunctatum	8			8
Argia sedula	46	123	185	354
Corydalus cornutus	8	8	8	23
Homoptera		8		8
Cheumatopsyche sp.	1038	1753	2384	5175
Nectopsyche sp.			31	31
Dubiraphia sp.			31	31
Stenelmis fuscata	15		54	69
Heterelm~~y~~is vulnerata		31		31
Dineutus sp. (larvae)		62		62
Ceratopogonidae	62			62
Ablabesmyia mallochi		31		31
Cladotanytarsus vanderwulpi gr.		62		62
Corynoneura taris group	492	523	800	1815
Cricotopus bicinctus group	123			123
Demicryptochironomus sp.		54		54
Pentaneura inconspicua	62	492	484	1038
Polypedilum convictum	3753	6783	4122	14657
P. fallax		123		123
P. illinoense		69		69
P. scalaenum		815	246	1061
P. simulans		62		62
Rheocricotopus robacki		1107		1107
Rheosmittia sp.		54		54
Rheotanytarsus exiguus group	492	615	431	1538
Tanytarsus glabrescens group		92		92
T. guerlus group		77	123	200
Thienemanniella fusca group	677	2030	738	3445
Simulium sp.	31	62		92
Planorbella scalaris			15	15
TOTAL NUMBER OF SPECIES	15	25	17	34
TOTAL NUMBER OF INDIVIDUALS	6,867	15,095	9,859	31,821
DIVERSITY ($\bar{d}$)	2.18	2.79	2.59	2.74

Table 5. Macroinvertebrates Collected Using Artificial Substrates from Payne Creek Station PC-2, February-March, 1989

Taxa	Replicates 1	 2	 3	Total
Dero nivea			31	31
Slavena appendiculata		31		31
Collembola			31	31
Baetis pygmaeus		62	77	138
Caenis diminuta	123		31	154
Stenacron interpunctatum	277	38	77	392
Stenonema exiguum	92	46	8	146
Argia sedula	15			15
Cheumatopsyche sp.			31	31
Cyrnellus sp.			38	38
Nyctiophylax sp.		31		31
Polycentropus sp.	31	23	8	62
Dubiraphia sp. (larva)	92		8	100
Stenelmis fuscata group	38	23	92	154
Dineutus sp. (larva)	31	23	15	69
Gyrinus sp. (larva)			15	15
Ceratopogonidae	31			31
Ablabesmyia mallochi	123	123	31	277
A. monilis			185	185
Corynoneura taris group	369	1415	1846	3630
Cricotopus bicinctus group	62	123		185
Endochironomus sp.	123			123
Labrundinea virescens	31	62	277	369
Nanocladius minimus?	185		308	492
Nilothauma babiyi	62			62
Orthocladius sp.	62			62
Parakiefferiella sp.	92			92
Pentaneura inconspicua	169	185	92	446
Polypedilum convictum	185	1384	1246	2815
P. fallax	615	92	200	907
P. scalaenum	400	123	338	861
Rheocricotopus robacki		92		92
Rheotanytarsus exiguus group	62	554	354	969
Tanytarsus glabrescens group			185	185
T. guerlus group	1600	892	1561	4053
Thienemanniella fusca group	62	4060	1476	5598
Hebetancylus excentricus	415	15		431
Micromenetus dilatatus avus	54			54
Physella cubensis	31			31
TOTAL NUMBER OF SPECIES	28	21	26	39
TOTAL NUMBER OF INDIVIDUALS	5,429	9,397	8,559	23,385
DIVERSITY ($\bar{d}$)	3.80	2.69	3.34	3.58

Table 6. Macroinvertebrates Collected Using Artificial Substrates from Payne Creek Station PC-3, February- March, 1989

Taxa	Replicates 1	2	3	Total
Helobdella fusca			8	8
Hyalella azteca		8	300	308
Callibaetis floridanus	8		8	15
Caenis diminuta	269	62	177	508
Stenacron interpunctatum	38	8		46
Argia sedula	8			8
Corydalus cornutus		8		8
Cheumatopsyche sp.	23			23
Cyrnellus sp.		8		8
Dubiraphia sp.			85	85
Stenelmis fuscata	31		31	62
Dineutus sp. (larvae)	8			8
Ceratopogonidae			8	8
Ablabesmyia mallochi		131	92	223
Corynoneura taris group	38	23		62
Cryptotendipes nr. *pseudotener*			154	154
Dicrotendipes sp.			308	308
D. simpsoni			738	738
Endochironomus group	400	315	408	1123
Glyptotendipes lobiferous			85	85
Kiefferulus dux			38	38
Nilothauma babiyi	8	31		38
Nanocladius minimus?	31	100		131
Paralauterborniella nigrohalteralis			100	100
Pentaneura inconspicua	54			54
Polypedilum fallax	115	469	215	800
P. illinoense		154		154
P. scalaenum group	215		31	246
Rheotanytarsus exiguus group		31		31
Tanytarsus glabrescens group	523			523
T. guerlus group		308	461	769
T. sp.XI Rutter		31		31
Hebetancylus excentricus		15	38	54
Laevipex floridana			8	8
Amnicola dalli johnsoni	8		15	23
Micromenetus dilatatus avus	123	38	8	169
Physella cubensis	46			46
Byssanodonta cubensis			8	8
TOTAL NUMBER OF SPECIES	18	17	23	38
TOTAL NUMBER OF INDIVIDUALS	1,946	1,738	3,322	7,006
DIVERSITY ($\bar{d}$)	3.14	3.11	3.56	4.11

Table 7. Macroinvertebrates Collected Using Ponar Grab Samples from Payne Creek Station PC-1, October, 1988

	Replicates				
Taxa	2	3	4	5	Total
Turbellaria			91		91
Prostoma rubrum			91		91
Dero furcata			45		45
Nais communis			45		45
N. variabilis				45	45
Pristina synclites			136		136
Limnodrilus hoffmeisteri	227		136	682	1045
Psammoryctides convolutus		591	45		636
Immature Tubific. w/o Capil. Setae	364	182	136	818	1500
Immature Tubific. w/ Capil. Setae		136	91		227
Helobdella triseralis			91	45	136
Myzobdella lugubris			273		273
Batracobdella phalera				91	91
Palaemonetes paludosus			45		45
Baetis fondalis			45		45
Caenis diminuta			1045		1045
Gomphus minutus			45	45	91
Cheumatopsyche sp.		45	45	45	136
Nectopsyche sp.			45		45
Dubiraphia sp.			318		318
Ablabesmyia monilis			45	45	91
A. mallochi			182	45	227
Chironomus sp.			45		45
Clinotanypus pinguis			45	91	136
Cryptochironomus blarina group			45		45
C. fulvus group		45			45
Endochironomus group			91		91
Polypedilum scalaenum		45	91		136
P. simulans		45	45		91
Hebetancylus exentricus			227		227
Micromenetus d. avus			91		91
Planorbella duryi			45	45	91
Corbicula fluminea	818	364	1182	3136	5499
Sphaerium sp.	45		45		91
Elliptio buckleyi	45			45	91
TOTAL NUMBER OF SPECIES	5	8	31	13	35
TOTAL NUMBER OF INDIVIDUALS	1,500	1,454	4,954	5,181	13,090
DIVERSITY ($\bar{d}$)	1.69	2.35	3.93	1.93	3.38

Table 8. Macroinvertebrates Collected Using Ponar Grab Samples from Payne Creek Station PC-2, October, 1988 (Page 1 of 2)

	Replicates				
Taxa	1	3	4	6	Total
Turbellaria	136	500			636
Dero flabelliger		45			45
D. furcata		136			136
Pristina synclites		91	91	45	227
P. leidyi			91		91
Slavena appendiculata	91				91
Limnodrilus hoffmeisteri	45	136			182
Psammoryctides convolutus	182		91	45	318
Immature Tubific. w/o Capil. S	45	136	136	91	409
Batracobdella phalera	91	45			136
Hellobdella fusca	136				136
H. triseralis	136	91			227
Collembola				91	91
Baetis sp.				45	45
Caenis diminuta	1000	591	45	45	1682
Stenacron interpunctatum		45			45
Stenonema smithae			45		45
Chloroterpes hubbelli	364	182			545
Gomphus minutus		45			45
Stylarus plagiatus		45			45
Macromia taeniolata	45	91			136
Oecetis sp.		45			45
Polycentropus sp.		45			45
Dubiraphia sp.	45	136			182
Dineutus sp. (larvae)	91				91
Ceratopogonidae		91		91	182
Ablabesmyia monilis	182	45		45	273
A. mallochi	182	45		45	273
Clinotanypus pinguis		45			45
Cryptochironomus fulvus group	91		45		136
Labrundinea sp. 4 Roback	45				45
Larsia lurida	45				45
Phaenopsectra sp.	91		45		136
Polypedilum convictum			45		45
P. scalaenum	545	273			818
P. simulans	45	227		136	409
Rheosmittia sp.				45	45
Rheotanytarsus exiguus group		45			45
Tanytarsus glabrescens group	45	45	45		136
T. guerlus group			45		45
Hebetancylus exentricus			91		91
Laevipex peninsulae	636	954	136		1727
Micromenetus d. avus			45		45

Table 8. Macroinvertebrates Collected Using Ponar Grab Samples from Payne Creek Station PC-2, October, 1988 (Page 2 of 2)

	Replicates				
Taxa	1	3	4	6	Total
Corbicula fluminea	136	1182	91	136	1545
Sphaerium sp.		136	45	0	182
Elliptio buckleyi	45			45	91
Physella cubensis		45			45
TOTAL NUMBER OF SPECIES	25	29	16	14	47
TOTAL NUMBER OF INDIVIDUALS	4,500	5,545	1,136	909	12,090
DIVERSITY ($\bar{d}$)	3.89	3.92	3.86	3.55	4.50

Table 9. Macroinvertebrates Collected Using Ponar Grab Samples from Payne Creek Station PC-3, October 1988

	Replicates				
Taxa	2	3	4	5	Total
Slavena appendiculata				45	45
Aulodrilus pigueti	727	227	954		1909
Limnodrilus hoffmeisteri				45	45
Immature Tubific.w/o capil. setae	136	45	45		227
Macromia taeniolata				45	45
Clinotanypus pinguis			91		91
Cryptotendipes nr. *pseudotener*			45		45
Paratendipes sp.			45		45
Polypedilum simulans			45		45
Tanytarsus sp. 1 Cantrell	45	45	91		182
Corbicula fluminea		909		45	954
TOTAL NUMBER OF SPECIES	3	4	7	4	11
TOTAL NUMBER OF INDIVIDUALS	909	1,227	1,318	182	3,636
DIVERSITY ($\bar{d}$)	0.88	1.12	1.54	2.00	2.07

Table 10. Macroinvertebrates Collected Using Ponar Grab Samples from Payne Creek Station PC-1, February 1989

	Replicates				
Taxa	1	3	5	6	Total
Nais pardalis	45				45
Pristina synclites		91			91
Limnodrilus hoffmeisteri	91		136	727	954
Psammoryctides convolutus		273	91	182	545
Immature Tubific. w/o Capil. Setae	227	545	273	1273	2318
Hyalella azteca	136	273			409
Caenis diminuta	45	273			318
Stenonema exiguum				364	364
Tricorythodes albilineatus				182	182
Gomphus minutus	45	45		182	273
Stylarus plagiatus				91	91
Cheumatopsyche sp.	227	545			773
Dubiraphia sp.	136	182	45	1273	1636
Stenelmis fuscata group				182	182
Ceratopogonidae	91	455	136	727	1409
Cladotanytarsus vanderwulpi group	318	455	773	1454	3000
Cryptochironomus fulvus group		636	91		727
Nanocladius minimus?	182	364		182	727
Orthocladius sp.	545	91	91		727
Pentaneura inconspicua	91				91
Polypedilum convictum	91			182	273
P. illinoense	455		727	545	1727
P. scalaenum	1364	1454	364	2182	5363
Rheocricotopus nr. *effusus*	45				45
Rheotanytarsus exiguus group		91			91
Stenochironomus sp.	45				45
Tanytarsus glabrescens group	45				45
T. guerlus group	45	182	227	364	818
Simulium sp.				545	545
Sphaerium sp.			136		136
Corbicula fluminea	1227	864		1136	3227
Elliptio buckleyi	91				91
TOTAL NUMBER OF SPECIES	22	17	12	18	32
TOTAL NUMBER OF INDIVIDUALS	5,590	6,818	3,091	11,772	27,270
DIVERSITY ($\bar{d}$)	3.51	3.64	3.07	3.67	4.02

Table 11. Macroinvertebrates Collected Using Ponar Grab Samples from Payne Creek Station PC-2, February 1989

Taxa	Replicates 1	 2	 3	 4	Total
Lumbriculidae		273			273
Limnodrilus hoffmeisteri	182	91	136	364	773
Immature Tubific.w/o capil. setae		91	136	364	591
Acroneura sp.			91		91
Baetis sp.			136	182	318
Caenis diminuta	182				182
Choroterpes hubbelli	182				182
Stenacron interpunctatum			364		364
Stenonema exiguum			91		91
Argia moesta	45				45
A. sedula			91		91
Hetaerina sp.	45				45
Gomphus minutus	45				45
Cyrnellus sp.			136		136
Polycentropus sp.	545		182		727
Dubiraphia sp.	1636		227		1863
Stenelmis fuscata group	182		136	364	682
Ceratoppogonidae		45	409	2182	2636
Ablabesmyia mallochi			954		954
A. monilis	1454		682		2136
Cladotanytarsus vanderwulpi group				4590	4590
Cryptochironomus fulvus group		91	136	545	773
Polypedilum convictum				182	182
P. fallax			136		136
P. illinoense				364	364
P. scalaenum			273	3818	4091
P. simulans		182		909	1091
Procladius sp.		91			91
Stenochironomus sp.			409		409
Tanytarsus guerlus group	364	273	409	182	1227
Laevipex floridana	182		136		318
Micromenetus d. avus			136		136
Corbicula fluminea		45	227	682	954
Elliptio buckleyi			45		45
Sphaerium sp.			273		273
TOTAL NUMBER OF SPECIES	12	9	24	13	35
TOTAL NUMBER OF INDIVIDUALS	5,045	1,182	5,954	14,726	26,906
DIVERSITY ($\bar{d}$)	2.71	2.89	4.20	2.83	4.14

Table 12. Macroinvertebrates Collected Using Ponar Grab Samples from Payne Creek Station PC-3, February, 1989.

	Replicates				
Taxa	3	4	5	6	Total
Nematoda			45		45
Dero furcata			45		45
Pristina synclites		45			45
Limnodrilus hoffmeisteri		182	45	45	273
Immature Tub. w/o Capil. Setae	136	136	45	45	364
Baetis sp.			45		45
Ceratopogonidae	45		91		136
Ablabesmyia mallochi			91		91
A. monilis				91	91
Chironomus sp.	227	91		45	364
Clinotanypus pinguis			45		45
Cryptochironomus fulvus group	182	45	182		409
Cryptotendipes nr. *pseudotener*	45	45	136		227
Polypedilum scalaenum			182		182
Procladius sp.		45			45
Tanytarsus guerlus gr.			182		182
T. sp. XI Rutter		45	136		182
Elliptio buckleyi			45		45
TOTAL NUMBER OF SPECIES	5	8	14	4	18
TOTAL NUMBER OF INDIVIDUALS	636	636	1,318	227	2,818
DIVERSITY ($\bar{d}$)	2.07	2.75	3.56	1.92	3.75

11.7 SUPPORTING NOISE INFORMATION

NOISECALC MODEL DESCRIPTION AND PROGRAM OUTPUTS

The computer program, NOISECALC, was developed by the New York Department of Public Service (NYPDS, 1986) to aid in calculating sound propagation from major noise sources. Source data is input as octave band sound pressure levels. All noise sources are assumed to be point sources; line sources may be simulated by several point sources. Ambient or background noise levels at user-defined receptors (sites) are optional inputs to the model. Both sources and receptors can be input as either polar or rectangular coordinates. Sound propagation is calculated by hemispherical spreading and three user selected attenuation options: Atmospheric attenuation, path specific attenuation and barrier attenuation. Atmospheric attenuation is calculated using the data specified by the American National Standards Institute method for the Calculation of the Absorption of Sound by the Atmosphere (ANSI, 1978). Path specific attenuation can be requested to take into account the attenuating effects of ground cover, foliage and wind shadow. Sound attenuation due to barriers can be specified by providing the barrier's coordinates. Each barriers attenuation contribution is calculated by assuming an indefinitely long barrier perpendicular to the source-receptor path. Both total and A-weighted SPLs are calculated for each receptor.

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* RESULTS *

SEMINOLE NOISE STUDY
PROPOSED FACILITY & BACKGROUND MINIMUMS

AT RECEIVER # 1  SITE #1

WITH THE BACKGROUND NOISE (IF ANY)
SOUND PRESSURE LEVEL =  +71.0 DB          SOUND LEVEL =  +49.5 DBA

WITHOUT THE BACKGROUND NOISE
SOUND PRESSURE LEVEL =  +71.0 DB          SOUND LEVEL =  +49.4 DBA

THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +70.1 +63.1 +55.1 +49.1 +45.1 +42.1 +42.1 +38.1 +31.1  +0.0

THE SOURCES WHOSE A-WT CONTRIBUTIONS ARE WITHIN 10 DB
OF THE TOTAL SOURCE SOUND LEVEL AT THE RECEIVER LOCATION, ARE:

SOURCE # 3 , CT #3, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +66.3 DB          SOUND LEVEL =  +44.7 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +65.3 +58.3 +50.3 +44.3 +40.3 +37.3 +37.3 +33.3 +26.3  +0.0

SOURCE # 2 , CT #2, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +66.3 DB          SOUND LEVEL =  +44.6 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +65.3 +58.3 +50.3 +44.3 +40.3 +37.3 +37.3 +33.3 +26.3  +0.0

SOURCE # 1 , CT #1, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +66.2 DB          SOUND LEVEL =  +44.6 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +65.2 +58.2 +50.2 +44.2 +40.2 +37.2 +37.2 +33.2 +26.2  +0.0

AT RECEIVER # 2  SITE #2

WITH THE BACKGROUND NOISE (IF ANY)
SOUND PRESSURE LEVEL =  +75.1 DB          SOUND LEVEL =  +53.5 DBA

WITHOUT THE BACKGROUND NOISE
SOUND PRESSURE LEVEL =  +75.1 DB          SOUND LEVEL =  +53.5 DBA

THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +74.1 +67.1 +57.1 +53.1 +49.1 +46.1 +46.1 +42.1 +35.1  +0.0
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THE SOURCES WHOSE A-WT CONTRIBUTIONS ARE WITHIN 10 DB
OF THE TOTAL SOURCE SOUND LEVEL AT THE RECEIVER LOCATION, ARE:

SOURCE # 1 , CT #1, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +70.4 DB          SOUND LEVEL =  +48.7 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +69.4 +62.4 +54.4 +48.4 +44.4 +41.4 +41.4 +37.4 +30.4  +0.0

SOURCE # 2 , CT #2, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +70.3 DB          SOUND LEVEL =  +48.7 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +69.4 +62.4 +54.4 +48.4 +44.4 +41.4 +41.4 +37.4 +30.4  +0.0

SOURCE # 3 , CT #3, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +70.3 DB          SOUND LEVEL =  +48.7 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +69.4 +62.4 +54.4 +48.4 +44.4 +41.4 +41.4 +37.4 +30.4  +0.0

AT RECEIVER # 3  SITE #3

WITH THE BACKGROUND NOISE (IF ANY)
SOUND PRESSURE LEVEL =  +70.0 DB          SOUND LEVEL =  +48.5 DBA

WITHOUT THE BACKGROUND NOISE
SOUND PRESSURE LEVEL =  +70.0 DB          SOUND LEVEL =  +48.4 DBA

THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +69.0 +62.0 +54.0 +48.0 +44.0 +41.0 +41.0 +37.0 +30.0  +0.0

THE SOURCES WHOSE A-WT CONTRIBUTIONS ARE WITHIN 10 DB
OF THE TOTAL SOURCE SOUND LEVEL AT THE RECEIVER LOCATION, ARE:

SOURCE # 1 , CT #1, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +65.3 DB          SOUND LEVEL =  +43.6 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +64.3 +57.3 +49.3 +43.3 +39.3 +36.3 +36.3 +32.3 +25.3  +0.0

SOURCE # 2 , CT #2, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +65.2 DB          SOUND LEVEL =  +43.6 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +64.3 +57.3 +49.3 +43.3 +39.3 +36.3 +36.3 +32.3 +25.3  +0.0

SOURCE # 3 , CT #3, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +65.2 DB          SOUND LEVEL =  +43.5 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +64.2 +57.2 +49.2 +43.2 +39.2 +36.2 +36.2 +32.2 +25.2  +0.0
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```
AT RECEIVER # 4  SITE #4

WITH THE BACKGROUND NOISE (IF ANY)
SOUND PRESSURE LEVEL =  +89.1 DB          SOUND LEVEL =  +67.5 DBA

WITHOUT THE BACKGROUND NOISE
SOUND PRESSURE LEVEL =  +89.1 DB          SOUND LEVEL =  +67.4 DBA

THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +88.1 +81.1 +73.1 +67.1 +63.1 +60.1 +60.1 +56.1 +49.1  +0.0

THE SOURCES WHOSE A-WT CONTRIBUTIONS ARE WITHIN 10 DB
OF THE TOTAL SOURCE SOUND LEVEL AT THE RECEIVER LOCATION, ARE:

SOURCE # 1 , CT #1, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +84.7 DB          SOUND LEVEL =  +63.1 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +83.8 +76.8 +68.8 +62.8 +58.8 +55.8 +55.8 +51.8 +44.8  +0.0

SOURCE # 2 , CT #2, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +84.3 DB          SOUND LEVEL =  +62.7 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +83.3 +76.3 +68.3 +62.3 +58.3 +55.3 +55.3 +51.3 +44.3  +0.0

SOURCE # 3 , CT #3, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +83.9 DB          SOUND LEVEL =  +62.2 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +82.9 +75.9 +67.9 +61.9 +57.9 +54.9 +54.9 +50.9 +43.9  +0.0

AT RECEIVER # 5  SITE #5

WITH THE BACKGROUND NOISE (IF ANY)
SOUND PRESSURE LEVEL =  +89.1 DB          SOUND LEVEL =  +67.4 DBA

WITHOUT THE BACKGROUND NOISE
SOUND PRESSURE LEVEL =  +89.1 DB          SOUND LEVEL =  +67.4 DBA

THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +88.1 +81.1 +73.1 +67.1 +63.1 +60.1 +60.1 +56.1 +49.1  +0.0

THE SOURCES WHOSE A-WT CONTRIBUTIONS ARE WITHIN 10 DB
OF THE TOTAL SOURCE SOUND LEVEL AT THE RECEIVER LOCATION, ARE:

SOURCE # 1 , CT #1, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +84.4 DB          SOUND LEVEL =  +62.8 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +83.4 +76.4 +68.4 +62.4 +58.4 +55.4 +55.4 +51.4 +44.4  +0.0

SOURCE # 2 , CT #2, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +84.3 DB          SOUND LEVEL =  +62.7 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +83.3 +76.3 +68.3 +62.3 +58.3 +55.3 +55.3 +51.3 +44.3  +0.0
```

```
SOURCE # 3 , CT #3, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +84.2 DB          SOUND LEVEL =  +62.5 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +83.2 +76.2 +68.2 +62.2 +58.2 +55.2 +55.2 +51.2 +44.2  +0.0

AT RECEIVER # 6  SITE #6

WITH THE BACKGROUND NOISE (IF ANY)
SOUND PRESSURE LEVEL =  +64.5 DB          SOUND LEVEL =  +43.9 DBA

WITHOUT THE BACKGROUND NOISE
SOUND PRESSURE LEVEL =  +64.5 DB          SOUND LEVEL =  +42.8 DBA

THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +63.5 +56.5 +48.5 +42.5 +38.5 +35.5 +35.5 +31.5 +24.5  +0.0

THE SOURCES WHOSE A-WT CONTRIBUTIONS ARE WITHIN 10 DB
OF THE TOTAL SOURCE SOUND LEVEL AT THE RECEIVER LOCATION, ARE:

SOURCE # 1 , CT #1, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +59.7 DB          SOUND LEVEL =  +38.1 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +58.8 +51.8 +43.8 +37.8 +33.8 +30.8 +30.8 +26.8 +19.8  +0.0

SOURCE # 2 , CT #2, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +59.7 DB          SOUND LEVEL =  +38.1 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +58.7 +51.7 +43.7 +37.7 +33.7 +30.7 +30.7 +26.7 +19.7  +0.0

SOURCE # 3 , CT #3, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +59.7 DB          SOUND LEVEL =  +38.0 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +58.7 +51.7 +43.7 +37.7 +33.7 +30.7 +30.7 +26.7 +19.7  +0.0


RESULTS SUMMARY
                WITH BACKGROUND NOISE (IF ANY)
RECEIVER        S.PRESSURE LEV.(DB)        SOUND LEVEL (DBA)

# 1  SITE #1       +71.0                        +49.5
# 2  SITE #2       +75.1                        +53.5
# 3  SITE #3       +70.0                        +48.5
# 4  SITE #4       +89.1                        +67.5
# 5  SITE #5       +89.1                        +67.4
# 6  SITE #6       +64.5                        +43.9
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* RESULTS *

SEMINOLE NOISE STUDY
PROPOSED FACILITY & BACKGROUND Leq

AT RECEIVER # 1  SITE #1

WITH THE BACKGROUND NOISE (IF ANY)
SOUND PRESSURE LEVEL =  +71.0 DB          SOUND LEVEL =  +52.4 DBA

WITHOUT THE BACKGROUND NOISE
SOUND PRESSURE LEVEL =  +71.0 DB          SOUND LEVEL =  +49.4 DBA

THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +70.1 +63.1 +55.1 +49.1 +45.1 +42.1 +42.1 +38.1 +31.1  +0.0

THE SOURCES WHOSE A-WT CONTRIBUTIONS ARE WITHIN 10 DB
OF THE TOTAL SOURCE SOUND LEVEL AT THE RECEIVER LOCATION, ARE:

SOURCE # 3 , CT #3, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +66.3 DB          SOUND LEVEL =  +44.7 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +65.3 +58.3 +50.3 +44.3 +40.3 +37.3 +37.3 +33.3 +26.3  +0.0

SOURCE # 2 , CT #2, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +66.3 DB          SOUND LEVEL =  +44.6 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +65.3 +58.3 +50.3 +44.3 +40.3 +37.3 +37.3 +33.3 +26.3  +0.0

SOURCE # 1 , CT #1, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +66.2 DB          SOUND LEVEL =  +44.6 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +65.2 +58.2 +50.2 +44.2 +40.2 +37.2 +37.2 +33.2 +26.2  +0.0

AT RECEIVER # 2  SITE #2

WITH THE BACKGROUND NOISE (IF ANY)
SOUND PRESSURE LEVEL =  +75.1 DB          SOUND LEVEL =  +53.9 DBA

WITHOUT THE BACKGROUND NOISE
SOUND PRESSURE LEVEL =  +75.1 DB          SOUND LEVEL =  +53.5 DBA

THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +74.1 +67.1 +59.1 +53.1 +49.1 +46.1 +46.1 +42.1 +35.1  +0.0
```

```
THE SOURCES WHOSE A-WT CONTRIBUTIONS ARE WITHIN 10 DB
OF THE TOTAL SOURCE SOUND LEVEL AT THE RECEIVER LOCATION, ARE:

SOURCE # 1 , CT #1, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +70.4 DB          SOUND LEVEL =  +48.7 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +69.4 +62.4 +54.4 +48.4 +44.4 +41.4 +41.4 +37.4 +30.4  +0.0

SOURCE # 2 , CT #2, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +70.3 DB          SOUND LEVEL =  +48.7 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +69.4 +62.4 +54.4 +48.4 +44.4 +41.4 +41.4 +37.4 +30.4  +0.0

SOURCE # 3 , CT #3, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +70.3 DB          SOUND LEVEL =  +48.7 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +69.4 +62.4 +54.4 +48.4 +44.4 +41.4 +41.4 +37.4 +30.4  +0.0

AT RECEIVER # 3  SITE #3

WITH THE BACKGROUND NOISE (IF ANY)
SOUND PRESSURE LEVEL =  +70.0 DB          SOUND LEVEL =  +49.2 DBA

WITHOUT THE BACKGROUND NOISE
SOUND PRESSURE LEVEL =  +70.0 DB          SOUND LEVEL =  +48.4 DBA

THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +69.0 +62.0 +54.0 +48.0 +44.0 +41.0 +41.0 +37.0 +30.0  +0.0

THE SOURCES WHOSE A-WT CONTRIBUTIONS ARE WITHIN 10 DB
OF THE TOTAL SOURCE SOUND LEVEL AT THE RECEIVER LOCATION, ARE:

SOURCE # 1 , CT #1, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +65.3 DB          SOUND LEVEL =  +43.6 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +64.3 +57.3 +49.3 +43.3 +39.3 +36.3 +36.3 +32.3 +25.3  +0.0

SOURCE # 2 , CT #2, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +65.2 DB          SOUND LEVEL =  +43.6 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +64.3 +57.3 +49.3 +43.3 +39.3 +36.3 +36.3 +32.3 +25.3  +0.0

SOURCE # 3 , CT #3, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +65.2 DB          SOUND LEVEL =  +43.5 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +64.2 +57.2 +49.2 +43.2 +39.2 +36.2 +36.2 +32.2 +25.2  +0.0
```

```
AT RECEIVER # 4  SITE #4

WITH THE BACKGROUND NOISE (IF ANY)
SOUND PRESSURE LEVEL =  +89.1 DB          SOUND LEVEL =  +67.9 DBA

WITHOUT THE BACKGROUND NOISE
SOUND PRESSURE LEVEL =  +89.1 DB          SOUND LEVEL =  +67.4 DBA

THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +88.1 +81.1 +73.1 +67.1 +63.1 +60.1 +60.1 +56.1 +49.1  +0.0

THE SOURCES WHOSE A-WT CONTRIBUTIONS ARE WITHIN 10 DB
OF THE TOTAL SOURCE SOUND LEVEL AT THE RECEIVER LOCATION, ARE:

SOURCE # 1 , CT #1, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +84.7 DB          SOUND LEVEL =  +63.1 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +83.8 +76.8 +68.8 +62.8 +58.8 +55.8 +55.8 +51.8 +44.8  +0.0

SOURCE # 2 , CT #2, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +84.3 DB          SOUND LEVEL =  +62.7 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +83.3 +76.3 +68.3 +62.3 +58.3 +55.3 +55.3 +51.3 +44.3  +0.0

SOURCE # 3 , CT #3, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +83.9 DB          SOUND LEVEL =  +62.2 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +82.9 +75.9 +67.9 +61.9 +57.9 +54.9 +54.9 +50.9 +43.9  +0.0

AT RECEIVER # 5  SITE #5

WITH THE BACKGROUND NOISE (IF ANY)
SOUND PRESSURE LEVEL =  +89.1 DB          SOUND LEVEL =  +67.4 DBA

WITHOUT THE BACKGROUND NOISE
SOUND PRESSURE LEVEL =  +89.1 DB          SOUND LEVEL =  +67.4 DBA

THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +68.1 +81.1 +73.1 +67.1 +63.1 +60.1 +60.1 +56.1 +49.1  +0.0

THE SOURCES WHOSE A-WT CONTRIBUTIONS ARE WITHIN 10 DB
OF THE TOTAL SOURCE SOUND LEVEL AT THE RECEIVER LOCATION, ARE:

SOURCE # 1 , CT #1, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +84.4 DB          SOUND LEVEL =  +62.8 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63    125   250   500    1K    2K    4K    8K   16K HERTZ
 +83.4 +76.4 +68.4 +62.4 +58.4 +55.4 +55.4 +51.4 +44.4  +0.0
```

```
SOURCE # 2 , CT #2, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +84.3 DB          SOUND LEVEL =  +62.7 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +83.3 +76.3 +68.3 +62.3 +58.3 +55.3 +55.3 +51.3 +44.3  +0.0

SOURCE # 3 , CT #3, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +84.2 DB          SOUND LEVEL =  +62.5 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +83.2 +76.2 +68.2 +62.2 +58.2 +55.2 +55.2 +51.2 +44.2  +0.0

AT RECEIVER # 6  SITE #6

WITH THE BACKGROUND NOISE (IF ANY)
SOUND PRESSURE LEVEL =  +64.5 DB          SOUND LEVEL =  +49.9 DBA

WITHOUT THE BACKGROUND NOISE
SOUND PRESSURE LEVEL =  +64.5 DB          SOUND LEVEL =  +42.8 DBA

THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +63.5 +56.5 +48.5 +42.5 +38.5 +35.5 +35.5 +31.5 +24.5  +0.0

THE SOURCES WHOSE A-WT CONTRIBUTIONS ARE WITHIN 10 DB
OF THE TOTAL SOURCE SOUND LEVEL AT THE RECEIVER LOCATION, ARE:

SOURCE # 1 , CT #1, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +59.7 DB          SOUND LEVEL =  +38.1 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +58.8 +51.8 +43.8 +37.8 +33.8 +30.8 +30.8 +26.8 +19.8  +0.0

SOURCE # 2 , CT #2, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +59.7 DB          SOUND LEVEL =  +38.1 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +58.7 +51.7 +43.7 +37.7 +33.7 +30.7 +30.7 +26.7 +19.7  +0.0

SOURCE # 3 , CT #3, CONTRIBUTES:
SOUND PRESSURE LEVEL =  +59.7 DB          SOUND LEVEL =  +38.0 DBA
THE OCTAVE BAND SOUND PRESSURE LEVELS ARE:
 31.5    63   125   250   500    1K    2K    4K    8K   16K HERTZ
 +58.7 +51.7 +43.7 +37.7 +33.7 +30.7 +30.7 +26.7 +19.7  +0.0


RESULTS SUMMARY
                WITH BACKGROUND NOISE (IF ANY)
RECEIVER        S.PRESSURE LEV.(DB)         SOUND LEVEL (DBA)

# 1  SITE #1        +71.0                       +52.4
# 2  SITE #2        +75.1                       +53.9
# 3  SITE #3        +70.0                       +49.2
# 4  SITE #4        +89.1                       +67.9
# 5  SITE #5        +89.1                       +67.4
# 6  SITE #6        +64.5                       +49.9
```

11.8 LIST OF PREPARERS

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11.9 INITIAL ORDER ON NEED DETERMINATION

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition of Seminole Electric)
Cooperative, Inc. to determine need)
for electrical power plant.)
)

DOCKET NO. 880309-EC
ORDER NO. 20930
ISSUED: 3-23-89

The following Commissioners participated in the disposition of this matter:

MICHAEL McK. WILSON, Chairman
THOMAS M. BEARD
GERALD L. GUNTER
JOHN T. HERNDON

INITIAL ORDER ON NEED DETERMINATION

BY THE COMMISSION:

On February 23, 1988, Seminole Electric Cooperative, Inc. (SEC) filed a petition to determine its need for two 220 MW class combined cycle generating units with an in-service date of January 1, 1993. Along with its petition, SEC submitted a Need Determination Study and Need Determination Study Appendices (Exhibits 1 and 2, respectively). These studies were intended to meet the requirements of Rule 25-22.081, Florida Administrative Code, our rule outlining the information required for this Commission to make a determination of need pursuant to the Florida Electrical Power Plant Siting Act (Siting Act), Sections 403.501-.517, Florida Statutes.

After reviewing these documents, Staff concluded that the petition filed by SEC did not meet the requirements of Rules 25-22.081(2), (4), and (6). SEC was given an opportunity to respond to Staff's written objections to its need determination petition. Based on a review of these documents, we found that SEC's petition did not comply with those sections of the rule and that it was unable to meet the statutory requirements of Sections 403.519 and 366.80-.85, Florida Statutes, until several events occurred. Using the earliest date on which all of these events could be completed and evaluated, we set a hearing date of December 7-9, 1988. Order No. 19468, issued on June 8, 1988, at 7-9.

SEC originally filed direct testimony in support of its petition on April 6, 1988 and rebuttal testimony on May 11, 1988. This was replaced by revised direct testimony filed on October 26, 1988. This October testimony completely superseded SEC's earlier testimony and formed the basis of SEC's testimony at trial. Staff filed the direct testimony of Wayne Makin and Theresa Walsh on April 6 as well. This testimony was no longer relevant after our ruling in June and was withdrawn. SEC filed its post-hearing brief on January 10, 1989, addressing all issues raised in the Prehearing Order in this docket, Order No. 20305, issued on November 15, 1988.

As part of its evaluation of the most cost-effective means of supplying its capacity needs in 1993, SEC issued a request for proposals (RFP) for capacity from qualifying facilities and independent power producers. At the December hearing, SEC indicated that it had compiled a "short list" of three bidders,

DOCUMENT NUMBER-DATE

two of whom, with further negotiation of terms, might provide a more economical means of supplying SEC with its needed capacity than construction of its proposed units. Based on that representation, we requested that our Staff develop a procedure for resolution of this docket which would allow SEC to go forward with the certification of its proposed plants while not impeding SEC's negotiations with the short list of bidders.

The record before us today is fully developed on both SEC's need for 450 MW of capacity in 1993 and the parameters which are attached to its own construction of two 220 MW class combined cycle generating units at its Polk/Hardee county location. That being the case, our Staff has suggested that this docket be bifurcated and two sets of findings made: an initial order which deals with the need of SEC for 450 MW of capacity in 1993 and a second order, the final order in the docket, which deals with the most economical means of satisfying that need if one exists. These two orders taken together would satisfy the reporting requirements of Section 403.507(b), Florida Statutes. We adopt our Staff's approach with the following modification: because we will hear no additional testimony on SEC's own construction alternative, we can find that certain requirements of the Siting Act have been met, absent the RFP process.

SEC is a generation and transmission cooperative serving its member systems from 1214 MW of its own capacity: two 600 MW coal units and a 14 MW share of Florida Power Corporation's (FPC) Crystal River 3. All load above that level is served by partial requirements purchases from Florida Power and Light Company (FPL) and FPC. With the exception of a 50 MW purchase from the City of Gainesville, SEC has been unable to secure reserve capacity contracts for its 1214 MW from other generating utilities beyond 1992.

Thus, unlike other need determination cases which have come before this Commission, SEC is not proposing to build capacity to serve its anticipated load growth. SEC's projected load growth can, for at least the next seven years, continue to be satisfactorily served by FPL and FPC through partial requirements contracts. SEC is instead seeking to build capacity which will provide the necessary reserve margins on its system to "back up" its own generation. For that reason, although we find that SEC's load forecasts are adequate for planning purposes, they do not support the need for the capacity addition requested in this docket.

In order to identify the type and amount of capacity which will allow it to maintain its own system reliability and integrity, SEC has used an Expected Unserved Energy (EUE) standard of 1%. EUE is particularly appropriate in this application because it provides a direct expression of the amount of member load which will not be served by SEC's own generation as a result of capacity shortfalls. Without the addition of 450 MW of capacity in 1993, SEC will fall below the 1% EUE target. At a level below 1% EUE SEC would be unable to meet its own system requirements should one or both of its coal units fail. Maintenance of this amount of capacity is also necessary for SEC to meet the level of reserves required by the terms of its emergency interchange agreements with the other

Florida utilities with whom it is interconnected. Based on this testimony, we find that SEC has proven a need for 450 MW of reserve capacity in 1993.

Having determined that it needed 450 MW of reserve capacity in 1993, SEC then used the PROMOD and PROSCREEN models to evaluate the least-cost construction alternative to satisfy that need. The SEC screened 75 technologies and performed detailed cost analyses over a 30-year period on combinations of three generating technologies: combustion turbine, combined cycle and pulverized coal units. Essentially, the PROMOD and PROSCREEN models compare the present worth of revenue requirements (PWRR) of different options which meet the 1% EUE reliability standard. PWRR measures the capital costs, carrying costs, operation and maintenance costs and fuel costs associated with each unit or combination of units over the study period

SEC developed its own fuel forecasts and capital carrying costs for input into the PROSCREEN and PROMOD models. The capital costs used as inputs into the models were either taken directly from the Electric Power Research Institute's (EPRI) Technical Assessment Guide (TAG) or were based on SEC's own historical experience or the cost projections of its consulting engineers. Operation characteristics of the various units were taken from the EPRI TAG document for all units.

Based on the PROMOD and PROSCREEN models using the above data, two 220 MW class combined cycle units fueled with natural gas and distillate oil on a 80%/20% basis were found to have the lowest PWRR over the 20 year study horizon as well as the 30-year life cycle of the plant. The total PWRR over the study horizon associated with each of the generating alternatives which meet the 1% EUE reliability criterium is as follows:

Two combined cycle 220 MW units*	$ 3300 million
Three 75 MW combustion turbines, one combined cycle 220 MW unit	$ 3326 million
Six 75 MW combustion turbines	$ 3388 million
Southern Company UPS 450 MW	$ 3363 million
500 MW steam coal	$ 3542 million
Two 220 MW combined cycle with coal gasifier	$ 3613 million

*These figures are based on the use of an 80/20% split of natural gas and distillate fuel for all combined cycle and combustion turbine unit combinations.

The figures developed above are the result from SEC's "base case" assumptions. The base case data is data which SEC considers to be the most likely scenario. SEC also did sensitivity studies which used high and low forecasts for fuel prices, the effect of broker sales, high and low load forecasts, high and low capital costs, and high and low interest rates in the computer models. In each instance, the proposed combined cycle units were found to be the most cost-effective on a PWRR basis. Additionally, SEC considered "strategic" factors: operating considerations (SEC's need for capacity which could be brought on line quickly), construction flexibility (combined cycle units are modular, can be constructed within a two-year period, and can be converted via the addition of a gasifier to burn coal as well as oil and gas) and impact on SEC's ratepayers (addition of a coal unit would initially have a rate impact of 1.0 cents/KWH more than SEC's proposed units; initially adding coal gasification capability to the combined cycle units would have a rate impact of 1.3 cents/KWH more than SEC's proposed units). These strategic factors also support the selection of two 220 MW class combined cycle units as SEC's construction option.

The proposed combined cycle units will be fueled by both natural gas and distillate oil. SEC testified that natural gas would be available on an interruptible basis from the Phase II expansion of the Florida Gas Transmission Company (FGT) pipeline throughout the proposed plant's expected life at least 80 percent of the time. This gas would be transported to the Polk/Hardee site by a service lateral from the FGT pipeline of approximately 34 miles. The site is also capable of handling coal should the addition of a coal gasifier to the site become economically feasible in the future.

In addition to the supply side options discussed above, SEC has also evaluated the ability of conservation or other nongenerating alternatives to mitigate the need for its proposed plant. The forecasts used in the computer model which identified a need for 450 MW of capacity in 1993 included the expected affects of SEC's conservation and load management programs. Conservation decreases primarily weather-sensitive peak period loads. In SEC's case, peak loads are served by its partial requirements contracts. Because the proposed 450 MW is not needed to serve peak period load, but rather to provide reserve capacity should one or all of SEC's own units fail, one would expect that increases in conservation would not affect the need for the capacity. This assumption is borne out by the sensitivity studies conducted by SEC. These studies showed that even when conservation and load management affects were projected at roughly double that projected for Peninsular Florida in the 1986 Planning Hearing, 450 MW of capacity would still be needed in 1993 to maintain a 1% EUE.

Based on the above, we find that SEC has proven that of all of the supply side and demand side options considered, 440 MW of combined cycle capacity constructed at its proposed Polk/Hardee county site would provide SEC with adequate electricity at at reasonable cost. We also find that of the alternatives fully developed in this proceeding, SEC has proven that this option is the most cost-effective. We note again, however, that the final resolution of these issues cannot be made until the record is developed on the alternative or alternatives which are the result of SEC's negotiations with its RFP bidders. We expect that a detailed analysis of these RFP alternatives will be presented at the continuation of this hearing which is currently scheduled for June 14, 1989. Our intention is that this order will establish SEC's construction of two 220 MW combined cycle units as the benchmark against which all RFP bids are measured.

Therefore, it is

ORDERED By the Florida Public Service Commission that Seminole Electric Cooperative, Inc. has proven a need for 450 MW of capacity in 1993. It is further

ORDERED that SEC has proven that of the demand side and supply side options fully developed in the record before us, this need is best and most economically provided by SEC's construction of two 220 MW combined cycle units located at its Polk/Hardee County site. It is further

ORDERED that the final resolution of the alternative which is most cost-effective is deferred until the alternative/s which are the result of negotiations with SEC's RFP bidders are known and presented to this Commission during a subsequent noticed public hearing.

BY ORDER of the Florida Public Service Commission, this 23rd. day of MARCH, 1989.

Steve Tribble
STEVE TRIBBLE, Director
Division of Records and Reporting

(S E A L)

SBr