

# **4.0 ENVIRONMENTAL EFFECTS OF SITE PREPARATION AND STATION CONSTRUCTION**

## TABLE OF CONTENTS

### CHAPTER 4.0

#### ENVIRONMENTAL EFFECTS OF SITE PREPARATION AND STATION CONSTRUCTION

| <u>Section</u>                                                           | <u>Page</u> |
|--------------------------------------------------------------------------|-------------|
| 4.1 AIR QUALITY . . . . .                                                | 4.1-1       |
| 4.2 CONSTRUCTION WATER SYSTEM . . . . .                                  | 4.2-1       |
| 4.2.1 Source and Quality of Construction Water . .                       | 4.2-1       |
| 4.2.2 Effects of Withdrawal . . . . .                                    | 4.2-1       |
| 4.2.3 De-watering Effects . . . . .                                      | 4.2-1       |
| 4.2.4 Construction Wastewater . . . . .                                  | 4.2-1       |
| 4.3 LAND DISTURBING ACTIVITIES . . . . .                                 | 4.3-1       |
| 4.3.1 Erosion and Runoff Effects . . . . .                               | 4.3-1       |
| 4.3.2 Impacts on Terrestrial Ecology . . . . .                           | 4.3-2       |
| 4.4 DREDGING IMPACTS . . . . .                                           | 4.4-1       |
| 4.5 NOISE IMPACTS . . . . .                                              | 4.5-1       |
| 4.5.1 Construction Noise Sources . . . . .                               | 4.5-1       |
| 4.5.2 Steam Blowout Noise . . . . .                                      | 4.5-2       |
| 4.5.3 Construction Noise Impact . . . . .                                | 4.5-3       |
| 4.6 OTHER IMPACTS . . . . .                                              | 4.6-1       |
| 4.6.1 Transportation . . . . .                                           | 4.6-1       |
| 4.6.2 Land Use . . . . .                                                 | 4.6-3       |
| 4.6.3 Historic, Scenic, Cultural, and Natural<br>Landmarks . . . . .     | 4.6-3       |
| 4.6.4 Flooding Impacts . . . . .                                         | 4.6-4       |
| 4.7 MITIGATING MEASURES . . . . .                                        | 4.7-1       |
| 4.8 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS . . . . .                  | 4.8-1       |
| 4.9 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF<br>RESOURCES . . . . . | 4.9-1       |
| 4.10 REFERENCES . . . . .                                                | 4.10-1      |

#### LIST OF TABLES

- 4.2-1 Estimated Construction Dewatering Pumping Rates.
- 4.5-1 Summary of Construction Equipment Types, Sound Levels and Usage Factors.
- 4.5-2 Construction Ambient Sound Levels.
- 4.5-3 Blowout Operation Sound Levels.
- 4.6-1 Schedule for Construction Equipment Likely to be Used Offsite.

#### LIST OF FIGURES

- 4.4-1 Intake Channel Dredge Plan.
- 4.4-1a Intake and Discharge Structures Dredge Plan.
- 4.4-2 Dredging Activities in the Site Vicinity.
- 4.5-1 Yearly Equivalent Sound Levels.

#### 4.0 ENVIRONMENTAL EFFECTS OF SITE PREPARATION AND STATION CONSTRUCTION

##### 4.1 AIR QUALITY

The impact of site preparation and station construction on ambient air quality will be minor and will result primarily from the generation of non-toxic fugitive dust due to land clearing, excavation, and movement of vehicles over unpaved surfaces. Any increase in particulate concentrations resulting from such activities will be intermittent and primarily confined to the immediate vicinity of the Putnam Site because dust particles created by fugitive mechanisms of this type tend to be relatively large and subject to rapid deposition. Control of nuisance dusts will be accomplished by the application of water and/or dust suppression chemicals when needed. No toxic or explosive dusts are expected to be created by construction activities.

Vehicle exhaust emissions will also occur during site preparation and station construction. In relation to existing traffic-related emissions in the area, however, these additional emissions will be insignificant and will result in a negligible impact.

## 4.2 CONSTRUCTION WATER SYSTEM

### 4.2.1 Source and Quantity of Construction Water

The station water supply well will provide water for construction as well as for later operation, including drinking water, construction water, and sanitary facilities. Two wells will draw water from the Floridan Aquifer and will be capable of yielding water at the rate of 50 gallons per minute (gpm) as required to provide the 20,000 gallons per day needed during the construction phase. The water will be chlorinated and stored in a pressure tank capable of holding at least 3,000 gallons.

### 4.2.2 Effects of Withdrawal

Withdrawal at the rate of 50 gpm will cause no significant effect on the potentiometric surface of the Floridan Aquifer outside the site area. Less than a half-foot of drawdown can be expected at the closest well drawing from the Floridan Aquifer (Well A-21, Figure D-7).

### 4.2.3 De-watering Effects

Temporary dewatering of the water table aquifer for construction will have no lasting environmental impact. Ground water that is removed will be allowed to recharge the aquifer at some distance from the de-watered area. Calculations show that the cone of depression caused by the withdrawal will not extend beyond the site property boundaries. The estimated pumping rates are listed in Table 4.2-1. It is unlikely that dewatering will take place in all foundation areas simultaneously.

### 4.2.4 Construction Wastewater

Wastewater during the period of construction will be essentially sanitary waste. The incidence of petroleum products or chemicals in this water is negligible. In the final stages of construction, there will be additional wastewater from the flushing of piping systems, testing of the boiler, and cleaning both the boiler and piping systems. This water will either be removed via tank truck to approved disposal facilities, or will be treated by the permanent wastewater treatment system (Section 3.6).

Further, during-construction housekeeping regulations will not permit dumping of any petroleum products on the ground which would form a potential for pollution but will require disposal of these products in an approved manner.

Sanitary wastes will be collected by a sewerage network and treated in a modularized extended aeration treatment plant. The effluent from this plant will comply with requirements of the Florida Departments of Environmental Regulation and Health and Rehabilitive Services before discharge into an onsite percolation field. There will also be some portable toilet facilities located in outlying areas of the construction site which will be of the holding tank type and pumped periodically by the supplier of the facility.

Table 4.2-1

Estimated Construction Dewatering Pumping Rates

| <u>Facility</u>                 | <u>Estimated<br/>Pumping Rate<br/>(gpm)</u> |
|---------------------------------|---------------------------------------------|
| Power Block                     | 800 to 1,000                                |
| Scrubbers/Precipitators         | 500 to 700                                  |
| Limestone/Waste Area/Stack Area | 800 to 1,100                                |
| Cooling Tower Area              | 700 to 900                                  |
| Silo                            | 500 to 800                                  |
| Pretreatment Area               | 600 to 800                                  |
| Coal Dumper/Tunnels/Tower       | 700 to 1,100                                |

---

Source: Burns and Roe, Inc.

### 4.3 LAND DISTURBING ACTIVITIES

#### 4.3.1 Erosion and Runoff Effects

Sediments represent the major nonpoint source of water pollution on most construction sites, especially on those which require extensive grading. Sediment consists primarily of solids and organic materials detached from the ground surface by runoff erosion and carried into the drainage system. The introduction of sediment into various natural bodies of water, and the associated turbidity and solids deposition, results in potential adverse physical, chemical, and biological effects.

Standards of performance to control the quantity or quality of pollutants discharged as the result of construction runoff are contained in "Effluent Guidelines and Standards for Steam Electric Power Generating" (40 CFR 423.45). These criteria do not apply, however, to any runoff greater than the 10-year, 24-hour rainfall event.

The site preparation and construction activity for the main structures will require approximately 420 acres of land (Area 1, Figure 3.1-3). As discussed in Appendix C, Section C.1.2, the soil in the site area is predominantly a fine sand that resists erosion due to its particle size and permeability. Based on the Universal Soil Loss Equation (SCS, 1975), the soil loss in the portion of the site undergoing construction activity will increase approximately from 0.2 to 3.0 tons per acre per year during land disturbing activities. The 3.0 tons per acre per year is still a relatively low rate of soil loss. From Chapter 2.0, Section 2.3.1.3, yields as high as 350 tons per acre per year have occurred on construction sites.

Construction runoff resulting from precipitation falling directly onto the construction area will be trenched away and dissipated through infiltration (see Figure 3.1-4). Therefore, the effect of erosion will be to displace soil from cleared areas toward these points of onsite discharge, and no offsite impacts are expected.

Upon completion of construction, cleared areas will be dressed and vegetated to be compatible with the existing natural landscape

elements. Therefore, no impacts due to construction area runoff will occur after this time.

#### 4.3.2 Impacts on Terrestrial Ecology

##### Vegetation

Much of the vegetation within the plant site boundaries will be removed or altered. About 65 percent will be left undisturbed. The habitat most adversely affected will be the Sandhill Community. Of the approximate 520 acres of Sandhill that exist on the Putnam Site (Figure 2.7-1), about 55 percent or 290 acres will be cleared. Previous lumbering activities in the Sandhill Community have significantly altered the plant life, so that the quality of this particular Sandhill area as a wildlife habitat has already been greatly lowered. Much of the Pine Flatwoods north of the Sandhill Community will be disturbed as this area is to be utilized for waste disposal. Other areas that will be either cleared or altered will be two small Cypress Heads on the west side of the site (Figure 2.7-1).

Dust from construction activities may cause some temporary effects on natural vegetation on adjacent land. However, much of the nearby area is agricultural, and the natural vegetation has been subject to dust from plowing and other farming operations. It is doubtful that the impact of dust caused by construction will be significant on these nearby areas.

##### Wildlife

The primary impact of site development on wildlife species presently utilizing the Putnam site will be the removal of habitat. The current plant layout places the plant structures and the waste storage area in the Sandhill and Pine Flatwoods habitats. These habitats will be cut and cleared which will remove them as useful areas to wildlife. The more motile species (i.e., birds and larger mammals) will probably be able to escape into surrounding habitat. Presently, Pine Flatwoods is the primary habitat surrounding the Putnam Site. Surveys on the site found wildlife populations to be relatively low due to frequent disruption by man and competition from feral hogs (Section 2.7).

Therefore, it is unlikely that the animals on site will overcrowd any populations in surrounding habitats. Animals unable to escape, such as amphibians, reptiles, and small mammals may be destroyed during site development. These populations were not very abundant, so their removal will represent a minor impact of site development.

The inhabitants of the disturbed portion of the Sandhill Community may be able to move to the undisturbed Sandhill habitat, but this may cause overcrowding since only about 45 percent of the Sandhill Community will remain undisturbed. The only inhabitant endemic to this habitat found on site was the gopher tortoise. Site development will destroy the tortoise burrows and probably any tortoises as well. A few tortoises may move into the surrounding undisturbed Sandhill and Flatwoods and be able to construct usable burrows, but much of their on-site habitat will be destroyed by site development. The actual size of the tortoise colony on this site is unknown, but three individuals of different sizes were found, and the majority of the burrows were in use. Investigations of the possibility of censusing this colony are continuing.

Tall pines in the northern portion of the Putnam Site may have been used as a nesting site by eagles in the past. These pines have been cut by the landowners, so the site is presently devoid of attractive nest trees (Section 2.7.1). Other areas in the Putnam Site region offer more attractive nesting for eagles.

The manatee is known to occur in the St. Johns River near the Putnam Site. These aquatic mammals are more numerous during the summer season but are probably not found in the immediate vicinity of the site due to a general lack of the aquatic macrophytes on which they feed. Nothing associated with the construction of the facility will impact the manatee.

#### 4.4 DREDGING IMPACTS

##### General

An intake structure located at the shoreline of the St. Johns River will require an intake channel to deep water. The channel will be dredged from the bottom of the river, and impacts will result. Figure 4.4-1 shows a conceptual intake channel dredge plan. The construction of the channel will be by bucket dredge. A "bucket dredge" is a chain conveyor with buckets attached that dumps onto a belt conveyor. The contractor will be given the option of using the bucket dredge or the clamshell dredge. This will apply to both the intake channel work and the discharge pipe embedment work. Upon selection of a specific dredging method the Department of Environmental Regulation will be notified for review and comment. About 3000 cubic yards of spoil will be removed from the intake channel and 700 cubic yards from the discharge pipeline trench (about 650 cubic yards will be returned to the pipeline trench for backfilling). Of this amount of spoil, about 1000 cubic yards will be removed from behind a sheet pile cofferdam placed around the actual intake structure foundation. Since excavation of this portion of the material will be separated from the river, it will not contribute to dredging impacts to the river. The spoil will be pumped as a slurry to a disposal area excavated on the main plant site (Figure 4.4-1, Part Plan, Spoil Area). Moisture will be allowed to drain from the spoil area by percolation. The contractor will be given the option of trucking the spoil to the disposal area. During dredging operations, turbidity curtains will be used.

##### Impacts to the Aquatic Ecosystem

Dredging operations may have several potential impacts on the aquatic ecosystem. The primary impact of dredging will be the removal of substrate and the commensurate alteration of habitat in the dredged area. Other impacts which may potentially occur during the actual dredging operation include a temporary increase in turbidity and the potential for some associated chemical releases from the dredged materials.

An area of approximately 30,000 sq. ft. of substrate will be dredged for the intake channel and pipeline trench. This operation will result in a temporary reduction in benthic organisms in the dredged area since they will be removed from the aquatic environment. Many of the benthic organisms are food sources for fish; therefore, dredging will also result in a reduction of available food in the immediate area being dredged. It should be noted that many of the fish in this area are not benthic feeders (bay anchovy, thredfin shad, gizzard shad), and that fish in general are extremely agile. It is probable that the dredging of the intake area will result in a temporary displacement of fish to other areas. Spoil disposal has usually been one of the more significant impacts of dredging on the aquatic environment. In this case however, it will not be a source of impact at the site since all disposal will be placed behind dikes inland from shore.

Aquatic macrophytes were observed within 250 feet of the shoreline. It is estimated that about 16,000 square feet of these macrophytes will be removed for the intake channel and about 3,000 square feet for the pipeline trench. Since the pipeline trench will be back-filled to original contours, macrophytes are expected to reestablish themselves in that area. However, no appreciable macrophyte populations are expected in the intake channel because of the increased water depths. The significance of the macrophyte bed as a potential nursery area is currently under study. Because of the large extent of macrophytes along many miles of shoreline in the general vicinity it is not expected that the loss of substrate in this limited area will be of particular concern.

Some short-term impacts such as increased turbidity and suspended sediments may potentially cause temporary and minor local reductions in light penetration, but this impact will be temporary in nature and limited in area, and the effect of the impact is expected to be negligible.

The suspended sediments associated with turbidity may potentially cause some mechanical damage to the gills of fish and invertebrates which remain in the area during dredging. Since the affected area is relatively small, the impact will be minor. Many fish will avoid the area and the invertebrate community, if damaged, will recover quickly after dredging is completed. Some benthic organisms may recolonize a dredged area within two weeks (Slotta, 1974), and in many cases complete recolonization is relatively complete in 6 months to a year (May, 1973).

Chemical releases associated with the resuspension of bottom sediments are not expected to be a source of significant impact. Compounds such as pesticides, PCBs and phenols were found in low concentrations in the sediments at Transect B and in most cases were at undetectable levels (Section 2.3.1.4). Arsenic and the various heavy metals which were evaluated as part of the sediment analysis (Section 2.3.1.4) should not cause any potentially significant adverse impacts to the aquatic biota. Concentrations of these materials were relatively low at Transect B in most cases, with the exception of arsenic and iron. The relatively nontoxic iron (most of which will probably be in the form of iron hydroxide) has the capability of scavenging other metals out of solution and precipitating them with the iron. It is also probable that the solubility rates of many of the materials are too low to become disassociated in the short time period required for the suspended sediments to resettle (May, 1973).

It should be noted that the amount of dredging proposed for this project is negligible when compared to the amount of dredging activities that have taken place in past years near the site as evidenced by Figure 4.4-2. Those activities have included placing spoil in the river (note the reference to "spoil areas" in Figure 4.4-2).

#### Impacts to Ground Water

The dredge disposal area is shown on Figure 4.4-1. Approximately 2,000 cubic yards of spoil at approximately 15 percent solids will be

placed in the disposal area. Additionally, approximately 1,000 cubic yards of essentially dry spoil will be placed in the disposal area. The potential impact upon ground water is associated with the slurry water used to transport the spoil to the disposal area. This water will be the interstitial water naturally contained in the sediments prior to dredging.

To evaluate the potential impacts of this blowdown to the water table aquifer, the water quality data for the St. Johns River (Table C-8 and the sediment analyses Table C-12) were used. The chemical constituents considered were chloride, sulfate, cadmium, mercury, lead, and zinc. All of these constituents, except sulfate, occasionally exceed Florida water quality criteria, but in general the concentrations are below the water quality criteria.

Compounds such as pesticides, PCBs, and phenols were found in low concentrations in the bottom sediments of the St. Johns, but in most cases were at undetectable levels. For the impact analysis, the concentrations of these constituents were estimated by conservatively assuming that 100 percent of the maximum concentrations found in the sediments would leach into the sluice water.

The results of the impact analysis are summarized on Table D-25 (Appendix D). As shown, the concentrations at the property boundary were calculated to be within the State of Florida ground water quality criteria, and impacts to off-site ground water are expected to be insignificant.

#### Summary

In summary, the overall impact of the dredging operation is expected to be minimal. This is because the area to be dredged is relatively small, and dredging activities will occur for only a short time. Construction activities such as inland spoil disposal and runoff control will also further minimize any potential for impacts to occur.

SOURCE: BURNS AND ROE, INC.  
 REVISED 3/15/79

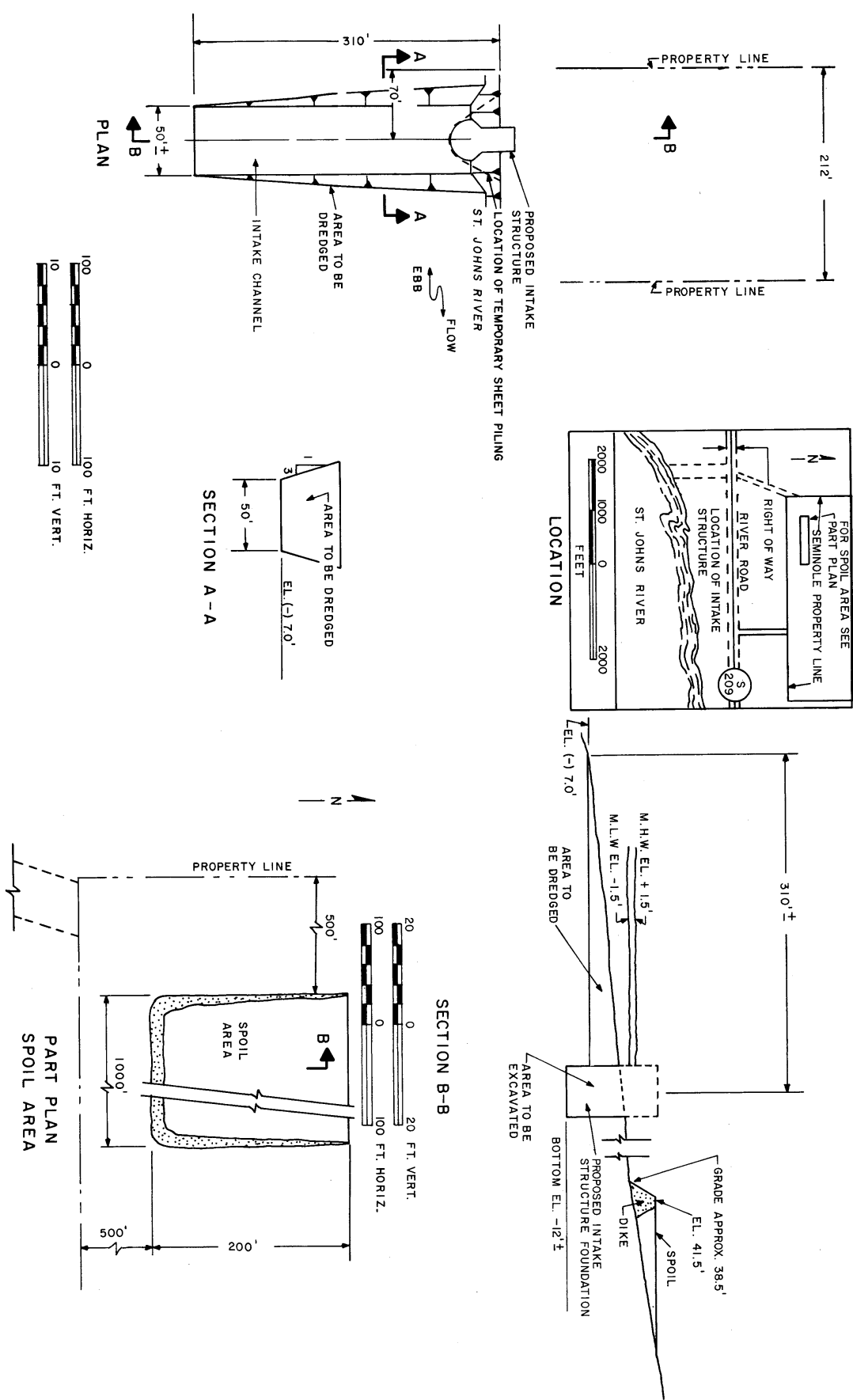


Figure 4.4-1. Intake Channel Dredge Plan.

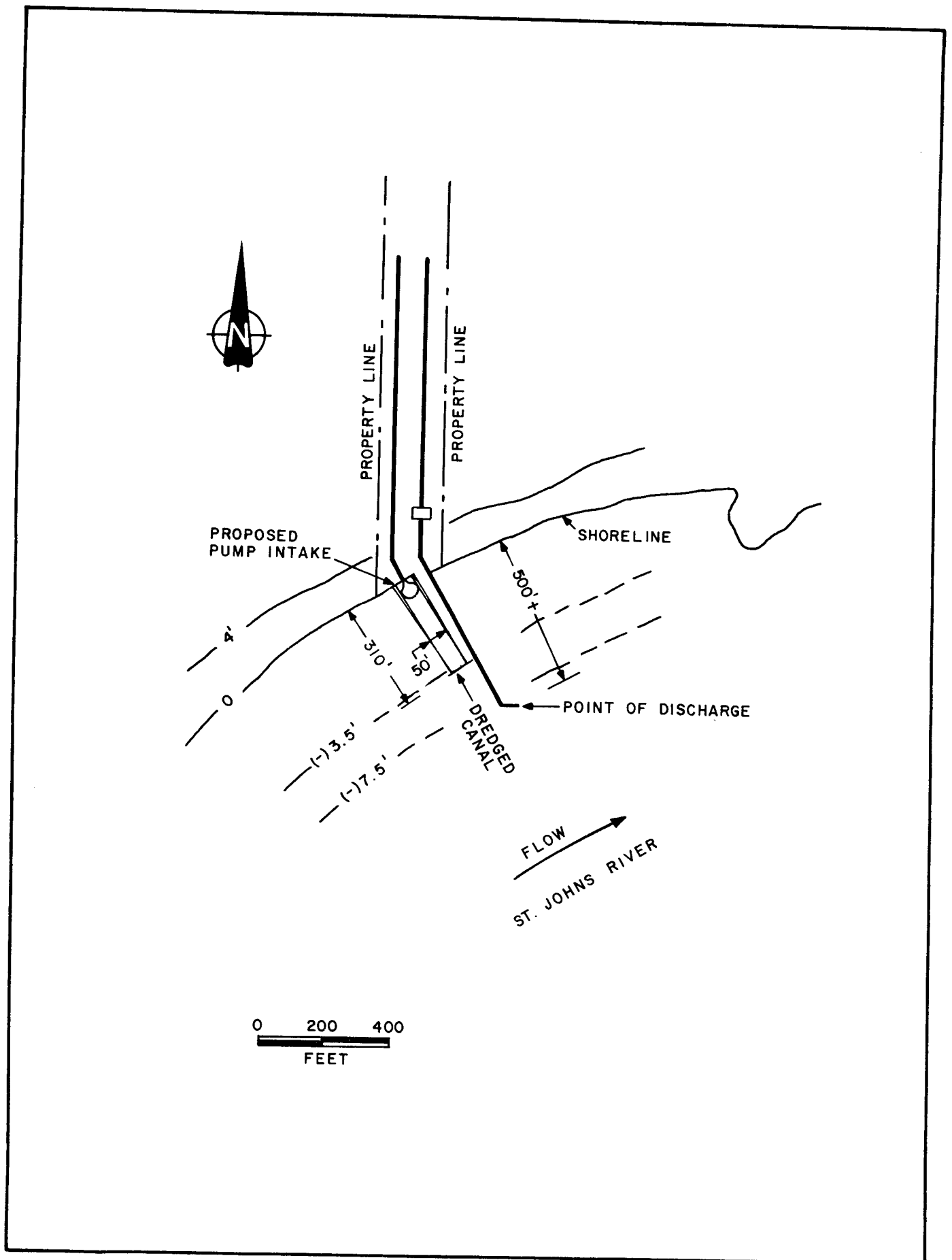


Figure 4.4-1a. Intake and Discharge Structures Dredge Plan.

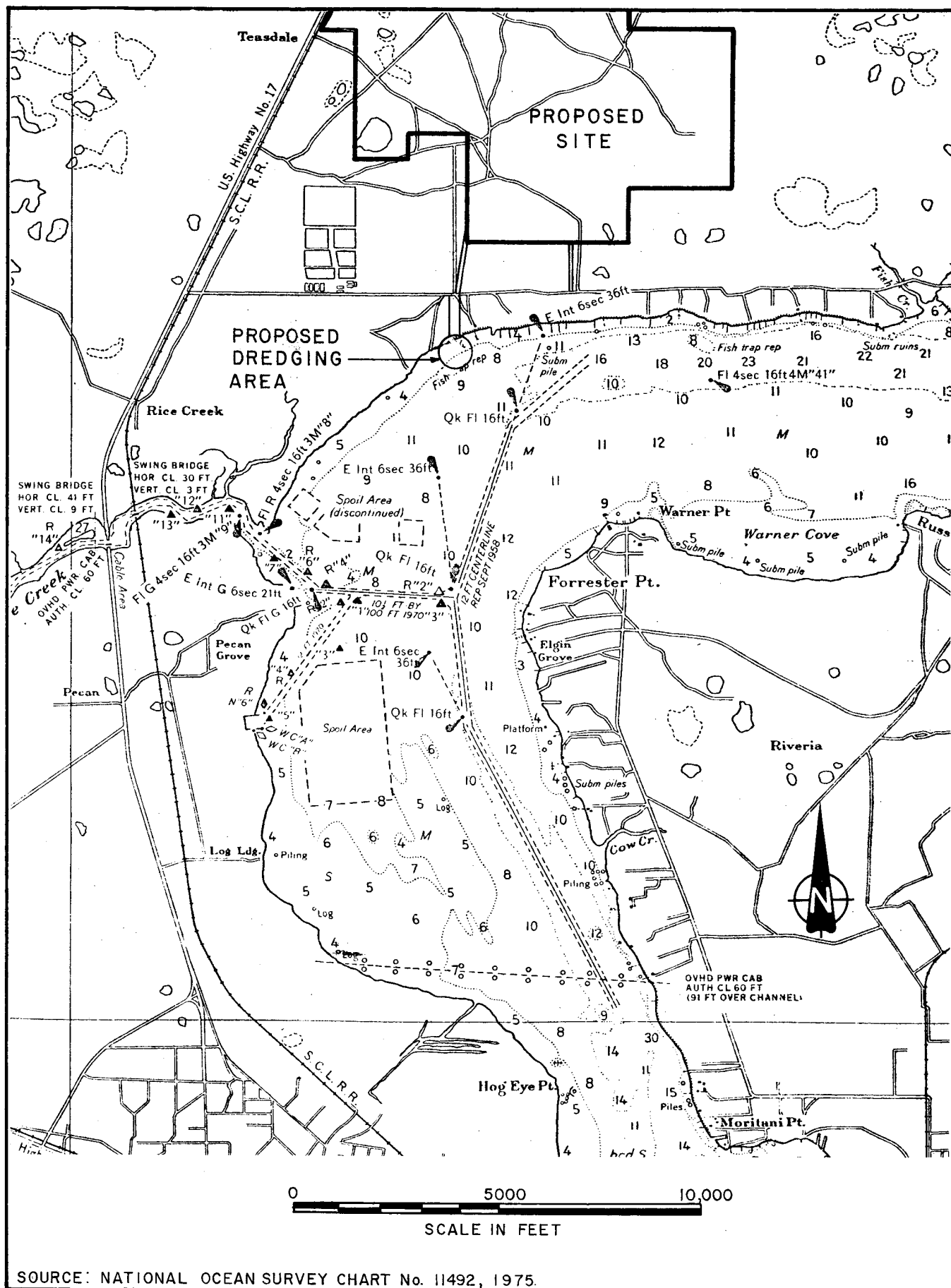


Figure 4.4-2. Dredging Activities in the Site Vicinity.

JOINT APPLICATION  
DEPARTMENT OF THE ARMY/FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION  
FOR  
ACTIVITIES IN WATERS OF THE STATE OF FLORIDA

Refer to Instruction Pamphlet for explanation of numbered items and attachments required.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                      |                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------|
| 1. Application number (To be assigned)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2. Date<br><br>Day      Mo.      Yr. | 3. For official use only |
| 4. Name, address and zip code of applicant<br><br>Seminole Electric Cooperative, Inc.<br>2410 East Busch Boulevard<br>Tampa, Florida 33612<br><br>Telephone Number <u>813-933-7406</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                      |                          |
| 5. Name, address, zip code and title of applicant's authorized agent for permit application coordination<br><br>Tom Crumlish, Project Manager<br>Seminole Electric Cooperative, Inc.<br>2410 East Busch Boulevard<br>Tampa, Florida 33612<br><br>Telephone Number <u>813-933-7406</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      |                          |
| 6. Describe the proposed activity, its purpose and intended use, including a description of the type of structures, if any, to be erected on fills, or pipe or float-supported platforms, and the type, composition and quantity of materials to be discharged or dumped and means of conveyance.<br><br>a. Dredging and excavation of intake channel. Dredging of discharge trench for discharge pipe.<br><br>b. Construction of intake and discharge structures.<br><br>FOR ADDITIONAL INFORMATION, SEE ATTACHMENT (ITEM 6).<br><br>Dredged/Excavated      Backfill<br>Volume of Material: <u>3700</u> CY <u>650</u> CY <u>3050</u> CY<br>Waterward of      Landward of      Waterward of      Uplands<br>O.H.W. or M.H.W.      O.H.W. or M.H.W.      O.H.W. or M.H.W. |                                      |                          |
| 7. Proposed use<br><br>Private [ ]    Public [ ]    Commercial [X]    Other [ ] (Explain in remarks)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                      |                          |
| 8. Name and address including zip code of adjoining property owners whose property also adjoins the waterway.<br><br>WEST - Daniel and Ruey Hodapp      EAST - Robert A. Warner<br>3400 S. Dixie Highway      6100 Lake Ellenor Drive<br>Room 104      Orlando, Florida 32809<br>Dayton, Ohio 45439                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                          |
| 9. Location where proposed activity exists or will occur<br>1.2 miles due East of U.S. Route 17 on<br>Street address      Florida State Highway 209<br>Longitude <u>91° 24' 25"W</u> Latitude <u>29° 42' 46"N</u> (If known)<br>Sec. <u>18</u> Twp. <u>9 S</u> Rge. <u>27 E.</u><br><u>Florida</u> <u>Putnam</u> <u>Palatka</u><br>State      County      In City or Town      Near City or Town                                                                                                                                                                                                                                                                                                                                                                         |                                      |                          |
| 10. Name of waterway at location of the activity      St. Johns River                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      |                          |

**RECEIVED**  
SEP 11 1978

PERMIT

11. Date activity is proposed to commence Feb. 1981  
Date activity is expected to be completed April 1981

12. Is any portion of the activity for which authorization is sought now complete? Yes [ ] No [X]

If answer is "Yes" give reasons in the remarks section. Month and year the activity was completed \_\_\_\_\_  
\_\_\_\_\_. Indicate the existing work on the drawings.

13. List all approvals or certifications required by other Federal interstate, state or local agencies for any structures, construction, discharges, deposits or other activities described in this application, including whether the project is a Development of Regional impact.

Issuing Agency                      Type of Approval                      Identification No.                      Date of Application                      Date of Approval

a. See Attachment (Item 13), STATUS OF PERMITS & APPROVALS

b. Proposed project is not regulated by Chapter 380 F.S. as a Development of Regional Impact.

14. Has any agency denied approval for the activity described herein or for any activity directly related to the activity described herein?

Yes [ ]      No [X]      (If "Yes" explain in remarks)

15. Remarks (see Instruction Pamphlet for additional information required for certain activities)

See Attachment (Item 15)

16. Application is hereby made for a permit or permits to authorize the activities described herein. I agree 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 protection standards both during construction and after the project is completed. I also agree to provide entry to the project site for inspectors from the environmental protection agencies for the purpose of making preliminary analyses of the site and monitoring permitted works, if permit is granted. 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

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.

The application must be signed by the person who desires to undertake the proposed activity; however, the application may be signed by a duly authorized agent if accompanied by a statement by that person designating the agent and agreeing to furnish upon request, supplemental information in support of the application.

FEE: Attach Checks/Money Orders on front  
Payable to Department of Environmental Regulation  
\$200 Standard form projects  
\$20 Short forms and Chapter 403 projects only

ATTACHMENT (ITEM 6)

Application is made to construct and operate river water Intake and Discharge Structures located on the St. Johns River in Putnam County approximately 5 miles downstream of the U.S. Route 17 bridge at Palatka, Florida (Figure A). The proposed structures will be on the northwest bank of the river (left bank facing downstream) at latitude  $29^{\circ}42'46''\text{N}$ , longitude  $91^{\circ}24'25''\text{W}$ . The river at this point is approximately 1.1 miles wide.

The structures (Figures B and C) are part of the proposed Seminole Plant Units 1 and 2, a coal-fired steam electric generating station designed to produce 1200 megawatts (net) of electric power. The station will consist of two coal-fired boilers and steam generating units; two 450-foot high natural draft hyperbolic cooling towers; two 600-foot high stacks; a flue gas desulfurization waste storage area; two bottom ash storage ponds; a switchyard; electric transmission lines; and other associated facilities.

The cooling water circulating system for the station requires 16,800 gallons per minute (gpm) as makeup water for the cooling tower evaporation and blowdown losses from the two units. The makeup water is proposed to be drawn from the St. Johns by means of a cylindrical wedge wire screen intake structure as shown in Figure B.

The screen structure will consist of 8 cylindrical wedge wire screen units located near the shoreline to allow access by maintenance personnel. A crane will be provided so that screen units can be lifted out for cleaning by water pressure hoses and brush scrubbing. This would be accomplished by cutting off flow through a screen unit by closing its sluice gate before lifting it out.

The screen surface area will be designed to achieve an approach velocity of 0.2 feet per second (fps) with clean screens. Screens will be cleaned when fouling reduces the screen opening area such that approach velocities reach about 0.4 fps. The final selection of screen

RECEIVED

SEP 11 1978

PERMIT

opening size is expected to be within the range of 1.0 to 2.0 mm, and will be the smallest feasible opening size that will not cause excessive fouling.

At the centerline of each screen unit will be an embedded air back-wash pipe. An air compressor equipped with a flexible air line will be provided to allow each screen unit to be cleaned in place. This procedure will reduce the required frequency for mechanical removal and brush cleaning.

The Intake Structure will require an intake channel to deep water (Figure B). About 3,000 cubic yards (c.y.) of fine to medium grain sand will be removed by bucket dredge from the bottom of the river. Of this total quantity, approximately 1,000 c.y. will be excavated or dredged behind sheet piling. In addition, periodic dredging of the canal is expected during operation. The spoil will be pumped as a slurry to a disposal area on the main plant site. Moisture will be allowed to drain from the spoil area by percolation. Approximately 100 c.y. of stone rip-rap will be placed on the river banks near the pump intake.

The effluent water at 2,083 gpm will be conveyed through a 16 inch diameter buried pipe to a submerged nozzle approximately 125 feet downstream of the intake structure and 500 feet waterward from the northwest bank of the St. Johns (Figure A). The discharge nozzle will be designed to pass the normal expected plant discharge at an exit velocity of 10 to 15 feet per second (fps).

As shown in Figure C, the nozzle will be directed away from the river bottom at an angle of approximately 20 degrees in order to prevent erosion of the bottom and resuspension of sediments. Near the discharge nozzle, riprap will be placed on the bottom to prevent scour caused by jet turbulence. The point of discharge will be elevated slightly from the bottom, about 1 foot above the riprap. The discharge jet will be directed toward the downriver flow direction at approximately 45 degrees to the ambient current direction.

RECEIVED  
SEP 11 1978

The trench for the submerged outfall will require the dredging of approximately 700 cubic yards of material from the bottom of the river. Of this total, approximately 650 c.y. will be returned for backfilling and the remaining will be pumped as a slurry to a disposal area in the same manner as the spoil from the intake channel.

For further reference, see Site Certification Application and Environmental Analysis for Seminole Plant Units No. 1 and No. 2, Seminole Electric Cooperative, Inc., prepared by Dames & Moore and submitted to the Army Corps of Engineers by the Florida Department of Environmental Regulation on August 7, 1978. Pertinent report sections are:

| <u>Subject</u>                | <u>Section</u> |
|-------------------------------|----------------|
| Station Layout and Appearance | 3.1            |
| Intake Structure              | 9.2.7          |
| Discharge Structure           | 3.5.2          |
| Dredging Requirements         | 4.4.1          |

RECEIVED  
SEP 11 1978

PERMIT

## ATTACHMENT (ITEM 13)

## STATUS OF PERMITS AND APPROVALS

| Subject of Permit Application or Approval     | Statutory Mandate                                                                                                                                                                             | Administering Agency | Date of Application (Proposed) | Approval Date (Expected) | Comments                                                                           |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------|--------------------------|------------------------------------------------------------------------------------|
| <u>FEDERAL</u>                                |                                                                                                                                                                                               |                      |                                |                          |                                                                                    |
| Application for loan approval                 | Rural Electrification Act                                                                                                                                                                     | REA                  | (3/79)                         | (12/79)                  |                                                                                    |
| Environmental Analysis                        | National Environmental Policy Act; Exec. Order 11514: Protection and Enhancement of Environmental Quality; Exec. Order 11991: Relating to Protection and Enhancement of Environmental Quality | REA                  | (8/78)                         | (11/79)                  |                                                                                    |
| NPDES                                         | Federal Water Pollution Control Act (\$402)                                                                                                                                                   | EPA                  | (8/78)                         | (11/79)                  |                                                                                    |
| Preconstruction New Source Air Quality Review | Clean Air Act (\$110)                                                                                                                                                                         | EPA                  | (8/78)                         | (11/79)                  | This review will be conducted by the State through its Site Certification process. |
| PSD                                           | Clean Air Act (\$160-169)                                                                                                                                                                     | EPA                  | 5/78                           | (Prior to 5/79)          |                                                                                    |
| Activities in Navigable Waters                | Rivers and Harbors Act (\$10)                                                                                                                                                                 |                      |                                |                          |                                                                                    |
| 1. Intake/discharge structures                |                                                                                                                                                                                               | COE                  | (8/78)                         | (11/79)                  |                                                                                    |
| 2. Transmission Lines                         |                                                                                                                                                                                               | COE                  | NA                             | NA                       | Applications to be filed prior to line construction.                               |

SEP 11 1978  
RECEIVED  
PERMIT

## ATTACHMENT (ITEM 13) Cont'd

| Subject of Permit Application or Approval | Statutory Mandate                                                 | Administering Agency | Date of Application (Proposed) | Approval Date (Expected) | Comments                                                     |
|-------------------------------------------|-------------------------------------------------------------------|----------------------|--------------------------------|--------------------------|--------------------------------------------------------------|
| Activities in Wetlands                    | Federal Water Pollution Control Act (§404)                        | COE                  | (8/78)                         | (11/79)                  |                                                              |
| Construction of Tall Stack                | Federal Aviation Act                                              | FAA                  | 2/78                           | 5/78                     | Approval contingent on State DOT stack construction approval |
| <u>STATE</u>                              |                                                                   |                      |                                |                          |                                                              |
| Site Certification Application            | Florida Electrical Power Plant Siting Act                         | DER                  | (8/78)                         | (10/79)                  |                                                              |
| Transmission Line Road Crossings          | Ch. 338 F.S. (Ch. 14-46 FAC Utilities Installation or Adjustment) | DOT                  | NA                             | NA                       | Application to be filed prior to construction.               |
| Modifications of State Road 17            |                                                                   | DOT                  | (8/79)                         | (11/79)                  |                                                              |
| Construction of Tall Stack                | Ch. 75-16 F.S.                                                    | DOT                  | 6/78                           | 6/78                     |                                                              |
| Water Well Drilling                       | Ch. 381.03(1)(9)3 F.S.                                            | DHRS                 | 4/78                           | 4/78                     |                                                              |
| Well Regulation                           | Florida Water Resources Act                                       | SJRWMD               | 4/78                           | 4/78                     |                                                              |
| Easement through State Owned Lands        | Ch. 253 F.S. and Ch. 76-24F F.S.                                  | DNR                  | (8/78)                         | (Prior to 10/79)         |                                                              |

PERMIT

SEP 11 1978

RECEIVED

ATTACHMENT (ITEM 13) Cont'd

| Subject of Permit Application or Approval | Statutory Mandate                                                     | Administering Agency         | Date of Application (Proposed) | Approval Date (Expected) | Comments                                              |
|-------------------------------------------|-----------------------------------------------------------------------|------------------------------|--------------------------------|--------------------------|-------------------------------------------------------|
| <u>LOCAL</u>                              |                                                                       |                              |                                |                          |                                                       |
| Land Use or Zoning Approval               | Putnam County Zoning Ordinance 75-6 Chapter 163 F.S. Chapter 125 F.S. | Putnam County Commission     | 4/78                           | 5/78                     |                                                       |
| Pipeline Road (209) Crossings             | Putnam County Ordinance Ch. 338 F.S.                                  | Putnam County Commission DOT | NA                             | NA                       | Application processed within two weeks of submission. |

Abbreviations:

|        |                                                          |
|--------|----------------------------------------------------------|
| REA    | U. S. Rural Electrification Administration               |
| EPA    | U. S. Environmental Protection Agency                    |
| COE    | U. S. Corps of Engineers                                 |
| FAA    | Federal Aviation Administration                          |
| DER    | Florida Department of Environmental Regulation           |
| DOT    | Florida Department of Transportation                     |
| DHRS   | Florida Department of Health and Rehabilitative Services |
| SJRWMD | St. Johns River Water Management District                |
| DNR    | Florida Department of Natural Resources                  |
| NA     | Not available                                            |

APPROVED

8/28/78

ATTACHMENT (ITEM 15)

Six intake structures were evaluated for the proposed structure.

Scheme 1 - Modified conventional intake with standard traveling screens. The modifications for fish protection include "flush mounting" of the screens and the provision of fish escape passages through the outside walls of the structure.

Scheme 2 - The same general configuration as Scheme 1, but with the traveling screen itself modified with the Surry-type, dual-spray fish recovery system.

Scheme 3 - Perforated (or wedge-wire) pipe offshore intake, with pump structure on shore.

Scheme 4 - Perforated (or wedge-wire) pipe shoreline intake, utilizing multiple removable screen units.

Scheme 5 - Radial well system (Ranney collectors).

Scheme 6 - Cylindrical, wedge-wire shoreline intake, utilizing multiple removable screen units.

Schemes 1 and 2 were rejected due to unacceptable biological impacts. Scheme 3 was rejected because of access problems in maintaining and cleaning the screen units at a remote offshore location.

Scheme 5 is presently being studied to determine the suitability of geologic conditions (i.e., the presence of an aquifer adjacent to the river and permeable soils).



Based on preliminary soils data, the radial well concept appears to be unfeasible. If this preliminary conclusion is substantiated, an in situ screen test will be conducted to determine the final design of the shoreline screen structure (Schemes 4 and 6). The screen test will lead to the final selection of intake configuration and screen opening sizes. Although Scheme 6 is expected to be the preferred configuration and therefore is described in detail in Item 6, if the in situ test indicates otherwise, Scheme 4 will be substituted (Figure D). Dredging requirements as described under Item 6 will be the same for both Schemes 4 and 6.

For the discharge structure, the alternative of locating it near the shore was considered. This was rejected as hydrodynamic model studies of the discharge plume indicated a separation of 500 feet should be maintained between the intake and discharge to prevent excessive recirculation of discharged water to the intake. As a single narrow corridor for both the intake and discharge pipeline is desired to limit consumption of land area, the separation between structures must be obtained by placing the discharge nozzle offshore.

Dredging operations may have several potential impacts on the aquatic ecosystem. The primary impact of dredging will be the removal of substrate and the commensurate alteration of habitat in the dredged area. Other impacts which may potentially occur during the actual dredging operation include a temporary increase in turbidity and the potential for some associated chemical releases from the dredged materials localized around the dredged site.

It should be noted that the amount of dredging proposed for this project is negligible when compared to the amount of dredging activities that have taken place in past years near the site. Those activities have included placing spoil in the river.

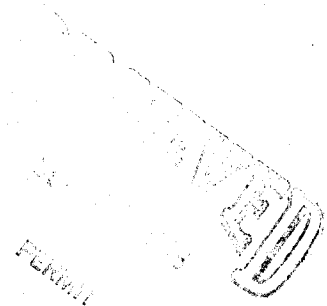
The overall impact of the dredging operation to the aquatic ecosystem will be minimal. This is because the area to be dredged is rela-

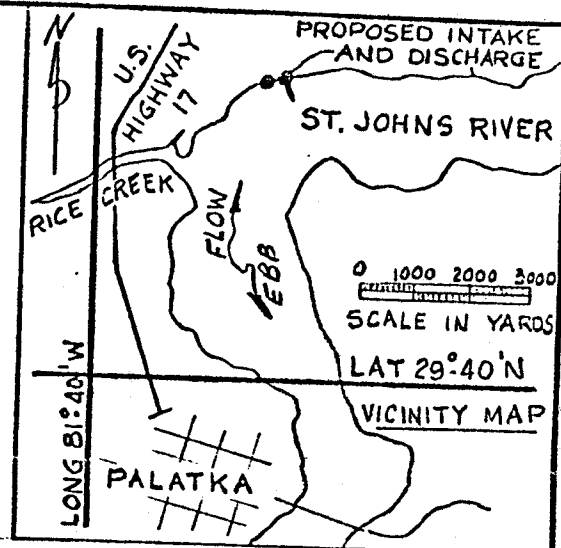
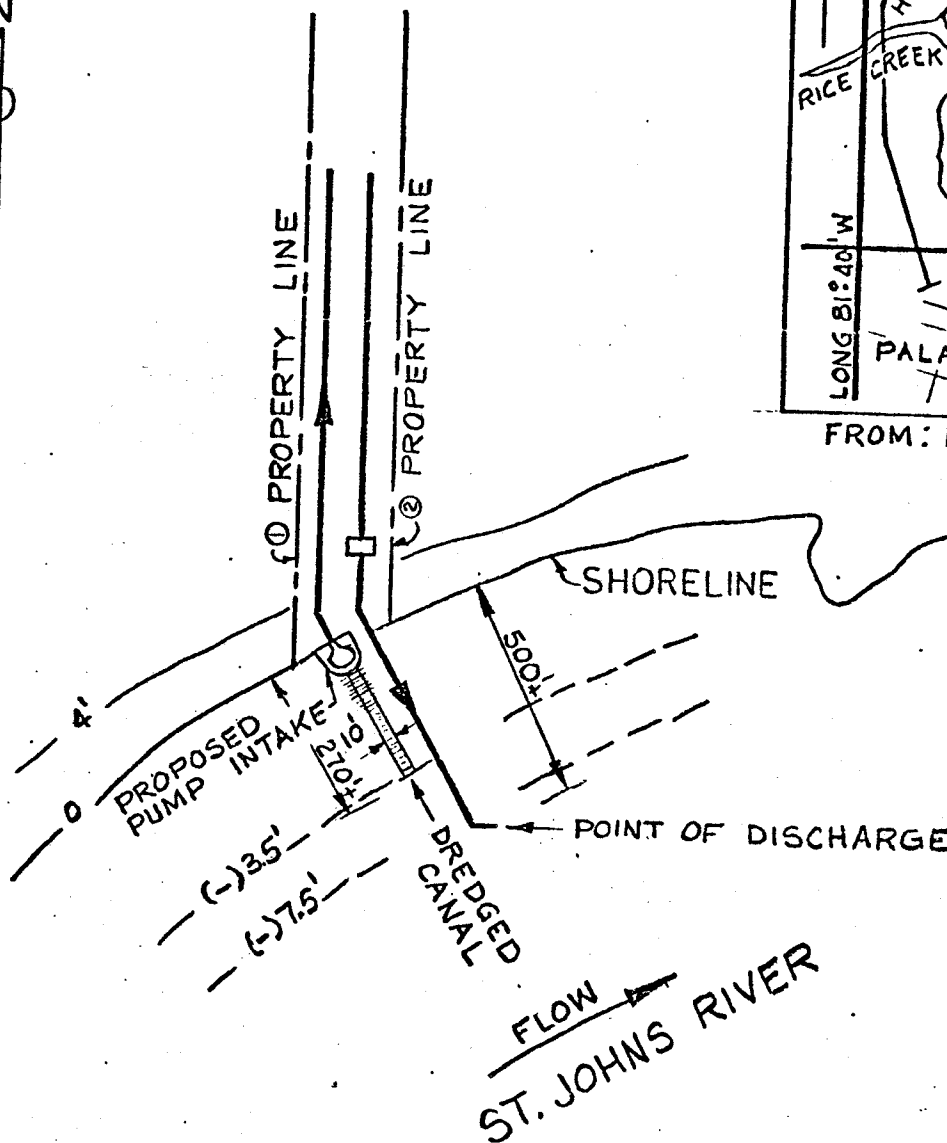
SEP 11 1978  
PERMIT

tively small, and dredging activities will occur for only a short time. Construction activities such as inland spoil disposal, runoff control, and dredging during the winter season will also further minimize any potential for impacts to occur.

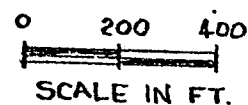
The overall plan for the project is contained in Site Certification Application and Environmental Analysis for Seminole Plant Units No. 1 and No. 2, Seminole Electric Cooperative, Inc., prepared by Dames & Moore. Pertinent report sections are:

| <u>Subject</u>                   | <u>Section</u> |
|----------------------------------|----------------|
| Intake Structure Alternatives    | 9.2.7          |
| Discharge Structure Alternatives | 9.2.8          |
| Dredging Impacts                 | 4.4.1          |





PLAN



PURPOSE: Power plant make-up and discharge

DATUM Mean sea level

ADJACENT PROPERTY OWNERS:

① Daniel and Ruey Hodapp

② Robert A. Warner

PROPOSED PUMP INTAKE &  
DISCHARGE PIPE

IN St. John River

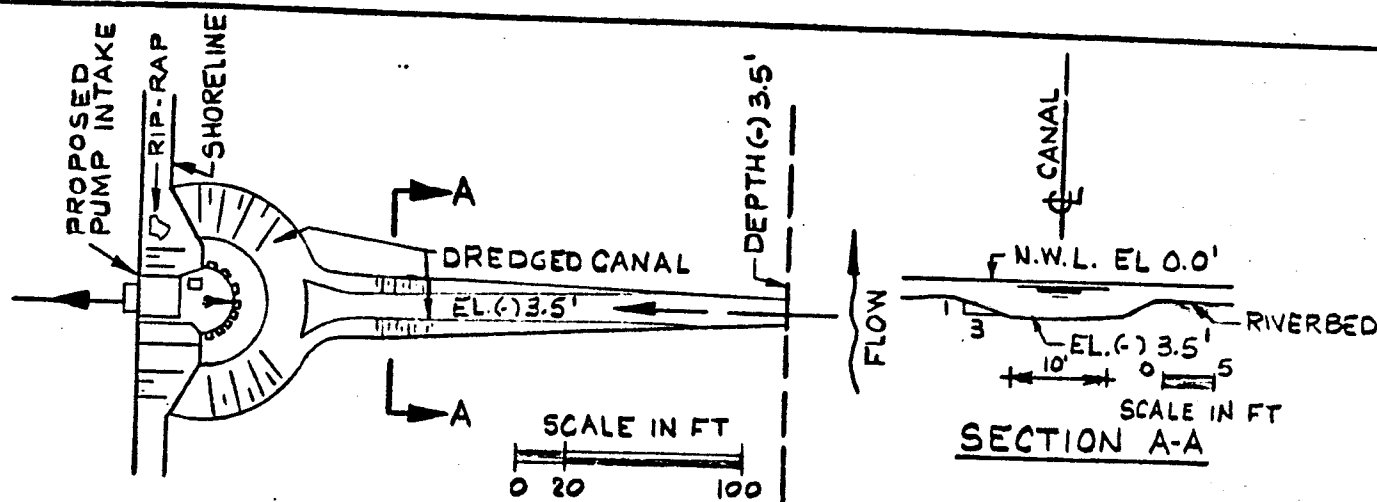
AT Palatka (4 miles north)

COUNTY OF Putnam STATE Florida

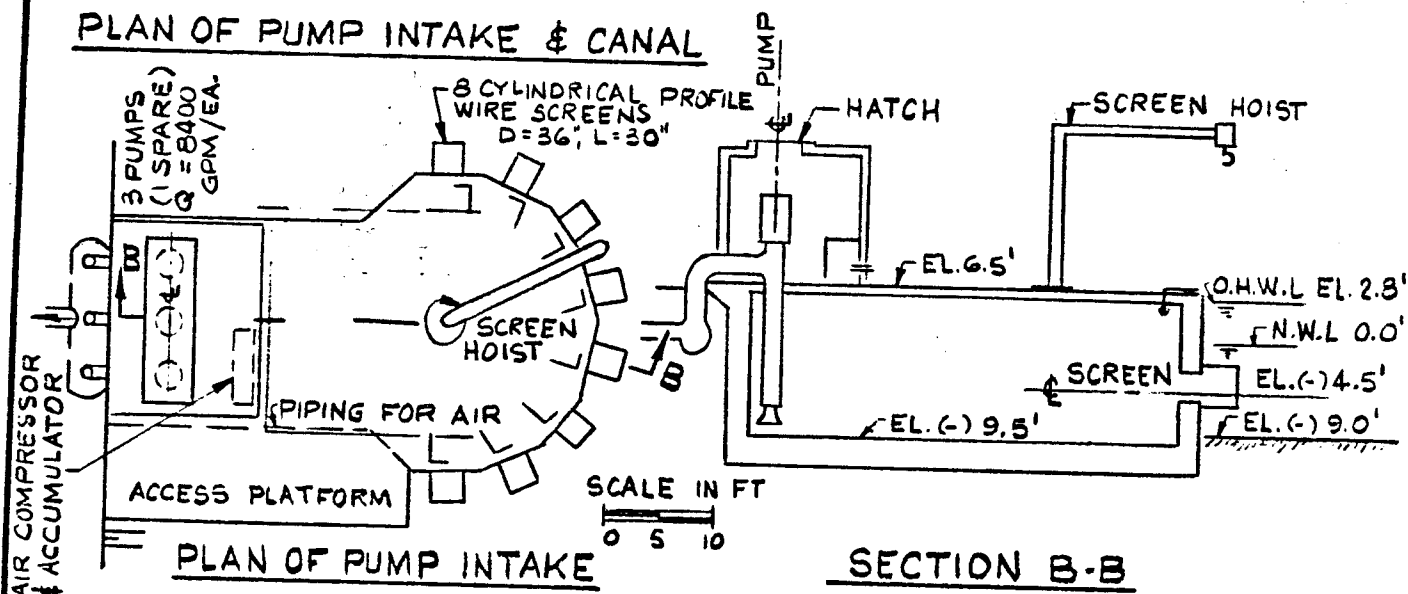
APPLICATION BY Seminole Electric  
Cooperative, Inc.

SHEET 1 OF 4 DATE 8/25/78

FIGURE A



PLAN OF PUMP INTAKE & CANAL



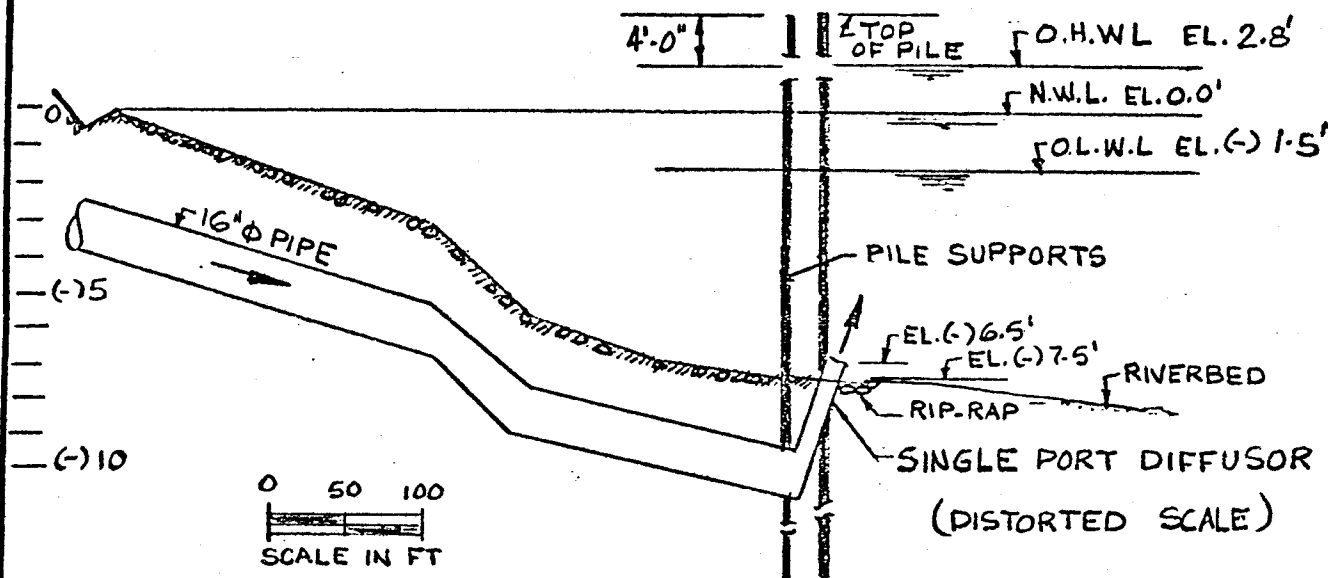
1. APPROX. 3000 C.Y. OF SOIL WILL BE DREDGED OR EXCAVATED DURING CONSTRUCTION OF THE PUMP INTAKE AND CANAL. OF THIS TOTAL QUANTITY 1000 C.Y. WILL BE EXCAVATED OR DREDGED BEHIND SHEET PILING. IN ADDITION, PERIODIC DREDGING OF THE CANAL IS EXPECTED DURING OPERATION.
2. DREDGED OR EXCAVATED SOIL WILL BE PLACED IN DISPOSAL AREA.
3. APPROX. 100 C.Y. OF STONE RIP-RAP WILL BE PLACED ON THE RIVER BANKS NEAR THE PUMP INTAKE.

PURPOSE: Power plant make-up and discharge  
 DATUM Mean sea level

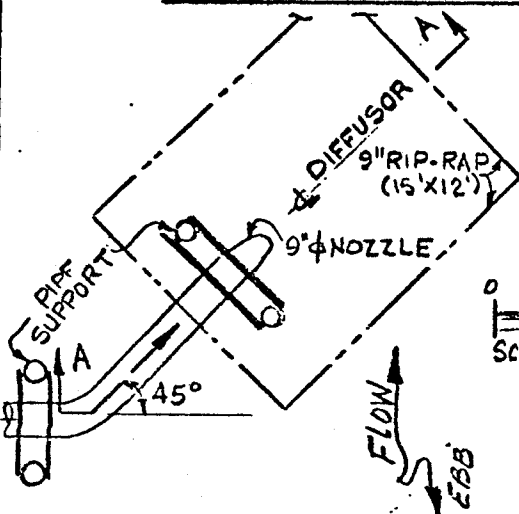
PROPOSED PUMP INTAKE &  
 DISCHARGE PIPE  
 IN St. John River  
 AT Palatka (4 miles north)  
 COUNTY OF Putnam STATE Florida  
 APPLICATION BY Seminole Electric  
 Cooperative, Inc.

SHEET 2 OF 4 DATE 8/25/78

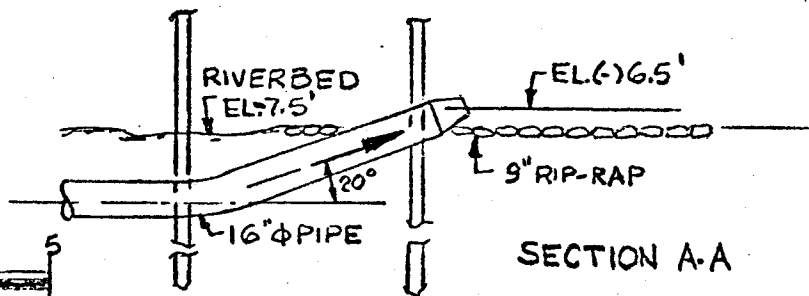
FIGURE B



PROFILE OF DISCHARGE PIPE



PLAN OF DIFFUSOR



SECTION A-A

1. APPROX. 700 C.Y. OF SOIL WILL BE DREDGED DURING CONSTRUCTION OF THE DISCHARGE PIPE.
2. OF THIS TOTAL DREDGED QUANTITY ABOUT 650 C.Y. WILL BE RETURNED FOR BACKFILLING AND APPROX. 50 C.Y. WILL BE PLACED IN DISPOSAL AREA.
3. APPROX. 5 C.Y. OF STONE RIP-RAP WILL BE PLACED ON THE RIVERBED NEAR THE DISCHARGE PORT.

PURPOSE: Power plant make-up and discharge  
 DATUM Mean sea level

PROPOSED PUMP INTAKE &  
 DISCHARGE PIPE  
 IN St. John River  
 AT Palatka (4 miles north)

COUNTY OF Putnam STATE Florida  
 APPLICATION BY Seminola Electric  
 Cooperative, Inc.

SHEET 3 OF 4 DATE 8/25/78

FIGURE C

CLEANING DECK  
THIS END

SCHEMATIC ONLY

7-SCREEN UNITS  
36" Ø x 4' LG.

3 PUMPS @  
9000 GPM  
(INCL. 1 SPARE)

PLAN

HOIST & MONORAIL  
TO CLEANING AREA

WATER BACKWASH

AIR BACKWASH  
EXT. L.W. - 2.5

SCREEN UNIT

DREDGED  
AREA

ISOLATION GATE

POSSIBLE INTERNAL SLEEVE  
FOR VELOCITY DISTRIBUTION

SECTION

PURPOSE: Power Plant  
Make-up and discharge  
Datum Mean Sea Level

NOT TO SCALE

PROPOSED PUMP INTAKE &  
DISCHARGE PIPE  
IN St. John River  
AT Palatka (4 miles north)

COUNTY OF Putnam STATE Florida  
APPLICATION BY Seminole Electric  
Cooperative, Inc.

SHEET 4 OF 4 DATE 8/25/78

FIGURE D

## INFORMATION NEEDED ON AFFIDAVIT OF OWNERSHIP OR CONTROL

1. The affidavit of ownership or control should be signed by at least one owner of the property, lessee, or easement holder.
2. If subdivided, the property should be described by lot number, block number (if any), name of subdivision, and plat book number and page where recorded.
3. If unplatted, the property should be described by section, township, and range, and subdivision of section.
4. If the description is based on courses and distances not following the plane coordinates, the point of beginning should be identified.

Please contact this office should clarification or further instructions be necessary.

## AFFIDAVIT OF OWNERSHIP OR CONTROL

TO THE DEPARTMENT OF ENVIRONMENTAL REGULATION:

I hereby certify that I am the (check one):

record owner \_\_\_\_\_

lessee \_\_\_\_\_

record ease-  
ment holder \_\_\_\_\_

applicant to record owner for  
easement \_\_\_\_\_

of the below described property situated in \_\_\_\_\_ County,  
Florida; and that said property is all the property that is contiguous to and landward of the area  
in which the work proposed in the permit application is to be conducted. Furthermore, I certify  
that as record owner, lessee, or record easement holder I have or will have prior to undertaking  
the work all necessary approvals or permission from all other persons with a legal interest in  
said property to conduct the work proposed in the permit application.

## LEGAL DESCRIPTION

\_\_\_\_\_  
\_\_\_\_\_  
Sworn to and subscribed before me at \_\_\_\_\_  
\_\_\_\_\_, County, \_\_\_\_\_, this \_\_\_\_\_ day  
of \_\_\_\_\_, 19\_\_\_\_.

\_\_\_\_\_  
NOTARY PUBLIC

My commission expires:

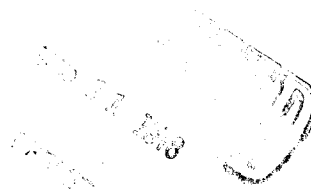


EXHIBIT A**Parcel One:**

The South one-half (S1/2) of the North East quarter (NE1/4) of the South East quarter (SE1/4) and the South East quarter (SE1/4) of the South East quarter (SE1/4) and the North West quarter (NW1/4) of the South East quarter (SE1/4) and the South East quarter (SE1/4) of the South West quarter (SW1/4) of Section 31, Township 8 South, Range 27 East, Putnam County, Florida, containing 140 acres of land, more or less.

The West one-half (W1/2) of the West one-half (W1/2) of Section 5, Township 9 South, Range 27 East, Putnam County, Florida, containing 160 acres of land, more or less.

All of Section 6, lying East of the Seaboard Coast Line Railroad, in Township 9 South, Range 27 East, Putnam County, Florida, containing 555 acres of land, more or less.

All of Section 7, Township 9 South, Range 27 East, less and except the following described tract of land containing 60 acres of land, more or less, to-wit: The South one-half (S1/2) of the South West quarter (SW1/4) of the South West quarter (SW1/4) and the South East quarter (SE1/4) of the South West quarter (SW1/4), Putnam County, Florida, containing 580 acres of land, more or less.

The West one-half (W1/2) of the West one-half (W1/2) and the South three-quarters (S3/4) of the East one-half (E1/2) of the West one-half (W1/2) and the South three-quarters (S3/4) of the West one-half (W1/2) of the East one-half (E1/2) of Section 8, Township 9 South, Range 27 East, Putnam County, Florida, containing 400 acres of land, more or less.

Government Lot 4, or the Northwest quarter (NW1/4) of the Northwest quarter (NW1/4), and the West 66 feet of Government lot 5, or the West 66 feet of the Southwest quarter (SW1/4) of the Northwest quarter (NW1/4) of Section 17, Township 9 South, Range 27 East, Putnam County, Florida, containing 42 acres of land, more or less.

Government lots 1 and 2, or the North one-half (N1/2) of the North East quarter (NE1/4), of Section 18, Township 9 South, Range 27 East, Putnam County, Florida, containing 80 acres of land, more or less.



**(Parcel One continued)**

The Southeast quarter (SE1/4) of the Southeast quarter (SE1/4) lying East of the East line of the Seaboard Coast Line Railroad, Section 1, Township 9 South, Range 26 East, Putnam County, Florida.

The Northeast quarter (NE1/4) of the Northeast quarter (NE1/4), lying East of the East line of the Seaboard Coast Line Railroad, Section 12, Township 9 South, Range 26 East, Putnam County, Florida.

**Parcel Two:**

A parcel of land situate lying and being in the South West quarter (SW1/4) of Section 18, Township 9 South, Range 27 East, more particularly described as follows:

Begin at the point of intersection of the South right-of-way line of State Road 209 and the East line of the South West quarter (SW1/4) of Section 18, Township 9 South, Range 27 East, thence run West along the South right-of-way line of said State Road 209 a distance of 200 feet to the point of beginning of the land herein described; from said point of beginning, run South to the St. John's River and Point A, thence begin again at the point of beginning and run West along the said South right-of-way line of State Road 209 a distance of 200 feet, thence run South to the St. John's River, thence run North and Easterly along said river to Point A, thence run North from Point A to the point of beginning of the land herein described.

RECORDED  
SEP 11 1908  
PERMIT

## 4.5 NOISE IMPACTS

### 4.5.1 Construction Noise Sources

To estimate ambient sound levels during construction, sound levels due to construction activity are extrapolated to the background ambient sound level survey locations using hemispherical sound radiation and attenuation due to foliage (dense woods). The assumption of hemispherical radiation does not include attenuation due to air absorption or ground effects and is therefore conservative.

Construction of the proposed steam-electric generating station is scheduled to begin in late 1979 and to continue to mid-1985. A seven-day work week is planned, but no night work is scheduled. A fifteen-hour work day is assumed.

The sound level contribution due to construction activity is estimated using a preliminary construction equipment schedule and equipment sound levels and usage factors presented in a U.S. Environmental Protection Agency (EPA) publication (EPA, 1975) and in a Construction Engineering Research Laboratory report (CERL, 1978).

The construction process is quite complex. Construction site noise varies with space and time and cannot be easily described. The methodology used for this analysis considers the average acoustic energy emitted by the equipment during the construction process. Equivalent sound levels,  $L_{eq}$ , are computed using the maximum sound level emitted by the equipment and the fraction of time that the maximum level is emitted. This method was developed by the EPA (1971). Details of this procedure are presented in Appendix G.

Table 4.5-1 presents a list of the equipment intended for use in construction of the facility. Equipment sound levels at 15 meters (50 feet) and their usage factors are also provided in the table.

The data presented in Table 4.5-1 were used to compute the yearly average equivalent sound levels emitted from the construction site. The yearly equivalent sound levels for the construction years 1979 through 1985 are presented in Figure 4.5-1. Highest annual equivalent sound levels will be emitted in 1982. The subsequent noise impact assessment is based on construction site noise emitted during 1982.

Some of the Putnam Site foliage will be cleared for construction. However, a border of at least 90 meters (300 feet) of trees will be left around the circumference of the site (Figure 3.1-3). The sound attenuation due to various types of woods is 10 to 25 decibels (dB) per 100 meters (328 feet) (Beranek, 1973). Construction site sound levels were extrapolated to offsite locations (baseline measurement locations, Figure 2.6-1) using an attenuation due to foliage of 10 dB per 100 meters, a conservative assumption.

Table 4.5-2 contains a summary of the estimated equivalent sound levels at offsite locations during the 1982 construction period. Summaries of the background ambient sound levels and construction sound level contributions are included in this table for comparison.

Construction activity will increase ambient sound levels only slightly at adjacent noise sensitive land use areas. The day sound levels at baseline measurement locations 1 and 3 were estimated to increase by 3 to 4 dB. Smaller increases were estimated at the other baseline locations. No night work is scheduled, thus the change in day/night sound levels,  $L_{dn}$  will be minimal.

#### 4.5.2 Steam Blowout Noise

Blowout operations will occur during plant startup and will represent one of the major noncontinuous noise sources during construction. Blowout operations will be required to clean the main steam lines and hot and cold reheat pipe lines prior to commencing plant operations.

Steam pipe blowout procedures vary little among plants. A common blowout program consists of two phases. The first consists of 40 blows over a 5-day period using 400 pounds per square inch (psi) steam. Each blowout lasts for 3.5 to 6 minutes at intervals of 45 to 50 minutes. The second phase consists of 115 blowouts over a 7-day period, using 800 psi steam. These blowouts occur with the same frequency and duration as the first phase blowout. The maximum noise levels emitted during the blowout operation were estimated to be 107 dB at 300 meters (1,000 feet) for phase one and 117 dB at 300 meters (1,000 feet) for phase two. The maximum sound level was estimated to last for the duration of the blowout. Blowout operations are scheduled for daytime hours only. Table 4.5-3 presents a summary of blowout operation ambient sound levels at the six baseline measurement locations.

#### 4.5.3 Construction Noise Impact

Construction average noise levels will be highest during 1982 as is indicated in Figure 4.5-1. The impact assessment and evaluations were made using EPA guidelines. The State of Florida has not promulgated noise control regulations for construction site noise sources.

The EPA has promulgated information which suggests that ambient sound levels below an  $L_{dn}$  of 55 dB do not degrade the public health and welfare (EPA, 1974). Table 4.5-2 indicates that the ambient day/night sound levels,  $L_{dn}$ , at noise sensitive land use Locations 2 and 6, before (baseline) and during the 1982 year of construction are slightly above  $L_{dn} = 55$  dB. The data also indicate that environmental sound levels at Locations 2 and 6 are not affected by construction site activities. Since many communities' environmental sound levels are specifically higher than  $L_{dn} = 55$  dB, the current EPA short term goals are to reduce environmental sound levels to below  $L_{dn} = 65$  dB, while their long term goals are to reduce environmental sound levels to below  $L_{dn} = 55$  dB (EPA, 1977).

At noise sensitive areas represented by Location 3, Wide Waters Trailer Park, the ambient daytime sound levels will increase by 4 dB, but the resulting day/night sound levels are below  $L_{dn} = 55$  dB.

There will be construction activities, such as pile driving, which increase instantaneous ambient sound levels significantly. Pile driving in the St. Johns River will be of relatively short duration, although the high level impact noise may be annoying and may generate some complaints.

Blowout operations are a source of construction noise which also will result in significant impact. As is evident from the sound levels presented in Table 4.5-3, blowout sound levels will increase environmental sound levels significantly. However, the total blowout operation will last for a period of only two weeks per unit, and proper and sufficient community notification should minimize complaints.

Steam blowout operations carried out during normal plant operations will be isolated events, and although they might precipitate some complaints, their impact is considered to be minimal.

Table 4.5-1

Summary of Construction Equipment Types  
Sound Levels and Usage Factors<sup>a, b</sup>

| <u>Equipment Type<sup>c</sup></u> | <u>Sound Level<br/>at 15 Meters<br/>(50 ft.) dB</u> | <u>Usage<br/>Factor</u> |
|-----------------------------------|-----------------------------------------------------|-------------------------|
| 50-250 ton Crane                  | 88                                                  | .1                      |
| 25 ton Crawler Pusher             | 86                                                  | .4                      |
| 75 ton Crawler Pusher             | 82                                                  | .4                      |
| Backhoe                           | 85                                                  | .4                      |
| 20-30 cu. yd. Pan Loader          | 87                                                  | .4                      |
| D7, D8 & D9 Bulldozers            | 89                                                  | .4                      |
| Fuel and Lubrication Truck        | 88                                                  | .16                     |
| Water Truck                       | 88                                                  | .26                     |
| Motor Grader                      | 85                                                  | .1                      |
| Vibrator/Roller                   | 80                                                  | .1                      |
| Master Mechanic Truck             | 88                                                  | .16                     |
| Flat Bed Truck                    | 88                                                  | .26                     |
| Dump Trucks                       | 88                                                  | .26                     |
| Flat Bed Trailers                 | 88                                                  | .26                     |
| Commercial Tractors               | 80                                                  | .3                      |
| Concrete Truck                    | 74                                                  | .4                      |
| Concrete Pumps                    | 82                                                  | .05                     |
| Front End Loaders                 | 83                                                  | .4                      |
| Road Scrapers                     | 87                                                  | .08                     |
| Automatic Ballast Vibrators       | 85                                                  | .4                      |
| River Barge Piledriver            | 101                                                 | .04                     |
| 50 ton Hoist                      | 83                                                  | .2                      |
| Air Compressor                    | 82                                                  | 1.0                     |

<sup>a</sup>"Background Document for Portable Air Compressors," U.S. EPA, EPA 550/9-76-004, December, 1975.

<sup>b</sup>Construction Engineering Research Laboratory, "Construction Noise Control Cost-Benefit Estimation Technical Background," Technical Report N-37, January, 1978.

<sup>c</sup>Source: Burns and Roe, Inc.

Table 4.5-2

Construction Ambient Sound Levels<sup>a</sup>

| Location <sup>b</sup>        | Background Ambient Sound Levels, dB |                |                 | Construction Contribution to Ambient Sound Levels, dB |                |                 | Construction Ambient Sound Levels, dB |                |                 | Change in Ambient Sound Levels, dB |                |                 |
|------------------------------|-------------------------------------|----------------|-----------------|-------------------------------------------------------|----------------|-----------------|---------------------------------------|----------------|-----------------|------------------------------------|----------------|-----------------|
|                              | L <sub>d</sub>                      | L <sub>n</sub> | L <sub>dn</sub> | L <sub>d</sub>                                        | L <sub>n</sub> | L <sub>dn</sub> | L <sub>d</sub>                        | L <sub>n</sub> | L <sub>dn</sub> | L <sub>d</sub>                     | L <sub>n</sub> | L <sub>dn</sub> |
| 1. Warner Point              | 43                                  | 40             | 47              | 43                                                    | 46             | 40              | 48                                    | 3              | 0               | 1                                  |                |                 |
| 2. Degeyter Motel            | 52                                  | 51             | 57              | 37                                                    | 52             | 51              | 57                                    | 0              | 0               | 0                                  |                |                 |
| 3. Wild Waters Trailer Park  | 47                                  | 39             | 48              | 48                                                    | 51             | 39              | 50                                    | 4              | 0               | 2                                  |                |                 |
| 4. Onsite                    | 43                                  | 36             | 44              | ---                                                   | Onsite         |                 |                                       | Onsite         |                 |                                    |                |                 |
| 5. Mulberry and Tillman Rds. | 47                                  | 35             | 46              | 43                                                    | 48             | 35              | 47                                    | 1              | 0               | 1                                  |                |                 |
| 6. U.S. Route 17             | 57                                  | 49             | 58              | 51                                                    | 58             | 49              | 58                                    | 1              | 0               | 0                                  |                |                 |

<sup>a</sup>Based on 1982 Construction Equipment Usage Schedule - Burns and Roe, for 15 hour day.<sup>b</sup>See Figure 2.6-1 for locations.<sup>c</sup>These sound levels reflect a 10 dB attenuation due to 90 metres (300 feet) of tree border.

Table 4.5-3.

Blowout Operation Sound Levels

| <u>Location</u>                 | <u>Sound Level*</u><br><u>dB</u> |
|---------------------------------|----------------------------------|
| 1. Warner Point                 | 86                               |
| 2. Degeyter Motel               | 79                               |
| 3. Wide Waters Trailer Park     | 91                               |
| 4. Onsite                       | --                               |
| 5. At Mulberry and Tillman Rds. | 100                              |
| 6. U.S. Route 17                | 92                               |

---

\*Second phase blowout operations 3.5 to 6 minutes duration at 45 to 50 minute intervals.

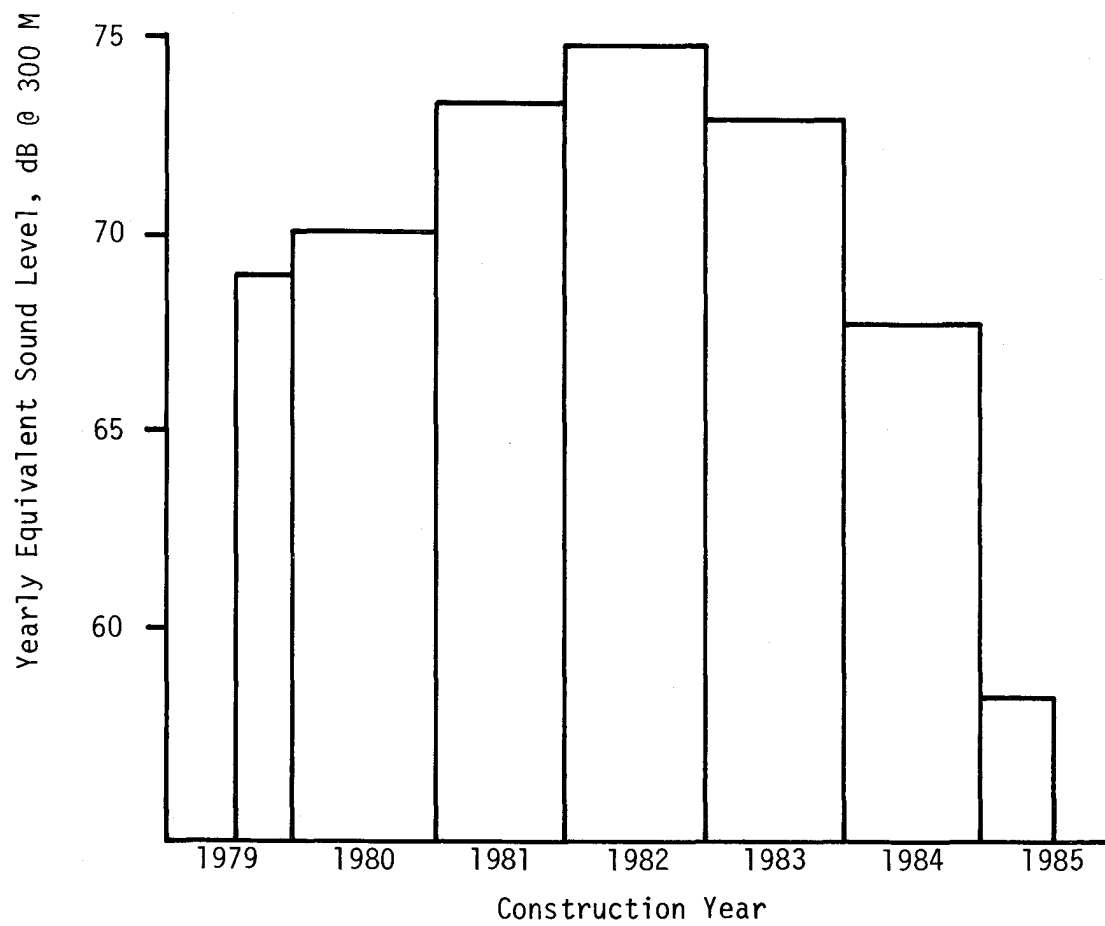


Figure 4.5-1. Yearly Equivalent Sound Levels.

## 4.6 OTHER IMPACTS

### 4.6.1 Transportation

During construction of the plant, traffic along U. S. Route 17 is expected to exceed normal levels. Traffic levels will increase in 1979, reach their peak in 1982, and gradually recede until completion of the plant in 1985. At the height of construction activity, approximately 1,000 construction and supervisory personnel will be employed at the plant site. The influx of personnel to the plant site each day is expected to be by private automobile, accounting for the increased traffic levels in the plant vicinity. Most of the traffic associated with arrival of the construction work force will occur in the morning and evening "peak hours" of traffic flow.

It was assumed that each automobile carrying workers to the plant site will carry an average of three persons; therefore, the expected amount of traffic generated at the plant construction site will be approximately 330 cars. In 1977, the Average Daily Traffic (ADT) on U. S. Route 17 in the site vicinity was 3,852 (Table 2.10-16). It was assumed that in 1977 the peak hour traffic on U. S. Route 17 was 10 percent of the ADT, or approximately 400 vehicles per hour. Thus, the additional plant traffic will increase the peak hour traffic to 700 cars per hour. It was estimated that the traffic capacity of U. S. Route 17 in the plant vicinity is approximately 750 cars per hour at Service Level C (manuverability retained). Therefore, with the plant's additional traffic volume, the capacity of U. S. Route 17 at Service Level C will be approached. The absolute capacity of U. S. Route 17 is 1,400 cars per hour. Assuming a 20 percent increase in ADT by 1982, without the Seminole project, the peak hour traffic, combined with the additional plant related traffic, may exceed 750 cars per hour and may exceed the estimated capacity of U. S. Route 17 at Level C, but would not exceed the highway's absolute capacity.

Construction of the four lanes on U.S. Route 17 from State Route S209 to Palatka is scheduled to begin in 1981 and end in 1982. Construction traffic associated with the plant is expected to peak in 1982 and diminishes thereafter so some overlap of these conditions could occur. However, since road construction will not occur along U.S. Route 17 in the immediate vicinity of the plant's main access road, the effects of the overlapping construction periods will be reduced. Replacement of the Rice Creek Bridge is scheduled for 1980 to 1981. The bridge should be completed before plant construction traffic reaches its peak in 1981 to 1982.

In addition to employees' arrival and departure traffic, construction activity at the site will generate traffic associated with material delivery and equipment usage (Table 4.6-1). Defining the amount of trips generated by these activities is difficult; however some estimation of the average number of trips per day during each construction year is possible. Using the construction equipment schedule for vehicles most likely to be used in trips to and from the site (Table 4.6-1), and assuming five trips per day for each vehicle, an estimate of the daily trips was determined. This estimate is shown in the last line of Table 4.6-1. Between 1981 and 1984, the volume of traffic produced by construction activities remains relatively constant varying from 270 to 350 trips per day, with the largest number of trips during 1982. These trips are expected to originate during the daytime but are not expected to increase peak hour traffic levels.

#### Average Daily Traffic Levels

Average daily traffic along U.S. Route 17 and State Route S209 will be increased during 1979 to 1985 by plant construction traffic. Estimates indicate that employee traffic, at its peak, will average approximately 330 round trips per day during 1982. During this same period, construction traffic will average 350 round trips per day. Thus,

total traffic levels during the day will increase by approximately 680 round trips per day or over 1,360 one-way trips. This total is a 33 percent increase over existing 1977 traffic levels of 3,852. If these additional trips are added to 1977 levels, plus an assumed 20 percent without project increase in traffic, U.S. Route 17 traffic levels may reach as high as 5,300 cars per day. These traffic levels are not expected to exceed daily capacity levels on U.S. route 17 which is presently rated as 14,000 cars per day under best conditions (Section 2.10.4, Transportation).

#### 4.6.2 Land Use

Construction of the plant should not greatly affect land uses in the site vicinity. The natural vegetation surrounding the site will serve to reduce most effects of construction on land uses adjacent to the site property. The vegetation will dampen noise, dust, and smoke from construction operations as well as providing a visual screening barrier. The land necessary for development of the plant will reduce the amounts of rural forested land in the county, but the area developed is fairly insignificant in regard to the amount of such land in the county (Table 2.8-1). Discussion on the losses in productivity and land use alternatives is found in Section 5.7.2.

#### 4.6.3 Historic, Scenic, Cultural, and Natural Landmarks

Construction activities associated with the Seminole Station should not effect any public lands, National Historic Register sites, or other cultural resources discussed in Section 2.8.4. These areas are far enough removed from the site that construction activity will not interfere with their operation or physical settings.

No archeological sites of significance were found on the plant site, nor in the preferred pipeline corridor to the river. The few homestead sites found were in the southern portion of the plant site where little development activity is planned. Thus, no impacts are expected. Discussion of archeological resources on site may be found in Appendix J.

#### 4.6.4 Flooding Impacts

The construction of the Seminole Plant Units No. 1 and No. 2 is expected to have no impacts on high water or flooding levels of the St. Johns River or any tributaries. The reason for this is that no structures, embankments, or fills of any significant size are planned to be placed in site vicinity floodplains that would affect the conveyance capacity of the floodway of any stream.

Table 4.6-1

## Schedule for Construction Equipment Likely to be Used Offsite

| <u>Description</u>    | <u>Equipment-Months</u> |             |             |             |             |             |             |
|-----------------------|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                       | <u>1979</u>             | <u>1980</u> | <u>1981</u> | <u>1982</u> | <u>1983</u> | <u>1984</u> | <u>1985</u> |
| Fuel/Lub. Truck       | 2                       | 24          | 18          | 24          | 24          | 24          | 4           |
| Wtr. Spray Trucks     | 2                       | 24          | 12          | 24          | 12          | 18          | 4           |
| Master Mech. Truck    | 4                       | 20          | 24          | 24          | 24          | 24          | -           |
| Pick-up Trucks        | 16                      | 112         | 291         | 331         | 345         | 271         | 60          |
| Flat Bed Trucks       | 4                       | 16          | 123         | 160         | 41          | 120         | 12          |
| Dump Trucks           | 8                       | 48          | 48          | 57          | 48          | 60          | 8           |
| Flat Bed Trailers     | -                       | 30          | 120         | 143         | 120         | 96          | -           |
| Commercial Tractors   | -                       | 6           | 44          | 56          | 47          | 36          | -           |
| Concrete Trucks       | <u>4</u>                | <u>22</u>   | <u>20</u>   | <u>21</u>   | <u>20</u>   | <u>10</u>   | <u>-</u>    |
| Total                 | 40                      | 302         | 700         | 840         | 681         | 659         | 88          |
| Estimated Daily Trips | 20                      | 130         | 290         | 350         | 280         | 270         | 40          |

Source: Burns and Roe, Inc.

\*Based on the assumption that each operating vehicle will make an average of five trips to and from the site each day.

#### 4.7 MITIGATING MEASURES

##### Fugitive Dust Control

Control of nuisance dusts will be accomplished by the application of water and/or dust suppression chemicals when needed.

##### Wastewater Treatment and Control

Construction-phase housekeeping regulations enforced by SECI will prevent dumping of any petroleum or other waste materials on the ground or in the sanitary waste system. Sanitary wastewaters will be treated by an extended aeration plant before onsite percolation.

##### Erosion and Construction Runoff Control

Potential impacts from sediments which escape from the construction area will be negligible because all construction runoff is expected to dissipate on site. Upon completion of construction, the construction area will be vegetated as required to be compatible with existing natural landscape elements. Limiting the amount of site clearing to specific needs will help to reduce erosion potential, particularly in the area of the steepest sloped terrain south and east of the main plant area.

The area to be revegetated, with the exception of that area occupied by the plant components, will be vegetated with native pines and grasses. Slash pine (Pinus elliottii) will be planted in this area and broomsedge (Andropogon virginicus) will be encouraged as the ground cover. Natural revegetation will occur rapidly in the area after site disturbance has ceased. Planted vegetation will be collected from other areas of the site with the pines possible coming from the Florida Forestry Commission or local timber companies engaging in reforestation. Local nurseries or turf farms may be a source of grasses if the site area cannot supply enough excess to revegetate the cleared portion of the site.

##### Maintaining and Enhancing Onsite Habitat

Existing habitats on the Putnam Site will be maintained as practical in accommodating plant access roads, rail lines, and other

facilities. Revegetating will use indigenous grasses, shrubs, and trees.

#### Relocating the Gopher Tortoise

Possibly the greatest impact on the terrestrial ecology of the Putnam Site due to site construction and development will be the removal of about 55 percent of the Sandhill Habitat. This will destroy a portion of this habitat important to the gopher tortoise, a threatened species in Florida. Investigations are currently underway to determine the population size of the tortoise colony and the feasibility of trapping and translocating this colony to other areas if the remaining Sandhill cannot accommodate the entire colony. Personnel of the Florida Game and Fresh Water Fish Commission have been asked to help with these investigations and with locating a suitable site for colony transfer.

#### Disposal of Dredged Spoil

Measures proposed to mitigate potential adverse environmental impacts to the aquatic ecosystem from dredging activities include (1) use of an inland diked spoil disposal area to reduce damage to the aquatic habitat, (2) conducting dredging during the autumn months when biological activity is relatively low and fish spawning has not yet occurred, and (3) use of silt restraining devices around the cutting head of the dredge and at the point of runoff (if any) from the spoil area.

#### Community Notification of Blowout Operations

The greatest noise impacts during construction will be during the steam blowout at unit startup. This phase of the startup procedure is estimated to last only about two weeks for each unit, and will be carried out during daytime hours. The community will be notified that such noise can be expected but will be temporary.

#### 4.8 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

Listed below is a brief summary of the adverse environmental impacts expected during construction of Seminole Plant Units No. 1 and No. 2 that cannot be avoided by any practical means. Except as noted, these impacts are considered to be minor or negligible.

1. Temporary escape of fugitive dust from the site.
2. Temporary escape of vehicle exhaust emissions from the site and along area roads due to traffic increases.
3. Slight lowering of the potentiometric surface of the Floridan Aquifer locally.
4. Increase in soil erosion rates from about 420 acres during construction until completion of revegetation efforts. However, no offsite impacts are expected.
5. A significant impact will be the loss of about 290 acres of Sandhill Community habitat. This represents about 55 percent of this habitat that presently exists on the Putnam Site.
6. Loss of some Pine Flatwood and Cypress Dome habitat.
7. Temporary dredging impacts including increases in turbidity and suspended sediments. Also, a permanent loss of macrophyte habitat is expected.
8. Temporary increases in ambient noise levels will be felt in the site vicinity. The most noticeable will be the steam blowout operations that will be intermittent and will last only about two weeks per unit.
9. Increased vehicular traffic will be experienced on nearby highways.

These unavoidable impacts are discussed in detail in Sections 4.1 through 4.6, and proposed mitigating measures to reduce them are discussed in each section with a summary in Section 4.7.

#### 4.9 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The most severe impact of the construction of Seminole Plant Units No. 1 and No. 2 is the loss of about 55 percent of the onsite Sandhill Community habitat (Section 4.3.2). However, this loss is not necessarily "irreversible and irretrievable" since after the station is retired, the structures could be removed and natural vegetation allowed to be reestablished. Although this could require a considerable period of time, and some Sandhill species may have to be translocated to the site in order to accomplish a complete recovery, it is a possibility.

Commitment of resources that will truly be irreversible and irretrievable will include the use of materials and energy to construct the facilities. It should be noted that, given the necessity for additional electric power capacity in the State of Florida, the expenditure of these material and energy resources would have to be made elsewhere if not made by Seminole Electric Cooperative, Inc. at the Putnam Site.

#### 4.10 REFERENCES

- Beranek, L. L., 1973, Noise and vibration control. McGraw Hill, New York, New York.
- Construction Engineering Research Laboratory, 1978, "Construction noise control cost-benefit estimation technical background", Technical Report N-37, January.
- May, E. B., 1973. Environmental effects of hydraulic dredging in estuaries. Alabama Marine Resources Bul. 9:1-85.
- Soil Conservation Service, 1965, Reservoir Sedimentation Surveys, Technical Release No. 22, Washington, D.C.
- Slotta, 1974, In proceedings of the sixth dredging seminar, January 25, Texas A&M University, 96 pp.
- U. S. Environmental Protection Agency, 1975, "Background document for portable air compressors", EPA 55019-76-004, December.
- \_\_\_\_\_, 1971, "Noise from construction equipment and operation, building equipment and home appliances", NTID 300.1.
- \_\_\_\_\_, 1974, "Information on levels of environmental noise requisite to protect public health and welfare with an adequate margin of safety, USEPA, 550/9-74-004, March.
- \_\_\_\_\_, 1977, "Toward a national strategy of noise control", April.
- University of California and others, 1973, Water resources engineering educational series, groundwater pollution. University of California, Berkely, Continuing Education in Engineering, University Extension, and the College of Engineering in cooperation with Geraghty & Miller, Inc., Consulting Goundwater Geologists and Hydrologist, Port Washington, New York, November 6-8, 1973.