BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Joint Petition to Determine Need for an Electrical Power Plant in Volusia County by the Utilities Commission, City of New Smyrna Beach, Florida, and Duke Energy New Smyrna Beach Power Company Ltd., L.L.P.	DOCKET NO. 981042-EM FILED: Sept. 28, 1998

DIRECT TESTIMONY

OF

JEFFREY L. MELING, P.E.

ON BEHALF OF

THE UTILITIES COMMISSION, CITY OF NEW SMYRNA BEACH, FLORIDA

AND

DUKE ENERGY NEW SMYRNA BEACH POWER COMPANY LTD., L.L.P.

IN RE: JOINT PETITION FOR DETERMINATION OF NEED
BY THE UTILITIES COMMISSION OF NEW SMYRNA BEACH
AND DUKE ENERGY NEW SMYRNA BEACH POWER COMPANY,
FPSC DOCKET NO. 981042-EM

DIRECT TESTIMONY OF JEFFREY L. MELING, P.E.

Q: Please state your name and business address.

A: My name is Jeffrey L. Meling, and my business address is 3701 Northwest 98th Street, Gainesville, Florida 32606.

Q: By whom are you employed and in what position?

A: I am employed as Vice President and Principal Engineer by Environmental Consulting & Technology, Inc.

Q: Please describe Environmental Consulting & Technology, Inc. and its business.

A: Environmental Consulting & Technology, Inc. ("ECT") provides multidisciplinary environmental services throughout the United States and worldwide. ECT's professional capabilities include a comprehensive range of consulting service areas focused on the environmental needs of its private and public sector clients. These diverse capabilities are provided throughout the following major service categories:

- Environmental monitoring, baseline descriptions, and impact assessments.

- Environmental siting, licensing, and permitting.
- Toxic and hazardous material management and control.
- Storage tank assessments and management.
- Environmental audit and liability management.
- Planning.
- Engineering services.
- Regulatory compliance services.
- Asbestos consultation.
- Industrial hygiene.

Q: Please describe your duties with ECT.

A: I have both staff and project management responsibilities. First, I manage a group of three other air quality engineers and scientists, and, as an officer, I also have companywide responsibilities regarding air quality staffing. Second, a majority of my time is spent managing and working on projects, both air quality permitting projects and multidisciplinary licensing/permitting projects.

QUALIFICATIONS AND EXPERIENCE

Q: Please summarize your educational background and experience.

A: I received my bachelor of science degree in civil

engineering in 1977 and a master of science degree in environmental engineering in 1979, both from the University of Illinois. In the fall of 1979, I began my professional consulting career, and I have been in this field since that time. During this approximately 19-year period, I have worked on a wide variety of environmental projects and studies across the United States and in several foreign countries. The clients I have worked with include governmental agencies (e.g., U.S. Environmental Protection Agency [EPA]), industrial companies, and power companies, both utility and nonutility.

Q: What is your experience in power plant siting and licensing?

A: My experience in this area is extensive. I have worked on power plant siting, licensing, and permitting projects since early in my career. These projects have been located in many of the United States and a number of foreign countries. I will highlight a few examples. First, beginning in 1990, I managed the air quality tasks for Tampa Electric Company's 1,100-megawatt (MW) Polk Power Station, which was licensed through the Florida Electrical Power Plant Siting Act (FEPPSA). I was responsible for

all air quality aspects of this licensing effort, including a multistation, year-long ambient air monitoring program, control technology assessments, and rigorous air quality impacts studies.

Second, from 1991 through approximately 1994, I managed a site selection study and all environmental permitting for Mission Energy Company's 150-MW Auburndale, Florida, cogeneration plant. This project required a Prevention of Significant Deterioration (PSD) (air quality) permit, a water use permit, noise monitoring and predictive modeling, wetlands delineation and permitting, and other environmental studies and permits.

Third, from 1992 through approximately 1996, I managed the licensing of Panda Energy Corporation's 230-MW Brandywine, Maryland, cogeneration facility. The requirements for this project were very similar to those just described for the Auburndale project. However, unlike the Auburndale project, the Brandywine licensing effort required approval from the Maryland Public Service Commission (PSC) via a process very similar to the certification process used here in Florida. Because of the project's location in the Washington, D.C., suburbs, we faced a number of complex issues and defended our analyses and conclusions in hearings conducted by a Maryland PSC

examiner. Brandywine was the first nonutility generating project successfully licensed by the PSC in Maryland.

I could give many more examples of similar projects. Let me conclude by saying that I have also managed or worked on power plant site selection studies in Florida (e.g., Seminole Electric Cooperative, Inc.) and elsewhere (e.g., Atlantic Electric [New Jersey]), and power plant environmental studies and permitting from Maine to Texas to Wyoming and in places like El Salvador and Pakistan. Besides the New Smyrna Beach Power Plant, I am currently managing a number of other power plant licensing/permitting projects in a number of locations.

Q: Have you previously testified before regulatory authorities or courts?

A: Yes

Q: What are your responsibilities with respect to the electrical power plant project that is the subject of this proceeding?

A: I am ECT's project manager, responsible to Duke Energy and UCCNSB for all aspects of the licensing efforts that have been assigned to ECT. My duties include:

- Day-to-day management of technical, budgetary, and scheduling aspects of the Project.
- Providing overall technical leadership.
- Coordination of ECT's work activities and the preparation of all work products.

Q: Are you a registered professional engineer?

A: Yes, I am a registered professional engineer in the State of Texas.

Q: Are you sponsoring any exhibits to your testimony?

A: Yes. I am sponsoring Exhibit ___ (JLM-1), a report entitled "Preliminary Evaluation of Site Features and Potential Impacts." This report essentially comprises a summary of the analyses that ECT conducted in support of the site certification application.

THE NEW SMYRNA BEACH PROJECT - SITE EVALUATION

Q: Have you prepared an analysis of the proposed site for the New Smyrna Beach Power Project?

A: Yes, as mentioned above, I have prepared a preliminary analysis of the proposed Project site titled "Preliminary Evaluation of Site Features and Potential Impacts."

Q: Please describe the steps that ECT's analysis encompassed.

A: The steps involved in the preliminary evaluation paralleled those in the licensing process: characterize the site and surrounding area; characterize the Project's conceptual features, especially discharges and emissions; and evaluate the extent to which the Project would affect its environment. By completing these steps, it has been possible to analyze the Project's anticipated environmental impacts and assess the viability of the site selected for the proposed Project.

Q: What sources of information did you consult in gathering information for ECT's analysis?

A: My project team and I have consulted a variety of available data and information on the site and its surroundings, including air quality monitoring data, information on site geology and hydrogeology, and information on land use, to cite a few examples. In addition, the ECT project team has completed several field studies of its own, including a thorough characterization of the site's ecological resources and a monitoring program to determine existing noise levels.

Q: Please summarize the results of ECT's analyses.

A: ECT has found that the proposed site is well-suited to its use for the New Smyrna Beach Power Project. Through the use of modern, state-of-the-art generation technology and clean natural gas fuel, air quality impacts will be minimal, and no sensitive receptors will be noticeably affected. To the extent that the Project's electrical generation displaces older, dirtier, less efficient facilities, its impact on regional air quality will be positive. The Project's use of treated effluent from the adjacent new wastewater treatment plant (WWTP), which will supply as much of the plant's water needs as possible, will reduce the amount of ground water withdrawals. And the Project's use of this WWTP effluent will significantly reduce—and possibly eliminate—the WWTP's discharges to the Indian River, another positive environmental aspect associated with the Project. Since wastewater discharges from the plant (except storm water) will be returned to the WWTP, there will be no impacts on surface water bodies. Most of the site's wetland areas will be avoided by placing the major equipment in predominantly upland areas. Impacts to other ecological resources will be minimized by the plant's relatively small land requirements and minimal emissions and discharges. Since the site is remote from residential areas, land use impacts will be minimal.

Proximity to two major highways, Interstate 95 (I-95) and State Road (SR) 44, will minimize any impacts on traffic during construction and operation. The Division of Historical Resources has informed us that the Project "will have no effect on historic properties . . . or [property having] historical, archaeological, or architectural value." Of course, from an economic perspective, the Project will have the positive impacts of jobs, economic activity to support construction and operation, and tax revenues.

Q: What are the major findings of your analysis?

A: The major findings of ECT's analysis of the site address air resources, water resources, ecology, and land use and socioeconomic aspects of the site and Project. These are discussed individually below.

Air Resources

The Project site is located in an attainment area for all criteria pollutants and a PSD Class II area for particulate matter, sulfur dioxide, and nitrogen dioxide. The nearest PSD Class I area to the site is the Chassahowitzka National Wildlife Refuge, which is located approximately 100 miles to the west. Ambient air pollutants have concentrations below ambient air quality standards at

the nearest locations for which data are available.

Given the exclusive use of clean natural gas for fuel, the New Smyrna Beach Power Project's combustion-related emissions are expected to result in air quality impacts that are less than the significant impact levels for sulfur dioxide, nitrogen dioxide, particulate matter, and carbon monoxide. The significant impact levels are well below the state and federal ambient air quality standards and the prevention of significant deterioration increments. The Project's air emissions are not expected to adversely affect the air quality related values in the Chassahowitzka PSD Class I area. Because of the use of natural gas and the distance of separation, the National Park Service staff has informed us that they have no concern regarding the Project's potential impacts on Chassahowitzka and that no analysis of impacts is therefore warranted.

Water Resources

The proposed site drains indirectly (i.e., via wetland areas) to an unnamed tributary, which eventually discharges into Spruce Creek. The portion of the proposed site on which the Project is to be constructed is located partially within the 100-year floodplain. Approximately the eastern third of the plant footprint area is at an elevation slightly below the 100-year flood elevation. This

relatively minor engineering matter will be remedied by filling that portion of the project site so that the plant equipment is out of the floodplain.

The site is within the jurisdiction of the St. John's River Water Management District. The Project's storm water management systems can and will be designed and constructed to meet the District's water quality and water quantity regulations.

Most of the Project's water use requirements will be met by using treated effluent from UCCNSB's WWTP, which is being constructed adjacent to the Project site. To the extent that the Project needs additional water, it is expected to be obtained from groundwater sources, potentially both on- and offsite. Productive zones in the Upper Floridan aquifer are capable of producing significant quantities of groundwater that meet the requirements of the proposed Project. Water treatment will be necessary prior to use; more pretreatment will be required for the reuse water than for ground water.

Cooling tower blowdown, process wastewater streams, and sanitary wastewater will be discharged back to the adjacent WWTP. No industrial or sanitary wastewater will be discharged to any surface waters. As a result, the Project will have little or no impact on surface waters, since no

wastewater streams (other than storm water runoff) will be discharged to the environment.

Overall, the Project's impacts on surface waters will be positive, as I mentioned earlier. The power plant will reuse treated effluent from the WWTP that otherwise could be discharged to the Indian River. The Utilities Commission is under a mandate to reduce discharges to the Indian River. The Project will help UCCNSB meet their objective.

Ecology

The ecology of the Project site is characterized by native Florida vegetation communities consisting of pine flatwoods, slash pine wetlands, cypress domes, and palmetto shrubland. No lakes, streams, or other aquatic resources exist onsite, except wetlands. Disturbed areas found onsite include roadways, electrical transmission lines, an electric substation, and borrow areas (scraped areas). The previously mentioned WWTP is under construction to the north.

Flora and fauna found onsite are typical of north Florida flatwoods/wetland community types. Two fern species listed by the Florida Department of Agriculture and Consumer Services as commercially exploited are found onsite, but no federally-listed plant species were found during field surveys. No wildlife species listed by the

Florida Game and Fresh Water Fish Commisison or the U.S. Fish and Wildlife Service were found onsite, although it is possible some species may forage on or traverse portions of the site. No areas characterized as ecologically unique or sensitive are found onsite. Additionally, only approximately 0.7 acre of state or federally jurisdictional wetlands will be impacted by the Project. In summary, the Project will not have significant ecological effects on the site or the region.

Land Use and Socioeconomics

The City of New Smyrna Beach has annexed the site. Land use currently consists of native vegetation communities with electric utility facilities, a road, and scraped borrow areas found onsite. Surrounding land uses are the WWTP undergoing construction to the north, a borrow pond and I-95 to the east, and more undisturbed forested and agricultural lands to the south and west. SR 44 and a gas station also lie to the south of the site. The site has been rezoned as Industrial-Planned Unit Development (I-PUD), which is compatible with electric generating stations. No residential or commercial development occurs on or near the site.

The site does not contain any parks, recreation areas, or natural resource areas. The State Division of Historical

Resources has concluded that the proposed project will have no effect on known or proposed historical/archaeological resources.

The Project will have a positive effect on local economies. The need for the construction workforce will mean more employment opportunities and direct/indirect economic expenditures. Upon completion, the Project will provide an economic and reliable source of clean energy for New Smyrna Beach and Florida and provide the city and county with tax revenues. No significant impacts to existing infrastructure or essential services are anticipated due to the relatively small workforce required for plant operation.

In summary, the Project will be consistent with existing land use plans and zoning ordinances and will provide social and economic benefits, with minimal impact to the residents of New Smyrna Beach and Volusia County.

Q: Do you still agree with the findings and conclusions of the analyses presented in Exhibit ___ (JLM-1)?

A: Yes, I do.

Q: What is the licensing schedule for the New Smyrna Beach Power Project?

A: The current plan is to submit the site certification application (SCA) in October. Project construction is anticipated to begin in early 2000, with commercial operation scheduled for the fourth quarter of 2001.

Q: Do you have a conclusion with respect to the ability of the New Smyrna Beach Power Project to obtain all necessary licenses within the time frames described in the licensing schedule?

A: Yes, I do.

Q: What is your conclusion?

A: Based on our analyses, ECT has concluded that the site is appropriate for the New Smyrna Beach Power Project, that the site can support the Project as proposed, and that the Project as proposed can obtain all necessary licenses and approvals within the times allotted in the licensing schedule.

Q: Does this conclude your direct testimony?

A: Yes, it does.

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FPSC Docket No. 981042-EM
UCNSB/Duke New Smyrna
Witness: Meling
Exhibit ____ (JLM-1)

NEW SMYRNA BEACH POWER PROJECT
PRELIMINARY EVALUATION OF
SITE FEATURES AND POTENTIAL IMPACTS

Prepared by:

ECT
Environmental Consulting & Technology, Inc.
3701 Northwest 98th Street
Gainesville, Florida 32606

ECT No. 98170-0400

September 1998

1.0 INTRODUCTION

Duke Energy New Smyrna Beach Power Company Ltd., L.L.P. (Duke), is planning to construct, own, and operate a new electric power generating plant in Volusia County, Florida. The New Smyrna Beach Power Project (the Project) will be capable of producing a nominal 500 megawatts (MW) of electricity using state-of-the-art technology and clean natural gas fuel. The Utilities Commission of the City of New Smyrna Beach (UCCNSB) is a co-applicant for the Project and will receive an entitlement of capacity to cost-effectively meet the needs of its customers. Duke/UCCNSB recently filed an application with the Florida Public Service Commission (FPSC) demonstrating the need for the Project, both in meeting UCCNSB's growing needs for electrical power as well as those of Peninsula Florida. The need application showed how the Project will constitute a reliable, cost-effective, and environmentally friendly power generation resource for Florida. Following the need application will be the site certification application (SCA), which will address the Project's environmental and socioeconomic impacts.

Environmental Consulting & Technology, Inc. (ECT), was retained by Duke to take the lead in conducting the environmental impacts analyses and preparing the SCA. This report presents a preliminary summary of key features of the Project and how the Project may affect the environment. Full details regarding the potential impacts will be included in the SCA.

Section 2.0 of this report describes the important environmental features of the site and surrounding area (i.e., the *baseline* conditions). Section 3.0 provides a summary of the facilities and equipment comprising the proposed Project. In Sections 4.0 and 5.0, the impacts potentially resulting from construction and operation, respectively, of the Project are summarized. Finally, Section 6.0 presents conclusions regarding the Project's impacts.

2.0 SITE AND VICINITY CHARACTERISTICS

2.1 SITE AND ASSOCIATED FACILITIES DESCRIPTION

The proposed site for the Project is located in eastern Volusia County, approximately 5 miles west of downtown New Smyrna Beach (see Figure 2-1). The site is a 30.5-acre parcel that lies northwest of the intersection of State Road (SR) 44 and Interstate 95 (I-95), as shown in Figure 2-2. Figure 2-2 also shows the site of a new wastewater treatment plant (WWTP) currently being constructed by UCCNSB.

The site includes an existing UCCNSB 115-kilovolt (kV) electrical substation and is bisected by an existing UCCNSB and Florida Power & Light Company (FPL) transmission line easement. The Project will be served with natural gas via a new 16-inch pipeline proposed by Florida Gas Transmission (FGT). The pipeline will originate at the existing FGT system in Lake County. Licensing and permitting of the new pipeline will be the responsibility of FGT.

The site is primarily rural in nature and undeveloped. Adjacent to the northeast is UCCNSB's new 6.0-million-gallons-per-day (MGD) WWTP still under construction. To the east is I-95 and an inactive borrow pit. To the south is SR 44 and a service station at the intersection of SR 44 and I-95. To the west is undeveloped land.

2.2 LAND USE FEATURES

The site has been annexed into the City of New Smyrna Beach. Because the site was annexed recently, the City's comprehensive plan has not yet been amended to include the annexed areas. Consequently, the site is still subject to the provisions of the Volusia County comprehensive plan.

Consistent with the County's comprehensive plan, the site has been rezoned by the City as an Industrial—Planned Unit Development (I-PUD) in the Southeast Activity Center. The I-PUD zoning authorizes the construction and operation of an electrical power plant

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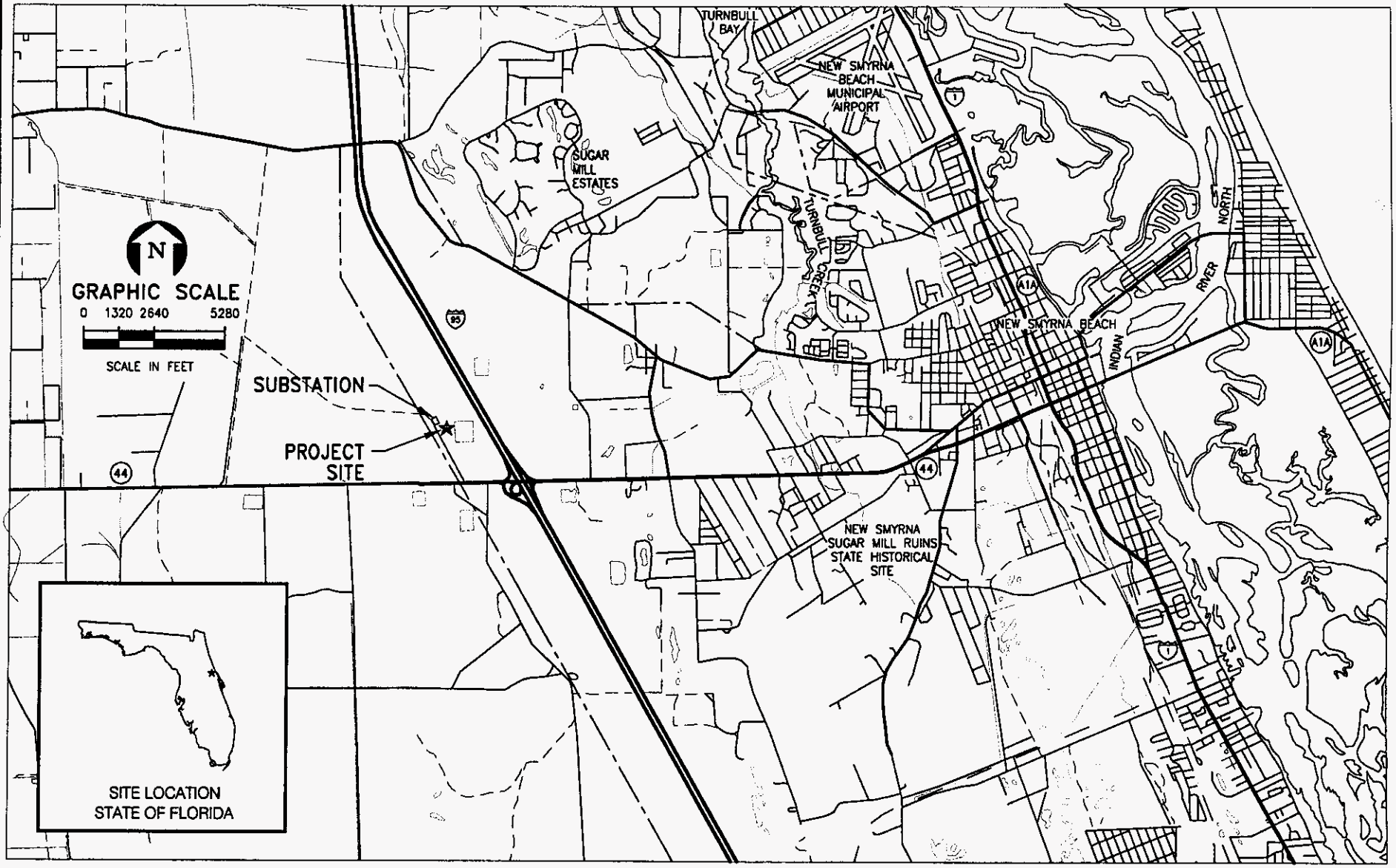

FIGURE 2-1.

NEW SMYRNA BEACH POWER PROJECT SITE LOCATION

Source: USGS Quads: New Smyrna Beach, FL, 1993; Edgewater, FL, 1970; Samsula, FL, 1993; Lake Ashby, FL, 1988.

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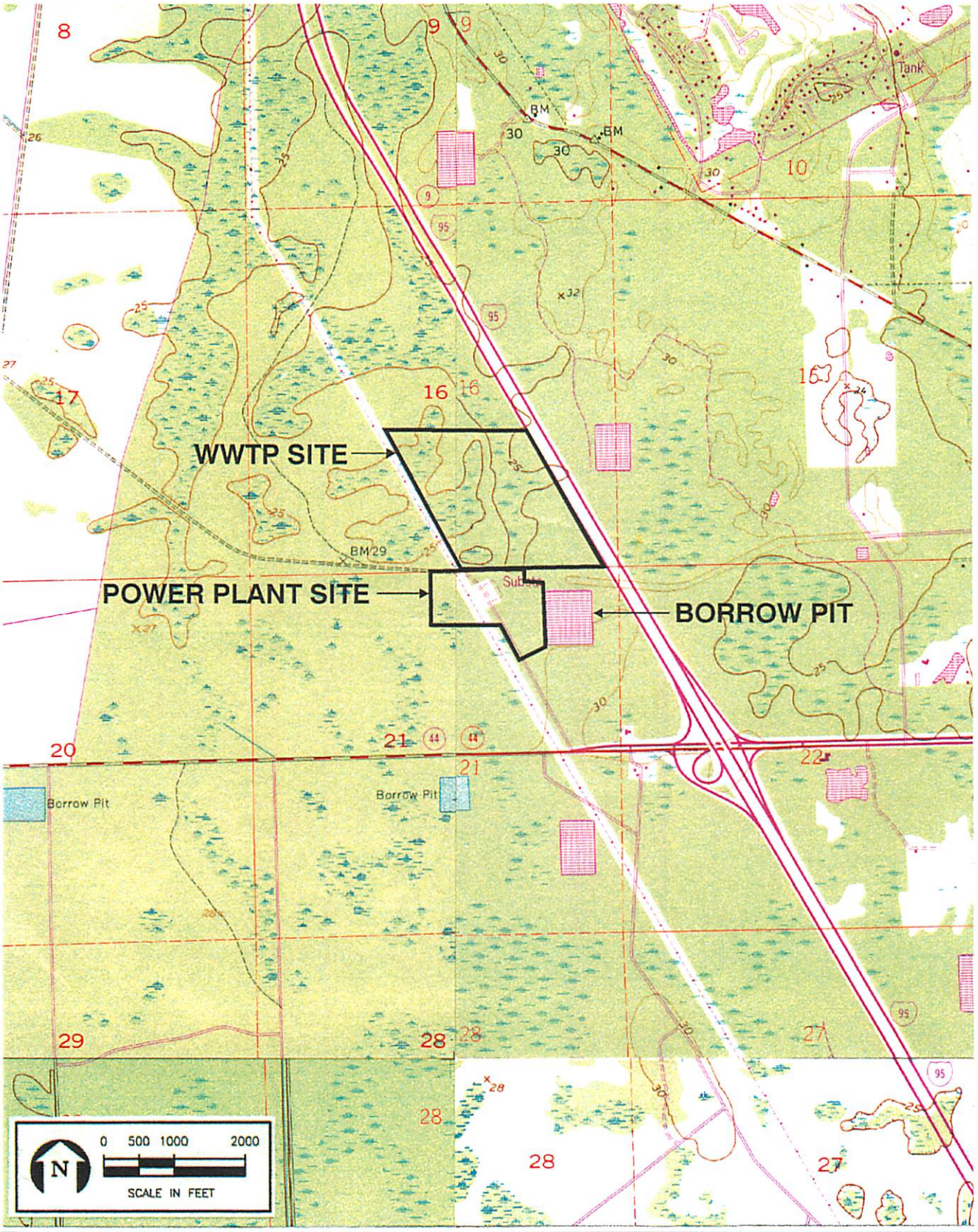

FIGURE 2-2.

PROJECT SITE LOCATION AND SURROUNDINGS

Source: USGS Quads: New Smyrna Beach, FL, 1993; Edgewater, FL, 1970; Samsula, FL, 1993; Lake Ashby, FL, 1988.

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on the site. The City also adopted a developers agreement, which establishes the land use restrictions that will govern the development of the site. The proposed Project is consistent and in compliance with the existing land use plans and zoning ordinances that are applicable to the site.

Agricultural land uses dominate the site region with some low-density residential development to the east of I-95. The proposed site is compatible with the nature of surrounding uses, which include a utility substation, electric transmission lines, WWTP facility, and transportation corridors. No sensitive natural resource, scenic, or cultural lands are found within 1 mile of the proposed site, and most are located more than 3 miles away.

2.3 SOCIOECONOMIC FEATURES

Volusia County exhibits a much lower unemployment rate than the statewide average, with services and retail trade being the major industries. Per capita income is lower than the state average, however. Almost one out of every seven persons works outside the county. Development of new housing has been steady to slightly declining within the region.

Economics of the region show the County's primary revenues come from ad valorem taxes and charges for services. Public safety is the primary expenditure for the County. The City of New Smyrna Beach enjoys the majority of its revenues from ad valorem taxes, while the majority of their expenditures go toward physical environment improvements.

Police, fire, emergency medical, and educational facilities found east of the site are all sufficient to handle this Project's demands for those services. The site will also be served by an existing potable water main, solid waste disposal services, and existing transportation facilities, including I-95 and the currently expanding SR 44. UCCNSB's

WWTP will have sufficient capacity to handle the Project's wastewater and provide a source of makeup water to the plant's operation.

2.4 GEOLOGICAL FEATURES

The Project site is located on the Pamlico Terrace with an average land surface elevation of 25 to 30 feet above mean sea level. The surficial layer under the site is unconsolidated sand, shell, and clay approximately 100 feet (ft) thick. Beneath that lies a thick sequence of sedimentary rocks. Figure 2-3 illustrates the basic geologic and hydrogeologic features of the area. No geologic faults have been mapped in the site vicinity, therefore posing no geologic hazard to the Project.

Soils in the site vicinity generally consist of poorly drained to depressional fine sands, characteristic of this region's flatwoods nature. Geotechnical investigations performed for the site are generally favorable for development of the power plant with proper site preparation.

2.5 GROUND WATER FEATURES

The subsurface hydrogeologic system at the site consists of two aquifers: the surficial and the Floridan (see Figure 2-3). These two aquifers are separated by an upper confining unit that is a variable sequence of sediments. The Floridan aquifer consists of an upper and lower aquifer separated by a middle confining unit. The Upper Floridan aquifer is generally more productive and of higher quality and, therefore, serves as the primary water source for the county. Although sinkholes are often associated with this type of geohydrologic formation, the site itself lies in an area where karst development (sinkhole formation) is low.

Recharge to ground water in the region is primarily through precipitation, irrigation water from the Upper Floridan aquifer, stream flow, and upward leakage of the Upper Floridan. Primary water use in Volusia County is from the Upper Floridan aquifer and is used for

GEOLOGIC UNITS

ERA	SYSTEM	SERIES	STRATIGRAPHIC UNIT	LITHOLOGY	AQUIFER
CENOZOIC	QUATERNARY	HOLOCENE	UNNAMED ALLUVIAL LAKE, & WINDBLOWN DEPOSITS	Thin, sand–&–gravel deposits adjacent to present–day streams; dune, estuary, and lagoon sediments contiguous to modern coast.	SURFICIAL AQUIFER
		PLEISTOCENE	PAMLICO FORMATION	Medium– to coarse–grained tan, white, or brown sand with local trace amounts of carbonaceous material and broken shell fragments.	
			ANASTASIA FORMATION	Cemented coquina reduced to small fragments, cemented by calcium carbonate, iron oxide, or other cements.	
	TERTIARY – UPPER	PLIO–CENE	CALOOSAHATCHEE FORMATION	Shallow marine rocks; thin sequence of interbedded clay, calcareous clay, and sand with much locally broken shelly material.	
		MIOCENE	HAWTHORN FORMATION	Marine interbedded sand, cream, white and gray, phosphatic, often clayey; clay, green to gray and white, phosphatic, often sandy; dolomite, cream to white and gray, phosphatic, sandy, clayey; and some limestone, hard, dense, in part sandy and phosphatic. Tends to be sandy in upper part and dolomitic and limy in lower part.	
	TERTIARY – LOWER	EOCENE – UPPER	OCALA LIMESTONE: CRYSTAL RIVER FORMATION	Marine limestone, cream to white, soft, granular, highly porous, coquinal; often consists almost entirely of tests of foraminifers; cherty in places.	FLORIDAN AQUIFER SYSTEM
			OCALA LIMESTONE: WILLISTON & INGLIS FORMATIONS	Marine limestone, cream to tan and brown, granular, soft to firm, porous, highly fossiliferous; lower part at places is dolomite, gray and brown, crystalline, saccaroidal, porous.	
		EOCENE – MIDDLE	AVON PARK & LAKE CITY FORMATIONS	Marine, limestone, light brown to brown, finely fragmental, poor to good porosity, highly fossiliferous (mostly foraminifers); and dolomite, brown to dark brown, slightly porous to good porosity, crystalline, saccaroidal; both limestone and dolomite are carbonaceous or peaty; gypsum is present in small amounts. Marine limestone, light brown to brown, fragmental, highly fossiliferous, slightly carbonaceous or peaty and cherty; and dolomite, brown to dark brown with very minor amounts of gypsum and anhydrite. Unit is slightly porous to porous.	
		EOCENE – LOWER	OLDSMAR FORMATION	Marine limestone, light brown to chalky, white, porous, fossiliferous, with interbedded brown, porous, crystalline dolomite; minor amounts of anhydrite and gypsum.	
		PALEO–CENE	CEDAR KEYS FORMATION	Marine dolomite, light gray, hard, slightly porous to porous, crystalline, in part fossiliferous, with consideroble anhydrite and gypsum, some limestone.	

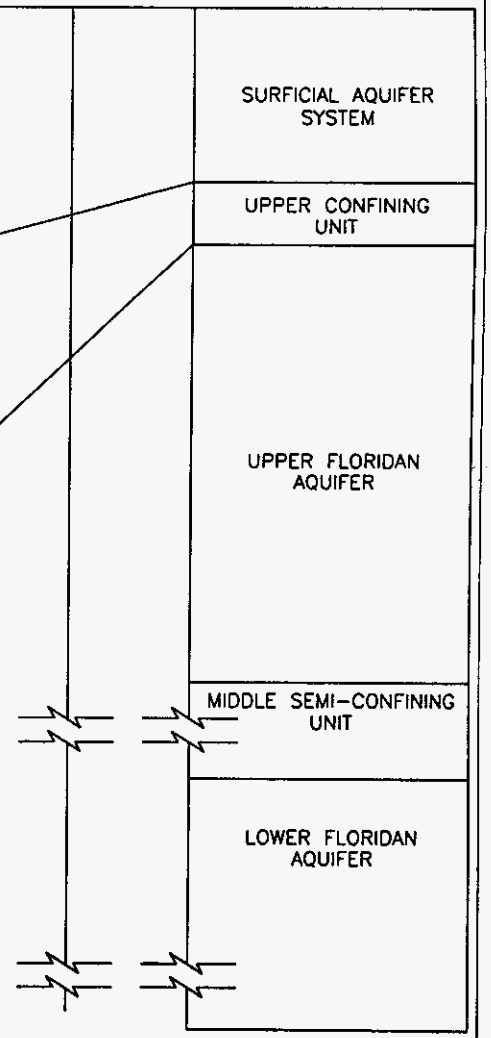

FIGURE 2-3.

PRIMARY GEOLOGIC AND HYDROGEOLOGIC UNITS IN VOLUSIA COUNTY

Source: Modified after Tibbals, 1990; Williams, 1997; McGurk, 1998; ECT, 1998.

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domestic use and agricultural irrigation. Ground water usage has increased significantly in the last 30 years primarily due to increases in public water supply and irrigation.

The Project will use 3.75 MGD of water for various plant needs on an annual average basis. Although some of this water (1.2 MGD) will be ground water from new onsite wells, the majority of the Project's water needs (up to 2.6 MGD) will be treated effluent from the adjacent WWTP.

2.6 SURFACE WATER FEATURES

The only surface waters on or adjacent to the proposed site are wetlands and an abandoned borrow pit (just offsite to the east). Most of the wetlands drain to the north and ultimately enter an unnamed tributary to Spruce Creek. Spruce Creek is approximately 4 miles from the site and is classified as an Outstanding Florida Water. The onsite wetlands and borrow pit are classified as Class III surface waters.

Overall drainage of the site is to the north (Spruce Creek drainage basin). Portions of the site fall within the 100-year floodplain according to the Federal Emergency Management Agency.

2.7 ECOLOGICAL FEATURES

The existing land use and vegetation types occurring on the site are shown in Figure 2-4. No lakes or streams exist on the site; the nearest is the adjacent abandoned borrow pit. Approximately 79 percent of the site is currently vegetated. Wetlands comprise approximately 30 percent of the site; however, only 1.4 acres lie within the portion of the site to be developed (17.9 acres).

Upland vegetation is primarily pine flatwoods and shrub lands (palmetto, immature pine trees). Certain cleared uplands exist on roads, trails, the areas under the transmission lines, and areas around the substation. Wetlands consist of wetland coniferous forest

LEGEND

PROPERTY BOUNDARY

CLASSIFICATION BOUNDARY

WETLAND

Land Use Codes	Land Use Type	Acres
320	Other Shrub and Bushes	3.2
411	Pine Flatwoods	12.8
620	Wetland Coniferous Forest	6.2
621	Cypress	2.0
742	Borrow Areas-Scraped Areas	0.9
814	Dirt Trail	0.7
831	Electrical Power Facilities	2.3
832	Transmission Lines	2.4

N

GRAPHIC SCALE
0 50 100 200
SCALE IN FEET

FIGURE 2.4.

VEGETATION AND LAND USE MAP

Source: ECT, 1998.

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(slash pine) and cypress domes. Some borrow areas around the substation and on the transmission right-of-way have been scraped, and herbaceous wetlands are found.

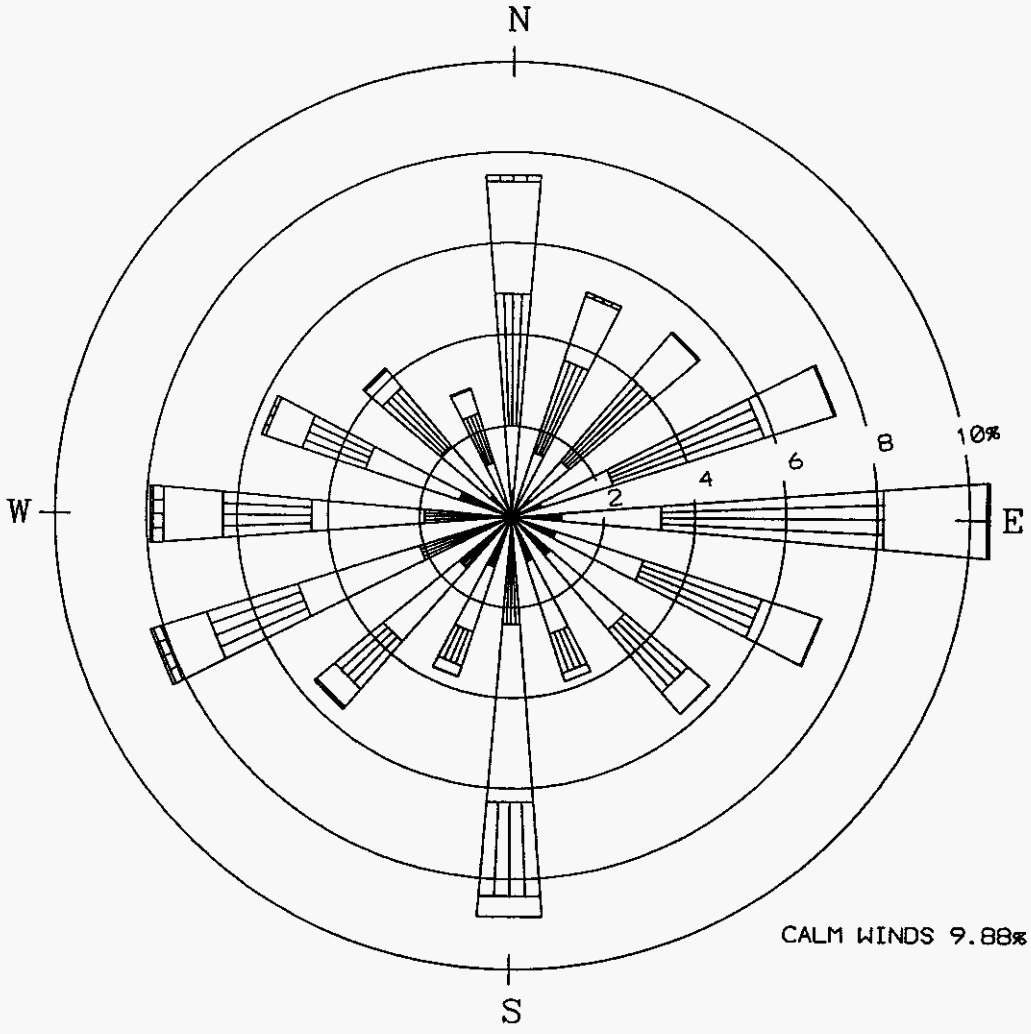
Review of agency records and ecological surveys of the site found no sensitive ecological features. No listed wildlife species were found onsite, and only two listed plant species, cinnamon fern and royal fern, were found. Both plant species are regionally common in Florida and have been listed by Florida Department of Agriculture and Consumer Services (FDACS) only for their protection from overcollecting.

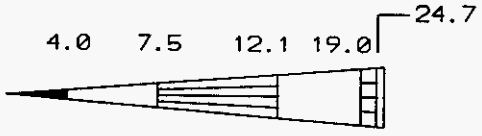
Wetlands onsite were surveyed. Jurisdictional limits were established and regulatory agencies have approved these limits. Appropriate mitigation will be provided for those wetlands impacted by plant construction. As currently proposed, only 0.7 acre of wetland impacts will occur due to project development. Existing stresses to the ecological resources of the site include the existing development (transmission right-of-way, substation, access road, SR 44, and I-95), as well as the ongoing construction of the WWTP.

2.8 AIR RESOURCES AND NOISE FEATURES

Climatological features for the site can be characterized as subtropical with maritime influences. Summers are hot and humid, while winters are mild and usually dry. Based on nearby meteorological data, January is the coldest month and July the warmest. Annual rainfall averages 48 inches, with September being the wettest month. March is the windiest month, and August is the calmest. Prevailing winds are from the east, although south, southwest, and westerly winds are also common. Figure 2-5 presents the wind rose for the area, based on data from Daytona Beach.

Thunderstorms are common weather events. Tornadoes and hurricanes are possible for the area, although their probability at the site is low.





WIND SPEED CLASS BOUNDARIES
(MILES/HOUR)

NOTES:
DIAGRAM OF THE FREQUENCY OF OCCURRENCE FOR EACH WIND DIRECTION. WIND DIRECTION IS THE DIRECTION FROM WHICH THE WIND IS BLOWING. EXAMPLE - WIND IS BLOWING FROM THE NORTH 7.5 PERCENT OF THE TIME.

WINDROSE

STATION NO. 12834
Daytona Beach, FL
PERIOD: 1987–1991

FIGURE 2-5.

5-YEAR ANNUAL WIND ROSE FOR DAYTONA BEACH MUNICIPAL AIRPORT (1987 - 1991)

Source: NCDC, 1998; ECT, 1998

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The area around the Project site has been classified by the Florida Department of Environmental Protection (FDEP) as attainment for all criteria air pollutants, based on data from the area's ambient air monitoring stations, whose locations are given in Table 2-1 and shown in Figure 2-6. This means air quality meets all State and Federal ambient air quality standards. Air quality is generally attributable to lack of major emission sources in the region. The only other major power plants in Volusia County are near Lake Monroe, approximately 20 miles southwest of the Project site, as shown in Figure 2-7.

Ambient noise in the site vicinity is generally low due to the relatively rural nature and vegetation buffering effects found there. No residences are located within 3,000 ft of the site. Manmade noise sources currently include traffic on SR 44 and I-95, farm equipment, and infrequent aircraft overhead. Natural noises come from wind, rain, insects, or birds.

Ambient noise monitoring was performed for a 24-hour period and included two monitoring stations, representative of the nearest noise receptors. Ambient noise at the receptor nearest SR 44 was the highest. Volusia County has a noise ordinance that limits noise produced in certain use occupancy categories. In both cases, the ambient noise measured at the site vicinity was below the County's limit.

Table 2-1. Ambient Air Quality Monitoring Stations Closest to the New Smyrna Beach Project Site

Pollutant	FDEP Station No.	Station Location		Relative to Project Site (km)
		County	City	
PM_{10}	0920 002 G01	Volusia	Daytona Beach	22 N
	0920 002 G09	Volusia	Daytona Beach	22 N
	0920 003 G01	Volusia	Daytona Beach	22 N
	1820 001 G01	Volusia	Holly	25 N
SO_2	4900 002 G01	Orange	Winter Park	55 SW
NO_2	4900 002 G01	Orange	Winter Park	55 SW
CO	3280 005 G01	Orange	Orlando	60 SW
	4900 002 G01	Orange	Winter Park	55 SW
Ozone	0920 002 G01	Volusia	Daytona Beach	22 N
	3730 001 G01	Volusia	Port Orange	14 N
Lead	1960 032 H01	Duval	Jacksonville	160 NNW
	1960 084 H01	Duval	Jacksonville	160 NNW

Sources: FDEP, 1997 and 1998.
ECT, 1998.

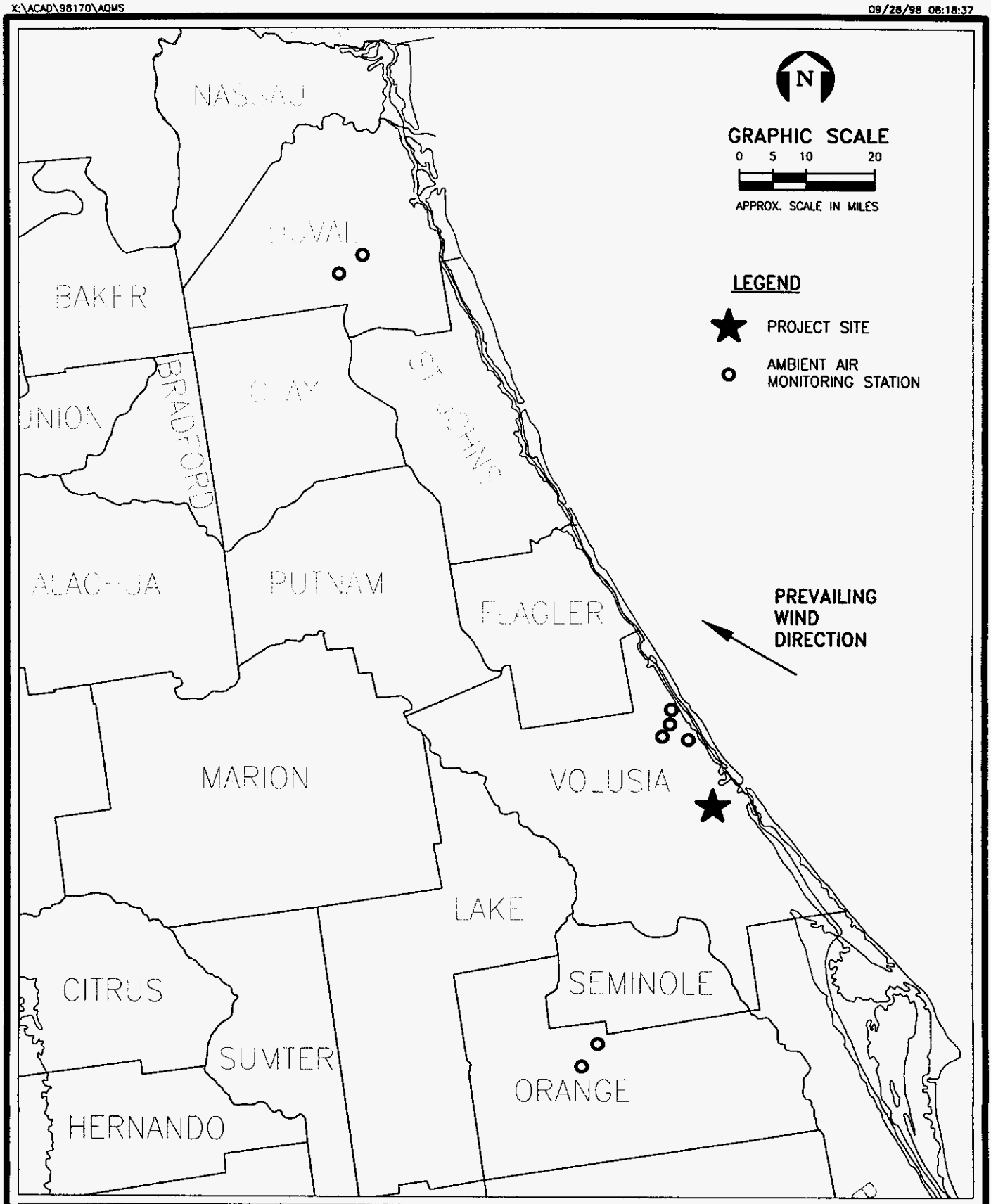

FIGURE 2-6.

LOCATIONS OF CLOSEST FDEP AMBIENT AIR QUALITY MONITORING STATIONS

Source: ECT, 1998.

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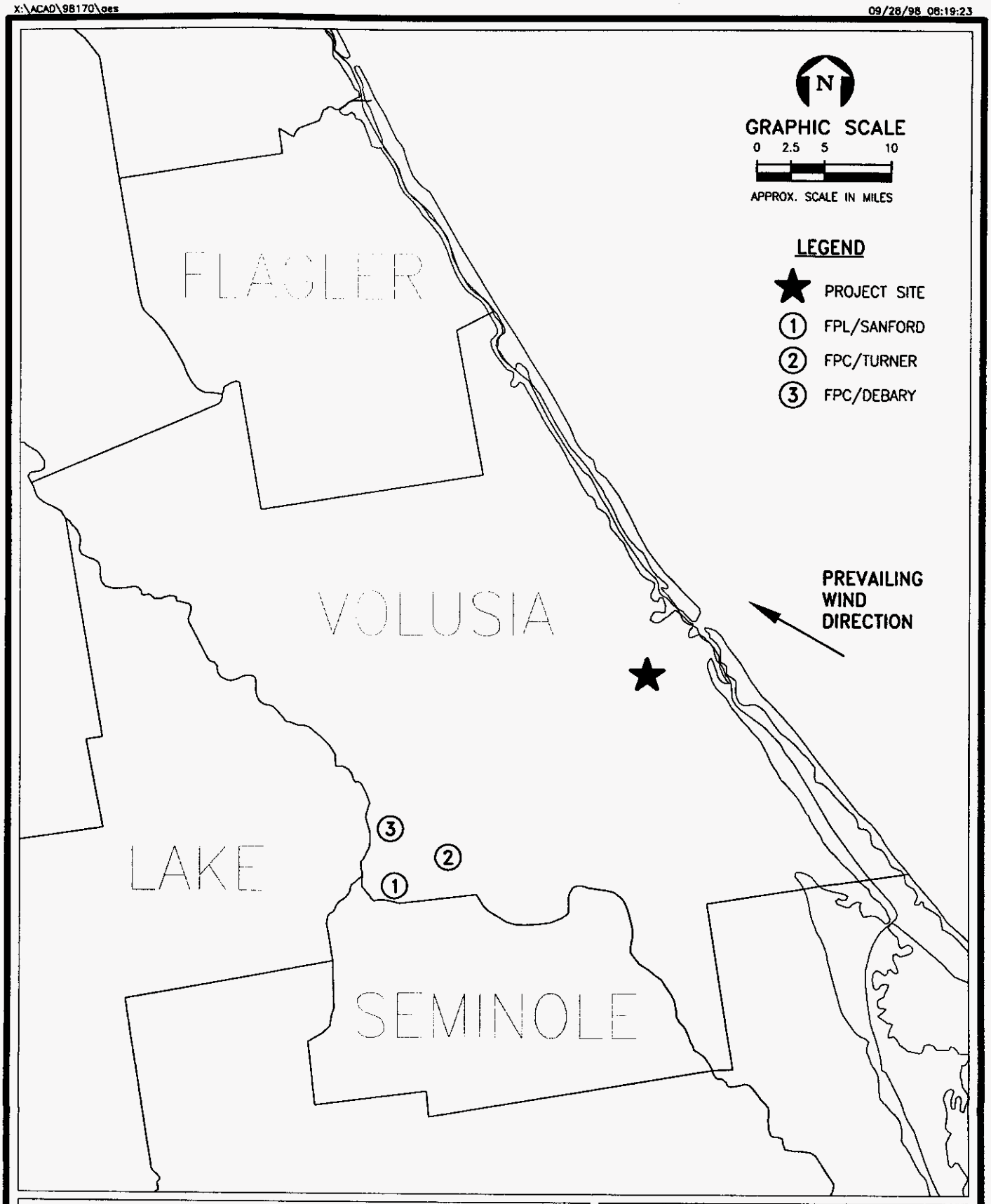

FIGURE 2-7.

OTHER LARGE AIR EMISSION SOURCES IN VOLUSIA COUNTY

Source: ECT, 1998.

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3.0 GENERAL PROJECT DESCRIPTION

The New Smyrna Beach Power Project will utilize state-of-the-art combined cycle (CC) design concepts and equipment to achieve a high level of efficiency in electrical power production. Figure 3-1 presents a simplified flow diagram of a CC unit. Figure 3-2 shows the layout of the plant, while Figure 3-3 provides a rendering of the plant. One of the distinguishing features of the facility will be its use of treated effluent from the adjacent WWTP for plant water makeup. The plant will use the maximum amount of treated effluent currently available to minimize the need for ground water.

In general, a CC electric generating unit consists of combustion turbine generator (CTG) units and a heat recovery steam generator (HRSG), as well as steam turbine facilities. The efficiency of electric generation is improved when CTG units are combined in a CC unit arrangement compared to CTG units operated in simple cycle mode. When CTG units are used in simple cycle, the hot combustion gases are released to the atmosphere after passing through the turbine. In a CC unit, the hot combustion gases from the CTG flow into an HRSG, where water in boiler tubes is heated to produce steam. The steam is then used to drive a steam turbine generator to produce additional electricity. Therefore, by reusing the waste heat from the CTG units, additional electricity is efficiently produced by the steam turbine generator without additional fuel input. The New Smyrna Beach Power Project will include two CTG/HRSG units.

The proposed CC power plant will be capable of continuous operation at base load for up to 8,760 hours per year (hr/yr), except for those years during which a major overhaul of the engine is required. Average availability for the Project is planned to be 96 percent (8,410 hr/yr) during non-overhaul years and 88 percent (7,700 hr/yr) during overhaul years. The two CTGs will be equipped with dry low-nitrogen oxides (NO_x) combustors. The CTGs may normally operate between 50- and 100-percent load, with commensurate steam turbine load. Table 3-1 summarizes maximum projected annual emissions of air pollutants for the facility, using worst-case operating assumptions. Neither CTG will be designed to

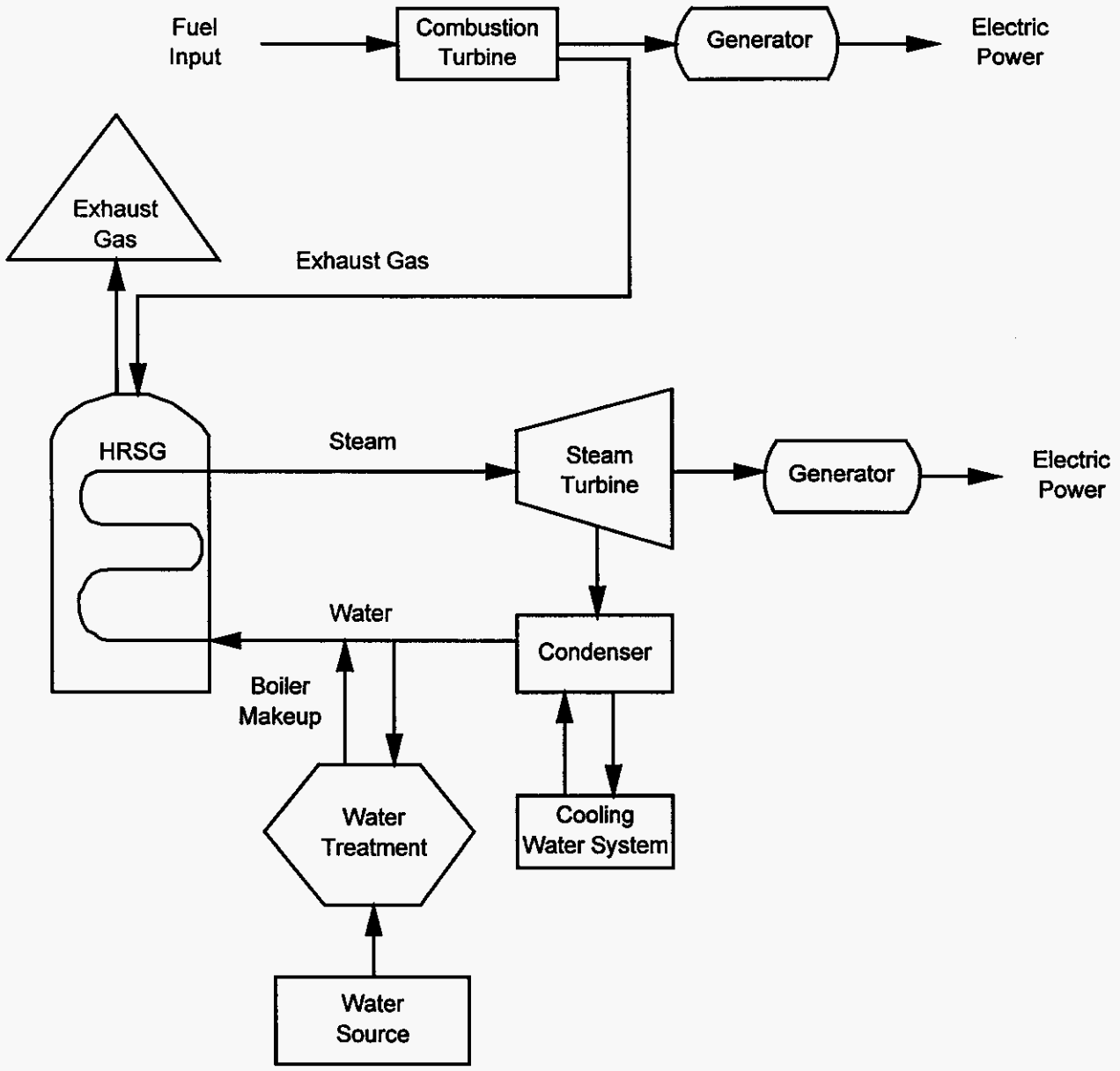

FIGURE 3-1.

SIMPLIFIED FLOW DIAGRAM OF CC POWER SYSTEM

Source: ECT, 1998.

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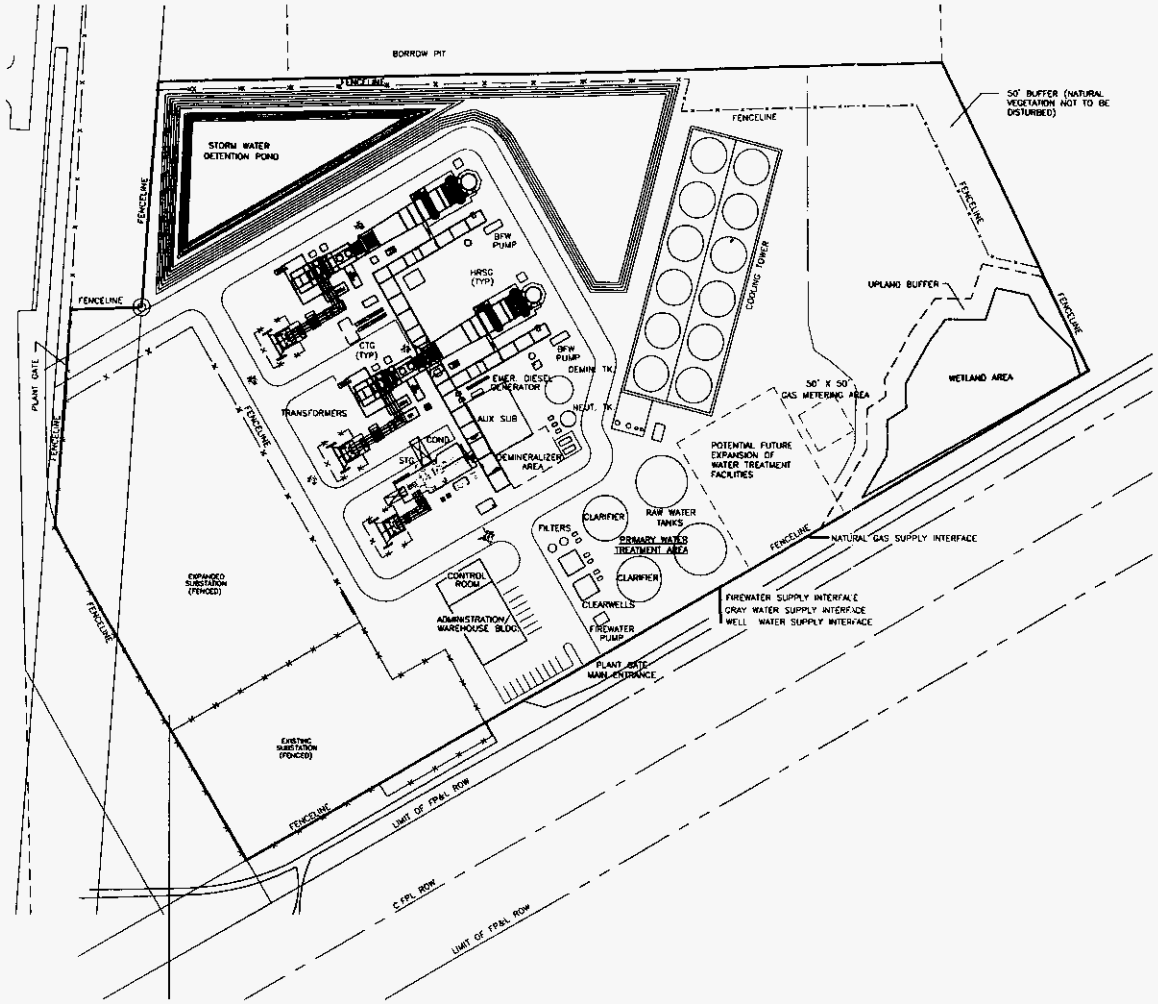

FIGURE 3-2.

PROPOSED PLANT LAYOUT

Source: Fluor Daniel, 1998

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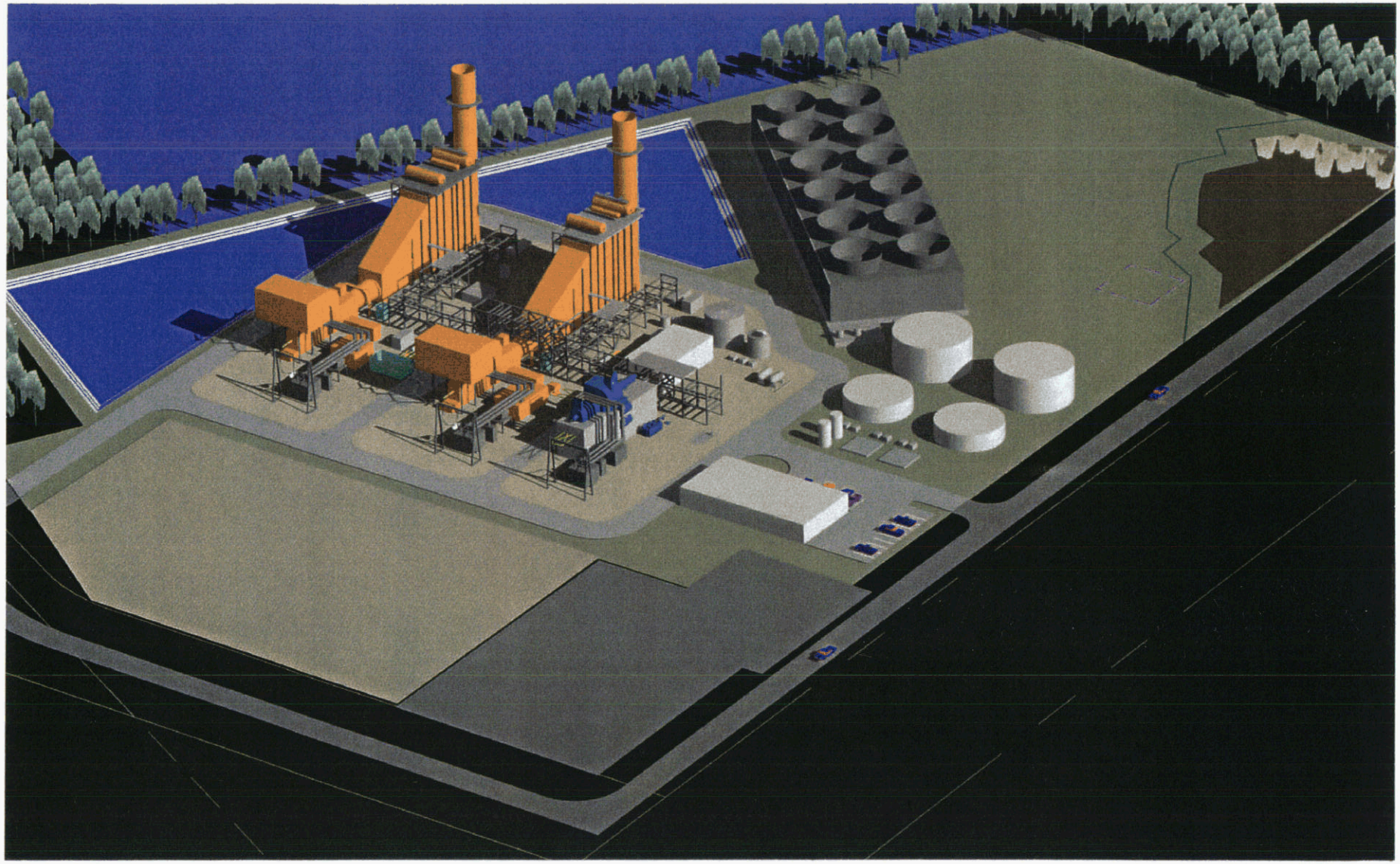

FIGURE 3-3.

ARTIST'S RENDERING

Source: D/FD, 1998.

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Table 3-1. Maximum Annualized Emission Rates for the New Smyrna Beach Power Project

Pollutant	Annualized Emission Rate (tpy)				
	CTG/HRSG Units	Emergency Generator	Emergency Firewater Pump	Cooling Tower	Facility Totals
NO_x	674.5	3.5	1.3	N/A	679.3
CO	339.0	0.1	0.3	N/A	339.4
PM/PM_{10}[1]	78.8	0.2	0.04	26.4	105.4
SO_2	87.7	0.08	0.03	N/A	87.8
VOC	24.7	0.07	0.07	N/A	24.8
H_2SO_4	10.1	0.01	0.003	N/A	10.1

Note: N/A = not applicable.

[1]Excludes H_2SO_4.

Sources: GE, 1998.
D/FD, 1998.
ECT, 1998.

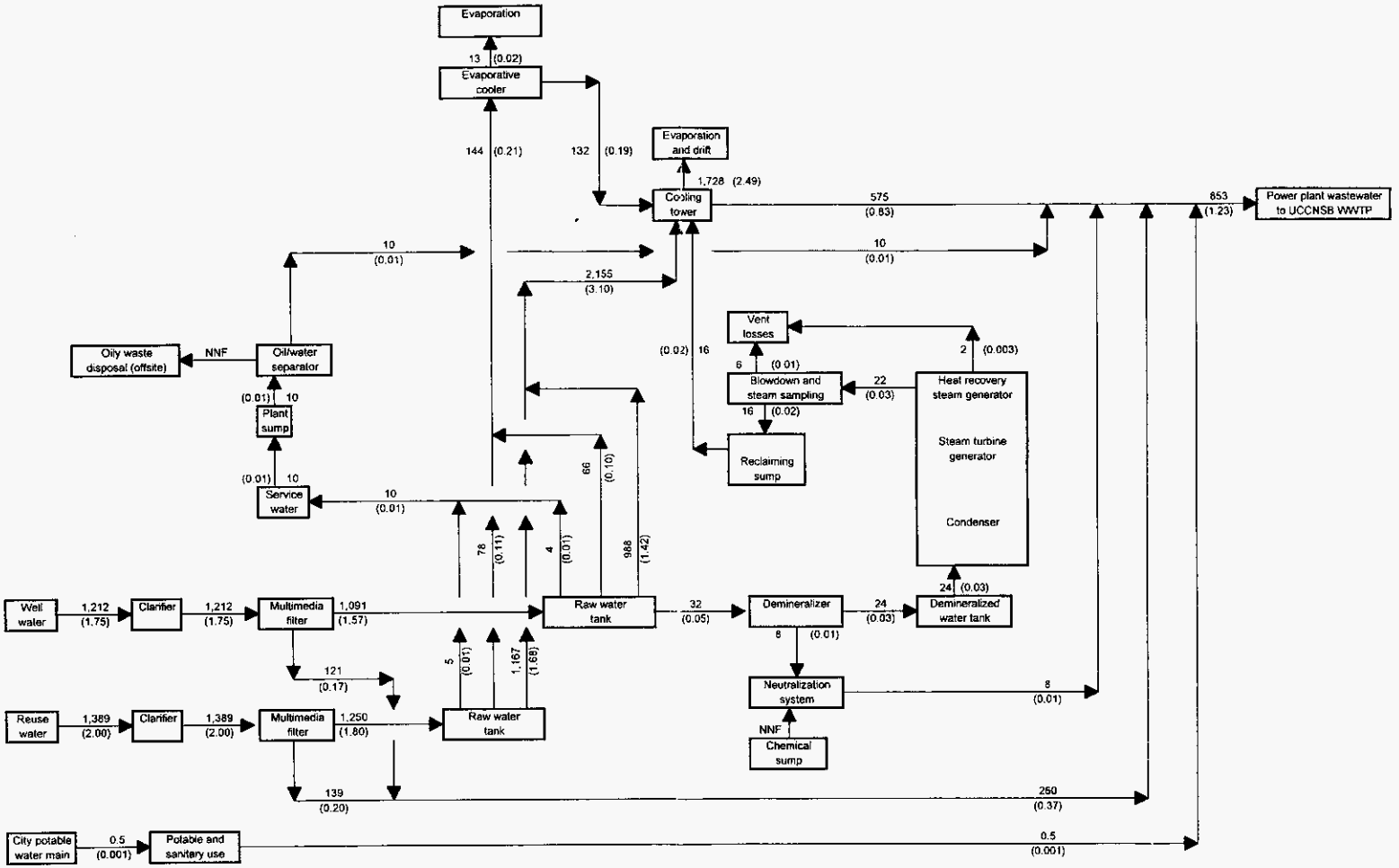
operate in simple cycle mode (i.e., by-passing the HRSG). The HRSG will be of an unfired design (i.e., no supplemental firing).

A cooling water system will provide cooling for condensing the steam turbine exhaust and supplying cooling water to other plant equipment. The cooling system's key component will be a multiple-cell cooling tower.

The Project's overall water requirement, most of which is needed for cooling tower makeup, will be met with water from three sources: treated effluent, ground water, and potable water from the municipal system, as shown in Figure 3-4. Maximum reuse will be made of treated effluent. Up to approximately 2.6 MGD of treated effluent will be available to the Project, with an annual average of approximately 2.0 MGD initially available; these quantities represent the differences between the WWTP's expected output and existing demands and obligations (golf courses, etc.). As the WWTP's throughput increases over time due to population growth in the area, it is possible that a larger amount of reuse water will be available to the power plant. Additional water not supplied from the UCCNSB reuse system will be supplied from a new onsite wellfield and raw water supplied by UCCNSB. As an additional back-up to the water supply system, the Project's full requirements could be met on a short-term basis by the UCCNSB potable water system, although, under normal circumstances, this source will be used only for the Project's small potable water needs.

Both reuse water and ground water will require treatment before being used in the power plant. The WWTP effluent will flow through a filtration and treatment system, then to the raw water storage tank. This tank will directly supply makeup water to the cooling tower. Ground water will be filtered, then will flow to the same raw water storage tank. This tank will supply makeup water to the steam system via the demineralization system.

Demineralized water will be needed as makeup to the steam cycle to replace HRSG blowdown and steam losses. Raw water will feed the demineralizer, which will reduce



NOTES:

1) Flows are in shown in gallons per minute and in (million gallons per day [MGD]).
2) Cooling tower blowdown is based on four cycles of concentration.
3) NNF - normally no flow.

FIGURE 3-4.

WATER BALANCE DIAGRAM—ANNUAL AVERAGE

Source: D/FD, 1998.

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dissolved solids to required levels. A demineralized water storage tank will be sized to provide 7 days of storage at normal usage rates.

The principal wastewater streams will be cooling tower blowdown, backwashes from the water filtration and treatment system, HRSG blowdown, and wastewaters from a neutralization system and an oil/water separator. A waste neutralization system will receive regeneration wastes from the demineralized waste system and the chemical waste sump. This system will agitate the regeneration wastes and inject acid or caustic to adjust the pH of the wastes to desired levels. Process wastewater containing oils will be segregated from other wastewater. This wastewater will be collected in the oily wastewater sump, where an oil/water separator will remove the oil. All treated wastewater and blowdown from the cooling tower will be discharged to the adjacent WWTP. A sanitary lift station will pump domestic wastewater to the adjacent WWTP. Storm water will be routed via sheet flow to culverts and directed to an onsite detention area.

The existing 115-kV substation will be expanded to provide a breaker-and-a-half configuration, into which the Project will be connected. Eight new breakers will be added to the existing substation to accommodate this reconfiguration. Within the substation, repositioning of three existing 115-kV transmission lines will be necessary.

Natural gas will be delivered to the site by a new pipeline from a connection to the FGT system. The interconnection will occur at Mount Plymouth, located in Lake County between Sanford and Mount Dora. Licensing of this pipeline will be the responsibility of FGT, not Duke/UCCNSB, and the license will, therefore, be applied for separately.

The conceptual design of the New Smyrna Beach Power Project just described was reached only after the consideration of various site and design alternatives. Throughout the conceptual design process, Duke/UCCNSB have held environmental protection as a primary goal. First, the Project site itself was selected to offer immediate access to the existing Smyrna Substation and the new WWTP being built adjacent to the site. With any

other site in New Smyrna Beach, new transmission lines and/or water pipelines would have to be constructed, with their associated environmental and other impacts. The chosen site is also already impacted by other construction and development (e.g., the WWTP) and is well buffered from residential areas. Immediate access to the new WWTP gives rise to two of the Project's key environmental mitigation features:

- Maximum use of treated WWTP effluent for cooling and other process needs, thereby both reducing the Project's reliance on ground water and helping significantly reduce the WWTP's amount of discharge to the Indian River.
- Discharge of all wastewater back to the WWTP, thereby eliminating any direct discharge of thermal or other pollutants to the environment.

Second, the proposed site layout has been designed to minimize wetland impacts. A significant portion of the site is wetlands. Duke/UCCNSB have selected the alternative of locating the physical plant to avoid impacting all but two isolated wetlands, which total less than an acre.

Finally, Duke/UCCNSB considered a number of possible technologies and designs for the Project, including alternative generation technologies and fuels (e.g., pulverized coal), air emission controls, cooling systems and sources of water, and wastewater treatment and discharge alternatives. The selection of natural gas-fired CC technology was relatively straightforward given the advantages this technology has over the alternatives. These advantages include higher efficiency, lower construction cost and shorter construction schedule, much lower air emissions, and lower operation and maintenance costs. With the selected technology, the New Smyrna Beach Power Project will be one of the least polluting, most efficient electrical power generating plants in Florida, and will be an industrial asset to the community.

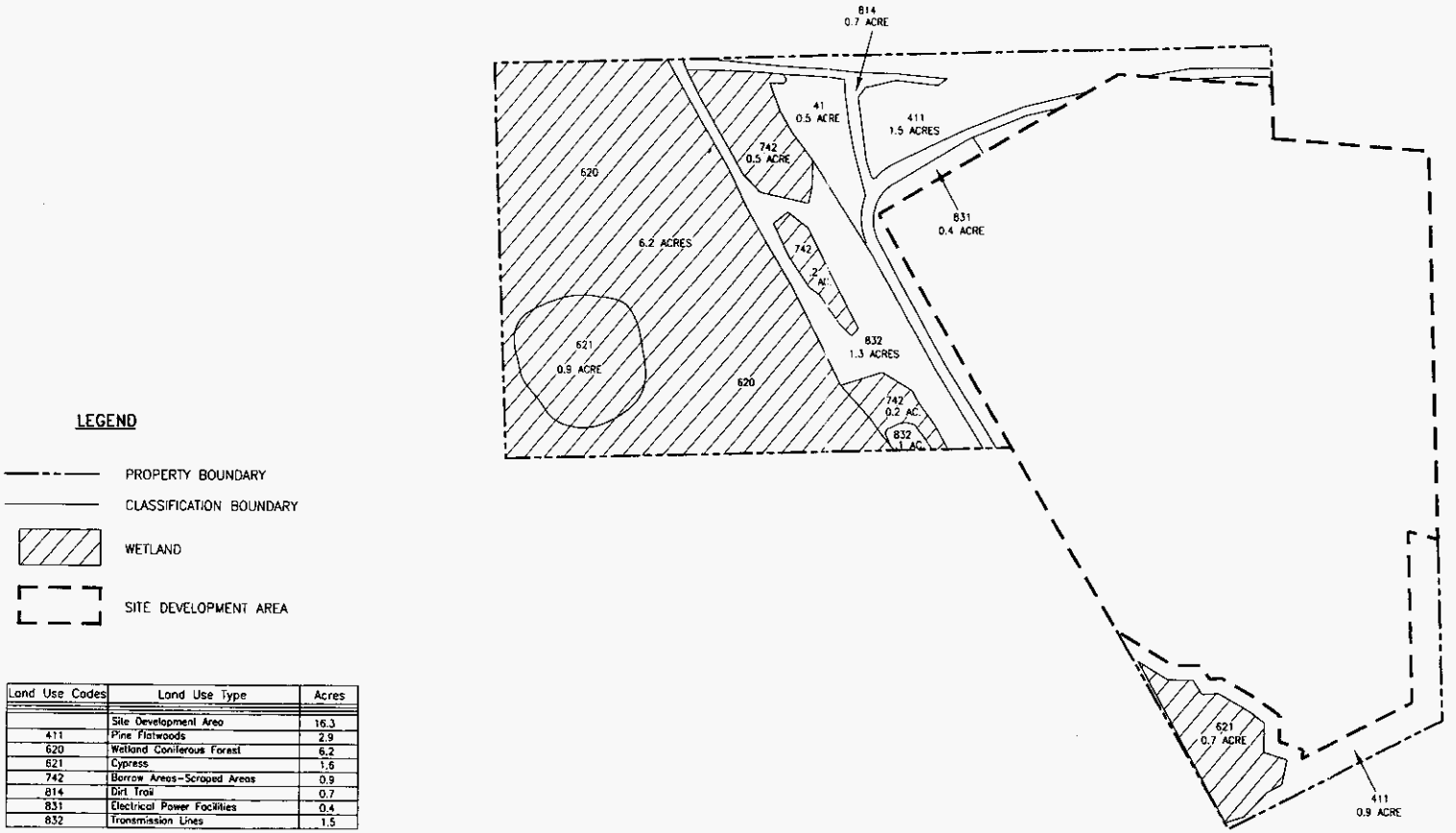
4.0 IMPACTS OF PROJECT CONSTRUCTION

The proposed New Smyrna Beach Power Project will be located on a 30.5-acre parcel, but the Project will only require development of 17 acres of that parcel, as illustrated in Figure 4-1. Land impacts, therefore, will be minimal due to construction of the facility. Construction activities will include site drainage and storm water basins, dewatering of low areas (if required), clearing, grading, final storm water management, power plant erection, and final grading and landscaping.

No explosives will be used in any aspect of construction. Construction impacts will be further minimized due to use of a construction access road already in place for the WWTP construction and possible use of adjacent UCCNSB property for the construction laydown area. Trash and construction debris will be removed or recycled by a licensed waste handling contractor.

Since the site is relatively flat, drainage patterns after construction will be designed to closely match preconstruction drainage. Use of temporary and permanent storm water basins, as well as erosion control measures, will minimize offsite runoff and sedimentation. The only surface water features potentially impacted by construction include the adjacent borrow pit and a few onsite wetlands. Use of best management practices (BMPs) will minimize offsite erosion/sedimentation. Construction will require the loss of less than 1 acre of onsite wetlands, but the loss will be mitigated by preservation of other onsite wetlands.

Construction impacts on ground water resources are expected to be short-term and minimal. Dewatering activities for construction will follow an approved dewatering plan, which will include a construction storm water and sedimentation pond to collect and settle surface water runoff before discharge. Dewatering impacts to the surficial aquifer will be offset by increased infiltration and recharge to the system and by the decreased



Land Use Codes	Land Use Type	Acres
	Site Development Area	16.3
411	Pine Flatwoods	2.9
620	Wetland Coniferous Forest	6.2
621	Cypress	1.6
742	Borrow Areas-Scraped Areas	0.9
814	Dirt Trail	0.7
831	Electrical Power Facilities	0.4
832	Transmission Lines	1.5

FIGURE 4-1.

PROJECT AREA---LAND USE AND VEGETATION CONSTRUCTION IMPACTS

Source: ECT, 1998.

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evapotranspiration that accompanies a lowered water table. No impacts will occur to drinking water supplies or other uses of the Upper Floridan aquifer.

Impacts to ecological resources are anticipated to be minimal. No surface waters are found onsite, so no net loss of such resources will occur. Use of BMPs during construction will minimize any potential impacts to offsite aquatic resources.

The site is vegetated with commonly occurring shrub and forested areas occurring in east-central Florida. The site is already impacted due to adjacent clearing and development of the existing substation, electric transmission line right-of-way, and WWTP. Less than 17 acres will be disturbed out of the 30.5-acre parcel. Less than 1 acre of wetlands will be impacted, and their loss will be compensated.

The site contains no unique ecological features or sensitive habitats. No state or federally listed wildlife species were found onsite, nor are any suspected of depending on the site's resources for their uses. Two fairly common fern species are found onsite and are listed by FDACS due to their commercial exploitation, not because of any endangerment. Construction of the project will, therefore, have minimal impacts to the local ecological resources and virtually no impacts to regional plant and animal populations.

Construction impacts on air resources may occur in three forms: clearing of the site resulting in fugitive dust, open burning of cleared debris, and construction vehicle emissions. All of these potential emissions will be low and short-termed in nature. Mitigation methods will include dust suppressant activities during clearing and grading, use of paved roads for access to the site, and controlling any open burning within applicable state and local guidelines.

Although construction of this facility represents a change in land use of the site, the change is compatible with existing City of New Smyrna Beach land use and zoning regulations. New Smyrna Beach has annexed the site into the City. Currently, Volusia

County's land use plan governs the site until the City has a chance to amend their land use plan.

Socioeconomic impacts of the project are largely beneficial, although short-term during construction. An approximate peak workforce of 320 people will be required with an approximate average of 200 persons working on the site during the 21-month construction period. Many of these workers will be local and will generate a $31.5 million construction payroll. Additionally, the Project is expected to generate over $113,000,000 in indirect local economic benefits (e.g., related goods sold and services generated locally). Much of that money will be spent locally on goods and services. The out-of-county workforce (70 percent) will largely use rental properties in Volusia County during construction providing further economic benefits. Available rental housing should be able to adequately provide for this workforce. No significant impacts to housing demand are anticipated due to the relatively short construction period.

Similarly, essential services (police, fire, emergency medical, and schools) are currently adequate to meet any short-term demands the construction workforce will generate. Although construction will generate additional traffic on local roadways, this increase will be short-term. Volusia County does not regard this increase as significant. Additionally, SR 44 is being widened, which will further minimize traffic impacts.

Project construction will have no impacts on any of the County's landmarks, natural resource areas, parks, or cultural resources.

Noise generated during construction will be generated by heavy equipment at the site and, to a lesser degree, by construction traffic going to and from the site. With the possible exception of temporary pile-driving activities, noise at the nearest receptor (service station at the I-95 and SR 44 intersection) will be at or below ambient noise levels already occurring along SR 44. Pile driving activities will be heard at this receptor, but the noise is of short duration.

5.0 OPERATION IMPACTS

Overall, the proposed facility will be a highly efficient and environmentally clean operation. Key features helping to minimize the operational impacts include modern clean burning equipment, small site size, use of clean natural gas fuel, reuse of treated wastewater for much of the plant's needs, and compatibility with adjacent land uses and existing utility facilities.

The plant will discharge all its wastewater to the neighboring WWTP, and water quality limits of the discharge will meet operational limits of the WWTP for proper treatment. Since there will be no discharges to surface waters, surface waters in the region will not be affected by any thermal or chemical effects of the power plant's discharges.

Since water use is primarily wastewater reuse from the WWTP and ground water from onsite wells, no surface waters will be diverted or consumptively used for plant operations. Based on ground water modeling for the proposed ground water usage at the plant, the amount of water withdrawn will not adversely affect the surficial or Upper Floridan aquifer, nor will any existing municipal wells, residential wells, or wetlands be adversely affected.

Drinking water at the plant will be supplied from the municipal system and amounts will be minimal given the small operational workforce. No discharges will occur to any drinking water source.

As with construction, use of BMPs and implementation of the storm water management plan will also help protect adjacent water resources during plant operation from any potential sedimentation and leachates. Solid wastes generated will be disposed offsite by a licensed contractor at a landfill permitted to receive such wastes. No hazardous wastes will be routinely generated at the facility. Specialty contractors involved in cleaning plant

components may generate such wastes, but will be responsible for proper handling, removal, and disposal of them.

The New Smyrna Beach Power Project is considered a major stationary source for air pollutants, meaning it has the potential to emit 100 tons per year (tpy) of any pollutant regulated under the federal Clean Air Act. As such, the facility is required to undergo prevention of significant deterioration (PSD) review to determine whether significant air quality deterioration will result from operation. As part of PSD review, a best available control technology (BACT) analysis was performed for control technologies applicable to each pollutant. Given the fuel type and control technologies proposed, modeling indicates that maximum impacts caused by combustion emissions will be less than regulated significance levels for all averaging times for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter nominally 10 microns and less (PM_{10}), and carbon monoxide (CO). This means operation of the Project will produce low impacts on air quality in the region. Emissions of PM_{10} from the cooling tower are conservatively predicted to have impacts above the significance level in the immediate plant vicinity (i.e., within several hundred yards of the plant site). However, overall impacts in this very localized area will be below all applicable air quality standards.

It is probable that the New Smyrna Beach Power Project will have a net *positive* impact on air quality in Florida. This is due to the fact that the Project's generation may, at least to some extent, displace that of older, less efficient facilities whose emissions are significantly greater per unit of electrical output. An analysis of this issue is provided in the Appendix to this report. A summary of the essential findings is as follows:

- Due to the Project's greater efficiency and use of clean natural gas, its emissions per unit of electricity produced will be much less than those from most existing facilities.
- Based on a model forecast of the Project's output of electricity in 2002, if the Project's generation were to completely offset generation from existing steam-

electric facilities burning a 50/50 mix of fuel oil and natural gas, air pollutant emissions in Florida would be decreased by the following amounts:

- NO_x—8,430 tpy
- CO—3,135 tpy
- SO_2—13,048 tpy
- PM—848 tpy

The Project's secondary air impacts, such as visibility impairment or deposition impacts on soils and vegetation, are expected to be negligible. Opacity from the plant's exhaust stack will be near zero. In addition, the visual character of the site is influenced by the WWTP and electric transmission structures so visual quality of the vicinity will not be affected significantly. The type of pollutants emitted and their low levels will not be sufficient to cause damage to soils, vegetation, or wildlife from deposition.

Noise generated by plant operation was modeled based on ambient noise levels for the site and estimated equipment noise levels during operation as provided by the vendors. Results show that noise levels will comply with Volusia County's ordinance at the plant border. Noise impacts to any residential areas are not anticipated due to their distance from the facility and attenuation effects of vegetation found around the site.

No ecological impacts are anticipated due to plant operation. Additional noise and human presence already exists at the site due to WWTP construction. Since air emissions are not significant and no discharges to surface waters will occur, no impacts to vegetation communities or listed plant and animal species are expected from plant operation.

Similarly, traffic generated by the operational workforce will be minimal compared to existing and soon-to-be-added capacity of SR 44. The operational workforce will most likely reside in the Volusia County area, but impacts to housing, educational facilities, and essential services will be negligible due to these few individual workers.

Socioeconomic benefits are positive and significant. Besides providing additional inexpensive and reliable electricity to rate payers in Florida, the Project will generate revenues for Volusia County and New Smyrna Beach. The plant and its capital assets will yield approximately $750,000 per year in ad valorem taxes to the local community. Additionally, the facility will pay fees to UCCNSB for water, reuse water, and wastewater treatment. The modest plant staff will generate a $1 million annual payroll, much of which will be spent on local goods and services. Various local contractors and vendors will also service the plant, providing additional revenues to the community.

In all, the Project will affect the following irreversible and irretrievable commitments of resources:

- Use of Land—The site is to be developed on approximately 17 acres of a 30.5-acre parcel. This relatively small acreage will represent an irreversible conversion of natural lands.
- Natural Gas—This fossil fuel is one of the cleanest, most efficient fuels available for this large capacity of generation. Nevertheless, the gas consumed will be an irreversible and irretrievable loss of this energy resource.
- Water—Evaporation of water in the plant's cooling process will represent a consumptive use of water. However, the plant will greatly reduce its water resource needs by extensive use of treated wastewater for plant operations. Given the use of treated effluent, which otherwise could be discharged to the Indian River, the overall impact on the region's water quality will be positive.
- Air—There will be a slight increment of air quality consumed by the Project. The emissions, however, will have no significant impacts on regional air quality, nor will they impede development of other industry in the area. In fact, it is reasonable to expect that, because of displacement of less efficient, more pollution-intensive electrical generation sources, the Project's overall impact on regional air quality will be positive.

6.0 CONCLUSIONS

In summary, the New Smyrna Beach Power Project will provide an efficient source of needed electrical power to UCCNSB and Florida, while minimizing the potential environmental impacts of power generation. In fact, the Project will have two important and *positive* environmental benefits:

1. Use of treated effluent from the UCCNSB WWTP, reducing—or even eliminating—the WWTP's discharges of effluent to the Indian River.
2. Significantly lower emissions of air pollutants compared to other electrical generation units whose production would be partially offset by the Project, resulting in a net positive impact on regional air quality.

Additionally, the Project will have positive socioeconomic impacts on the New Smyrna Beach area, due to jobs created, taxes and fees paid, and reduced costs of power to the City's residents.

APPENDIX

APPENDIX

Comparison of Air Emissions: New Smyrna Beach Power Project Relative to Existing Facilities

Air pollutant emissions from the New Smyrna Beach Power Project are compared here to those from existing Florida power generation facilities. The Project's emissions are based on the specific vendor performance information for the combustion turbines, as represented in the site certification application. For the existing facilities, available information from the Florida Department of Environmental Protection and the U.S. Environmental Protection Agency has been employed to develop characteristic emissions from *proxy* units. The proxy units are oil- and natural gas-fired steam-electric generation units that are representative of existing facilities in Florida.

The accompanying figure compares the Project's emission rates for nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter (PM) with those of the proxy units. The emission rates for each pollutant are presented in terms of pounds of pollutant per megawatt-hour (lbs/mwh). As shown, the Project's emission rates are less than—in some cases *significantly* less than—those of the proxy units. The Project's greater mechanical efficiency and clean fuel result in lower emissions per megawatt of electricity produced.

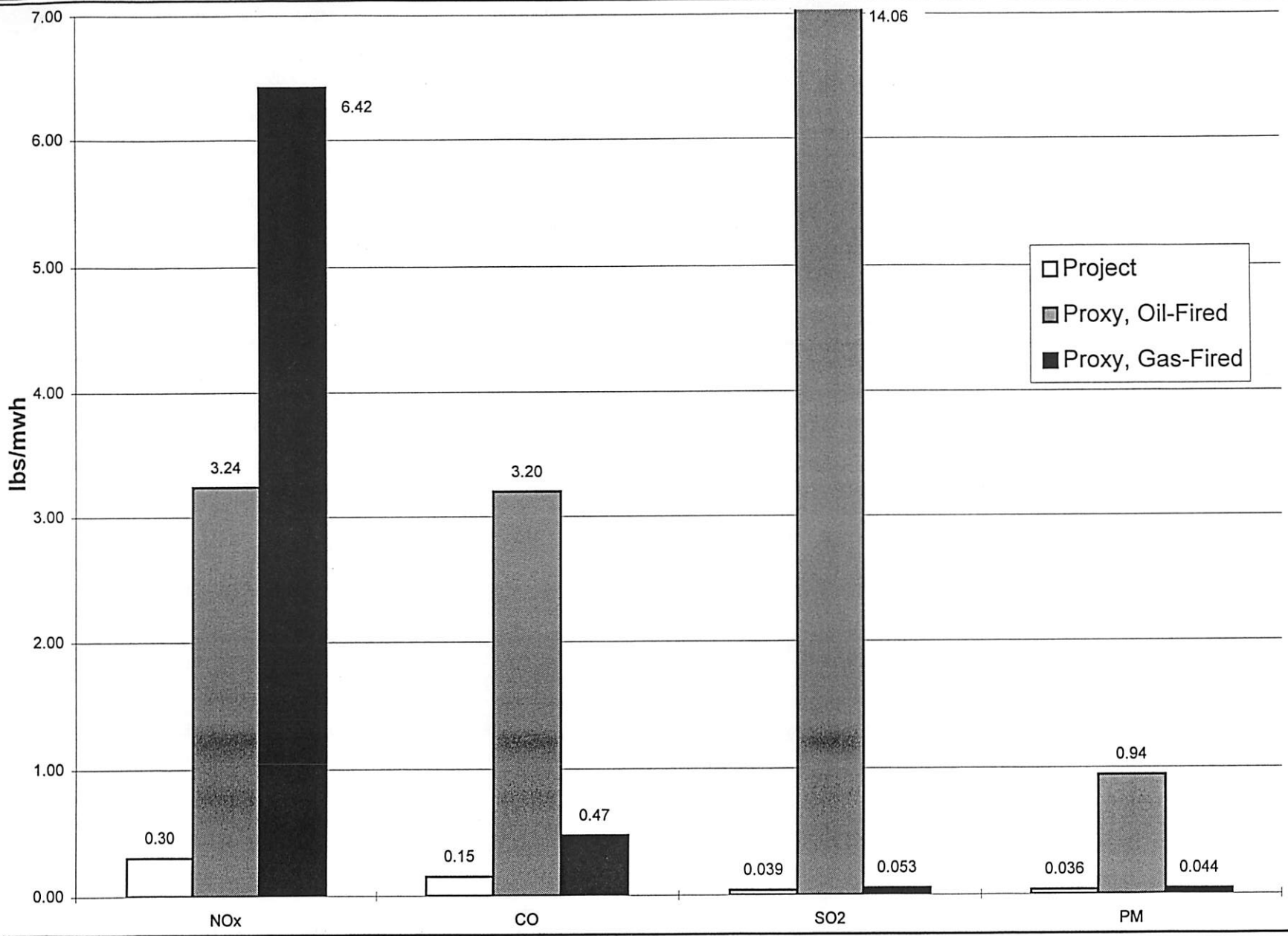
These emission rates can be used to estimate the reductions in total emissions that would occur if the Project's electrical generation offsets or displaces the operation of existing facilities. Based on an economic dispatch model, the Project is estimated to generate 3,719,550 mwh of electricity in 2002. The following table compares the resulting emissions under various scenarios:

	Annual Emissions (tons per year [tpy])			
	NO_x	CO	SO_2	PM
Project	558	279	73	67
Proxy, oil-fired	6,029	5,958	26,142	1,747
Proxy, gas-fired	11,947	869	99	82
Proxy, 50/50 mix	8,988	3,414	13,121	915

From these estimates, the emissions reductions that could result from the Project can be calculated as follows:

	Annual Emissions Reductions Due to the Project (tpy)			
	NO_x	CO	SO_2	PM
Project offsetting Proxy, oil-fired	5,471	5,679	26,069	1,680
Project offsetting Proxy, gas-fired	11,389	590	26	15
Project offsetting Proxy, 50/50 mix	8,430	3,135	13,048	848

These comparisons show that, if the Project's generation offsets that of existing facilities, the reductions in emissions will be significant.



COMPARISON OF EMISSION RATES

Source: ECT, 1998.

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