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United States
Environmental Protection
Agency

Region IV
345 Courtland Street NE
Atlanta, GA 30365

EPA 904/9-94-002(c)
June 1994

Adopted as DOE/EIS-0210
on 7/28/94

EPA

FINAL

Environmental Impact Statement

Executive Summary

Tampa Electric Company - Polk Power Station

PUBLIC NOTICE

June 10, 1994

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, NE
ATLANTA, GEORGIA 30365

Availability of the U.S. Environmental Protection Agency's (EPA) final environmental impact statement (FEIS) entitled "Tampa Electric Company - Polk Power Station" was noticed by EPA Region IV as a Notice of Availability (NOA) in the *Federal Register* on June 10, 1994. EPA published the NOA for the draft environmental impact statement (DEIS) in the Federal Register at 59 FR 9211 on February 25, 1994. EPA has tentatively made an NPDES new source determination for the proposed project. This EIS provides EPA's National Environmental Policy Act (NEPA) documentation for the NPDES permitting decision for a new source. Pending successful completion of this EIS process, EPA's preferred permit action is to issue the NPDES permit with conditions.

Through license and permit applications, Tampa Electric Company is proposing to construct and operate a new power plant and associated facilities on an approximately 4,348-acre site in southwestern Polk County, Florida. The proposed facilities would be known as the "Tampa Electric Company Polk Power Station." The proposed total net generating capacity at full build-out of the units at the site would be approximately 1,150 megawatts (MW: EIS references to MW capacities of power generating units are understood to be "nominal net" capacities). The generating units planned for the Polk Power Station would be developed at the site according to a phased schedule that matches Tampa Electric Company's forecasted growth in electricity demands beginning in 1996 and continuing into the year 2010. The first generating facility at the Polk Power Station site is proposed to be an integrated gasification combined cycle (IGCC) unit. This IGCC unit would be known as "Polk Unit 1." Cost-shared financial assistance for the IGCC unit would be provided by the U.S. Department of Energy (DOE) through the DOE Clean Coal Technology (CCT) Demonstration Program, pending successful completion of this environmental impact statement (EIS) process. The 260 MW IGCC unit would consist of a 150-MW advanced combustion turbine (CT), heat recovery steam generator (HRSG), steam turbine (ST), and coal gasification (CG) facilities. The IGCC unit would be fueled by coal-derived gas called coal gas or syngas, which is produced in the CG facilities with low-sulfur No. 2 fuel oil as a backup fuel. Tampa Electric Company's current Power Resource Plan indicates that later facilities would consist of two combined cycle (CC) generating units and six simple-cycle CTs fueled by natural gas with low-sulfur No. 2 fuel oil as the backup fuel.

Received written comments on this FEIS and/or draft NPDES permit will be accepted by EPA if postmarked by the close of the NEPA 30-day public comment period on:

JULY 11, 1994

Comments should be addressed to Ms. Lena Scott; Public Notice Coordinator; U.S. Environmental Protection Agency, Region IV; 345 Courtland Street, NE; Atlanta, Georgia 30365; Telephone: (404) 347-3004. Facsimile transmittals may be sent to EPA at (404) 347-5206. EPA will prepare an EIS Record of Decision (ROD) after the 30-day public comment period. Any substantive comment letters received by EPA will be addressed in the ROD and all letters will be appended to the ROD. Comments must be timely in order to be considered in the EPA ROD.

Both DOE and U.S. Army Corps of Engineers (USACOE) are Cooperating Agencies to EPA for this EIS. DOE is primarily concerned with its CCT Demonstration Program. Pending successful completion of this EIS process, DOE's preferred action is to provide cost-shared financial assistance to Tampa Electric Company for the IGCC Polk Unit 1. USACOE is primarily concerned with its dredge-and-fill permitting decision under Section 404 of the Clean Water Act. Pending successful completion

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of this EIS process, it is expected that both DOE and USACOE would, at their discretion, adopt this EIS as NEPA documentation for their agency actions. As appropriate, DOE and USACOE would also prepare their respective agency EIS RODs separate from EPA's EIS ROD. DOE and USACOE final action decisions are pending.

During the NEPA public comment period for the DEIS, EPA held a Public Hearing near the project site proposed by Tampa Electric Company. This Public Hearing was held on the evening of March 31, 1994, at the Polk County Commission Board Room located at 330 West Church Street, Administrative Building, First Floor, in Bartow, Florida 33830. The hearing was a joint Public Hearing for both the EIS (including DOE's CCT action) and the NPDES permit, and was announced in the *Polk County Democrat* and the *Tampa Tribune* newspapers on February 24, 1994. The FEIS includes a copy of the draft EPA NPDES permit (dated March 31, 1994) and a copy of the EPA Public Hearing transcript as appendices.

The preferred alternative for the EIS is "Tampa Electric Company's Proposed Project (Preferred Alternative With DOE Financial Assistance)." Other reasonable project alternatives and subalternatives to the proposed project including the "No-Action Alternative" were also considered in the EIS.

This EIS generally considered environmental impacts for the full build-out capacity to 1,150 MW proposed by Tampa Electric Company by the year 2010 for the Polk Power Station. Impacts addressed included: air quality, groundwater, surface water, geological, terrestrial (including wetlands), aquatic, socio-economic, land use, transportation, cultural, noise, human health, environmental justice, and cumulative impacts. Minimization/mitigation of some of the project impacts was also addressed.

The Florida Department of Environmental Regulation (FDEP) has approved the Prevention of Significant Deterioration (PSD) permit as part of its Final PSD Determination. Approval is for the 260-MW Polk Unit 1 increment. The Florida Public Service Commission (FPSC) has approved the need for a 220-MW capacity (not 260 MW as stated in DEIS) proposed in Tampa Electric Company's need petition. Based on EPA coordination with FPSC, the FPSC is aware of Tampa Electric Company's proposed 260-MW capacity for Polk Unit 1 and that Tampa Electric Company is including it in its future plans. Although the FPSC has at this time only approved a 220-MW capacity for Polk Unit 1, Polk Unit 1 is nevertheless referred to in this EIS as a "260-MW" facility since it is proposed to have such a design capacity based on a Tampa Electric Company engineering study.

One or two copies of this FEIS are available for public review at:

Bartow Public Library
315 East Parker Street
Bartow, Florida 33830
ATTN: Ms. Linda Chancey
(813) 534-0131

Lakeland Public Library
100 Lake Morton Drive
Lakeland, Florida 33801
ATTN: Ms. Betty Boyd
(813) 499-8242

Ft. Meade Public Library
75 East Broadway
Ft. Meade, Florida 33841
ATTN: Ms. Kay Jackson
(813) 285-8287

Tampa Electric Company
Mulberry Customer Service
101 2nd Street, NW
Mulberry, Florida 33860
ATTN: Mr. Al Dorsett
(813) 425-4988

Bruton Memorial Library
302 McLandon Street
Plant City, Florida 33566
ATTN: Mr. Tim Pasden
(813) 757-9215

It may also be noted that in addition to the requested 12 FEIS copies mailed to the U.S. Department of the Interior (Ms. Lillian Stone) and the 10 FEIS copies to State of Florida (Ms. Janice Hatter) for their internal distribution, additional copies were also mailed to selected offices within these agencies.

Upon request, a limited number of copies of this FEIS is also available from EPA (Mr. Chris Hoberg (FAB-4), Federal Activities Branch, Environmental Policy Section; 345 Courtland Street, NE; Atlanta, GA 30365; Telephone: 404/347-3776;

FINAL
Environmental Impact Statement

Executive Summary

Tampa Electric Company - Polk Power Station

FINAL
ENVIRONMENTAL IMPACT STATEMENT

POLK POWER STATION
TAMPA ELECTRIC COMPANY

PROPOSED EPA ISSUANCE OF A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FOR A NEW SOURCE

PROPOSED DOE CLEAN COAL COST-SHARED FINANCIAL ASSISTANCE UNDER THE DOE CLEAN COAL TECHNOLOGY DEMONSTRATION PROGRAM

Prepared by:

U.S. ENVIRONMENTAL PROTECTION AGENCY

in cooperation with:

U.S. DEPARTMENT OF ENERGY
U.S. ARMY CORPS OF ENGINEERS

ABSTRACT

Tampa Electric Company proposes to construct and operate a 1,150-MW power station in southwestern Polk County, Florida. The proposed Polk Power Station would require an EPA NPDES permit for a new source and would include a 260-MW IGCC unit as a DOE Clean Coal Technology demonstration project. This EIS document assesses the proposed project and alternatives with respect to environmental impacts. Mitigative measures are also evaluated for the preferred alternative.

Comments or inquiries should be directed to:

Heinz J. Mueller, Chief
Environmental Policy Section
U.S. Environmental Protection Agency, Region IV
345 Courtland Street, Northeast / Atlanta, Georgia 30365
(404) 347-3776 / FAX (404) 347-5206

Approved by:

Patrick M Tobin for John H. Hankinson, Jr.
Regional Administrator
U.S. Environmental Protection Agency
Region IV

May 26, 1994
Date

EXECUTIVE SUMMARY

FINAL
ENVIRONMENTAL IMPACT STATEMENT
TAMPA ELECTRIC COMPANY
POLK POWER STATION

( ) **Draft**
(X) **Final**

U.S. Environmental Protection Agency, Region IV
345 Courtland Street, Northeast
Atlanta, Georgia 30365

1. Type of Action Administrative (X) Legislative ( )

2. Description of Action

Tampa Electric Company proposes to expand its electric generating capacity by establishing a 1,150-megawatt (MW: note that EIS references to MW capacities of power generating units are understood to be "nominal net" capacities) power station on an approximately 4,348-acre site in southwestern Polk County, Florida (see Figure E-1). The proposed power station would be known as the "Tampa Electric Company Polk Power Station." At full build-out to a 1,150-MW generating capacity, the proposed power station would consist of two combined cycle (CC) generating units, six combustion turbine (CT) generating units, and one integrated gasification combined cycle (IGCC) generating unit. The proposed IGCC unit would be capable of firing either coal-derived gas known as syngas produced by an on-site coal gasification (CG) facility or low-sulfur fuel oil and operated in a CC mode. The proposed Polk Power Station project would include on-site material handling and storage facilities for fuel oil, coal, and the by-products of CG and syngas treatment (slag and sulfuric acid [H_2SO_4]); water supply and wastewater treatment systems; solid waste disposal areas; a cooling reservoir; a substation; and storm water management facilities. The project would also include on-site and off-site transmission lines, rail spur, and ultimately a natural gas pipeline and a possible fuel oil pipeline.

Development of the proposed Polk Power Station would occur in three phases. The initial phase would involve the construction of a 260-MW IGCC unit, which would be known as "Polk Unit 1," centered on a 150-MW advanced CT unit, with attendant on-site and off-site support facilities. Phase I would also include overall site development/reclamation activities. Phase II would consist of the construction of two 220-MW CC units and a 75-MW CT unit. These units would burn natural gas as primary fuel and fuel oil as backup fuel. Phase III would involve the construction of five more 75-MW CT units. According to Tampa Electric Company's proposed plans, the IGCC Polk Unit 1 would be in service in mid-1996. The full build-out of the proposed Polk Power Station to its ultimate capacity of 1,150 MW is planned to be completed in 2010.

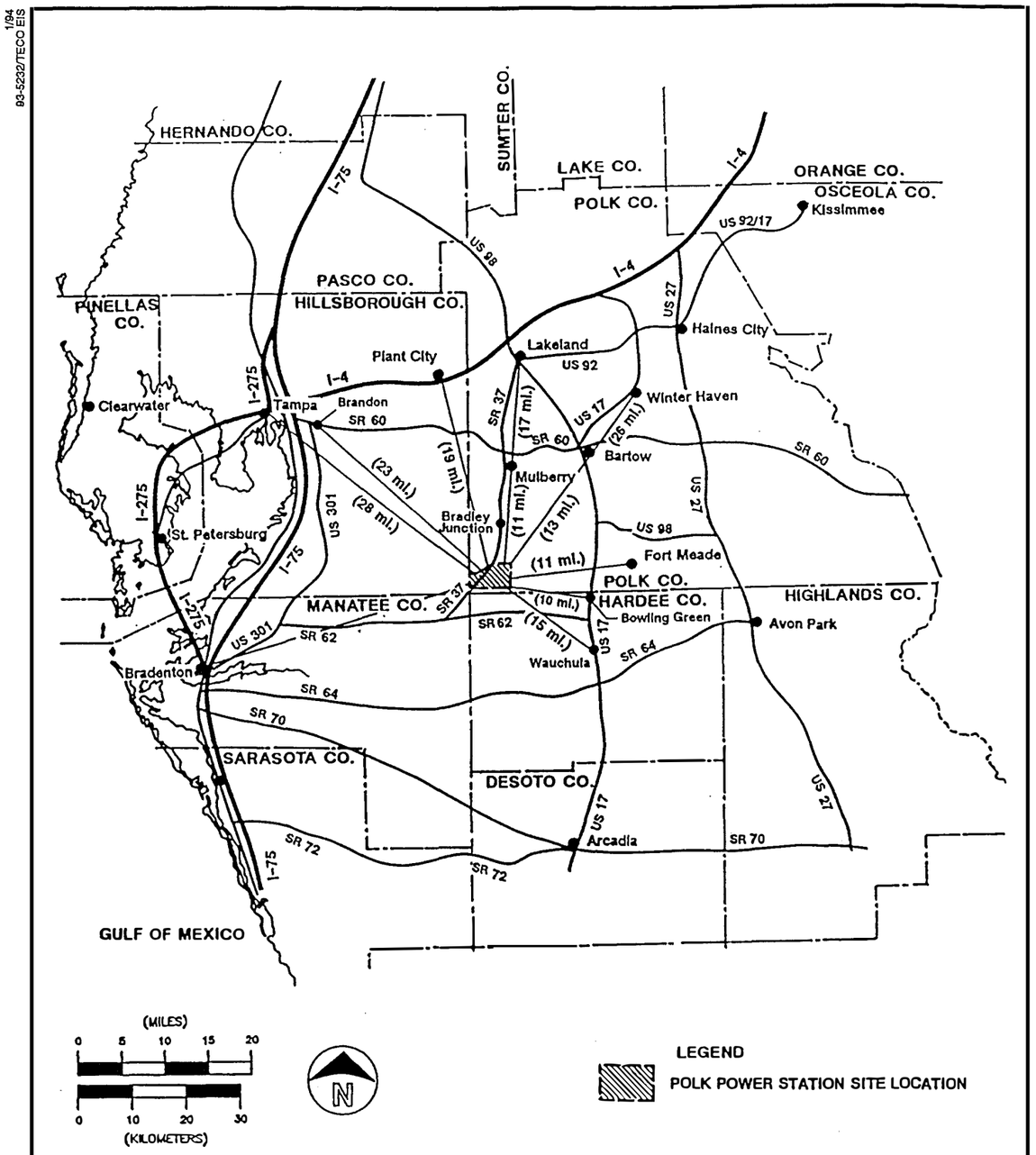

FIGURE E-1.
Regional Location of the Polk Power Station Site.

SOURCES: ECT 1992; TEC, 1992a.

U.S. Environmental Protection Agency, Region IV

Environmental Impact Statement

Polk Power Station
Polk Count , Florida

The proposed project requires major federal actions on the part of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE), each action requiring National Environmental Policy Act (NEPA) documentation. As such, this environmental impact statement (EIS) was considered the appropriate NEPA documentation for the proposed EPA and DOE major federal actions. Through a memorandum of understanding (MOU) (March 1993) between these two agencies as well as the U.S. Army Corps of Engineers (USACOE), EPA was designated the federal Lead Agency for the preparation of this EIS. The EPA notice of intent (NOI) for this EIS was published in the *Federal Register* at 58 FR 29577 on May 21, 1993.

DOE is a Cooperating Agency to EPA for the preparation of this EIS primarily due to DOE's project involvement through the DOE Clean Coal Technology (CCT) Demonstration Program. Specifically, the proposed 260-MW IGCC Polk Unit 1 is being considered by DOE for approximately $130 million (amended from $120 million because of additional costs of design changes and improvements) of cost-shared financial assistance to Tampa Electric Company under the DOE CCT Demonstration Program. The decision to provide cost-shared financial assistance for the IGCC demonstration project is considered a major federal action subject to NEPA. The DOE "EIS Action Alternatives" are to provide cost-shared financial assistance for the proposed demonstration project or to deny such financial assistance. DOE's preferred action alternative for this proposed project is to provide the cost-shared financial assistance, pending successful completion of this EIS process.

USACOE is also a Cooperating Agency to EPA for this EIS, largely due to the proposed dredge-and-fill permitting issues associated with the project and the USACOE permitting responsibilities for dredge-and-fill activities in waters of the United States pursuant to Section 404 of the Clean Water Act (CWA). USACOE has received a Section 404 permit application (original and updated) from Tampa Electric Company to fill approximately 253 acres of wetlands on Tampa Electric Company's preferred site (site "PLK-A"). These 253 acres have been determined by USACOE to be jurisdictional wetlands with formal notification of this determination provided to Tampa Electric Company on November 4, 1992. USACOE's permitting alternatives are to issue, issue with conditions, or deny the requested Section 404 dredge-and-fill permit. Since Section 404 permitting is also subject to NEPA, USACOE, as the permitting agency, expects to adopt this EPA EIS, as appropriate, to comply with its NEPA review responsibilities associated with appropriate NEPA documentation for any Section 404 permits USACOE may choose to issue.

Tampa Electric Company has submitted a National Pollutant Discharge Elimination System (NPDES) permit application to EPA seeking approval for discharge of water from the proposed power station cooling reservoir to waters of the United States, in accordance with the provisions of the CWA as amended (33 United States Code [USC] 1251 *et seq.*; EPA, 1989a). Tampa Electric Company also requested EPA to provide an NPDES "new source determination." By a letter dated January 11, 1994, to Tampa Electric Company, EPA tentatively determined the proposed Polk Power Station to be a "new source" requiring an NPDES permit based on New Source Performance Standards (NSPS).

EPA's "EIS Action Alternatives" are to issue, issue with conditions, or deny the NPDES permit for Tampa Electric Company's proposed project. EPA's preferred permitting action for this proposed project is to issue the permit with conditions, pending successful completion of this EIS process.

In July 1992, Tampa Electric Company submitted to the Florida Department of Environmental Protection (FDEP) and other appropriate agencies a site certification application (SCA) for the construction and operation of the proposed Polk Power Station project pursuant to the Florida Power Plant Siting Act (PPSA). The Florida PPSA provides for the coordination of all applicable state, regional, and local regulatory requirements, permits, and approvals for steam electric generating facilities with capacities greater than 75 MW under the SCA review and certification process. PPSA also requires that two administrative hearings be held: a land-use hearing to determine the consistency of the proposed project with local land-use plans and zoning ordinances, and a site certification hearing to determine the compliance of the project with all other state, regional, and local applicable environmental regulatory requirements. FDEP is responsible for the central coordination and administration of the site certification process, including coordination efforts to notify, consult, and obtain appropriate inputs and reports from affected agencies, governmental entities, and other public parties. Based on the findings from the land-use and site certification hearings and the FDEP staff analysis report (SAR), including recommendations from other agencies, the hearing officer prepares recommended orders for consideration and final decision-making by the Florida Governor and Cabinet (sitting as the Power Plant Siting Board) regarding approval of the project.

In accordance with the State of Florida PPSA process, the land-use hearing for the proposed Polk Power Station was held in Bartow, Florida, on October 29, 1992, and the Power Plant Siting Board approved the hearing officer recommended order that the proposed project was consistent with state, regional, and local land-use plans on January 26, 1993. The site certification hearing for the project was held in Bartow, Florida, on October 13, 1993, and the Power Plant Siting Board concurred with the recommended order granting certification for the proposed Polk Power Station project subject to specific conditions of certification on January 25, 1994.

Tampa Electric Company Need for Additional Power Supply

Based on its long-range integrated resource planning process, Tampa Electric Company has determined the need for additional resources of approximately 800 MW beginning in 1995 through the year 2001, and approximately 1,300 MW from 2002 through 2010. Thus, over the future 15-year period, Tampa Electric Company has determined the need for a total of approximately 2,100 MW in additional resources to meet its customer electric power demands. The need for these additional resources is primarily based on the projected continued growth of population and resulting electricity demands in the Tampa Electric Company service area. Based on this forecasted population growth and despite Tampa Electric Company's existing conservation efforts, load management, and cogeneration programs to reduce energy demands, Tampa Electric Company currently has determined the need for a total of approximately 1,150 MW in new generating capacity from 1996 to 2010.

Based on this forecasted growth, Tampa Electric Company would not meet its dual system reliability criteria in this future timeframe without the additional resources. These reliability criteria are a minimum 20-percent winter generation reserve margin and an assisted loss of load probability (LOLP) of less than 0.1 day per year. This latter criterion is accepted by the Florida Public Service Commission (FPSC) in determining the peninsular Florida power capacity needs. The former criterion has been adopted by Tampa Electric Company and determined to be appropriate by FPSC to meet intrastate transmission constraints or extreme weather conditions.

FPSC Need Determination for the IGCC Unit

Under the Florida PPSA, the determination of need for new electric generating capacity in Florida is the exclusive responsibility of FPSC. On September 5, 1991, Tampa Electric Company filed a "Petition to Determine Need for Electrical Power Plant" with FPSC pursuant to Section 403.519, Florida Statutes (F.S.) of PPSA. In conjunction with this filing, Tampa Electric Company submitted to FPSC a document entitled "Polk Unit One Need Determination Study" to support the need determination petition.

In the petition to determine need and the supporting study, Tampa Electric Company provided FPSC with information from its integrated resource plan that demonstrated the need for an additional 440 MW of new generating capacity during the period of 1995 through 2000. The information also showed that Tampa Electric Company's total resource needs to meet customer demands for the 5-year period were almost 800 MW, of which more than 40 percent would be met through the Tampa Electric Company's existing conservation and load management programs and power purchases from cogenerators. According to Tampa Electric Company's integrated resource plan, the remaining resource needs would be most cost-effectively and reliably met by the construction of the proposed IGCC unit with a scheduled commercial operation date of July 1996, followed by the phased construction of a 220-MW CC unit with a planned in-service date of 1999 for the first 75-MW CT unit comprising the CC unit and ultimate build-out and operation of the CC unit in 2001.

At a Special Commission Conference held by FPSC on January 31, 1992, FPSC voted to approve and issue a certification of need order for the IGCC unit (Polk Unit 1) of the proposed power station. The order determining the need for Polk Unit 1 was issued on March 2, 1992. In its order, FPSC determined that the proposed Polk Unit 1 was needed to maintain electric system reliability and integrity of the Tampa Electric Company electric system and is also needed to contribute to the reliability and integrity of the electric system of the state as a whole. FPSC also concluded that the proposed IGCC unit is the most cost-effective alternative to provide the additional needed capacity for Tampa Electric Company and peninsular Florida. Further, FPSC concluded that Tampa Electric Company had adequately explored power purchases from cogeneration and other utilities to provide the required generating capacity. Finally, FPSC concluded that Tampa Electric Company's existing residential conservation programs were reasonable in saturating the eligible market and that no additional conservation measures were reasonably available to Tampa Electric Company to avoid the

need for the proposed IGCC unit. Based on these findings, FPSC approved and issued Tampa Electric Company an order (March 2, 1992) determining the need for 220 MW (Note: not 260 MW as stated in the draft EIS [DEIS]) for a proposed electrical power plant at the proposed Polk Power Station site. However, FPSC's approval was limited to 220 MW for Polk Unit 1. As such, Tampa Electric Company would need to make additional need determination application to FPSC for the proposed future capacity beyond the approved 220 MW and up to the proposed 1,150-MW build-out capacity. (Note: EPA understands from Tampa Electric Company that results from a Tampa Electric Company engineering study completed before the FPSC's March 2, 1992 order showed that the actual expected capacity from the IGCC unit would be 260 MW. Based on EPA coordination with FPSC [1994], the FPSC is aware of Tampa Electric Company's proposed 260-MW capacity for Polk Unit 1 and that Tampa Electric Company is including it in its future plans. However, at this time, FPSC has only approved a 220-MW capacity for Polk Unit 1. In this EIS, Polk Unit 1 is nevertheless referred to as a "260-MW" facility since it is proposed to have such a design capacity. Furthermore, Tampa Electric Company projects that future demands will exceed the approved 220-MW capacity or the expected 260-MW capacity of Polk Unit 1. Also, the environmental impacts of 260-MW generation are expected to be nominally the same as for 220-MW generation.)

DOE Need for the IGCC Unit

In December 1985, Congress made funds available to DOE to administer cost-shared financial assistance for proposed projects under the DOE CCT Demonstration Program. The CCT Demonstration Program is designed to address a wide range of issues associated with the use of coal as an energy resource including acid rain, global climate change, improved energy efficiency, energy security, and environmental quality. Under this program, advanced coal technologies are being demonstrated at or near commercial scale, and are incorporating new power generation and pollution control concepts. Congress has appropriated a total budget of nearly $2.75 billion for the CCT Demonstration Program. These funds are being committed to demonstration projects through five competitive solicitations. The first four solicitations have resulted in a combined commitment by the federal government and the private sector of about $4.7 billion. DOE's cost share for these projects would be some $1.8 billion, or approximately 38 percent of the total. Upon final DOE approval, project sponsors (such as Tampa Electric Company) would provide the remainder of more than $2.9 billion, or approximately 62 percent of the total estimated cost. The response to DOE's fifth solicitation would bring the combined commitment by the federal government and the private sector to approximately $6.9 billion, thereby increasing the average industry cost share to approximately 66 percent, which far exceeds the 50 percent share of non-DOE funding mandated by Congress.

Under terms of Public Law No. 100-446, Congress provided approximately $575 million to DOE to support the construction and operation of demonstration facilities selected for cost-shared financial assistance as part of the third round of DOE CCT Demonstration Program. The CCT projects cover a broad spectrum of technologies having the following in common:

- All are intended to increase the use of coal in an environmentally acceptable manner
- All are ready to be proven at the demonstration scale

The electricity-producing industry largely depends on coal as its primary fuel. In 1989, 86 percent of total coal consumption in the United States was for the generation of electricity. Coal use in the electricity production industry is projected to increase at least 50 percent by 2010 and double by 2030, even with optimistic estimates of contributions from conservation, renewable resources, and nuclear energy to reduce electricity demands. However, the existing available technologies for coal-fired power plants would have difficulty in satisfying the rapidly changing environmental, economic, and technical performance requirements.

The coal-fueled power plant of the future must be capable of meeting stringent siting and environmental requirements, while, with a high level of reliability, efficiently produce power. Further, the ability to rapidly add generation capacity, in modules, that closely matches load growth will be an important factor in keeping future electricity costs reasonable. Hence, over the next 10 years, it will be critical to bring new technology options into the marketplace to satisfy not only the requirements of the traditional utility industry, but also the requirements of independent power producers and cogenerators that are producing an increasing share of power in the United States. Based on such consideration and pending successful completion of the NEPA process for this EIS, DOE is considering cost-shared financial assistance for the proposed IGCC unit at the Polk Power Station through the DOE CCT Demonstration Program under a cooperative agreement with Tampa Electric Company.

Under this cooperative agreement and if cost-shared financial assistance is provided by DOE for the proposed IGCC unit, Tampa Electric Company would demonstrate a hot gas cleanup (HGCU) system for removing sulfur compounds, particulates, and other potential pollutants from syngas produced in the CG facility prior to firing in the advanced CT. The demonstration HGCU system has the potential to achieve pollutant removal efficiencies equivalent to or greater than the conventional cold gas cleanup (CGCU) technology, while providing a more efficient power generation system. The proposed IGCC unit would also demonstrate the overall integration of CG and CC technologies for power production. These demonstration activities would occur over a two-year period after initiation of the IGCC unit operation.

Requirements for Ultimate Site Build-Out

Since Tampa Electric Company's application submitted to EPA for an NPDES permit was for the full build-out of the proposed power station to 1,150 MW, this EIS is written for a 1,150-MW facility (with the understanding that FPSC has only approved the need for 220 MWs for Polk Unit 1 at this time). Tampa Electric Company proposes a phased build-out for the Polk Power Station to 1,150 MW by 2010. Build-out of the proposed Polk Power Station to the ultimate generating capacity of

1,150 MW is proposed by Tampa Electric Company with DOE cost-shared financial assistance under the DOE CCT Demonstration Program or without such financial assistance. Accordingly, Tampa Electric Company's SCA submittal to FDEP was also for an ultimate 1,150-MW facility. Although Tampa Electric Company's application for a Prevention of Significant Deterioration (PSD) permit (i.e., air quality construction and operation permit), which was submitted to FDEP as part of the SCA process, included modeling analyses and potential impact assessments for the proposed 1,150-MW build-out of the power station, FDEP approval of the PSD permit was limited to the first 260-MW unit increment. Therefore, additional PSD permit application(s) approvals would need to be pursued by Tampa Electric Company for additional proposed units at the Polk Power Station to the 1,150-MW level. Similarly, Tampa Electric Company would need to make additional need determination application to FPSC for the proposed future capacity beyond the approved 220 MW and up to the proposed 1,150-MW build-out capacity.

Site Location and Land Use

Tampa Electric Company's selection of their preferred site (site "PLK-A") was based on a comprehensive, structural methodology that integrated multidisciplinary environmental, engineering, and economic siting factors in the evaluation of potential areas. The site selection assessment was structured into a phase I regional screening, a phase II intermediate screening, and a phase III detailed analysis screening. To this end, a site selection task force identified potential candidate sites within a six-county study region. Under the phase I screening analysis, 34 areas within the study region were considered for CC only, 23 areas for CC or baseload, and 21 areas for both CC and baseload plants on one site. Under the phase II analysis, 21 sites were screened; five of the most suitable sites were rated as suitable for the CC and baseload option. Under the phase III analysis, sites PLK-1, PLK-2, and PLK-A underwent detailed investigation. Based on guidance from the siting task force, site PLK-A was selected as the preferred site. The PLK-A site preferred by Tampa Electric Company has been selectively inspected by Tampa Electric Company, USACOE, U.S. Fish and Wildlife Service (FWS), EPA, DOE, Southwest Florida Water Management District (SWFWMD), and consulting contractors.

The proposed Tampa Electric Company Polk Power Station site is located in southwestern Polk County, Florida, approximately 17 miles south of the City of Lakeland, 11 miles south of the City of Mulberry, and 13 miles southwest of the City of Bartow (see Figure E-1). The site is bordered by the Hillsborough County line along the western boundary; Fort Green Road (County Road [CR] 663) on the east; CR 630, Bethlehem, and Albritton Roads along the north; and State Road (SR) 674 and several phosphate clay settling ponds on the south.

A majority of the land at the Polk Power Station project site has been mined to recover phosphate or disturbed due to mining-related activities. Mining of portions of the proposed site will continue into 1994. Approximately 94 percent of the 4,348-acre site would be mined or disturbed by mining activities prior to Tampa Electric Company's proposed use of the site for the Polk Power Station project.

After proposed full build-out to 1,150 MW, electrical power plant facilities would occupy approximately 150 acres, or less than 4 percent of the overall site. Other areas classified for use as power plant facilities would total approximately 111 acres. A cooling reservoir would occupy approximately 860 acres. The remainder of the site would be predominantly used for pastureland (776 acres), shrub and brushland (544 acres), upland hardwood forest (55 acres), upland mixed forest (774 acres), lakes (264 acres), wetland hardwood forest (61 acres), wetland mixed forest (310 acres), and herbaceous wetland (428 acres). The 1,511-acre portion of the site to the west of SR 37 would be reclaimed to an integrated system of forested and nonforested wetlands and uplands and is intended to develop into a wildlife habitat/corridor area since no power plant facilities would be located on this tract. Project wetland mitigation (168.41 acres) would be provided in several on-site areas east of SR 37.

Within a 5-mile radius of the site, which includes the community of Bradley Junction, land use is dominated by activities associated with the mining and processing of phosphate ore. These uses include mined areas, spoil banks, sand tailing areas, settling ponds, and reclaimed areas. Facilities associated with phosphate mining and processing in the area include IMC Fertilizer Haynsworth Mine, Mobil Chemical Company Big Four Mine, and the Agrico Chemical Company Fort Green and Payne Creek Mines. Other electrical generating facilities in the area include the Hardee Power Station located 4 miles south of the site and the proposed Florida Power Corporation 3,000-MW power plant to be located approximately 5 miles east of the site. Excluding the community of Bradley Junction, which is located approximately 4.5 miles north of the site, residential areas within a 5-mile radius of the site include approximately 85 homes located west of SR 37 (1.5 miles), an area of 14 homes located southeast of the site along Mills Road (1.5 miles), and an area of approximately 30 homes located west of the site adjacent to SR 674 in Hillsborough County.

Generating Units

The proposed generating units include Polk Unit 1, a 260-MW IGCC unit, two 220-MW CC units, and six stand-alone 75-MW CT units. The proposed construction and operation of these units would provide a total, ultimate generating capacity of 1,150 MW at the Polk Power Station site.

For the proposed 260-MW IGCC generating unit, a pressurized, oxygen-blown, entrained-flow gasifier would be used to produce a medium-British thermal unit (Btu) syngas for firing in the advanced 150-MW CT. In the gasifier, coal/water slurry would be combined with oxygen at high temperature and pressure to produce the syngas. When fired on the syngas and operated with the addition of nitrogen gas from the air separation unit, the advanced CT unit would have a generating capacity of 190 MW. The unit would have the capability to fire low-sulfur fuel oil as backup fuel and to operate in a CC mode to provide required flexibility in the event of unanticipated disruptions in the delivery of coal or unplanned unavailability of CG facilities.

The proposed operation of the IGCC unit would involve a number of major associated systems and processes including the following: coal grinding and slurry preparation; air separation unit; CG facilities; slag handling and storage; syngas scrubbing and cooling systems; gasification process black water handling and brine concentration system; acid gas removal unit; demonstration HGCU system; H_2SO_4 by-product plant and storage facilities; heat recovery steam generator (HRSG); and steam turbine (ST) generator.

Operation of the proposed IGCC unit offers environmental and economic advantages over current conventional systems. Emissions of toxic air pollutants such as sulfur dioxide (SO_2) and nitrogen oxides (NO_x) would be reduced and an HRSG would increase efficiency compared to conventional power generating facilities. The proposed IGCC unit would produce up to 25 percent more electricity from burning the same amount of coal than a conventional plant. According to DOE calculations, overall plant output would increase 50 to 150 percent. Less carbon dioxide (CO_2) would be released to the atmosphere, thereby lowering the contribution to the "greenhouse" effect. From an economic perspective, the operation of the proposed IGCC unit would save Tampa Electric Company ratepayers $195 million over the life of the unit.

The proposed Polk Power Station would also include two 220-MW CC units. Each of the CC units is expected to be comprised of two 75-MW CTs, two HRSGs, and one ST generator. Natural gas would be used as the primary fuel for the units with low-sulfur fuel oil as a backup fuel. The CTs would also be designed with by-pass exhaust stacks capable of operating in both CC and simple-cycle modes.

The six stand-alone, simple-cycle CT units would have a generating capacity of 75 MW for each CT. The proposed primary fuel for the CT units would be natural gas with low-sulfur fuel oil as backup fuel.

Fuel Delivery, Storage, Handling, and Usage

The proposed IGCC unit would require nearly 2,325 tons (dry) of coal per day, when operating at full load. Proposed coal delivery to the site would initially be by trucks, with delivery by unit train railcars as a potential future delivery option. Two unit trains per week would be needed to meet the IGCC's fuel requirements if all coal were delivered by train. Use of the back-haul availability of trains that currently transport phosphate from Polk County to terminals on Tampa Bay is another rail delivery option. For the proposed coal delivery by truck only, 80 to 100 loads per day would be required, using specially designed 28-ton payload capacity trucks with bottom dumps and aluminum covers.

Coal would be stored in two silos. The planned aggregate capacity in the coal storage silos is approximately 10,000 tons, which is the coal fuel supply needed to operate the proposed IGCC unit at full generating capacity for approximately five days. To prevent leachate and storm water runoff from entering the surficial aquifer, runoff from the coal unloading and silo storage areas would be collected

in concrete sumps and pumped to the coal grinding/slurry preparation facilities for use as makeup water in the plant operations. No direct discharges to groundwater or surface waters would occur.

Natural gas usage for the stand-alone CT and CC units is estimated to be about 11 million cubic feet per hour (ft^3/hr) of natural gas fuel with all units operating at full load. Because natural gas would be delivered directly to the site via pipelines from the natural gas transmission system in the region, no on-site natural gas storage would be needed. Tampa Electric Company is currently evaluating various alternatives for the natural gas supply and no specific interconnection points to the existing or planned future gas transmission system has been determined. Permitting issues associated with the natural gas pipeline route to the site would be evaluated when the route is finalized and if permission to build these units is received from FPSC and FDEP. Thus, the pipeline route and its potential impacts on the environment are unknown at this time and are not addressed in this EIS. Tampa Electric Company anticipates the need for natural gas by 1999.

Fuel oil would be delivered to the site by tanker truck and/or railcar. Fuel oil would serve primarily as a backup fuel for the stand-alone CT and CC units as well as for the advanced CT component of the IGCC unit when operated in CC mode. An estimated total of 77,000 gallons per hour of fuel oil would be consumed by the stand-alone CC and CT units if all units were operated at full load, and an additional 13,500 gallons per hour of fuel oil would be needed for the IGCC unit if syngas was not available from the CG facilities.

Fuel oil, following proposed full build-out, would be stored in three on-site aboveground steel tanks, each with a storage capacity of 3 million gallons. The tank storage area would be furnished with an impervious secondary containment system around and under the tank containment area. An earthen berm sealed with asphalt or other comparable materials would surround the storage area to contain any unexpected oil spills. Appropriate safeguards and systems to prevent, control, and recover any accidental spills would also be built or installed in accordance with federal and state regulatory requirements for above-ground storage tanks. Storm water runoff from the fuel oil storage tank area would be collected and routed to an oil/water separation system designed to reduce any potential oil and grease content in water to a level not exceeding 15 milligrams per liter (mg/L). The oil/grease and other solid sediments then would be collected and hauled off site by a licensed contractor for appropriate recycling or disposal. Effluent from the oil/water separation system would be routed into the wastewater equalization basin for further treatment.

Air Emissions and Controls

Air emissions associated with the proposed project operations fall into three categories: combustion emissions, process emissions, and fugitive emissions. The combustion-related air emission sources would be: the advanced CT integral to the IGCC unit; the HGCU thermal oxidizer; the IGCC unit flare; an auxiliary boiler associated with the IGCC unit; the four CTs associated with the two CC units; and the six stand-alone, simple-cycle CTs. Process emission sources would include the H_2SO_4

plant and minor, intermittent emissions of gaseous pollutants that may be generated in the gasification plant. Fugitive particulate emissions would be potentially generated by material handling and storage, principally coal and slag.

Controls for particulate matter (PM) and heavy metal emissions from the IGCC unit would include water scrubbing, use of fuels with low PM content, and good operational practices to achieve efficient combustion. Controls for PM emissions from coal and slag handling and storage systems would include railcar and truck coal unloading in an enclosed building, storage of coal in silos, baghouse particulate control at transfer points, enclosure of certain coal conveyors, wet grinding in the rod mills, and the paving of roads within the Polk Power Station site. Slag would be transported wet to minimize or eliminate fugitive dust emissions.

Carbon monoxide (CO) and volatile organic compounds (VOC) emissions from the IGCC unit and stand-alone CCs and CTs would be controlled by the use of advanced combustion equipment and operational practices to obtain efficient combustion, which in turn would result in low CO and VOC emission rates.

Control of SO_2 and H_2SO_4 mist emissions is integrated in the IGCC unit. With the conventional CGCU technology, hydrogen sulfide (H_2S) and carbonyl sulfide (COS), present as the syngas exits the gasifier, are removed using a promoted amine process in the acid gas removal unit. With the demonstration HGCU technology, H_2S present in the syngas stream would be reacted with zinc titanate sorbent in a moving bed absorber. Regeneration of the absorber would yield a concentrated SO_2 stream that would then be converted to H_2SO_4 in an H_2SO_4 production plant. The expected efficiency of sulfur removal with the demonstration HGCU technology would meet or exceed that of conventional CGCU technology (i.e., 95.6 percent).

H_2SO_4 mist emissions from the IGCC combustion sources would be controlled by the use of low-sulfur fuels. Sulfur content of treated syngas and fuel oil would be 0.07 and 0.05 weight percent, respectively. SO_2 emissions from the stand-alone CC and CT units would also be controlled by the use of low-sulfur natural gas and fuel oil. Sulfur content in the natural gas would be less than 10 grains (gr)/100 standard cubic feet (scf). Fuel oil would contain less than 0.05 weight percent sulfur.

The advanced CT in the IGCC unit would use nitrogen produced from the air separation unit to control NO_x emissions during syngas firing. Water injection would be employed when backup fuel oil is used. NO_x emissions from the remaining IGCC facility combustion sources would be controlled by using low-NO_x burners and/or good combustion practices that reduce NO_x formation. The stand-alone CC and CT units would be equipped with dry low-NO_x burners when fired on natural gas to control NO_x emissions. Water injection would be used when the CC and CT units are fired on backup fuel oil.

Water Supply and Usage

Water to supply the potable, process, and cooling reservoir makeup needs for operations of the proposed power station would be provided by pumping groundwater from the Floridan aquifer through on-site wells. According to current engineering designs and analyses, groundwater from the Floridan aquifer would be withdrawn and provided directly to the cooling reservoir at an estimated annual average rate of 5.0 million gallons per day (mgd) and a peak rate of 6.5 mgd to maintain normal operational water levels. Total groundwater withdrawals for potable, process, and cooling water makeup use is estimated to be about 9.3 mgd on a maximum month daily basis and approximately 6.6 mgd on an annual average basis. If the CC and CT units are fired with natural gas, water injection for NO_x control is no longer needed and the daily groundwater withdrawals should be lower than these values. To minimize groundwater withdrawals for makeup purposes, water lost from the cooling reservoir would also be replenished from rainfall directly to the reservoir surface, runoff from the surrounding and internal berms, treated wastewater, treated runoff, and groundwater seepage from the surficial aquifer.

Surface water discharges from the reservoir, estimated to be 3.1 mgd on an annual average basis, would be routed to an unnamed, reclaimed lake on the eastern edge of the site and then off site to the Little Payne Creek system. Based on the results of water quality modeling analyses, the quality of water discharges from the reservoir is predicted to meet all applicable State of Florida Class III surface water quality standards except the thermal standard, which would be met within a 250-foot (ft) mixing zone within the reclaimed lake. Groundwater seepage discharges from the reservoir are expected to meet all Florida primary and secondary drinking water standards with the exception of iron and color, which are secondary drinking water parameters. The secondary drinking water standards for iron (0.3 mg/L) and color (15 color units) would be exceeded by the predicted concentrations in the reservoir (0.627 mg/L and 50.49 color units). Even with these exceedances, seepage from the cooling reservoir is not predicted to cause adverse impacts on the groundwater quality in the area since the iron and color concentrations are below ambient levels in the surficial aquifer.

Wastewater Treatment System

Construction of an on-site industrial wastewater treatment (IWT) system is planned to collect and appropriately treat the process and service wastewater, storm water runoff, and washdown from the materials storage areas. The proposed treatment strategy would be to collect wastewater at its source, pretreat it if necessary, and direct it to the wastewater equalization basin prior to filtration and discharge to the cooling reservoir. The proposed IWT system would include the following basins and units: oil/water separation; neutralization tank; diversion box; slag runoff retention basin; clarification; and filtration.

All oil-bearing equipment would be segregated using a combination of curbed and sloped concrete areas with drains directing washdown, runoff, minor leaks, and spills to the oil/water separation system through an oily sewer. The oil/water separation system is designed to remove oil, grease, and sludge

from wastewater prior to discharge to the IWT equalization basin. Potentially oil-contaminated streams would be collected using segregated diked areas and sumps. Oil-contaminated wastewater would be directed to an oil/water separator. Skimmed oil and froth from the separator would be collected in a skimmed oil tank for further separation and either recycling or disposal off site by an approved contractor. Treated wastewater would be pumped to the equalization basin with an effluent having an oil and grease level not exceeding 15 mg/L.

Low-volume wastewaters would be treated according to the nature of the waste. Boiler blowdowns, laboratory wastes, and reverse osmosis (RO) concentrate stream would be combined in the neutralization tank where pH would be adjusted to a range of 6 to 9 before being discharged to the cooling reservoir. Filter backwash water from the makeup water treatment unit would be directed to the equalization basin and subsequently filtered. The nonchemical cleaning wastes associated with CT and compressor washing could be generated up to six times per year and would be routed to the equalization basin for subsequent filtration treatment. Spent chemicals and metal cleaning wastes would be disposed off site by a licensed contractor.

Black water removed from the slag and the syngas scrubber would be directed to a vacuum flash drum and gravity settler, which together would remove nearly all suspended solids in the black water. The resulting grey water would be routed to the grey-water treatment system that would include the grey-water tank, grey-water evaporator, evaporator condensate tank, and concentrated brine storage tank. Most of the grey water would be reused in the gasification plant for syngas scrubbing or slag flushing, and the remainder would be processed and concentrated to a brine solid waste. No liquid discharges would occur from the black water processing system associated with the CG facilities.

Storm water runoff and wash water from the coal unloading structure and silo storage area would be collected in a sump for each area and would be directed to the coal grinding sump to be used for makeup water in the coal grinding/slurry preparation operation. Slag pile runoff would be collected in a lined retention basin and pumped to the filtration system prior to discharge to the cooling reservoir. The slag pile storage area would also be lined with a synthetic material or other low-permeability materials.

Discharges from showers, wash basins, bathrooms, and other facilities are expected to result in 10,500 gallons per day (gpd) of combined sanitary wastewater flow. After treatment in an on-site package plant, effluent would be discharged into the cooling reservoir for reuse.

Solid Wastes Handling and Disposal Systems

Nonhazardous solid wastes generated by the Polk Power Station would include the following: sanitary wastewater treatment sludge, IWT solids, CG wastewater treatment brine solids, water treatment media, HGCU system wastes, and general solid wastes. The resultant wastes would be removed and transported off site according to approved practices (e.g., reclamation and licensed contractor

transportation for storage at landfills). The H_2SO_4 and slag by-products would be marketed for off-site uses. Unmarketable slag by-products would be temporarily stored on site in a lined storage area.

Sludge from the sewage treatment package plant would be periodically transported off site for disposal. Used water treatment media, filter media (such as sand), activated carbon, and RO cartridge filters would be disposed at an off-site permitted landfill. Solids from the IWT equalization basin systems and filtration would be periodically removed and transported off site for disposal.

The CG wastewater treatment brine solids would be discharged from the brine concentrator at a rate of approximately 26.5 ft^3/hr. Ammonium chloride, sodium chloride, and ammonium formate are expected to represent 99 percent of the total brine solids makeup. The remaining 1 percent would consist of trace elements present in the feed coal ash, such as aluminum, barium, cobalt, copper, vanadium, and zinc. The brine concentrator solids would be stored in an on-site disposal area consisting of storage cells with runoff collection and leachate collection systems and an impermeable liner in accordance with Chapter 17-701, Florida Administrative Code (FAC).

The demonstration HGCU system is expected to generate salt from the barrier filter, sorbent fines from the regenerator, and solids from the cyclone unit at the approximate rate of 125, 25, and 25 pounds per hour (lb/hr), respectively. Salt from the barrier filter would be disposed in the brine storage area. The sorbent fines would be reclaimed off site. The nonhazardous cyclone solids would be transported off site to a permitted landfill.

Transmission Line Corridors

To link the proposed Polk Power Station with the Tampa Electric Company and the Florida electric transmission grids, an on-site substation and four 230-kilovolt (kV) transmission line circuits would be needed. Two of the 230-kV circuits from the substation would be constructed within a corridor located entirely within the Polk Power Station property. These two 230-kV circuits would interconnect with the existing Tampa Electric Company 230-kV Hardee-Pebbledale transmission line that runs along the eastern border of the site. Two additional circuits would be built within an on-site corridor running west from the substation to SR 37, then off site north along SR 37 approximately five miles, and to interconnect with Tampa Electric Company's existing Mines-Pebbledale 230-kV transmission line at a point to the west of the community of Bradley Junction. The proposed transmission line would be routed to avoid residential areas in the community of Bradley Junction.

Although Tampa Electric Company has selected a proposed corridor for the off-site portion of this northern transmission line, a specific alignment has not been finalized. Although FWS inspected the proposed corridor on December 23, 1993, additional coordination with other appropriate resource agencies by Tampa Electric Company regarding potential alignment impacts is pending.

3. Alternatives Analysis

Under NEPA regulations, preparation of an EIS requires identification and assessment of reasonable alternatives to the proposed project that could avoid or minimize potentially adverse effects on the quality of the human environment. The proposed project for this EIS is "Tampa Electric Company's Proposed Project (Preferred Alternative With DOE Financial Assistance)." Reasonable project alternatives and subalternatives to the proposed project were considered in this EIS. In addition to "Tampa Electric Company's Alternative Power Resource Proposal (Without DOE Financial Assistance)" and the "No-Action Alternative," alternatives/subalternatives considered were: alternatives to constructing new generating facilities, alternative generation technologies, alternative sites, and alternative processes and facilities. Table E-1 summarizes the alternatives/subalternatives considered in this EIS.

4. Summary of the Major Environmental Impacts of Tampa Electric Company's Proposed Project (Preferred Alternative With DOE Financial Assistance)

Construction-Related Impacts

Physical Environment--Small quantities of fugitive dust, vehicle emissions, and combustion products would be generated during construction, site preparation, vehicle movement, and open burning of debris. While on-site air quality may be slightly affected, no violations of applicable ambient air quality standards are expected.

No significant construction-related impacts to surface water resources are anticipated as a result of the proposed project. Existing surface waters within the proposed site primarily consist of open water in mine cuts that were artificially created through phosphate mining operations, reclaimed and unreclaimed mine cut lakes, and remnant unmined areas of disturbed and hydrologically isolated wetlands. The proposed project construction, including the 860-acre cooling reservoir, would result in the loss of approximately 253 acres of USACOE jurisdictional wetlands (approximately 212 acres of surface water in mine cuts and approximately 41 acres of highly stressed wetlands). The unmined areas have been highly altered through surface water drainage, groundwater drawdowns, and other disturbances associated with mining activities.

The proposed project would have minor potential effects on the reclaimed hydrology and water quality on and in the vicinity of the site. Construction activities that disturb five acres or more require an NPDES permit for storm water discharges from the site to ensure the implementation of Best Management Practices (BMPs) and minimize impacts to off-site surface waters. Tampa Electric Company has filed a notice of intent for coverage under the General Permit for "Storm Water Discharges Associated with Construction Activities" and is currently (as of August 25, 1993) covered under that General Permit. As a part of the General Permit, Tampa Electric Company has prepared a Pollution Prevention Plan (PPP), including BMPs to control erosion and hydrologic and water quality

Table E-1. Summary of Alternatives/Subalternatives Considered in this EIS (Page 1 of 3)

1. Alternatives to Constructing New Generating Facilities
   - Construct all 2,100 MW of needed capacity
   - Conservation (TEC's proposed project)
   - Interruptible load (TEC's proposed project)
   - Residential load control (TEC's proposed project)
   - Cogeneration power purchases (TEC's proposed project)
   - Other purchased power (TEC's proposed project)

2. Alternative Generation Technologies
   - TEC's proposed resource plan (TEC's proposed project)
   - Three CC without CG facilities
   - Three IGCC units
   - PC with FGD unit (TEC's alternative power resource proposal)

3. Alternative Sites
   - PLK-A site (TEC's proposed site)
   - PLK-1 site
   - PLK-2 site

4. Site Layout Alternatives
   - Reversing locations of coal unloading and storage and slag by-product storage areas
   - Proposed site layout (TEC's proposed project)

5. Fuel Handling and Storage Alternatives
   - Coal delivery by rail or truck, bottom-dump rail car or truck, coal storage in silos, above-ground fuel oil storage tanks (TEC's proposed project)
   - Lined storage pile with fugitive emission, leachate, and runoff controls and mobile equipment reclamation
   - Rotary dumper unloading and stacker-reclaimer
   - Unlined storage area and covered coal storage area
   - Below-ground oil storage tank.

6. Cooling System Alternatives
   - Cooling reservoir (TEC's proposed project)
   - Cooling towers: mechanical draft
   - Once-through cooling

7. Cooling Water Makeup Source Alternatives
   - Groundwater from upper Floridan aquifer, treated wastewater, storm water runoff (TEC's proposed project)
   - Groundwater from intermediate aquifer
   - Groundwater from deep lower Floridan aquifer (highly mineralized)
   - Storm water from all or large portion of the site
   - Surface water from streams
   - Public water supply/wastewater treatment system

Table E-1. Summary of Alternatives/Subalternatives Considered in this EIS (Page 2 of 3)

8. Cooling Reservoir Discharge Alternatives

- Discharge to Little Payne Creek (TEC's proposed project)
- Discharge to Payne Creek or South Prong Alafia River
- Deep well injection
- Zero discharge

9. Sanitary Wastewater Alternatives

- On-site package plant (TEC's proposed project)
- Septic tank system
- Off-site publicly-owned treatment works

10. CC Process Wastewater Treatment/Disposal Alternatives

- Discharge of treated wastewater to reservoir (TEC's proposed project)
- Discharge of treated wastewater directly off site
- Disposal by deep well injection
- Zero liquid discharge

11. CG Process Water Handling Alternatives

- Treat and reuse of water with zero off-site discharge (TEC's proposed project)
- Treat discharge to cooling reservoir
- Treat and discharge off-site

12. Air Emission Control Alternatives

- PM and trace heavy metals alternatives
  a) Use natural gas, syngas, and distillate fuel oil (TEC's proposed project)
  b) Post-combustion controls: electrostatic precipitators, centrifugal collector, baghouse, or wet scrubber
- SO_2 alternatives
  a) CGCU and HGCU systems and low-sulfur fuels (TEC's proposed project)
  b) Lower sulfur fuel oil
  c) Post-combustion controls: FGD
- NO_x alternatives
  a) Nitrogen and water injection, and dry low-NO_x burners (TEC's proposed project)
  b) Steam injection
  c) Selective catalytic reduction
  d) Selective noncatalytic reduction
- CO and VOCs alternatives
  a) Efficient combustion practices (TEC's proposed project)
  b) Oxidation catalyst
- Fugitive alternatives
  a) Coal storage in silos, equipment enclosures, filters, application of dust suppression materials, and use of paved roads (TEC's proposed project)
  b) Covered coal storage areas

Table E-1. Summary of Alternatives/Subalternatives Considered in this EIS (Page 3 of 3)

13. Solid Waste Storage/Disposal Alternatives

- Combination of on-site and off-site storage and disposal (TEC's proposed project)
- All on-site storage and disposal
- All off-site disposal

14. By-product Storage and Management Alternatives

- Sale for off-site commercial use with temporary storage on site (TEC's proposed project)
- Permanent disposal on site
- Permanent disposal off site

15. Transmission Line Corridor Alternatives

- North on SR 37 and west of Bradley Junction to Mines-Pebbledale transmission line (TEC's proposed project)
- South on SR 37 to SR 674 and west to Polk/Hillsborough county line, then north to Mines-Pebbledale transmission line

16. Other Linear Facility Alternatives

- Natural gas pipeline, alternatives to be determined
- Fuel oil pipeline, alternatives to be determined
- TEC proposed rail spur location (TEC's proposed project)
- Adjacent rail spur location

17. EPA and DOE "EIS Action Alternatives"

- EPA approves NPDES permit and DOE provides financial assistance (TEC's proposed project)
- EPA approves NPDES permit and DOE denies financial assistance (TEC's alternative power resource proposal)
- EPA approves NPDES permit with conditions and DOE provides financial assistance (TEC's proposed project)
- EPA approves NPDES permit with conditions and DOE denies financial assistance (TEC's alternative power resource proposal)
- EPA denies NPDES permit and DOE provides financial assistance
- EPA denies NPDES permit and DOE denies financial assistance

18. No-Action Alternative

- EPA denies NPDES permit
- FDEP denies site certification
- TEC withdraws permit/certification applications

Note: "TEC" refers to Tampa Electric Company.

effects from storm water runoff during proposed construction. Both structural and nonstructural (vegetative) measures would be designed, implemented, and properly maintained in accordance with BMPs.

Overall site reclamation (which is required by FDEP with or without implementation of the proposed project, and is a State of Florida process separate from the EIS process) would be performed to restore the approximate premining hydrologic boundaries between the South Prong Alafia River, Payne Creek, and Little Payne Creek watersheds. The post-reclamation on-site acreages within these watersheds would be within 1.8 percent of premining acreages. No structures would be constructed either within streambeds or floodplains of the existing off-site drainage systems of Little Payne Creek, Payne Creek, or South Prong Alafia River. Construction of the cooling reservoir, plant facilities, and overall site reclamation activities would have a minor effect on surface hydrology based on long-term modeling predictions. Approximately 1,100 acres of the site would have runoff controlled by the proposed cooling reservoir and other water retention areas instead of more natural runoff patterns planned for other reclaimed areas on the site.

Site preparation and facility construction activities would have short-term effects on groundwater in the surficial aquifer within and adjacent to the site due to temporary dewatering activities. Dewatering would last for approximately one year and is not expected to adversely impact on-site and off-site groundwater resources. Drawdown in off-site areas directly adjacent to dewatering activities would be 5 feet (ft) or less for all land uses, except for under the clay settling ponds south of the site that would experience approximately 10-ft drawdowns (permission has been obtained from landowner in accordance with SWFWMD requirements). Essentially no water from the surficial aquifer would be lost since dewatering water would be retained on site in subareas not actively under construction. Potential dewatering effects on the surficial aquifer would be generally offset by the increased infiltration from adjacent storage areas.

The proposed main power plant facilities would be primarily constructed on lands disturbed by associated mining activities. Existing soils would likely be converted to Arents-Urban Land Complex soil association as a result of the proposed construction. The existing soils are not considered prime farmland. No adverse impacts to on-site topography is anticipated since the re-establishment of premining watershed divides would occur.

Biological Environment--Consideration of any impacts to the biological components of the environment due to construction of the proposed project would be tempered by the fact that the majority of the site currently consists as a damaged ecosystem due to the mining of phosphate ore. The proposed main power plant facilities, including the cooling reservoir, would occupy approximately 1,090 acres of land within the eastern portion of the property. This area includes 253 acres of USACOE jurisdictional wetlands. Compensation for this projected wetland loss would be made by Tampa Electric Company by the proposed implementation of project mitigative measures (wetland

enhancement/creation) that together with site reclamation measures would result in an overall net increase in open water/wetland habitats compared to premining and existing conditions and would help restore site biodiversity.

Construction activities such as clearing of vegetation from the power block area and the transmission line corridor would have impacts on resident wildlife. Species that are mobile may be able to relocate to other suitable nearby habitats if ecological carrying capacities permit. Those species that are not mobile would be lost. Noise from construction equipment is expected to have only transitory effects on wildlife.

No threatened or endangered species or species of special concern are expected to be significantly impacted by the proposed construction activities. Wetland species such as herons, egrets, ibis, wood stork, sandhill crane, limpkin, and round-tailed muskrat can be expected to experience temporary displacement during construction. Although Tampa Electric Company's preferred project site is within the range of the gopher tortoise and potential commensals such as indigo snake, pine snake, short tailed snake, and gopher frog, these species are generally not expected in areas scheduled for the proposed power plant development due to the general absence of favorable habitat.

Socioeconomic Environment--Construction of the proposed project should have positive socioeconomic impacts including increased employment opportunities, payrolls, and tax base. Increased demands on community services and housing should be minimal. Construction impacts to surrounding land use are expected to be minimal based on the predominance of phosphate mining activities in the area. The proposed northern transmission line corridor is not expected to have significant impacts on adjacent areas and land use. Analysis of construction-related transportation impacts indicates that impacts would be temporary and would not result in unacceptable level of service (LOS) ratings for roadway links and intersections in the vicinity of the site.

Proposed site preparation and construction activities would involve the use of heavy equipment producing continuous daytime noise. Construction-related noise can be divided into the following stages: (1) site preparation and excavation; (2) foundation preparation and pouring; (3) steel erection and equipment installation, and (4) site cleanup and plant start-up. Based on recent literature, the first two stages can be expected to produce noise levels up to 95 decibels (dB) at 50 ft. The highest noise levels (97 dB at 50 ft) are expected to be produced by diesel locomotives. Rail deliveries are estimated to range from 12 to 30 rail deliveries (or a total of 24 to 60 trips to and from the site) on an infrequent basis during the construction of the IGCC unit and less frequent during future construction phases. The site preparation and steel erection stages are expected to produce the highest levels of continuous daytime noise. Due to the distance (1.6 miles) between the plant site and the nearest residence, the construction noise levels would be attenuated to an average-hour equivalent $L_{eq(1)}$ (the averaged hourly noise measurements) of between 40 and 35 dB at the nearest residence. This project construction contribution would be below the existing $L_{eq(24)}$ level of 51.7 dB at this residence. Steam

line blow-out activities during the plant start-up phase would produce a significant maximum instantaneous noise level of between 85 to 80 dB at the nearest residence, which represents a noticeable increase from background noise levels would likely create a "startle effect" to nearby human and wildlife receptors. Tampa Electric Company will publish advance notice of the steam line blow out activities in area local newspapers to minimize inconvenience due to these activities.

During the construction phase of the proposed facility, Tampa Electric Company would implement a health and safety plan to promote accident prevention through compliance with the Occupational Safety and Health Administration (OSHA) standards. The project safety and health plan would include key components which are designed to minimize accidents and to maximize workers health and safety during the construction phase.

Human health risk from radiation exposure during construction is negligible due to the absence of phosphogypsum on the site. Phosphogypsum is a waste by-product from the processing of phosphate ore into phosphoric acid and becomes enriched with radium-226 (Ra^{226}) and radium-228 (Ra^{228}). No phosphate ore was processed on the PLK-A site and the site was not used for disposal of phosphogypsum from any off-site processing facilities.

Operation-Related Impacts

Physical Environment--Air modeling results indicate that the operation of the proposed Polk Power Station would not cause or contribute to a violation of any air quality regulations including consumption of PSD increments or National and State of Florida Ambient Air Quality Standards (AAQS). Furthermore, the results of a No-Threat Level analysis indicate that public health in Polk County and adjacent counties would not be jeopardized with respect to direct human inhalation of air emissions from the proposed project operations. Based on the results of a human health analysis, the total cancer risk for individuals due to direct human inhalation of the proposed project air emissions is 1.8×10^{-6} (or 2 persons per one million persons).

Hydrologic impacts should be primarily beneficial due to a steady supply of water to headwaters of the Little Payne Creek from the cooling reservoir, and the storm water controls applied elsewhere within the site to reduce peak flood flows. The proposed continuous average discharge from the cooling reservoir would increase the average annual discharge of Little Payne Creek at Fort Green Road from an estimated premining discharge of 8.2 cubic feet per second (cfs) (5.3 mgd) to an average of 11.9 cfs (7.69 mgd). In order to protect water quality in the reservoir and receiving waters, all sanitary and industrial wastewater would be treated in accordance with applicable regulations before discharge to the cooling reservoir for reuse in the facility cooling systems. Water quality modeling results demonstrate that cooling reservoir discharges throughout the year would comply with State of Florida Class III surface water quality standards, except the thermal standard. A mixing zone of 250 ft from the point of discharge would be required to reduce the temperature to less than 3 degrees

Fahrenheit (°F) above the ambient temperature in the receiving unnamed reclaimed lake water body during winter conditions.

The annual average and annual maximum groundwater withdrawal rates for operation of the plant and associated facilities would be approximately 6.6 and 9.3 mgd, respectively. Regional modeling results show an average drawdown of approximately 4.5 ft would occur at the site boundaries, which is in compliance with the SWFWMD requirements of less than a 5-ft drawdown at property boundaries. Therefore, the proposed groundwater withdrawals and associated drawdowns are not expected to affect other water users in the site vicinity. Impacts to water quality in the Floridan or intermediate aquifers are not anticipated from the proposed project operations due to the presence of confining layers between these aquifers and the overlying surficial aquifer and the fact that water in the proposed cooling reservoir would meet applicable FDEP Class G-II standards, with only minor exceedances of secondary drinking water standards. Iron and color concentrations in the reservoir would exceed secondary drinking water standards; however, the concentrations are below ambient levels in the surficial aquifer.

Biological Environment--Potential adverse effects to local or regional terrestrial and wetland vegetation resulting from plant operation are not anticipated since air emissions and water discharges would be in compliance with applicable AAQS and water quality standards. Groundwater withdrawals from the Floridan aquifer are not expected to result in drawdown of the surficial aquifer and, therefore, would not cause changes to terrestrial or wetland habitats.

During operation of the proposed Polk Power Station, pollution prevention and Best Available Control Technology (BACT) procedures would be implemented to minimize air emissions deleterious to biota. Both SO_2 and NO_x emissions would be below threshold injury levels for native vegetation and agricultural crops reported in various scientific studies. Emissions of air toxics including metals within a 10-kilometer (km) radius would not cause significant risk to wildlife based on assessments using FWS contaminant hazard review information. Mercury deposition and entrance into the food chain has become an emerging environmental problem in Florida. Bioconcentration of this metal has been observed in aquatic ecosystems placing wildlife dependent on fish at risk from mercury toxicity. The proposed Polk Power Station is predicted to emit 0.000177 $\mu g/m^3$ of mercury as an annual maximum concentration. Using the ISCLT2 air quality/deposition model the mercury concentration in the unnamed, reclaimed lake east of the main power block is predicted to be 0.0045 µg/L, a concentration below the 0.012 µg/L Florida Class III water quality standard. However, fish bioconcentrate mercury and wildlife foraging on contaminated species are at risk from metal toxicity. For this reason an ecological analysis was completed for this FEIS using the southern bald eagle as the receptor species to mercury exposure. The results of this analysis showed that uptake of this metal through foraging on fish to be within acceptable bioaccumulation levels. Data are insufficient to make a determination for other resident-at-risk species from mercury emissions.

The previously mentioned, unnamed reclaimed lake leading to Little Payne Creek would receive an average of 3.1 mgd of water discharged from the cooling reservoir. Based on water quality modeling results, the discharges from the cooling reservoir are predicted to meet State of Florida Class III surface water quality standards. Therefore, no adverse biological impacts are expected outside of the thermal mixing zone in the reclaimed lake or in any off-site waters.

Socioeconomic Environment--As with construction, the proposed project operations would have positive socioeconomic impacts. At the proposed project build-out, 210 persons would be employed, the majority of which are expected to be drawn from the local labor pool. The total cumulative annual operational payroll is estimated to be approximately $109 million (in 1992 dollars) from 1995 to 2010. Ad valorem taxes generated by the project for Polk County would increase from $1.9 million in 1996 to $19.6 million in 2011. Operation of the proposed project would not adversely impact any community services or facilities including community water or wastewater systems or local roads. Adequate buffering between the main operating facilities and surrounding land use has been incorporated into the design of the project.

The proposed project is not expected to have significant adverse effects on human health due to direct human inhalation of air emissions from the facilities under the proposed normal operating conditions, since the total individual cancer risk is at the 1.8×10^{-6} level (or two persons per one million persons) and the noncarcinogen exposure level is below the Florida No-Threat Level, given the protective assumptions and models used in this EIS. An estimate of the number of people in the entire affected population that would potentially suffer an increased incidence of cancer due to the proposed Polk Power Station emissions is one additional case every 4,000 years. Cooling reservoir discharge water quality is expected to meet all Class III surface water quality standards; therefore, impacts to human health are considered unlikely through this pathway. The rights-of-way for the proposed transmission lines and the existing transmission lines that would be interconnected would comply with the State of Florida EMF rule (Chapter 17-274, FAC). No adverse human health effects are expected from radiation on the mined land due to the absence of phosphogypsum.

Average noise levels contributed by the operation of the proposed Polk Power Station would be similar to existing noise levels and would be at relatively low noise levels for nearby residences. For example, at the residential area nearest to the power block (one residence at 1.6 miles away), the modeled $L_{eq(24)}$ noise level at full build-out operation is 51 dB $L_{eq(24)}$, which is essentially the same as the measured existing level (51.7 dB $L_{eq(24)}$) and as such would cause only a slight overall noise elevation at that receptor. The calculated $L_{eq(24)}$ levels of plant noise contributions at full build-out at the other nearest residential areas are 51 dB (45 residences at 1.9 miles away) and 40 dB for the most distant residential area considered (53 residences at 4.2 miles away).

Although average noise levels during plant operation are relatively low, the instantaneous maximum noise levels are significant during noise single events. Modeling for the maximum instantaneous

levels for the operation of the plant flare stack showed significant noise levels for intermittent periods compared to the average measured ambient (e.g., 77 dB versus the existing level of 55.4 dB $L_{eq(24)}$ and 75 dB versus 51.7 dB $L_{eq(24)}$ for the existing level at the two nearest residential areas). Flare stack operation is expected to be relatively infrequent, occurring during start-up and shut-down of the CG facilities and during emergencies, totaling some 24 hours per year.

Peak-hour $L_{eq(1)}$ (noise level during peak traffic hour) noise traffic levels due to project coal trucks at full build-out at the residence nearest the edge of the route along SR 674 (85 ft away) is predicted to be 57.5 dB $L_{eq(1)}$ compared to a predicted peak-hour level of 64 dB $L_{eq(1)}$ from existing traffic. However, coal truck noise during pass-bys are calculated to be a significant 86 dB at the nearest residence and 77 dB at the most distant (250 ft away) residence considered. At full build-out, it is conservatively estimated that the proposed project operations would generate 302 total truck trips (i.e., 151 trips entering the site and 151 trips exiting the site) per day for coal and other project truck deliveries (excluding approximately 100 trips per year for general consumables) with approximately 30 total trips occurring during the peak traffic hour. The estimated existing truck traffic on the proposed SR 674 coal delivery route is 47 total trips during the peak traffic hour.

The maximum instantaneous noise levels for coal trains is not predicted to be significant for residences nearest the power block (e.g., 54 dB versus 51.7 dB $L_{eq(24)}$ for the existing level at the nearest receptor), although single events such as whistles could be intrusive. Based on the recent literature, diesel locomotives can be expected to generate noise levels of 97 dB at 50 ft during pass-bys. Train noise is not new to the project area due to phosphate mining activities.

5. Comparison of Environmental Impacts of Project Alternatives

Tampa Electric Company's Proposed Project (Preferred Alternative With DOE Financial Assistance) was compared to Tampa Electric Company's Alternative Power Resource Proposal (Without DOE Financial Assistance) relative to potential environmental impacts. Under the Alternative Power Resource Proposal, the proposed 260-MW IGCC unit and two 75-MW CTs would be replaced by a 500-MW pulverized coal (PC) with flue gas desulfurization (FGD) generating unit. Primarily due to the resource requirements and effectiveness of pollution control and minimization measures associated with the proposed IGCC unit, the proposed project is expected to create less potential environmental impacts than the alternative proposal with the PC unit. The No-Action Alternative would generate no project-related operational impacts, although FDEP-required reclamation activities would be needed for the proposed site even if the No-Action Alternative was selected.

Physical Environment

The Alternative Power Resource Proposal PC unit would result in higher SO_2 emissions and greater than two times higher NO_x emissions than an equivalent IGCC unit. Particulates would also be higher with the Alternative Power Resource Proposal. Therefore, the Alternative Power Resource Proposal

would result in significantly greater potential air quality impacts than the proposed project, although the potential impacts could also comply with applicable air quality regulations with the use of appropriate BACT measures.

The larger coal, limestone and solid by-product storage areas and the larger main power plant area needed for the Alternative Power Resource Proposal would result in increased storm water runoff. Process water demands and the resulting water quality in the cooling reservoir are expected to be equivalent with the proposed project or alternative proposal. The Alternative Power Resource Proposal would result in greater cooling water needs and a significantly larger reservoir area, which would result in additional discharges to receiving waters; however, the increased discharges would not be expected to cause a significant hydrologic impact. The greater groundwater pumpage required for the Alternative Power Resource Proposal to provide for cooling reservoir makeup might result in unacceptable drawdowns at the property boundaries and a larger withdrawal in the SWFWMD Water Use Caution Area (WUCA).

Biological Environment

The Alternative Power Resource Proposal would result in greater impacts to terrestrial ecosystems than the proposed project, due to the increased land acreages required for coal and product storage, increased cooling water requirements, and increased air emissions. Compared to the proposed project, no significant increase in potential impacts to off-site aquatic systems are expected with the Alternative Power Resource Proposal.

Socioeconomic Environment

Demographic, economic, and community service impacts from the Alternate Power Resource Proposal would be equivalent to those resulting from the proposed project. Operational employment would parallel the proposed project; however, peak construction employment would be greater with the proposed project. Consistency with land-use plans and zoning ordinances would not change with the Alternative Power Resource Proposal. Intermittent noise from the flare stack would be eliminated with the Alternative Power Resource Proposal since the PC alternative would not require a flare stack. However, compared to the proposed project, there would be an increase in noise with the Alternative Power Resource Proposal due to increased truck or rail traffic to deliver coal and limestone and remove solid waste by-products.

In summary, Tampa Electric Company's Proposal Project (Preferred Alternative With DOE Financial Assistance) with the 260-MW IGCC unit would have several environmental advantages relative to Tampa Electric Company's Alternative Power Resource Proposal (Without DOE Financial Assistance) which would include a 500-MW PC unit. The advantages of the proposed project include the need for less land area for the main plant facilities and coal and by-product storage; a smaller cooling reservoir area and lower groundwater makeup and surface water discharge requirements; lower SO_2, NO_x, and PM air emissions; and lower coal usage which in turn would require fewer truck/train deliveries.

Implementation of the No-Action Alternative would result in avoidance of environmental impacts resulting from the proposed project operations.

6. Cumulative Impacts

Cumulative impacts were assessed for construction and operation of the proposed Polk Power Station including other existing and proposed facilities in the site area. These assessments included cumulative consequences to the physical, biological, and socioeconomic resources of southwestern Polk County and the region. Based on the results of mathematical modeling and other analyses for full build-out of the proposed 1,150 MW facility, cumulative impact assessments were made for air quality, surface and groundwater quality, aquatic and terrestrial ecology, noise, land use, transportation and secondary induced impacts from construction and operation of the proposed facility. Cumulative impacts from air emissions relate to human health and ecological issues. The human health analysis based on maximum air emissions showed that the proposed Polk Power Station would account for two additional cases of cancer per one million persons per year from direct inhalation of air emission pollutants. No significant adverse impacts are expected to affect flora or fauna, including federally and state-listed species. Greenhouse gas emissions from the facility would represent approximately 0.041 percent of the total fossil fuel carbon emissions produced in 1985 for energy production in the United States. Tampa Electric Company has also instituted conservation efforts to reduce greenhouse effects through a mix of education, conservation, and load management programs designed to reduce both the customers' current energy usage and, over the long term, the customers' energy costs.

Other cumulative ecological impacts relate to surface and groundwater. The proposed loss of approximately 253 acres of USACOE jurisdictional wetlands would represent potential cumulative impacts that would be mitigated by the proposed wetland mitigation and by reclamation plans. The discharge of 3.1 mgd from the cooling reservoir ultimately into Little Payne Creek may be beneficial by supplementing low-flow conditions in Little Payne Creek. Potential cumulative effects from groundwater withdrawal would include the reversal of potentiometric gradients in coastal areas, upward movement of poor quality water from deep parts of the aquifer, reduction in lake levels and loss of habitat. The potential cumulative impacts from the average 6.6 mgd withdrawal would not create adverse impacts and would be further addressed through the implementation of water reuse and recycling and minimization of water consumption.

Cumulative impacts from noise, transportation and other socioeconomic parameters including secondary induced impacts were also considered. Plant noise from construction and average operation should not generally elevate levels above average ambient levels. However, intermittent steam blow out, flare stack, and truck/train pass-by-noise are single events that can be expected to be intrusive to nearby human and wildlife receptors. While the proposed project at full build-out would have some operation-related impacts, all existing roadway links and intersections are expected to operate at an acceptable LOS. Employment opportunities for local residents would increase as a result of

construction and operation of the proposed Polk Power Station. Tampa Electric Company would institute training coursework within the local community college curriculum for those residents interested in employment. The construction and operation of the Polk Power Station can be expected to secondarily support additional population growth and economic development in the region. Accordingly, developments resulting from this secondary or induced growth can be expected to create additional potential impacts in the region such as air pollution, soil erosion, water use and wetland losses.

7. Impact Avoidance, Minimization, and Mitigative Measures for Tampa Electric Company's Proposed Project (Preferred Alternative With DOE Financial Assistance)

In the development of plans for the proposed Polk Power Station project, Tampa Electric has incorporated several impact avoidance and pollution prevention features or measures. These measures started with the previously discussed site selection study. The site selection process provided a systematic analysis and comparison of possible sites to balance the needs of the Tampa Electric Company system and avoidance of as many environmental impacts as possible. Additional efforts and best management practices (BMPs) by Tampa Electric Company to avoid impacts and minimize pollution due to the proposed power station are as follows:

- Implementation of existing conservation, load management and cogeneration programs to meet a significant portion of its power resources needs to limit the construction of new power plants, thereby avoiding impacts of the additional plants
- Selection of a proposed site which has been already highly impacted by phosphate mining activities to avoid potential impacts to an undisturbed "greenfield" land area
- Use of DOE CCT for Polk Unit 1 to reduce emissions of metals, acid gases, and organics from use of coal as a fuel source by treatment of the syngas before combustion to remove potential pollutants
- Directions to design engineers to review ongoing design efforts and to modify designs and systems which could decrease impacts by pollution prevention or measures to avoid impacts
- Extensive reuse of water in the proposed gasification facilities and extensive treatment of the wastewater to avoid discharges of potentially contaminated water
- Construction of the cooling reservoir in mined-out areas as a primarily below grade facility to reduce groundwater withdrawals and to avoid potential impacts due to unexpected berm failure
- Use of enclosed silos for coal storage to avoid potentially contaminated storm water runoff and leachate from open coal piles and to minimize fugitive coal dust emissions
- Use of lined material storage areas (i.e., slag and brine storage areas) with storm water runoff collection and leachate collection and treatment systems to avoid potential contamination impacts to groundwater and surface water

- Conversion of waste sulfur compounds removed from the syngas to a saleable H_2SO_4 by-product with productive off-site uses to avoid the need for permanent storage facilities
- Selection of a route for coal trucks between Big Bend Power Station and the proposed Polk Power Station that passes through primarily industrial and rural land uses to avoid potential impacts to residential areas
- Use of specially designed trucks for coal delivery with aluminum covers to avoid fugitive dust emissions during transport
- Siting of facilities within the proposed site to avoid potential impacts to sensitive environmental resources such as high-quality wetlands

In addition to these measures, Tampa Electric Company would implement other BMPs and pollution prevention and avoidance plans during construction and operation of the proposed Polk Power Station. These plans would include:

- BMPs and pollution prevention conditions in accordance with the requirements of the EPA draft NPDES permit
- A construction-dewatering monitoring and mitigation plan and operational groundwater monitoring plan
- Spill prevention control and countermeasure (SPCC) plan
- Resource conservation and recovery act (RCRA) contingency plan

Construction-Related Impacts

A number of measures would be employed to minimize many of the proposed project potential construction impacts. Fugitive dust emissions from the proposed construction activities would be minimized by using dust suppression controls including paving roads and applying water to roads and other exposed surfaces as needed. Emissions from open burning would be limited by removing materials that would produce excessive smoke (i.e., green vegetation), and by complying with applicable state and local regulations.

A PPP including construction BMPs for sedimentation and erosion control would be implemented to minimize impacts to on-site and off-site surface waters. During construction, inactive subareas of the cooling reservoir and areas to be reclaimed as wetlands would be used to retain storm water runoff and dewatering water on site. Swales would be constructed to convey construction site runoff to the inactive subareas or to sedimentation basins. Tampa Electric Company would also use ground cover techniques (such as seeding) to control erosion and sedimentation. As needed, additional erosion control BMPs would include construction of temporary perimeter berms, use of rip-rap, staked hay bales, silt fences, diversionary berms or swales.

Potential impacts to the surficial aquifer from dewatering drawdown would be reduced by retaining withdrawn water on site. Tampa Electric Company would also implement a SWFWMD-required

dewatering monitoring and mitigation plan which would involve the installation of monitoring wells to determine if off-site drawdowns occur and, as needed, rim ditches to recharge the surficial aquifer.

Following construction, natural functions of the premining habitats would be restored or enhanced through the proposed reclamation plans for the site. The premining land forms on the site (primarily pine flatwoods/pine plantation, oak/pine woods, hardwood hammock, mixed swamp, hardwood swamp, freshwater marsh, shrub and brushland, grassland, mixed rangeland, lakes, citrus groves, and pastureland) would again be present.

The proposed development/reclamation/mitigation plan would result in a net increase of approximately 187 acres of wetlands on the site compared to premining conditions. Tampa Electric Company proposes to fill a total of approximately 253 acres of USACOE jurisdictional wetlands (212 acres of phosphate mine cuts and 41 acres of highly stressed wetlands) for construction of the proposed power station. As compensation for these wetland losses, Tampa Electric Company would create or enhance 168.41 acres of wetlands (see Table E-2). This proposed mitigation is subject to USACOE and other resource agencies review and approval.

The wetlands to be created/enhanced on site per project mitigation and the wetlands to be reclaimed on site from mined land per site reclamation are planned to remain as wetlands through the 2010 planning horizon. As the owner of the proposed site, Tampa Electric Company has no plans to change these parcels during or after this plan period. It should also be noted that if a change in use is desired at some point in the future by any party, it would be subject to public scrutiny through the regulatory review and permitting process.

Construction vehicle/machinery noise impacts during construction would be minimized by ensuring that machinery is only operated according to design specifications and only during daytime working hours. For steam blow-out events during the final construction phase, advanced notice will be published in local newspapers. Tampa Electric Company also will provide a special toll-free telephone number (1-800-282-4667, Extension 34269) to receive public comments regarding plant construction activities.

If the proposed project is implemented, Tampa Electric Company would construct certain geometric improvements at the intersections of site driveways and SR 37 and Fort Green Road to accommodate project construction and operational workforces. Entrances to the power station would be designed with appropriate deceleration, acceleration, and turn lanes, based on Florida Department of Transportation (FDOT) standards. If the proposed project is constructed, Tampa Electric Company will repair and maintain entrance areas to the site as necessary.

Table E-2. Project Wetland Mitigation and Site Reclamation Acreages Proposed by Tampa Electric Company

Mitigation/Reclamation	Wetland Type: Forested (acres)	Herbaceous (acres)	Total (acres)
Project Wetland Mitigation (for USACOE)*			
Wetland Creation	62.69	63.58	126.27
Wetland Enhancement	18.94	23.20	42.14
Total Wetland Mitigation†	81.63	86.78	168.41
Site Reclamation (for FDEP)			
Premining Wetlands (total site)	335	277	612
Required Wetland Reclamation (mandatory lands)	283	260	543
Proposed Wetlands After Reclamation† (total site)	371	428	799
Proposed Increase in Wetlands Over Premining Conditions	36	151	187

* Mitigation for SWFWMD jurisdictional wetlands are included in the USACOE wetland mitigation acreages. Tampa Electric Company proposes to fill 253 acres of USACOE jurisdictional wetlands.

† The "Total Wetland Mitigation" acreages (e.g., 168.41 acres) are included in the "Proposed Wetlands After Reclamation" acreage totals (e.g., 799 acreages).

Sources: Tampa Electric Company's Joint Application for Works in the Waters of Florida (see Appendix C of this EIS).
TEC, 1992a

Operation-Related Impacts

The operation of Tampa Electric Company's proposed project would result in potential environmental impacts. However, these potential impacts would be minimized by the use of state-of-the-art impact control technologies in all project phases.

To minimize potential air quality impacts, Tampa Electric Company would implement BACT measures in the proposed project wherever feasible to reduce combustion, process, and fugitive emissions. Use of the IGCC unit represents the most efficient technology for producing electricity from coal. The IGCC and stand-alone CT and CC units would also use BACT for control of potential pollutants and emission sources. Use of low-sulfur and low-ash fuels would minimize emissions of SO_2 and particulates. Coal handling and slag systems would be designed to effectively control fugitive emissions of PM. The coal dust control system would involve the use of a combination of controls, including railcar and truck unloading in an enclosed building, coal storage in silos, enclosure of certain coal conveyors, baghouse particulate control at transfer points, and wet grinding in the rod mills. Slag would be transported wet to minimize or eliminate potential fugitive dust emissions.

Two potential sources of impacts to surface waters during operation are storm water runoff and wastewater discharges. The proposed cooling reservoir would be designed to minimize discharges to surface drainage systems. The reservoir would minimize the potential for downstream flooding impacts by acting as a storage basin for runoff in addition to the other proposed storm water retention basins on the site. Potential impacts from storm water runoff would be minimized by implementation of a storm water management plan consistent with SWFWMD and FDEP requirements. Potential wastewater discharge impacts would be minimized through appropriate treatment of process water prior to discharge to the cooling reservoir.

Impacts to groundwater resources could result from groundwater drawdown through consumptive use or contamination from effluent discharge or leachate. The proposed cooling reservoir design minimizes makeup water requirements and withdrawal drawdown impacts to the Floridan aquifer and prevents significant water quality impacts to the surficial aquifer resulting from reservoir seepage. In order to prevent or manage potential spills from the chemical handling and storage areas, a preliminary SPCC plan, a preliminary RCRA contingency plan, and a BMP plan have been developed by Tampa Electric Company. The measures outlined in these plans would limit the possibility of an accidental spill actually impacting groundwater.

Tampa Electric Company would consider noise reduction measures a priority as it evaluates equipment and prepares the detailed designs of the plant. In addition to the proposed vegetative buffer along the site boundary, options would include silencers for CT air intakes and the requirement that vehicles on the plant site travel at slow speeds. These proposed measures, in addition to attenuation by distance and a proposed vegetative buffer zone along site boundaries with public roadways, would collectively reduce the noise contributions of the proposed project operations at nearby residential receptors.

Project truck peak-hour noise levels are predicted to be below existing peak-hour traffic noise levels, although pass-by single events would be elevated (e.g., 85 dB $L_{eq(1)}$ at the nearest residence at 85 ft from edge of roadway). It should be noted that the number of residences/people along the considered 250-ft corridor along the proposed coal delivery route within the 5-mile project radius is relatively sparse (five residences), truck traffic is not a new noise along the proposed route due to existing phosphate mining, and Tampa Electric Company will also provide a special toll-free telephone number (1-800-282-4667, Extension 34269) to consider public comments regarding plant operation activities. Further minimization of project truck noise would be difficult since the truck delivery route is off the site. However, truck delivery scheduling may be one option for Tampa Electric Company to consider to minimize nighttime disturbance.

Site Reclamation

In addition to the previously described project mitigation for the loss of USACOE jurisdictional wetlands proposed by Tampa Electric Company, FDEP-required reclamation measures would also be implemented for the site. The proposed wetland mitigation/reclamation/development plan for the proposed Polk Power Station site would result in 799 acres of wetlands after reclamation of the site is completed. The 799 acres of wetlands represent a net increase of 187 acres of wetlands relative to site premining conditions. Although the FDEP-required site reclamation is a separate State of Florida process from the previously described project wetland mitigation, project wetland mitigation will be considered toward site reclamation, so that the mitigated acreage (168.41 acres) is included in the total site reclamation wetland acreage of 799 acres (see Table E-2). Further, even though the existing and premining wetlands on the site were not FDEP jurisdictional, Tampa Electric Company has committed to planting densities, success criteria, and monitoring requirements for reclaimed wetlands which exceed the typical FDEP mined land reclamation requirements.

8. State of Florida Site Certification Process Summary

The previously discussed State of Florida site certification process for this proposed project generally paralleled the EPA EIS process. It is a related but separate process from the EIS NEPA process. Consistent with the PPSA, the site certification process included (1) Tampa Electric Company filing an SCA with FDEP (July 30, 1992), (2) the state coordinating with EPA and other agencies during SCA review, (3) FDEP preparing an SAR, including the conditions of certification, (4) the state conducting the administrative hearings for certification (October 13, 1993), (5) the state hearing officer filing a recommended order (November 30, 1993) and State Governor and Cabinet (Florida Power Plant Siting Board) approval of the recommended order, subject to specific conditions of certification (January 25, 1994), which then became the final order, (6) the state approving the Final PSD Determination, which includes the PSD permit (February 24, 1994) for the 260-MW Polk Unit 1, and (7) the state approving the proposed site reclamation plans (approved in conjunction with approval of the recommended order) for site "PLK-A," which has been purchased (December 31, 1993) by Tampa Electric Company.

9. Resolution of Draft EIS Unresolved Issues

The unresolved issues at the DEIS stage either have been resolved or mechanisms to resolve them have been established. The unresolved issues at the DEIS stage primarily pertained to DOI-requested air quality depositional modeling, USACOE Section 404 dredge-and-fill permitting, and NEPA compliance with federal, state, and/or local agencies for several proposed linear facility alignments (i.e., transmission lines, railroad spur, natural gas line, and possibly fuel oil pipeline).

Air Quality Depositional Modeling

Issue--In response to EPA coordination during DEIS development, DOI indicated concerns regarding potential PSD air quality impacts to the Chassahowitzka National Wilderness Area (NWA) and requested additional modeling using a revised MESOPUFF II model to predict deposition and concentration of sulfate, nitrate, mercury, and beryllium.

Initial EPA Response--EPA's initial response to the DOI concerns was that Industrial Source Complex (ISC) dispersion modeling as opposed to MESOPUFF II modeling had been conducted for the four parameters. Additionally, EPA indicated that EPA had fully delegated the PSD Program to the State of Florida, that beyond the PSD incremental assessment the DOI Federal Land Manager (FLM) at the Chassahowitzka NWA may interpret the proposed power station to have an adverse effect on the environmental criteria for the Class I area, that the State of Florida consequently would be coordinating with the FLM, and that EPA would also consider the need for additional modeling from a NEPA perspective based on the FLM's decision.

Subsequent DOI-FDEP Coordination--Because the PSD Program is now fully delegated to the State of Florida, additional coordination occurred between DOI and FDEP. Relative to the Air Quality Related Values Analysis in a letter to FDEP dated February 14, 1994, DOI expressed concern about cumulative depositional effects of sulfate, nitrate, mercury, and beryllium and about the DEIS analysis not being cumulative for these pollutants. DOI stated, "We need to know: (1) the cumulative deposition of pollutants, and (2) the ecological consequences of this deposition" and "We ask that TECO be required to perform these analyses when they apply for permits for future phases of their Polk Power Station."

EPA's NEPA Resolution--From a NEPA perspective, EPA agrees with the State of Florida that additional modeling to determine potential cumulative depositional effects for sulfate, nitrate, mercury, and beryllium (as well as any other reasonable parameters that may need to be monitored) should be modeled for the proposed additional units beyond the 260-MW Polk Unit 1 (if Tampa Electric Company pursues these additional units and the additional need for capacity above the approved 220 MW is approved by the Florida PSC). Additional coordination should therefore be conducted by Tampa Electric Company with FDEP during the prospective application for such additional units up to 1,150 MW at the Polk Power Station. Based on the February 14, 1994, letter from DOI to FDEP, it

appears that the mechanism for resolving the air quality modeling issue has been established for units beyond the 260-MW and up to the proposed 1,150-MW full build-out for the Polk Power Station.

USACOE Section 404 Permitting

Tampa Electric Company has submitted a dredge-and-fill permit application ("Joint Application for Works in Waters of Florida"), dated July 24, 1992, to USACOE and the State of Florida. A USACOE Public Notice regarding this application was issued by USACOE on October 7, 1992. At the subsequent request of EPA, which independently reviews Section 404 dredge-and-fill permit applications, USACOE has agreed to hold in abeyance Tampa Electric Company's application to fill approximately 253 acres of jurisdictional wetlands until the completion of the EIS NEPA process. More recently, Tampa Electric Company has submitted an update (May 9, 1994) to its original permit application to USACOE, and EPA has provided a comment letter (May 11, 1994) to the USACOE on their Public Notice. The USACOE permitting decision will follow after the completion of the NEPA process.

Pending successful completion of this EIS process, it is expected that USACOE would adopt this EPA EIS as NEPA documentation for any Section 404 permits USACOE may choose to issue. If the EIS is adopted, USACOE would also prepare, as appropriate, its own EIS ROD (separate from EPA's ROD) for its Section 404 permitting action.

NEPA Compliance for Linear Facility Alignments

Since the final alignments for the proposed off-site/on-site transmission lines and natural gas pipeline and the possible off-site/on-site fuel oil pipeline either have not been determined or have not been finalized at this time, additional coordination will be needed by Tampa Electric Company, since alignment finalization would not occur until after completion of this NEPA EIS process. Coordination for these interconnecting linear facilities would need to be made with appropriate federal and state agencies once alignments are finalized. For example, environmental impacts such as potential wetland, cultural resource and endangered species impacts will need to be properly coordinated with USACOE, Florida SHPO, and FWS, respectively. The transmission lines would be required at plant operation start-up while the need for a natural gas pipeline is expected by 1999 as a primary fuel source, and the fuel oil pipeline may or may not be needed. The interconnecting 200-ft railroad spur alignment adjacent to the site has been coordinated on site with the FWS and by telephone with the Florida SHPO; however, the USACOE may wish to review this alignment as part of the 404 permitting process and the Florida SHPO may request more formal coordination in conjunction with the other proposed alignments. The railroad spur would be required during both plant construction and operation.

10. Public Comments at the EPA Public Hearing and on the DEIS

EPA published a Notice of Availability (NOA) for the DEIS in the *Federal Register* on February 25, 1994 (59 FR 9211, EIS No. 940056), which initiated the 45-day public comment period for the DEIS. On March 31, 1994, during the comment period, EPA held a public hearing in Polk County in Bartow, Florida near the proposed project site. The public hearing was held at the Polk County Commission Board Room in the Administrative Building, which was provided for the evening courtesy of Polk County. This hearing was a joint public hearing for the EPA EIS (including DOE's CCT action) and EPA's NPDES permit action. The hearing was announced on February 24, 1994, in the *Polk County Democrat* and the *Tampa Tribune*.

In addition to four EPA representatives and associated personnel (third-party contractor and court reporter), 20 people registered at the public hearing. These attendees consisted primarily of DOE and Tampa Electric Company representatives and their contractors, but also included the public. One public speaker provided verbal comments at the public hearing. This speaker represented the Central Florida Development Council and promoted the proposed project.

Approximately 200 addressees were provided a copy/copies of the DEIS and an additional approximately 80 addressees were provided a copy of the DEIS Executive Summary (only) during the NEPA distribution at the DEIS stage. Nine (9) public comment letters on the DEIS were received by EPA, generally within the 45-day public comment period from February 25, 1994 to April 11, 1994. These letters were received from: U.S. Department of Housing and Urban Development (HUD - Atlanta, GA); U.S. Department of Agriculture (Soil Conservation Service (SCS) - Gainesville, FL); U.S. Department of Commerce (National Oceanographic and Atmospheric Administration (NOAA) - St. Petersburg, FL); Florida Department of State (Division of Historic Resources/State Historic Preservation Officer (SHPO) - Tallahassee, FL); Colorado State University (Documents Department - Fort Collins, CO); Federal Aviation Administration (FAA, Orlando Airports District Office - Orlando, FL); Florida Department of Environmental Protection (FDEP, Southwest District - Tampa, FL); Florida Department of Community Affairs (State Clearinghouse - Tallahassee, FL); and U.S. Department of Health and Human Services (Centers for Disease Control (CDC)/National Center for Environmental Health - Atlanta, GA). Of these, EPA considered comments provided by CDC, FDEP, and FAA as requiring substantive responses. Copies of all nine letters are provided with individual EPA responses in the FEIS. In addition to these comment letters, EPA and Tampa Electric Company corresponded generally throughout the EIS process.

Environmental concerns raised in the nine comment letters included the following:

- Cumulative human health effects of air-deposited pollutants attributable to the proposed Polk Power Station
- Presence/absence of chlorinated dioxins and furans during IGCC coal gasification

- Analysis of indirect human exposure risk due to plant emissions
- Hexavalent chromium levels due to IGCC coal gasification
- Adequacy of groundwater monitoring for the proposed plant
- Quality control of the coal gasification slag by-product, including toxicity characteristic leachate procedure (TCLP) testing and radionuclide levels
- Height of structures and stacks proposed for the plant and FAA permitting for structures greater than 200 ft above ground level
- Site inspection procedures for the proposed plant
- Potential EPA inclusion of more stringent conditions regarding penalties than those contained in the standard Part II NPDES permit language and Florida law
- Potentially linking NPDES permit conditions with final approval and continuance of the proposed DOE cost-shared financial assistance under the DOE CCT Demonstration Program
- Identification and hazardous waste potential of catalysts referenced in the DEIS (vanadium pentoxide)

As in the case of the DEIS stage, EPA has also published an NOA in the *Federal Register* to announce the availability of this FEIS.

11. EPA's Preferred Permit Action

As previously discussed, EPA's "EIS Action Alternatives" for this EIS are to issue, issue with conditions, or deny an NPDES permit for the operation of the proposed Polk Power Station. EPA's preferred EIS Action Alternative is to issue the NPDES permit with conditions, pending successful completion of this EIS process. The conditions of the permit will involve certain limits, conditions, monitoring requirements, and reporting requirements. These permit conditions are intended to evaluate the effectiveness of the proposed pollution control systems. Conditional issuance of the NPDES permit by EPA would allow Tampa Electric Company to operate the proposed Polk Power Station by allowing regulated point-source discharges from the spillway of the cooling reservoir to an unnamed reclaimed phosphate mining lake leading to Little Payne Creek (both water bodies are waters of the United States).

EPA has requested State of Florida certification for the draft NPDES permit. Any more stringent requirements received from the state will be incorporated into the final EPA NPDES permit.

Pending successful completion of this EIS process, EPA will prepare, as appropriate, an EIS ROD for its preferred NPDES permitting action for the proposed project.

12. DOE's Preferred CCT Financial Assistance Action

DOE's "EIS Action Alternatives" for this EIS are to provide cost-shared financial assistance or to deny the cost-shared financial assistance under the DOE CCT Demonstration Program. DOE's preferred action alternative is to provide Tampa Electric Company approximately $130 million in cost-shared financial assistance for the 260-MW IGCC Polk Unit 1 portion of the proposed Polk Power Station, pending successful completion of this EIS process. The $130 million figure has increased from the original $120 million estimate because of additional costs of design changes and improvements.

Pending successful completion of this EIS process, DOE expects to adopt this EPA EIS as NEPA documentation for its preferred CCT cost-shared financial assistance action for the proposed project. As appropriate, DOE would also prepare its own EIS ROD (separate from EPA's ROD) for its proposed action.

13. Post-DEIS Design Changes Proposed by Tampa Electric Company

Project design modifications and improvements proposed by Tampa Electric Company for the preferred alternative, i.e., Tampa Electric Company's proposed project (Preferred Alternative With DOE Financial Assistance), occurred during the EIS process. Relevant design aspects not documented in the published DEIS are incorporated in this FEIS. The preferred alternative documented in this FEIS essentially constitutes Tampa Electric Company's final design proposal, although this remains a somewhat ongoing and dynamic process. The design modifications have resulted in overall design improvements, cost reductions, and general environmental impact reductions. For the purposes of this EIS, the most significant design changes are the proposed use of coal storage silos instead of an on-site coal pile, and the increase in size and hours of operation of the auxiliary boiler.

The shift from a coal pile to the use of coal silos caused several changes in the proposed layout of the plant:

- Use of silos for coal storage instead of open piles requires a smaller area
- Deletion of the on-site rail loop and a change of the truck coal delivery system; maintainance of the proposed on-site rail spur for other deliveries
- Deletion of the coal pile mobile equipment maintenance shop
- Deletion of the coal pile runoff treatment package plant
- Routing of runoff water to sumps in the coal unloading and silo storage areas for use in coal grinding
- Routing of the wastewater filter backwash to the equalization basin instead of the coal pile detention basin

Engineering design considerations and the elimination of the coal pile caused an increase in the size and operation of the auxiliary boiler and a reconfiguration of the layout. Some alterations, such as in the size of the on-site subarea drainage basins, are attributable to one or more changes in the location and size of several components of the proposed facility:

- Increasing the size (49.5 to 120 MMBtu/hr), normal operating hours (1,000 to 3,000 hr/yr), and standby operating hours (0 to 8,760 hr/yr) for the auxiliary boiler
- Deleting of the administration/visitor building, the parking lot, and the associated 0.2-acre storm water detention basin
- Adding 60 operational parking spaces near the general services building
- Reducing the size of the southern construction lay-down area from over 20 acres to approximately 9 acres
- Deleting the brine storage area runoff basin
- Revising the structure dimensions for the 7F HRSG enclosure, SG-C wings 1 and 2, the gasifier, the cold box, the coal grinding day bin, coal storage silos 1 and 2, oil tanks 1, 2, and 3, and the coal delivery enclosure
- Revising the locations of the IGCC HRSG, the auxiliary boiler, and the thermal oxidizer stacks
- Routing the runoff from the substation area to the storm water detention basin instead of to the cooling reservoir
- Increasing the diameter of the discharge pipe from 10 to 18 inches in diameter
- Changing the initial storage cell from a 1-year storage capacity to a 2.5-year storage capacity
- Increasing the fire protection water system from 3,000 to 6,000 gpm and changing the primary source of system water from the service water tank to the cooling reservoir
- Changing the on-site subarea drainage basin sizes
- Routing a small (less than 40 gpm) waste stream from the sulfuric acid plant to the equalization basin
- Decreasing in the use of the HGCU system for the treatment of syngas
- Providing separate stacks for the sulfuric acid plant and the thermal oxidizer and decreasing the size of the thermal oxidizer for the HGCU unit

Although instances of increases in individual environmental impacts due to design changes exist, the design changes are not predicted to result in environmental compliance changes, i.e., aspects of the proposed Polk Power Station did not come out of or into compliance since the DEIS stage due to the proposed design modifications and improvements. However, FDEP may choose to modify the PSD permit for Polk Unit 1 due to certain air quality impact changes, such as an increase in the number of plant emission stacks. Also, the use of Tampa Electric Company's nearby Big Bend plant for coal pile storage beyond the on-site silos would not require a facility modification, but would require an FDEP permit modification, which was pursued by Tampa Electric Company. The permit modification was approved by FDEP on March 31, 1994.

The shift from an on-site coal pile to the use of coal storage silos is predicted to result in the following changes in environmental impacts:

- Reduction of more than 30 acres in the area needed for power plant facilities
- Elimination of leachate materials (particularly metals) from the coal pile in the wastewater system and in the water and sludge produced by this system
- Reduction in anticipated fugitive dust generation and associated particulate matter impacts on air quality
- Use of Tampa Electric Company's nearby Big Bend plant for coal storage beyond the on-site coal storage silos

The increase in size and operating hours for the auxiliary boiler are predicted to result in the following changes in environmental impacts:

- Slight increases (0.3 percent and 1.2 percent, respectively) in ambient air quality impacts from sulfur dioxide and nitrogen oxides
- Slight increase (1.3 percent and 1.0 percent, respectively) in ambient air quality impacts from CO and PM
- Required monitoring of continuous NO_x and opacity on auxiliary boiler emissions

All of the other changes are predicted to have minor influences upon the environmental impacts of Tampa Electric Company's proposal. The cumulative effects of these other changes are as follows:

- The storm water management plan has changed slightly due to the deletion of a small detention basin and minor changes in drainage area caused by other changes in layout.
- The land needed to be developed has been reduced slightly (approximately 30 acres).
- The generation of contaminated waste water has been additionally reduced.
- Changes in stack locations, number of stacks, and building dimensions have resulted in minor changes in air quality impacts.