SECTION 9-A5

PROGRESS ENERGY FLORIDA

CRYSTAL RIVER ENERGY COMPLEX TO BROOKRIDGE

230-kV TRANSMISSION LINE PROJECT

CITRUS AND HERNANDO COUNTIES

JUNE 2, 2008

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ACRONYMS AND ABBREVIATIONS

ACSS/TW	Aluminum Conductor Steel Support/Trapezoidal Wire
AM	amplitude modulation
ANSI	American National Standards Institute
CAFEP	Corona and Field Effects Program
CB	Crystal River Energy Complex Switchyard to the Existing Brookridge substation
CR	County Road
CRAS	Cultural Resource Assessment Survey
CRB	Crystal River Brookridge transmission line
CREC	Crystal River Energy Complex
Cross Florida Greenway	Marjorie Harris Carr Cross Florida Greenway State Recreation and Conservation Areas
dB	Decibels
dBA	A-Weighted Sound Level
EMF	Electric and Magnetic Fields
ERP	Environmental Resource Permit
ESRI	Environmental Systems Research Institute, Inc.
FAA	Federal Aviation Administration
F.A.C.	Florida Administrative Code
FCC	Federal Communications Commission
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDHR	Florida Department of State, Division of Historical Resources
FDNR	Florida Department of Natural Resources
FDOT	Florida Department of Transportation
FFWCC	Florida Fish and Wildlife Conservation Commission
FLUCCS	Florida Land Use, Cover and Forms Classification System
FM	frequency modulation
FMA	Florida Managed Area
FMSF	Florida Master Site File
FNAI	Florida Natural Areas Inventory
FPSC	Florida Public Service Commission
F.S.	Florida Statutes
GIS	Geographic Information System
Golder	Golder Associates Inc.
KCmil	thousand circular mil
kV	kilovolt
kV/m	kilovolt per meter
LNP	Proposed Levy Nuclear Plant Units 1 and 2
MCR	maximum current rating
mG	milliGauss
MHz	Megahertz
NESC	National Electrical Safety Code
NRHP	National Register of Historic Places

OFW	Outstanding Florida Water
OSHA	Occupational Safety and Health Administration
PEF	Progress Energy Florida, Inc.
PPSA	Florida Electrical Power Plant Siting Act
RV	recreational vehicle
SHPO	Florida's State Historic Preservation Officer
SR	State Road
Suncoast 2	Proposed Suncoast Parkway Extension
SWFWMD	Southwest Florida Water Management District
TIITF	Florida Board of Trustees of the Internal Improvement Trust Fund
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
Utility Search Conference	Community Partnership for Energy Planning Utility Search Conference
WMA	Wildlife Management Area

9-A5.0 INTRODUCTION

Florida Power Corporation, d/b/a Progress Energy Florida, Inc. (PEF), is committed to providing safe, reliable, and affordable energy to its customers. PEF provides electric service to 1.7 million customers and a population of more than 5 million people. The company maintains a diverse mix of power generating facility resources to help maintain affordable, efficient, and reliable service when fuel prices and supplies are volatile.

As demand for electricity grows, generation and transmission capability must be prepared to do the same. The proposed Levy Nuclear Plant (LNP), new transmission lines and certain transmission system upgrades are components in PEF's baseload generation plan for serving the increasing load and customer base in the Central Florida region. PEF is seeking certification of the corridors identified in this application pursuant to the Florida Electrical Power Plant Siting Act (PPSA), Chapter 403, Florida Statutes (F.S.) and Chapter 62-17, Florida Administrative Code (F.A.C.). The certification provides for the centralized and coordinated permitting of the LNP as well as the associated facilities, including the transmission lines included in this application. For linear facilities associated with an electrical power plant, such as the proposed transmission line, the PPSA provides for the certification of "corridors," the area within which the associated linear facilities' rights-of-way must be located. Once the rights-of-way for the new transmission line have been acquired, the boundaries of the corridors will be revised to those of the acquired rights-of-way. The remainder of the corridors will then have no further legal significance with relation to this project. Certification under the PPSA is the sole license of the State of Florida and non-federal agency approval of the location of the LNP, associated facilities and transmission corridors and authorizes, in part, construction and maintenance of the transmission line. Section 9-A5 addresses the certification of the corridor for a 230-kilovolt (kV) transmission line from the existing Crystal River Energy Complex (CREC) switchyard in Citrus County to the existing Brookridge substation in Hernando County (CB). This transmission line is also known as the Brookridge transmission line.

9-A5.1 MAPS

The figures included in this application comply with or exceed the standards set forth in the Draft Proposed Rule 62-17.900 (Application Guidelines) dated June 27, 2007[1] related to electrical transmission lines.

9-A5.2 PROJECT DESCRIPTION

9-A5.2.1 Introduction

To identify a corridor for the 230-kV CB transmission line, PEF assembled a corridor selection team consisting of specialists in transmission line design, environmental science, land use planning, system planning, real estate

[1] Pursuant to Sections 403.501 – 518, F.S. and Chapter 62-17, Part I (62-17.011 – 62-17.293), F.A.C.

acquisition, and corporate communications to complete the studies necessary to identify corridors that could be permitted, appropriately balance the various siting criteria, and meet the reliability, safety, and constructability criteria of the company and applicable agencies and organizations.

The multidisciplinary corridor selection team included representatives of PEF's Environmental Services, Engineering, Real Estate, Regional Administration, and External Relations departments; and consultants with expertise in transmission line siting and licensing, ecology, land use planning, Geographic Information System (GIS), engineering, historical and archaeological resources, regulatory and community relations. In addition, PEF's legal staff and outside legal counsel provided guidance during the corridor selection process. The corridor selection team was also assisted throughout this process by PEF's proactive process to inform the public and obtain community input on the planning for transmission facilities associated with the LNP. PEF created the Community Partnership for Energy Planning which is a partnership between PEF and a broad range of stakeholders designed to include all interests within the communities that may be impacted by new transmission lines. Stakeholders involved in the process included local governments, regional planners, land and property owners, environmentalists, agencies for environmental resources, and business among others.

The Community Partnership for Energy Planning Utility Search Conference (Utility Search Conference) and its Community Working Groups, an innovative process designed to create an open dialogue between divergent stakeholders and public interest groups, was utilized as part of the public involvement process. In addition, 13 publicly-noticed open houses were conducted in the ten counties with candidate transmission line corridors and PEF established a Web site to provide the public with the latest news and information on the work of the corridor selection team. Attachment 9-A5-1 summarizes the project's public involvement process.

9-A5.2.2 Corridor Location

The general location of the corridor for the 230-kV CB transmission line is presented in Figure 9-A5.0-1. The width of the corridor ranges from approximately 1000 feet to a mile to provide flexibility in establishing a future final right-of-way. The right-of-way for the 230-kV transmission line will be located within this CB Corridor.

9-A5.2.3 Need for the Project

As Florida's population and energy use continue to grow, PEF is pursuing a balanced solution to meeting future energy demands. That solution includes a continued emphasis on energy efficiency and alternative sources of electricity, as well as investments in new power generating facilities. Because power generating facilities take years to plan and build, PEF is evaluating options for new facilities that will be needed in the future. Through careful planning, PEF

seeks to ensure that Florida has a safe, reliable, and affordable source of electricity.

The demand for electricity in PEF's service territory is estimated to increase by 25 percent over the next decade as a result of population growth, larger homes and more appliances and electronics per customer. Adequate electric system capability ensures reliable power for customers and continued economic stability for the community.

The LNP is a key component in PEF's baseload generation plan for serving the increasing load and customer base in the Central Florida region. In addition to the generation plant itself, construction of the LNP will, among other things, require construction of new transmission lines, including the 230-kV transmission line between the existing CREC switchyard and the existing Brookridge substation, as well as certain transmission system upgrades. Figure 9-A5.0-1 depicts the corridor within which the right-of-way for the 230-kV CB transmission line will be located. Pursuant to Section 403.519, F.S. a Petition for Determination of Need for the 230-kV CB transmission line between the CREC switchyard and the existing Brookridge substation, among other facilities, was filed with the Florida Public Service Commission (FPSC) on March 11, 2008.

9-A5.2.4 Proposed Transmission Line Design Characteristics

The 230-kV CB transmission line will be constructed using single-shaft tubular steel or spun concrete structures, with the capability of accommodating an additional 230-kV circuit. Typical structure configurations anticipated for use on the 230-kV CB transmission line are shown in Figures 9-A5.2-1 through 9-A5.2-9. The structures will be supported with engineered foundations. The tangent structure foundations will normally consist of either direct buried structures with compacted rock or concrete backfill or reinforced concrete drilled pier. The angle and deadend structure foundations will normally consist of either direct buried structures with compacted rock backfill, concrete backfill or a reinforced concrete drilled pier, depending on soil and loading conditions. Structures may also utilize guys and anchors at angle and deadend structures to help support the load. Structures other than those shown may be required to accommodate specific features such as streams, major road intersections and highway crossings, other transmission lines, or other site-specific engineering considerations.

The conductor is anticipated to be a two conductor bundle 954 thousand circular mil (KCmil) Aluminum Conductor Steel Support/Trapezoidal Wire (ACSS/TW) "Cardinal." The maximum conductor operating temperature will be 200°C (392°F) for normal operation and 180°C (356°F) for emergency operation conditions. The maximum current rating (MCR) is 3000 amps. The structures will include one or two overhead ground wires (shield wires). One or both of the shield wires will be standard optical ground wire (fiber optic cable) and will be used for protection and control and other communications. The typical conductor configuration, insulators, and hardware are shown in Figures 9-A5.2-10 and 9-A5.2-11. The conductor profiles for the typical structure configurations are shown in Figures 9-A5.2-12 and 9-A5.2-13. The conductors will be attached to the structures with

braced line post or V-string insulators. The braced line post arrangement is a compressed construction design which minimizes the amount of right-of-way needed. The V-string insulator design allows longer span lengths due to the increased strength of this assembly over the standard braced line post arrangement. Advances in strength capability of the braced line post may allow it to be used in lieu of the V-string assembly and will be determined at the time of detailed design.

The typical span lengths between structures will range from approximately 500 to 700 feet for the braced line post structures and 700 feet to 1400 feet for the V-string structures. The typical structure heights will range from approximately 80 to 170 feet depending upon the structure design used and site-specific conditions. The individual span lengths will be based on the topography of the specific route, the location of the existing structures if the new lines parallel other transmission structures, the width of the right-of-way, and other transmission engineering design parameters.

Although the vertical clearance of the transmission line will vary along the right-of-way, in all instances the transmission line will meet the requirements of the National Electrical Safety Code (NESC) (Institute of Electrical and Electronics Engineering, Inc., approved April 2007) and will have a typical minimum clearance above the ground of 29 feet. Figures 9-A5.2-6 and 9-A5.2-7 show typical conductor clearances for the 230-kV CB transmission line. Clearance will also be provided for operational requirements of regulatory agencies such as over roads and works of a water management district.

Existing roadways, access roads, and structure pads will be used for construction and maintenance access to the transmission line, wherever practicable. In areas where the new transmission line will be constructed adjacent to existing transmission right-of-way, if any, improvements to the associated access roads and/or pads may be made depending on the status of the existing conditions. Where adequate access roads or structure pads do not exist, new roads and pads will be constructed. These roads will be unpaved with a top elevation up to 2 feet above expected seasonal high water and a typical road surface width of 18 feet. Figures 9-A5.2-14 and 9-A5.2-15 present a plan and profile view of a typical access road and typical structure pad. No new bridges are anticipated to be constructed for the 230-kV CB transmission line project.

9-A5.3 CORRIDOR

9-A5.3.1 Corridor Selection

Siting studies were conducted to identify a corridor for the 230-kV CB transmission line. The corridor selection team’s primary focus was to develop the transmission line corridor siting methodology, establish corridor segments and candidate corridors, conduct a systematic evaluation of the candidate corridors, assist in the public involvement process, and identify a corridor for the 230-kV CB transmission line that provides an appropriate balance when considering the siting criteria. The work of the corridor selection team consisted of a sequential

screening and evaluation process which included the establishment of a study area, regional screening and mapping of that study area, selection and evaluation of candidate corridors, and selection of the 230-kV CB Corridor. A summary description of each phase of the corridor selection process is presented in the following sections. The methodology for ranking candidate corridors is also presented.

9-A5.3.1.1 Establish and Define the Project Study Area

Based on the location of the two endpoints of the transmission line, study area boundaries were established that would allow for multiple candidate corridors to be developed between the two endpoints. The 230-kV CB Corridor Study Area is approximately 16 miles (east-west) by 31 miles (north-south) and includes approximately 496 square miles in Citrus and Hernando Counties (see Figure 9-A5.3-1). The study area boundaries are as follows:

North: The northerly boundary is an east-west alignment approximately 2 miles north of the CREC;

East: The easterly boundary is a north-south alignment approximately 5.8 miles east of the existing PEF 500/230/115-kV transmission lines that run north-south between the existing Crystal River East substation and the existing Brookridge substation;

South: The southerly boundary is a east-west alignment approximately 2 miles south of the existing Brookridge substation; and

West: The westerly boundary is a north-south alignment approximately 8 miles west of US 19.

9-A5.3.1.2 Regional Screening and Mapping

Based on environmental and land use features, the regional screening exhibit (see Figure 9-A5.3-2) for the 230-kV CB transmission line was developed to preliminarily identify potentially unfavorable and restricted areas within the study area as well as to identify existing linear facilities that could be considered as co-location opportunities for the 230-kV transmission line in subsequent analysis phases.

Using collected geographic information and the regional screening criteria developed by the corridor selection team, environmental and land use features were identified and input to the GIS database. The features included on the regional screening map are identified in Table 9-A5.3-1. Aerial photography, the regional screening exhibit as well as other data collected by the corridor selection team were used in the candidate corridor identification process.

9-A5.3.1.3 Selection and Evaluation of Corridor Segments

Based on the corridor selection team's knowledge of this part of the State of Florida, experience in previous transmission line studies, and input from the public involvement process, criteria for identifying corridor segments were developed. Those criteria required corridor segments, to the extent practicable, to:

- Maximize co-location with existing PEF transmission lines;
- Maximize co-location with other linear features including arterial and collector roads, major canals, and railroads;
- Minimize locating corridor segments adjacent to existing residential development where no transmission line already exists;
- Minimize the severance of land under common ownership;
- Maximize following previously disturbed alignments (roads, trails, canals, ditches, etc.) through Florida Managed Areas (FMA), wetlands and upland forested areas;
- Minimize river and canal crossings where no crossing (road, railroad, transmission or other utility crossing) already exists;
- Minimize locating corridor segments abutting schools;
- Minimize locating corridor segments abutting community facilities;
- Encourage location close to existing industrial and extractive land uses;
- Minimize location within traditional business districts with concentrations of older or historic buildings; and
- Maintain distance from registered public and private airports consistent with Federal Aviation Administration (FAA) and other applicable state and county regulations.

Candidate corridor segments were identified by applying these criteria to the data collected during the regional screening stage of this project. Those candidate corridor segments were then mapped on aerial photography and, after review and acceptance by the corridor selection team, each of the candidate corridor segments was given an identification number (see Figure 9-A5.3-3). Candidate corridors were developed by linking the candidate corridor segments together to extend between the transmission line endpoints, then entered into a corridor table, given a corridor identification number and carried forward for further evaluation. Some of the corridor segments were included in more than one candidate corridor. The GIS database was used to determine quantitative measurements and other engineering considerations that formed the basis of the cost evaluation for the candidate corridors. The candidate corridors were subjected to a quantitative and qualitative evaluation to determine the transmission line corridors most suitable for construction, operation, and maintenance in a safe, reliable manner considering the environmental, land use/real estate, design, engineering, safety, and cost criteria described herein.

9-A5.3.1.4 Candidate Corridor Review

Available engineering information for candidate corridor review included system maps for the existing PEF transmission lines and other facilities within the study

area, and PEF's general layout drawings for existing and planned substations. The identification and evaluation of ecological, physiographical, infrastructure, land use and cultural resource data were also conducted based on data collected from various federal, state, and local agencies as well as private sources including the following data sources:

- U.S. Geological Survey (USGS) 7.5-minute series quadrangle maps;
- Florida Department of Agriculture and Consumer Services (FDACS) protected species data;
- Florida Fish and Wildlife Conservation Commission (FFWCC) protected species data;
- Florida Natural Areas Inventory (FNAI) element occurrence data;
- Southwest Florida Water Management District (SWFWMD) land use/land cover data;
- Citrus and Hernando County information regarding existing and proposed schools, community facilities, parks, and roadway improvements;
- Citrus and Hernando County GIS databases consisting of property ownership maps, public records, and aerial photography;
- Comprehensive plans, future land use maps, and land development codes for Hernando and Citrus Counties; and
- Florida's Turnpike facility maps.

Systematic land use field reconnaissance was conducted on publicly accessible roads and by helicopter. In the field, the team's land use observations were recorded on the aerial photographs. When 2007 aerial photography became available to the corridor selection team in January 2008, those aerials were compared to the previously marked-up aerials. All of this information, as well as the county property appraiser's records, were added into the project GIS database.

The ecological review of the candidate corridors utilized existing SWFWMD land use/land cover data and FNAI element occurrence data for the study areas. Protected species (flora and fauna), eagle nests, upland forests, forested wetland areas, and herbaceous wetland areas were mapped and entered into the GIS database. Listed species that were not directly observed or identified in the FNAI database, but considered likely to occur based upon available habitat within the corridors, were described and their protected status identified.

Quantitative evaluation was used to eliminate less desirable candidate corridor segments and narrow down the list of candidate corridors to a reasonable number of discrete options for further detailed evaluation. The corridor selection team developed measurable evaluation criteria that reflected the suitability of candidate corridors in terms of environmental and land use resources, project design, engineering, safety, and cost considerations. The use of GIS spatial analysis allowed the corridor selection team to compile, integrate, analyze, and compare all of the land feature data within a study area to meet the technical objectives of the project and to establish relative numerical weights among the data layers for the analysis.

The initial evaluation of candidate corridors consisted of a quantitative measurement of a series of environmental, land use, engineering, safety, and cost criteria. All criteria used in this quantitative evaluation were measurable in terms of actual numbers of units, length or area, and U.S. dollars. The quantitative criteria (see Table 9-A5.3-2) were consistent with the criteria identified in the community involvement Utility Search Conferences (see Attachment 9-A5-1).

Criteria weights were developed by a panel of experts that was comprised of environmental scientists, land use planners, real estate specialists, project managers, and transmission engineers experienced in corridor selection and the multidisciplinary aspects of transmission line facilities. The quantitative criteria weights used in the quantitative evaluation were based on the average quantitative criteria scores generated by each disciplinary group of the panel members after discussion and independent weighting by the panel members. Weights were assigned to each criterion to reflect their relative importance to the overall ranking. The candidate corridors were then ranked based on the weighted composite scores — the lowest weighted composite score quantitatively representing the top candidate corridor.

GIS raw data for each of the candidate corridors was compiled in the GIS database. Wherever a candidate corridor segment was located to encompass one or more existing PEF transmission line, the corridor width was designed to provide adequate space on both sides of the existing right-of-way to allow the alternative of constructing the transmission line on either side of the existing right-of-way. These candidate corridor widths vary depending on the width of the existing transmission line right-of-way but range from 380 feet to 0.5 mile. When considering candidate corridors in areas without existing PEF transmission lines, the candidate corridor widths were set at 0.5 mile to evaluate multiple alternative locations for the transmission lines. The GIS raw data for each segment were analyzed within these variable corridor widths as well as with a consistent 0.25-mile width for each criterion. Both data sets were analyzed with and without cost as an evaluation criterion.

The GIS raw data for each criterion were analyzed for each candidate corridor utilizing these variable corridor widths as well as a consistent 0.5-mile width. Both data sets were analyzed with and without cost as an evaluation criterion. The quantitative evaluation resulted in the identification of a group of high-ranking candidate corridors that were ranked based on the weighted composite scores. The overall weighted composite scores for the highest-ranking candidate corridors and their overall ranking is presented in Table 9-A5.3-3.

Through the quantitative analysis, the majority of the highest-ranking corridors are similar regardless of whether cost was used as a criterion or not. For example, the highest-ranking corridor was the same under either scenario; the top three highest-ranking corridors were the same except that the second and third positions were reversed with and without any cost considerations. The range of scores for the candidate corridors included the low score of 12.5 and a

high score of 74.2. Table 9-A5.3-3 indicates the top-ranking candidate corridors included in the 230-kV CB Corridor.

The corridor selection team eliminated the lowest-ranking candidate corridors from further consideration and grouped the remaining high-ranking corridors into general corridor study areas also known as opportunity areas. The opportunity areas containing these alternatives were reviewed at the Utility Search Conferences. In general, the preferences of the participants of the Utility Search Conference committees were consistent with the results of the qualitative evaluation of the corridor selection team.

9-A5.3.1.5 Qualitative Evaluation

After completing the quantitative evaluation, a comprehensive evaluation was conducted on quantitatively high ranked candidate corridors by the corridor selection team to determine the candidate corridors most suitable for certification based on the environmental and land use considerations, suitability for construction, operation and maintenance, safety, public acceptance, cost, and electric system needs consistent with applicable regulations and PEF's policies. The collected information was also used to assess the effort required and likelihood of meeting environmental standards so that environmental permits could be obtained for the corridor.

This evaluation included information collected during each phase of the analysis supplemented by information received from the public involvement process, site visits and meetings with PEF field personnel experienced in construction, operation, and maintenance of transmission lines, state and local agencies, and the corridor selection team. Individual corridor selection team members as well as the collective corridor selection team in group meetings reviewed information about each of the candidate corridors on paper and conducted visits of the study area both by helicopter and by vehicle. Both GIS and Google Earth software were reviewed utilizing similar data layers and those visuals were compared against the quantitative analysis results. For a discussion of the alternative corridors considered for the 230-kV CB Corridor see Section 9-A5.3.1.6. Input from the Utility Search Conferences was utilized in the corridor selection team's initial evaluation of potential transmission line opportunity areas within the study areas (see Attachment 9-A5-1).

Golder biologists conducted a series of field visits of high-ranking candidate corridors via vehicular and pedestrian surveys. The primary purpose of the field work was to confirm the accuracy of available data, update the data to existing conditions, if required, and to visit specific areas that contain ecological communities which may harbor threatened or endangered species. Habitat classifications and wildlife observations (including listed species observations) were conducted during the site visits.

9-A5.3.1.6 Major Alternative Corridors Considered

Multiple candidate corridors were evaluated for the 230-kV CB transmission line. The candidate corridors from the quantitative analysis for the 230-kV CB transmission line can be generally described by one of four groups, all of which exit the CREC switchyard and traverse east until it reaches US 19. The first group of candidate corridors follows the existing PEF 500/230/115-kV Corridor south and then generally follows either the existing PEF 115-kV Crystal River East - Brookridge (CRB) transmission line right-of-way or the existing PEF 500/230-kV transmission line right-of-way to the existing Brookridge substation. Those candidate corridors that followed the existing PEF 115-kV transmission line right-of-way varied in where they turn to the east to reach the existing Brookridge substation.

The second group of candidate corridors followed the proposed Suncoast Parkway Extension (Suncoast 2) alignment for some or all of its length. The Suncoast 2 project proposed by Florida's Turnpike Enterprise, ties into the existing State Road (SR) 589 (Suncoast Parkway), which ends in Hernando County, and goes through Citrus County to US 19. PEF has been coordinating with the Suncoast 2 project which is in the early stages of design.

The third group of candidate corridors contained segments from both the first and second group of candidate corridors. Each of the candidate corridors included segments along both the proposed Suncoast 2 alignment and one or more of the existing PEF transmission line rights-of-way.

The fourth group of candidate corridors, the smallest number of the four groups, turned south on US 19 and continued in that alignment before turning to the east at various locations before reaching the existing PEF 115-kV transmission line right-of-way. These candidate corridors also varied in where they turned to the east to reach the existing Brookridge substation.

9-A5.3.2 Corridor Description

Locating the 230-kV CB Corridor required extensive data collection and analysis and the exercise of professional judgment by the corridor selection team; balancing land use, environmental, safety, engineering and cost considerations. Based on the quantitative and qualitative evaluation described herein, which included input from PEF and the public involvement process, a 230-kV CB Corridor has been developed to connect the CREC switchyard with the existing Brookridge substation. Figure 9-A5.3-4 depicts the 230-kV CB Corridor and the network of the candidate corridor segments considered.

9-A5.3.2.1 Description of the 230-kV CB Corridor

The 230-kV CB Corridor originates at the CREC switchyard in Citrus County and terminates at the existing Brookridge substation in Hernando County. The overall length of the 230-kV CB Corridor is approximately 38 miles. The 230-kV CB Corridor is co-located with PEF's existing transmission line rights-of-way for most of its length; its width ranges from approximately 1000 feet to a mile.

Corridor width is expanded to a mile as the corridor approaches the two endpoints. The anticipated right-of-way width needed for the 230-kV CB transmission line is approximately 100 feet. The 230-kV CB Corridor sectional maps are presented as Figure 9-A5.3-5 (Sheets 1 of 10). The 230-kV CB Corridor can be described as follows:

CREC Switchyard to Crystal River East Substation

The 230-kV CB Corridor originates at the CREC 230-kV switchyard where the corridor is a mile wide. Portions of the CREC switchyard including the existing transmission line rights-of-way are included in the mile-wide corridor in order to provide flexibility in entering or exiting the area. From the 230-kV CREC switchyard, the 230-kV CB Corridor traverses east for approximately 5.5 miles until turning south near the existing Crystal River East substation. The 230-kV CB Corridor in this section is co-located with the existing PEF 500/230/115-kV transmission line rights-of-way. The 230-kV CB Corridor traverses along the northern edge of the Crystal River Preserve State Park. The predominant land uses within this 230-kV CB Corridor section are mining activities, rural residential, forested, and existing utilities.

Crystal River East Substation to Hexam Road

The 230-kV CB Corridor traverses south from the vicinity of the existing Crystal River East substation approximately 8.4 miles until crossing SR 44. At SR 44, PEF's existing 115-kV transmission line right-of-way splits from the 500/230-kV transmission line rights-of-way to turn in a southerly direction for approximately 21 miles until it crosses Hexam Road. Approximately a mile south of Centralia Road, the 230-kV CB Corridor turns southwest and then crosses Hexam Road. The 230-kV CB Corridor width in this section is approximately 1000 feet, centered on the existing transmission line rights-of-way.

It is anticipated that this section of the 230-kV CB transmission line will utilize the existing PEF 115-kV Crystal River – Brookridge (CRB) transmission line right-of-way. It is also anticipated that the existing 115-kV CRB transmission line structures will be removed and the line will be reconstructed on new monopole structures that will be installed for the 230-kV CB transmission line. Other existing lines on or adjacent to the CRB line will remain.

The predominant land uses within this 230-kV CB Corridor section are rural residential with scattered higher density residential areas, forested areas, lands managed for environmental consideration, and existing utilities. The 230-kV CB Corridor traverses through the Withlacoochee State Forest, Chassahowitzka Wildlife Management Area (WMA), and the Annutteliga Hammock.

Hexam Road to Brookridge Substation

South of Hexam Road the 230-kV CB Corridor turns east and runs approximately 1.7 miles until it terminates at the existing Brookridge substation; this section of

the corridor widens to a mile to allow flexibility as the transmission line enters/exists the substation. The predominant land uses within this 230-kV CB Corridor section are residential, forested, and existing utilities.

9-A5.3.3 Alternate Corridors

PEF is not proposing any alternative corridors for this proposed corridor.

Pursuant to 2008 Florida House of Representatives' Bill 7135, Section 70 (Enrolled 2008), PEF will allow consideration of alternate corridors that may be proposed by other parties for all or portions of this corridor, including alternate substation sites for the two proposed substations. Accordingly, PEF requests that the Florida Department of Environmental Protection (FDEP) use the application processing schedule set forth in Sections 403.521 – 403.526, 403.527(4), and 403.5271 for this corridor, including the opportunity for the filing and review of alternate corridors or substation sites, if a party timely proposes an alternate transmission line corridor route or substation site for consideration. Any party that chooses to propose an alternate corridor or substation site should consult with the FDEP Siting Coordination Office, 2600 Blair Stone Road MS-48, Tallahassee, FL 32399-2400, (850) 245-8002, Attn: Mike Halpin, to obtain guidance on the statutes, rules, and policies that govern the filing of alternate corridors. All information regarding any proposed alternate corridor must be submitted in accordance with the procedures and in compliance with the schedule for submittal of such alternate corridors under Florida House of Representatives' Bill 7135 Section 70 (Enrolled 2008), amending section 403.5064(4), F.S., or on such other schedule established by the Administrative Law Judge assigned to this site certification proceeding.

9-A5.3.4 Access Roads

Access roads are required to provide efficient and safe ingress and egress to the transmission line structures for construction and maintenance of the transmission line. Access roads are generally installed the full length of the transmission line right-of-way. Existing access roads will be used, where available, for construction and maintenance activities associated with the new transmission line. In some areas these existing roads may need to be upgraded for construction and maintenance activities associated with the new transmission line.

Where existing structure pads are utilized for the transmission line, areas will be expanded to encompass the new structure. In areas where new right-of-way is required, new access roads and structure pads may also be required. Figures 9-A5.2-14 and 9-A5.2-15 provide typical access road and structure pad cross sections.

Construction in wetlands begins with installation of silt fences or stacked hay bales along the perimeter of the right-of-way, followed by selective clearing of the right-of-way. Construction of access roads and pads in wetland areas follows the initial clearing and consists of additional silt fence installation along the perimeter of the proposed access road and pads followed by final clearing and grubbing of

the access road and pad areas. Once the area is free of trees and stumps, a geo-textile liner is laid and staked in place. Following the liner installation, compacted clean fill is installed up to about 6 inches below finished grade. The final 6 inches consists of compacted sand and gravel mixture to ensure a stable surface. The final grade of the road and/or pad is generally set up to 2 feet above the seasonal high water line elevation (see Figures 9-A5.2-14 and 9-A5.2-15).

Culverts are added under the access roads in wetlands to maintain flow. A minimum of 2 feet of cover is installed over culverts. The culvert inverts are placed so that the invert elevation is the same as the wetland floor elevation. A combination of 18-inch, 24-inch and 36-inch diameter culverts is typically utilized with the 18-inch diameter pipe used in most cases to limit the depth of fill. Culverts and access roads are designed to equalize the water volume created from a small rainfall event. The culvert's intended use is to maintain normal pool equilibrium. The culvert system is not intended to create a retention or detention area. Under a major intensity rainstorm the water level will flow over the access road. The access road will function as an emergency spillway, thus equalizing the wetland pool.

Where construction of roads is required in upland areas, soil from both sides of the road surface may be used for fill. Bulldozers and/or motor graders will be used. In cases where hauled fill is required, the fill will be spread, compacted, and shaped to the design width and elevations. (See Figure 9-A5.2-15.)

9-A5.3.5 Cost Projections

Cost projections for the transmission line are based on preliminary design data and estimated costs. The cost projections are based on comparable lines of similar voltage constructed in the region along with average real estate costs from Hernando County. The actual costs for the transmission line will depend upon the final location of the right-of-way within the corridor, line length, structure configuration, the number and type of structures, mitigation costs, costs of right-of-way, and other site-specific conditions. The exact location, number, and types of structures needed will be determined following certification of the corridor and selection of the right-of-way.

The estimated cost for transmission line construction, including right-of-way acquisition, right-of-way clearing, access road construction, mitigation, and line installation, ranges from approximately $4 million to $8 million per mile, or a total construction cost of approximately $170 million to $340 million for the 230-kV CB transmission line. Right-of-way acquisition costs may be lower if the transmission line can be built within existing right-of-way. Cost estimates were calculated in current year dollars and then escalated for the year of expected expenditure.

9-A5.3.6 Social and Political Environment of the Corridor Area

9-A5.3.6.1 Governmental Jurisdictions

The 230-kV CB Corridor is located within Citrus and Hernando Counties, Florida. There are no municipalities within 0.5 mile of the 230-kV CB Corridor (see Figure 9-A5.3-6).

There are four state lands (Crystal River Preserve State Park, Withlacoochee State Forest, Chassahowitzka WMA, and Annutteliga Hammock) and one Outstanding Florida Water (OFW) (Crystal River system) within the 230-kV CB Corridor. Within 0.5 mile of the 230-kV CB Corridor there is one greenway (Marjorie Harris Carr Cross Florida Greenway State Recreation and Conservation Area [Cross Florida Greenway]) (see Figure 9-A5.3-6). The properties in the vicinity of the 230-kV CB Corridor that are considered scenic, cultural, and natural landmarks are further discussed in Section 9-A5.3.6.4.

Other federal, state, and local jurisdictional areas that were evaluated but found to be neither in nor within 0.5 mile of the 230-kV CB Corridor: National Parks, National Forests, National Seashores, National Wildlife refuges, National Wilderness Areas, National Memorials, National Monuments, marine sanctuaries, estuarine sanctuaries, Roadless Area Review and Evaluation Areas, National Wild & Scenic Rivers, State Archaeological Landmarks or Landmark Zones, Aquatic Preserves, Florida Springs, Indian Reservations, and Military Lands.

9-A5.3.6.2 Zoning and Land Use Plans

The PPSA, Sections 403.501 to 403.518, F.S., is the State's process for the licensing of large power plants. The PPSA is designed to provide a streamlined multi-agency review and approval process including local governments and coordinated by the FDEP. While most facilities typically need to obtain any number of permits or approvals from local, regional and state agencies, large electrical power plants in the State receive all necessary regulatory approvals through the PPSA process. All procedures for the issuance of local, regional and state permits or approvals are pre-empted by the PPSA, and only one license is issued, called a "certification." A PPSA-certified project may include a power plant's directly associated facilities and the electrical transmission lines carrying the power to the electrical grid. Such is the case for the PEF Levy Nuclear Project. As a result, the licensing is conducted pursuant to the PPSA and applicable FDEP procedural rules. Unless a variance, exemption or exception is approved through the PPSA process, all applicable non-procedural requirements of agencies and local governments are applied to the transmission line via the agency review process and appropriate conditions of certification.

Florida law excludes electrical transmission lines from the definition of "development" that is subject to local government comprehensive plans and the land development ordinances that implement those comprehensive plans. See Section 163.3164(6), F.S, of Florida's Local Government Comprehensive Planning Act, which incorporates the definition of "development" found in Section 380.04, F.S. That statutory definition excludes electrical transmission lines and

other linear utility facilities from the statutory definition of "development." Section 380.04(3)(b), F.S. The 230-kV CB transmission line is covered by this exclusion and is not subject to local land use plans and zoning regulations under Section 403.50665, F.S. Electrical substations are not included in this statutory exclusion.

The following sections describe comprehensive plans, land development regulations and codes of ordinances of the local government jurisdictions through which the 230-kV CB transmission line traverses. Where appropriate, some of these non-procedural requirements may be imposed as conditions of certification for the transmission lines. As stated above, references in ordinances and comprehensive plan provisions to separate approval processes and regulatory permits are not applicable under the PPSA process and are summarized in the following discussion only for the purpose of reflecting the contents of the ordinances or plans.

9-A5.3.6.2.1 Comprehensive Plans

Each Florida county and municipality has adopted a local comprehensive plan to meet the requirements of the Local Government Comprehensive Planning and Land Development Regulations Act of 1985 (also referred to as Florida's Growth Management Act), as presented in Chapter 163, Part II, F.S. and Chapter 9J-5, F.A.C.

The 230-kV CB Corridor has been evaluated relative to the local comprehensive plans of Citrus and Hernando Counties. The following summarizes the policies that may be relevant to the 230-kV CB transmission lines. This information is also presented in Attachment 9-A5-2 as an information source.

Citrus County

The Citrus County Comprehensive Plan identifies public utilities in the Future Land Use Element, Utility Element, and the Conservation Element of the plan. In the Future Land Use Element (as amended through July 2006) Policy 17.14.2 states that public utilities are permitted in all future land use districts including planned residential developments, with the understanding that performance standards are met. In the Utility Element (as amended through July2006) the County recognizes that existing systems may need to be upgraded and transmission lines may need to be extended and/or constructed to meet future demands. The element also states that when new facilities or extension to existing facilities are needed, existing corridors will be evaluated and used whenever possible to minimize environmental impacts.

In the Conservation Element (last amended in July 2006), Policy 3.1.3 states that construction in the vicinity of water bodies or wetland areas must retain a buffer of 15 feet or greater for natural vegetation or 25 feet or greater upland of springs, spring-fed water bodies and open sinkholes; existing topography and vegetation must be retained; runoff should be reduced into adjacent and downstream water with pervious pavement materials; silt screens must be in place between construction or land clearing and the water body or wetland to prevent erosion

and siltation; and vegetation must be retained or replaced with suitable native vegetation to minimize and stabilize erosion and to decrease pollution. Policy 3.1.4 states that the land development code should identify a mechanism for greater setbacks and buffers when environmental characteristics of any area require additional protective measures. Concerning wildlife and habitat, the County identifies the need to maintain a natural balance between ecological communities and increased development. The County will continue to enforce wetland protection regulations and permitting requirements (Policy 3.9.4); continue to enforce regulations and programs for the protection of species listed as endangered, threatened, and of special concern (Policy 3.9.5); request that projects in excess of 5 acres be required to have a biological survey conducted when native vegetative or ecological communities are present (Policy 3.9.8); preserve and protect the native tree canopy and offset the loss of trees due to construction activities; and continue to develop and implement wetland protection standards, permitting requirements, and compensatory mitigation programs (Policies 3.16.1 – 3.16.9).

Hernando County

The Hernando County Comprehensive Plan discusses public facilities in the Future Land Use Element and the Conservation Element of the plan. In the Future land Use Element (as amended through June 2007) Policy 1.01A (2) identifies that land development regulations should establish a Planned Development Project category for public and quasi-public facilities. Policy 1.01T(2) states that infrastructure needs for future development should be provided within areas of facility availability and investment in accordance with long range plans by the County. Infrastructure should be provided within residential, commercial, industrial, and planned development district categories. Policy 1.01U(1) states that the location of major public facilities should be approved only after adequate opportunity has been provided for public review and comment. The County also requests a statement of impacts concerning adjacent natural resources and land uses and how projected impacts could be mitigated or minimized should be provided (Policy 1.01U[2]). The element also identifies that major public facilities should be within a separate zoning district which is allowed in any future land use category with performance standards (Policy 1.01U[4]).

In the Conservation Element (as amended through February 2006) public utilities are identified in two Policies. Policy 6.05A(3) states that the removal, alteration or encroachment within a Class I Wetland will only be allowed in situations where no other feasible or practical alternative exists and where there is an overriding public benefit. An overriding public benefit includes public utility projects that will serve the larger community. Policy 6.06E(2) states that the canopy road ordinance which identifies standards and conditions for facilities and activities (e.g., utility projects) within the canopy tree protection zone should be enforced.

9-A5.3.6.2.2 Future Land Use Categories

The relevant future land use categories for the governmental jurisdictions traversed by the 230-kV CB Corridor are described below for information purposes only. The future land use categories within the 230-kV CB Corridor and extending 0.25 mile from its boundary are depicted on Figure 9-A5.3-7. Attachment 9-A5-2 contains reproductions of the future land use maps of Citrus and Hernando Counties.

Citrus County

Low Intensity Coastal and Lakes – The Low Intensity Coastal and Lakes future land use category is intended to provide for areas with environmental characteristics that are sensitive to development and should be protected. Residential development is restricted to a maximum of one dwelling unit per 20 acres. In addition, the category allows single family developments, multifamily residences, recreational uses, agricultural and silviculture uses, public/semi-public institutional facilities, home occupations, new railroad rights-of-way, communication towers, utilities, commercial fishing and marina related uses, and commercial uses that are water related and dependent when uses are compatible with surrounding uses and development standards are met.

Rural Residential – The Rural Residential future land use category is intended to provide for areas that are in transition between higher density developments and agricultural or conservation uses. The category encourages the preservation of economically viable agricultural land and large tracts of residential land to maintain the rural atmosphere in appropriate areas of the County. Residential densities allowed in the category are up to one dwelling unit per 10 acres. In addition, the category allows recreation uses, agricultural and silviculture uses, public/semi-public institutional facilities, home occupations, new railroad rights-of-way, storage facilities, or related structures, communication towers, and utilities when uses are compatible with surrounding uses and development standards are met.

Agriculture – The Agriculture future land use category is intended to provide for areas that are suitable for crops, pasture, forestry, and rangeland. Single family residences are permitted with a maximum density of one unit per 10 acres. Higher density developments are permitted when development standards are met. In addition, the category allows recreational uses, public/semi-public institutional facilities, and utilities when uses are compatible with surrounding uses and development standards are met.

Transportation, Communication and Utilities – The Transportation, Communication and Utilities future land use category is intended to provide for uses directly related to transportation, communication and utilities. In addition, the category allows service and storage related facilities necessary to support the intended uses.

Industrial – The Industrial future land use category is intended to provide for manufacturing, processing, storage and warehousing, wholesaling, and distribution uses. The category allows uses that include industrial uses or transportation, communication, utilities when uses are compatible with surrounding uses and development standards are met.

General Commercial – The General Commercial future land use category is intended to provide for commercial and office developments. In this category single family and multi-family residential development is permitted when development standards are met. This category will not be located within environmentally sensitive areas of the County due to its intended high density/intensity development.

Residential Mixed Use – The Residential Mixed Use future land use category is intended to provide for integrated planned developments and a mixture of land uses is encouraged. The intended maximum density is six dwelling units per acre.

Medium Density Residential – The Medium Density Residential future land use category is intended to provide for single family residential development with a maximum density of up to four dwelling units per acre. The category represents an urbanizing area and also permits multifamily residences, home occupations, recreational uses, public/semi-public institutional facilities, utilities, professional services and offices (in association with housing developments) and limited commercial uses (in association with housing developments) in this category when uses are compatible with surrounding uses and development standards are met.

Professional Services/Offices – The Professional Services/Offices future land use category is intended to provide for professional office development. The category is intended for very limited uses and buffers areas between commercial and residential development or is intended as a transitional use between residential areas and major thoroughfares. In addition, the category allows recreational uses, public/semi-public institutional facilities, utilities, neighborhood commercial development, adult and child day care centers, and multi-family residential (10 units per acre) when uses are compatible with surrounding uses and development standards are met.

Low Density Residential – The Low Density Residential future land use category is intended to provide for single family residential developments with a maximum density of two dwelling units per acre. In addition, the category allows attached housing, silviculture uses, recreational uses, public/semi-public institutional facilities, home occupations, and utilities when uses are compatible with surrounding uses and development standards are met.

Public/Semi-Public Institutional – The Public/Semi-Public Institutional future land use category is intended to provide for buildings and grounds not designated as Recreation. Uses allowed in the category include public and private educational

(i.e., nature centers), religious, governmental uses, cultural (i.e., art galleries, museums, theaters, playhouses, and libraries), and limited recreational uses (i.e., camps, arboretums, playgrounds, and outdoor ball fields). Public uses refer to those owned or operated by a public entity. Semi-public uses refer to public but owned or operated by a non-public body.

Recreation – The Recreation future land use category is intended to provide for public and private areas where outdoor recreation is the primary land use. In addition, the category allows recreational and supporting ancillary uses such as marinas, golf courses, fishing and hunting camps, and recreational vehicle (RV) parks.

Conservation – The Conservation future land use category is intended to provide for publicly owned lands where management objectives are towards protection and conservation of sensitive land, water, and other natural resources. The category may also be intended for resource-based recreational development, public water supply well-fields and ancillary facilities. Where privately owned land is designated by this category development may not exceed a density of one dwelling unit per lot, parcel or tract of record.

High Density Residential – The High Density Residential future land use category is intended to provide for multi-family residential and planned developments with a maximum density of up to six dwelling units per acre. When additional development standards are met up to 20 units per acre is allowed in the category. When compatible with surrounding area and performance standards are met, the category will also allow the following uses: home occupations, recreational uses, public/semi-public institutional facilities, utilities, professional services and offices (in association with housing developments) and limited commercial uses (in association with housing developments).

Mobile Home Park – The Mobile Home Park future land use category is intended to provide for existing compact, affordable, high quality housing. Typical uses allowed in the category include manufactured housing and mobile home parks. The maximum density allowed in the category is six dwelling units per acre.

Extractive – The Extractive future land use category is intended to provide for surface mining operations (encompassing areas rich in limestone and dolomite). Permitted uses include rock quarries, strip mines (clay, sand and gravel), and industrial complexes (where extracted material is refined, packaged or further processed). In addition, the category allows limited recreation use, agricultural uses, railroad rights-of-way (including switching, freight, or storage yards), communication towers, and single caretaker residences when uses are compatible with surrounding uses and development standards are met.

Hernando County

Residential – The Residential future land use category is intended to provide for areas of existing and perceived growth corridors where development limitations

are minimal and access and infrastructure are good. The category directs intensive growth to areas not designated for protection or utilization of natural resources. Single family developments are allowed with maximum densities of up to 5.4 units per acre. In addition, the category allows resort residences and ancillary uses such as recreation, churches, and community centers. With performance standards met multifamily housing with a maximum density of 16 dwelling units per acre, rural residential, neighborhood commercial, offices and professional, schools, hospitals and minor public facilities are allowed.

Conservation – The Conservation future land use category is intended to provide to retain forests, protected wetlands and areas of wildlife and marine habitat. Uses allowed in the category include timbering, limited resource-oriented recreational activities and up to one residential unit per 40 acres.

Rural – The Rural future land use category is intended to provide for the continuation of agricultural areas and the retention of the rural nature and to limit residential development outside growth or public infrastructure corridors. Uses allowed in the category include agriculture, agricultural commercial, recreation, and residential development with a maximum density of one unit per 10 acres. In addition, the category allows neighborhood commercial, schools, and minor public facilities when designated performance standards are met.

Mining – The Mining future land use category is intended to provide for the extraction of mineral resources where impact on major residential areas is minimal. In addition, the category allows mining activities (excavation of hard rock limerock, soft rock limerock, sand mining and ancillary/accessory activities) and agricultural uses.

Public Facility – The Public Facility future land use category is intended to provide for major public facilities. Uses allowed include well fields, sewage treatment plants, solid waste disposal sites, towers, power transmission lines and power plants. In addition, the category allows limited recreation and agricultural uses by special designation and when adjacent land uses are compatible.

Recreation – The Recreation future land use category is intended to provide for needs of residents and visitors in locations containing natural features or convenient to residents. Uses allowed include private or public recreational uses including lodging, ancillary commercial activity and housing for security purposes.

9-A5.3.6.2.3 Land Development Regulations and Code of Ordinances

Potentially relevant substantive provisions for each of the relevant governmental jurisdictions land use regulations or code of ordinances are summarized and discussed in the following paragraphs. This summary includes local government right-of-way use regulations. PEF will demonstrate compliance with the substantive provisions of these regulations through post-certification submittals to the respective local governments. Separate permits will not be required.

Citrus County

The Citrus County Land Development Code (Chapter 1 General Provisions, Section 1500 Definitions) defines utility, public or private, to exclude electrical transmission and distribution lines. In Chapter 2 Administrative and Legislative Procedures, Section 2030, the County discusses the requirements of development orders and identifies exemptions. In this chapter, essential services are defined as services authorized and regulated by State or National public utility commissions or services owned, franchised or permitted by the County and are permitted in any district. This provision states that electric utility poles and transmission towers must, insofar as possible, conform to the character of the district as to architecture and landscaping and meet all yard, area and similar requirements as identified for each district involved.

In Chapter 4 Mandatory Use, Design Standards, and Development Criteria of the Land Development Code the tree protection and removal requirements are discussed. In Section 4344 of this chapter the installation and maintenance of essential utilities within existing road rights-of-way or within a utility easement do not require a tree removal permit. Outside of existing road rights-of-way, and utility easements for nonresidential development projects, the removal of a tree is prohibited without prior consent from the County, as specified in Section 4346. In Section 4242, the use of rights-of-way for public or private utilities for electric transmission and pole placement is allowed and is typically subject to a right-of-way utilization permit from the County Department of Public Works and is required to follow the placement specification as required by the County.

The Citrus County Code of Ordinances (Chapter 21 Noise, Vibration and Air Pollution, Article II Noise) identifies and discusses noise regulations. As specified in Section 21-20 any person that makes, causes, or allows the making of any noise or sound that exceeds the noise levels presented in this chapter is in violation of this article. Noise is measured in decibels/A-weighted (dBA). Sound levels have been established by land use classification for noise generated across property lines, interior noise within multifamily dwelling units, and maximum instantaneous sound levels.

Noise Generated Across Property Lines		
Receiving Land Use	**Time**	**Sound Level Limit (dBA)**
Residential	Daytime Nighttime	60 55
Government-owned buildings or property (institutional or recreational)	Daytime Nighttime	55 50
Commercial or business	Daytime Nighttime	65 60
Industrial or manufacturing	Daytime Nighttime	75 75
Agricultural	Daytime Nighttime	75 75
Maximum Instantaneous Sound Levels		
Residential	Daytime Nighttime	70 60
Government-owned buildings or property (institutional or recreational)	Daytime Nighttime	65 55
Commercial or business	Daytime Nighttime	75 65
Industrial or manufacturing	Daytime Nighttime	85 85
Agricultural	Daytime Nighttime	85 85
Multi-family Dwelling	Daytime Nighttime	60 50

As specified in Section 21-27, the operation of equipment used in construction work, building, excavation, grading, pile driving, pneumatic hammering, demolition, dredging, building alteration or repair work is typically prohibited between the hours of 10:00 pm and 7:00 am unless prior authorization has been provided by the County. Activities that are exempt from the noise level regulations include the construction, emergency or routine maintenance of public service utilities as specified in Section 21-29.

The 230-kV CB transmission line construction, operation, and maintenance will comply with the Citrus County noise ordinance except as authorized by the County.

Hernando County

The Hernando County Code of Ordinances (Appendix A Zoning, Article I Definitions) identifies utilities as a public service use(s) and structure(s), which are defined as any use or structure necessary for the operation and maintenance of a utility that is regulated or controlled by the city, county, state or federal

government or legally empowered special governmental district. The County has designated a zoning overlay district to be used as a mechanism to allow governmental uses, structures, public service facility uses, and structures in all zoning districts. Public service facility uses and structures include electric transmission lines that are 230 kV or greater (Article II General Regulations, Section 1[77][a]).

The Hernando County Code of Ordinances (Chapter 21 Offenses and Miscellaneous Provision, Article VIII Noise) identifies and discusses noise regulations. As specified in Section 21-133, noise is defined as any kind of sound that exceeds the levels presented in this article. As specified in Section 21-134, sound levels are measured at or within the property line of the receiving land use. Levels have been established by receiving land use and in maximum sound levels.

As specified in Section 21-136 exemptions to the noise level regulations include emergency or routine maintenance of public service utilities and construction activities that occur between 7:00 am and 9:00 pm. Deviations from the noise level regulations are typically granted by the Board of County Commissioners for temporary uses, as specified in Section 21-138.

The transmission line construction, operation, and maintenance will comply with the Hernando County noise ordinance except as authorized by the County.

The Hernando County Code of Ordinances (Chapter 24 Roads and Bridges) identifies and discusses regulations pertaining to county rights-of-way. As specified in Section 24.3 a permit is typically required for any work in or placement of any obstructions within a County right-of-way.

Sound Level Limit (By Receiving Land Use)

Receiving land use	Time	Sound Level Limit (dBA)
Residential, institutional, public space, or recreational district areas measured at the property line Agricultural, agricultural/residential, conservation, or rural district areas for sound level measured at the residence	7:00 am to 9:00 pm	60
	9:00 pm to 7:00 am	55
Commercial district areas	7:00 am to 9:00 pm	65
	9:00 pm to 7:00 am	60
Agricultural, agricultural/residential, conservation, industrial, mining, or rural district areas for sound level measured at the property line	At all times	75

Maximum Sound Level

Receiving land use	Time	Sound Level Limit (dBA)
Residential, institutional, public space, or recreational district areas measured at the property line Agricultural, agricultural/residential, conservation, or rural district areas for sound level measured at the residence	7:00 am to 9:00 pm	70
	9:00 pm to 7:00 am	60
Commercial district areas	7:00 am to 9:00 pm	75
	9:00 pm to 7:00 am	65
Agricultural, agricultural/residential, conservation, industrial, mining, or rural district areas for sound level measured at the property line	At all times	85

The Hernando County Code of Ordinances (Chapter 10 Community Appearance, Article II Landscaping) identifies and discusses the preservation and protection of trees and vegetation within the County. As specified in Section 10-30(b)(3) the installation and maintenance of utilities within existing street right-of-way or within a utility easement is exempt from the requirements of this Article in regards to trees. Section 10-22 specifies that a land clearing permit is typically required prior to any clearing of land within the County.

9-A5.3.6.3 Easements, Title, Agency Works

Easements or other appropriate authorizations will be necessary to cross lands under the jurisdiction of the Florida Board of Trustees of the Internal Improvement Trust Fund (TIITF) and other governmental agencies. Crossing federal highways such as I-75 would typically require approval from the Florida Department of Transportation (FDOT). Other entities that would normally be contacted for permits or approvals to cross existing facilities include state, county, and municipal governments for maintained roads; water management districts; railroads and gas pipeline companies for their facilities. All crossing of

state roads will conform to the applicable specifications in the FDOT's Utility Accommodation Manual (2007).

The 230-kV CB Corridor crosses four state lands (Crystal River Preserve State Park, Withlacoochee State Forest, Chassahowitzka WMA, and Annutteliga Hammock). Crossing these properties may require easements or other appropriate authorizations.

Table 9-A5.3-4 identifies the facilities anticipated to be crossed by the 230-kV CB transmission line, the affected agency, and the type of approval that would typically be required for the 230 kV-CB transmission line to be constructed across public lands.

9-A5.3.6.4 Vicinity Scenic, Cultural, and Natural Landmarks

The 230-kV CB Corridor is co-located with PEF's existing transmission lines rights-of-way through its entire length. The properties within the vicinity of the 230-kV CB Corridor that can be considered scenic, cultural, and natural landmarks are described below.

The Crystal River Preserve State Park is located along the south edge of the 230-kV CB Corridor. The park borders 20 miles of the northern Gulf Coast between Yankeetown and Homosassa. The area is used for outdoor recreation and natural resource management (FDEP, Office of Greenways & Trails, 2007). The park offers hiking, bicycling, kayaking, and canoeing.

The Withlacoochee State Forest is located within the 230-kV CB Corridor. The Withlacoochee State Forest is currently the third largest state forest in Florida and is divided into several distinct tracts of land. The Florida Division of Forestry provides for multiple uses of the forest resources which include timber management, wildlife management, ecological restoration, and outdoor recreation.

The 230-kV CB Corridor crosses the Chassahowitzka WMA, which encompasses 33,919 acres in northwest Hernando County. It was established in 1985 under the authority of the State Game Lands. Recreation activities include hunting, hiking and a driving loop, along with wildlife and bird viewing. The Chassahowitzka WMA may be accessed by canoe or kayak from Ryle Creek.

The 230-kV CB Corridor crosses the Annutteliga Hammock, which is located in north central Hernando County and lower Citrus County. It totals 31,250 acres, of which 11,511 have been acquired by the state. Situated in the Brooksville Ridge, the land is slightly higher in elevation than the adjacent coastal or more central portions of the state. It is an important area for groundwater recharge into the Floridan aquifer. The property links with the Chassahowitzka WMA and the Withlacoochee State Forest. The Annutteliga Hammock offers equestrian use and hiking on unimproved roads.

The Cross Florida Greenway is adjacent to the northern edge of the 230-kV CB Corridor. The Cross Florida Greenway traverses through Citrus, Levy, Marion and Putnam Counties, which occupy much of the land that was formerly the Cross Florida Barge Canal. The Cross Florida Greenway stretches from the Gulf of Mexico to the St. Johns River, encompassing a variety of habitats and ecosystems and offers an array of trails and recreation areas for visitors.

The Crystal River and the Crystal River system are designated as an OFW. The Crystal River system is located within the southern edge of the 230-kV CB Corridor and the Crystal River is located approximately 2 miles south of the 230-kV CB Corridor. An OFW is defined as “waters designated by the environmental Regulation Commission as worthy of special protection because of their natural attributes” (Chapter 62-302.700(9), F.A.C.).

9-A5.3.6.5 Archaeological and Historic Sites

Coordination was conducted with the Florida Department of State, Division of Historical Resources (FDHR) to identify previously recorded archaeological sites and historic resources and to determine the potential for unrecorded resources within the 230-kV CB Corridor. This coordination included a detailed search of the Florida Master Site File (FMSF), which is the official inventory of previously documented archaeological sites and historic resources, and a guide to National Register of Historic Places (NRHP)-listed or eligible resources in the State. This search included an analysis of the most current GIS data, which include both a spatial and tabular representation of previously recorded cultural resources within the State. Attachment 9-A5-3 contains an analysis of archaeological and historic sites in the 230-kV CB Corridor and the other transmission line corridors.

No NRHP–listed or eligible historic resources were identified in the FMSF. Although portions of the 230-kV CB Corridor have been subjected to previous surveys, no comprehensive survey of the corridor that meets current FDHR standards has been conducted. The FMSF included ten previously recorded archaeological sites and one previously recorded historic structure within or adjacent to the corridor. Although not designated as NRHP–eligible in the FMSF, the presence of these archaeological sites and the historic structure indicates the potential for additional unrecorded cultural resources to be present. A teleconference with the FDHR confirmed the need to conduct a cultural resource assessment survey once a route for the 230-kV CB transmission line has been finalized. This survey will be conducted prior to construction and will meet the requirements of Chapter 1A-46, F.A.C. (Archaeological and Historical Report Standards and Guidelines).

9-A5.3.7 Biological and Physical Environment of the Corridor Area

9-A5.3.7.1 Land Use/Vegetation (Habitat)

The 230-kV CB Corridor originates at the CREC switchyard and traverses east through upland and wetland hardwood-conifer mixed forests, cypress swamps, freshwater marshes, and coniferous (pine) plantations along the northern edge of the Crystal River Preserve State Park co-located with the existing PEF 500/230-

kV transmission line rights-of-way before crossing US 19. East of US 19, the corridor turns south near the existing Crystal River East substation and traverses through mixed hardwood-conifer forests and areas of low density residential, freshwater marshes, reservoirs, lakes, and cypress swamps. Near County Road (CR) 495 (North Citrus Avenue), the 230-kV CB Corridor traverses longleaf pine-xeric oak habitats and freshwater marshes along the existing PEF 500/230/115-kV transmission line rights-of-way. Further south, the 230-kV CB Corridor crosses pine flatwoods, reservoirs, lakes, low to medium density residential areas, CR 486, and an extractive (mined) area. The 230-kV CB Corridor continues southeast along the existing PEF 500/230/115-kV transmission line rights-of-way, traversing improved pasture, longleaf pine-xeric oak forests, and low to medium density residential areas and intersects SR 44.

At SR 44, the 230-kV CB Corridor turns south, following the existing PEF 115-kV transmission line right-of-way through primarily longleaf pine-xeric oak habitat and low density residential areas. The 230-kV CB Corridor traverses longleaf pine-xeric oak habitat of the Withlacoochee State Forest north of CR 490 (West Homosassa Trail) and traverses longleaf pine-xeric oak and shrub and brushland habitats of the Withlacoochee Forest south of CR 490. The 230-kV CB Corridor continues south traversing primarily longleaf pine-xeric oak habitat and low density residential areas until intersecting longleaf pine-xeric oak and coniferous plantations of the Withlacoochee State Forest, US 98, coniferous plantations, a golf course, and the longleaf-pine xeric oak and sand pine habitats of the Chassahowitzka WMA. South of the Chassahowitzka WMA, the 230-kV CB Corridor traverses longleaf pine–xeric oak habitat of the Annutteliga Hammock. Approximately a mile south of Centralia Road, the 230-kV CB Corridor turns southwest and traverses low density residential areas, and crosses Hexam Road. As the 230-kV CB Corridor turns east, the width of the corridor widens to a mile, bisects Whitehurst Pond, and ends at the existing Brookridge substation in a primarily low density residential area.

The existing land use and habitat types were identified for the 230-kV CB Corridor using Florida Land Use, Cover and Forms Classification System (FLUCCS) data (FDOT, 1999) and the Guide to the Natural Communities of Florida (FNAI and Florida Department of Natural Resources [FDNR], 1990). Existing land use/land cover data dated 2004 was obtained from SWFWMD (SWFWMD, Data & Maps: GIS, 2008) and updated after ground truthing between November 2007 and January 2008. Land use is mapped at Level II or Level III and land cover (habitats) are mapped at Level III. Land use and habitats are depicted in Figure 9-A5.3-8. Table 9-A5.3-5 lists the various land uses and habitats found along the 230-kV CB Corridor and their approximate acreages. ; Information was mapped by SWFWMD and ground truthed by Golder. Habitat descriptions and vegetation summaries of the upland, aquatic, and wetland habitats are presented in Attachment 9-A5-4. Summaries of the major land uses and habitats that occur within the 230-kV CB Corridor are provided in the following subsections.

Land Use

The land use/land cover that occurs along the 230-KV CB Corridor represents human-induced changes within the landscape. Much of the historical habitats that occurred along the 230-kV CB Corridor have been cleared for low to high density residential areas, golf courses/recreational, commercial areas, industrial and extractive areas, improved pastures, utilities, and transportation.

Habitats

Although some of the areas within the 230-kV CB Corridor have been altered by the various land uses previously described, a variety of habitats exist within the corridor.

Upland - Upland habitats range from relatively undisturbed areas, such as longleaf pine-xeric oak and sand pine forests of the Withlacoochee State Forest, Annutteliga Hammock, and Chassahowitzka WMA, to disturbed habitats, such as improved pastures and coniferous (pine) plantations.

The upland habitats that exist within the 230-kV CB Corridor include open lands, improved pastures, shrub and brushland, pine flatwoods, longleaf pine-xeric oak forests, sand pine forests, xeric oak forests, hardwood-conifer mixed forests, coniferous plantations, and disturbed lands. Of these, longleaf pine-xeric oak forests and coniferous plantations are the most prevalent.

Wetland and Aquatic - Forested and herbaceous wetlands in the 230-kV CB Corridor are comprised of seven different associations including stream and lake swamps, cypress swamps, mixed forested wetlands, freshwater marshes, saltwater marshes, wet prairies, and intermittent ponds. Of these, freshwater marshes and mixed forested wetlands are the most prevalent, consisting of approximately 277 and 201 acres, respectively. Aquatic habitats located within the 230-kV CB Corridor include lakes, reservoirs, and bays and estuaries.

The quality of the wetlands within the 230-kV CB Corridor ranges from those exhibiting expected floristic and structural characteristics providing valuable wildlife habitat, to freshwater marshes located within pasture areas that have been impacted by drainage alterations and cattle grazing.

9-A5.3.7.2 Affected Waters and Wetlands

Surface water bodies crossed by the 230-kV CB Corridor were identified using 2004 SWFWMD land use/land cover data (SWFWMD, Data & Maps: GIS, 2008), recent aerial photographs (Aerials Express, 2007), hydrologic data (Environmental Systems Research Institute, Inc [ESRI], Named Streams and Rivers, 1999) and site observations.

Water Bodies

The 230-kV CB Corridor bisects Whitehurst Pond, which is classified as a Class III water (FDEP, Chapter 62-302, Surface Water Quality Standards, 2006). The remainder of waters and wetlands crossed by the 230-kV CB Corridor include numerous roadside ditches, small lakes and reservoirs, forested wetland communities, and herbaceous wetland communities.

Wetlands

All of the wetland habitats that occur in the 230-kV CB Corridor are listed in Section 9-A5.3.7.1 and described in Attachment 9-A5-4.

9-A5.3.7.3 Ecology

The 230-kV CB Corridor was evaluated for the potential presence of important plant and wildlife species. Important species of plants and animals, as specified in the Draft Proposed Rule 62-17.900, F.A.C. (Application Guidelines) dated June 27, 2007, include: (l) species listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS), (2) species listed by the FFWCC in Rule 39-27, F.A.C. as endangered, threatened or species of special concern, (3) species listed as game, furbearers, or freshwater game fish in Rule 39-1, F.A.C. and (4) species which are indicators of, endemic to, or are otherwise unique to specific plant communities and habitat types. In addition to these important species, the 230-kV CB Corridor was also evaluated for the potential presence of plant species listed as threatened or endangered by the FDACS.

Wildlife habitat in the area of both the 230-kV CB Corridor has been altered significantly from its natural state for residential and commercial use, improved pasture, and coniferous (pine) plantations. However, several wildlife species do utilize the areas within the 230-kV CB Corridor for foraging and cover. Wildlife resources were evaluated through site reconnaissance, literature reviews, and availability of suitable habitat. Where access was available wildlife observations were recorded during site reconnaissance activities conducted between October 2007 and January 2008, and included direct visual observation, calls, tracks, scat, burrows, or other signs. Both the FNAI GIS database of documented occurrences of listed species (FNAI, Element Occurrence Point Data, 2006) and the FFWCC bald eagle nest locator database (FFWCC, 2008) were queried. FNAI listed species occurrences, FFWCC bald eagle nest locations, and listed species identified during site visits are depicted on Figure 9-A5.3-8 (Sheets 1 – 10) for the areas within 0.5 mile of the 230-kV CB Corridor. Detailed discussions for listed flora and fauna that occur, or have a potential to occur, within the 230-kV CB Corridor can be found within the text below and associated Tables 9-A5.3-6 and 9-A5.3-7.

Flora

Initiated in 1984, the Preservation of Native Flora of Florida Act (Sections 581.011 and 581.185(2), F.S. and Rule Chapter 5B-40.001, F.A.C.) defines plant

species in Florida that are protected due to danger of extinction, rapid decline, or are commercially exploited, thus averting damage to native plant populations (FNAI, FNAI Tracking List, 2008). Agency permits as well as permission from the landowner are required to harvest or disturb plants listed in this Act and a permit is required to sell commercially exploited plants. The FNAI list of threatened and endangered plants was used to determine which threatened and endangered plants occur within Citrus and Hernando Counties since the FNAI list incorporates both the USFWS (federal) and FDACS (state) listed species (FNAI, FNAI Tracking List, 2008).

There are 28 listed plant species known to occur within Citrus and Hernando Counties (see Table 9-A5.3-6) (FNAI, FNAI Tracking List, 2008). Of the 28 listed plants, 25 are classified by the State as endangered and three species are classified as threatened (FNAI, FNAI Tracking List, 2008). Three species are classified as federally endangered by the USFWS.

Due to the presence of potential habitat and the known range of these species, it is possible that some of these species could occur within either of the 230-kV CB Corridor; however, none of these listed plant species were observed by Golder at the time of the site reconnaissance.

Fauna

The presence and potential for occurrence of important faunal species in the 230-kV CB Corridor were determined by evaluation of habitat types present, literature review (including FNAI database and FFWCC bald eagle nest locator queries), and ground surveys.

The habitat types identified in the 230-kV CB Corridor that serve as the principal wildlife habitat types include longleaf pine-xeric oak forests, and mixed hardwood-conifer forests; also wetland/aquatic habitats including freshwater marshes, mixed forested wetlands, and reservoirs.

A total of 72 important wildlife species were identified as species occurring or possibly occurring in the 230-kV CB Corridor (FNAI, FNAI Tracking List, 2008). Of these 72 species, 36 are game species or furbearers, as identified in Rule 39-1, F.A.C., and the remaining 36 are USFWS (federal) and/or FFWCC (state) listed species known to occur in Citrus and Hernando Counties (FNAI, FNAI Tracking List, 2008).

The status and potential for occurrence of these species in the 230-kV CB Corridor are summarized in Table 9-A5.3-7. USFWS and FFWCC listed species are discussed in the following paragraphs.

Fish

No listed fish species are known to occur in Citrus or Hernando Counties (FNAI, FNAI Tracking List, 2008). General information on freshwater game fish,

including their potential for occurrence within the 230-kV CB Corridor, is summarized in Table 9-A5.3-7.

Amphibians

Gopher Frog (*Rana capito*)

The gopher frog is listed by the FFWCC as a species of special concern. It is typically found in sandhill and scrub habitat in the vicinity of isolated wetlands or large ponds, and is considered a commensal species to the gopher tortoise, using its burrow for shelter (FNAI, FNAI Search, 2001). Due to the presence of potential habitat, there is a high likelihood that the gopher frog is present the 230-kV CB Corridor.

Reptiles

American Alligator (*Alligator mississippiensis*)

The alligator is listed by the USFWS as threatened due to similarity in appearance to the endangered American crocodile (*Crocodylus acutus*), and is listed by the FFWCC as a species of special concern (FNAI, FNAI Tracking List, 2008). Alligators are common in almost all permanent bodies of fresh water in Florida, including marshes, swamps, lakes, and rivers (FNAI, FNAI Search, 2001) and it is very likely that they are present within these habitats along the 230-kV CB Corridor.

Loggerhead (*Caretta caretta*)

Loggerheads are listed as threatened by both the USFWS and the FFWCC. They inhabit marine coastal and oceanic waters, nesting on coastal sand beaches, often near the dune line. Juvenile turtles frequent bays, inlets, and lagoons. The 230-kV CB Corridor includes a small area of bay and estuary habitat in the vicinity of the CREC; therefore there is a potential for juvenile loggerhead turtles to inhabit this area.

Green Turtle (*Chelonia mydas*)

The green turtle is listed as endangered by both the USFWS and the FFWCC. Green turtles inhabit estuarine and marine coastal and oceanic waters, nesting on coastal sand beaches, often near the dune line. Juvenile green turtles frequent coastal bays, inlets, lagoons, and offshore worm reefs. The 230-kV CB Corridor includes a small area of bay and estuary habitat in the vicinity of the CREC; therefore, there is a potential for juvenile green turtles to inhabit this area.

Eastern Indigo Snake (*Drymarchon couperi*)

The eastern indigo snake is listed as threatened by both the USFWS and the FFWCC. These snakes can occur within a broad range of suitable habitats, from scrub and sandhill to wet prairies. In its northern range, it is often commensal with the gopher tortoise, using its burrows for shelter during the winter (FNAI, FNAI Search, 2001). Due to the presence of potential habitat, there is a high likelihood that the eastern indigo snake is present within the 230-kV CB Corridor.

Gopher Tortoise (*Gopherus polyphemus*)

The gopher tortoise is currently listed as threatened by the FFWCC. Gopher tortoises are commonly found in dry upland habitats, such as sandhills, scrub, xeric oak hammock, and dry pine flatwoods. They are also found in pastures and old fields (FNAI, FNAI Search, 2001). It is likely that the gopher tortoise is found in the 230-kV CB Corridor.

Numerous gopher tortoise burrows were observed along the 230-kV CB Corridor. Golder observed several gopher tortoises and their burrows within areas of longleaf pine-xeric oak, improved pasture, and within the existing 500/230/115-kV transmission line rights-of-way along the 230-kV CB Corridor.

Additionally one gopher tortoise burrow was identified by FNAI along the eastern portion of the 230-kV CB Corridor, just south of CR 490 and northeast of the existing Crystal River East substation. When possible, transmission structures and associated access roads will be located such that entrances of gopher tortoise burrows can be avoided by a buffer that exceeds 25 feet in radius. In the event that impacts to burrow entrances cannot be avoided, a relocation permit will be obtained from the FFWCC and gopher tortoises will be relocated to either on or off-site areas pursuant to FFWCC guidelines.

Kemp's Ridley (*Lepidochelys kempii*)

The Kemp’s ridley is listed as endangered by both the USFWS and the FFWCC. They inhabit marine coastal areas, and rarely nest on Florida beaches; however, juvenile turtles frequent bays, inlets, and lagoons. The 230-kV CB Corridor includes a small area of bay and estuary habitat in the vicinity of the CREC; therefore there is a potential for juvenile Kemp’s ridley turtles to inhabit this area.

Florida Pine Snake (*Pituophis melanoleucus mugitus*)

The Florida pine snake is listed as a species of special concern by the FFWCC. It often coexists with gopher tortoises and pocket gophers (*Geomys pinetis*) in sandhills, old fields and pastures, sand pine scrub, and scrubby flatwoods (FNAI, FNAI Search, 2001). Due to the presence of gopher tortoises and suitable habitat within the 230-kV CB Corridor, there is a high likelihood that the Florida pine snake is also present.

Suwannee Cooter (*Pseudemys concinna suwanniensis*)

The Suwannee cooter is listed as a species of special concern by the FFWCC. These turtles inhabit rivers and large streams, mainly Gulf coastal rivers from the vicinity of Tampa Bay north and west up to Tallahassee (FNAI, FNAI Search, 2001). Due to the lack of suitable habitat, there is a low likelihood of the Suwannee cooter inhabiting the 230-kV CB Corridor.

Short-tailed Snake (*Stilosoma extenuatum*)

The short-tailed snake is listed as threatened by the FFWCC. It prefers sandhill, xeric hammock, and sand pine scrub habitat (FNAI, FNAI Search, 2001). Since large areas of longleaf pine-xeric oak forests exist within the 230-kV CB Corridor, there is a high likelihood that the short-tailed snake is present within these habitats.

Birds

Scott's Seaside Sparrow (*Ammodramus maritimus*)

Scott's seaside sparrow is listed as a species of special concern by the FFWCC. Sparrows present along the Gulf coast inhabit areas dominated by extensive stands of black needlerush, with smooth cordgrass and scattered areas of saltgrass (*Distichlis spicata*) (FNAI, FNAI Search, 2001). Due to the presence of saltwater marshes in the vicinity of the 230-kV CB Corridor, it is likely that this species is present.

Florida Scrub-jay (*Aphelocoma coerulescens*)

The Florida scrub-jay is listed as threatened by both the USFWS and the FFWCC. They prefer low-growing oak scrub habitats, but they can persist in overgrown scrub habitats (FNAI, FNAI Search, 2001). Due to large areas of scrub habitat within the 230-kV CB Corridor, there is a high likelihood that scrub-jays inhabit these areas.

Limpkin (*Aramus guarauna*)

The limpkin is listed as a species of special concern by the FFWCC. Limpkins generally inhabit mangroves, freshwater marshes, swamps, springs and spring runs, and pond, lake, and river margins (FNAI, FNAI Search, 2001), and can reasonably be expected to forage in the wetlands and surface waters located in the 230-kV CB Corridor.

Florida Burrowing Owl (*Athene cunicularia floridana*)

The Florida burrowing owl is listed as a species of special concern by the FFWCC. It lives in burrows in sandy soils associated with cattle pastures,

prairies, and sandhills (FNAI, FNAI Search, 2001). It has a high likelihood of occurrence in open, drier habitats along the 230-kV CB Corridor.

Piping Plover (*Charadrius melodus*)

The piping plover is listed as threatened by both the USFWS and the FFWCC. They are found on open, sandy beaches and on tidal mudflats (FNAI, FNAI Search, 2001). Due to the presence of saltwater marshes in the 230-kV CB Corridor, it is likely that this species is present.

Marian's Marsh Wren (*Cistothorus palustris marianae*)

Marian's marsh wren is listed as a species of special concern by the FFWCC. They inhabit tidal marshes dominated by black needlerush (*Juncus roemerianus*) on the Gulf coast (FNAI, FNAI Search, 2001). Due to the presence of saltwater marshes within the 230-kV CB Corridor, it is likely that this species is present.

Little Blue Heron (*Egretta caerulea*)

The little blue heron is listed as a species of special concern by the FFWCC. They prefer freshwater lakes, marshes, swamps, and streams for foraging, and cypress trees for roosting (FNAI, FNAI Search, 2001). Therefore, little blue herons are likely to forage in surface waters and wetlands within the 230-kV CB Corridor.

Snowy Egret (*Egretta thula*)

The snowy egret is listed as a species of special concern by the FFWCC. It is widely distributed in Florida in both freshwater and coastal wetlands, as well as surface waters (FNAI, FNAI Search, 2001). It is likely to occur in the wetlands and surface waters along the 230-kV CB Corridor.

Tricolored Heron (*Egretta tricolor*)

The tricolored heron is listed as a species of special concern by the FFWCC. It inhabits a variety of wetland habitats, such as ditches, pond and lake edges, and coastal areas (FNAI, FNAI Search, 2001). Due to the presence of herbaceous wetlands and surface waters within the 230-kV CB Corridor, it is likely that this species is present.

White Ibis (*Eudocimus albus*)

The white ibis is listed as a species of special concern by the FFWCC. It inhabits a variety of wetland habitats, including freshwater and brackish marshes, salt flats, forested wetlands, wet prairies, swales, and man-made ditches (FNAI, FNAI Search, 2001). It is likely to occur in the wetlands and surface waters along the 230-kV CB Corridor.

Peregrine Falcon (*Falco peregrinus*)

The peregrine falcon is listed as endangered by the FFWCC. They generally inhabit open land near rivers and lakes, and also live in suburban areas (Bull & Farrand, 1994). Due to the presence of urban (residential) areas in the 230-kV CB Corridor, it is likely that this species is present.

Southeastern American Kestrel (*Falco sparverius paulus*)

The southeastern American kestrel is listed as threatened by the FFWCC. The southeastern American kestrel is found year-round in open areas, such as open pine habitats, woodland edges, prairies, and pastures, primarily in peninsular Florida, while the non-listed, migrant American kestrel (*F. sparverius*) generally arrives in September and departs by March. All birds found in the breeding season (April through early September) should be treated as the listed subspecies (FNAI, FNAI Search, 2001).

Two American kestrels (*F. sparverius*) were observed by Golder along the 230-kV CB Corridor; one near the existing transmission line right-of-way within a low density residential area, north of CR 476 (see Figure 9-A5.3-8, Sheet 9 of 10); the other northwest of the existing Brookridge substation (see Figure 9-A5.3-8, Sheet 10 of 10). Due to the time of year, these observations were most likely of the non-listed variety and not the listed subspecies. However due to similarity of appearance and presence of the southeastern American kestrel's preferred habitat, it can reasonably be assumed that the listed subspecies inhabits the 230-kV CB Corridor.

Florida Sandhill Crane (*Grus canadensis pratensis*)

The Florida sandhill crane is listed as threatened by the FFWCC. The Florida sandhill crane is found year-round in prairies, freshwater marshes and pastures throughout Florida, while the non-listed migrant, greater sandhill crane (*G. canadensis tabida*), generally arrives in October and departs by March. The two species are indistinguishable, so identification is largely dependent on the time of year the cranes are observed (FNAI, FNAI Search, 2001). However, based on the presence of Florida sandhill cranes' preferred habitat (prairies, freshwater marshes, and pasturelands); it can reasonably be assumed that they inhabit the 230-kV CB Corridor.

American Oystercatcher (*Haematopus palliatus*)

The American oystercatcher is listed as a species of special concern by the FFWCC. Oystercatchers typically require large areas of beach, sandbar, mud flat, and shellfish beds for foraging, and are more common on the Gulf coast (FNAI, FNAI Search, 2001). Due to the presence of bay and estuary habitat and saltwater marshes within the 230-kV CB Corridor, it is likely that these birds are present.

Bald Eagle (*Haliaeetus leucocephalus*)

Although the bald eagle is not currently classified as threatened or endangered by the USFWS or the FFWCC, it is protected under the Federal Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, as well as Florida's Bald Eagle Management Plan. Impacts to bald eagles may be avoided through adherence to the management plan guidelines of 330 foot to 660 foot construction setback from any active nests.

Bald eagles typically inhabit areas close to coastal areas, bays, rivers, lakes, or other bodies of water that provide concentrations of food sources (FNAI, FNAI Search, 2001). One bald eagle nest is known to occur approximately 675 feet west of the western boundary of the 230-kV CB Corridor in an area of mixed forested wetland; northwest of the CREC switchyard (FFWCC, 2008) (see Figure 9-A5.3-8, Sheet 1 of 10).

Wood Stork (*Mycteria americana*)

The wood stork is listed as endangered by both the USFWS and the FFWCC. Wood storks prefer nesting in cypress swamps and mixed forested wetlands, and they forage mainly in shallow water in freshwater marshes, swamps, lagoons, ponds, tidal creeks, flooded pastures and ditches (FNAI, FNAI Search, 2001). Due to the presence of these habitats within the 230-kV CB Corridor, it is likely that this species is present.

Brown Pelican (*Pelecanus occidentalis*)

The brown pelican is listed as a species of special concern by the FFWCC. They are mainly coastal birds, feeding in shallow estuarine waters, and occasionally, far offshore (FNAI, FNAI Search, 2001). The 230-kV CB Corridor includes small areas of bays and estuaries and salt marshes; it is possible that the brown pelican inhabits these areas.

Red-cockaded Woodpecker (*Picoides borealis*)

The red-cockaded woodpecker is listed as endangered by the USFWS and as a species of special concern by the FFWCC. They have specific habitat requirements of old growth pine forests (typically longleaf or slash pine), with an open, grassy understory (FNAI, FNAI Search, 2001). The sandhill areas of the Withlacoochee State Forest are known to support significant populations of the red-cockaded woodpecker; and since the 230-kV CB Corridor intersects portions of the Withlacoochee Forest (Withlacoochee State Forest: Florida Division of Forestry - FDACS, 2008), the probability that the red-cockaded woodpecker is present within the 230-kV CB Corridor is high.

Roseate Spoonbill (*Platalea ajaja*)

The roseate spoonbill is listed as a species of special concern by the FFWCC. It forages in shallow water of variable salinity, including marine tidal flats and ponds, coastal marshes, mangrove-dominated inlets and pools, and freshwater sloughs and marshes (FNAI, FNAI Search, 2001). Therefore, it can reasonably be expected to be found foraging within the wetlands of the 230-kV CB Corridor.

Black Skimmer (*Rynchops niger*)

The black skimmer is listed as a species of special concern by the FFWCC. They inhabit coastal waters, including beaches, bays, estuaries, sandbars, and tidal creeks (FNAI, FNAI Search, 2001) although they have also been observed foraging in more inland areas including large lakes, phosphate pits, and flooded agricultural fields. Due to presence of bay and estuary habitat in the 230-kV CB Corridor, it is possible that the black skimmer utilizes these areas.

Least Tern (*Sterna antillarum*)

The least tern is listed as threatened by the FFWCC. They are present in coastal areas throughout Florida, including beaches, lagoons, bays, and estuaries (FNAI, FNAI Search, 2001). A small area of bay and estuary habitat is included in the 230-kV CB Corridor; therefore, it is possible that least terns are present in this area.

Mammals

Florida Mouse (*Podomys floridanus*)

The Florida mouse is listed as a species of special concern by the FFWCC. They prefer xeric upland communities with sandy soils, such as scrub, sandhill, and ruderal sites, and they often inhabit burrows of the gopher tortoise (FNAI, FNAI Search, 2001). Due to the presence of gopher tortoises and their habitats in the vicinity of the 230-kV CB Corridor, it is likely that the Florida mouse is present.

Sherman's Fox Squirrel (*Sciurus niger shermani*)

The Sherman’s fox squirrel is listed as a species of special concern by the FFWCC. They commonly inhabit sandhills, pine flatwoods, pastures and other open, ruderal habitats with scattered pines and oaks (FNAI, FNAI Search, 2001). It is highly likely that the fox squirrel is present along the 230-kV CB Corridor because of the prevalence of longleaf pine-xeric oak forests and pasture areas.

Several Sherman’s fox squirrels were observed by Golder, south of US 98, in an area of longleaf pine-xeric oak along the 230-kV CB Corridor (see Figure 9-A5.3-8, Sheet 8 of 10).

Homosassa Shrew (*Sorex longirostris eionis*)

The Homosassa shrew is listed as a species of special concern by the FFWCC. Though initially recognized from a single locality in the vicinity of Homosassa Springs, it is now thought to occur in other areas of suitable habitat in the northern two-thirds of peninsular Florida (Jones et al. 1991). Due to available habitat and proximity to Homosassa Springs, there is a moderate likelihood that the Homosassa shrew is present within the 230-kV CB Corridor.

Manatee (*Trichechus manatus*)

The manatee is listed as endangered by both the USFWS and the FFWCC. Manatees inhabit coastal waters, bays and rivers (FNAI, FNAI Search, 2001). There is a designated manatee aggregation site adjacent to the 230-kV CB Corridor, within the effluent canal west of the CREC switchyard. According to USFWS staff, up to five manatees use this area for short periods of cool weather, mostly during the spring when manatees disperse northward from Crystal River (FNAI, Element Occurrence Point Data, 2006). No transmission line structures will be placed within the CREC discharge canal. No adverse impacts to manatees are anticipated as a result of transmission line construction and operation.

Florida Black Bear (*Ursus americanus floridanus*)

The Florida black bear is listed as threatened by the FFWCC. They prefer large upland forests and large swamps (FNAI, FNAI Search, 2001). Florida black bears are present within the Chassahowitzka Wildlife Management Area (FFWCC, Recreation: Chassahowitzka, 2008), which the 230-kV CB Corridor intersects, so there is a likely potential for Florida black bears to occur within the 230-kV CB Corridor.

9-A5.3.7.4 Other Environmental Features

There are no additional known environmental features of interest along or within the 0.5 mile area surrounding the 230-kV CB Corridor.

9-A5.4 EFFECTS OF RIGHT-OF-WAY PREPARATION AND TRANSMISSION LINE CONSTRUCTION

9-A5.4.1 Construction Techniques

Where the 230-kV CB transmission line is co-located with the existing transmission line rights-of-way, the use of adjacent undisturbed areas will be minimized during all phases of construction, including right-of-way clearing, road and pad construction, and line construction. Where the 230-kV CB Corridor is not co-located with existing transmission line rights-of-way, construction activities including clearing, road and pad construction, and transmission line construction in these new rights-of-way will be performed in accordance with all permitting requirements to minimize potential impacts on human populations, water bodies, archaeological and historic sites, vegetation, and wildlife.

The construction techniques discussed in this section describe the common practices of PEF in the types of environments identified. In general, line construction activities will include erosion control, right-of-way preparation, construction and placement of foundations, assembly and erection of structures and installation of conductors. Each of these stages of construction is described below.

9-A5.4.1.1 Erosion Control

Construction activities will be planned to minimize disturbance to natural ground covers, to the greatest extent practicable. In areas where soil is anticipated to be disturbed, erosion control measures will be implemented. Construction plans and drawings will depict the erosion control measures required. Measures may include turbidity screens, temporary culverts, silt fence or staked hay bales.

With the exception of access roads and work areas around the structures and structure pads, low-lying vegetation will remain. These types of ground cover re-establish themselves quickly and will assist to reduce erosion at the work areas.

Following construction activities, all disturbed areas will be restored. Right-of-way restoration includes removal of all construction equipment and supplies, grading of the right-of-way, if needed, and planting or seeding of the disturbed area. Erosion control measures will be removed at the conclusion of the project after the right-of-way has been stabilized with ground cover.

9-A5.4.1.2 Right-of-Way Preparation

In its right-of-way selection, right-of-way preparation and construction of the new lines, PEF will minimize effects on human populations, water bodies, archaeological and historic sites, vegetation, and wildlife to the extent practicable.

9-A5.4.1.2.1 Right-of-Way Preparation

General Clearing

For areas where existing PEF transmission line rights-of-way widths are insufficient for placement of the transmission line, additional clearing will be necessary. In general, the entire width of the right-of-way will be completely cleared except in wetlands. Clearing shall be in accordance with the descriptions shown below and will be determined by existing conditions, environmental constraints and line design requirements.

Clearing in Upland Areas

Vegetation in upland areas will be cleared to ground level. Stumps will either be cut or ground down to natural grade and treated with an approved herbicide to prevent re-growth or the entire stump and root mat will be grubbed to 6 inches below grade. All holes resulting from the removal of stumps shall be refilled to natural grade. Chipping material will be spread up and down the right-of-way

unless specific landowner restrictions require it to be removed and disposed of off-site. Limbs, brush, stumps and cleared debris may be piled and burned within the limits of the right-of-way in compliance with the appropriate state and local regulations.

Pruning along the right-of-way edge will be performed to remove any overhanging branches in the right-of-way. All required tree pruning will conform to the latest approved edition of American National Standards Institute (ANSI) Z133 Safety Standards, ANSI A-300 Plant Maintenance, and Occupational Safety and Health Administration (OSHA) 1910.269 as a minimum to assure safety and industry standards are maintained.

If practicable, a 25-foot deep foliage screen of existing vegetation with mature heights not exceeding 12 feet will be left intact at locations where the right-of-way crosses a navigable waterway. A path may be cleared through the vegetation for PEF maintenance access to the right-of-way.

Herbicides used on the transmission line right-of-way will include only those registered by the U.S. Environmental Protection Agency (USEPA) and which have state approval. Herbicide application rates and concentrations will be in accordance with label directions and will be carried out by a licensed applicator, meeting all federal, state, and local regulations.

Danger trees are any dead, diseased, damaged or leaning trees standing outside the right-of-way which may interfere with or endanger the transmission lines and related facilities. Danger trees will be removed in accordance with the guidelines above, except in wetlands, where the wetland tree removal guidelines described below will be followed.

Clearing in Wetland Areas

Vegetation in wetland areas will be cleared utilizing restrictive clearing techniques. Restrictive wetland clearing will be done by hand, usually with chain saws, or with low-ground pressure shear or rotary machines to reduce soil compaction and damage to vegetation. These methods may be used alone or in combination, as may be necessary for specific sites. Restrictive clearing shall consist of the cutting and removal of all trees and growth with a mature height greater than 12 feet, leaving all other vegetation in the right-of-way outside of the access road and structure pad areas. Outside of the access roads and structure pads, trees will be cut to as low as possible or to existing water level. Stumps may be left in place to preserve the root mat, and treated with an approved herbicide to prevent re-growth. All trees and debris will be removed from the rights-of-way and disposed of in upland areas or off-site depending on landowner restrictions. The cut material will be removed from the wetland utilizing either low ground pressure equipment or temporary construction mats. Care will be taken at all times to minimize rutting and disturbance of the root mat.

The right-of-way in wetland areas will be cleared as described above and maintained in an herbaceous state. Tree stumps under the conductors and in the cleared work areas for the access road and at the structure sites will be removed, sheared, or ground to 6 inches below the ground line to allow for the installation of access roads and structure pads as well as general travel and related construction activities.

9-A5.4.1.3 Construction and Placement of Foundations

The types of foundations that may be used on this project will vary based on the structure types and load capacity required. In general, direct embedded, steel vibratory cased, cast-in-place concrete pile foundations or monolithic slab and pier will be used.

With the exception of steel vibratory cased and monolithic slab and pier type foundations, all installation requires the excavation of a hole, drilled vertically, of varying depths depending on subsurface soil conditions. Typical foundation diameters will vary between 6 feet and 9 feet. The foundation holes are drilled using a truck-mounted hydraulic auger machine.

Depending on the type of subsurface soil conditions, a mixture of water and additive may be used to maintain the cylindrical shape of the open shaft and prevent soil destabilization or cave in. Containment barriers will be used to control runoff of liquids and silts during the drilling operations as required. The natural earth material excavated from the hole may be spread in upland areas as allowed by the conditions of certification.

Typical equipment used in all construction and placement of foundations includes but is not limited to cranes, water trucks, concrete trucks, bucket trucks, semi trucks, front-end loaders, backhoes, dump trucks and support vehicles.

Direct Embedded Foundations

Direct embedded foundations are installed following the drilling operation. For direct embedded foundations, the base section of the pole for multi-piece poles or the entire pole for single-piece poles is picked up by a crane, raised vertically and then lowered into the hole. Once centered in the hole at the required depth, concrete or rock backfill is hauled to the site and placed uniformly around the entire annulus of the embedded portion of the pole. The backfill will be compacted and/or vibrated into place.

Steel Vibratory Cased Foundations

Steel vibratory cased foundations utilize cylindrical steel casings of specified length, thickness and diameter that are driven into natural earth using a vibratory hammer. This method may be used when soil conditions are loose and rock or clay substrata do not prevent full embedment of the casing.

The steel casing is designed to allow the vibratory hammer to clamp to the sides of the casing at one end and is then raised vertically and centered over the proposed foundation location. The casing is then lowered to rest upon the ground and aligned vertically. Once the casing is aligned, the hydraulic hammer is activated and the casing is driven downward into the soil to the specified depth.

The vibratory hammer equipment generally consists of a diesel motor-driven hydraulic pump connected to the vibratory hammer using long hydraulic hoses.

Cast-In-Place Concrete Pile Foundations

Cast-in-place concrete pile foundations are also referred to as reinforced concrete drilled piers and consist of a system of rebar, concrete and anchor bolt cage. The rebar cage provides the method for transferring the anchor bolt loads from the structure to the surrounding soil. The anchor bolt cage attaches to the structure and transfers the structure loads to the rebar cage. The rebar cage consists of many rebar of uniform length and spacing oriented vertically and tied together through horizontal rings to form a cylindrical shaft of the required diameter and length. The anchor bolt cage is constructed in a similar fashion and is generally 6 inches smaller in diameter than the rebar cage and shorter in length. The rebar cage and anchor bolt cages are assembled separately on the ground prior to excavation of the foundation hole. Once the augered hole is drilled, a short steel sleeve is placed over the hole and used to form the foundation cap above ground. This sleeve will provide a uniform shape and finish. Next, the rebar cage is lifted and set into the hole to the desired depth and secured. The anchor bolt cage is then lifted and placed inside the rebar cage with the top bolts extending above the steel sleeve approximately 12 inches and secured in place. Concrete is hauled to the site and placed uniformly in the hole around the rebar and anchor bolt and rebar cages. Concrete is poured from the bottom up and is rodded or vibrated into place during the installation process. When complete the top of the anchor bolt cage is exposed to receive the structure base plate.

Monolithic Slab and Pier Foundations

Monolithic slab and pier foundations are also referred to as spread footings and are suitable for locations that require dissipation of large vertical loads. This application is typical for running angle and dead-end structures which use guys and anchors to provide support. The application involves excavation into the top soil layers using mechanized equipment and placement of a stable supporting fill base. A precast or cast-in-place type concrete or steel grillage foundation is hauled to the site and then installed on top of the stabilized base and backfilled with natural earth or other suitable material. The size of the excavation and foundation is dependent on the subsurface soil and load capacity requirements. Typical equipment used is a frontend loader or backhoe. This method typically requires only the top 6 to 10 feet of soil around the structure base to be disturbed. The excess natural earth material excavated from the hole may be spread in upland areas as allowed by the conditions of certification.

9-A5.4.1.4 Assembly and Erection of Structures

Transmission structures are generally delivered to the site using semi-trucks with open trailers and are assembled on site as close as possible to the foundation. Typically the structures are framed with the structure arms, insulator assemblies, climbing attachments, etc. while lying on the ground. Multi-piece structures are typically assembled on the ground prior to lifting into place, but may be installed in the air one section at a time with a crane. During the assembly process, poles are maneuvered into place using cranes and other lifting equipment to facilitate connections. Cribbing is used to maintain a level working surface to prevent excess stress on components and connections. Once assembled, the structures are ready for final placement on the foundation. When ready a crane is used to pick up the structure. Tag lines may be used to facilitate the proper orientation and control of the structure until placed in the hole or on the base section, casing or foundation, as appropriate.

The upper portions of direct embedded poles are generally attached to the embedded base section via a slip fit or bolted flange connection. Structures attached to vibratory cased foundations are generally bolted or slip fit to the top of the embedded casing. Structures utilizing cast-in-place concrete pile foundations or monolithic slab and pier foundations are attached to the embedded anchor bolts via the structure base plate.

Guys and anchors may be required depending on the structure type and the applied load. Anchors will typically consist of multi-helix screw-in type, slug type or other engineered solutions. Multi-helix anchors are installed using mechanized equipment designed to screw the anchor into the ground to a specified length or torque which meets the design requirements. Slug anchors are designed to provide high strength applications by burying a mass of material, typically reinforced concrete, a specified depth into natural earth. The slug is then backfilled with a suitable material or concrete to obtain the desired strength. A rod is attached to the slug and extends above ground for connection to the guy wire. When required, an engineered solution may be needed to meet the environmental constraints or physical limits of each location. These applications may require the drilling and installation of a concrete cast-in-place type anchor system. Guy wires are utilized to attach the anchor to the structure. Guys typically consist of high strength steel wire, typically 0.5 inch in diameter or larger. The guy wire is connected to the structure and anchor rods using preformed or adjustable guy grips. Typical equipment used in this operation includes but is not limited to a crane, helicopter, bucket trucks, flatbed-trucks, semi-trucks, front-end loaders, and support vehicles.

9-A5.4.1.5 Installation of Conductors

After the structures are erected, conductor installation commences. The process of installing conductors involves stringing a lead line into each structure stringing block to form a continuous connection between stringing end points. This lead line is then used to pull the final conductor into position. The conductor is then tensioned to design specifications, transferred to the support clamp and then

clipped into final position. This operation is performed on all overhead ground wires and conductors for the line.

Typical equipment used in the conductor installation operation includes, but is not limited to bucket trucks, wire-pulling equipment, guard structures, wire reels, trailers, tensioners, helicopters, and support vehicles.

9-A5.4.2 Environmental Resource Permit (ERP)

Once the right-of-way for the CB transmission line is finalized, detailed design information typically provided in an Environmental Resource Permit (ERP) application will be submitted to reviewing agencies for post-certification monitoring for compliance with the conditions of certification, as authorized by Rule 62-17.191, F.A.C.

9-A5.4.3 Solid Wastes

Solid waste generated from right-of-way clearing and line construction typically consists of cleared vegetation and construction debris. Where practicable, PEF may mulch or chip vegetation on-site, which then may be spread on-site or removed for use elsewhere. Alternatively, cleared vegetation and combustible debris may be burned on-site. Applicable state and local fire-related regulations will be followed.

All noncombustible solid waste will be collected and removed for off-site disposal in compliance with all applicable regulations. The quantity of solid waste generated will depend upon site-specific characteristics of the area being cleared.

9-A5.4.4 Changes to Vegetation, Wildlife, and Aquatic Life

Permanent changes to the vegetation, wildlife, and aquatic systems in the 230-kV CB Corridor are anticipated to be minimal and localized. Vegetation will be impacted in the transmission line right-of-way by maintenance activities such as trimming, mowing, or herbicide application. Clearing and placement of fill material may be required in the immediate area of the transmission line structures and at access road locations. Forested wetlands will be cleared to facilitate construction and maintenance of the transmission line. This will result in the conversion of the wetland from a forested system to an herbaceous wetland.

To the extent practicable, all of the named surface waters can be spanned and no structures will be located within the major water bodies. Most of the ditches draining improved pastures are shallow and intermittent. It may be necessary to impact some of these manmade, minor drainages. Impacts to surface waters will be addressed in more detail during the post-certification process as authorized by Rule 62-17.191, F.A.C.

A number of structures may require unavoidable impacts to wetlands. In these cases, fill at each structure location may be required to facilitate construction and

maintenance. It will be necessary to clear trees within forested wetlands crossed by the transmission lines and limit the growth of vegetation under the lines to no more than 12 feet in height.

It is anticipated that construction for the placement of structures, pads, and access roads may be required in some wetlands. Where practicable, access roads will be located to avoid or minimize wetland impacts. All wetland impacts will be addressed in accordance with applicable State and local criteria. Detailed design information will be provided to the appropriate regulatory agencies during post-certification to demonstrate that drainage patterns and characteristics are not further altered from the pre-development condition, as authorized by Rule 62-17.191, F.A.C. Impacts proposed to jurisdictional wetlands will also be detailed during the post-certification process.

No impacts to listed species are anticipated. The majority of listed species observed in the 230-kV CB Corridor are mobile avian species that may relocate to similar habitats during construction activities. The movement of migratory birds should not be impeded and there should not be a significant increase in bird strikes due to the placement of the proposed transmission line since a large portion of the proposed line will be placed adjacent to existing linear facilities. In the event that impacts to gopher tortoise or other less mobile species cannot be avoided, these impacts will be mitigated as required under existing FFWCC and USFWS regulations.

Once the right-of-way for the 230-kV CB transmission line is finalized, it will be surveyed for listed species and the applicants will consult with FFWCC on appropriate mitigation or avoidance methods in a post-certification process pursuant to conditions of certification.

9-A5.4.5 Impact on Human Populations

The approximate length of time needed to construct the 230-kV CB transmission line is 4 weeks per mile. During this construction time, a particular crew's time at a structure location could typically be 1 to 2 weeks. Crew sizes will vary depending upon the task. Use of construction equipment may result in temporary noise typical of construction activities. This noise will be brief and intermittently spaced due to the nature of transmission line construction and equipment use. A majority of the construction activities are planned to occur during daylight hours to minimize disturbance. Special circumstances could require nighttime activities. These special circumstances will be coordinated with appropriate agencies and governmental representatives.

Clearing and road construction will be minimized where the 230-kV CB transmission line right-of-way is adjacent to, or in proximity of existing transmission line right-of-way. Where the transmission line follows existing public roads, the construction contractor will follow FDOT guidelines for flagging and use of barriers for traffic control.

9-A5.4.6 Impact on Regional Scenic, Cultural, and Natural Landmarks

As discussed in Section 9-A5.3.6.4, there are four state parks (Crystal River Preserve State Park, Withlacoochee State Forest, Chassahowitzka WMA, and Annutteliga Hammock) and one OFW (Crystal River system) within the 230-kV CB Corridor. It is anticipated that the 230-kV CB transmission line right-of-way will be approximately 100 feet wide in these areas and be co-located with the existing PEF transmission line rights-of-way. Any changes to these areas due to clearing or construction will be limited to the right-of-way. The range in 230-kV CB Corridor width provides the opportunity to minimize potential impacts to the area's scenic, cultural and natural landmarks to the extent practicable.

9-A5.4.7 Impact on Archaeological and Historic Sites

Following the certification of the 230-kV CB Corridor and selection of the right-of-way, a cultural resource assessment survey (CRAS) will be conducted that meets the requirements of Chapter 267, F.S. and Chapter 1A-46 (Archaeological and Historical Report Standards and Guidelines), Florida Administrative Code. The results of this CRAS will be documented in a report submitted to the FDHR/Florida's State Historic Preservation Officer (SHPO). If significant resources are identified, PEF will avoid these resources. If avoidance is not feasible, then PEF will coordinate with the FDHR/SHPO to develop a strategy to minimize or mitigate impacts.

9-A5.5 POST-CONSTRUCTION IMPACTS AND EFFECTS OF MAINTENANCE

9-A5.5.1 Maintenance Techniques

Maintenance activities for the 230-kV CB transmission line will consist of preventive and corrective measures. Although transmission lines normally require minimal maintenance, PEF will conduct annual inspections to ensure the safe and reliable operation using ground or aerial means.

In general, maintenance of the right-of-way will consist of mowing, pruning, danger and other tree removals, as well as herbicide treatments. Maintenance of the right-of-way will be consistent with the right-of-way clearing described in Section 9-A5.4.1.2. Using these same restrictive clearing practices will allow right-of-way maintenance in wetlands areas to be performed while encouraging the growth of low-growing woody and herbaceous vegetation that will not exceed 12 feet in height at maturity, to the greatest extent practicable. Care will be taken not to cause unnecessary damage to vegetation in these environmentally sensitive areas. Any vegetation that may be cut during clearing of the right-of-way may alternatively be girdled or selectively treated with herbicides during line maintenance. Girdled or treated vegetation will be allowed to remain standing to provide habitat and food sources for wildlife unless access to PEF facilities is a concern.

Herbicides used on the 230-kV CB transmission line right-of-way will include only those registered by the USEPA and approved by the State. Herbicide application

rates and concentrations will be in accordance with label directions and will be carried out by a licensed applicator, meeting all federal, state, and local regulations.

The exact manner in which maintenance will be performed will depend on the location, type of terrain, and surrounding environment. Each area of the right-of-way will be addressed based on site-specific vegetation and habitat. Endangered or threatened species, if present, are considered and accommodated in the maintenance program.

Maintenance of the transmission line will be performed using various types of equipment. This equipment may consist of helicopters, bucket trucks, cranes, semi-trucks and support vehicles. Typical line maintenance operations may include insulator replacements, conductor repairs, shield wire repairs, grounding and other activities associated with structures, conductors and foundations. In general, PEF crews or authorized contractors will mobilize in line trucks capable of supporting various operations. Once on site, the crew will establish a safe working area and perform the required repair. When maintenance is required in environmentally sensitive areas where access and fill pads do not exist, temporary matting may be employed to minimize damage to the areas during repairs.

9-A5.5.2 Multiple Uses

Multiple uses within a transmission line right-of-way typically can include agricultural operations (e.g., grazing and row crops), controlled landscaping and other activities that do not interfere with PEF's use of the right-of-way for the operation and maintenance of the transmission line. In areas where the new transmission line will be located within, adjacent to, or in proximity of an existing transmission line right-of-way, multiple uses consistent with those currently allowed will generally be acceptable.

PEF currently maintains a right-of-way utilization program that will consider future requests for multiple uses. This program reviews requests for such multiple uses to assure that the proposed use of the right-of-way is compatible with safe line operation and maintenance.

9-A5.5.3 Changes in Species Populations

Impacts to plant and animal populations as a result of maintenance and post-construction activities will be minimized. Maintenance practices will be similar to the initial clearing activities and will not result in adverse impacts to plant and animal populations.

9-A5.5.4 Effects of Public Access

Neither the establishment of the right-of-way for the 230-kV CB transmission line nor access roads is anticipated to increase the exposure of previously undisturbed areas to the public. The only vehicular traffic permitted will be that

necessary for PEF routine maintenance activities. In areas where the transmission line will be located either adjacent to, or in proximity of existing transmission right-of-way, the degree of public access is anticipated to remain unchanged. Locked gates will be provided at all points where a transmission line access road intersects previously fenced property. Other access restrictions will be coordinated with the underlying fee owners.

9-A5.5.5 Other Post-Construction Effects

9-A5.5.5.1 Electric and Magnetic Field Effects

Like all electric power lines, the 230-kV CB transmission line will produce electric and magnetic fields (EMF). The electric field strength is dependent upon the voltage impressed on the transmission line conductors. The magnetic field strength is a function of the amount of current flowing on the transmission line. The voltage on a transmission line is held relatively constant (usually within 5 percent), but the current flowing on the conductors varies depending upon the power needs of the customers ultimately served by a line. Because of these characteristics, the electric field near transmission lines is relatively constant over time, but the magnetic field fluctuates depending on load requirements.

The major cause of variation in electric field strength at various locations along the transmission line right-of-way is the fluctuation in the height of the conductors above the ground. The conductors are securely attached to the support structures at the end of each span but sag somewhat between structures. Consequently, they are usually closest to the ground midway between the structures. This point halfway between the structures is called midspan. Increases in conductor temperature resulting from high current in the conductors and from extreme weather conditions result in temporary elongation of the conductors and additional sag at midspan. The extent to which the conductors sag is carefully designed to ensure that adequate safety clearance is maintained between the conductors and ground for all extremes of electrical load and weather conditions. Since the extreme conditions of electrical load and weather conditions are very infrequent, the actual midspan height of the transmission line conductors is usually considerably higher than their design minimum midspan clearance. At points other than midspan, the conductors are even higher, reaching their greatest height above ground at the structures. Directly beneath the transmission line, the electric field strength is strongly influenced by the conductor height. The electric field is greatest at the point where the conductors are closest to ground. Consequently, the maximum electric field occurs at midspan when load and weather conditions cause the transmission line conductors to sag to their minimum height above ground. At all other times and at all other locations along the span, the conductors are higher above ground and the electric field is less than the maximum value. At locations other than those directly beneath the conductors, such as at the edge of the right-of-way or beyond, the electric field is less dependent on conductor height and will increase or decrease depending on location, line design, shielding by vegetation or other structures and other factors.

Magnetic field strength varies depending on load current and on conductor height. The highest magnetic field occurs at midspan when the current in the transmission line is at its maximum value and load and existing weather conditions cause the conductors to sag to their minimum height above the ground. At all other times and at all other locations, the magnetic field will be considerably less than the maximum. As with electric fields, magnetic fields directly beneath the transmission line are most strongly dependent on conductor height. At other locations such as at the edge of the right-of-way and beyond, increased conductor height leads to lower magnetic fields, but the effect is slight.

The FDEP regulates EMF from electrical transmission lines under the provisions of Sections 403.061(30) and 403.523(10), F.S. The 230-kV CB transmission line complies with the FDEP EMF regulations found in 62-814.450(3), F.A.C. The FDEP EMF rules applicable to this new 230-kV transmission line project generally provide[2]:

- The maximum electric field at the edge of the transmission line right-of-way and at the substations' property boundaries shall not exceed 2 kilovolts per meter (kV/m);
- The maximum electric field on the transmission line right-of-way shall not exceed 8 kV/m; and
- The maximum magnetic field at the edge of the transmission line right-of-way and at the substations' property boundaries shall not exceed 150 milliGauss (mG).

EMF associated with the 230-kV CB transmission line was calculated using the EzEMF software program developed through the Florida Electric Power Coordinating Group and accepted by FDEP as a methodology for verifying compliance with the FDEP EMF rule. The EzEMF software was developed using the Bonneville Power Administration Corona and Field Effects Program (CAFEP) as the source for the electric and magnetic calculations.

Table 9-A5.5-1 presents the maximum calculated EMF that can be produced by the transmission line under maximum normal operating conditions consistent with Chapter 62-814, F.A.C. These fields comply with FDEP rule requirements for new 230-kV CB transmission lines. Since some of the 230-kV CB Corridor contains existing transmission line rights-of-way that may be used for alignment of the new transmission line, the existing lines were included in the calculations, where appropriate.

[2] Where calculations under this section indicate that operation of existing electrical facilities on an existing right-of-way produces electric or magnetic fields at levels higher than the limits specified for new facilities in rule 62-814.450, F.A.C., a new electrical facility may be constructed and operated on that existing right-of-way provided that the new facility does not increase the electric or magnetic fields above the maximum field values created by the existing lines. Rule 62-814.470(1) (c), F.A.C.

The detailed design of the transmission line will start after the 230-kV CB Corridor is certified, during which a specific right-of-way within the 230-kv CB Corridor will be selected. To the extent the detailed design includes configurations not reflected in Table 9-A5.5-1, PEF will submit EMF calculations for all such configurations used in the final detailed design to FDEP at least 90 days prior to the start of construction, as required by the FDEP EMF rule.

9-A5.5.5.2 Corona Effects

The electric field at the surface of transmission line conductors, under some conditions, results in localized ionization of the air near the conductors. This phenomenon is called corona. As explained in the following paragraphs, corona activity at the surface of transmission line conductors produces low levels of acoustic and radio frequency electric energy which, under some conditions, can result in audible noise and radio or television interference.

9-A5.5.5.2.1 Audible Noise

The primary cause of audible noise on high-voltage transmission lines is corona resulting from an irregularity on the surface of the conductor, such as buildup from fog, water droplets, and significant particulate matter. Corona activity at the surface of the conductor produces a low-level audible noise that is a slight humming sound. Under wet conditions, higher noise levels are experienced than would occur under dry conditions. However the background noise from various sources such as falling rain, traffic, or blowing leaves has the effect of masking transmission line noise. A secondary cause of audible noise on transmission lines is gap-type discharges on hardware or scintillations on insulators with an accumulation of salt deposits or certain other foreign particles. Gap-type discharges are not anticipated to be significant audible noise sources for this project because gap-type discharges are characteristic of higher frequencies than the audible noise frequency band for “A” weighted human hearing (less than 10,000 hertz).

During fair weather conditions when the conductors are dry, the audible noise levels produced by the 230-kV transmission line will be less than normal outdoor ambient noise levels. When the conductors are wet from rainfall or heavy fog, the transmission line noise will increase. Table 9-A5.5-2 presents the maximum calculated audible noise levels that could be produced by the transmission lines, at the edge of the right-of-way, during rain or other wet weather conditions. During all other weather conditions, audible noise levels associated with the 230-kV CB transmission line will be lower than the levels reflected in Table 9-A5.5-2. Audible noise levels were calculated using the CAFEP developed by Bonneville Power Administration.

9-A5.5.5.2.2 Radio and Television Interference

Electrical noise in the radio frequency range can be produced by corona on transmission line conductors or by gap-type discharges on transmission line hardware. Corona noise is most significant in the lower frequencies such as those used for amplitude modulation (AM) radio broadcasting. Noise from gap-

type discharges, on the other hand, extends to higher frequencies (peak levels are in the 30 to 100 megahertz (MHz) range) and can be a source of interference with television broadcast reception. Since the transmission lines will be constructed with new hardware, gap-type discharges are not anticipated to occur. Should a gap-type discharge develop on a damaged, defective, or improperly installed piece of hardware and lead to interference, the hardware causing the gap-type discharge will be located and repaired or replaced. Therefore, the following analysis focuses on interference from corona on the transmission line conductors. Radio and television interference levels were calculated using the CAFEP developed by Bonneville Power Administration. The results of the calculations are summarized in the following paragraphs.

Radio

Communications systems using frequency modulation (FM), such as FM radio broadcast or business and public service communications, are not affected by transmission line noise because the corona discharge radio frequency amplitude decreases significantly above 3 MHz (which is below the FM frequency band). Systems using amplitude modulation, such as AM radio and the video (picture) portion of television broadcasts can be affected if the broadcast signal strength is weak or the noise level is high, or both. The Federal Communications Commission (FCC) has characterized AM broadcast signals into categories based on the strength of signal received. Six categories Type A, B, C, D, E, and F have been identified, with the stronger signals being Type A. The FCC primarily protects the Type A and Type B signals from co-channel or adjacent channel interference.

AM radio stations providing broadcast signals sufficiently strong to be free of naturally occurring atmospheric interference (static) at least 90 percent of the time are classified as providing Type A signal service by the FCC. In general, stations with Type A signal service will not experience objectionable interference from the 230-kV CB transmission line during fair weather if the receiver is located beyond the edge of the right-of-way.

Weaker AM radio station signals, which are likely to experience naturally occurring atmospheric interference at least 50 percent of the time, are defined as Type B signal service by the FCC. Weak stations minimally meeting the Type B criterion (signal strength equal to 54 decibels (dB)) could experience noticeable interference from transmission line corona during fair weather at receivers located at the edge of the right-of-way; however, these stations will not experience objectionable interference from the transmission lines during fair weather if the receiver is located 100 feet or more beyond the outermost conductor (radio noise interference levels are below 32 dB which results in an acceptable signal-to-noise ratio of 22 dB or higher).

During rainy weather, naturally occurring radio interference from atmospheric electricity (static) increases significantly causing interference with all but the stronger local AM radio stations, thereby masking any interference from

transmission lines. The primary source from atmospheric noise is lightning activity. Lightning activity several thousands of miles away can cause severe static to weak AM radio signals. Consequently, interference from transmission line corona during rain is not a significant concern.

Television

Grade A television signal strengths have been defined by the FCC as those capable of providing acceptable reception at 70 percent of the receiver locations more than 90 percent of the time. The transmission line will not likely cause interference with any Grade A television station under any weather conditions regardless of antenna location outside the right-of-way.

Grade B television signals generally provide acceptable reception at 50 percent of the receiver locations 90 percent of the time. The transmission line may interfere with the reception of weaker stations minimally meeting the Grade B signal criterion and operating on Channels 2 through 6 (signal strength equal to 47 dB). Signal interference for these weaker stations may occur at the edge of the right-of-way under wet weather conditions; however, these signals will not experience objectionable interference from the transmission line during wet weather conditions if the receiver is located 100 feet beyond the outermost conductor (television interference levels are approximately 7 dB which results in an acceptable signal-to-noise ratio of 40 dB or higher). Grade B stations operating on Channels 7 through 13 (signal strength equal to 56 dB) and above will not likely experience interference from the transmission line under any weather conditions if the receiver is located outside the right-of-way.

Television receivers may experience interference if the antenna happens to be pointed in a direction of maximum noise. This interference is usually correctable by reorienting the antenna to get more signal, less line noise, or both.

Summary of Radio and Television Interference

PEF has more than 30 years of experience operating 230-kV transmission lines and although the analysis indicates the possibility of interference with some Grade B or lesser radio stations and Grade B television stations, the probability of such interference is low for the following reasons:

- Only the weakest Grade B and lower radio signals are affected.
- Only the weakest Grade B television stations operating on Channels 2 through 6 are affected.
- The radio or television antenna axis orientation may not conflict with the line and, if a conflict exists, can be rotated to optimize reception.
- The transmission line will not interfere with cable television, satellite television, or telephone reception.

Should any homeowner or business experience abnormal interference as a result of the 230-kV CB transmission line, PEF will investigate all complaints and

provide appropriate mitigation for impacts to radio or television reception caused by the transmission line.

9-A5.5.5.3 Induced or Conducted Ground Currents

Objects located near a transmission line can become electrically charged due to their immersion in the lines' electric field. This charge results in a current that flows through the object to the ground. The current is called "induced" because there is no direct connection between the line and the object. The induced current can also flow to the ground through the body of a person who touches the object. An object that is insulated from the ground can actually store an electrical charge, becoming what is called "capacitively charged." A person standing on the ground and touching a capacitively charged vehicle or a fence receives an electrical shock due to the sudden discharge of the capacitive charge through the person's body to the ground. After the initial discharge, a steady-state current can develop, the magnitude of which depends on several factors including the following:

- The strength of the electric field which, in turn, depends on the voltage of the transmission line as well as its height and geometry.
- The size of the object on the ground.
- The extent to which the object is grounded.

Touching the object at a point remote from an electrical ground can result in a shock. To minimize these induced ground currents and distribute ground fault currents, each structure will be grounded. Each structure will have an electrical connection between the shield wire and ground lead that will be connected to ground rods. Ground resistance tests will be made at each structure before the shield wire is electrically connected to the ground lead. Sufficient ground rods will be installed to reduce the resistance to 10 ohms or less under normal atmospheric conditions. In addition, PEF standards require that fences and gates either crossing or parallel to and within the transmission line right-of-way be grounded to mitigate shock hazards.

The NESC addresses induced currents in Rule 232 C1c, F.A.C. for lines with voltage exceeding 98-kV alternating current to ground. This rule is often referred to in the industry as the 5 milliamp rule and states that clearances shall be increased as required to limit the steady-state current due to electrostatic effects to 5 milliamps if the largest anticipated truck, vehicle, or equipment under the line were short-circuited to ground. The size of the anticipated truck, vehicle, or equipment used to determine these clearances may be less than but need not be greater than that limited by federal, state, or local regulations governing the area under the line. Short circuit calculations performed for the project are based upon the Electric Power Research Institute Transmission Line Reference Book, Third Edition, Chapter 7, Section 7.8, Electric Field Induction on Objects. PEF chose three different scenarios and specific vehicle sizes for each scenario to review:

- Case 1: Residential driveways and areas accessible to pedestrians only. In these areas, the maximum size vehicle anticipated under the line is a pickup truck or similar size off-road vehicle (17 feet long, 6.6 feet wide and 5.6 feet tall).
- Case 2: Residential and secondary streets. On residential and secondary streets, the largest vehicle anticipated under the line is a large truck 57 feet 6 inches long by 13 feet 6 inches high by 8 feet 6 inches wide as found in the vehicle size limits from the American Trucking Associations, Inc. Summary of Size and Weight Limits.
- Case 3: Interstate, federal, state highways and major arterials. On these highways and arterials, the largest combination truck tractor-semi-trailer vehicle anticipated under the line is 75 feet long by 13 feet 6 inches high by 8 feet 6 inches wide as described in Section 316.515, F.S. for Motor Vehicle Maximum (with appropriate flagging) as width, height and length limits.

Cases 1, 2 and 3 yielded minimum required clearances that are lower than the project minimum design clearance of 29 feet planned for this 230-kV line.

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TABLES

FIGURES