SECTION 9-A6

PROGRESS ENERGY FLORIDA

BROOKRIDGE SUBSTATION TO BROOKSVILLE WEST SUBSTATION

230-kV TRANSMISSION LINE PROJECT

HERNANDO COUNTY

JUNE 2, 2008

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ACRONYMS AND ABBREVIATIONS

ACSS/TW	Aluminum Conductor Steel Support/Trapezoidal Wire
BBW	Brookridge substation to the existing Brooksville West substation
CAFEP	Corona and Field Effects Program
CR	County Road
CRAS	Cultural Resource Assessment Survey
dB	Decibels
Dbh	Diameter at breast height
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
FDOT	Florida Department of Transportation
FFWCC	Florida Fish and Wildlife Conservation Commission
FLUCCS	Florida Land Use Cover and Forms Classification System
FMA	Florida Managed Areas
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
mG	milliGauss
MHz	megahertz
NESC	National Electrical Safety Code
NRHP	National Register of Historic Places
PEF	Progress Energy Florida, Inc.
PPSA	Florida Electrical Power Plant Siting Act
SHPO	Florida's State Historic Preservation Officer
SR	State Road
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

9-A6.0 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 corridor 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 lines, 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 has been acquired, the boundaries of the corridor will be revised to those of the acquired rights-of-way. The remainder of the corridor 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 lines. Section 9-A6 addresses the certification of the corridor for a 230-kilovolt (kV) transmission line from the existing Brookridge substation in Hernando County to the existing Brooksville West substation in Hernando County (BBW). This transmission line is also known as the Brooksville West transmission line.

9-A6.1 MAPS

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

9-A6.2 PROJECT DESCRIPTION

9-A6.2.1 Introduction

To identify the corridor for the 230-kV BBW transmission line, PEF assembled a corridor selection team consisting of specialists in transmission line design, environmental science, land use planning, system planning, real estate acquisition, and corporate communications to complete the studies necessary to

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

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 government, 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 Conferences) 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 Website to provide the public with the latest news and information on the work of the corridor selection team. Attachment 9-A6-1 summarizes the project's public involvement process.

9-A6.2.2 Corridor Location

The general location of the corridor for the 230-kV BBW transmission line is presented in Figure 9-A6.0-1. The width of the 230-kV BBW Corridor ranges from approximately 1000 feet to a mile wide 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 the 230-kV BBW Corridor.

9-A6.2.3 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 a 230-kV BBW transmission line between the Brookridge substation and the Brooksville West substation, as well as certain transmission system upgrades. Figure 9-A6.0-1 depicts the 230-kV BBW Corridor within the right-of-way for the 230-kV BBW transmission line will be located.

9-A6.2.4 Proposed Transmission Line Design Characteristics

The 230-kV BBW 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 BBW transmission line are shown in Figure 9-A6.2-1 through Figure 9-A6.2-7. 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 180°C (356°F) for normal operation and 200°C (392°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 Figure 9-A6.2-8 and 9-A6.2-9. The conductor profiles for the typical structure configurations are shown in Figures 9-A6.2-10 and 9-A6.2-11. 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-A6.2-10 and 9-A6.2-11 show typical conductor clearances for the 230-kV BBW 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-A6.2-12 and 9-A6.2-13 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 BBW transmission line project.

9-A6.3 CORRIDOR

9-6.3.1 Corridor Selection

Siting studies were conducted to identify a corridor for the 230-kV BBW 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 BBW 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 BBW 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-A6.3.1.1 Establish and Define the Project Study Area

Based on the location of the two endpoints of the 230-kV BBW transmission line, study area boundaries were established that would allow for multiple candidate corridors to be developed between the two endpoints. The 230-kV BBW Corridor study area includes approximately 26,880 acres in Hernando County. Figure 9-A6.3-1 shows the BBW study area together with major geographical features and existing 115-kV area. The BBW study area includes property in Hernando County. The study area boundaries are as follows:

North: The northerly boundary is approximately 1.4 miles north of County Road (CR) 476;

East: The easterly boundary is approximately 2.5 miles east of the State Road (SR) 589 (Suncoast Parkway);

South: The southerly boundary is approximately 1.4 miles south of SR 50 (Cortez Boulevard); and

West: The westerly boundary is approximately 0.5 mile east of US 19 and approximately 0.7 mile west of the existing PEF 115-kV transmission line right-of-way.

9-A6.3.1.2 Regional Screening and Mapping

Based on environmental and land use features, the regional screening exhibit (see Figure 9-A6.3-2) for the 230-kV BBW 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 BBW 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-A6.3-1. Aerial photography, the regional screening exhibit as well as other data was used in the candidate corridor identification process.

9-A6.3.1.3 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, each of the candidate corridor segments was given an identification number (see Figure 9-A6.3-3). Candidate corridors were developed by linking the candidate corridor segments together to extend between the two 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-A6.3.1.4 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 was 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;
- Hernando County information regarding existing and proposed schools, community facilities, parks, and roadway improvements;
- Hernando County GIS databases consisting of property ownership maps, public records, and aerial photography; and
- Comprehensive plans, future land use maps, and land development codes for Hernando County.

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 candidate 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-A6.3-2 were consistent with the criteria identified in the community involvement Utility Search Conferences (see Attachment 9-A6-1).

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 lines, 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 proposed 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 proposed 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 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-A6.3-3.

The top-ranking candidate corridor from the quantitative evaluation for the 230-kV BBW transmission line was the one co-located with the existing PEF 500/230/115-kV transmission line right-of-way (Figure 9-A6.3-4). The second top-ranking candidate corridor from the quantitative evaluation was the one co-located with the existing PEF 115-kV transmission line right-of-way. The total weighted score for the highest-ranking corridor was 8.8. The weighted scores for the other candidate corridors range from 8.4 to 43.5.

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 Conferences were consistent with the results of the qualitative evaluation of the corridor selection team.

9-A6.3.1.5 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 selected corridor.

This evaluation included information collected during each phase of the analysis supplemented by information received from 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 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. 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-A6-1).

Golder Associates Inc. (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-A6.3.1.6 Major Alternative Corridors Considered

Multiple candidate corridors were evaluated for the 230-kV BBW transmission line, which generally follow the existing PEF 500/230/115 transmission line, the existing PEF 115-kV transmission line or SR 589 (Suncoast Parkway).

9-A6.3.2 Corridor Description

Locating the 230-kV BBW Corridor required 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, the 230-kV BBW Corridor has been developed to connect the Brookridge substation with the Brooksville West substation. The corridor selection process identified the highest-ranking candidate corridor for the 230-kV BBW Corridor.

The 230-kV BBW Corridor originates at the existing Brookridge substation traverses south and terminates at the existing Brooksville West substation. The overall length of the 230-kV BBW Corridor is approximately 3 miles. The 230-kV BBW Corridor is approximately 0.5 mile wide and is co-located with the existing PEF 500/230/115-kV transmission line right-of-way. The 0.5 mile wide 230-kV BBW Corridor allows flexibility when entering/existing the substations. The predominant land use within the 230-kV BBW Corridor is residential. It is anticipated that the right-of-way needed for the 230-kV BBW transmission line is 100 feet. The 230-kV BBW Corridor Map is presented as Figure 9-A6.3-5.

9-A6.3.3 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 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 . Attention: 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-A6.3.4 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 lines. Access roads are generally installed the full length of the transmission line rights-of-way. Existing access roads will be reviewed to determine if they can be used for construction and maintenance activities associated with the new transmission lines. In some areas these existing roads may need to be upgraded for construction and maintenance activities associated with the new transmission lines.

Where there are existing structure pads on an existing transmission line, these areas may be expanded to include the structure pad area for the new transmission line. In some areas, additional structure pads may be required. In areas where new rights-of-way are required, new access roads and structure

pads may also be required. Figures 9-A6.2-12 and 9-A6.2-13 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-A6.2-12 and 9-A6.2-13).

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 elevation (See Figure 9-A6.2-12).

9-A6.3.5 Cost Projections

Cost projections for the 230-kv BBW transmission line is 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 in Hernando County. The actual costs for the 230-kV BBW transmission line will depend upon the final location of the right-of-way within the 230-kV BBW 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 230-kV BBW 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 $6 million to $13 million, per mile or a

total construction cost of approximately $26 million to $52 million for the BBW 230-kV transmission line. Right-of-way acquisition costs may be lower if the transmission line can be built within the existing right-of-way. Cost estimates were calculated in current year dollars and then escalated for the year of expected expenditure.

9-A6.3.6 Social and Political Environment of the Corridor Area

9-A6.3.6.1 Governmental Jurisdictions

The 230-kV BBW Corridor is located within Hernando County, Florida. There are no municipalities within 0.5 mile of the 230-kV BBW Corridor (see Figure 9-A6.3-6). There are no federal, state or local jurisdictional areas located within the 230-kV BBW Corridor (see Figure 9-A6.3-6).

There are none of the following federal, state, and local jurisdictional areas located neither within nor within 0.5 mile of the 230-kV BBW 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 Forests, Game Management Areas, Areas of Critical State Concern, Save Our Rivers Lands, Aquatic Preserves, Outstanding Florida Waters, Florida Springs, Florida Wild & Scenic Rivers, County Parks, Indian Reservations, Military Lands.

9-A6.3.6.2 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 government s and coordinated by 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 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 BBW 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 BBW Corridor 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-A6.3.6.2.1 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 BBW Corridor has been evaluated relative to the local comprehensive plan of Hernando County. The following summarizes policies that may be relevant to the 230-kV BBW transmission lines. This information is also presented in Attachment 9A6-2 as an information source.

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-A6.3.6.2.2 Future Land Use Categories

The relevant future land use categories traversed by the 230-kV BBW Corridor are described below for information purposes only. The future land use categories within the 230-kV BBW Corridor and extending 0.25 mile from their boundaries are depicted on Figure 9-A6.3-7. Attachment 9-A6-2 contains reproductions of the future land use map of Hernando County.

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 unit 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.

Commercial — The Commercial future land use category is intended to provide for major roads in residential growth corridors. In addition, the category allows recreation, offices, minor public facilities and minor institutional 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.

Education — The Education future land use category is intended to provide for schools within the County. Uses allowed in the category include schools and ancillary activities such as recreation facilities, offices and housing for security.

9-A6.3.6.2.3 Land Development Regulations and Code of Ordinances

Potentially relevant substantive provisions of the relevant local government's 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. The Hernando County Code of Ordinances (Appendix A Zoning, Article I Definitions) identifies utilities as a public service use(s) and structure(s), which is 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. Noise is measured in decibels/A-weighted (dBA). 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 permissible noise levels.

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

As specified in Section 21-136 exemptions to the noise level regulations typically 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 230-kV BBW 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.

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-A6.3.6.3 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; railroad and gas pipeline companies. All crossing of state roads will conform to the applicable specifications in the FDOT's Utility Accommodation Manual (2007).

Table 9-A6.3-4 identifies the roads anticipated to be crossed by the 230-kV BBW transmission line within the 20-kV BBW Corridor, the affected agency, and the type of approval that would typically be required for the 230-kV BBW transmission line to be constructed across public lands.

9-A6.3.6.4 Vicinity Scenic, Cultural, and Natural Landmarks

There are no scenic, cultural, and natural landmarks within 0.5 mile of the 230-kV BBW Corridor.

9-A6.3.6.5 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 BBW 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-A6-3 contains an analysis of archaeological and historic sites in the 230-kV BBW Corridor and the other transmission line corridors.

No NRHP-listed or eligible archaeological sites or historic resources were identified in the 230-kV BBW Corridor through the FMSF. Although portions of the 230-kV BBW Corridor have been subjected to previous survey, no comprehensive survey that meets current FDHR standards has been conducted. The FMSF included 10 previously recorded archaeological sites within or

adjacent to the 230-kV BBW Corridor. Although not designated as NRHP-eligible in the FMSF, the presence of these archaeological sites indicates the potential for additional unrecorded sites 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 BBW 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-A6.3.7 Biological and Physical Environment of the Corridor Area

9-A6.3.7.1 Land Use/Vegetation (Habitat)

The 230-kV BBW Corridor originates at the Brookridge substation in Hernando County, in an area which is predominantly low density residential, improved pasture, and longleaf pine- xeric oak habitat. The 230-kV BBW Corridor exits the Brookridge substation to the south, intersecting mostly low density residential areas, commercial areas, longleaf pine-xeric oak habitat, improved pasture, nurseries and vineyards, extractive/mining areas, and a school until it crosses SR 50 (Cortez Boulevard). The 230-kV BBW Corridor continues south traversing low to medium density residential areas, urban lands in transition, disturbed lands, commercial areas, intermittent ponds, improved pastures, and longleaf pine-xeric oak habitats eventually terminating at the Brooksville West substation. The Brooksville West substation abuts primarily low to medium density residential and commercial areas, interspersed with intermittent ponds, urban lands in transition, disturbed lands, longleaf pine-xeric oak habitat, improved pastures, and the existing PEF's 500/230/115-kV transmission line right-of-way.

The existing land use and habitat types were identified for the 230-kV BBW 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 FDNR, 1990). Existing land use/land cover data dated 2004 was obtained from the SWFWMD (SWFWMD, 2008) and updated after ground truthing. 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-A6.3-8. Table 9-A6.3-5 lists the various land use and habitats found along the 230-kV BBW Corridor and their approximate acreages. Table 9-A6.3-5 lists the various land use and habitats found along the 230-kV BBW Corridor and their approximate acreages. Information was mapped by SWFWMD and ground truthed by Golder. Habitat descriptions and vegetation summaries of the upland, wetland, and aquatic habitats are presented in Attachment 9-A6-4. Summaries of the major land uses and habitats that occur within the 230-kV BBW Corridor are provided in the following subsections.

Land Use

The land use/land cover classifications that occur along the 230-kV BBW Corridor represent human-induced changes within the landscape. Much of the historical vegetation that occurred along the 230-kV BBW Corridor has been cleared for residential or commercial use, extractive, agriculture, utilities, and

coniferous plantations. Low density residential comprises the majority of the land use within the 230-kV BBW Corridor

Habitats

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

Upland - Upland habitats in the 230-kV BBW Corridor range from relatively undisturbed habitats, such as longleaf pine-xeric oak, hardwood-conifer mixed forests, pine flatwoods, and upland coniferous forest along the 230-kV BBW Corridor, to disturbed habitats, such as coniferous plantations, open and disturbed lands, and improved pastures. The upland habitats that exist within the 230-kV BBW Corridor include open land, improved pastures, longleaf pine-xeric oak forests, coniferous (pine) plantations, and disturbed lands.

Wetland and Aquatic - No forested wetlands exist within the 230-kV BBW Corridor. However, although limited in quantity, non-forested, herbaceous wetlands exist within the 230-kV BBW Corridor and consist of approximately 6 acres of intermittent ponds. The quality of these wetlands ranges from those exhibiting appropriate vegetation and community structure which may provide adequate cover, foraging and/or breeding habitat for wildlife, to those areas located within the transmission line right-of-ways that have reduced functionality due to their proximity to roadways and other man-made structures.

9-A6.3.7.2 Affected Waters and Wetlands

Surface water bodies crossed by the 230-kV BBW Corridor were identified 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

No named water bodies are crossed by or fall within the boundaries of the 230-kV BBW Corridor. The remainder of waters and wetlands crossed by the 230-kV BBW Corridor include numerous roadside ditches (not shown on Figure 9-A6.3-8 due to the scale), small lakes and reservoirs, and herbaceous wetland communities.

Wetlands

All of the wetland habitats that occur along the 230-kV BBW are non-forested systems. Descriptions of each of these habitats (listed in Table 9-A6.3-5) can be found in Attachment 9-A6-4.

9-A6.3.7.3 Ecology

The 230-kV BBW 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 BBW Corridor was also evaluated for the potential presence of plant species listed as threatened or endangered by the Florida Department of Agricultural and Consumer Services (FDACS).

Wildlife habitat in the area of the 230-kV BBW Corridor has been altered significantly from its natural state for planted pine, agriculture, utilities, and residential and commercial use. However, based on site observations, several wildlife species do utilize the area within the 230-kV BBW 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 in December 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 (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-A6.3-8 for the area within 0.5 mile of the 230-kV BBW Corridor. Detailed discussions for listed flora and fauna that occur, or have a potential to occur, within the 230-kV BBW Corridor can be found within the text below and associated Tables 9-A6.3-6 and 9-A6.3-7.

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 Hernando County since the FNAI list incorporates both the USFWS (federal) and FDACS (state) listed species (FNAI, 2008).

There are 19 listed plant species known to occur within Hernando County in habitats similar to those identified within the 230-kV BBW Corridor (see Table 9-

A6.3-6)(FNAI, FNAI Tracking List, 2008). Of the 19 listed species, 16 are classified by the state as endangered and 3 are classified as threatened (FNAI, FNAI Tracking List, 2008).

Due to the presence of potential habitat and the known range of these species, (FNAI, FNAI Tracking List, 2008) (NatureServe Explorer, 2008), it is possible that some of these species could occur in or near the 230-kV BBW Corridor; however, none of these listed plants were observed at the time of the site reconnaissance.

Fauna

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

The habitat types identified in the 230-kV BBW Corridor that serve as the principal wildlife habitat types include longleaf pine-xeric oak forests, pine flatwoods, and wetland areas such as freshwater marshes and wet prairies. Habitats such as improved pastures, open and disturbed lands, residential, extractive areas, and coniferous plantations are of relatively lower value to wildlife.

A total of 63 important wildlife species were identified as species occurring or possibly occurring in the 230-kV BBW Corridor (FNAI, FNAI Tracking List, 2008). Of these 63 species, 37 are game species or furbearers, as identified in Rule 39-1, F.A.C., and the remaining 26 are USFWS and/or FFWCC listed species known to occur in Hernando County (FNAI, FNAI Tracking List, 2008). The status and potential for occurrence of these species in the 230-kV BBW Corridor are summarized in Table 9-A6.3-7. USFWS (Federal) and FFWCC (State) listed species are discussed in the following paragraphs.

Fish

No listed fish species are known to occur within Hernando County (FNAI, FNAI Tracking List, 2008). General information on freshwater game fish, including their potential for occurrence within the 230-kV BBW Corridor, is summarized in Table 9-A6.3-8.

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; considered a commensal species to the gopher tortoise, using their burrow for shelter (FNAI, FNAI Search, 2001). Due to the presence of potential

habitat, there is a moderate likelihood that the gopher frog is present within the 230-kV BBW 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 the 230-kV BBW Corridor.

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 their burrows for shelter during the winter (FNAI, FNAI Search, 2001). Due to the presence of suitable habitat in the 230-kV BBW Corridor, there is a high likelihood that the eastern indigo snake is present.

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 BBW Corridor.

If gopher tortoise burrows are identified within the 230-kV BBW Corridor, 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.

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 suitable habitat in the 230-kV BBW Corridor, there is a high likelihood that the Florida pine snake is 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 BBW 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 BBW Corridor, there is a moderate likelihood that the short-tailed snake is present within these habitats.

Birds

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 the limited low-growing oak scrub habitat, the likelihood of occurrence of scrub-jays within the 230-kV BBW Corridor is low.

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). There is a moderate likelihood of occurrence that limpkins forage in the intermittent ponds located in the 230-kV BBW 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 moderate likelihood of occurrence in open, drier habitats along the 230-kV BBW Corridor.

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 or herbaceous wetlands within the 230-kV BBW 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 herbaceous wetlands and surface waters along the 230-kV BBW 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 BBW 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 herbaceous wetlands and surface waters along the 230-kV BBW 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 urban (residential) nature of the 230-kV BBW Corridor, there is a moderate likelihood 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 (*Falco 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).

An American kestrel was observed along the 230-kV BBW Corridor, just west of the existing Brookridge substation. Due to the time of year, this observation was most likely of the non-listed, northern, migratory American kestrel 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 BBW Corridor.

Florida Sandhill Crane (*Grus canadensis pratensis*)

The Florida sandhill crane is listed 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 the Florida sandhill cranes' preferred habitats (marshes, wet prairies, and pasturelands); it can reasonably be assumed that they inhabit the 230-kV BBW Corridor.

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 a 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). Although no known bald eagle nests occur along the 230-kV BBW Corridor, there is a moderate likelihood that bald eagles utilize these areas.

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 lack of forested wetland habitats within the 230-kV BBW Corridor, it is only moderately likely that this species is present.

Red-cockaded Woodpecker (*Picoides borealis*)

The red-cockaded woodpecker is listed as endangered by the USFWS and 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). Since old growth pine habitats are limited, their occurrence within the 230-kV BBW Corridor is low.

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 is moderately likely to be found foraging within the intermittent ponds located in the 230-kV BBW 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 limited suitable habitat, there is a low likelihood that the black skimmer utilizes the 230-kV BBW Corridor.

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 suitable habitat in the 230-kV BBW Corridor, there is a high likelihood that the Florida mouse is present.

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

The Sherman’s fox squirrel is listed as 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 likely that the fox squirrel is present along the 230-kV BBW Corridor because of the prevalence of longleaf pine-xeric oak forests and pasture areas.

Homosassa Shrew (*Sorex longirostris eionis*)

The Homosassa shrew is listed as a species of special concern by the FFWCC. They inhabit a wide variety of habitats, including cypress and bay swamps, hydric hammocks, pine flatwoods, palmetto thickets, sandhills, scrub, and clear-cuts (Whitaker, 1996). 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 the presence of suitable habitat, there is a high likelihood that the Homosassa shrew is present within the 230-kV BBW Corridor.

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). It is not likely that the Florida black bear is present along the 230-kV BBW Corridor due to the absence of large, contiguous tracts of mixed forested wetlands and mixed hardwood-conifer forests.

9-A6.3.7.4 Other Environmental Features

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

9-A6.4 EFFECTS OF RIGHT-OF-WAY PREPARATION AND TRANSMISSION LINE CONSTRUCTION

9-A6.4.1 Construction Techniques

The 230-kV BBW Corridor is co-located with an existing PEF 500/230/115-kV transmission line right-of-way for most of its length. If the proposed transmission line is co-located with that existing right-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 BBW 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-A6.4.1.1 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-A6.4.1.2 Right-Of-Way Preparation

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

9-A6.4.1.2.1 Clearing Techniques

General Clearing

For areas where existing PEF transmission line rights-of-way widths are insufficient for placement of the proposed 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 them to be removed and disposed 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 ANSI Z133 Safety Standards, ANSI A-300 Plant Maintenance, and 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 road 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-A6.4.1.3 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 4 feet and 12 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 deadend 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 front-end 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-A6.4.1.4 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 10.5 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-A6.4.1.5 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-A6.4.2 Environmental Resource Permit (ERP)

Once the right-of-way for the BBW transmission line is finalized, detailed design information typically provided in an 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-A6.4.3 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-A6.4.4 Changes to Vegetation, Wildlife, and Aquatic Life

Permanent changes to the vegetation, wildlife, and aquatic systems within the 230-kV BBW 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.

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 likely to occur in the 230-kV BBW 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 Sherman’s fox squirrel, 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 BBW 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-A6.4.5 Impact on Human Populations

The approximate length of time needed to construct the 230-kV BBW transmission line is 4 weeks per mile. During this construction time, a particular crews' 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 BBW right-of-way is adjacent to, or in proximity of existing transmission line right-of-way. Where the proposed transmission line follows existing public roads, the construction contractor will follow FDOT guidelines for flagging and use of barriers for traffic control.

9-A6.4.6 Impact on Regional Scenic, Cultural, and Natural Landmarks

As identified in Section 9-A6.3.6.4, there are no scenic, cultural, or natural landmarks within the 230-kV BBW Corridor.

9-A6.4.7 Impact on Archaeological and Historic Sites

Following the certification of the 230-kV BBW 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-A6.5 POST-CONSTRUCTION IMPACTS AND EFFECTS OF MAINTENANCE

9-A6.5.1 Maintenance Techniques

Maintenance activities for the BBW 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 9A-6.4.1.2. 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 BBW 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.

Where the 230-kV BBW transmission line right-of-way crosses public land, PEF will work with public land managers to develop a management plan for the right-of-way.

9-A6.5.2 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 safe and reliable 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-A6.5.3 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-A6.5.4 Effects of Public Access

Neither the establishment of the right-of-way for the 230-kV BBW 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-A6.5.5 Other Post-Construction Effects

9-A6.5.5.1 Electric and Magnetic Field Effects

Like all electric power lines, the 230-kV BBW 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 proposed 230-kV 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]:

[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 maximum electric field at the edge of the transmission line right-of-way and at the substation's property boundaries shall not exceed 2 kilovolts per meter (kV/m);
- The maximum electric field at the edge of the transmission line right-of-way and at the substation's 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 new substation property boundary shall not exceed 150 milliGauss (mG).

EMF associated with the proposed 230-kV BBW 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-A6.5-1 presents the maximum calculated EMF that can be produced by the proposed 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 transmission lines. Since some of the 230-kV BBW 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.

The detailed design of the transmission line will start after the 230-kV BBW Corridor is certified, during which a specific right-of-way within the certified 230-kV BBW Corridor will be selected. To the extent the detailed design includes configurations not reflected in Table 9-A6.5-1, 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-A6.5.5.2 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-A6.5.5.2.1 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 are 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 10000 hertz).

During fair weather conditions when the conductors are dry, the audible noise levels produced by the proposed 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-A6.5-2 presents the maximum calculated audible noise levels that could be produced by the proposed transmission line, at the edge of the right-of-way, during rain or other wet weather conditions. Audible noise levels were calculated using the CAFEP developed by Bonneville Power Administration.

9-A6.5.5.2.2 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 proposed 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, & 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 BBW 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 proposed 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 230-kV BBW 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 230-kV BBW 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 230-kV BBW 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 Channel 7 through 13 (signal strength equal to 56 dB) and

above will not likely experience interference from the proposed 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 of a signal, less line noise, or both.

Summary of Radio and Television Interference

PEF has more than 30 years of experience operating 230-kV 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 thru 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 proposed 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 BBW transmission line, PEF will investigate all complaints and provide appropriate mitigation for impacts to radio or television reception caused by the 230-kV BBW transmission line.

9-A6.5.5.3 Induced or Conducted Ground Currents

Objects located near transmission lines 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 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