CHAPTER 4: ENVIRONMENTAL IMPACTS OF CONSTRUCTION
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4.0 ENVIRONMENTAL IMPACTS OF CONSTRUCTION

Chapter 4 presents the potential environmental impacts of construction of Units 6 & 7. Impacts are analyzed, and a single significance level of potential impact to each resource (i.e., SMALL, MODERATE, or LARGE) is assigned consistent with the criteria that NRC established in 10 CFR 51, Appendix B, Table B-1, Footnote 3 as follows:

SMALL — Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For the purposes of assessing radiological impacts, the Commission has concluded that those impacts that do not exceed permissible levels in the Commission's regulations are considered small.

MODERATE — Environmental effects are sufficient to alter noticeably, but not to destabilize, any important attribute of the resource.

LARGE — Environmental effects are clearly noticeable and are sufficient to destabilize any important attributes of the resource.

This chapter is divided into eight sections:

- Land Use Impacts (Section 4.1)
- Water-Related Impacts (Section 4.2)
- Ecological Impacts (Section 4.3)
- Socioeconomic Impacts (Section 4.4)
- Radiation Exposure to Construction Workers (Section 4.5)
- Measures and Controls to Limit Adverse Impacts During Construction (Section 4.6)
- Cumulative Impacts Related to Construction Activities (Section 4.7)
- Nonradiological Health Impacts (Section 4.8)

4.1 LAND USE IMPACTS

The following subsections describe the potential impacts of construction of Units 6 & 7 and associated facilities on land use. Based on NUREG-1555 guidance, the assessment of potential impacts is differentiated according to geographic area: (1) impacts to land use on the Turkey Point plant property (defined as the "site" for this section) and within a six-mile radius of Units 6 & 7 (defined as the "vicinity" of the site) as a result of construction activities (Subsection 4.1.1) and (2) impacts to land use at the specific area locations of construction activities for the associated transmission line corridors and other project facilities that are outside the Turkey Point plant property (defined as "offsite") and may or may not be located in whole or in part within the vicinity of the site (Subsection 4.1.2). The assessment of project land use impacts also includes a separate assessment of potential impacts to historic and cultural resources (Subsection 4.1.3).

4.1.1 THE SITE AND VICINITY

4.1.1.1 The Site

4.1.1.1.1 Site Conditions and Construction Activities

Units 6 & 7 and their associated infrastructure, including the mechanical draft cooling towers, makeup water reservoir, substation, deep injection wells, associated buildings, etc. would be located on the approximately 218-acre Units 6 & 7 plant area. A temporary concrete batch plant would also be constructed on the plant area for use during construction (Figure 3.9-1).

As described in Sections 2.2 and 2.4, the Units 6 & 7 plant area presently consist of hypersaline mudflats (majority of the plant area), open water, dwarf mangroves, uplands and wetlands, man-made remnant canals, mangrove heads, and fill areas/roadways. The plant area has been previously disturbed by construction and operational activities associated with the other Turkey Point Units. The plant area has been isolated from tidal water influence as a result of the isolation afforded by the cooling canals of the industrial wastewater facility. Construction plans are for the entire 218-acre plant area to be disturbed, as described in ER Section 3.9. The plant area would be permanently occupied during Units 6 & 7 operation.

Additional supporting facilities and infrastructure would be constructed on the Turkey Point plant property. These facilities and infrastructure include laydown areas (including transmission and radial collector well areas), parking areas, nuclear and administration buildings, heavy haul road, equipment barge unloading area improvements, radial collector wells and pipelines, FPL reclaimed water treatment facility and pipelines, security buildings, onsite transmission infrastructure improvements, potable water pipelines, bridge improvements/construction, access road improvements, and spoils areas. Most of the construction of the associated facilities and infrastructure necessary for Units 6 & 7 construction and operation would be on previously disturbed land resulting from construction and operation of Units 1 through 5. Major construction

related land disturbances are identified in Section 3.9 (See Table 3.9-2). Permanent above grade facilities would be the FPL reclaimed water treatment facility, nuclear and administration buildings and associated parking lots, spoils areas, laydown areas, heavy haul road, equipment barge unloading area, and the radial collector well area. Temporary construction disturbance includes the below grade installation of potable water, reclaimed water, and radial collector well pipelines.

4.1.1.1.2 Regulatory Requirements

Federal Requirements

As described in Section 2.4, no farmland exists on the Units 6 & 7 plant area, and, therefore, no prime or unique farmland, as defined in the Farmland Protection Policy Act (7 U.S.C. Section 4201(b)) occurs on the plant area. Agricultural land comprises approximately 9 percent (3500 acres) of land use within the 6-mile vicinity of the Turkey Point plant property (Figure 2.2-4; Table 2.2-1). The land acreage with use/cover designation of agricultural in the vicinity is concentrated in an area adjacent to the west-northwest corner of the plant property within Miami-Dade County. An assessment of soil types in the area of the plant property indicated that no prime farmland, as defined in the Farmland Protection Act (7 U.S.C. Section 4201(b)) occurs on the Turkey Point plant property or in the 6-mile vicinity. In addition, there is no indication of unique farmland (i.e., used for the production of specific high value foods and fiber crops) in the 6-mile vicinity. Further discussion of agriculture in the four-county region surrounding the Turkey Point plant property is provided in Subsection 2.2.3.

The Florida Coastal Management Act (§380.205-380.27, Florida Statutes) authorizes the Coastal Zone Management Section of the Florida Department of Environmental Protection (FDEP) to certify consistency with the Florida Coastal Management Program for all federal licenses, permits, activities, and projects, when such activities affect land or water use.

State of Florida Requirements

The Florida National Pollutant Discharge Elimination System (NPDES) Stormwater Permitting Program (Rule 62-621.300(5)(a), F.A.C.), the EPA-FDEP (joint) Generic Permit for Stormwater Discharge from Large and Small Construction Activities (Table 1.2-1) (Rule 62-621-300(4)(a) F.A.C), other regulatory guidance, and standard industry practices would be followed to minimize erosion and sedimentation effects and protect receiving waters and downstream areas.

Miami-Dade County Requirements

As described in Section 2.2, the Turkey Point plant property is zoned as GU, Interim District. On the Comprehensive Development Master Plan, Future Land Use Plan Map, the plant property has dual land use designations of Institutional, Utilities, and Communications and Environmental Protection Subarea F. Nuclear reactors are a permitted use in the GU zoning district, provided an

Unusual Use Variance is obtained. In 2007, FPL submitted an application to Miami-Dade County for an Unusual Use Variance, several Non-Use Variances, and appropriate modifications to preexisting resolutions for two additional nuclear power plants (atomic reactors) and ancillary structures and equipment.

On December 20, 2007, the Miami-Dade County Board of County Commissioners approved FPL's application (Resolution Z-56-07), designating the public hearing subject property as Environmental Protection Subarea F and making the project subject to certain requirements.

Summary of Potential Impacts and Mitigation Measures

As stated in Subsection 2.2.1, FPL owns most of the property within the Turkey Point plant property boundary with the exception of certain encumbrances on portions of the property, specifically, certain canal, drainage, reclamation, oil, gas, and mineral rights reservations held by the Trustees of the Internal Improvement Fund of the State of Florida, and a canal reservation held by Miami-Dade County. Currently, there are no known oil or gas wells nor any sand or rock mining located within the Turkey Point plant property boundaries. Therefore, there would be no known impacts to oil, gas, or mineral resources from project construction activities.

Site preparation and construction activities for Units 6 & 7 would be conducted in accordance with applicable federal, state, and local regulations. FPL would acquire the necessary permits and authorizations, and would implement environmental controls such as stormwater management systems, fugitive dust control, and spill containment controls before earth-disturbing activities begin. Site preparation and construction activities affecting land use include clearing, grubbing, grading and excavating, dewatering, and stockpiling soils. Permanently disturbed locations would be stabilized and contoured in accordance with design specifications. When necessary, revegetation would comply with site maintenance and safety requirements. Methods to stabilize areas and prevent erosion or sedimentation would comply with applicable laws, regulations, and permit requirements; good engineering and construction practices; and recognized environmental best management practices.

Mitigation measures, designed to lessen the impact of construction activities, would be specific to erosion control, dust control, controlled plant access for personnel and vehicular traffic, and restricted construction zones. Initial site preparation work would consist of clearing, excavating, grading, and fill. Grading and drainage would be designed to minimize erosion during the construction period.

Because construction activities would only affect the majority of land that has already been disturbed and protective measures are required during construction activities in accordance with the Miami-Dade County Unusual Use Permit, the impacts to land use of the Turkey Point plant property from construction would be SMALL and would not require additional mitigation.

4.1.1.2 The Vicinity

Land within the vicinity of Units 6 & 7 is predominantly wetlands and forestland (Table 2.2-1, Figure 2.2-4), including environmentally protected areas as designated by the Miami-Dade County Comprehensive Development Master Plan. Biscayne National Park is immediately north and east of Turkey Point. Also, a small portion of the state-designated, 75,000-acre Biscayne Bay Aquatic Preserve lies outside of the national park boundaries. Homestead Bayfront Park is located adjacent to Biscayne National Park. The Model Lands Basin, an SFWMD Save Our Rivers acquisition, is located in the vicinity to the west of the Turkey Point plant property. The FPL-owned Everglades Mitigation Bank is adjacent to most of the western and southern boundaries of the Turkey Point plant property.

No land use impacts would occur to recreational or protected areas in the 6-mile vicinity. Most temporary and permanent facilities associated with Units 6 & 7 would be contained within the Turkey Point plant property boundaries, and construction activities for these facilities are not expected to impact land use in nearby park areas. Additionally, the Miami-Dade Unusual Use Resolution Z-56-07 stipulates several mitigative actions/plans to minimize impacts to the vicinity.

4.1.2 TRANSMISSION CORRIDORS AND OFFSITE FACILITIES AND AREAS

This subsection addresses the land use impacts from construction activities associated with the preferred transmission corridors, offsite substations, fill borrow areas, and makeup water systems.

4.1.2.1 Proposed Transmission Corridors

As described in Subsection 3.7.3, FPL has undertaken a route selection process to choose the transmission corridors that will be submitted for approval under the Florida Electrical Power Plant Siting Act (PPSA; §403.501-518, F.S). As part of the selection process, the state approves a corridor and the transmission line right-of-way is determined after state certification. The objective of the corridor selection process is to select a certifiable corridor that balances land use, socioeconomic, environmental, engineering, and cost considerations. The siting criteria included land use considerations to minimize potential disruption to such areas as national, state, and county parks; wildlife refuges; estuarine sanctuaries; landmarks; and historical sites. Also, the route selection process minimizes land use impacts by seeking opportunities to collocate with existing linear features (e.g., farm roads, canals, railroads, FPL transmission lines, other transportation rights-of-way, etc.).

New transmission lines for Units 6 & 7 would be built within Miami-Dade County. The proposed corridors for these transmission lines are described in Sections 2.2 and 3.7, and are shown in Figure 2.2-5. The land use along these proposed transmission line corridors are identified in Tables 2.2-2 and 2.2-3.

Where practicable, new transmission lines would be routed in existing corridors owned by FPL and routed adjacent to existing transmission lines or other existing linear facilities (e.g., access roads, transportation routes) to minimize impacts.

Miami-Dade County Unusual Use Resolution Z-56-07, Condition 20, requires that impacts to any Miami-Dade County-designated natural forest community, as a result of any FPL transmission corridor improvement, are to be minimized and consistent with County natural forest community standards and requirements (Section 4.3).

As described in Section 2.2, Units 6 & 7 would be connected, via underground facilities, to a new 500/230 kV substation known as Clear Sky, which would be constructed in the Units 6 & 7 plant area. As described in Subsection 4.1.1.1, this connection would be on previously disturbed land and no new construction impacts would be anticipated.

The Clear Sky substation would have two 500 kV transmission lines extending west and then north, approximately 43 miles long, connecting it to the existing Levee 500 kV substation in a planned transmission West Preferred/Secondary Corridor. A new 230 kV line, approximately 52 miles long, would be constructed in the same West Corridor between Clear Sky substation and a new 230 kV bay position at the existing Pennsuco substation; the line would share the same right-of-way with the two new 500 kV lines between Clear Sky and Levee substations.

In addition to the planned new transmission line West Corridor, a new 230 kV line, approximately 19 miles long, would be constructed to connect Clear Sky substation to a new 230 kV bay at the existing Davis substation in a planned transmission East Preferred Corridor. In addition, a new 230 kV line, approximately 18 miles long, would be constructed (in a new right-of-way to be selected) to connect the Davis substation to a new 230 kV bay position at Miami substation.

Two access-only corridor laterals would be constructed as part of the West Preferred/Secondary Corridor alignments. These access corridors would be used to access the transmission corridor and eventual right-of-way. No transmission structures would be built in these access corridors, although access roads or road improvements may be required. The two access corridors (Figure 2.2-5) are:

- Tamiami Trail Corridor
- Krome Avenue Corridor

Current land use for the transmission line access corridor at Tamiami Trail is 100 percent wetland (Table 2.2-4).

Current land use for the transmission line access corridor at Krome Avenue is 98 percent wetland and 2 percent urban or built-up land (Table 2.2-4).

The two new 500 kV lines and two new 230 kV lines for Units 6 & 7 would be located within state-approved corridors that would be narrowed to rights-of-way after state certification and before construction. Rights-of-way would be acquired in fee or easement.

The estimated total acreage where land disturbance could occur from new construction of transmission lines from Clear Sky to Pennsuco is 3576 acres and 1862 acres from Clear Sky to Miami (see Table 2.2-2). It should be noted that included in these areas where new land disturbance could occur is acreage in preexisting FPL-owned corridors (e.g., Clear Sky to Davis). Because plans would be to use existing rights-of-way within the corridors to the extent practicable, the areas of new disturbance and use of previously undeveloped land is expected to be relatively minor compared to the total acreage of the corridors.

Construction activities for new transmission structures, tower pads, conductors, and access roads are described in Section 3.7. These activities could result in vegetation loss and temporary habitat disruption in the land types occurring along the final rights-of-way. Land used for structure pads and access roads would no longer be available for use by others, but land located between towers would only be temporarily impacted and would be restored after construction and available, upon approval by FPL, for joint uses that do not jeopardize the safe and reliable operation of the transmission lines. Subsection 4.1.3.2 describes potential impacts from transmission line construction to historical and cultural resources.

FPL construction programs, plans, and procedures routinely use standard industry construction practices, environmental best management practices, and mitigation measures to ensure adverse environmental effects of construction are avoided, minimized, or mitigated. Specific environmental protection and impact mitigation measures (with the associated construction phase) that potentially would be used within the Units 6 & 7 transmission line rights-of-way include:

- Use of restrictive land-clearing processes in forested wetland areas (right-of-way clearing and preparation)
- Use of turbidity screens and erosion-control devices in areas of wetlands and water resources (access road/structure pad construction)
- Use of existing access roads for ingress and egress to rights-of-way where available (access road/structure pad construction)
- Use of standard industry construction practices for foundation and structure excavation and construction (line construction)

As described in Section 1.2, FPL would comply with applicable laws, regulations, and permit requirements for the Units 6 & 7 project. Standard industry construction practices would be used for the transmission line construction, including use of existing rights-of-way, to the extent practicable, and environmental management, including such things as erosion-control devices, matting to reduce compaction caused by equipment, use of wide-track vehicles when crossing wetlands, and restoration activities after construction.

Although impacts to wetlands could potentially occur, they would be limited by careful siting and construction practices to avoid and minimize adverse effects. Where wetland impacts do occur, compensatory mitigation, as required by state and federal agencies, would be provided. Given the careful consideration of land use in the route selection process (Subsection 2.2.2) and the availability of a viable method for mitigation, impacts to offsite land use would be SMALL.

4.1.2.2 Offsite Substations

As described in Subsection 2.2.2, several upgrades and/or expansions would be needed to the Turkey Point, Clear Sky, Levee, Pennsuco, Davis, and Miami substations that could impact current land use (Table 2.2-5). Work at the Pennsuco substation would require acquisition of additional property for expansion on a previously disturbed area.

The existing Turkey Point substation, located on the Turkey Point plant property, would be expanded by 0.9 acre to accommodate a new bay with two new 230 kV line terminals and enlargement of the existing relay vault building. Current land use of the 0.9-acre area of expansion for the onsite Turkey Point substation is 100 percent urban or built-up land.

The existing Levee substation would be expanded by 2.3 acres to accommodate a new bay with two 500 kV line terminals. The interconnection work at Levee substation would include filling, grading, and rocking an expansion area of approximately 130 x 850 feet to the north of the existing 500 kV yard for construction of a new bay and associated equipment. In addition, a new stormwater retention system would be constructed. Current land use of the 2.3 acres area of expansion for the Levee substation is 100 percent wetland.

The existing Pennsuco substation would be expanded by approximately 0.65 acres to accommodate addition of a stormwater retention system and installation of new equipment. Current land use of the 0.65 acres area of expansion for the Pennsuco substation is 100 percent urban or built-up land.

The existing Davis substation would be expanded by approximately 1.21 acres to accommodate addition of two new 230 kV line terminals and installation of equipment to control power flow for the line connecting to the Miami substation. Current land use of the 1.21 acres area of expansion for the Davis substation is 91 percent forestland and 9 percent urban or built-up land.

The Miami substation would be modified to expand and reconfigure the 230 kV section, add a new 230 kV line terminal for connection of the line from the Davis substation, and replace the autotransformer to match the rating with that of the Miami substation. These modifications would involve no expansion of land area of the substation.

Substation facilities would meet all environmental regulatory requirements for their construction and expansion; accordingly, potential land use impacts from construction would be SMALL and not require additional mitigation.

4.1.2.3 FPL-Owned Fill Source

Borrow material for the Units 6 & 7 plant area, estimated at 8.9 million cubic yards, would be obtained from a combination of an FPL-owned fill source, other regional sources, or reused material. Using existing commercial quarries for borrow materials would have no impact on land use and, therefore, would not require mitigation. Additional borrow material would be obtained from the same sources for other construction activities including the FPL reclaimed water treatment facility, road upgrades, transmission tower pads, etc. Any additional fill material needed during operation and maintenance of Units 6 & 7 would be supplied through a commercial provider. Accordingly, the FPL fill source would be expected to cease operation with the completion of Units 6 & 7 construction activities. Future plans are that the 300-acre area and newly created lake would be maintained as a water management feature, under FPL or other local or regional ownership, management, and control. Using FPL-owned property for borrow material would permanently disturb approximately 300 acres of land classified as agricultural land. However, this land disturbance represents a small portion of the available agricultural land in the surrounding area and would, therefore, be a SMALL impact.

4.1.2.4 Makeup and Potable Water Systems

As described in Sections 3.3 and 3.4, reclaimed water from the Miami-Dade Water and Sewer Department (MDWASD) and/or radial collector wells-supplied water would be used as cooling water makeup for Units 6 & 7. Potential impacts of construction activities for these cooling water systems are described below.

As described in Section 2.2, the reclaimed water pipeline corridor would require approximately 9 miles of pipelines between the Turkey Point plant property and the MDWASD South District Wastewater Treatment Plant to the north (Figure 2.2-5). For about 6.5 miles of their length, the pipelines would be collocated with the existing Clear Sky-to-Davis transmission line right-of-way and adjacent road and canal rights-of-way. For the remaining approximately 2.5 miles, the pipelines would then diverge from the existing right-of-way. The current land use of the 137 acres within this corridor, some smaller portion of which could be impacted with the construction of the pipelines and right-of-way, is approximately 60 percent wetland and 35 percent forestland

(Table 2.2-6). Construction activities for the pipelines could result in vegetation loss and habitat disruption. As described in Section 4.3, the pipelines would be trenched beneath/along an existing access road on the west side of the corridor and, upon completion, the disturbed portions of the corridor would be graded to the contours of the surrounding landscape and revegetated or returned to previous land uses. Clearing of new corridors and/or expansion of existing corridors would include use of environmental best management practices to minimize impacts to sensitive habitats. Most of the reclaimed water pipelines would follow existing rights-of-way.

Construction of the radial collector wells would not cause new surface land disturbance to any previously undeveloped property. Also, as described in Subsection 4.1.1.1.2, Miami-Dade County has approved the rezoning of the land for development.

Accordingly, land use impacts from construction of the makeup water systems in the six-mile vicinity would be SMALL and would not require mitigation.

As described in Section 2.2, the radial collector wells would include horizontal laterals extending underground from a collection caisson to a depth of approximately 40 feet under Biscayne Bay. Because construction of the radial collector wells would involve surface land disturbance only on the Turkey Point plant property and no surface land disturbance in offsite areas, there would be no new construction impacts associated with the radial collector wells to offsite land use.

An approximately 9-mile-long pipeline corridor would be constructed to obtain potable water for Units 6 & 7. The new potable water pipelines would deliver potable water from the source facility to a storage tank in the Units 6 & 7 plant area. The route of the pipelines is identified in Figure 3.9-1. Selection of this route was made to minimize environmental impacts from construction of the new pipelines. Other than the north-south section of pipelines along SW 137th Avenue/Tallahassee Road from SW 288th Street to SW 328th Street/N. Canal Drive, most of the route is within the area of already planned roadway improvements to avoid additional congestion with the existing and planned new other utilities on the access road to Units 6 & 7. Because of the commonality of the pipeline route with previous disturbance and/or new disturbance already expected to occur resulting from construction of other Units 6 & 7 project facilities (e.g., roadway improvements), construction of the underground pipelines would have minimal additional environmental impacts.

4.1.2.5 Access Roadways

As described in Section 3.9, the Units 6 & 7 project includes roadway improvements to allow access to the site for construction and operations. The improvements include the widening of three existing roadways and the development of existing unpaved roads to four paved roadways (Figure 3.9-1). The current land use along the roads is summarized in Table 2.2-7.

The improvements for the existing paved roadways consist of the widening from two lanes to four lanes of SW 328th Street/N. Canal Drive, SW 344th Street/Palm Drive, and SW 117th Street, for a total roadway length of approximately 3.25 miles.

Development of the four new paved roadways include (with approximate lengths): SW 359th Street at two locations, three lanes between SW 137th Avenue/Tallahassee Road and SW 117th Avenue (2 miles in length) and four lanes between SW 117th Avenue and Units 6 & 7 (3 miles in length), plus construction of a bridge over the L-31 Canal; three lanes at SW 137th Avenue/ Tallahassee Road between SW 344th Street/Palm Drive and SW 359th Street (1 mile in length); and four lanes at SW 117th Avenue between SW 344th Street/Palm Drive and 359th Street (1 mile in length). The new paved roadway for SW 359th Street from SW 137th Avenue/Tallahassee Road to the Turkey Point plant property would also serve as the access road for the new transmission lines along its route. There is a South Florida Water Management District (SFWMD) canal that crosses the L-31E canal along the SW 359th Street route with FPL-owned property on either side.

Improvements to four existing intersections and the development of two new intersections would also be required to accommodate traffic to and from Units 6 & 7. Each of the intersections would require signalization and/or traffic control personnel depending on the peak traffic period and flow.

The locations for the road improvements were selected to use, to the greatest extent practicable, existing roadways and to minimize environmental impacts. Because of the location of the Turkey Point plant property, the majority of the roadway improvements can be located within an existing FPL-owned right-of-way, which extends from the plant property toward the west (SW 359th Street) and along portions of SW 117th Avenue south of SW 344th Street/Palm Drive (approximately 5 miles). The remaining 4 miles of roadway improvements are along existing paved and unpaved roads.

The roadway improvements would be located in unincorporated Miami-Dade County and in the City of Homestead. The roadway corridor would traverse the following zoning designations: Agricultural District (AU), Interim District (GU), and Planned Unit Development (PUD). With the exception of SW 359th Street, all the roadways have been designated as roads by Miami-Dade County. With the expansion of the roadways, certain easements from governmental agencies may be required depending upon the final design. The paved road for SW 359th Street from SW 137th Avenue/Tallahassee Road to the Turkey Point plant property would be located on FPL property, with the exception of the crossing of the L-31E Canal. The canal crossing would require an easement from SFWMD.

Relevant future land use categories of the Miami-Dade County Comprehensive Development Master Plan allow for utility uses in the proposed corridor for the roadway improvements.

Roadway design standards and construction would follow the requirements of the Miami-Dade County Public Works Department and the Florida Department of Transportation. Construction activities would include the installation of silt fences, removal of vegetation, construction of drainage, removal of unsuitable soils, placement of road base materials, laying layers of asphalt, and striping. The shoulders would be appropriately sloped and surface water runoff would be managed with the installation of swales and culverts at suitable locations.

With local governmental approval for the planning of the roadway improvements, the granting of easements for the roadway use, and the use of environmental best management practices, land use impacts from the improvements associated with the construction of Units 6 & 7 would be SMALL and not require additional mitigation.

4.1.3 HISTORIC PROPERTIES

FPL has initiated consultation with the State Historic Preservation Officer (SHPO) regarding the proposed project. FPL is currently preparing work plans that will describe (1) areas of potential effects (APEs) for physical disturbance and visual impacts to historic properties from the Units 6 & 7 project, and (2) what investigations, if any, are needed in those APEs to determine potential effects to historic properties. FPL will consult with the SHPO regarding the work plans. FPL has conducted research of the APEs to determine the likelihood for historic properties to be located there. Results of some of this research are presented in Subsection 2.5.3.

4.1.3.1 Onsite Facilities and Construction Areas

Research of the onsite APEs indicates that no previously recorded historic properties or locally-designated sites are located within or adjacent to (within 100 feet) the onsite APEs, and also determined that prior to 1963, the area surrounding the site was undeveloped. The archaeological field assessment confirmed that some of these areas are frequently inundated and have a low probability for archaeological sites. Many of the construction use areas are located on lands that have been extensively disturbed during other construction projects. Based on this information, it is anticipated that no further field investigations or research will be required for these construction areas. It is also anticipated that there would be no impacts to historic properties from construction of the onsite permanent facilities and the temporary construction facilities and use areas. FPL will consult with the SHPO on the work plans, archaeological field assessment, and the recommendations of no further field survey and no historic properties impacted.

4.1.3.2 Offsite Transmission Line Corridors

The work plan for the transmission line corridors will include an APE for direct physical effects and an APE for indirect or visual effects. It is anticipated that field assessments within the APEs will be required for the corridors. The transmission line corridors and associated staging areas

would likely require archaeological survey, with subsurface testing in areas with moderate to high archaeological potential. Testing in low potential areas would be judgmental. An historic resources survey would likely also be required for areas within 500 feet of the corridors. FPL will consult with the SHPO on the work plan. The results of the field assessments and FPL's recommendations on effect to historic properties will be submitted to the SHPO.

4.1.3.3 Other Offsite Areas

The work plan for the reclaimed and potable water pipelines, borrow areas, and access roads will include an APE for direct physical effects only. An APE for indirect or visual effects is not needed for this infrastructure because they are at or below the ground surface. It is anticipated that archaeological field assessments within the APE will be required for the infrastructure. These construction areas would likely require archaeological survey, with subsurface testing in areas with moderate to high archaeological potential. Testing in low potential areas would be judgmental. FPL will consult with the SHPO on the work plan. The results of the field assessments and recommendations on effect to historic properties will be submitted to the SHPO.

4.1.3.4 Discovery Provisions

FPL is currently preparing work plans for the onsite and offsite areas, and will consult with the SHPO regarding these plans. The work plans will contain recommendations for development of an Unanticipated Finds Plan and a Contractor Training Program. The plan will outline procedures and identify responsible personnel to be contacted if significant archaeological materials or human remains are encountered during construction. The plan will be included in a contractor training program prior to construction. The goal of the training will be to inform construction personnel, inspectors, and managers of the possibility for human remains and archaeological materials in a given area, and to develop clear understanding of what procedures should be followed if human remains or archaeological materials are identified during earth-disturbing activities.

4.2 WATER-RELATED IMPACTS

Water-related impacts from the construction of Units 6 & 7 could result from (1) hydrologic alteration of local surface water bodies, including streams and wetlands, and groundwater because of diversions, (2) surface elevation changes, and (3) groundwater elevation changes because of local pumping/dewatering. Impacts could also occur to downstream water quality as a result of erosion and sedimentation and to surface water and groundwater resulting from spills of fuels, lubricants, and other construction-related pollutants. Because of this potential for impacting surface water and groundwater resources, applicants are required to obtain a number of permits before initiating construction. Table 1.2-1 lists the consultations, authorizations, and permits required for initiating the construction activities. In addition, FPL is required to comply with Conditions of the Miami-Dade County Resolution Z-56-07.

A description of Preconstruction activities, Limited Work Authorization activities, and Construction activities is provided in Section 3.9.

Water bodies and areas that would be affected by construction activities in the Units 6 & 7 plant area are the mudflats (consisting of wet organic soil material) and the remnant canals. Water bodies that could be affected by other construction activities on the Turkey Point plant property include Biscayne Bay, the cooling canals of the industrial wastewater facility (which is not a water of the state or the United States), the truncated portion of the industrial wastewater facility lying to the northwest of the plant area, and numerous named and unnamed surface water drainage canals. As described in Subsections 2.3.1.2 and 2.3.2.2, the surficial aquifer at the Turkey Point plant property is the Biscayne aquifer. Although the Biscayne aquifer is the sole-source aquifer for Miami Dade County, the Biscayne aquifer at is not used as a source of potable water for the existing units.

4.2.1 HYDROLOGIC ALTERATIONS

This subsection identifies onsite and offsite construction activities that could result in impacts to the hydrology on the Turkey Point plant property and offsite areas. Activities include construction of the new units and associated facilities, heavy haul road, equipment barge unloading area modification, transmission facility construction and modification, reclaimed water pipelines, FPL reclaimed water treatment facility, improvements to access roads, potable water pipelines, radial collector wells and pipelines, borrow and spoil areas, nuclear administration and training buildings, security facilities, and laydown/parking areas. Section 3.9 provides a complete summary of land disturbances.

Impacts resulting from the disturbance of surface soils are regulated under the National Pollutant Discharge Elimination System (NPDES) pursuant Section 402(p) of the Clean Water Act. The Florida Department of Environmental Protection (FDEP) is the NPDES permitting authority for

Florida. Implementing its EPA-approved NPDES stormwater program, FDEP has adopted its Generic Permit for Stormwater Discharge from Large and Small Construction Activities (CGP) which is incorporated by reference under Rule 62-621.300(4), F.A.C. The NPDES CGP applies to construction activities which disturb one or more acres of total land area. Disturbance includes clearing, grading and excavating. The CGP may apply to the disturbance of less than one acre of land if part of a larger common plan of development.

NPDES permit coverage is obtained under the CGP by preparing a Stormwater Pollution Prevention Plan (SWPPP) and filing a Notice of Intent (NOI) to utilize the CGP along with a filing fee. FDEP now allows the NOI to be filed electronically. Permitting coverage is limited to 5 years. The SWPPP must be prepared prior to filing the NOI but is not filed with FDEP. However, the plan must be kept on-site and available for FDEP inspection at all times. The SWPPP must include, among other items: a site plan for managing stormwater runoff; identification of appropriate erosion and sedimentation controls and best management practices (BMPs) that will be employed to minimize the discharge of pollutants off-site during storm events: a schedule for inspection and maintenance of BMPs: and a record keeping process documenting any maintenance or repairs performed and any modifications made to the plan. The SWPPP may include structural or non-structural controls. Structural controls may include retention ponds, silt fencing or berms while non-structural controls might include soil stabilization by sodding, seeding or mulching or scheduling construction during the dry season. Once construction is complete and any disturbed areas are stabilized (usually through sodding, seeding or other means), a Notice of Termination may be filed terminating NPDES permit coverage. If construction exceeds the initial 5-year period, a new Notice of Intent must be filed to reapply for coverage.

4.2.1.1 Onsite Facilities

4.2.1.1.1 Construction and Laydown Areas

Surface Water

Surface water that could be impacted during construction activities at the Units 6 & 7 plant area consists of the cooling canals of the industrial wastewater facility.

Flooding that could occur in the proximity of the plant area would be the result of major storm precipitation events. Overland flow in the proximity of the plant area and Units 3 & 4 currently discharges to the industrial wastewater facility that surrounds the plant area and not to surface water drainage features that drain to Biscayne Bay. During construction, surface water from the plant area would be directed to the cooling canals of the industrial wastewater facility. FPL would seek to modify the existing industrial wastewater facility permit to include Units 6 & 7.

Two remnant canals of the industrial wastewater facility are located in the Units 6 & 7 plant area which would be excavated to remove the muck. The dead-end canal located northwest of the

plant area would be permanently backfilled for use as an additional laydown area. The material excavated from approximately the upper 5 feet in the plant area would be deposited in one of the spoils areas described in Section 3.9. Engineered fill would be used to raise the grade level in the plant area to a working grade elevation. Excavation of the power block locations would then begin. Excavated material from the power block locations could eventually be used as fill throughout the plant area. Unsuitable excavated material would be transported to the spoils areas. Stormwater would be managed with the appropriate environmental controls to reduce the amount of sediment in the surface water runoff before release to the industrial wastewater facility. The removal of original soils, replacement with compacted engineered fill material, and change of the elevation at the power block area to approximately 25.5 feet would permanently alter the flow of surface water in the plant area. However, the alterations would be limited to the plant area by the presence of the industrial wastewater facility and the berm east of the return canal, and would not result in impacts to downstream surface water bodies or resources. Therefore, impacts to surface water because of hydrologic alterations would be SMALL and would not warrant additional mitigation.

Groundwater

Curtain wall technology would be used to isolate the cooling canals of the industrial wastewater facility from the plant area. Dewatering would not be expected to be required for the first 5 feet depth of excavated material, but would be required for subsequent excavation depths in the power block areas. As described in Subsection 2.3.1.2, the subsurface soils underlying the 5 feet of muck in the vicinity of the power blocks consist of formational material capable of substantial groundwater yield. The placement of engineered fill would alter the permeability of the subsurface material currently at the plant area. As described in Section 3.9, a slurry diaphragm wall would be installed to a depth of approximately -65 ft NAVD around the power blocks during dewatering and excavating subsurface materials. The slurry wall, which would be permanent, would alter local horizontal groundwater flow around the power block excavations and would, therefore, alter the hydrologic flow through the power block area. Impacts to the hydrologic flow of groundwater would occur from the presence of the slurry wall and the emplacement of the engineered fill material. The impacts would be limited to the vicinity of the slurry wall. The use of the slurry wall would allow dewatering of the power block areas with minimal impacts to groundwater directly outside of the slurry wall containment area. Groundwater flow may also be locally altered as a result of backfilling the dead-end canal.

A geo-hydrologic model (Visual MODFLOW) was used to simulate impacts to the surficial aquifer from these dewatering activities. The maximum rate of groundwater production required to maintain a “dry” level of –35 feet NAVD 88 in each excavation simultaneously is estimated to be approximately 18,000 gpm or 26 MGD. This was considered the worst case, or bounding, scenario. The groundwater elevation during dewatering would exist in the upper part of the Fort Thompson formation. Based on the simulation, approximately 50 percent (9000 gpm or 13 MGD)

of the dewatering flow would come from Biscayne Bay, while the remaining flow would come from the discharge side of the cooling canals of the industrial wastewater facility and inland areas west of the plant area.

The circulating water flow rate in the industrial wastewater facility for Units 1 through 4 is 4250 cubic feet per second (2747 MGD). The extracted groundwater from dewatering would be less than 1 percent of the circulating water flow rate, assuming all 9000 gpm came directly from the discharge canal. The water withdrawn from the excavations would be released into the industrial wastewater facility. As described in Subsection 2.3.1.2.2.5, makeup water for the industrial waste water facility comes from treated process water, rainfall, stormwater runoff, and groundwater infiltration. This inflow, along with the low amount of predicted water withdrawal from the discharge canal, would result in minimal net effect on the cooling canals of the industrial wastewater facility.

The net effect on water withdrawal from Biscayne Bay (9000 gpm or 13 MGD) would also be minimal due to the substantial amount of water in the bay and the relatively temporary nature of the dewatering activities.

The dewatering system would be designed using environmental best management practices to control turbidity of the effluent released to the cooling canals of the industrial wastewater facility. FSAR 2.4.12, Appendix CC, contains a discussion of the construction dewatering simulation.

Groundwater levels at the Units 6 & 7 plant area would be altered during construction activities, due to the dewatering necessary for the deep foundations. However, these temporary alterations would be mitigated in part by the hydraulic isolation of the plant area with regard to local surface water and the interconnection between the cooling canals of the industrial wastewater facility and the shallow aquifer. Slight changes in percolation rates would have negligible impacts on water levels, because the surface infiltration would affect only a localized area.

During construction of Units 6 & 7, one of the deep injection wells (see Subsection 4.2.1.1.9) could be used for the disposal of construction-related and sanitary wastewater. Injection would be in accordance with the underground injection control permit and would be consistent with the use of deep injection wells in Florida. The anticipated amount of wastewater injected would be less than the amount anticipated during operations. Groundwater quality and hydrologic monitoring would be performed on two wells installed in the upper Floridan aquifer as required by FDEP's underground injection control permit.

For these reasons, the impacts of alterations to the groundwater resource would be SMALL and no further mitigation would be required.

4.2.1.1.2 Spoils Area Establishment

Surface Water

Spoils areas would be established at three locations as described in Subsection 3.9.1.1 and identified in Figure 3.9-1. The spoils areas would be graded and bermed to direct drainage from the spoils to the industrial wastewater facility. Thus, the potential impacts resulting from hydrologic alteration of surface water would be SMALL and would not require additional mitigation.

Groundwater

Adding water to the cooling canals of the industrial wastewater facility from the spoils areas would be minimal when compared to the water normally in the canals. Temporary highs in the groundwater table could occur from drainage from the spoils areas because the canals are hydraulically connected to the underlying groundwater. Therefore, the impacts to groundwater would be SMALL and would not require additional mitigation.

4.2.1.1.3 Access Roads, Heavy Haul Road, Bridges, and Equipment Barge Unloading Area Improvements

Surface Water

Modifications to the existing equipment barge unloading area would be performed under permits issued by the U.S. Army Corps of Engineers (USACE) (Section 404 Permit and Section 10 — Rivers and Harbors Act Permit; Table 1.2-1). Excavation and limited dredging could create turbid waters that could migrate from the vicinity of the equipment barge unloading area into Biscayne National Park. Curtain wall technology would be used to isolate the affected area from the waters of the park.

The equipment barge unloading area would be enlarged to accommodate larger barges. The modification would be performed using sheet piles to isolate the equipment barge unloading area from the barge turning basin. Excavated and dredged soils would be stockpiled in the spoils areas described in Section 3.9. Potential impacts to flow from the use of sheet piles would temporarily impact the surface water flow. Impacts to surface water flow from equipment barge unloading area modifications would be SMALL and would not warrant further mitigation.

As described in Section 3.9, existing roads on the Turkey Point plant property would support the construction activities for Units 6 & 7. The construction of a heavy haul road leading from the equipment barge unloading area to the Units 6 & 7 plant area would follow existing roads and would require the improvement of those roads in several places.

Five new permanent bridges would be built for Units 6 & 7 including a bridge over the L-31 canal and one over the northern tip of the interceptor ditch. Two bridges would be built along the heavy haul route where the industrial wastewater facility is crossed. Temporary bridges would also be installed to facilitate construction activities until the permanent bridges are completed. In addition, bridges would be built to access berms within the industrial wastewater facility for construction of transmission towers. Modifications to two existing bridges would be required to support load requirements of transporting excavated material to the spoils areas. Modifications to the existing roads would be required to support the load requirements. The heavy haul road would cross a laydown area that would require filling. Constructing the heavy haul road could alter hydrologic flow in and along the road path by the stockpile of soil, stone, and fill material. Equipment staged along the route could also impede surface water flow. Ditches and the use of culverts would allow surface water drainage to be maintained along the road route. During construction, surface water runoff would be released to the industrial wastewater facility. Construction activities for the heavy haul road would be temporary. Culverts would be used to maintain surface water flows where required. Restoration activities could be necessary along the road right-of-way.

Construction traffic access to the Turkey Point plant property would be via various routes including, SW 117th Avenue, SW 137th Avenue/Tallahassee Road, SW 328th Street/N. Canal Drive, SW 344 Street/Palm Drive, and SW 359th Street. The main road for construction activities would be SW 359th Street. This would allow the access road to be in the existing transmission corridor right-of-way. New construction would be required to connect SW 359th Street with an access road on the Turkey Point plant property. Most of this new construction would be offsite and is described in Subsection 3.9.1.2. The access road on the Turkey Point plant property would be constructed where SW 359th Street currently terminates at the property boundary. This short section of road would cross wetlands.The new road construction would require fill material to be brought in to raise the elevation to the grade of SW 359th Street. Culverts would be used to maintain current natural flow patterns in the area. Road improvements to SW 359th Street would require the existing road to be widened and additional gravel or pavement added to meet projected load specification. Once access to the existing roads on the plant property has been established, construction traffic would flow as described above. Existing roads would be used as much as possible to limit unnecessary construction. Existing drainage features would be used including ditches and detention ponds. New ditches and detention ponds would be constructed as needed. Should modification to the existing draining ditches or drainage features be required, the impacts would be temporary and the disturbed areas would be returned to preconstruction conditions. Revegetation could be required. Work would be performed in accordance with applicable permits. Impacts to surface water hydrologic alteration would be SMALL and would not require additional mitigation other than those described above.

Groundwater

Modifications to the existing equipment barge unloading area would be performed under permits issued by the USACE (Section 404 Permit and Section 10 — Rivers and Harbors Act Permit; Table 1.2-1). The equipment barge unloading area would be enlarged. Unsuitable soils from the operation would be stockpiled in the spoils areas described in Section 3.9. Impacts to groundwater flow from equipment barge unloading area modifications would be temporary and SMALL and would not warrant mitigation.

Soils along the route of the new construction connecting SW 359th Street with an access road on the Turkey Point plant property could require excavation to a suitable base elevation before the placement of fill material. Groundwater could be encountered during these road construction activities. However, potential impacts would be temporary and groundwater levels and flow direction would return to preconstruction conditions.

Hydrologic alteration to groundwater from the improvement of existing roads on the plant property could occur. However, impacts resulting from the hydrologic alteration of groundwater flow, if it occurs, would be temporary and groundwater would return to pre-existing conditions. Therefore, impacts would be SMALL and would not require additional mitigation.

4.2.1.1.4 Security Facilities

Surface Water

Constructing a new security building and infrastructure (see Section 3.9) could result in altering surface water hydrologic flow. Because of the small size and construction methods that would be used for these security facilities, impacts would be localized to the building site. Impacts from constructing fences, gates, and physical barriers (flow through) would also be limited in area and would not disrupt surface water flow as the result of their construction. Impacts to hydrologic alteration of surface water would be SMALL and would not require additional mitigation.

Groundwater

As described above, the building of security facilities would result primarily in impacts from the disturbance of surface soils. Impacts to groundwater from hydrologic alteration could occur. However, impacts would be temporary. Once construction activities cease, any alteration to groundwater would cease. Impacts to groundwater from hydrologic alteration would be SMALL and would not warrant additional mitigation.

4.2.1.1.5 Construction Utilities

Surface Water

As described in Section 3.9, temporary utilities would be constructed that support the entire construction site and associated activities. These would include aboveground and underground infrastructure for power, lights, communications, potable and construction water, wastewater and waste treatment facilities, fire protection, and for constructing gas and air systems.

The potential impacts caused by these activities would include surface water runoff from excavation activities for installing subsurface utilities and for installing the necessary structures for the aboveground utilities. Detention basins used in support of other existing facilities or Units 6 & 7 activities could be used for developing the site utilities. These activities would result in the short-term potential for impacts in a relatively small area. Impacts from hydrologic alterations would be SMALL and would not require additional mitigation other than those specified through permit requirements.

Groundwater

Dewatering for temporary utilities could require the use of detention basins before release to the industrial wastewater facility. Impacts to groundwater from hydrologic alteration while constructing these utilities would be temporary and flow would return to normal when construction activities ceased. Impacts would be SMALL and would not warrant mitigation other than that specified in the required permits.

4.2.1.1.6 Construction Facilities and Preparation Activities

Surface Water

Facilities include parking areas, laydown areas, storage and fabrication areas, measuring and testing facilities, offices, warehouses, workshops, sanitary facilities, locker rooms, training facilities, storage facilities, and site access facilities.

The concrete batch plant would be located in the northern portion of the plant area just north of the power blocks. Wastewater from batch plant operations would be directed to the industrial wastewater facility. The impacts associated with the construction and operations of the batch plant would have no additional impacts from hydrologic alteration than described above for the plant area.

Fill may be added to several areas. Where fill material is added, the alterations would be permanent (e.g., the laydown area just west of the plant area and the dead-end portion of the industrial wastewater facility located northwest of the plant area). However, most of the construction facilities would be in areas where fill would not be needed. Once construction

activities were completed, the facilities could be removed and the areas returned to preconstruction conditions.

For these reasons, impacts on surface water would be SMALL and additional mitigation would not be required.

Groundwater

These facilities would not require the deep excavation of soils during their construction and would not directly cause impacts from hydrologic alteration. Impacts from the hydrologic alteration of groundwater from constructing and operating these facilities would be SMALL and would not require additional mitigation.

4.2.1.1.7 Constructing Reclaimed Water Pipelines on Turkey Point Plant Property

Surface Water

The reclaimed water pipelines would enter the Turkey Point plant property at the location of the FPL reclaimed water treatment facility. Following treatment, the reclaimed water would be pumped via pipelines to the makeup water reservoir on the Units 6 & 7 plant area. The pipelines would cross areas previously disturbed and segments of the existing industrial wastewater facility, as described in Section 2.2.

Installation of the reclaimed water pipelines across segments of the industrial wastewater facility would be accomplished via bridging to minimize potential impacts.

Surface disturbance that could affect hydrologic alteration would be short-term and would result in an impact to a limited area. The construction areas would be contoured to facilitate drainage and the area seeded with native species. During construction, water resulting from dewatering and surface water runoff would be released to the industrial wastewater facility. Potential impacts to surface water from hydrologic alteration for constructing the onsite portion of the reclaimed water pipelines would also be of short duration.

The potential impact from hydrologic alteration of surface water as a result of construction of the reclaimed water pipelines would be SMALL and would not warrant additional mitigation.

Groundwater

Installing the onsite portion of the reclaimed water pipelines could alter the flow of groundwater in the proximity of the excavation activity. Once construction activities come to an end, the groundwater hydrologic flow would return to preconstruction conditions. Impacts during construction would be short-term and limited to the area of construction activity. Therefore, impacts would be SMALL and would not warrant additional mitigation.

4.2.1.1.8 Constructing Radial Collector Wells

Surface Water

Radial collector wells would be installed adjacent to Biscayne Bay to provide cooling water for Units 6 & 7 (see Figure 3.1-3). The well caissons would be located on the Turkey Point peninsula, east of the existing units. Each radial collector well would consist of a central reinforced concrete caisson extending below the ground level with laterals projecting from the caisson. The well laterals would be advanced horizontally a distance of up to 900 feet beneath Biscayne Bay and installed to a depth of approximately 40 feet. Groundwater recharge from Biscayne Bay would flow into the horizontal well laterals and flow by head force to the collection caisson located onshore where the water would be pumped via pipelines to Units 6 & 7. Seawater from Biscayne Bay would flow downward, recharging the groundwater aquifer. Constructing the delivery pipelines from the radial collector wells to the Units 6 & 7 plant area would be accomplished using surface excavation methods. The location of the pipelines is shown on Figure 3.9-1.

The construction activities would be performed in accordance with the required local, state, and federal guidelines and standard industry practices. Necessary permits would be obtained before beginning construction activities. Constructing the delivery pipelines would alter the surface flow in the vicinity of the pipelines during construction activities. However, the disturbance would be short-term and the routes would be recontoured afterward.

Constructing the radial collector wells, associated facilities, and the delivery pipelines would result in short-term alteration of surface flow patterns in the vicinity of the caissons and the delivery pipelines. Unused excavated material would be placed in the designated spoils areas. Sedimentation barriers or other appropriate measures would be installed to limit potential impacts to surface water bodies. Once construction activities are complete, the drainage would be restored to preconstruction conditions. Impacts from hydrologic alteration of surface water because of construction activities associated with the radial collector wells, associated facilities, and the delivery pipelines would be SMALL and would not warrant mitigation.

Groundwater

Construction could alter groundwater flow, primarily as a result of dewatering from the construction of the radial collector well caissons and laterals. Dewatering during construction could impact wetland areas located near the dewatering activities for the caissons and pipelines. Water from the dewatering activities for the radial collector wells and delivery pipelines would be added to the industrial wastewater facility.

FPL would comply with federal and state requirements regarding the siting of the radial collector wells and delivery pipelines. The use of standard industry construction practices would include the use of existing corridors or roadways on the Turkey Point plant property to the extent

practicable. Sheet piles could be used to limit potential impacts during construction dewatering activities. The effects of groundwater drawdown would be minimal because of the relatively small volume of water that would be withdrawn from the source.

Therefore, impacts would be SMALL and would not warrant additional mitigation.

4.2.1.1.9 Deep Injection Wells

Surface Water

Twelve deep injection wells would be installed in the Units 6 & 7 plant area as shown on Figure 3.1-3. The injection wells would be installed into the Boulder Zone of the Lower Floridan aquifer in accordance with a permit issued under the FDEP underground injection control program. The injection wells would also require the installation of dual zone monitoring wells to monitor the potential impact of the injection process on overlying aquifer units adjacent to the Boulder Zone.

As with other construction activities in the Units 6 & 7 plant area, surface water runoff during well installation would be directed to the cooling canals of the industrial wastewater facility. Impacts to surface water from hydrologic alteration would be SMALL and would not warrant additional mitigation.

Groundwater

The deep injection wells and the required monitoring wells would be installed in accordance with a permit issued under the FDEP underground injection control program. The FDEP underground injection control program stipulates methods and approaches, such as sequential casing installation and isolation of individual aquifers, to protect groundwater resources during the installation and development of injection wells.

During construction of Units 6 & 7, one of the injection wells could be used for the disposal of construction-related wastewater. Injection would be in accordance with the underground injection control permit and would be consistent with the use of deep injection wells in Florida. Groundwater monitoring data, including groundwater elevation data and chemical data, would be collected and submitted to FDEP in accordance with the underground injection control permit. Impacts to groundwater from hydrologic alteration would be SMALL and would not warrant additional mitigation measures other than those required by the injection permit. See Subsection 4.2.2.2.1.

4.2.1.1.10 Onsite Connector Transmission Corridors

Surface Water

As described in Sections 2.2 and 3.7, alterations would be required along the existing Turkey Point-to-Davis corridor. New towers would be required to connect to the existing corridor from the new Clear Sky substation. This description is limited to the portion of that corridor from the Clear Sky substation to the Turkey Point-to-Davis corridor on the Turkey Point plant property.

The construction activities associated with new transmission towers would require the excavation and temporary storage of soils and the dewatering of groundwater at the tower locations. These activities would occur on Turkey Point plant property where the surface water runoff patterns have already been established. Existing drainage features would be used including ditches and detention ponds. New ditches and detention ponds would be constructed as needed. Should modification to the existing draining ditches or drainage features be required, the impacts would be temporary and the disturbed areas would be returned to preconstruction conditions. Work would be performed in accordance with applicable permits. The new line along the segment from the Clear Sky substation to the Turkey Point property boundary would cross over a wetland area. Adding the new line would require vehicular traffic in the corridor that could alter surface water flow direction because of rutting of the surface soils by vehicles. Excavated soils would be removed, the affected area recontoured, and the corridor segment restored to preconstruction conditions. Where needed, the vegetative cover would be re-established. For these reasons, impacts to hydrologic flow from adding a new transmission line to the existing Turkey Point-to-Davis transmission corridor would be SMALL and would not require additional mitigation.

The Clear Sky-to-Pennsuco/Levee onsite segment would require constructing new transmission towers. The onsite segment would cross the industrial wastewater facility to the west and follow the existing transmission line corridor to the property boundary and beyond. Constructing towers within the industrial wastewater facility would require stockpiling soils that could alter surface water flow in the vicinity of the activity. Construction methods, controls, and impacts would be similar to those described for the Turkey Point-to-Davis corridor above. For these reasons, impacts to hydrologic flow from adding a new transmission line from Clear Sky to Pennsuco/Levee would be SMALL and would not require additional mitigation.

Groundwater

It could be necessary to dewater the excavations for the foundation of the towers required to make the connection from the Clear Sky substation to the transmission towers offsite. The dewatering effects would be short-term and the water level would return to preconstruction levels. Hydrologic alteration would occur only at the foundations on the Turkey Point plant property. No effects would occur offsite for this segment of the lines. Impacts to groundwater from hydrologic

alteration would be SMALL and would not require additional mitigation other than those required in the site-specific permits.

4.2.1.1.11 Potable Water Pipelines

Surface Water

The operation of Units 6 & 7 would require potable water pipelines be constructed from an existing MDWASD supply line near the intersection of SW 288th Street and SW 137th Avenue/ Tallahassee Road to the Turkey Point plant property, connecting to the location of the site meter for the existing Turkey Point potable water supply line (Figure 3.9-1). The route to the Turkey Point plant property would parallel and cross multiple drainage canals and the L131E Interceptor Canal along SW 359th Street. The potable water pipelines would pass just to the north of the cooling canals of the industrial wastewater facility, and turn south before entering the Units 6 & 7 plant area.

Standard pipeline techniques including open trenching and backfilling would be used for most of the installation. Directional drilling could also be used for canal crossings, where site conditions and pipeline size permit. Surface crossings could also be accomplished in the vicinity of the bridge to be located on the cooling canals of the industrial wastewater facility. The onsite portion of the pipelines would cross areas previously disturbed. Surface disturbance that could alter the hydrology would be short-term and would result in an impact to a limited area. Construction areas would be contoured to facilitate drainage and the area seeded with native species, where needed. During construction dewatering, surface water runoff would be released to the industrial wastewater facility. Potential impacts to surface water from hydrologic alteration from the onsite portion of the potable water pipelines would also be of short duration.

The potential impact from hydrologic alteration of surface water as a result of construction of the potable water pipelines would be SMALL and would not warrant additional mitigation.

Groundwater

Installation of the onsite portion of the potable water pipelines could alter the flow of groundwater in the proximity of the excavation activity. Once construction activities come to an end, the groundwater hydrologic flow would return to preconstruction conditions. Impacts during construction would be short-term and limited to the area of construction activity. Therefore, impacts would be SMALL and would not warrant additional mitigation.

4.2.1.2 Offsite Facilities

4.2.1.2.1 Borrow Areas

Surface Water

Borrow material for construction would be obtained from a combination of an FPL-owned fill source, other regional sources, or reused material. The FPL-owned fill source is located just to the southeast of the former location of the Homestead Air Reserve Base. The borrow area would be permitted and operated in accordance with FDEP permit requirements. The facility would be operated as a dragline facility. Therefore, dewatering would not be required during dragline operations. Impacts to surface water could occur as the result of altering surface water flow in the vicinity of the property. A perimeter berm could be used to restrict the flow of surface water onto the property. The berm could also be used in association with detention basins and a truck wash facility to reduce surface water runoff from the site and prevent soils from being unintentionally spread to offsite areas. Drainage ditches could be used to direct surface water flow away from the site and could be reconnected to any drainage features that once flowed through the property to maintain surface flow.

Impacts from operating a borrow area because of hydrologic alteration of surface water would be temporary and SMALL and would not warrant additional mitigation.

Groundwater

Groundwater dewatering that could alter flow direction in the aquifer would not be necessary for operating a borrow pit using a dragline. However, once dragline operations begin, water in the surrounding aquifer would flow toward the quarry to replace the void left from the mined material as the aquifer attempts to equilibrate. Once dragline operations cease, the groundwater level would return to static. Impacts from hydrologic alteration would be temporary and SMALL and would not warrant additional mitigation.

4.2.1.2.2 Transmission Corridors

Surface Water

As described in Subsection 2.2.2.1, new transmission lines would be routed in existing FPL transmission line corridors to the extent practicable. FPL would also pursue several substation upgrades and expansions as part of the proposed project.

<u>Clear Sky-to-Levee Transmission Corridor</u>

The preferred route (West Preferred Corridor) for the transmission line is described in Sections 2.2 and 3.7. Water bodies potentially impacted along the primary route include several

unnamed streams or surface water features, including drainage canals and wetlands. The canals include the L-31, C-113 Canal, C-103 Canal, C-102 Canal, the L-31E, and the Tamiami Canal. These water bodies could be impacted by the construction activities along the corridor.

New transmission towers would be required. The construction activities associated with new towers would require the excavation and temporary storage of soils at the tower locations. Construction activities for new transmission structures, tower pads, conductors, and access roads are described in Section 3.7. These activities could result in vegetation loss and land disruption in the land types occurring along the final rights-of-way. The right-of-way for the West Preferred Corridor would be largely along existing public roads or existing rights-of-way. Existing roads could require improvements and/or continued maintenance during construction activities.

FPL construction programs, plans, and procedures routinely use environmental best management practices and mitigation measures to ensure adverse environmental effects of construction are avoided, minimized, or mitigated. Specific environmental protection and impact mitigation measures (with the associated construction phase) that potentially would be used in the Units 6 & 7 transmission line rights-of-way include:

- Use of restrictive land-clearing processes in forested wetland areas (right-of-way clearing and preparation)
- Use of turbidity screens and erosion-control devices in areas of wetlands and water resources (access road/structure pad construction)
- Use of existing access roads for ingress and egress to rights-of-way where available (access road/structure pad construction)
- Use of standard industry construction practices for foundation and structure excavation and construction (line construction)

As described in Section 1.2, FPL would comply with all applicable laws, regulations, and permit requirements. Standard industry construction practices would be used for transmission line construction, including use of existing rights-of-way, to the extent practicable, and environmental management, including erosion-control devices, matting to reduce compaction caused by equipment, use of wide-track vehicles when crossing wetlands, and restoration activities after construction.

Construction activities would require vehicular traffic in the corridor that could alter surface water flow direction because of rutting of the surface soils by vehicles. Excavated soils would be removed and the affected construction areas recontoured as necessary and restore the corridor segment to preconstruction conditions. Where needed, the vegetative cover would be

reestablished. Impacts to surface water from altering hydrologic flow would be SMALL and would not require mitigation in addition to those described.

Construction activities at the Levee substation would consist of the expansion of the current facility by approximately 100 feet along the northern portion of the existing facility. The expansion would include the excavation, filling, grading, and the addition of fencing. Additional stormwater retention areas would also be added to the vacant area north of the planned expansion. Similar mitigation measures would be used for the substation construction activities. Impacts would be temporary and limited to the area of construction.

The potential impacts at the substation from hydrologic alteration would be similar to construction impacts along the transmission route, would be SMALL, and not warrant additional mitigation.

Levee-to-Pennsuco Corridor

The 230 kV transmission line terminating at the Pennsuco substation would also follow the Clear Sky-to-Levee corridor identified above, but would not connect at Levee substation.

The new line would continue largely within or along an existing right-of-way from the Levee substation to the Pennsuco substation. The right-of-way would follow along existing drainage ditches and run adjacent (and not across) ponds located along the route. The new line would require the construction of new transmission towers.

Construction activities at the Pennsuco substation would require the expansion of the fenced substation by approximately 0.65 acres (Section 2.2). The expansion could include the excavation, filling, grading, and the addition of fencing. Additional stormwater retention areas could also be added to the vacant area south of the planned facility expansion. Similar mitigation measures would be used for the substation modification activities as would be used for the transmission corridor. Impacts would be temporary and limited to the area of disturbance. Therefore, the impacts would be SMALL and not warrant additional mitigation.

Clear Sky-to-Davis Corridor

The Clear Sky-to-Davis corridor would use existing transmission line rights-of-way. This existing corridor and rights-of-way cross and border a land area that is now a small part of the property of Biscayne National Park just north of the Turkey Point plant property and near the park headquarters, and also crosses the Florida City Canal, the L-31E Canal, the North Canal, an unnamed drainage feature, the Military Canal, the Princeton Canal (C-102), and Black Creek and the Black Creek Canal (C-1) before arriving at the Davis substation.

The expansion of the transmission capacity along the Clear Sky-to-Davis corridor would require the construction of new transmission towers. The potential hydrologic impacts would be similar to

those for the Clear Sky to Levee route described above. Access to the existing right-of-way would be via current access locations and under existing access agreements. Mitigation measures for potential impacts would be similar to those for the Clear Sky-to-Levee route.

Construction activities at the Davis substation would take place within the existing facility. Similar mitigation measures would be used for the substation modification activities as would be used for the transmission corridor. Impacts would be temporary and limited to the area of disturbance. Therefore, the impacts to this corridor would be SMALL and not warrant additional mitigation.

The new transmission lines would require constructing new towers, the modification of existing towers, and constructing in existing or new rights-of-way. New transmission lines would be built in Miami-Dade County and the prospective corridors are shown in Figure 2.2-5. The land use along the transmission corridors is presented in Table 2.2-2.

Davis-to-Miami Corridor

As described in Section 3.7, the Davis-to-Miami corridor would follow an existing FPL transmission right-of-way east from the Davis substation until the corridor crosses U.S. Highway 1. The corridor would then follow existing transportation and utility rights-of-way northeast until the corridor reaches the Miami substation. Waterbodies crossed would include the Cutler Drain Canal (C-100), the C-100A Canal, the Snapper Creek Canal (C-2), the Coral Gables Canal, and the Miami River (C-6 Canal).

New single pole towers would be required for the new 230 kV transmission line. For any minor ditches, canals, or wetlands that are crossed, construction activities could include the installation of culverts to maintain flow. The new line would be above ground except where the transmission line would be installed below ground in traditional open-cut trenches in the vicinity of the Miami River with the crossing performed beneath the river by horizontal drilling method. The new line would continue the remaining distance after the crossing via above ground installation until the substation is reached.

No new access roads would be required. Existing public access roads would be used to access the corridor. Construction would be performed to minimize disturbance to natural ground cover. Where surface disturbance is necessary or fill material required, erosion control devices would be used to minimize impacts to wetlands and other waterbodies in accordance with state stormwater regulations and environmental best management practices. Silt fence technology and other stormwater runoff controls would be used to limit the potential impacts to nearby surface waters from stormwater runoff. Disturbed areas would be graded and seeded where necessary with a Florida approved seed mix. In areas where pavement currently exists, the pavement would be replaced in a timely manner to limit the amount of exposure soils would have to possible erosion.

Excavation of trench areas could require dewatering. Water discharged to the surface during dewatering activities could be discharged to catch basins, temporary settling basins, or watercourses if the water is sufficiently free of sediments.

Drilling beneath the Miami River would be performed in accordance with applicable regulations. Impacts to surface water bodies during construction of the Davis-to-Miami transmission line would be similar to those for the other transmission line segments. Impacts would be of short duration and localized to the activities being performed. Therefore, impacts would be SMALL and not warrant additional mitigation.

There would be a need for new facility components within the existing Miami substation in support of the new 230 kV line. No additional land would be required for these activities. Construction activities would include limited excavation and construction activities associated with bring the new aboveground line into the substation. Silt fence technology and other stormwater runoff controls would be used to limit the potential impacts to nearby surface waters from stormwater runoff during construction activities. FPL would obtain any permits necessary for the construction activities associated with the substation alteration.

Impacts to surface water bodies during construction activities within the Miami substation would be similar to those for the other substations. Impacts would be of short duration and localized to the activities being performed. Therefore, the impacts would be SMALL and not warrant additional mitigation.

Groundwater

It could be necessary to dewater the excavations for the foundation of the towers along the rights-of-way. Dewatering during trenching activities and for manhole excavation along the Davis-to-Miami corridor would also be necessary. The dewatering effects would be short term and the water level would return to preconstruction levels. Hydrologic alteration would occur locally at the foundations within the FPL rights-of-way. Dewatering could impact areas off of the right-of-way depending on the duration. However, the impacts would be temporary. Impacts to groundwater from hydrologic alterations would be SMALL and would not require additional mitigation other than those required in the site-specific permits.

4.2.1.2.3 Reclaimed Water Pipelines and FPL Reclaimed Water Treatment Facility

Surface Water

The use of reclaimed water would require constructing delivery pipelines from the Miami-Dade Water and Sewer Department (MDWASD) South District Wastewater Treatment Plant (SDWWTP) and an FPL reclaimed water treatment facility located on the Turkey Point plant property to treat the reclaimed water received from the Miami-Dade system. The location for the reclaimed water pipelines is from the SDWWTP located north of the Turkey Point plant property.

The reclaimed water pipelines would cross water bodies including wetlands, the Florida City Canal, the L-31E Canal, the North Canal, the Military Canal, the Princeton Canal (C-102), the Goulds Canal, and the Black Creek Canal (C-1).

Construction activities for the reclaimed water pipelines would be performed in accordance with the required local, state, and federal guidelines, permitting requirements and accepted industry practices for the pipelines and treatment facility construction. Constructing the reclaimed water pipelines and the FPL reclaimed water treatment facility would alter the surface water flow in the vicinity during construction activities. The pipelines and facility excavation, the storage of excavated soils and/or spoils, stockpiling fill material, and the storage of equipment and supplies could impact surface water flow. Use of a stormwater detention basin would also alter the surface water flow.

Construction activities for the pipelines could result in vegetation loss and land disruption. As described in Section 4.3, the pipelines would be trenched beneath an existing access road on the west side of the corridor and, on completion, the disturbed portions of the corridor would be graded to the contours of the surrounding landscape and revegetated or returned to previous land uses. Clearing new corridors and/or expansion of existing corridors would include use of environmental best management practices to minimize impacts to surface waters.

Dewatering could be required during the excavation of the pipelines and the FPL reclaimed water treatment facility. Disposal of the water after it passes through a detention basin could alter the surface drainage downstream of the detention basin. However, impacts would be temporary. The disturbed areas would be recontoured and restored to preconstruction conditions. The disturbance would be short term. Impacts to surface water from hydrologic alteration would be SMALL and would not require additional mitigation other than those described above.

Groundwater

Construction activities could also alter the groundwater flow locally because of the excavations and foundation for the pipelines and treatment facility. The alteration would be permanent, although local to the construction activity. Dewatering activity during construction would also impact groundwater flow local to the pipelines and facility foundation. Alteration to groundwater flow would be temporary and local to the activity. Therefore, impacts from hydrologic alteration because of construction activities along the reclaimed water pipelines and at the FPL reclaimed water treatment facility would be SMALL and would not warrant mitigation other than those required by permit or identified above.

4.2.1.2.4 Offsite Roads

Surface Water

Impacts to surface water from construction activities on offsite roads would be similar to the onsite road impacts. Construction traffic access to the plant property would be via various routes including, SW 117th Avenue, SW 137th Avenue/Tallahassee Road, SW 328th Street/N. Canal Drive, SW 344th Street/Palm Drive, and SW 359th Street. Road improvements are described in Subsection 3.9.1.2.

As part of the road improvements, drainage ditches, culverts, and swales would be installed as appropriate. During construction activities, surface water would be routed to areas that could accept the additional surface flow that would then alter the flow in the vicinity of the road. Impacts from hydrologic alterations would be SMALL for groundwater and would not require mitigation.

Groundwater

Impacts to groundwater from construction activities on offsite roads would be similar to those for the onsite roads. Impacts from hydrologic alterations would be SMALL for groundwater and would not require mitigation.

4.2.1.2.5 Potable Water Pipelines

Surface Water

The operation of Units 6 & 7 would require potable water pipelines be constructed from an existing MDWASD supply line near the intersection of SW 288th Street and SW 137th Avenue/ Tallahassee Road to the Turkey Point plant property, connecting to the location of the site meter for the existing Turkey Point water supply line. The route to the Turkey Point plant property would parallel and cross multiple drainage canals and the L31E Interceptor Canal along SW 359th Street. The potable water pipelines would pass just to the north of the cooling canals of the industrial wastewater facility, and turn south before entering the Units 6 & 7 plant area.

Construction activities would also include the construction of a metering station at the intersection of SW 117th Avenue and SW 359th Street that would be used to monitor and maintain pressure in the pipelines to help meet Units 6 & 7 water requirements. Standard pipeline techniques including open trenching and backfilling would likely be used for most of the installation. Directional drilling could also be used for, road crossings and canal crossings, where site conditions and pipeline size permit. MDWASD would perform construction activities in accordance with industry standards and MDWASD protocols and procedures.

Construction activities for the potable water pipelines would be performed in accordance with the required local, state, and federal guidelines, permitting requirements and accepted industry

practices for the pipelines and metering station construction. Constructing the potable water pipelines and the metering station would alter the surface water flow in the vicinity during construction activities. The pipelines and facility excavation, the storage of excavated soils and/or spoils, stockpiling fill material, and the storage of equipment and supplies could impact surface water flow. Use of a stormwater detention basin, if required, could also alter the surface water flow.

Construction and restoration along the pipelines route would be performed by MDWASD in accordance with their protocol and procedures and industry standards. Dewatering could be required during the excavation of the pipelines and the metering station. Disposal of the water after it passes through a detention basin or through other sediment control devices could alter the surface drainage downstream of the detention basin. However, impacts would be temporary. The disturbed areas could be recontoured and restored to preconstruction conditions. The disturbance would be short term. Impacts to surface water from hydrologic alteration would be SMALL and would not require additional mitigation other than those described above.

Groundwater

Construction activities could also alter the groundwater flow locally because of the construction of the potable water pipelines and metering station. The alteration would be local to the construction activities and temporary. Dewatering activity during construction would also impact groundwater flow local to the potable water pipelines and metering station construction. Alteration to groundwater flow would be temporary and local to the activity. Therefore, impacts from hydrologic alteration because of construction activities along the potable water supply pipelines and at the metering station would be SMALL and not require additional mitigation.

4.2.2 WATER USE IMPACTS

4.2.2.1 Surface Water

Construction for Units 6 & 7 and associated onsite and offsite facilities is estimated to require approximately 555gpm (0.8 MGD) of potable water used for such activities as fugitive dust control, concrete production, hydrotesting and flushing, and potable water use by the construction workforce. The dewatering rate for Units 6 & 7 is estimated to be 18,000 gpm (25.9 MGD).The source of construction water would be the existing units potable water supply and/or potable water brought in from tanker trucks. In addition, freshwater from any constructed stormwater ponds may be used for fugitive dust control during backfill operations. A description of the impacts to public infrastructure is included in Section 4.4. Because surface water would not be used for the construction-related activities, there would be no impacts from surface water use because of construction-related activities.

Wastewater during construction would be released to the industrial wastewater facility or to one of the deep injection wells. The impacts of release of construction wastewater to the industrial wastewater facility would be SMALL due to the small percentage of wastewater when compared to flow within the canals (26.7 MGD is the estimated potable water required for all uses during the construction of Units 6 & 7). Assuming all of the required potable water and water from dewatering activities for Units 6 & 7 would be released to the industrial wastewater facility, this would represent approximately 2 percent of 2747 MGD water flow in the industrial wastewater facility. The construction wastewater flow is assumed lower.

4.2.2.2 Groundwater

As previously stated, construction water would be supplied by Miami-Dade County. Therefore, there would be no impact to groundwater use. Impacts to public water supplies is discussed in Section 4.4. However, construction-related dewatering activities would be required at both onsite and potentially offsite areas. A description of these activities, impacts, and potential mitigative measures is provided in the following subsections. Under authority of Chapter 373, State Statutes, 40E-20, F.A.C, the South Florida Water Management District (SFWMD) manages the general water use permitting process within its boundaries. Dewatering activities associated with construction of Units 6 & 7 would require a dewatering water use permit from SFWMD with appropriate regulatory requirements.

Wastewater during construction could be released to one or more of the deep injection wells. The impacts of construction dewatering and wastewater releases are described in the following paragraphs.

4.2.2.2.1 Onsite Areas

Dewatering for the new power blocks would be to depths of approximately 20 to 35 feet below sea level. Dewatering would also be required for the caisson installations for the radial collector wells. This would require dewatering systems to remove subsurface water associated with the shallow water table aquifer. Impacts could also occur to surface water in the vicinity of the dewatering activities. However, in the vicinity of dewatering activities, the closest surface water features that could be impacted are portions of the existing industrial wastewater facility. The industrial wastewater facility and slurry diaphragm wall would act as barriers to localize drawdown. The results of a pumping test to determine the need for dewatering and estimate potential impacts, indicate that impacts to groundwater and surface water would remain local to the Turkey Point plant property. Any impacts associated with the dewatering activities would remain local to the excavation site. Once dewatering ceases, the groundwater level in the surficial aquifer would return to preconstruction conditions. Because of the location chosen for Units 6 & 7, the use of isolation measures, and the presence of the industrial wastewater facility,

impacts to offsite groundwater users from dewatering activities would be SMALL and would not require additional mitigation.

The injection of construction wastewater into the Boulder Zone via the deep injection wells would be in accordance with the current usage of the Boulder Zone by the State of Florida and in accordance with FDEP required permits. As described further in Section 5.2, the injectate would be isolated within the Boulder Zone from the overlying drinking water aquifers due to the construction protocols for the wells. In the exploratory well permit application, a radius of influence of up to 3.5 miles was estimated over a 10 year period of time for an assumed maximum injection rate of 90 mgd. The amount of construction wastewater that would be injected would be much less than 90 mgd resulting in a substantially reduced radius of influence. For these reasons, impacts to groundwater hydrology from the injection of wastewater during construction would be SMALL.

4.2.2.2.2 Offsite Areas

Shallow groundwater dewatering may be required during construction of new transmission towers, the reclaimed water pipelines, and new potable water pipelines. During any required dewatering activities along the transmission lines and water pipelines, surface water flow could be affected because of the release of groundwater to the ground surface or to nearby surface water bodies. As a mitigative measure, sheet piles could be used to limit the extent of potential impacts to surrounding areas where needed. Water from potential dewatering activities along the corridors could be released to a detention pond, surface pool, or other type of sediment trap before the release to a permitted outfall under any required NPDES permit requirements and SWPPPs for the construction activities. Therefore, impacts to groundwater along the transmission corridors and pipelines from dewatering activities would be SMALL.

Based on these considerations and their localized and temporary effects during dewatering, groundwater use impacts from construction activities would be SMALL and would not warrant additional mitigation.

The FPL-owned borrow area that would provide fill material is located about 4.5 miles northwest of the Units 6 & 7 plant area. The aggregate mining operation would be conducted in a manner to minimize impacts to groundwater following applicable state and local regulations. Mining operations conducted below the water table would be performed without dewatering the formation. Aggregate removed from the mine would be stockpiled inside the perimeter berm and allowed to drain before it would be transported offsite. While the mine is under construction, the water may become turbid, due to the suspension of solids. This turbidity would not impact groundwater quality away from the mine property.

A lake would be created from the mining activities in the deep cut areas. The depth of the lake would be established to ensure that the mining is performed in the fresh water portion of the

aquifer and that it would not induce saltwater intrusion into the aquifer or the lake. Therefore, the impacts to groundwater resources from the mining or construction of the lake would be SMALL.

4.2.3 WATER-QUALITY IMPACTS

Available surface water and groundwater quality data for existing facilities on the Turkey Point plant property is summarized in Subsection 2.3.3. Impacts to the existing surface water and groundwater quality at on the Turkey Point plant property and offsite areas are summarized below.

4.2.3.1 Surface Water

Impacts to surface water quality at both onsite and offsite facilities can occur as the result of soil erosion because of soil disturbance during construction of onsite and offsite facilities that could result in increased surface water sediment loading to nearby water bodies.

Surface water flow from onsite construction activities, including spoils placement, would be to the industrial wastewater facility. Impacts on surface water quality would be minimal because the industrial wastewater facility operates as a closed loop cooling water system for the existing units and it does not discharge to other surface water bodies.

Modifications to the existing equipment barge unloading area would be performed under permits issued by the U.S. Army Corps of Engineers (USACE) (Section 404 Permit and Section 10 — Rivers and Harbors Act Permit; Table 1.2-1). Excavation and limited dredging could create turbid waters that could migrate from the vicinity of the equipment barge unloading area into Biscayne National Park. Curtain wall technology would be used to isolate the affected area from the waters of the park.

The equipment barge unloading area would be enlarged to accommodate larger barges. The modification would be performed using sheet piles to isolate the equipment barge unloading area from the barge turning basin. Excavated and dredged soils would be stockpiled in the spoils areas described in Section 3.9. Impacts to surface water quality from equipment barge unloading area modifications would be SMALL and would not warrant mitigation.

The water quality for the dewatering effluent released to the industrial wastewater facility would be of similar quality as the water in the facility and the flow would be negligible when compared to the total flow in the cooling canals and thus would have a SMALL impact. Ground-disturbing activities that meet federal, state, and local regulations requiring permits, would be permitted and overseen by applicable regulations, and guided by an approved SWPPP. The SWPPP would also contain a plan for the construction activities. Any impacts to surface water quality during construction would be SMALL and would not warrant mitigation beyond those best practices required by permits.

Construction of transmission lines would comply with applicable regulations and standard industry construction practices (including use of existing corridors to the extent practicable) would be used. Accordingly, impacts to surface water sources from transmission line and pipeline construction would be SMALL and would not warrant mitigation.

4.2.3.2 Groundwater

4.2.3.2.1 Onsite Areas

The plant area overlies a surficial saltwater aquifer beneath the plant that is hydraulically connected to both the industrial wastewater facility and Biscayne Bay. Makeup water for the industrial wastewater facility comes from process water, rainfall, stormwater runoff, and groundwater infiltration to replace evaporative and seepage losses**.** In addition, the surficial aquifer is tidally influenced and unsuitable for potable water uses.

Any spills of diesel fuel, hydraulic fluid, lubricants, or other construction-related pollutants would be cleaned up to prevent them from moving into the groundwater. This would also mitigate impacts to local surface water because spills would be addressed and not allowed to flow to nearby surface water.

In the unlikely event small amounts of contaminants escape into the environment, they would have only a small, localized, temporary impact on the water table aquifer. Impacts to groundwater quality would be SMALL and would not warrant mitigation beyond those described in this section or required by federal and state permits.

4.2.3.2.2 Offsite Areas

Construction of new transmission towers or modification of existing lines, the construction of access roads, potable water pipelines and reclaimed water pipelines could cause potential impacts to surface water and groundwater along the chosen routes. Any spills of diesel fuel, hydraulic fluid, lubricants, or other construction-related pollutants along the routes or at offsite facilities would be cleaned up to prevent spilled fuel or oil from moving into nearby surface waters. This would also mitigate impacts to local groundwater because spills would be quickly attended to and not allowed to penetrate to groundwater. The construction activities would be performed under a new SWPPP or under a modification of an existing SWPPP and associated spill prevention plan.

In the unlikely event small amounts of construction-related pollutants escape into the environment during road, transmission line, or water pipelines construction, they would have only a small, localized, and temporary impact on the water table aquifer. Impacts to groundwater quality would be SMALL and would not warrant mitigation beyond those described in this section or required by permit.

Section 4.2 References

FDEP Mar 2003. Florida Department of Environmental Protection, *The Florida NPDES Stormwater Permitting Program for Construction Activity*. March 2003.

U.S. EPA Oct 1992. (U.S. Environmental Protection Agency), *Stormwater Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices*, Office of Water, Washington, D.C., October 1992.

U.S. EPA Jun 1996. *Overview of the Stormwater Program*, Office of Water, Washington, D.C., June 1996.

4.3 ECOLOGICAL IMPACTS

This section addresses potential impacts to terrestrial and aquatic communities from the construction of Units 6 & 7 and associated onsite and offsite facilities. Details of construction activities and their potential landscape alterations are provided in Sections 3.9 and 3.1, respectively.

The Units 6 & 7 plant area is within the industrial wastewater facility and within the larger approximately 11,000-acre Turkey Point plant property (Figures 2.4-1 and 2.4-2). The Units 6 & 7 plant area is immediately south of Units 3 & 4 and consists primarily of hypersaline mudflats and other wetland habitats, as well as a few upland habitats established on old spoil deposits. Other onsite habitats (within the Turkey Point plant property) include the industrial wastewater facility, existing facilities associated with Units 1 through 5 (including the barge turning basin), and dwarf mangrove areas. The primary landscape features adjacent to the plant property are Biscayne Bay, Card Sound, and the Everglades Mitigation Bank. The transmission corridors, the reclaimed and potable water pipeline corridors, and expanded access roads cross a variety of land use types, including various kinds of wetlands (marshes, forested wetlands, and canals), agricultural areas, rangelands, and developed/urban areas.

The impacts on terrestrial and aquatic habitats associated with the construction of Units 6 & 7 and the associated infrastructure are primarily permanent disturbances and they are described in this section. Most terrestrial disturbance would occur on previously disturbed/filled land. Onsite wetlands and water bodies that could be impacted by construction activities include:

- Hypersaline mudflats
- Mangrove heads associated with historical tidal channels
- Dwarf mangroves
- Remnant canals

Other water bodies on the plant property that would be impacted by construction activities include:

- Cooling canals of the industrial wastewater facility
- Mangrove wetlands
- Barge turning basin/equipment barge unloading area

Offsite water bodies that could be affected by construction activities include:

- Biscayne Bay
- Canals and wetlands traversed by transmission corridors, reclaimed water pipelines, potable water pipelines, and access roads

Onsite and offsite construction activities that could impact site hydrology are described in Subsection 4.2.1 and include:

- Clearing land on the Turkey Point plant property and constructing infrastructure such as roads, bridges, parking areas, and stormwater drainage systems
- Constructing new power block buildings (reactor containment structure, turbine building, auxiliary building), cooling towers, nuclear administration building, training building, security facilities, Clear Sky substation, roads, FPL reclaimed water treatment facility, laydown areas, parking areas
- Constructing reclaimed water pipelines from the Miami-Dade Water and Sewer Department (MDWASD) South District Wastewater Treatment Plant (SDWWTP) to the FPL reclaimed water treatment facility
- Constructing the radial collector wells and associated pipelines
- Creation of spoils storage areas and sand/soil/gravel stockpiles
- Deep injection wells
- Excavating and removing the upper approximately 5 feet of muck within the plant area
- Dewatering of foundation excavations during construction
- Clearing and construction/modification of transmission ROWs and construction/modification of transmission access roads, towers, access bridges, and pads for transmission lines
- Plant access road construction and expansion
- Installation of potable water pipelines
- Expanding the existing equipment barge unloading area and excavation/dredging in the vicinity of existing barge turning basin
- Mobilizing and demobilizing

4.3.1 TERRESTRIAL ECOSYSTEMS

The terrestrial resources of the Units 6 & 7 plant area, the Turkey Point plant property in general, and the southeastern region of Florida, are described in Subsection 2.4.1. This information provides a baseline from which to gauge potential impacts of construction activities. Potential impacts to plant property areas are discussed in Subsection 4.3.1.1 and potential offsite impacts are discussed in Subsections 4.3.1.2 (reclaimed water pipelines) and 4.3.1.3 (transmission corridors, borrow site, and access roads/potable water pipelines).

4.3.1.1 Potential Impacts to the Units 6 & 7 Plant Area and Other Plant Property Areas

Construction of Units 6 & 7 and associated onsite facilities (Figure 4.3-1) would result in approximately 600 acres being disturbed (and would represent the maximum possible area of soil exposed at one time) during the construction phase. Approximately 330 acres of wetlands would be disturbed by construction activities. Construction of the heavy haul road would result in land disturbance, but would mostly occur on previously disturbed land on the Turkey Point property and, therefore, would not impact terrestrial habitats. Clearing methods, disposal of construction wastes, and methods of limiting erosion, runoff, and siltation are addressed in Section 4.1.

As described in Subsection 2.4.1, the approximately 218-acre Units 6 & 7 plant area consists primarily of hypersaline mudflats and other wetland types (Figure 2.4-2). The area has been impacted by unit operations for three decades. Although the Units 6 & 7 plant area has not been developed directly, it has been impacted by the construction of berms/spoil deposit areas and the adjacent and remnant canals associated with the industrial wastewater facility.

An approximate 46-acre laydown area would be established west of the Units 6 & 7 plant area. This area consists of open water and dwarf mangrove areas (part of the industrial wastewater facility), upland spoil, and industrial/filled land. Another 6-acre laydown area would be established on the site of a dead-end canal within the industrial wastewater facility. It is primarily open water habitat, with surrounding upland spoil habitat.

An approximate 44-acre FPL reclaimed water treatment facility would be built on a parcel of land between SW 344th Street/Palm Drive and the test canals (immediately north of the industrial wastewater facility). This facility would be built on dwarf mangrove habitat (wetlands), and delivery pipelines would extend south from this facility through dwarf mangrove/industrial habitats to the makeup water reservoir. The facility is immediately north of land considered crocodile critical habitat.

The existing barge facility would be expanded to allow delivery of large components and modules for Units 6 & 7. The expansion, termed the equipment barge unloading area, would be about 60

feet by 150 feet in size and would be excavated from an existing filled area on the northwest edge of the barge turning basin.

Existing roads within the Turkey Point Plant property would be improved to provide a heavy haul road for transportation of large components and equipment from the equipment barge unloading area. This would impact approximately 7 acres of previously disturbed land, although two new bridges would be established over existing canals.

Three separate areas totaling approximately 200 acres would be used for spoils storage. One storage area would be about 55 acres and would lie along the west bank of the main north-south canal of the industrial wastewater facility (does not include the existing road). The second area would be about 122 acres and would lie along the eastern bank of the main north-south canal of the industrial wastewater facility (does not include the existing road). The final storage area would be about 23 acres and would be located along the southern bank of the east-west canal at the lower end of the industrial wastewater facility (does not include the existing road). All three storage areas would be established on portions of the Turkey Point property previously disturbed by construction and maintenance of the industrial wastewater facility.

4.3.1.1.1 Plants and Plant Communities

Plants and plant communities on the Turkey Point plant property are sparse resulting from harsh conditions (hypersaline soils and fluctuating water levels) and disturbed soils. Common plants include red mangrove (*Rhizophora mangle*), white mangrove (*Laguncularia racemosa*), saltwort (*Batis maritima*), and glasswort species (*Salicornia spp.*). Listed, rare, or unusual plant species have been observed in the Clear Sky to Levee transmission corridor within the Turkey Point plant property but not in other areas within the Turkey Point plant property. Listed (state threatened) plant species observed in the Clear Sky to Levee transmission corridor are locustberry (*Bysonima lucida*), mullein nightshade (*Solanum donianum*), and West Indian trema (*Trema lamarkianum*). These species would be avoided to the maximum extent practical. Because the majority of habitats to be disturbed have a previous history of disturbance or alteration, construction impacts to plants and plant communities would be SMALL and no further mitigation measures would be warranted. Construction activities would not significantly reduce the regional diversity of plants or plant communities.

4.3.1.1.2 Threatened and Endangered Species

Important wildlife species, as defined by NUREG-1555, do exist and/or have existed within the Turkey Point plant property. These important species include four federally listed species: American crocodile (*Crocodylus acutus*), wood stork (*Mycteria americana*), Florida manatee (*Trichechus manatus latirostris*), and eastern indigo snake (*Drymarchon corais couperi*) (see Subsection 2.4.1.2).

Existing Turkey Point facilities and new Units 6 & 7 are within the area designated as critical habitat for the crocodile (see Figure 2.4-4), and crocodiles reside and breed within the industrial wastewater facility (see Figure 2.4-5). The harsh environment (mudflats with little cover/shade) within the construction footprint of the Units 6 & 7 plant area is poor habitat for the crocodile, although crocodiles occasionally use the adjacent canals as travel corridors. Adjacent canals may be temporarily impacted (erosion, sedimentation, turbidity) by construction activities (see Subsection 4.3.1.3.1), including transmission line construction. However, these potential impacts would be limited by standard industry construction practices (silt fences, mulching, slope texturing, vegetated buffer strips, reseeding areas of disturbed soils) and the canals would continue to provide crocodile habitat during and after construction. There are a small number of crocodile nests (three in 2008) in the northern end of the return canals (see Figure 2.4-5) within approximately 300-650 feet of the Units 6 & 7 plant area. It is possible that these nesting crocodiles may be disturbed by construction noise and increased activity on the roadways and berms (e.g., trucks carrying spoil/muck, construction materials, transmission line construction, etc.) in the industrial wastewater facility, and could possibly leave the area. Also, 359th Street will be improved immediately adjacent to the northern end of the industrial wastewater facility. Traffic on this road may pose a threat to crossing crocodiles. Project-specific management plans for crocodiles and other listed species have been created by FPL for all recent facility additions and would be created for this construction activity as well. These management plans include monitoring for species occurrence and mitigation measures. Although the affected land is considered of marginal quality for the crocodile, it is still considered “potential” habitat. The loss of potential habitat would be mitigated by the creation of additional freshwater refugia for juvenile crocodiles on selected berms and vegetation restoration (removing exotics and managing for native plants). To mitigate for hazards associated with increased traffic on the road between the northern end of the industrial wastewater facility and the test canals, four wildlife underpasses would be installed to allow safe travel between the two sites. Water within these corridors may connect during periods of high water, resulting in exchange of water, and possibly fish, between the two sites. All current aspects of the crocodile research and monitoring programs would be continued. These aspects include education of on-site workers about status of and threats to crocodiles, constraints on vehicular traffic within the industrial wastewater facility at night and during critical periods of the nesting season, and constraints on road maintenance and construction activities at night and during nesting as well as at/near crocodile crossings.

Construction activities for Units 6 & 7 would not impact crocodile populations in southern Florida or hinder continued recovery of this species. However, given that the industrial wastewater facility hosts a significant crocodile population and given the proximity of small numbers of nesting crocodiles to the construction area and to roadways that would be used during construction, impacts to the local population as a result of increased traffic and construction noise would be MODERATE and would require mitigation such as that described above.

Small numbers of wood storks have been observed in shallow water within the laydown area immediately west of the Units 6 & 7 plant area. Wetlands within this laydown area and the plant area would be eliminated by construction of Units 6 & 7. However, wood storks and other wading birds also use shallow waters within the industrial wastewater facility and, therefore, the loss of these wetlands within the construction areas would not significantly impact local or regional wood stork populations, and impacts would be SMALL (also see Subsection 4.3.1.3.1).

Manatees have been observed within the barge turning basin, but this area is not designated as critical habitat for the species (see Figure 2.4-4). Construction of Units 6 & 7 would result in additional barge traffic (80 deliveries per unit over 6 years) delivering large components and modules to Turkey Point and thus could result in an increased probability of manatee/barge interactions. A management plan would be implemented for in-water activities to avoid and/or limit potential impacts to manatees. This plan would include the use of observers to spot manatees during in-water activities and reduction of in-water activities if manatees were observed within the basin. Given that the construction activities relative to the equipment barge unloading area (including barge traffic) are modifications/increases of existing activities and that a management plan would be implemented to avoid and/or limit potential impacts on manatees, the impacts of construction activities on manatees would be SMALL.

There have been occasional sightings of the eastern indigo snake on and near the Turkey Point plant property. None of these sightings occurred within the construction footprint or on areas likely to be impacted by construction activities. Given the limited number of sightings of this species on plant property (see Subsection 2.4.1.2), construction impacts on eastern indigo snakes would be SMALL.

4.3.1.1.3 Other Important Species

Other important wildlife species under NUREG-1555 are state-listed species and game animals. Wildlife observed on the Turkey Point plant property includes two state-threatened species: the least tern (*Sterna antillarum*) and the white-crowned pigeon (*Columba leuccephala*). Six wading birds designated as species of concern have been observed on and/or adjacent to the Units 6 & 7 plant area: little blue heron (*Egretta caerulea*), roseate spoonbill (*Ajaia ajaja*), reddish egret (*Egretta rufescens*), snowy egret (*Egretta thula*), tricolored heron (*Egretta tricolor*), and white ibis (*Eudocimus albus*). Given the use of other higher-quality habitats within Turkey Point plant property by these state-listed species, the impacts of construction on these species would be SMALL. Game species observed within the Turkey Point plant property include white-tailed deer (*Odocoileus virginianus*), rabbits (*Silvilagus sp.*), and mourning doves (*Zenadura macroura*). Habitat for these terrestrial game animals is generally limited on the Turkey Point plant property and, therefore, their onsite populations are likely to be small. Therefore, the impacts of construction activities on game species would be SMALL.

4.3.1.1.4 Wetlands

Wetlands function as breeding habitat, foraging habitat, protective cover, and water sources for a variety of wildlife species and are considered “important habitats” under NUREG-1555. Wetlands and remnant canals within the approximately 218-acre Units 6 & 7 plant area were delineated in 2008 using standard methods documenting hydrology, hydrophytic plants, and hydric soils. Approximately 250 acres of wetlands in the plant area would be eliminated by construction, with mudflats (187.5 acres) the primary wetland type converted (see Subsection 2.4.1.3 and Figure 2.4-2). As hypersaline, ephemeral water bodies, the value of these wetlands to local wildlife is limited to those species that can tolerate harsh environmental conditions [e.g., sheepshead minnow (*Cyprinodon variegatus*), killifish (*Fundulus sp.*)] and the species that prey upon them (e.g., snowy egret, tricolored heron). Thus, the primary species found within the construction areas are hardy fish and invertebrate species and the piscivorous birds which use them as forage.

Excavation for the power block foundations would be on top of the hard Key Largo formation, approximately 35 feet below MSL, requiring dewatering to remove subsurface water associated with the shallow, water table aquifer. Additional construction impacts could also occur to surface water in the vicinity of the dewatering activities, including portions of the industrial wastewater facility. The cooling canals would act as a barrier limiting the impacts to the area being dewatered. The results of a pumping test determined that dewatering impacts to groundwater and surface water would/would not alter water levels within the industrial wastewater facility.

A laydown area would be established west of the Units 6 & 7 plant area. This area consists of open water and dwarf mangrove areas (part of the industrial wastewater facility), upland spoil and industrial/filled land. Another laydown area would be established on the site of a dead-end canal within the industrial wastewater facility. It is primarily open water habitat, with surrounding upland spoil habitat. After construction activities are completed, this land could be regraded.

A nuclear administration building, training building, and parking areas would be built on two adjacent parcels of land north of the Units 6 & 7 plant area. These areas total approximately 32 acres, consisting of 24 acres of mangrove swamps/wetlands, 2 acres of willows, and 6 acres of fill areas and roads.

The FPL reclaimed water treatment facility would be built on a parcel between SW 344th Street/ Palm Drive and the test canals (immediately north of the industrial wastewater facility). This facility would be built on dwarf mangrove habitat (wetlands), and pipelines would extend south from this facility through dwarf mangrove/industrial habitats (10 acres) to the makeup water reservoir. The facility would be immediately north of land considered crocodile critical habitat. Any required mitigation for wetland loss would likely include wetland enhancement, land swapping, and/or purchase of EMB credits (see description in Subsection 4.3.1.1.4).

There would be approximately 10.8 total miles of roadway improvements and new road construction to create better access to the Turkey Point plant property for construction workers and trucks delivering fill and other material. The majority of these improvements would occur along existing paved and non-paved roads and transmission corridors, thus reducing potential impacts to the environment. Land uses/covers associated with these roadway corridors include tree nurseries, Brazilian pepper uplands, canals, mangroves, mixed wetland hardwoods, exotic wetland hardwoods, and freshwater marshes. The new construction would occur between the existing road on the northern end of the cooling canals and SW 359th Street and would require the construction of a bridge to cross the L31E canal.

Construction/expansion of the roadways would follow the design standards of FDEP and the Miami-Dade County Public Works Department. Activities to reduce impacts to water and wetlands would include use of silt fences and floating turbidity curtains. Culverts would be installed and placed to maintain hydrologic flows through the area, based on hydrologic studies. Unavoidable wetland impacts resulting from roadway improvements would be mitigated in consultation with FDEP and USACE.

Potable water pipelines approximately 9 miles long would bring potable water from MDWASD to the Units 6 & 7 plant area. The pipelines would generally follow existing roadways/corridors. Much of the pipelines would be installed by trenching adjacent to or within the corridors containing the access road improvements and construction along SW 328th Street/N. Canal Drive to SW 117th Avenue to SW 359th Street to the plant area. Crossings of major canals would be established by horizontal directional drilling. The habitats/land covers associated with this corridor include existing roadways, urban/disturbed, agriculture, and various canals and wetlands.

Three bridges would need to be built along the heavy haul route where the industrial wastewater facility is crossed. Modifications to the existing roads would be required to support the load requirements. The heavy haul road would cross a laydown area that would require filling. Constructing the heavy haul road could alter hydrologic flow in and along the road path by the stockpile of soil, stone, and fill material. The heavy haul road would then extend generally south and cross over two new heavy haul bridges, one at the main cooling discharge canal and the other at the main cooling return canal.

Three spoils storage areas would be established on land bordering the cooling canals within the industrial wastewater facility. Waters within the industrial wastewater facility are not waters of the state or the United States, but still provide habitat for regional fauna including the endangered American crocodile. Soil from the spoil piles could be carried into the cooling canals with stormwater, increasing sediment levels and turbidity. Environmental best management practices such as silt fences, mulching, slope texturing, and avoiding wetlands and other sensitive habitats to the extent practicable, would be employed to minimize these potential impacts to canal waters.

Overall, approximately 330 acres of wetland habitats would be impacted by construction of Units 6 & 7 and ancillary facilities. Additional wetland acres may be impacted, although these impacts would be temporary and mitigated to the extent practical by environmental best management practices. Although much of this wetland habitat exists as harsh, hypersaline mudflats with minimal value as wildlife habitat, the impacts of construction on wetland habitats would be MODERATE.A three-pronged approach to wetland mitigation would be used. The first option would be active mitigation (e.g., creation of crocodile habitat, establishment of culverts under existing roadbeds to allow sheet flow of water, etc.). The second option would be “land swapping” (e.g., providing relatively natural land as a preserve, etc.). The third option would be purchase of wetland credits from the Everglades Mitigation Bank.

4.3.1.1.5 Other Construction Impacts

Construction noise is another potential impact on wildlife at the Units 6 & 7 plant area, although wildlife utilizing Turkey Point should be acclimated to the operational noise from operation and maintenance of the existing facilities (see Subsection 4.4.1.4). Measures to reduce noise and vibration levels during construction may include staggering work activities, and use of noise dampeners and noise control equipment on vehicles and equipment. Noise levels in construction areas can be as high as 100 dBA at 100 feet from the noise source, but the noise attenuates over a relatively short distance. For example, at a distance of 400 feet from a 100-dBA construction noise source, noise levels will typically drop to within the 60-80 dBA range (Golden et al. 1980). This is generally below noise levels known to startle waterfowl and small mammals. Even with attenuation, some noise-associated displacement of wildlife is expected during construction activities, with the displacement being permanent for some species and temporary for others. Given the limited number of wildlife species present due to existing harsh conditions, likely acclimation to existing facility operational noise, attenuation of construction noise and the limited displacement of local species, impacts to wildlife due to construction noise would be SMALL.

Avian collisions with equipment (cranes), structures (buildings, fences, etc.) and new transmission lines during construction could result in mortalities. Cranes would be the tallest equipment that would be used, potentially reaching up to 460 feet high. The buildings in the power block would range from approximately 36 to 228 feet above grade. The likelihood of avian collisions depends on the height and positioning of the man-made structures as well as the size and behavior of the birds, general landscape features, and weather conditions (Brown 1993). Construction activities and noise can also affect avian movements and increase the probability of collisions. Weather conditions resulting in poor visibility can result in avian mortalities because of collisions; however, these losses have not been found to significantly impact common or abundant species. Therefore, avian collisions during construction of Units 6 & 7 would be negligible and any impacts from these collisions would be SMALL.

Direction and intensity of lighting during facility construction and operation can alter the behavior of birds and bats. However, lighting for the existing units is necessary for their safe operation and would be required for safe construction of Units 6 & 7 (see Subsection 4.4.1.3). To the extent practicable, unnecessary lights would be turned off at night, lights would be turned downward or hooded (directing light downward), and lower-powered lights would be used during construction to minimize impacts on wildlife. Given the sparseness of wildlife populations in the construction areas, impacts of lights would be SMALL.

4.3.1.2 Potential Impacts of Makeup Water Systems

Cooling water for Units 6 & 7 would originate from two sources. One source is reclaimed water from the nearby MDWASD South District Wastewater Treatment Plant and the other source is water obtained from radial collector wells.

4.3.1.2.1 Reclaimed Water Pipelines

Reclaimed water pipelines (72-inch diameter or equivalent) would extend approximately 9 miles to bring reclaimed water from the SDWWTP to the FPL reclaimed water treatment facility. For about 6.5 miles of their length, the pipelines would be collocated with the existing Clear Sky-to-Davis transmission line right-of-way and adjacent road and canal rights-of-way, although most of the route is classified as wetland habitat. The pipelines would generally be trenched beneath an existing access road on the west side of the transmission line right-of-way. Upon completion, the disturbed portions of the corridor would be graded to the contours of the surrounding landscape and allowed to revegetate or returned to previous land uses where appropriate. Clearing of new corridors and/or expansion of existing corridors would include use of standard industry construction practices to reduce impacts to sensitive habitats. Standard industry construction practices would include employing silt fences, mulching, slope texturing, vegetated buffer strips, reseeding areas of disturbed soils, and avoiding wetlands and other sensitive habitats to the extent practical. Endangered manatees may exist in any of the SFWMD canals crossed by this pipeline corridor. Any required mitigation for wetland loss would likely include wetland enhancement, land swapping, and/or purchase of EMB credits (see description in Subsection 4.3.1.1.4).

In summary, given that the pipelines would be collocated with existing rights-of-way along much (approximately 6.5 miles) of its route, disturbed soils would be revegetated, and standard industry construction practices would be employed during the clearing/expansion of the corridors and construction of the pipelines, impacts of the reclaimed water pipelines on terrestrial resources would be SMALL.

4.3.1.2.2 Radial Collector Wells

Radial collector wells would be installed adjacent to Biscayne Bay to provide cooling water for Units 6 & 7 (see Figure 3.1-3). The wells would be located on the Turkey Point peninsula, east of the existing units. Each radial collector well would consist of a central reinforced concrete caisson extending below the ground level with laterals projecting from the caisson. The well laterals would be advanced horizontally a distance of up to 900 feet beneath Biscayne Bay and installed to a depth of approximately 40 feet.The lateral screens under Biscayne Bay would be installed by horizontal drilling. Water from the wells would flow by head force to a collection caisson where the water would be pumped via pipelines to Units 6 & 7, thereby limiting surface disturbance to the bottom of Biscayne Bay.

Installation of the lateral screens by horizontal direct drilling could possibly produce noise/ vibrations during this phase that potentially could disturb local aquatic biota (e.g., manatees, sea turtles, fish, etc.) sensitive to such disturbance. Given the depth (approximately 40 feet) of these screens, such disturbance is unlikely. However, if this procedure does result in disturbance, it would be temporary and at worst should only result in departure from the area for the duration of the event.

The radial collector wells would be located within 3 acres of previously filled lands on the northern edge of Turkey Point. Habitats adjacent to the filled lands include coastal mangroves and Biscayne Bay. The pipelines would cross the following habitat types: existing perimeter roads, mangroves, and one cooling canal. Another 3 acres of industrial/filled habitat would be required for the construction laydown area.

Wildlife species existing near the well sites and the associated pipelines would be similar to those observed on the Turkey Point plant property. Concerning “important” species (under NUREG-1555), the pipelines would cross critical habitat of the threatened American crocodile. Of the approximately 21 acres of land disturbed by well and pipelines construction, only 4.5 acres may provide habitat for crocodiles. Increased vehicle traffic during construction would pose a threat to individual animals at crossing sites. No other areas designated by the U.S. Fish and Wildlife Service as critical habitat for endangered or threatened species would be crossed by this pipelines, nor would it cross any state or federal parks, wildlife refuges or preserves, or wildlife management areas. Approximately 4.5 acres of wetland habitats, another important habitat under NUREG-1555, would be impacted by radial collector well and pipelines construction.

Clearing for the well sites and new pipelines and/or modification of existing roadways and berms would include use of environmental best management practices to reduce impacts to sensitive habitats such as wetlands and critical habitat.

In summary, the pipelines would follow the existing roadway to the extent practicable and environmental best management practices would be employed during clearing/modification and construction of the pipelines and wells. Given the small amount of wetlands habitat disturbed and the potential impacts on crocodiles, the impacts of construction of the radial collector wells (including pipelines) on terrestrial resources would be SMALL. Mitigation to minimize impacts to crocodiles would include educating construction personnel concerning occurrence of and hazards to crocodiles, enforcing reduced speed limits near potential habitats, and potentially limiting nighttime work.

4.3.1.3 Potential Impacts to Offsite Areas

4.3.1.3.1 Transmission Corridors

Construction activities associated with new transmission lines would include clearing of new corridors (to the extent necessary), adding new transmission facilities and expanding existing substations. Existing linear corridors would be used, to the extent practicable, to limit the disturbance of wooded or sensitive habitats. Clearing of wooded areas would be accomplished using heavy equipment (bulldozers, cranes, tractors, bucket trucks, light trucks) to clear the entire corridor, establish access roads, facilitate tower and line installation, and right-of-way restoration (see Subsection 3.7.3.5). For tower and line installation in open landscapes (e.g., existing transmission corridor, agricultural fields, pasture, marsh), the installation of transmission tower pads and corridor land uses are generally permitted to continue outside of the tower footprint unless activities interfere with existing uses.

Wetlands of various types are crossed by the existing corridors and would be crossed by the proposed lines. The transmission corridors traverse regional canals in several locations, but construction activities would not impact these aquatic habitats. Portions of the Clear Sky-to-Levee corridors would require the installation of pads and towers within wetland habitats (Figure 2.2-5). Further, the West Secondary Option of the Clear Sky-to-Levee corridor would impact wetland habitats in Everglades National Park (see Subsection 2.4.1). Additional wetlands would be crossed within the West Preferred Option of the corridor. Construction impacts on adjacent wetlands could include erosion-caused sedimentation and increased turbidity. Standard industry construction practices would be used to reduce these impacts, including employing silt fences, mulching, and avoiding wetlands and other sensitive habitats to the extent practicable. Pending discussions with regulatory agencies, some mitigation for wetland loss may be required. Mitigation could include habitat enhancement, land swapping, or purchasing EMB credits.

The initial component of the Clear Sky-to-Levee corridor would cross the industrial wastewater facility, most of which is considered critical habitat for the crocodile. Small areas of habitat within the industrial wastewater facility would be lost for transmission tower pads and bridges to access the pads and crocodiles may be disturbed temporarily during tower installation. Potential

mitigation for construction impacts to crocodiles are described in Subsection 4.3.1.1.2, including enhancement of other portions of their habitat and construction constraints during sensitive periods of activity (nesting season and nocturnal period).

Florida panthers have been observed historically within the area containing the two Clear Sky-to-Levee transmission corridor options. Construction of either corridor would result in temporary disturbance during the activity and some loss of potential panther habitat. Construction of the preferred route along an existing access road would result in less habitat loss that the alternate route (see discussion in Section 2.2). Pending finalization of the corridor route, the potential impacts of this construction are likely SMALL, although discussions with regulatory agencies after route selection may result in mitigation actions such as habitat enhancement and/or purchase of panther mitigation credits.

Wood storks have nested in two Everglades National Park colonies just south of Tamiami Trail near one of the two alternative transmission corridors between the Clear Sky and Levee substations. One colony is within 1 mile of the corridor, although the corridor is outside of the 2500-foot radius primary zone for the colony where most activities are restricted (USFWS 1990). The other colony is within 3 miles of the corridor. The habitat management guidelines for this species recommend restriction of “high-tension power lines” within 1 mile of wood stork colonies and “tall transmission towers” within 3 miles of colonies (USFWS 1990). These recommendations stem from the concern that low-flying and/or inexperienced (e.g., recently fledged young) wood storks may collide with tall objects. Also, the alternative corridor is within the core foraging area of both wood stork colonies (18.6 mile radius around colonies where flight activities by storks are common) and there are concerns about loss of their wetland foraging habitats. Whereas collisions with transmission lines and resulting mortalities of storks have been documented, they are not common occurrences. Therefore, the impacts of establishing new transmission corridors on storks would be SMALL, but may still warrant discussions with regulatory agencies and result in mitigation activities. Mitigation actions could include marking new transmission lines and/or tower guy-wires to make them more visible and thus avoidable to the storks and possibly wetland enhancement to replace potential foraging habitat losses.

Surveys of the transmission corridors for threatened or endangered plants found approximately 36 listed species (see Table 2.4-4). Three were federally-listed candidate species: Florida brickell-bush (*Brickellia mosieri*), pineland deltoid spurge (*Chamaesyce deltoidea* ssp. *pinetorum*), and sand flax (*Linum arenicola*). All three are endemic to fire maintained, pine rockland habitats. One 9-acre pine rockland area (maintained by fire, not mowing) contained 21 listed plant species, although several species occurred on disturbed habitats (e.g., spoil areas). Impacts to rare plants found near the transmission corridors may require mitigation, pending discussions with regulatory agencies, such as avoidance (to the extent practicable), possible movement of plant populations, and/or habitat enhancement.

Given that the sensitive plants discovered within the transmission corridor already exist within managed and/or maintained habitats and an avoidance policy (to the extent practicable), impacts of installation and/or expansion of transmission corridors on listed plants would be SMALL.

4.3.1.3.2 Borrow Material

Borrow material for construction would be obtained from a combination of an FPL-owned fill source, other regional sources, or reused material. The FPL-owned fill source is located about 4.5 miles northwest of the Units 6 & 7 plant area (see Subsection 4.1.2.3). The borrow area (approximately 300 acres) consists primarily of consists primarily of palm tree nurseries (82 percent), exotic wetland hardwoods (11 percent), and 7 percent other wetlands (marsh, ditches, and scrub). Fill material would be brought to the Turkey Point plant property along new and existing roads, although some modifications of existing roads to support this traffic would be necessary. Because the fill would be taken from existing quarries or a palm tree nursery, impacts on terrestrial resources would be SMALL and would not warrant mitigation.

4.3.1.3.3 Access Roads and Potable Water Pipelines

Approximately 11 miles of access road expansions and construction and 9 miles of potable water pipelines would traverse existing roadways, urban/disturbed, agriculture, and various canals and wetlands. Most of the potable water pipelines would be trenched within the corridor associated with the roadway enhancements: SW 328th Street/N. Canal Drive to SW 117th Avenue to SW 359th Street to the plant area. Wildlife species within the areas impacted by these projects would be those typical to southern Florida. Listed species would likely include wading birds (e.g., egrets, ibis, and possibly storks) and possibly crocodiles in adjacent wetland habitats and plants within the SW 359th Street corridor (see Subsection 4.3.1.3.3). Potential impacts to wetlands and mitigation methods are discussed in Subsection 4.3.1.1.4. Given that mobile species (birds and crocodiles) would likely move to nearby similar habitat and plant species found in this habitat tend to be those that inhabit disturbed soils, impacts of these projects on wildlife species would be SMALL. Florida panthers could possibly occur in more remote areas along the access roads. Disturbance during construction would be temporary, the activity could possibly result in habitat loss and increased traffic could pose a mortality risk to panthers. The impacts to the panther of access road expansion would be SMALL, but would likely warrant discussions with regulatory agencies concerning possible mitigation measures such as habitat enhancement or purchase of panther mitigation credits.

4.3.1.4 Summary

Construction activities would result in the permanent loss of some wetland habitats and the potential temporary disturbance to other wetland habitats. The temporary disturbance would be SMALL and mitigated by standard industry construction practices, but the impacts resulting from

wetland loss would be MODERATE and may warrant mitigation. Impacts to other terrestrial resources, including “important” species (as defined by NUREG-1555), would be SMALL. However, given the location of the construction activities within the designated critical habitat of the American crocodile, the proximity to active breeding habitat, and the increased construction-related traffic on roads within the industrial wastewater facility, impacts to this species would be MODERATE. Management/conservation plans would be implemented to avoid and/or limit the impacts of construction activities on protected species such as the crocodile and manatee.

4.3.2 AQUATIC ECOSYSTEMS - CONSTRUCTION IMPACTS

4.3.2.1 General Impacts to Aquatic Resources

Roads, bridges, and spoils areas, described in Subsection 4.3.1.1, would be placed so as to minimize impacts to aquatic resources. However, construction on land would result in impacts to nearby onsite and offsite aquatic ecosystems, including sedimentation and increased turbidity (as a result of erosion of surface soil) and, although less likely, spills of petroleum products. Aquatic habitat would be lost in areas that would be dewatered and backfilled to support construction of Units 6 & 7. Each of these impacts is described below.

4.3.2.1.1 Sedimentation

Three major groups of aquatic organisms are typically affected by the deposit of sediment in wetlands: (1) aquatic plants, (2) benthic macroinvertebrates, and (3) fish. The effects of excess sediment in wetlands, including sediment generated by construction activities, are influenced by particle size. Finer particles may remain suspended, blocking the light needed for photosynthesis, and initiating a cascade of effects from the primary producers. Suspended particles may also interfere with respiration in invertebrates and newly hatched fish, or reduce their feeding efficiency by lowering visibility (Waters 1995).

Construction sites are subject to erosion, which can then lead to sedimentation in adjacent areas. The land in the construction areas is flat and characterized by sheet flow and rapid infiltration of surface water. Much of the surface water runoff would simply be absorbed by the soil, and any sediment it carried would be deposited in place; excess runoff would be directed toward retention ponds, as described below.

Construction-related activities such as excavation, grading for drainage during and after construction, temporary storage of soil piles, and use of heavy machinery all disturb vegetation and expose soil to erosive forces. Reducing the length of time that disturbed soil is exposed to the weather is one of the most effective ways of controlling excess erosion and sedimentation (Waters 1995).

Construction impacts to water resources would be avoided or minimized through environmental best management practices and standard industry construction practices such as stormwater retention basins and silt screens, under a Generic Permit for Stormwater Discharge from Large and Small Construction Activities, (Rule 62-621.300(4)(a), Florida Administrative Code) (FDEP 2008b). Other practices that would be used to minimize impacts to aquatic habitats during construction include mulching, slope texturing, creating vegetated buffer strips, and reseeding areas of disturbed soil. Preventing erosion by covering disturbed areas is a preferred method of controlling sedimentation, especially when constructing bridges, which are necessarily near surface water. When erosion cannot be prevented entirely, intercepting and retaining sediment before it reaches surface waters can reduce impacts (Waters 1995). Given the preventative measures employed, impacts from sedimentation would be SMALL.

4.3.2.1.2 Turbidity

Sedimentation can cause a temporary increase in turbidity as the imported sediment settles to the bottom. If high turbidity persists for several days in an area that is generally clear, the photosynthetic process can be reduced (FDEP 2008a). However, most aquatic and wetland habitats in south Florida are buffeted by frequent high-energy storms that cause temporary increases in turbidity. Such temporary disturbances are part of the natural environmental dynamic experienced by the aquatic species that occur in both the onsite and offsite project areas. No crystalline springs are in the area. The Guide to Living with Florida's Wetlands (FDEP 2008a) states that the damaging effects of construction on wetlands can be minimized by good planning and design. To control sedimentation, a variety of measures would be implemented to limit the effects of increased turbidity resulting from construction activities. Impacts would be temporary and SMALL. Onsite and offsite construction would use standard industry construction practices, described in Section 4.2, to minimize impacts to aquatic resources resulting from increased turbidity.

4.3.2.1.3 Petroleum Spills

Spill prevention techniques would include locating storage areas for petroleum products at a safe distance from surface waters. For example, heavy equipment would be driven to a bermed and drained location for refueling. Any spills of diesel fuel, hydraulic fluid, or lubricants during construction would be cleaned up to prevent spilled fuel or oil from impacting aquatic resources. A Spill Prevention, Control, and Countermeasure (SPCC) Plan would be implemented in accordance with EPA regulations (40 CFR Part 112). Spills would be attended to and not allowed to flow to nearby surface water. Any impacts to aquatic resources as a result of spills would be SMALL.

4.3.2.1.4 Habitat Disturbance

Construction of Units 6 & 7 would result in the unavoidable destruction of approximately 330 acres of wetlands and man made canals, most of it hypersaline mudflats, as described in Subsection 2.4.2.1.1 and shown in Figure 2.4-2. The area contains marginal habitat which has been impacted by unit operations for at least 30 years. The aquatic species in the impacted wetlands are widely distributed across similar habitats in south Florida. No rare or specially protected species exist there.

An approximately 46-acre laydown area west of the Units 6 & 7 plant area has open water and dwarf mangrove habitat that is part of the industrial wastewater facility. A 6-acre laydown area, created by filling in a dead-end canal within the industrial wastewater facility, would also be needed.

An approximately 44-acre FPL reclaimed water treatment facility would be built immediately north of the industrial wastewater facility on dwarf mangrove habitat. Reclaimed water pipelines would extend south from this facility through dwarf mangrove/industrial habitats to the makeup water reservoir. The open water and dwarf mangrove habitats do not support any specially protected species. Only ubiquitous, hardy aquatic species are expected to occur there.

Other aquatic habitats in the plant area and on the Turkey Point plant property may be temporarily impacted, but would not be destroyed. Specific areas are described in the following sections: Equipment Barge Unloading Area (Subsection 4.3.2.2.1), Drilling Deep Injection Wells (Subsection 4.3.2.2.2), and Staging Areas (Subsection 4.3.2.2.3).

Potential impacts to offsite aquatic resources are described in Subsection 4.3.2.3. Offsite construction that may impact aquatic resources includes installation of pipelines for delivery of reclaimed water (Subsection 4.3.2.3.1) installation of radial collector wells (Subsection 4.3.2.3.2), development of transmission corridors and construction of transmission lines (Subsection 4.3.2.3.3), improvement of roadways (Subsection 4.3.2.3.4), and collection and transport of borrow material to fill the plant area (Subsection 4.3.2.3.5).

4.3.2.2 Potential Impacts to the Units 6 & 7 Plant Area and Other Onsite Aquatic Resources

When a wetland or other surface water body is impacted by construction activities and aquatic organisms are present, impacts to these organisms are expected. If the water body has an outlet, and the disturbance is gradual rather than abrupt, some animals may relocate. However, construction impacts to small wetlands or other surface waters result in loss of the fishes and invertebrates. No important aquatic species are known to exist in onsite construction areas (see Subsection 2.4.2).

Although the habitats onsite that would be impacted do support aquatic life, the Turkey Point plant property is similar to other mudflat-dominated acreage in the vicinity, as described in Subsection 4.3.1. The aquatic species that exist onsite are common in nearby waters. These species, listed in Subsection 2.4.2.1.1, are expected to exist in similar habitats in the vicinity. Most of these common species tend to be tolerant of salinity and temperature fluctuations, and are common in coastal wetlands throughout south Florida (see Subsection 2.4.2).

The surface water bodies that could be impacted include the cooling canals of the industrial wastewater facility. The power block foundations would be approximately 35 feet below MSL. Portions of the Units 6 & 7 plant area would be dewatered, organic matter removed, and backfilled. Surface waters on the Units 6 & 7 plant area would be permanently altered by the excavation of the surficial soil and the placement of backfill material. No natural aquatic habitat would remain in the plant area. The plant area is isolated from offsite aquatic resources by the cooling canals of the industrial wastewater facility, which lie between the Units 6 & 7 plant area and the Turkey Point plant property boundary. Sheet pile technology may be used to isolate the industrial wastewater facility from the plant area. Stormwater would be managed with the appropriate environmental controls to reduce the amount of sediment in the surface water runoff before release to the industrial wastewater facility, As described in Section 3.9, a slurry diaphragm wall would be installed around the power blocks during dewatering and excavating subsurface materials. The use of the slurry wall would allow dewatering of the power block areas with minimal impacts to groundwater directly outside of the slurry wall containment area.

The impacts to aquatic species onsite would be SMALL and would not warrant mitigation.

As described in Subsection 4.3.1.1, approximately 330 acres of aquatic habitat would be impacted by the construction of Units 6 & 7 and ancillary facilities. The Units 6 & 7 plant area would require the permanent use of approximately 218 acres, as shown in Figure 3.9-1.

In addition to construction of Units 6 & 7, ancillary activities that may affect aquatic resources on the Turkey Point plant property include (1) enlarging the existing equipment barge unloading area, (2) installation of the deep injection wells, (3) parking areas, (4) installing the reclaimed water pipelines from the SDWWTP to the FPL reclaimed water treatment facility and the pipelines from this facility to the plant, (5) installing the radial collector wells and pipelines, (6) nuclear administration and training buildings, and (6) supporting facilities.

4.3.2.2.1 Equipment Barge Unloading Area

Expansion of the equipment barge unloading area may result in some impacts to aquatic resources in the immediate area. The existing barge turning basin currently receives five to seven barge shipments of fuel oil per week throughout the year. The number of weekly shipments of fuel oil would not be expected to change; however, during the 6-year construction period, there

would be approximately 80 additional barge trips for delivery of construction equipment and modules per unit. The equipment barge unloading area would be expanded to a total area of about 0.15 acres (6000 square feet). A survey of the area showed sparse growth of submerged aquatic vegetation, including seagrasses and algal species, within the turning basin. The green algae *Caulerpa paspaloides* var. *laxa* occurs along southern edge of the basin, in an area of approximately 24 square feet (ft^2). Another small area of *C. paspaloides* var. *laxa* and the algae *Acetabularia calyculus* occur in an equal-sized area (approximately 24 ft^2) on the northeastern shore of the basin, extending into Biscayne Bay. Sparse patches of seagrass occur along the northern shore of the basin, in the vicinity of the existing boat slip and equipment barge unloading area. Several small areas with 5 to 20 percent coverage of turtlegrass (*Thalassia testudinum*) and shoal grass (*Halodule wrightii*) were observed, comprising a total of approximately 170 ft^2 (0.004 acres). Temporary, local impacts to aquatic resources during expansion of the equipment barge unloading area would include sedimentation and increased turbidity, as described below.

Enlargement of the equipment barge unloading area would cause some disturbance in the immediate area. As described in Subsection 4.2.1.1.3, enlargement of the equipment barge unloading area would require the removal of about 2700 cubic yards of sediment. The excavation and limited dredging of the equipment barge unloading area could result in increased suspended sediment in the immediate area for a short period of time. Curtain wall technology would be used to isolate the equipment barge unloading area from adjacent areas. Dredging would conform to guidance provided by the Army Corps of Engineers and dredging permit conditions.

The excavation and limited dredging would cause an increase in suspended sediment in the immediate area, and could result in a plume of suspended sediment some distance from the equipment barge unloading area. The ecological effect of the suspended sediment would depend on a variety of factors, including the type of dredge used, the timing and duration of the dredging, the particle size of the suspended sediment, wind direction and speed, the success of environmental controls to contain suspended sediment, and the life stage of the species present. Both short-term direct behavioral effects (such as entrainment and fish injury) and long-term cumulative effects (such as contaminant release and habitat alteration) on marine organisms can result from dredging (Nightingale and Sinenstad, 2001). Although effects may be similar, concern is often greater at the disposal site than at the dredge site.Material dredged from this area would be placed in the spoils areas located on existing berms within the industrial wastewater facility. The application to the Army Corps of Engineers for a permit to dredge the barge turning area will provide sufficient information for the alternatives analysis under 404(b)(1) Guidelines (40 CFR 230.10) to support a determination of the Least Environmentally Damaging Practicable Alternative (LEDPA).

When barges move into or out of the barge turning basin, turbulence and turbidity increase for a short time. This is part of the background disturbance related to the standard operation of the existing facility. Increased barge traffic during construction phase of Units 6 & 7 would result in

incremental increases in the frequency of these disturbances. The organisms that currently exist in the turning basin would be those that are tolerant of intermittent disturbance in the form of turbulence and turbidity associated with barge activity. No change in the nature of the impacts would occur as a result of increased barge traffic.

Aquatic resources in the barge turning basin that could be temporarily affected by dredging include eggs, larvae, and adults of invertebrates and fishes. Mojarra, grunts, and pinfish were the most common adult fishes reported in a 2008 trawl survey of the nearshore area of Card Sound (see Subsection 2.4.2). Eggs and larvae of clupeids (herring, shad, menhaden, and sardine) were also common in the area, as were larvae of gobies and sleepers. These species could be temporarily affected by high levels of suspended sediment, which can interfere with vision (impacting foraging) and respiration, as well as cause dermal abrasion to delicate fishes. Common larval and adult invertebrates in the nearshore area of Card Sound included blue crab, stone crabs, mantis shrimp, brown shrimp, and several non-commercially important crabs and bivalves (see Subsection 2.4.2). The species typically occurring in Card Sound would be expected to also occur in the barge turning basin. The effects of dredging on these particular species are unknown; however, in a study of dredging in the Chesapeake Bay, benthic communities survived deposits of suspended sediment despite the exceedance of certain water quality standards (Nichols et al. 1990).

No threatened or endangered aquatic species would be affected by the excavation and limited dredging in the equipment barge unloading area.

The assemblage of aquatic species varies throughout the year, because of spawning and migration patterns of individual fish and invertebrate species. The season of the year in which construction occurs would determine to a large extent the impact on specific aquatic resources in the barge turning basin. However, because the area to be excavated and dredged is small and in a protected near-shore area that is already dedicated to barge activity, the overall impact on eggs and larvae of aquatic organisms would be SMALL. No other significant impacts to aquatic habitats on the Turkey Point plant property would occur. Construction activities would not affect important (as defined by NUREG-1555) fish or invertebrates in surface waters, which would be protected from sedimentation and surface runoff by physical separation. Temporary, minimal sedimentation and increased turbidity are possible, as described above.

4.3.2.2.2 Drilling Deep Injection Wells

Wastewater from Units 6 & 7 construction would be discharged to the Boulder Zone of the Lower Floridan aquifer, a deep and highly cavernous zone of saline groundwater that is used for underground injection of industrial and domestic wastes in south Florida. The wells would be installed under an underground injection control permit. Dual zone monitoring wells would also be installed to monitor the potential impact of the injection process on overlying aquifer units

adjacent to the Boulder Zone. The wells would be located in the plant area adjacent to new Units 6 & 7. This area would be built up from approximately sea level to an elevation of approximately 25.5 feet. During the construction of the deep injection wells and associated facilities, any surface water runoff would be directed to a detention pond in the vicinity of the drilling operations where sediment would be allowed to settle before being released to the industrial wastewater facility. Construction of the injection wells would not impact any aquatic habitats. Therefore, impacts would be SMALL.

4.3.2.2.3 Staging Areas

Muck removed from the excavated areas would be placed in the spoils storage areas. The construction impacts identified in Subsection 4.3.2.1 (sedimentation, turbidity, chemical spills, habitat destruction) that could result from the placement of muck in upland areas within the industrial wastewater facility would be mitigated by using environmental best management practices designed to prevent movement of soil or to intercept soil before it reaches the canals. Runoff would be controlled through structural and operational measures such as berms, riprap, and sedimentation filters before any water drainage to the cooling canals. Environmental best management practices are described in more detail in Section 4.2.

Construction of Units 6 & 7 and ancillary facilities would eliminate approximately 330 acres of aquatic habitats, including wetlands and open water. Because no important aquatic species are present, no critical habitat for aquatic species would be impacted, and the area that would be impacted is relatively small compared to the area of the industrial wastewater facility, construction impacts on aquatic resources on the Turkey Point plant property would be SMALL.

4.3.2.3 Potential Impacts to Offsite Aquatic Resources

Offsite construction that may impact aquatic resources includes (1) installation of pipelines for delivery of potable water and reclaimed water, (2) installation of radial collector wells and pipelines, (3) development of transmission corridors and construction of transmission lines, (4) transport of borrow material to fill the Units 6 & 7 plant area, and (5) roads. Each of these is presented below as well as potential impacts to essential fish habitat (6).

4.3.2.3.1 Reclaimed and Potable Water Pipelines

Reclaimed water pipelines approximately 9 miles long would be constructed to carry water from the SDWWTP to Units 6 & 7. As described in Subsection 4.3.1.2.1, approximately 6.5 miles of the pipelines would be collocated with the existing Clear Sky-to-Davis transmission line right-of-way and adjacent road and canal rights-of-way. The corridor for the reclaimed water pipelines was selected to use, to the greatest extent practicable, existing infrastructure and minimize environmental impacts. Because of the SDWWTP location, the reclaimed water pipeline corridor would be located primarily within and/or adjacent to existing roads and FPL-owned rights-of-way.

The reclaimed water pipelines would cross water bodies including wetlands, the Florida City Canal, the L-31E Canal, the North Canal, the Military Canal, the Princeton Canal (C-102), the Goulds Canal, and the Black Creek Canal (C-1). No significant natural surface water bodies would be crossed by the reclaimed water pipelines.

An approximately 10-mile potable water pipeline would bring potable water from the Miami-Dade County Water and Sewer Department to the Units 6 & 7 plant area. The line would generally follow existing roadways/corridors. Much of the line would be established by trenching adjacent to or within the corridors containing the access road improvements and construction along SW 328th Street/N. Canal Drive to SW 117th Avenue to SW 359th Street to the plant area. Crossings of major canals would be established by horizontal directional drilling. The aquatic habitats associated with this corridor include various canals, ditches, and wetlands.

Other surface water features in the water pipeline corridors include drainage ditches, which typically occur on the borders of roadside ROWs, freshwater marshes, mangroves, and mixed hardwood wetlands. Temporary impacts to wetlands may occur during excavation of the trench for subaqueous pipeline installation. Any temporary impacts to wetlands associated with pipeline installation would be addressed in accordance with FDEP and USACE requirements. Temporary wetland impacts resulting from pipeline installation would be mitigated through restoration of the excavated trench with native wetland soils. Wetland soils removed during trench excavation would be stockpiled and replaced following pipeline installation to allow the natural vegetative community to re-establish on the canal bank. The replacement of native soils at original grade would result in no net loss of wetland acreage or wetland functions following pipeline installation.

Environmental best management practices, such as silt fencing and floating turbidity curtains, would be used to prevent secondary impacts to surface waters or wetlands associated with pipeline installation. Permanent impacts to wetland habitats located within these pipeline corridors would be avoided, and no significant adverse impacts to aquatic resources would be anticipated.

The artificial canals within these corridors contain relatively steep slopes and limited littoral zone vegetation, reducing the quality of wildlife habitat. Canals provide habitat for common native freshwater forage fishes, such as mosquitofish, sailfin molly, least killifish, sunfish, and gar, as well as nonindigenous fishes such as peacock bass, spotted tilapia, blue tilapia, Mayan cichlid, jaguar guapote, and oscar. The only important aquatic species in the reclaimed water pipeline corridor is the native mangrove rivulus. According to the FNAI database, an occurrence of mangrove rivulus was documented within the C-1 Canal in the northwestern portion of the proposed reclaimed water corridor.

Because the pipelines would follow existing corridors along much of their lengths, and erosion and sedimentation would be minimized using environmental best management practices

(sediment screens, mulching, revegetation), no impacts to the mangrove rivulus or other aquatic resources would occur. Overall impacts to aquatic resources would be SMALL.

4.3.2.3.2 Radial Collector Wells

Radial collector wells would be installed adjacent to Biscayne Bay to provide cooling water for Units 6 & 7 (see Figure 3.3-1). The wells would be located on the Turkey Point peninsula, east of the existing units. Each radial collector well would consist of a central reinforced concrete caisson extending below the ground level with laterals projecting from the caisson. The well laterals would be advanced horizontally a distance of up to 900 feet beneath Biscayne Bay and installed to a depth of approximately 40 feet. The lateral screens under Biscayne Bay would be installed by horizontal drilling. Water from the wells would flow by head force to a collection caisson where the water would be pumped via pipelines to Units 6 & 7, thereby limiting surface disturbance to the bottom of Biscayne Bay. The pipelines would cross the following habitat types: existing perimeter roads, mangroves, and a cooling canal. Another 3 acres of industrial/filled habitat would be required for a construction laydown area.

Construction of the radial collector wells and supporting infrastructure could affect aquatic resources in the vicinity. The only important aquatic species is the mangrove rivulus, a state and federal species of concern (described in Subsection 2.4.2.3.1) that is associated with red mangrove communities. Red mangroves exist in the general vicinity of the radial collector wells. Because this species is closely tied to the distribution of red mangrove, any activity that removes red mangrove could have a potential impact on this fish. Construction activities for the radial collector wells and associated pipelines would be controlled so as to minimize any impacts to red mangroves. The radial collector wells would be located within five acres of previously filled lands on the northern edge of Turkey Point. No presently undisturbed mangrove habitat would be disturbed by well construction because standard industry construction practices would reduce the amount of erosion and sedimentation associated with construction, and would limit impacts to aquatic communities in down-gradient water bodies. Because the well laterals would be drilled horizontally beneath Biscayne Bay, and surface water and sediment would not be disturbed, no increases in turbidity or sedimentation would occur.

No other significant impacts to aquatic habitats would result. The construction of the radial collector wells and associated pipelines would not affect any rare or protected aquatic species. Overall, the impacts from construction of the radial collector wells would be SMALL and would not require mitigation beyond that described above.

4.3.2.3.3 Transmission Corridors

Construction activities associated with the transmission corridors would include clearing, adding new transmission facilities, access road and pad construction, and expanding existing

substations, as described in Subsection 4.3.1.3.1. Some construction activity would occur in areas that support aquatic resources within the transmission rights-of-way and at substations. Certification of the selected transmission line corridors is ongoing pursuant to the Florida PPSA. The impacts to aquatic habitats would be avoided and minimized by using existing corridors whenever practicable, thereby reducing the disturbance to currently undisturbed habitat using environmental best management practices. Wherever towers would be installed in open landscapes (such as marshes), the towers would be built on pads and the land use surrounding the towers would be maintained to the maximum extent practical.

Wetland impacts of transmission corridors are described in Subsection 4.3.1.3.1. Fish in the wetland and open water habitats within the proposed corridors include common freshwater forage fishes native to south Florida, such as mosquitofish (*Gambusia holbrooki*), sailfin molly (*Poecilia latipinna*), least killifish (*Heterandria formosa*), sunfish (*Lepomis* spp.), and gar (*Lepisosteus* spp.). Nonindigenous fishes commonly inhabiting canals of Miami-Dade County include peacock bass (*Cichla ocellaris*), spotted tilapia (*Tilapia mariae*), blue tilapia (*Oreochromis aureus*), Mayan cichlid (*Cichlasoma urophthalmus*), jaguar guapote (*Cichlasoma managuense*), and oscar (*Astronotus ocellatus*). Culverts may be placed in some wetlands, ditches, and smaller canals, resulting in localized temporary increases in turbidity. No rare or protected fish or aquatic invertebrates are known or expected to exist within the proposed corridors. Nevertheless, environmental best management practices would be used to reduce soil erosion and sedimentation to minimize impacts to aquatic resources. No withdrawals or discharges to surface water are planned during the construction of new transmission facilities or modification of existing transmission facilities. Other than the mangrove rivulus described previously, none of the 13 freshwater fishes listed by the Florida Fish and Wildlife Conservation Commission (FWC 2008) as endangered, threatened, or of special concern exist in the impacted areas. Impacts to important aquatic species from the construction of transmission facilities would, therefore, be SMALL.

4.3.2.3.4 Roadway Improvements

The roadway improvements would involve widening of existing paved roads and paving existing unpaved roads. In addition, intersection improvements at six locations would be made to accommodate peak construction traffic. The roadway improvements are about 10.75 miles in length, of which about 5.5 miles would be on the Turkey Point plant property.

Wetlands and terrestrial habitats affected by the roadway improvements are described in Subsection 2.4.1. Aquatic habitats potentially affected by roadway improvements include canals and mangroves, which are described in Subsection 2.4.2 and below.

The new 4-lane roadway planned for SW 359th Street would run along the northern edge of the existing industrial wastewater facility. Construction of this road would be separated from the industrial wastewater facility by the existing berms as well as construction buffers.

Canals exist adjacent to the roadways associated with SW 344th Street/Palm Drive and SW 328th Street/N. Canal Drive. In-stream vegetation is minimal within the man-made canals adjacent to existing roadways, due to the steep slopes and minimal littoral zone. These canals provide habitat for common freshwater forage fishes native to south Florida, as well as for nonindigenous fishes commonly inhabiting canals of Miami-Dade County. Areas of mangroves occur adjacent to SW 359th Street near the L-31 Canal. During times of high water, fishes from the canals may enter the mangrove areas. Most will move back into channels as waters recede.

Construction of the roadways would follow the Miami-Dade County Public Works Manual and the Florida Department of Transportation Design Standards. Environmental best management practices, such as silt fencing and floating turbidity curtains, would be used to prevent secondary impacts to surface waters or wetlands associated with construction of roadway improvements. No adverse changes to the aquatic habitats near the roadways would be anticipated. The roadway expansions and new roads would be located within existing linear facilities (existing paved and unpaved roads and transmission corridor), reducing required disturbance of habitats during installation.

Any impacts to aquatic habitats associated with roadway improvements would be addressed in accordance with FDEP and USACE requirements. Unavoidable wetland impacts resulting from construction of roadway improvements would be mitigated in consultation with the FDEP and USACE. No fish or other aquatic life in canals or mangroves would be impacted by construction of the roadways because fish can easily move away from the area of construction for the short duration of the disturbance.

Because the roadway improvements would occur in areas that are already disturbed by human activity and existing infrastructure, and environmental best management practices would be followed, direct and indirect impacts to aquatic habitats due to construction would be SMALL and further mitigation would not be warranted.

4.3.2.3.5 Borrow Material

Borrow material for construction would be obtained from a combination of an FPL-owned fill source, other regional sources, or reused material. The FPL-owned fill source is located about 4.5 miles northwest of the Units 6 & 7 plant area (see Subsection 4.1.2.3).

Obtaining borrow material from the FPL-owned fill source would permanently disturb approximately 300 acres of land classified as agricultural. The area consists primarily of palm tree nurseries (82 percent), exotic wetland hardwoods (11 percent), and other wetlands,

including marsh, ditches, and scrub (7 percent). Fish in the ditches are expected to be species common to south Florida, such as mosquito fish, sailfin molly, least killifish, and sunfish. No aquatic habitats would be impacted by the transport of borrow material from the existing quarries to the Turkey Point plant property.

Given the limited acreage of previously altered (ditching and invasive species) wetlands at the FPL-owned fill source site, impacts on aquatic resources would be SMALL.

4.3.2.4 Summary

Construction of Units 6 & 7 would result in the unavoidable disturbance of approximately 330 acres of wetlands and manmade canals, most of it hypersaline mudflats, as described in Subsection 2.4.1.3 and shown in Figure 2.4-2. The aquatic species in the impacted wetlands and canals are widely distributed across similar habitats in south Florida. Construction impacts to small wetlands or other surface waters result in loss of the fishes and invertebrates. No imperiled aquatic species, as defined by the Florida Fish and Wildlife Conservation Commission (FWC Jun 2006), are believed to exist in the construction areas (see Subsection 2.4.2).

Roads, bridges, and spoils areas, described in Subsection 4.3.1.1, would be placed so as to minimize impacts to aquatic resources. However, construction on land may result in impacts to nearby aquatic ecosystems on the Turkey Point plant property and offsite, including sedimentation and increased turbidity (as a result of erosion of surface soil) and, although less likely, spills of petroleum products. Complete loss of aquatic habitat would occur in areas that would be dewatered and backfilled to support construction of Units 6 & 7.

Construction of the radial collector wells and supporting infrastructure may affect aquatic resources in the vicinity. However, aquatic resources in the area affected by the radial collector wells are common and ubiquitous in south Florida. No rare or protected aquatic species would be affected. Overall, impacts from construction of the radial collector wells would be SMALL.

Important aquatic resources in the barge turning basin that may be temporarily affected by dredging include eggs, larvae, and adults of invertebrates and fishes. Construction activities would not affect important (as defined by NUREG-1555) fish or invertebrates in surface waters, which would be protected from sedimentation and surface runoff by physical separation. Temporary, minimal sedimentation and increased turbidity are possible, as described above.

Offsite construction may impact aquatic resources in manmade canals, including small common fishes of south Florida as well as several species of nonindigenous fishes that have become established in the canals.

Apart from the lands that will be permanently modified by construction, impacts to aquatic communities from construction would be SMALL and temporary, and would not warrant

mitigation. Construction activities that may cause erosion that could lead to harmful deposits in aquatic water bodies would be (1) of relatively short duration, (2) permitted and overseen by state and/or federal regulators, and (3) guided by an approved stormwater pollution prevention plan. Any small spills of construction-related hazardous fluids, such as petroleum products, would be mitigated according to a spill prevention control and countermeasure plan(s). Some sensitive wetland habitats exist within the areas affected by construction activities; however, no important aquatic species would be affected.

Section 4.3 References

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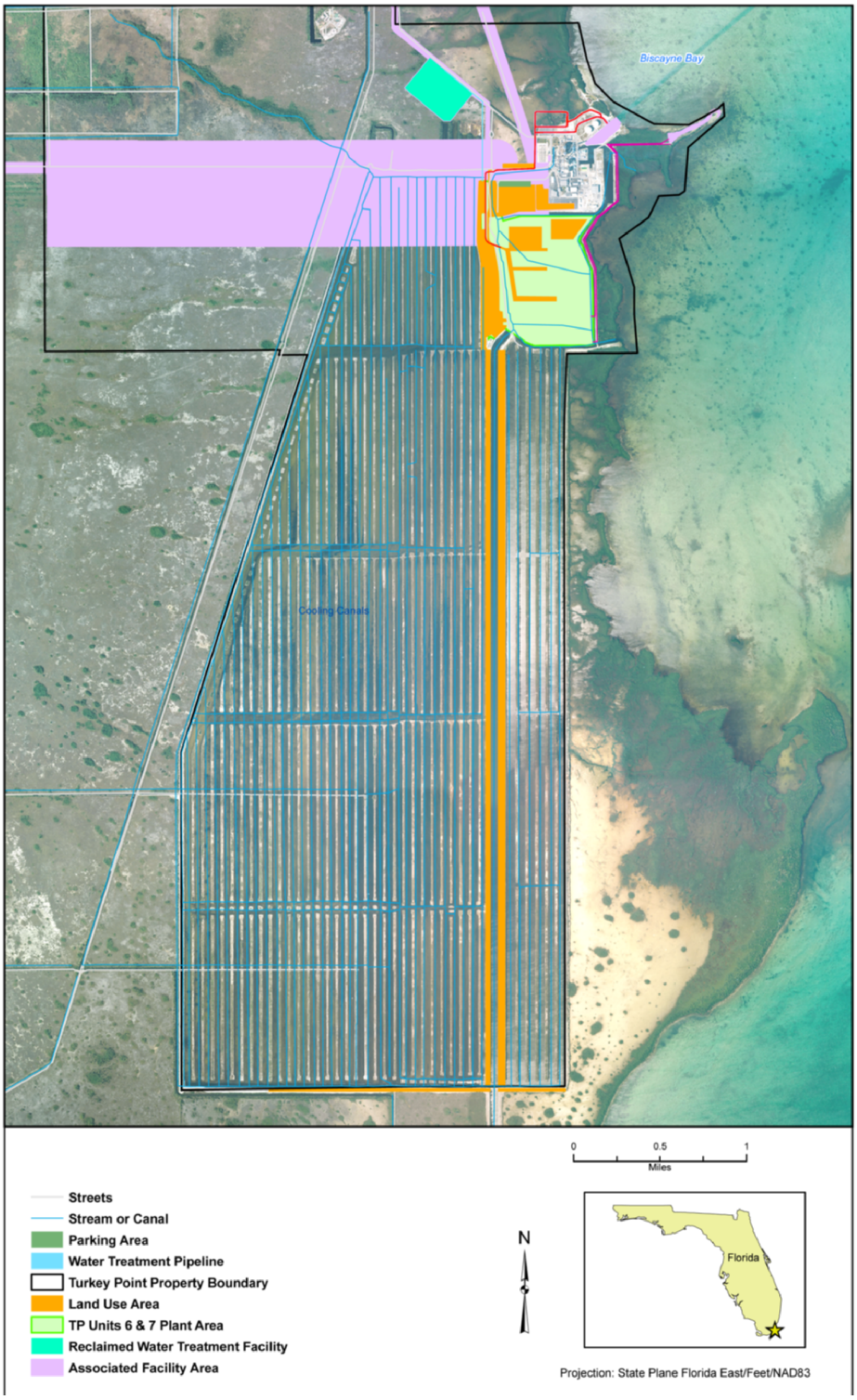
Figure 4.3-1 Turkey Point Disturbed Area



4.4 SOCIOECONOMIC IMPACTS

This section addresses the socioeconomic impacts of the construction of Units 6 & 7 at the Turkey Point plant property in Miami-Dade County, Florida. The evaluation assesses impacts of construction and of demands placed on the region by the workforces. Subsection 4.4.1 describes and addresses an assessment of the physical impacts of construction. Subsection 4.4.2 describes the impacts of construction to the region in the areas of demography, economy, taxes, land use, transportation, recreational resources and aesthetics, housing, public services, and education. Subsection 4.4.3 assesses the construction of Units 6 & 7 with regard to disproportionate adverse impacts to minority and low-income populations.

4.4.1 PHYSICAL IMPACTS OF CONSTRUCTION

This section assesses the potential physical impacts as a result of construction of the new units on the nearby communities or residences. Potential impacts include noise, odors, exhausts, thermal emissions, and visual intrusions. These physical impacts would be managed in compliance with applicable federal, state, and local environmental regulations and would not significantly affect the Turkey Point plant property and the vicinity.

As stated in Section 2.2, Miami-Dade County has more than 1946 square miles of land, of which approximately 500 square miles have been developed for urban uses. The predominant existing land uses around the plant are undeveloped and protected areas. The closest incorporated communities are Homestead and Florida City. Homestead is 9 miles northwest of the Units 6 & 7 plant area and Florida City is 8 miles west of the plant area (Subsection 2.2.1.2). There are no residential areas or public roads within the Turkey Point plant property. The existing major facility within a 6-mile vicinity of the Units 6 & 7 plant area is the Homestead Air Reserve Base. No major industrial or commercial facilities other than new Units 6 & 7 are planned for this area; however, a portion of the Homestead Air Reserve Base (717 acres) is to be set aside for mixed economic uses (commercial, residential, or recreational uses) by Miami-Dade County (Subsection 2.2.1.2).

4.4.1.1 Noise

The noise impacts of Units 6 & 7 construction activities have been evaluated. The evaluation considered construction equipment associated with site preparation and construction of permanent features, such as foundations, buildings, cooling towers and other components of each unit. The noise sources used were typical of conservative noise levels from similar equipment. The highest levels of construction noise from the Units 6 & 7 plant area would be generated by impact wrenches, cranes, backhoes, front-end loaders, trucks, bulldozers and the concrete batch plant. The analysis predicts that the highest onsite construction noise level would be between 70-90 dBA (measured at a distance of 50 ft). The noise level would be 85 dBA at 3 ft, 75 dBA at 200 ft and 65 dBA at 400 ft.

The noise generated during Units 6 & 7 construction activities would be attenuated by distance from the source. As described in Subsection 2.7.7, an ambient noise monitoring survey was performed in June 2008 to assess existing ambient noise in areas adjacent to the existing units. From two monitoring points located at the Turkey Point plant property boundary (monitoring points S2 and S3), current daytime and nighttime noise level equivalent (L_{eq}) readings were recorded. The daytime L_{eq} readings ranged from 60 to 68 dBA and the nighttime L_{eq} readings ranged from 60 to 67 dBA. The L_{eq} includes all noise sources including transient sounds such as traffic that influence observations. In comparison, the maximum noise level generated by construction activities at the nearest permanent private residence would be 64.4 dBA during the daytime and 54.1 dBA during the nighttime.

Other noise generated by the construction of Units 6 & 7 would be the noise levels resulting from construction of new transmission systems and substation expansions. The noise generated from construction of the transmission lines and expansion of substations would include right-of-way clearing, access road and pad construction (where necessary), line construction, and right-of-way restoration. The noise generated from the machinery required for these phases of construction would include bulldozers, shearing machinery, chain saws, trucks, cranes and possibly helicopters. The transmission line construction and expansion within the western corridor would be on primarily wetlands, agricultural or undeveloped land; therefore, any noise from the construction would be attenuated prior to reaching receptors in the urban areas. The transmission line construction and expansion within the eastern corridor would be on primarily urban land. The noise would be attenuated by distance from the source. The transmission lines construction activities would be taking place in both agricultural areas with few people to be impacted by the additional noise and urban settings where people already experience noise from construction, traffic, etc; also this phase of construction would be accelerated, short term and performed during daytime hours. Therefore, noise generated by the construction of the transmission systems and substations would result in SMALL impacts and would not warrant mitigation.

Further noise generated by construction would be due to roadway expansions and improvements and increase in traffic by the construction workforce on access roadways and onsite roads. The noise generated by the roadway improvements and expansions would be associated with jack hammers, bulldozers, road pavers, road scrapers, earth movers and trucks. The road expansions and the new access road would be constructed on agricultural or undeveloped land; therefore, any noise from the construction would be attenuated prior to reaching receptors in the urban areas. Other road improvements would be along existing roadways. The noise generated by construction activities would be short term and during daytime hours. Noise from the increase in traffic by the construction workforce would occur on existing roadways as well as the road extensions once they are completed and on the Turkey Point plant property. Due to the short duration of construction activities in a single location, setting in urban areas or in agricultural or

undeveloped areas with few receptors, and limiting construction to daylight hours, the impacts from noise from road construction and traffic would be SMALL and further mitigation would not be warranted.

4.4.1.2 Air

Temporary and minor impacts to the local ambient air quality could occur as a result of construction activities. Fugitive dust and fine particulate matter emissions, including those less than 10 microns (PM_{10}), would be generated during excavation of muck, backfilling, grading and compacting, concrete batching, and vehicular travel over paved and unpaved roads. Construction equipment and offsite vehicles used for hauling debris, soil, construction equipment, and supplies would also produce emissions. Wind erosion over exposed land area may also generate fugitive dust, smoke, and other fine particulate emissions. Open burning associated with clearing laydown areas and site preparation activities could be conducted as needed with proper notification to the Florida Division of Forestry.

Pollutants of primary concern include less than 10 microns of fugitive dust, reactive organic gases, oxides of nitrogen, carbon monoxide, and to a lesser extent, sulfur dioxides. Varying affecting construction emissions have been assessed and the level of PM_{10} emissions estimated to be released during both site preparation and construction of Units 6 & 7 is 97.5 tons. Also, based on the EPA emission factors and estimated maximum numbers of vehicles, the CO, NO_x, VOC, PM_{10}, and SO_2 emissions are estimated to be 63.7, 65.9, 8.3, 3.7, and 0.14 tons per year due to exhaust of construction equipment and diesel engines during both site preparation and construction of Units 6 & 7.

Impacts to air quality could be minimized by compliance with federal, state, and local regulations that govern construction activities and emissions such as the Southeast Florida Intrastate Air Quality Control Region and the Clean Air Act which established the National Ambient Air Quality Standards. These standards include criteria for pollutants such as:

- Sulfur dioxide
- Particulate matter with aerodynamic diameters of 10 microns or less (PM_{10})
- Particulate matter with aerodynamic diameters of 2.5 microns or less ($PM_{2.5}$)
- Carbon monoxide
- Nitrogen dioxide
- Ozone

- Lead

The Southeast Florida Intrastate Air Quality Control Region is in attainment for criteria air pollutants. Attainment areas are areas where the ambient levels of criteria air pollutants are designated as being *better than*, *unclassifiable/attainment*, or *cannot be classified or better than* the EPA-promulgated National Ambient Air Quality Standards.

Specific mitigation measures to control fugitive dust would be identified in a dust control plan, or similar document, prepared before the start of construction. These mitigation measures could include:

- Stabilizing construction roads and unsuitable soils piles
- Limiting speeds on unpaved construction roads
- Using water for dust control
- Periodically watering unpaved construction roads to control dust
- Performing housekeeping (e.g., removing dirt spilled onto paved roads)
- Covering haul trucks when loaded or unloaded
- Minimizing material handling (e.g., drop heights, double handling)
- Ceasing grading and excavating activities during high winds and during extreme meteorological events
- Phasing grading to minimize the area of disturbed soils
- Revegetating road medians and slopes

While emissions from construction activities and equipment would be unavoidable, a mitigation plan would minimize impacts to local ambient air quality and the nuisance impacts to the public close to the project. The mitigation plan would include:

- Phasing construction to minimize daily emissions
- Performing proper maintenance of construction vehicles to maximize efficiency and minimize emissions

Therefore, air quality impacts from construction would be SMALL and would not require mitigation.

4.4.1.3 Aesthetics

The viewscape of the new units from north to south or from south to north would be similar to that of the existing units, except for the additional height of cranes being used for the construction of the cooling towers and plant modules. The cranes could reach approximately 460 feet high and would be removed after the end of construction. As stated in Subsection 2.5.2.5, the tallest structures at the plant property are the existing 400-foot emission stacks. However, the viewscape perpendicular to the Turkey Point plant property, that seen by commercial and recreational boating traffic on the eastern side of the property, would have a broader view of the entire Units 6 & 7 plant area, and would have an open view of Units 6 & 7 construction. This viewscape would be temporarily impacted by the presence of construction equipment and the new reactor modules being installed, after which the viewscape would be similar to that of the existing units. Thus, the visual impact of the construction cranes and other equipment for Units 6 & 7 would be slightly more than the impacts from Units 1 & 2 emission stacks, which would be SMALL and would not warrant mitigation.

Outdoor lighting would be necessary to satisfy NRC and Occupational Safety and Health Administration (OSHA) requirements for security, worker and plant safety, including lighting walkways, parking areas and various equipment areas. Unconstrained lighting can cause light pollution and light trespass. Light pollution or sky glow is the term used to describe sky brightness caused by scattering of light in the atmosphere. Light trespass is the term used to describe light that strays from its intended purpose and becomes an annoyance.

Light pollution and light trespass would be addressed during construction of Units 6 & 7 when working in low light hours. Guidelines specifically addressing potential lighting issues, from the Illuminating Engineering Society of North America (IESNA), would be adhered to. These guidelines would be incorporated into the outdoor lighting design to the extent practicable while meeting NRC and OSHA requirements. Typical features to be incorporated would include: minimize upward light from luminaries, minimize upward light in general so that light reaches its intended target, turn off lighting not needed for safety and security between 11 PM and sunrise, contain light within its intended target area by suitable choice of luminaries for light distribution, by selection of mounting height and physical location, and by minimizing glare in the horizontal or vertical directions.

Outdoor light monitoring was conducted in 2008. The monitoring was performed from ten locations surrounding Turkey Point such as the racetrack, cooling canals, and Biscayne Bay. The results indicate that, while light from the existing units is visible, the light is localized. Sky glow was observed from the major urban areas such as Homestead and Miami. The use of the IESNA guidelines to the extent practicable, while meeting NRC and OSHA security and safety requirements, would result in low lighting impacts from Units 6 & 7 and would not warrant mitigation.

The visual impacts of the construction within the eastern transmission line corridors (Clear Sky to Turkey Point, Clear Sky to Davis, and Davis to Miami) would consist of the clearing and installation of new concrete pads and 80-105 feet concrete poles upon which two 230 kV lines would be spanned. This area would consist of other construction activities and the Clear Sky to Turkey Point line would be fully contained on the Turkey Point plant property. The view would be similar to the existing lines between Turkey Point switchyard and the McGregor switchyard. The Clear Sky to Davis line would also span between 80-105 feet concrete poles in an established transmission corridor that is currently being utilized for seven other power lines. The Davis to Miami line would again span between 80-105 feet concrete poles collocated with the MetroRail and a major transportation highway. A short section of the proposed Davis-Miami 230 kV transmission line, at the crossing of the Miami River adjacent to the existing Miami substation, would be constructed underground. Construction phases would consist of right-of-way clearing (where required), access road and structure pad construction (where necessary), line construction, and right-of-way restoration.The construction of new concrete pads with a single line and new poles within this corridor would be temporary and accelerated and would be similar to the current linear facilities established. Therefore the presence of these new lines would have a SMALL impact and would not warrant mitigation.

The visual impacts of construction within the western transmission line corridor (Clear Sky to Levee and Clear Sky to Pennsuco) would consist of clearing area within the current and preferred corridors to expand the right-of-way to contain new concrete pads and concrete poles for two 500 kV lines and a single 230 kV line. These lines would follow an existing corridor up to the Everglades National Park (ENP), after which, the two 500 kV lines would terminate at the Levee substation and the 230 kV line would continue to the Pennsuco substation. The existing corridor to the ENP is currently utilized by a single transmission line and predates much of the current development along the corridor. The visual impacts of the construction of the addition lines would consist of the installation of new 80-105 feet high concrete poles and new concrete guyed single-circuit structures at heights of 135-150 feet approximately 1000 feet apart. The construction of these new structures would alter and inhibit the viewscape; however, due to the flat topography, the visibility would be reduced with increased distance. The present corridor located within ENP would be visible within the park up to 20 miles away; however, visibility would be reduced with increased distance from the structures and at the furthest distances the image would be faint. There is an option to relocate the corridor along the eastern edge of the park; however, the impacts would be similar to the previous corridor through ENP, except it would be farther away from visitors immediate view within the park. The 230 kV line that continues through Levee substation to Pennsuco substation would be in portions of existing rights-of-way where the line would be collocated with existing transmission lines and would require construction in heavily industrial and urban areas. Impacts to the natural and built environment would be minimized due to the presence of existing facilities and, to the extent feasible through the selection process,

engineering options, and construction techniques used. Therefore, the presence of these new lines would have a SMALL impact and would not warrant additional mitigation measures.

4.4.1.4 Traffic

Construction workers commuting to and from the Turkey Point plant property would converge on SW 344th Street/Palm Drive or SW 328th Street/N. Canal Drive to gain access to the plant property. From these roadways, workers would travel on improved roads designed to accommodate peak construction traffic to the new access road, SW 359th Street, and finally a new entrance to Units 6 & 7. Road improvements would be made from SW 344th Street/Palm Drive to SW 359th Street and from SW 117th Street to SW 359th Street.

Fill materials used to build up the Units 6 & 7 plant area could either be trucked from a nearby FPL-owned fill source or from other regional sources. This fill material would be brought to the Turkey Point plant property via haul trucks using two different routes to minimize impacts to local traffic. Impacts of peak construction on the roadways would be MODERATE. In addition, U.S. Highway 1, State Road 997, and other roads in the vicinity would experience a temporary increase in traffic during shift changes. Additional descriptions of transportation are provided in Subsection 4.4.2.2.4.

Construction materials would arrive at the Turkey Point plant property by truck and barge. Large components and equipment would arrive by barge. Approximately 80 barge trips for large components and modules would be required for each unit over a 6-year period (see Subsection 3.9.1.3). Materials arriving by barge would then be trucked over the onsite heavy haul road to the Units 6 & 7 plant area. Florida's Intracoastal Waterway traverses the eastern coastline of Florida and intersects with the port of Miami, as shown in Figure 2.5-7. The existing barge turning basin is accessed via the waterway through an existing shipping channel in Biscayne Bay. Modifications to the equipment barge unloading area would be required to accommodate the delivery of large components and modules. These alterations would be limited to the equipment barge unloading area of the turning basin and would not impact Biscayne Bay barge traffic. As explained in Subsection 4.3.1.1, the barge facility is currently active throughout the year, receiving five to seven shipments of fuel oil per week for Units 1 & 2. Because of the infrequent number of trips required to deliver large components and modules by barge, the current frequent number of fuel oil shipments, the impacts to waterborne traffic in Biscayne Bay and the Intracoastal Waterway would be SMALL and would not require mitigation.

4.4.1.5 Conclusion

Physical impacts to the surrounding communities and residences as a result of construction of the new units and linear facilities would be SMALL and would not warrant mitigation. However, the impacts from traffic and transportation would be MODERATE and would require mitigation.

4.4.2 SOCIAL AND ECONOMIC IMPACTS

This section evaluates the demographic, economic, infrastructure, and community impacts to the region of influence as a result of constructing Units 6 & 7 in Miami-Dade County, Florida. The evaluation assesses impacts of construction-related activities and of the construction workforce on the region of influence.

The construction schedule assumes a 108-month duration from the start of preconstruction activities to the start of commercial operation of Unit 7. Site preparation activities would begin in 2011. The projected commercial operation dates for Units 6 & 7 are 2018 and 2020, respectively. See Table 3.9-1.

A total of 3647 workers are estimated (including 3548 construction and 99 operations workers) at peak construction activity (anticipated to occur in 2016 (Section 3.10.1.3). There would be two types of workforces onsite during the construction peak because the operation of Unit 6 would begin before the completion of construction for Unit 7. Figure 3.10-1 illustrates the distribution of the construction workforce over the anticipated construction period, Figure 3.10-2 illustrates the distribution of operations workers during the same period, and Figure 3.10-3 illustrates the distribution of both workforces during the construction period. The nature of the two types of workforces is different and may cause differing impacts. In Subsection 4.4.2, these two workforces are analyzed together and separately.

Major factors in determining socioeconomic impacts are the number of workers and family members that relocate to an area and where they settle. Assumptions regarding workforce characteristics and migration, family characteristics, and workforce retention at Units 6 & 7 are depicted in Table 4.4-1. Assumptions regarding families, children, and the indirect workforce are described in more detail in Subsection 4.4.2.1. As stated in Subsections 3.10.2 and 3.10.3, it is assumed that 50 percent of the total construction workforce would migrate into the region of influence and 50 percent of the operations workforce would migrate into the region of influence. Therefore, the total number of workers that would migrate into the region of influence would be 1824 (50 percent of 3647 workers).

As described in Subsection 2.5.1, the evaluation of the residential distribution of the current workforce for Turkey Point Units 1 through 5 and socioeconomic variables within 50 miles of the Turkey Point plant property has determined that the socioeconomic region of influence for this project includes Miami-Dade County, and specifically, the Homestead and Florida City area. Approximately 83 percent of the current operations workers reside in Miami-Dade County. Approximately 43 percent of Turkey Point's workers reside in the Homestead and Florida City area. For this project, it could be assumed that 83 percent of the in-migrating construction workforce would reside in Miami-Dade County and the remainder would reside in the other counties in or near the 50-mile radius, but Miami-Dade County's population is so large and

resources are so plentiful that it can be conservatively assumed that 100 percent of the 1824 workers would migrate to the county. On a more local level, however, it is assumed that, based on the residential distribution of the current operations workforce, 43 percent of the in-migrating workers (780 workers) would reside in the Homestead and Florida City area. The impact analyses in Subsection 4.4.2 are based on the socioeconomics of Miami-Dade County in general and the Homestead and Florida City area in particular.

In Subsection 4.4.2.2, incremental increases in resource use caused by the incoming workforces for the new units are compared to the available capacity of those resources in Miami-Dade County and particularly the Homestead and Florida City area.

As stated in Section 1.1, the significance of the impacts as SMALL, MODERATE, or LARGE have been identified in accordance with the NRC-established criteria in 10 CFR Part 51, Appendix B, Table B-1, Footnote 3, as follows:

SMALL — Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE — Environmental effects are sufficient to alter noticeably, but not to destabilize, any important attribute of the resource.

LARGE — Environmental effects are clearly noticeable and are sufficient to destabilize any important attributes of the resource.

These impact significance terms are assigned to both county-level and city-level analyses.

4.4.2.1 Demography

It is estimated that the construction of both units would be completed by 2020. The 2000 population within 50 miles was approximately 3,105,717 and is projected to grow to approximately 3,879,394 by 2020 (Table 2.5-1). The 2000 population of Miami-Dade County was 2,253,779 and is projected to grow to 2,860,921 by 2020 (Table 2.5-4). The 2000 populations of Homestead and Florida City were 31,909 and 7843, respectively (Subsection 2.5.1). The 2007 estimates for the two cities were 56,601 and 9601, respectively (Subsection 2.5.1). Population projections for the two cities in 2020 are not available.

It is anticipated that 1824 workers would migrate into Miami-Dade County to support the construction of the new units (Table 4.4-1). It is anticipated that 780 of those workers would migrate to the Homestead and Florida City area (Table 4.4-1). The demographic analysis is based on these numbers.

The in-migration of 1824 workers would create new indirect jobs in the area because of the multiplier effect. Under the multiplier effect, each dollar spent on goods and services by an in-migrant becomes income to the recipient, who saves a portion but re-spends the rest. In turn, this re-spending becomes income to someone else, who, in turn, saves part and re-spends the rest. The number of times the final increase in consumption exceeds the initial dollar spent is called the multiplier. The U.S. Department of Commerce's Bureau of Economic Analysis (BEA), Economics and Statistics Division, provides multipliers for industry jobs and earnings (BEA 2009a). Their economic model, RIMS II, incorporates buying and selling linkages among regional industries, and provides multipliers by industry sector to estimate the impacts of changes in that sector to a regional economy. The analysis here uses the detailed employment multipliers for the construction industry and the power generation and supply industry to estimate the number of indirect jobs and the impact of new nuclear plant-related expenditures in Miami-Dade County, as a result of the influx of construction and operations workers during the period of construction. Table 4.4-2 provides direct and indirect employment data for the county.

The multipliers predict that for every in-migrating construction worker, an estimated additional 0.9535 jobs would be created in Miami-Dade County (BEA 2009a). During the construction peak, the influx of 1774 construction workers would generate approximately 1692 indirect jobs, resulting in a total of 3466 new jobs (direct and indirect) in Miami-Dade County (Table 4.4-2). For every in-migrating operations worker (50 during the construction peak), an estimated additional 2.1696 jobs would be created in Miami-Dade County (BEA 2009a). During the construction peak, the influx of 50 operations workers would create approximately 108 indirect jobs, for a total of 158 new jobs (direct and indirect) in Miami-Dade County (Table 4.4-2). Therefore, the total number of indirect jobs created in Miami-Dade County by the construction of Units 6 & 7 would be 1800.

Most indirect jobs are service or retail-related and not highly specialized, so, for this analysis, it was assumed that most indirect jobs would be filled by the existing labor force in the 50-mile region of influence, and, specifically, Miami-Dade County, where there were 69,781 unemployed people in 2008 (Subsection 2.5.2.1). The number of indirect jobs, 1800, represents approximately 3 percent of the number of unemployed people in Miami-Dade County in 2008.

To estimate the family characteristics of the construction and operations workforces, the NRC study, *Migration and Residential Location of Workers at Nuclear Power Plant Construction Sites* (BMI Apr 1981) and U.S. Census Bureau (USCB) data were evaluated. Published in 1981, the Battelle Memorial Institute (BMI) study was based on 49,000 observations from 28 surveys at 13 nuclear power plant construction sites. The study sought to improve the accuracy of socioeconomic impact assessments by providing an improved methodology for predicting in-migrating workforce sizes and residential distribution patterns at future nuclear power plant construction project sites. Though the study was an analysis of construction workforces in general, information about nuclear plant nonconstruction workers (i.e., managers, engineers, supervisors, clerical, security, and medical personnel who were on the site during construction)

was also included. Because nonconstruction workers have many similar characteristics to operations workforces, their data is useful for this analysis. The study is the most current of its nature and there is little evidence that the observations of fundamental worker characteristics and behaviors detailed in the BMI study have changed meaningfully since the study's publication. Therefore, the worker migration patterns and family characteristics described in the 1981 study are a valid proxy for assumptions made for nuclear power plant construction and operations workforces today.

According to the BMI study, approximately 70 percent of the in-migrating nuclear plant construction workers were likely to bring families. Therefore, for this project, of 1774 in-migrating construction workers, 1242 would bring families into Miami-Dade County and 532 would not. Approximately 531 workers would bring families into the Homestead and Florida City area. According to the BMI study, the average family size of a nuclear plant construction worker was 3.25.

Consequently, it is estimated that the size of the construction worker family for this project would be 3.25. Therefore, 1242 in-migrating construction workers would bring 2794 family members into Miami-Dade County. The 531 workers that would move into the Homestead and Florida City area would bring 1195 family members.

According to the BMI study, the average number of school-age children per construction worker who relocated his/her family was 0.8. Therefore, 1242 in-migrating families would include 993 school-age children. The 531 families that would relocate to the Homestead and Florida City area would include 425 children.

With respect to the operations workers onsite during the construction peak, it is assumed that 100 percent of the 50 in-migrating workers would bring families. Twenty-one of those workers would settle in the Homestead and Florida City area. According to the BMI study, the average family size of a nuclear plant nonconstruction worker (i.e., managers, engineers, supervisors, clerical, security, and medical personnel who were onsite during construction) was slightly less than 3.25. According to the USCB (USCB 2007), the average family size in Miami-Dade County in 2007 was 3.36, while the average family size for the state of Florida was 3.08. Therefore, it is assumed that the average family size of 3.25 used for the construction workforce, would also be a reasonable estimate for the operations workforce. Thus, 50 in-migrating operations workers would bring 113 family members, for a total of 163 additional people in Miami-Dade County (Table 4.4-1). The 21 workers that would migrate to the Homestead and Florida City area would bring 48 family members, for a total of 70 additional people in that area (Table 4.4-1).

The BMI study reported that while construction workers averaged 0.8 school-age children per family, nonconstruction workers had an average of 0.6 children. However, to provide a more conservative impact estimate, it is estimated that, like the construction worker families, each of

the 50 operations families would bring 0.8 school-age children, for a total of 40 children. The 21 families that would settle in the Homestead and Florida City area would include 17 children.

When the population increases from the two sets of in-migrating workers are totaled, Miami-Dade County's population during the construction peak would grow by 4731 people. This represents an increase of approximately 0.2 percent over the 2000 population of Miami-Dade County and approximately 0.2 percent over Miami-Dade County's projected 2020 population (Table 2.5-4). Therefore, Units 6 & 7-related population impacts to Miami-Dade County during construction would be SMALL.

When approximately 43 percent of the in-migrating workers (construction and operations) settle in the Homestead and Florida City area, the Homestead and Florida City area's population during the construction peak would grow by 2024 people. This represents an increase of approximately 5 percent over the combined 2000 populations of Homestead and Florida City (Table 2.5-3), and approximately 3 percent over the combined 2007 population estimates of Homestead and Florida City. Therefore, Units 6 & 7-related population impacts to the Homestead and Florida City area during construction would be SMALL.

Upon construction completion, it is assumed that, based on the BMI study, 50 percent of the in-migrating construction workforce would leave the region of influence and 50 percent would remain (BMI Apr 1981). Essentially, 2284 people, including workers and family members, would migrate back out of the region of influence (Table 4.4-1). Nine hundred and seventy-seven (977) people would leave the Homestead and Florida City area. Because the Turkey Point project-related impacts to the populations of the region of influence would be small, the impacts of the post-construction population declines would also be SMALL.

4.4.2.2 Impacts to the Community

This section evaluates the economic, infrastructure, and community service impacts to the region of influence, Miami-Dade County, and, specifically, the Homestead and Florida City area, as a result of constructing Units 6 & 7. Site preparation and construction activities would continue for 108 months and employ as many as 3647 workers at peak employment, 50 percent of which would migrate into Miami-Dade County.

4.4.2.2.1 Economy

As noted previously, a one-county region of influence—Miami-Dade County—has been identified. The impacts of construction on the local and regional economy depend on the region of influence's current and projected economy and population.

In 2007, there were 52,741 jobs in the construction industry in the region of influence, which represented approximately 6.1 percent of jobs in the region of influence (Table 2.5-11). In 2007, 12.5 percent (6591) of these construction jobs were in heavy and civil engineering construction.[1]

As explained in Subsection 4.4.2 (Table 4.4-1), approximately 1824 construction and operations workers would be expected to migrate into the region of influence during the construction period. Table 4.4-3 shows that these workers would represent 0.2 percent of the region of influence's 2007 total employment, 3.5 percent of the region of influence's employment in construction, and 27.4 percent of the region of influence's employment in heavy and civil engineering construction.[1]

Subsection 4.4.2 also addresses employment multipliers, which predict that the in-migrating workers would create 1800 indirect jobs in the region of influence, resulting in a total of 3624 new jobs in the region of influence during the construction peak. It is estimated that region of influence residents and spouses of in-migrating workers would be available to fill the 1800 indirect jobs. To the extent that the new indirect jobs would reduce unemployment in the region of influence, the impact would be SMALL and positive.

The BEA's RIMS II program (Subsection 4.4.2.1) also calculates earnings multipliers. The analysis here uses the detailed earnings multipliers for the construction industry and the power generation and supply industry sectors to estimate the impacts in the region of influence from earnings by in-migrating construction and operations workers, respectively. For every dollar earned by an in-migrant construction worker, an estimated additional 0.8022 dollars would be injected into the regional economy, while each dollar earned by an in-migrant operations worker would inject an estimated additional 0.788 dollars into the region of influence's economy (BEA Jun 2009a).

4.4.2.2.1.1 Construction In-Migrants

To estimate impacts to the region of influence economy by the construction in-migrants, wage data for Industrial Sector 237, Heavy and Civil Engineering Construction, was obtained from the Department of Labor, Bureau of Labor Statistics (BLS), *Quarterly Census of Employment and Wages* (BLS 2009a). As shown in Table 2.5-12, the average annual wage in this sector for Miami-Dade County was $56,897 in 2007. The estimated average monthly wage of $4741 ($56,897 ÷ 12) was multiplied by the number of in-migrating workers for each month and then summed to calculate total dollars earned by the in-migrants. The number of in-migrants is assumed to be 50 percent of the total workforce onsite per month. Table 4.4-4 provides the total construction worker wages for each month during the construction period. The wage total for the 108-month construction period is $561,194,077. The impact of these wages to the region of

1. The numbers for total employment for all industries, construction, and heavy and civil engineering construction reflect privately owned firms and establishment sizes. These figures do not include government employees.

influence's economy depends on the proportion of their wages that workers would spend in the region of influence. Because of uncertainty surrounding this proportion, a sensitivity analysis was conducted, shown in Table 4.4-5, to further assess the dollar impact on the region of influence by a range of percentages spent in the region of influence. The earnings multiplier (1.8022) for the construction industry in the region of influence was also applied to the wages (BEA Jun 2008 a). According to these calculations, the total economic impact of in-migrating construction worker wages on the region of influence would range from $101,138,396 to $1,011,083,965 over the life of the construction project. There are numerous commercial establishments and opportunities scattered throughout the many urbanized areas of the region of influence, but BEA does not report data at the local level for municipalities such as Homestead and Florida City. Therefore, it is not possible to estimate a range of economic impact from the in-migrating construction worker wages to the Homestead and Florida City area. However, such impacts would be positive and SMALL.

To approximate the magnitude of the impacts in the region of influence, the total wages for each year during the construction period were computed. Based on a conservative assumption that workers would spend 50 percent of their wages in the region of influence, the multiplier was applied to these values and compared the annual totals to the region of influence's total personal income for 2007. As seen in Table 4.4-6, these estimates predict that wages spent in the region of influence would represent increases to the region of influence's total personal income of 0.01 percent in the first year, 0.11 percent in the fifth year, and 0.03 percent in the final year of construction. Impacts to the region of influence's economy would be positive and SMALL. However, as a result of potential growth in personal income in the region of influence, independent of Units 6 & 7, the construction worker wages could very well represent a decreasing proportion of total income in the future. Also, impacts would vary if more or less than 50 percent of worker wages were spent in the region of influence. In any of these cases, impacts to the region of influence's economy would remain SMALL and positive.

Another local economic impact would result from possibly increased earnings by the 50 percent of construction workers who would already reside in the region of influence. The level of this impact would depend on those workers' existing wages and the amount by which their wages would increase when working on Units 6 & 7. While that information cannot be known at this time, it is assumed that such impacts would be SMALL and positive.

4.4.2.2.1.2 Operations In-Migrants

In addition to the in-migrating construction workers, operations workers would also be onsite during the construction period. At the peak construction period, an operations workforce of 99 workers is estimated, but the operations workforce would grow to 806 workers by the end of the construction phase (Subsection 3.10). As stated previously, it is assumed that 50 percent of operations workers would migrate into the region of influence.

The BLS collects employment and wage data by occupational category. To estimate impacts to the region of influence economy by the operations in-migrants, national wage data was obtained for categories 51-8011, Nuclear Power Reactor Operators, and 19-4051, Nuclear Technicians, from the BLS, *Occupational Employment and Wages, May 2007*. The mean annual wage for these two categories was $71,220 and $65,850, respectively (BLS 2009b). Operator wages would be greater, but these employees comprise a smaller percentage of the workforce. Therefore, to be conservative, the technician wage was used.

The methodology for predicting in-migrant operations worker impacts was similar to that used for predicting in-migrant construction worker impacts. The average annual wage of $65,850 was divided by 12 to obtain an average monthly wage of $5488, which was then multiplied by the number of in-migrating workers each month, and summed to calculate total dollars earned. Table 4.4-7 provides these calculations, and shows that total operations worker wages during the construction period would total $61,289,888.

Again, a sensitivity analysis was applied to compute impacts based on the proportion of wages spent in the region of influence, and the earnings multiplier for power generation and supply workers (1.7880) was applied. This analysis found that impacts to the region of influence's economy from operations worker wages would range from $12,653,104 to $126,531,038 over the construction period (Table 4.4-8). As noted above, it is not possible to predict economic impacts from in-migrating operation worker wages to the Homestead and Florida City area. However, it is likely that local businesses would experience SMALL and positive impacts as a result of expenditures by in-migrating workers and their families.

Total wages were then computed by year. Again, it was conservatively assumed that workers would spend 50 percent of their wages in the region of influence, the multiplier was applied to these values, and the annual totals were compared to the region of influence's total personal income for 2007. The results are shown in Table 4.4-9. As noted previously, these impacts could be slightly overstated because of possible growth in the region of influence's total personal income independent of Units 6 & 7, and impacts would vary if workers spent more or less than 50 percent of their wages within the region of influence. Operations worker wages would increase steadily through the construction period as new workers arrived onsite, and would represent an increase in the region of influence's total personal income ranging from zero in the first year (when no operations workers are present) to 0.027 percent in the final year of construction. Therefore, impacts to the region of influence's economy during the construction period would be positive and SMALL.

Impacts to the region of influence's economy during the 60-year operation of Units 6 & 7 are explained in Subsection 5.8.2.2.1.

4.4.2.2.1.3 Summary of Combined Impacts of Construction and Operations Workers

In all, construction and operations workers during the construction period would earn a total of more than $632 million over the estimated 9-year construction period (Table 4.4-10). Depending on the proportion of wages spent in the region of influence, the creation of the Units 6 & 7 jobs would inject between $113.8 million and $1.1 billion into the region of influence's economy during construction. Although large in absolute terms, because of the region of influence's large economy, this would be a SMALL and positive impact.

Annual impacts are conservatively estimated to range from $11.9 million in the first year, to a peak of $92.6 million in the sixth year, to $48.2 million in the final year of construction. As shown in Table 4.4-11, these wages and their multiplied impacts would increase total personal income in the region of influence by 0.06 percent in the first year, by 0.11 percent in the sixth year, and by 0.05 percent in the tenth year, when compared to the region of influence's total personal income in 2007. Impacts to the region of influence's economy would be positive and SMALL.

In addition, the injection of new income would create jobs in the region of influence's economy and create business opportunities for housing and service-related industries. While the magnitude of those impacts cannot be predicted at this time, it is assumed that impacts would be SMALL in the region of influence overall and could be SMALL to MODERATE in specific communities in the region of influence. All impacts would be positive.

4.4.2.2.1.4 End of Construction Period

It is estimated that after construction is complete, approximately 50 percent of the construction worker in-migrants would leave the region of influence. Operation workers would remain in the region of influence. The loss of construction jobs, population, wage income, and indirect jobs and income (from the multiplier effect), would be considered a negative and SMALL impact to the region of influence, and depending on the worker residence patterns, impacts could be SMALL to MODERATE in specific region of influence communities, such as Homestead or Florida City.

However, as Figure 3.10-1 indicates, the out-migration would occur gradually over the last few years of the construction phase, and the out-migration of construction workers would be partially offset by the incoming operations workers. The gradual nature of the decline in the construction workforce would assist in mitigating the impact to communities in the region of influence from the destabilizing effects of a sudden decrease in households.

Because it cannot be known with certainty where in the region of influence incoming workers would reside, it is not possible to gauge which communities in the region of influence would be most affected by the departing workforce and their families. In some locations where impacts could be MODERATE, mitigation may be warranted. To mitigate these impacts, FPL would maintain timely communication with municipal and county government authorities and

nongovernmental organizations to disseminate project information that could have socioeconomic impacts in the community. FPL would also provide timely information to the local media, enabling businesses and individuals to make informed decisions and economic choices.

Even before the construction worker influx, local agencies, organizations, businesses, and individuals could make planning decisions regarding economic choices with the understanding that much of the positive economic impact of the construction project would be temporary, and could disappear when the construction project is complete.

4.4.2.2.2 Taxes

Construction-related activities, purchases, and workforce expenditures would generate several types of taxes, including corporate income taxes, sales and use taxes, and property (also known as *ad valorem*) taxes. Increased tax collections are viewed as a benefit to the state of Florida, the region of influence, and communities in the region of influence.

In the *Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants* (NUREG-1437), the NRC presents its method for defining the impact significance of tax revenue impacts during refurbishment (i.e., large construction activities). Although these criteria are focused on property taxes, the impact ranges can also be applied to other types of taxes. This methodology was reviewed and it was determined that the significance levels were appropriate to apply to an assessment of tax impacts as a result of construction.

In the GEIS, the NRC concluded that changes in tax revenues at nuclear plants would be:

SMALL — When new tax payments by the nuclear plant constitute less than 10 percent of total revenues for local taxing jurisdictions. The additional revenues provided by direct and indirect plant payments on refurbishment-related improvements result in little or no change in local property tax rates and the provision of public services.

MODERATE — When new tax payments by the nuclear plant constitute 10–20 percent of total revenues for local taxing jurisdictions. The additional revenues provided by direct and indirect plant payments on refurbishment-related improvements result in lower property tax levies and increased services by local municipalities.

LARGE — When new tax payments by the nuclear plant represent more than 20 percent of total revenues for local taxing jurisdictions. Local property tax levies can be lowered substantially, the payment of debt for any substantial infrastructure improvements made in the past can easily be made, and future improvements can continue.

4.4.2.2.2.1 Personal and Corporate Income Taxes

As noted in Subsection 2.5.2.3, Florida has no personal income tax, but does levy a corporate income tax on corporations that conduct business in Florida. The tax liability is computed using federal taxable income, modified by certain Florida adjustments, to determine adjusted federal income. FPL currently pays Florida corporate income tax on power plants and other properties throughout the state, including existing Units 1, 2, 3, 4, and 5. In 2007, the state of Florida received $2.4 billion in corporate income tax revenues, and it is likely that the state's corporate income tax revenues could increase over the coming years as a result of business growth. Because of the many factors involved in computing the amount of total tax, it is not known at this time how much FPL's corporate income tax would increase during the construction period as a result of the construction of Units 6 & 7. However, during the last two years of construction, Unit 6 would be operational, and FPL would therefore pay corporate income tax on those revenues. For every $1 million of net taxable revenues from Unit 6 (taxed at 5.5 percent) during the construction period, FPL would pay $55,000 in corporate income tax, which would represent an increase of 0.002 percent over Florida's 2007 corporate income tax revenues (Table 4.4-12). This would be a SMALL and positive impact to the state's tax collections.

Local construction expenditures and purchases by the construction workforce[1] would have a multiplier effect on the local economy, where money would be spent and re-spent in the region of influence (Subsection 4.4.2). Because of this multiplier effect, region of influence businesses, particularly retail and service sector firms, could experience revenue increases, and there may be prospects for new startup firms to service the construction effort as well as workers and their families. Existing and new firms could generate additional profits, which would contribute to increased corporate income taxes, although the exact amount is unknown. Impacts would be positive, and SMALL, relative to overall state corporate income tax revenues.

4.4.2.2.2.2 Sales and Use Taxes

The state of Florida and Miami-Dade County would experience an increase in the amount of sales and use taxes collected. The additional taxes would be generated from construction expenditures for Units 6 & 7 and from retail purchases of goods and services by the construction workforce and visitors. As explained in Subsection 2.5.2.2.3, Florida imposes a 6 percent sales and use tax, and Miami-Dade County adds a 1 percent discretionary sales tax, bringing the total sales tax in the region of influence to 7 percent. Cities and towns in the region of influence do not levy local sales tax.

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1. As addressed in Subsection 4.4.2, the "construction workforce" includes both construction workers and operations workers who are onsite during the 9-year construction period.

Florida provides a 100 percent tax exemption for equipment and materials associated with the construction of power plant equipment and for pollution control equipment, leaving purchases of labor and services as the only taxable expenditures directly associated with construction activities. Therefore, FPL's expenditures for Units 6 & 7 for labor and services from Florida providers would be subject to the state's sales tax of 6 percent, and purchases from Miami-Dade County providers would also be subject to the 1 percent sales tax levied by the county. FPL estimates that labor and services will make up 34 percent of construction costs. Of this labor and services component, 33 percent would be purchased from out-of-state providers, and 67 percent would be purchased from Miami-Dade County providers. Therefore, 23 percent of the construction expenditures for Units 6 & 7 (67 percent x 34 percent = 22.78 percent, rounded to 23 percent) would generate sales tax (FPL Undated).

FPL's *Petition To Determine Need for Turkey Point Nuclear Units 6 & 7 Electrical Power Plant* was submitted to the Florida Public Service Commission on October 16, 2007 (FPL Oct 2007). In Appendix J of this petition, three construction cost scenarios were developed for the total costs over a 14-year construction period study.[1] The mid-cost estimate of $7.7 billion was used as the base case scenario, while the low cost scenario involved costs of $6.7 billion, and the high cost scenario, $9.8 billion (FPL Oct 2007).

To estimate the potential sales tax impacts to Miami-Dade County and Florida, the total cost figures for each scenario were multiplied by 23 percent to obtain the amounts subject to sales tax, and then multiplied by 1 percent and 6 percent, respectively, to calculate the tax revenues for Miami-Dade County and the state. That amount was then divided by 14 years to determine an average yearly amount, which in turn was taken as a percentage of the 2007 total sales tax revenues for each taxing entity. Table 4.4-13 shows the potential sales tax impacts to Miami-Dade County and Florida from the three scenarios. Because of their large economies, both entities have sizable sales tax revenues. Therefore, while the absolute amount of FPL's sales tax payments on Units 6 & 7 would be large, the payments would represent small increases over 2007 revenues, ranging from 1.9 to 2.8 percent for Miami-Dade County and 0.03 percent to 0.04 percent for Florida, a SMALL and positive impact. Note that although this methodology uses a yearly average to estimate the tax impacts, it is highly improbable that expenditures would be evenly distributed during the 14-year period. In fact, if a sufficient proportion of the expenditures occurred within 1 year, it is possible that impacts to Miami-Dade County could be MODERATE in that year. Table 4.4-14 shows that for 2007, taxable purchases exceeding $575,040,000 would yield sales tax payments that would increase Miami-Dade County's sales tax revenues by more than 10 percent. However, Miami-Dade County's tax revenues are likely to increase over the

1. In this report, FPL defined the construction period as 14 years, from the initiation of licensing activities to completion of Unit 7.

construction period, and a corresponding increase in FPL's taxable purchases would be required to exceed the 10 percent threshold.

As explained in Subsection 2.5.2.3, workers and visitors would pay Florida sales or use tax on items purchased in the state (or purchased elsewhere but subject to state use tax), regardless of whether the purchase was made in the region of influence. They would also pay Miami-Dade County sales or use tax on purchases in the county or subject to county taxation. In absolute terms, the amount of state sales and use taxes collected from workers during the construction period could be sizable, but would provide a SMALL and positive impact when compared to the total amount of taxes collected by Miami-Dade County and Florida.

Because Homestead, Florida City, and other cities in the region of influence do not impose a local sales tax, they would not experience direct sales tax impacts as a result of the construction of Units 6 & 7. However, they could benefit indirectly from Florida's and Miami-Dade County's increased sales tax revenues if those revenues allowed more services to be provided in their communities. Impacts would be SMALL and positive.

4.4.2.2.2.3 Other Sales and Use-Related Taxes

Units 6 & 7 workers who reside in the state would also be subject to the state's communications services tax on phone, cable, cellular phone, and related services, and the documentary sales tax on deeds and other types of legal documents (Subsection 2.5.2.3.3). Conservatively assuming that workers and their families migrating into the region of influence would come from out of state, the in-migrating workers and their families would represent an increase of only 0.03 percent over Florida's 2000 population (Table 4.4-15). Therefore, impacts to Florida's tax revenues for the communications services tax and the documentary sales tax would be SMALL but positive.

4.4.2.2.2.4 Property Taxes — County and Special Districts

In 2007, as stated in Subsection 2.5.2.3.4, FPL paid personal property taxes totaling $4.4 million to Miami-Dade County, representing 0.57 percent of the county's property tax revenues (Table 2.5-19). FPL also paid tangible personal property taxes to four special taxing districts: the Florida Inland Navigation District, the South Florida Water Management District, the Everglades Construction Project, and the Children's Trust Authority (Table 2.5-20).

According to FPL's *Economic Impact Analysis*, ad valorem (property) tax is based on the undepreciated book value of the plant through its life, with exemptions for pollution control equipment (FPL Undated). The assessed value of Units 6 & 7 during construction is not known at this time, and the projected amount of tax payments to the various taxing districts cannot be estimated. However, as Table 4.4-16 shows, FPL's payments to these jurisdictions in 2007 represented well under 1.0 percent of each district's total revenues, because of the region of

influence's large tax base. Although property tax payments could increase during the construction of Units 6 & 7, the increases would constitute SMALL and positive impacts to each district.

To the extent that new homes were constructed or property values rose, the in-migrating construction period workers and their families could also increase property tax revenues in the jurisdictions where they choose to reside. As Table 4.4-15 shows, if incoming worker families were to reside in Miami-Dade County, they would represent an increase of 0.2 percent over Miami-Dade County's 2000 population. These increases would have a positive and SMALL impact on property tax revenues in Miami-Dade County.

If 43 percent of in-migrants would choose to reside in the Homestead and Florida City area, in accordance with the residence patterns of current Turkey Point workers, incoming workers and families would make up approximately 5 percent of the 2000 population of the Homestead and Florida City area. These in-migrating worker families would contribute property taxes to the counties and special districts where they reside.[1] It is unlikely that the percentage of tax revenue increase in Homestead or Florida City would be as much as the potential population increase associated with the construction of Units 6 & 7, because much of any jurisdiction's tax base consists of higher-valued industrial or commercial property rather than residential. Therefore, the property tax impacts from new residents would be positive and could be SMALL to MODERATE.

4.4.2.2.2.5 Property Taxes — Independent School District

As stated in Subsection 2.5.2.3, property taxes for Turkey Point are paid to the Miami-Dade County tax collector for the Miami-Dade School district (Tables 2.5-19 and 2.5-20). As shown in Table 4.4-16, FPL's current payments to this district represented 0.07 percent of the district's total revenues in 2007. The amount of property taxes that would be assessed on Units 6 & 7 during construction could increase, but the amount is unknown at this time. However, because of the district's large tax base, FPL's payments for Units 6 & 7 would likely represent a SMALL and positive impact.

In-migrating workers who purchase homes in Miami-Dade County would also pay property taxes to the Miami-Dade County tax collector for the Miami-Dade School district, resulting in positive but SMALL impacts to the school district's revenues.

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1. Even workers who occupy rented housing or lodging contribute indirectly to the property tax payments by the property owner, although in this case, the tax base would not increase unless assessed valuations rose.

4.4.2.2.2.6 Summary of Tax Impacts

The overall potential beneficial impacts of taxes collected during the construction of Units 6 & 7 would be positive and SMALL in the region of influence and the state of Florida. Property tax impacts in smaller entities in the region of influence, such as Homestead or Florida City, could be SMALL to MODERATE and positive, and would thus require no mitigation.

4.4.2.2.3 Land Use

In the GEIS, the NRC provides the methodology for defining the impact significance of land use during refurbishment (i.e., large construction activities).

In the GEIS, the NRC concluded that land use changes during refurbishment at nuclear plants would be:

SMALL — If population growth results in very little new residential or commercial development compared with existing conditions and if the limited development results only in minimal changes in the area's basic land use pattern.

MODERATE — If plant-related population growth results in considerable new residential and commercial development and the development results in some changes to an area's basic land use pattern.

LARGE — If population growth results in large-scale new residential or commercial development and the development results in major changes in an area's basic land-use pattern.

Further, the NRC defined the magnitude of population changes as follows:

SMALL — If plant-related population growth is less than 5 percent of the study area's total population, especially if the study area has established patterns of residential and commercial development, a population density of at least 60 people per square mile, and at least one urban area with a population of 100,000 or more within 50 miles.

MODERATE — If plant-related growth is between 5–20 percent of the study area's total population, especially if the study area has established patterns of residential and commercial development, a population density of 30 to 60 people per square mile, and one urban area within 50 miles.

LARGE — If plant-related population growth is greater than 20 percent of the area's total population and density is less than 30 people per square mile.

This methodology was reviewed and it was determined that the significance levels were appropriate to apply to an assessment of land use impacts as a result of new construction.

Miami-Dade County is the focus of the land use analysis because the new units would be built in Miami-Dade County and it was assumed that the workforce during construction would reside in the county. Impacts to land use would be confined to Miami-Dade County.

4.4.2.2.3.1 Land Use

All or parts of four Florida counties are within 50 miles of the Turkey Point plant property: Broward, Collier, Miami-Dade, and Monroe. The 50-mile radius encompasses over 3168 square miles. However, impacts to land would be confined to the region of influence, Miami-Dade County. As explained in Subsection 2.2.3, most of the land use and land cover in the 50-mile region consist of wetlands (69.1 percent) and urban or built-up area (17.5 percent) (Figure 2.2-3).

As addressed in Subsection 2.5.2.4, Miami-Dade County and the municipalities of Homestead and Florida City use comprehensive land use planning to guide residential and commercial development. There are 35 incorporated cities in Miami-Dade County. Only two of the 35 incorporated communities are within 10 miles of the plant property, Homestead and Florida City.

From the land use perspective, Miami-Dade County and the Homestead and Florida City area are likely to continue to urbanize as the projected population increases. The population-related increases (4731 people) associated with the construction of Units 6 & 7 would create an increase in commercial and residential activity. If the population influx results in new construction, both the region of influence and the Homestead and Florida City area have some undeveloped land currently zoned for residential and commercial uses (Subsection 2.5.2.4). The present housing inventory in Miami-Dade County and in the Homestead and Florida City area can support the in-migrating workers and their families without the addition of new housing units (Subsection 4.4.2.2.6). Miami-Dade County had 124,237 total vacant housing units in 2006. The Homestead and Florida City area had 1361 vacant units in 2000. Because both the region of influence in general, and the Homestead and Florida City area in particular, have well-established residential and commercial districts, little land use conversion, from undeveloped to residential or commercial use, or residential to commercial, would be expected from the construction-related population increase in the area. Any conversion that did occur would be in the areas that are already well-defined and identified in the applicable comprehensive land use plans.

Using the NRC's GEIS guidance, it is concluded that impacts to land use as a result of Turkey Point-related population increases that would cause land use conversions in Miami-Dade County would be SMALL because the population influx would result in very little new residential or commercial development compared with existing conditions and because there would be minimal changes in the area's basic land use pattern.

4.4.2.2.3.2 Construction-Related Population Growth

The 2000 population of Miami-Dade County was 2,253,362 people, with a population density of 1158 people per square mile (USCB 2008a). The projected 2008 population for the region of influence, Miami-Dade County, is 2,398,245 people (USCB 2009) which would result in a higher population per square mile than in 2000. The 2000 population of the Homestead and Florida City area was 39,752 people and the area had a population density of 2196 people per square mile (USCB 2000a). The projected population for the area in 2007 is 66,202 people (USCB 2008b). As a point of reference, the population per square mile in the USA is 79.6 people per square mile (USCB 2008c), approximately 1/15th (6.66 percent) of the density of the region of influence.

Units 6 & 7 construction-related growth in Miami-Dade County would consist of 4568 construction workers and family members along with 163 operations workers and family members, for a total of 4731 in-migrants (Subsection 4.4.2.1), which equates to 0.2 percent of the 2000 population and an even smaller percentage of the projected 2008 population. Assuming that 43 percent of the in-migrating workers and families would settle in the Homestead and Florida City area, the increase in population would represent 5.1 percent of the total 2000 population and 3.1 percent of the projected 2007 population.

Using the GEIS guidance, land use impacts attributed to construction workforce population growth in Miami-Dade County would be SMALL because the county has established patterns of residential and commercial development, there is a population density of at least 60 people per square mile, and there is at least one urban area with a population of 100,000 people or more within 50 miles. The Homestead and Florida City area meets the NRC criteria for a SMALL land use impact because the population increase is 5.1 percent of the 2000 population, but 3.1 percent of the 2007 projected population. The area also has a population density greater than 60 people per square mile, has established patterns of residential and commercial development, and has at least one urban area with a population of 100,000 people or more within 50 miles.

4.4.2.2.3.3 Conclusion

Overall, impacts to land use in the region of influence, Miami-Dade County in general, and in the Homestead and Florida City area in particular, would be SMALL. There would be very little new residential or commercial development and basic land use patterns would remain in place. Existing comprehensive plans would guide development of new residential construction. Population increases would represent less than 5 percent of the 2007 population base and not meaningfully alter land use densities or use.

Therefore, overall land use impacts would be SMALL. To mitigate these impacts, FPL would maintain communication with local and regional governmental and nongovernmental organizations, including but not limited to the Department of Planning and Zoning and

Department of Community and Economic Development, to disseminate project information in a timely manner. This would allow these organizations to be given the opportunity to plan accordingly.

4.4.2.2.4 Transportation

The Units 6 & 7 construction activities were assessed for impacts on transportation infrastructure and traffic from deliveries of fill and construction material and the commuting workers to Turkey Point. The assessment, explained below in Subsection 4.4.2.2.4.1, focused on roadways; however, some large components and modules would arrive by barge. The description in Subsection 4.4.2.2.4.2 focuses on the portions of the likely commuting routes outside of the urban areas and off the freeways where the impact would be most noticeable. Other descriptions below address the potential increase in traffic from the in-migrating population in the Homestead and Florida City area and impacts to public transportation and evacuation routes.

4.4.2.2.4.1 Deliveries of Construction Materials to the Turkey Point Plant Property

Construction materials would arrive at the Turkey Point plant property by truck and barge. Fill materials would be trucked in from nearby borrow areas and construction materials would arrive primarily by truck. Large components and modules would arrive by barge (Subsection 2.5.2.2). Approximately 80 barge trips for large components and modules are estimated for each unit (Subsection 3.9.1.2). Materials arriving by barge would be trucked over an onsite heavy haul road to the Units 6 & 7 plant area. There is no rail access to the plant property. As stated in Section 3.9, a new entrance to the plant property would be constructed for truck deliveries and construction workers. The new entrance and access road is estimated to be completed by December 2014. Prior to this date, construction traffic would use the existing entrance and access road, SW 344th Street/Palm Drive.

The new entrance would be SW 359th Street. The existing SW 359th Street and the existing service road at the northern end of the industrial wastewater facility would be joined by a new road segment, and improved to handle the construction traffic.

The SW 359th Street improvements would extend from the Turkey Point plant property westward to connect with two road improvements that would connect the new entrance to SW 344th Street/ Palm Drive. The road improvements would include portions of SW 137th Avenue/Tallahassee Road and SW 117th Avenue. In addition, existing roadways would be widened and turn lanes and signals added.

Fill material would be transported to the plant property. The number of fill shipments is estimated to be 36 per hour. The potential fill sources are to the northwest and southwest of the plant property. For fill sources to the northwest, the shipping route would be south on SW 117th Avenue to SW 359th Street and then east to the new entrance into Turkey Point. For fill sources

to the southwest, the shipping route would be north on Card Sound Road to U.S. Highway 1 east on SW 344th Street/Palm Drive south on SW 137th Avenue/Tallahassee Road to SW 359th Street. For this analysis, half of the fill shipments were assumed to originate to the northwest and half to the southwest. With the trucks divided equally between the two routes, the number of trucks per hour on each of the routes is 18, each making a round trip.

Construction materials, such as aggregate to supply the concrete batch plant, steel, piping, and cable, would arrive at the plant property by truck. The total number of shipments is estimated at approximately 20,000 for the preconstruction period through the 9-year construction period. However, the shipments would not be evenly distributed throughout this time period. The shipment routes would converge in Florida City from the north, likely via U.S. Highway 1, Florida's Turnpike, or SR 997. Trucks using Florida's Turnpike would exit onto U.S. Highway 1. Then trucks would continue south on U.S. Highway 1 or SR 997 to their connection with SW 344th Street/Palm Drive, then east to the new road extension at SW 137th Avenue, south on this new road to its connection with SW 359th Street, then east on SW 359th Street to Turkey Point, where the road would continue to the construction areas.

Table 2.5-17 presents the traffic volumes at the monitoring stations along U.S. Highway 1, Florida's Turnpike, and SR 997 in the Homestead and Florida City area. The average annual daily traffic counts on U.S. Highway 1 and Florida's Turnpike are more than 27,000 vehicles and SR 997s range from 17,600 in Homestead to 8800 south of Florida City just before it intersects with U.S. Highway 1. The available traffic capacity for the segment of SW 344th Street/Palm Drive that would be used by the delivery vehicles is nearly 2800 vehicles (Table 2.5-16). It is not possible to forecast trucks per hour to quantify impacts; however, if the shipments were compressed to approximately one-half of the time frame (5 years) and evenly distributed over the weekdays, 20,000 shipments would represent 15 truck deliveries per day. These traffic counts indicate that the roads likely to be used for shipments are currently heavily used, so the addition of several trucks per day would likely not be noticeable.

4.4.2.2.4.2 Workers Commuting to the Turkey Point Plant Property

The peak workforce that would be commuting to Units 6 & 7 would be 3647. This number of workers represents the peak construction workforce (3548) and the operations workers already onsite by that time (99), month 29 of the construction period (Subsection 3.10). Workers are assumed to singly commute to the plant property in private vehicles. The workforce would be divided into two shifts with 70 percent assigned to shift 1 (6:00 a.m. to 4:30 p.m.). The peak arrival commuting hour would be 5:00 a.m. to 6:00 a.m. and the peak departing commuting hour would be 4:30 p.m. to 5:30 p.m. Shift 2 (5:00 p.m. to 3:00 a.m.) would be composed of 30 percent of the workforce with the peak arriving commute hour being 4:00 p.m. to 5:00 p.m. It was assumed that workers' arrivals and departures would be evenly spread during the peak commuting hour, so even with an overlap during the afternoon commute of Shifts 1 and 2

workforce, the number of employees commuting at any one hour would be 70 percent, 2553 workers.

Workers would commute from directional sectors in the region of influence and converge in the Homestead and Florida City area to finalize the commute to Turkey Point. For those commuters who do not originate in the Homestead and Florida City area, U.S. Highway 1, SR 997, or Florida's Turnpike would be the likely routes used to reach the Homestead and Florida City area. Once in the Homestead and Florida City area, workers could take various routes to reach the plant property. These routes were projected based on existing traffic patterns associated with the current workforce. The results of this projection indicate that workers would travel on (1) SW 137th Avenue/Tallahassee Road (56 percent), (2) SW 328th Street/N. Canal Drive (6 percent), and (3) SW 344th Street/Palm Drive (38 percent) to reach the vicinity of the plant property (Figure 2.5-8). The workers traveling on SW 137th Avenue/Tallahassee Road would either continue on this road to its intersection with SW 344th Street/Palm Drive (6 percent of total) or turn onto SW 328th Street/N. Canal Drive to join those workers already traveling on SW 328th Street/N. Canal Drive. From SW 328th Street/N. Canal Drive, workers would turn south onto SW 117th Avenue. The impacts of the commuting workers are assessed on these roadways based on the following number of vehicles:

- SW 137th Avenue/Tallahassee Road north of SW 328th Street/N. Canal Drive,
  2553 x 56% = 1430

- SW 328th Street/N. Canal Drive west of SW 137th Avenue/Tallahassee Road,
  2553 x 6% = 153

- SW 328th Street/N. Canal Drive east of SW 137th Avenue/Tallahassee Road,
  2553 x 56% = 1430

- SW 344th Street/Palm Drive west of SW 137th Avenue/Tallahassee Road,
  2553 x 38% = 970

Before SW 359th Street is available, once workers reach SW 344th Street/Palm Drive, they would travel east of this roadway to the plan property entrance. Once the new entrance and access road are available, workers traveling on SW 117th Avenue would continue past SW 344th Street/Palm Drive on the new road extension of SW 117th Avenue to its terminus at SW 359th Street, then east on SW 359th Street to the new entrance. Workers traveling on SW 344th Street/ Palm Drive from Florida City are assumed to transfer to SW 137th Avenue/Tallahassee Road at its new extension rather than the SW 117th Avenue extension to minimize traffic, and then turn east at SW 359th Street and continue to the new entrance. Traffic counts for these roads are not available with the exceptions of SW 328th Street/N. Canal Drive and SW 344th Street/Palm Drive, both west of SW 137th Avenue/Tallahassee Road. Therefore, an estimate of the traffic on

other road segments at the peak hour of commuting was developed from the commuting characteristics of the existing site workforce (see descriptions below). Because of the proximity to the plant property, this workforce would have the greatest influence on peak hour traffic.

4.4.2.2.4.3 Existing Site Workforce Traffic

To characterize the existing traffic accessing the plant property, traffic counts were conducted at the entrance gate from March 27 through April 2, 2007. The counts indicate that current employees generally commute to the plant property as one person per vehicle, and that the peak hour of commuting is 6:00 a.m. to 7:00 a.m. Thus, the peak hour of commuting for the existing units and the Units 6 & 7 workforce would not overlap. However, about 200 employees arrived during the 5:00 a.m. to 6:00 a.m. hour with the maximum weekday peak hourly traffic volume being 228 vehicles in the inbound lane. Using the commuting routes as described above, 56 percent of workers travel on SW 328th Street/N. Canal Drive to SW 117th Avenue, then south to SW 344th Street/Palm Drive. The traffic counts were apportioned to be:

- SW 328th Street/N. Canal Drive to SW 117th Avenue — 228 x 56 percent = 128
- SW 344th Street/Palm Drive west of SW 117th Avenue — 228 x 44 percent = 100

4.4.2.2.4.4 Impacts to Existing Roadways

The impact on the existing roadways from shipments of construction materials, fill, and the commuting workers was accessed for five road segments:

- SW 344th Street/Palm Drive west of SW 137th Avenue/Tallahassee Road
- SW 344th Street/Palm Drive east of SW 137th Avenue/Tallahassee Road before second entrance is available
- SW 328th Street/N. Canal Drive west of SW 137th Avenue/Tallahassee Road
- SW 328th Street/N. Canal Drive east of SW 137th Avenue/Tallahassee Road with improvements
- SW 117th Avenue from SW 328th Street/N. Canal Drive to SW 344th Street/Palm Drive

Impacts are based on the effect that the increased traffic would have on the ability of drivers to maneuver and traffic flow. In the GEIS, the NRC took this approach to assigning impacts with regard to refurbishment activities at nuclear plants and this same approach is appropriate for this evaluation because both refurbishment and construction of Units 6 & 7 are large construction projects. The ability to maneuver and traffic flow conditions is called the roadway's Level of

Service (LOS), which is designated as A through F. Movement on roads with an LOS A is described as free-flowing at or above the posted speed limit. LOS B may limit lane changes, but does not reduce speed. LOS C and D are progressively more congested. LOS E provides marginal service. LOS F is considered as exceeding capacity. The NRC associates small impacts with LOS A and B, moderate impacts with LOS C and D, and large impacts with LOS E and F.

SW 344th Street/Palm Drive west of SW 137th Avenue/Tallahassee Road: This roadway would be used by the existing and new workforce and for the delivery of construction materials and fill. However, the fill deliveries would be completed before the occurrence of the peak new workforce so they are not accounted for in this explanation. This road segment is monitored by Miami-Dade County and traffic counts would already account for the existing workforce. The additional traffic would be 970 commuting vehicles and two truck deliveries. As identified in Table 2.5-17, this road segment has an available capacity of nearly 2800 vehicles and the peak hour traffic is 231, which corresponds with LOS A for a four-lane divided highway in an urban area. The additional traffic would decrease the LOS on this road segment to LOS B.

SW 344th Street/Palm Drive east of SW 137th Avenue/Tallahassee Road before new entrance is available: The peak workforce that would use the existing entrance is estimated at 2066, the employment estimated for month –1 (Table 3.10-2) when the road would be available for use. The existing entrance would also be used for delivering construction materials and fill at this time. Using the assumptions regarding shifts and no carpooling, the peak hour would experience 1446 vehicles (2066 x 70%), 18 fill trucks before the intersection with SW 117th Avenue where an additional 18 fill trucks would turn onto SW 344th Street/Palm Drive, approximately 2 vehicles delivering construction materials, 100 existing workforce vehicles estimated to commute during the peak hour (5:00 a.m. to 6:00 a.m.), and approximately 128 existing workforce vehicles joining at the intersection with SW 117th Avenue, for a total of approximately 1712 vehicles. SW 344th Street/Palm Drive's peak hour directional capacity is 1400 vehicles as a rural two-lane undivided road (FDOT 2007). Therefore, the traffic volume would exceed capacity.

SW 328th Street/N. Canal Drive west of SW 137th Avenue/Tallahassee Road: This road segment would be used by the existing and new workforce. As identified in Table 2.5-17, this road segment is monitored by Miami-Dade County and has an available capacity of 2346 vehicles and the peak hour traffic is 254, which corresponds in LOS C for a rural two-lane highway. The additional traffic from the new workforce of 153 vehicles would not change the LOS.

SW 328th Street/N. Canal Drive east of SW 137th Avenue/Tallahassee Road with improvements: Existing and new workers would travel on SW 328th Street/N. Canal Drive to SW 117th Avenue. Traffic would include plant-related vehicles as well as traffic traveling to Biscayne Bay National Park and Homestead Bayfront Park. However, the visitors to these parks

would be on the road segment throughout the day and would not be expected to add more than an occasional vehicle during the weekday peak hour (5:00 a.m. to 6:00 a.m.) Therefore, the peak hour estimate only accounts for plant-related traffic from the Units 6 & 7 and existing workforces of 1558 vehicles (1430 new and 128 existing). SW 328th Street/N. Canal Drive would be widened to four lanes (two in each direction) and signals and turn lanes would be added. These improvements would raise the peak hour directional capacity to approximately 2700 vehicles for LOS D, Miami-Dade County's planning threshold capacity. With the road improvements, the peak hourly traffic would be within capacity and correspond with LOS C.

SW 117th Avenue from SW 328th Street/N. Canal Drive to SW 344th Street/Palm Drive: This same 56 percent of the workforce would also travel on SW 117th Avenue to reach SW 359th Street. On the road segment from SW 328th Street/N. Canal Drive to SW 344th Street/ Palm Drive, the Units 6 & 7 workers would add traffic to the existing workforce traffic. SW 117th Avenue would also be widened to four lanes (two in each direction) and signals and turn lanes would be added, increasing its capacity to that of the improved SW 328th Street/N. Canal Drive. The combined total traffic of the two workforces would be the same as presented above for SW 328th Street/N. Canal Drive. SW 117th Avenue is bordered by agricultural land, so travelers on the road would primarily be using it to reach other designations; therefore, little local traffic would be expected. The impact to SW 117th Avenue would be the same as for SW 328th Street/N. Canal Drive.

Traffic associated with the Homestead Miami Speedway during one of its major events could further impact traffic on the same routes traveled by Turkey Point workers. However, the peak hours for commuting and visitors arriving at the speedway would not overlap and contra-flow lanes and a detailed traffic management plan are used during major events at the speedway.

Using the NRC significance levels associated with the estimated LOS for the roadways, the impacts would be SMALL to MODERATE during peak construction. SW 344th Street/Palm Drive west on SW 137th Avenue/Tallahassee Road would experience SMALL impacts and workers traveling on and SW 328th Street/N. Canal Drive would experience SMALL impacts that would increase to MODERATE when workers traveling on SW 137th Avenue/Tallahassee Road would converge into the traffic flow. MODERATE impacts would also be experienced on SW 117th Avenue. A LARGE impact would be temporarily experienced on SW 344th Street/Palm Drive during the last few months before the new entrance is available.

4.4.2.2.4.5 New Access Road, Road Extensions, and Improvements to Existing Roads

A new access road would be constructed from SW 359th Street which would be connected to SW 344th Street/Palm Drive by improving SW 137th Avenue/Tallahassee Road and SW 117th Avenue. In addition, existing road segments of SW 328th Street/N. Canal Drive, SW 117th Avenue, and SW 344th Street/Palm Drive would be widened. Figure 3.9-1 shows the roadway

improvements. The estimated traffic during the peak hours of commuting (both morning and afternoon) would not exceed 1100 vehicles per lane, which is the capacity associated with a rural roadway at LOS D, the Miami-Dade County planning capacity limit. The details of these road improvements include:

Improved SW 137th Avenue/Tallahassee Road (SW 344th Street/Palm Drive to SW 359th Street)

- Three lanes (two southbound and one northbound)

Improved SW 359th Street (SW 137th Avenue/Tallahassee Road to SW 117th Avenue)

- Three lanes (two eastbound and one westbound)

SW 137th Avenue/Tallahassee Road at SW 359th Street — New Curve

- Construct a curve linking SW 137th Avenue/Tallahassee Road with SW 359th Street. This curve would be designed so that it integrates appropriately with the existing FPL transmission lines

Improved SW 117th Avenue (SW 344th Street/Palm Drive to SW 359th Street)

- Four lanes (two northbound and two southbound)

Improved SW 359th Street (SW 117th Avenue to Turkey Point plant property)

- Four lanes (two eastbound and two westbound)

SW 359th Street and SW 117th Avenue — New Intersection

- Signalization or police control
- Construct two eastbound approach lanes (prohibit eastbound left-turns)
- Construct one westbound through lane
- Construct one westbound right-turn lane
- Construct two southbound approach lanes (one striped as an exclusive left-turn lane and the other as a shared left-turn/right-turn lane)

SW 328th Street/N. Canal Drive (SW 137th Avenue/Tallahassee Road to SW 117th Avenue)

- Widen from two to four lanes

SW 328th Street/N. Canal Drive and SW 137th Avenue/Tallahassee Road

- Signalization or police control
- Construct one additional southbound left-turn lane
- Construct one additional westbound through lane
- Construct two westbound right-turn lanes

SW 328th Street/N. Canal Drive and SW 117th Avenue

- Signalization or police control
- Construct two northbound left-turn lanes
- Construct one eastbound right-turn lane
- Restripe the eastbound through lane to a shared through/right-turn lane

SW 117th Avenue (SW 328th Street/N. Canal Drive to SW 344th Street/Palm Drive)

- Widen from two to four lanes

SW 344th Street/Palm Drive (SW 137th Avenue/Tallahassee Road West to SW 137th Avenue/ Tallahassee Road (East))

- Widen from two to four lanes

SW 344th Street/Palm Drive and SW 137th Avenue/Tallahassee Road (West)

- Signalization or police control (p.m. peak hour only)
- Construct one separate eastbound through lane
- Construct one additional westbound left-turn lane

SW 344th Street/Palm Drive and SW 137th Avenue/Tallahassee Road (East) — New Intersection

- Signalization or police control (p.m. peak hour only)
- Construct two eastbound right-turn lanes

- Construct two northbound approach lanes (one striped as an exclusive left-turn lane and the other as a shared left-turn/right-turn lane)

SW 344th Street/Palm Drive and SW 117th Avenue

- Signalization or police control
- Construct one eastbound left-turn lane
- Construct one eastbound right-turn lane
- Construct one westbound right-turn lane
- Construct one northbound left-turn lane
- Construct two northbound through lanes (outside lane will function as a shared through/right-turn lane)
- Construct one southbound left-turn lane
- Construct one southbound through lane (outside lane will function as a shared through/right-turn lane)

4.4.2.2.4.6 Refueling Outage

The first refueling outage for Unit 6 would be at approximately month 73, when 900 construction workers working on Unit 7 and 806 operations workers (operating Unit 6 and in training for Unit 7) are estimated to be onsite. The number of refueling outage workers for Unit 6 would be 600. The number of workers commuting to the plant property (900 + 806 + 600 = 2306 <3647) would be less than the peak number of workers described above. Therefore, the impacts experienced during this first Unit 6 refueling outage would be bounded by peak construction period impacts.

4.4.2.2.4.7 Roads in the Homestead and Florida City Area

The adult population increase of 1334 in the Homestead and Florida City area as a result of the in-migrating workers (553 workers + 553 adults accompanying the workers + 228 workers without families, see Subsection 4.4.2.1) and their families (assuming that each worker accompanied by their family would have one adult in addition to the worker) would add traffic to the roadways in the Homestead and Florida City area. The roads in the Homestead and Florida City area are heavily traveled as evidenced by the traffic counts presented in Table 2.5-16. The additional trips by the construction-related population would be dispersed on these roads as well as the remaining road system in this urban area. Florida City has 36 road-miles in the Florida Department of Transportation System and Homestead has 139 road-miles (FDOT 2008).

Therefore, the impacts to the transportation infrastructure in this area as a result of the increase in population associated with construction of Units 6 & 7 (excluding the commuting impact explained above) would be SMALL.

4.4.2.2.4.8 Roads in Miami-Dade County (Region of Influence)

As stated in Subsection 2.5.2.2, Miami-Dade County has a well-developed road and transportation infrastructure. The adult population increase of 3116 as a result of the in-migrating population in the region of influence (1292 workers + 1292 adults accompanying the workers + 532 workers without families) would add traffic to the roadways in the area; however, the roads in this urbanized area are heavily traveled and the additional trips by the construction-related population would be widely dispersed. The impact to the region of influence's road infrastructure would be SMALL and not warrant mitigation.

4.4.2.2.4.9 Region of Influence Public Transportation

Miami-Dade County operates public transportation services including rail, express bus, and buses that have multiple stops (Subsection 2.5.2.2.2), with a daily ridership of 300,000 (MDC 2008). The population increase of 4731 in Miami-Dade County (Subsection 4.4.2.1) as a result of the in-migrating workers and their families could increase public transportation use in the county, but even if every new member of the population used public transportation daily, the increase in ridership would only be 1.6 percent (4731/300,000 = 0.016 x 100 = 1.6 percent). Therefore, there would be no noticeable impacts to public transportation in the region of influence.

4.4.2.2.4.10 Evacuation Routes

The evacuation routes for hurricanes and other storms for Miami-Dade County in the Florida City and Homestead area are shown in Figure 2.5-8. The additional traffic volume would be most noticeable in the vicinity of the Turkey Point plant property and in the Homestead and Florida City area because of the cities' proximity to the plant properly. The need for construction workers at Units 6 & 7 to evacuate as well as family members residing in the Homestead and Florida City area would result in an increase in traffic in the area. The peak number of additional vehicles is estimated at 2553 commuter vehicles plus one vehicle for each worker family assumed to in-migrate to the Homestead and Florida City area, 553 vehicles, for a total of 3106 maximum additional vehicles. Staggered departure times and contra-flow on major roadways are commonly used during evacuations to alleviate traffic congestion.

4.4.2.2.4.11 Summary

Constructing Units 6 & 7 would involve transportation by roadway and by barge. Roadways would be used by commuting workers as well as transportation of construction materials. Barge

transport would be used for large components and modules with the estimated number of barge trips being approximately 80 per unit. A new access road and road extension to connect the new road to existing roadways would be constructed to accommodate the peak construction traffic. In addition, existing road segments would be widened and signals and turn lanes added to accommodate the peak construction traffic. Roadways in the vicinity of the plant property would experience SMALL to MODERATE impacts during peak construction. For a few months before the completion of the new access road, LARGE impacts could occur on the current access road, SW 344th Street/Palm Drive. The traffic impacts would diminish with distance from the plant property as the traffic gets distributed over the extensive network of roadways. Impacts to traffic at the Homestead and Florida City area and Miami-Dade County levels would be SMALL.

4.4.2.2.5 Aesthetics and Recreation

This subsection describes the aesthetics and use impacts on recreation opportunities of the construction activities for Units 6 & 7 and its associated facilities in the 6-mile vicinity and 50-mile region. Subsection 2.5.2.5.2 presents basic information on recreation in the vicinity and 50-mile region. Section 3.9 describes the construction activities that could cause aesthetic impacts and environmental protection procedures to address the impacts. Subsection 4.4.1.3 analyzes the aesthetic impacts of the construction of Units 6 & 7 and associated facilities.

As stated in Subsection 4.1.1.2, the major land uses within 6 miles are undeveloped and protected wetland and forestland. The topography of the region and the Turkey Point plant property is relatively flat. Construction facilities would include parking areas, laydown and fabrication areas, offices, warehouses, workshops, a concrete batch plant, and cranes. The cranes used during construction could reach a height of approximately 460 feet.

4.4.2.2.5.1 Aesthetic Impacts to Recreation

Aesthetic impacts can be visual, auditory, and/or tactile (vibratory, etc.). With respect to aesthetic impacts to recreation, these impacts can be experienced by humans directly (e.g., visually) and/or indirectly by affecting the flora and fauna used by humans in the pursuit of recreation (e.g., frightening animals from viewing stations).

Changes to the viewscape that would result from construction of the new power block structures, elevation gradient changes, and land cover changes, could be seen from 10 miles because the area is relatively flat. However, trees and vegetation to the west and north screen the view.

People boating on Biscayne Bay are accustomed to seeing the structures of Units 1 through 5. The construction cranes and additional structures associated with Units 6 & 7 would not appreciably alter the plant's appearance as viewed from Biscayne Bay. People using Biscayne Bay could hear the onsite construction activities. Individuals in recreational facilities

that are not adjacent to the Turkey Point plant property would be unable to distinguish the noise from construction of Units 6 & 7 from urban and traffic noise.

The private and public recreational facilities and opportunities within 6 miles are Biscayne National Park, Homestead Bayfront Park, Mangrove Preserve, and Homestead Miami Speedway. Therefore, these are the recreational opportunities that are analyzed for aesthetic impacts to recreation.

Property boundaries of Biscayne National Park and Homestead Bayfront Park are within 1 mile of the Turkey Point plant property along the western shore of Biscayne Bay. Recreational users would be able to see the cranes and taller structures on the Units 6 & 7 plant area; however, recreational users are accustomed to seeing Units 1 through 5. Recreational users may hear the onsite construction activities, but they would not experience tactile impacts. Although recreational users would be able to see and hear temporary construction activities, aesthetic impacts to this resource would be SMALL and would not warrant mitigation.

Only a small portion of the Mangrove Preserve is within 6 miles of the Turkey Point plant property. There are three types of mangroves: red, black, and white with tree heights ranging from 20–50 feet (Law and Arny Undated). Recreational users of the preserve would not be able to see the construction activities at the Units 6 & 7 plant area through the mangroves. With only a portion of the preserve approximately 6 miles from the power blocks, recreational users would experience no auditory or tactile impacts. Therefore, aesthetic impacts to this resource would be SMALL and would not warrant mitigation.

As stated in Subsection 2.5.2.5.2, Homestead Miami Speedway is a privately owned auto-racing track approximately 5 miles northwest of the Units 6 & 7 plant area. Subsection 4.4.2.2.4 addresses the potential transportation impacts for Homestead Miami Speedway from Units 6 & 7 traffic, which could affect recreational users of the speedway. Spectators may be able to see the construction cranes; however, they are accustomed to seeing Units 1 through 5. Speedway patrons would not be able to discern the auditory impacts from construction of Units 6 & 7 from the operations of Units 1 through 5 and from the racing vehicles. There would be no induced tactile impacts. Therefore, aesthetic impacts to this resource would be SMALL and would not warrant mitigation.

The privately owned Mangrove Preserve is not open to the public. Impacts to the Preserve were not determined.

In summary, aesthetic impacts to recreation would be SMALL and would not warrant mitigation.

4.4.2.2.5.2 Use Impacts to Recreation

While aesthetic impacts to recreation are driven by the recreation user's proximity to the site, use impacts to recreation are driven by how close the recreational facilities and events are to the user's residence. Construction workers and their families would be expected to use recreational facilities near their residences, rather than near their place of work (i.e., the Turkey Point plant site). Some recreational opportunities would be sought out because of their uniqueness, a particular national park for example, independently of recreation area's proximity to the workers' residences.

The influx of 4731 people during construction could affect the use of recreational areas and participation in recreational events in the 50-mile region. Use impacts to recreation would be the result of the plant-related population growth in the region of influence, and therefore, increased use of recreational facilities and events. Residential distribution of the in-migrating workers in Miami-Dade County is the most important determinant of recreational facility use.

The in-migrating construction workforce and their families would result in a 0.2 percent increase over the 2000 Miami-Dade County's population. Use of recreational facilities and areas would be expected to increase by a similar percentage. For the purpose of this analysis, the recreational facilities are broadly classified into three groups: (1) wildlife management areas, national wildlife refuges, and preserves, (2) state parks, and (3) privately owned recreational facilities expected to be impacted by construction-related population increases. Tables 2.5-29 and 2.5-30 present information about these facilities and events and, where available, information about the current use rates and capacities of those facilities and events.

The wildlife management areas, national wildlife refuges, and preserves could be impacted by the construction-related population increase. There are eight wildlife management areas, national wildlife refuges, and preserves that are open to the public (Table 2.5-29) in the 50-mile region. Generally, agencies managing these properties do not tabulate the number of annual visitors or determine capacity information. All 4731 residents of the project-induced population in the region could use the areas, refuges, and preserves. Because the wildlife management areas, national wildlife refuges, and preserves are so large and have open and wooded lands appropriate for multiple uses (snorkeling/scuba diving, nature walks, picnics, camping, fishing), they can accommodate a large number of people. Impacts to wildlife management areas, national wildlife refuges, and preserves from the in-migrating construction workforce would be SMALL and would not warrant mitigation.

The state park system could be impacted by the construction-related population increase. The 11 state parks in the region (Table 2.5-30) had a total annual visitor count of 2,739,696 from July 2007 to June 2008, and a total daily capacity of 29,147 visitors, or approximately 10,638,655, annually. Thus, the 11 state parks within 50 miles could accommodate an additional 21,641 daily

visitors. The construction-related population increase of 4731 people represents approximately 22 percent of the available capacity if the construction-related population were to visit on any single day. Because the state park system has open and wooded lands appropriate for multiple uses (snorkeling/scuba diving, nature walks, picnics, camping, fishing), the state park system can accommodate additional use more readily than local park systems, which often specialize in dedicated use opportunities (tennis courts, swimming pools, baseball fields). Impacts to state parks from the in-migrating construction workforce would be SMALL and would not warrant mitigation.

Homestead Miami Speedway may be impacted by construction of the new units. The commuter traffic and construction vehicles could interrupt traffic flow during the speedway's racing events. Subsection 4.4.2.2.4 addresses traffic impacts. The Homestead Miami Speedway seats 65,000 people. It is unlikely that the in-migrating population increase would meaningfully impact this resource's capacity. Impacts to this recreational facility use would be SMALL, beneficial, and would not warrant mitigation.

As noted in Subsection 2.5.2.5, there are over 400 community, neighborhood, and municipal parks in the 50-mile region. Approximately 24 of these are in the Homestead and Florida City area. Increased use of community, municipal, and neighborhood parks would likely reflect the same rate of project-induced population increase.

In summary, during construction, some employees and their families would use the regional recreational facilities in the region; however, the increase attributable to construction would be small compared to overall use of these facilities. Impacts of facility construction on recreation use would be SMALL and would not warrant mitigation.

4.4.2.2.6 Housing

Impacts on housing from the Units 6 & 7 construction workforce and the operations workers employed during construction would depend on the number of workers that would relocate from outside the region of influence and the type of housing workers would desire. Therefore, it was conservatively assumed that a maximum of 1824 workers would migrate into the region of influence for construction and require housing.

Approximately 1292 of these workers would bring families and 532 workers would relocate to the region of influence without families. All 1824 in-migrating workers would need housing. Some of the workers would require permanent housing, generally owner-occupied, and others would elect to rent housing. Still others would elect to reside in transitional housing such as residential hotels, motels, rooms in private homes, or to bring their own housing in the form of campers and mobile homes. To present a more realistic analysis, the impacts to housing during construction for the region of influence were analyzed, as well as the Homestead and Florida City area.

Subsection 2.5.2.6 presents data about the existing housing conditions in the region of influence and the Homestead and Florida City area. The sources for data presented in this section are from Subsection 2.5.2.6, except where cited.

4.4.2.2.6.1 Miami-Dade County (Region of Influence)

In 2006, approximately 5.7 percent of the 333,061 rental units, or 18,984 rental units, were vacant in Miami-Dade County (Table 2.5-31). Rental units include housing of any type such as single-family units, multifamily units, apartments, condos, or mobile homes that the owner has declared available to the rental market. Mobile homes, a popular temporary housing option among construction workforces, represent 1.8 percent (or 15,338 units) of the housing in Miami-Dade County (Table 2.5-31). Some temporary workers may transport recreational vehicles (RVs) to facilities near the jobsite. There are eight recreational vehicle (RV) parks in Miami-Dade County, with a total capacity of 1277 spaces with full hookup (Table 2.5-34). The RV parks could accommodate up to 70 percent of the in-migrating workforce. There are 41,728 hotel/motel rooms per night throughout Miami-Dade County, which could accommodate the in-migrating workers and their families.

As described in Subsection 2.5.2.6, Miami-Dade County had 124,237 total vacant housing units in 2006. In Miami-Dade County, an additional 100,753 housing units were added to the total inventory between 2000 and 2006, increasing the 2000 housing inventory by 12 percent. Because of the temporary nature of construction, workers often choose not to live in permanent housing. However, permanent housing could accommodate the entire in-migrating peak construction workforce.

If the 1824 workers elected to make the county their home, readily available housing could accommodate them. Miami-Dade County could accommodate the entire construction workforce based on the vacancy of housing units. The entire in-migrating workforce could be accommodated in vacant permanent housing units, in vacant rental units, or in hotel or motels. In addition, the existing RV parks could accommodate up to 70 percent of the in-migrating workforce. If workers elect to build new housing, comprehensive plans are in place to guide development (Subsection 2.5.2.4).

Rental rates for housing units, new and existing housing prices, and short-term and long-term hotel/motel leasing rates, are unlikely to rise as a result of increased demand because of the abundance of available units. In 2000, the median gross monthly rent for a renter-occupied unit in Miami-Dade County was $647, but the estimated median gross monthly rent was $891 in 2006, an increase of 38 percent in 6 years (Table 2.5-31). Given the potential Units 6 & 7-related increase in demand for housing, purchase prices of existing and newly constructed housing and rental rates could rise with the influx of workers during construction. However, with the uncertainty of the current housing market in Miami-Dade County and the large housing inventory,

the housing and rental rates at the time of construction of Units 6 & 7 cannot be predicted. The county government would benefit from any increased real property values.

The current housing inventory is sufficient to accommodate 100 percent of the in-migrating workforce. Impacts to housing in the region of influence would be SMALL.

4.4.2.2.6.2 The Homestead and Florida City Area

Unlike the 2006 detailed information available for Miami-Dade County, no post-2000 housing information for the Homestead and Florida City area is available from the USCB. As stated in Subsection 4.4.2, approximately 43 percent of the site's current workforce resides in the Homestead and Florida City area. It is assumed that approximately 780 workers could settle in the Homestead and Florida City area.

As described in Subsection 2.5.2.6, the Homestead and Florida City area had 1361 total vacant housing units in 2000. Because of the temporary nature of construction, workers often choose not to live in permanent housing. In 2000, of the 7784 rental units, approximately 672 rental units were vacant in the Homestead and Florida City area (Table 2.5-32). Rental units include housing of any type such as single-family units, multifamily units, apartments, condos, or mobile homes that the owner has declared available to the rental market. There were also 689 other vacant units in the Homestead and Florida City area in 2000. Vacant permanent housing and vacant rental units could accommodate the entire in-migrating workforce in the Homestead and Florida City area. If workers elect to build new housing, comprehensive plans are in place to guide development (Subsection 2.5.2.4).

Mobile homes, a popular temporary housing option among construction workforces, represent 2.4 percent (or 335 units) of the housing in Homestead and Florida City area (Table 2.5-32). Some temporary workers may transport RVs to facilities near the jobsite, less than 10 miles from the Homestead and Florida City area. There are five RV parks in the Homestead and Florida City area, with a total capacity of 788 spaces with full hookup (Table 2.5-34). The RV parks could accommodate the in-migrating workforce expected to settle in the Homestead and Florida City area. There are 1410 hotel/motel rooms per night in the Homestead and Florida City area.If more than 780 workers elected to make the Homestead and Florida City area their home, readily available housing could accommodate them. Some existing units that are vacant, but classified as owner-occupied, could be used. Units currently classified as seasonal or occasional use could be converted to a more traditional use. Additional housing units could be built, additional mobile homes could be set up, and additional hotel/motel rooms and RV spaces could be made available (Subsections 2.5.2.4.4 and 2.5.2.4.5). The in-migrating workforce expected to settle in the Homestead and Florida City area could be accommodated in vacant permanent housing units and in vacant rental units, in hotel/motels, or in the existing RV parks. In addition, the in-migrating

workforce expected to settle in the Homestead and Florida City area workforce could bring mobile homes.

Impacts to the housing in the Homestead and Florida City area would be SMALL and not warrant mitigation.

4.4.2.2.6.3 Conclusion

The region of influence has ample existing housing to accommodate the entire in-migrating construction workforce. The existing inventory includes a wide range of housing choice by type, location, and price. The Homestead and Florida City area has the capacity to provide enough housing to accommodate the in-migrating workers expected to settle in the area.

County and local governments in the region of influence, including Homestead and Florida City, would benefit from the increased taxable value of existing housing and from any new residential construction. It is concluded that the region of influence and the Homestead and Florida City area would benefit from positive tax impacts. Therefore, the impact to the Miami-Dade County and the Homestead and Florida City area's housing market would be SMALL and mitigation would not be warranted.

4.4.2.2.7 Public Services

4.4.2.2.7.1 Water Supply Facilities

The impacts on local public water resources from both construction demand and population increases during the construction phase were considered. Construction-related impacts are primarily based on the population increase caused by the number of workers and their families migrating into the region of influence. The workers would include construction employees and operations workers. This in-migrating population is estimated to be 4731 people (Table 4.4-1).

Miami-Dade County (Region of Influence)

As explained in Section 3.3, water from Miami-Dade county would provide the necessary water for potable onsite uses during construction. The estimated maximum use during the peak construction period, including personal use (potable), concrete batch plant operation, concrete curing, cleanup activities, dust suppression, placement of engineered backfill, and piping hydrotests and flushing operations is 555 gpm, or 0.799200 million gallons per day (mgd) (Section 4.2). Currently, the Miami-Dade Water and Sewer Department (MDWASD) system is operating at 55.66 percent capacity (Table 2.5-36). The MDWASD system's new operating capacity as a result of the construction activities is 55.73 percent. However, not all of the water uses would occur simultaneously. The increased use would not stress the public water supplies

or infrastructures. Impacts to the MDWASD system would be SMALL and would not warrant mitigation.

As indicated in Table 4.4-1**,** construction of Units 6 & 7 could bring as many as 4731 workers and family members to the region of influence. As addressed in Subsection 2.5.2.7.1.1, municipal water suppliers in the county have excess capacity. The impact to the local water supply systems from construction-related population growth can be estimated by calculating the amount of water that would be required by the total population increase. People in the United States use an average of approximately 100 gpd (U.S. EPA 2008).The increase of 4731 people could increase consumption by 0.4731 mgd. The increased use would not stress public water supplies or infrastructure.

Collectively, public water suppliers in Miami-Dade County are operating at 54.79 percent capacity (Table 4.4-17). If 4731 construction-related individuals relocated to Miami-Dade County, the population would increase above the 2000 population by 0.2 percent. The additional demand of approximately 0.4731 mgd would increase the Miami-Dade County operating capacity to 54.86 percent. When the construction-related population increase (0.4731 mgd) is combined with the peak construction water use estimate (0.799200 mgd), the total public water usage in Miami-Dade County would be increased by 0.37 percent. Impacts to the public water supply systems in Miami-Dade County, based on the construction-related population increase and the peak construction water demands, would be SMALL and would not warrant mitigation.

Homestead and Florida City Area

The impact to the Homestead and Florida City area, which are likely candidates for the workers to relocate, can be estimated by adding the estimated distribution of likely construction-related population to the area. The increased population would represent approximately 43 percent of the in-migration workforce, or 2024 people, into the Homestead and Florida City area. This population increase would, in turn, increase demand collectively of the public water capacity for Homestead and Florida City systems, respectively, from 48.64 percent capacity usage to 53.41 percent capacity usage (Table 4.4-17).

Therefore, the increased demand from the estimated increase in population as a result of the construction-related workforce would not exceed the available capacity of the municipal water supplies in the entire region of influence. Also, the 43 percent population distribution in the Homestead and Florida City area would not exceed the available capacity of the combined water supplies of the Homestead and Florida City area. Therefore, the impacts to the region of influence and to the Homestead and Florida City area would be SMALL and would not require additional mitigation.

To mitigate impacts, FPL would communicate with local and regional governmental planning organizations such as the Miami-Dade County Department of Planning and Zoning, the MDWASD, and the South Florida Water Management District. FPL could share information such as project activity scheduling and projected workforce in-migration, thus giving these organizations time to prepare for demands on services because of the increased population as a result of Units 6 & 7 construction.

4.4.2.2.7.2 Wastewater Treatment Facilities

Units 1 through 5 use an existing onsite wastewater treatment facility to meet current operational needs.

Sanitary/wastewater treatment during the initial phases of Units 6 & 7 construction would be provided via potable facilities and/or a separate, packaged wastewater treatment facility. Portable toilet facilities would be used until the wastewater treatment facility could be completed. Therefore, onsite construction-related activities for Units 6 & 7 would have no impact on public wastewater services.

Subsection 2.5.2.7.1.2 describes the public wastewater treatment systems in the region of influence, their plant-designed average flows, and monthly average wastewater processed. Wastewater treatment facilities in the region of influence have at least 15 percent available capacity with the exception of the MDWASD South District Wastewater Treatment Plant (SDWWTP) (12.5 percent) and the city of Homestead (3 percent) (Table 4.4-18).

Impacts to local wastewater treatment systems would occur as the population increases as a result of the in-migration of the construction-related workers and their families. The magnitude of the impact can be conservatively estimated by assuming that 100 percent of the water used by this population would go to a wastewater treatment facility. As previously described, the construction-related population increase could require 0.4731 mgd of potable water and, by extension, 0.4731 mgd additional wastewater treatment capacity. As described in the following paragraphs, the in-migration of the maximum construction-related workforce and their families would increase the current wastewater treatment system use for the region of influence by approximately 0.13 percent.

Miami-Dade County (Region of Influence)

Subsection 2.5.2.7.1.2 describes the public wastewater treatment systems in the region of influence, their plant-designed average flows, and monthly average wastewater processed. Yearly average wastewater processed in the region of influence is 310.73 mgd, with a systems capacity of 374.04 mgd. If an additional 0.4731 mgd were processed in the region of influence, the average daily flow of wastewater to be processed would increase by 0.47 percent. Impacts to

wastewater treatment capacity in the region of influence would be SMALL and would not require mitigation.

Homestead and Florida City Area

The Homestead wastewater treatment facilities (WWTFs) are currently operating at approximately 96.83 percent (Table 4.4-18) capacity; however, the city of Homestead WWTF uses the SDWWTP system as backup and excess flows are diverted to the county wastewater treatment facilities. These excess flows are included in the SDWWTP flow reports. The wastewater generated in Florida City falls under the jurisdiction of the SDWWTP. The SDWWTP was operating at 87.58 percent of its capacity in 2005 (Table 4.4-18). If the estimated distribution of construction-related workers (2024 people) settled in the area of Homestead and Florida City, the overall capacity could accommodate 2024 people. This could be accomplished by using both the Homestead WWTF and the SDWWTP because of the remaining capacity of both facilities. Therefore, impacts on wastewater treatment facilities as a result of construction-induced population increases for Homestead and SDWWTP would be SMALL and would not require mitigation.

To mitigate any potential impacts, FPL would initiate early communication with local and regional governmental organizations, including planning commissions and local and regional economic development agencies, such as the Miami-Dade Planning and Zoning Department, to disseminate construction-related information in a timely manner. Local governments and planning groups would have time to plan for the influx. Infrastructure upgrades and expansions could be funded, at least in part, by construction-related property and sales and use tax payments.

4.4.2.2.7.3 Law Enforcement, Fire, and Medical Services

Law Enforcement

With respect to onsite law enforcement, FPL would employ its own security force. Security services and emergency response are addressed in the Emergency Plan.

Miami-Dade County

Residents-to-law enforcement officer ratios for the region of influence are presented in Table 4.4-19. In 2007, the region of influence ratio of residents-to-law enforcement officers was 723 to 1.

With respect to the influx of workers and their families during peak construction periods, 4731 people would move into the region of influence (Table 4.4-1), and this population increase would increase the 2007 residents-to-law enforcement officer ratio in the region of influence by 0.21 percent (Table 4.4-19), creating a SMALL impact.

Assuming the region of influence is already near or at its capacity to provide law enforcement protection, maintenance of the current preconstruction ratio would be desirable. Therefore, to accommodate the additional population caused by the construction of Units 6 & 7, seven additional law enforcement officers (and associated equipment) would be needed in the region of influence during the peak construction period to maintain the current ratio.

Homestead and Florida City Area

Residents-to-law enforcement officer ratios for the Homestead and Florida City area are presented in Table 4.4-19. In 2007, the Homestead and Florida City area ratio of residents-to-law enforcement officers was 286 to 1. With respect to the influx of workers and their families during the peak construction period, 2024 people would increase the 2007 residents-to-law enforcement officer ratio by 5.1 percent (Table 4.4-19), creating a SMALL impact. The community would need five additional officers to maintain preconstruction ratios during construction.

This conclusion and its mitigation are based in part on the GEIS. The NRC selected seven case study plants whose characteristics resembled the spectrum of nuclear plants in the United States today, and reported that public safety services were not disrupted as a result of the construction of new plants. The taxes directed to the local communities as a result of the plant construction enabled the growth of the public safety services in these areas by purchasing new buildings and equipment, and acquiring additional staff.

Moreover, impacts created by the influx of workers and their families could be mitigated by the increased property and sales/use tax revenues that would be generated by the construction project. However, expanding law enforcement services, including the hiring of additional personnel, would likely begin before a sufficient amount of these tax revenues would be available to local governments. Therefore, local governments could access other funding sources or issue bonds until the tax revenues would become available. Also, the peak construction workforce would not be in place until month 28 of construction activities, giving local governments time to plan and budget accordingly. Additionally, FPL would communicate regularly with local and regional governmental officials regarding Units 6 & 7 and its schedules, allowing local and regional officials ample opportunity to plan for the population influx.

Upon construction completion, the additional law enforcement personnel and equipment needed to support the personnel could be considered in excess. However, some, if not all, of the personnel and equipment could be used to continue to support the Units 6 & 7 operations workforce-related population growth and future non-Units 6 & 7-related population growth in the region of influence. The additional personnel and equipment could also be used to supplement the general provision of law enforcement services in the region of influence. These services could continue to be funded by the plant's property taxes and the sales and use tax revenues generated by Units 6 & 7 and workforce expenditures in the region of influence.

During the peak construction period, to maintain pre-Units 6 & 7 construction ratios, seven additional law enforcement officers would be required in the region of influence to maintain preconstruction ratios (Subsection 4.4.2.2.7.3). The operations workforce would reach its peak in month 71 of construction, well after the construction peak. During the operations period, a maximum of two additional law enforcement officers and associated equipment would be required in the region of influence (Table 5.8-13). Therefore, assuming that seven additional law enforcement officers were hired in the region of influence during peak construction period, only two of those officers would be required by the end of construction (when the number of workers on the site would drop to 806) to serve the operations-related population increase (Figure 3.10-2). Officers could be retained to supplement the general provision of law enforcement services in the region of influence, thereby reducing the ratios to achieve national averages. Units 6 & 7-related tax payments, including both property taxes and sales and use taxes made by the Units 6 & 7 and its employees, could continue to assist in funding these services.

Fire Protection Services

Fire protection services and emergency response are addressed in the Emergency Plan.

Miami-Dade County

Residents-to-active firefighter ratios for the region of influence are presented in Table 4.4-20. In 2007, the resident-to-active firefighter ratio in the region of influence was 666 to 1. If the number of active firefighters in the region of influence remained at 2007 levels, the additional population of 4731 would increase the residents-to-active-firefighter ratios in the region of influence to 668 to 1, a 0.21 percent increase, creating a SMALL impact. To maintain preconstruction ratios, seven additional active firefighters (and associated equipment) would be needed in the region of influence during peak construction period.

Homestead and Florida City Area

Residents-to-active firefighter ratios for the Homestead and Florida City area are presented in Table 4.4-20. In 2007, the resident-to-active firefighter ratio in the Homestead and Florida City area was 432. If the number of active firefighters in the Homestead and Florida City area remained at 2007 levels, the additional population of 2024 people would increase the residents-to-active firefighter ratios in the region of influence to 454 to 1, a 5.1 percent increase, creating a SMALL impact.

This impact could be mitigated by the use of the increased property and sales/use tax revenues that would be generated by the construction activities. However, expanding fire suppression services, including the hiring of additional personnel, would likely begin before a sufficient amount of these tax revenues would be available to local governments. Therefore, local

governments could access other funding sources or issue bonds until the tax revenues would become available. Also, the peak construction workforce would not be in place until month 28 of construction activities, giving local governments time to plan and budget accordingly. Additionally, FPL would communicate regularly with local and regional governmental officials about the Units 6 & 7 construction activities and schedule, allowing local and regional officials ample opportunity to plan for the population influx.

As with the analysis of the adequacy of law enforcement, this conclusion and its mitigations are also based in part on the GEIS.

Upon construction completion, the additional fire protection personnel and equipment needed to support the population increase during peak construction period could be considered in excess. However, some, if not all, of the personnel and equipment could be used to continue to support the operations workforce-related population growth and future non-Units 6 & 7-related population growth in the region of influence. The additional personnel and equipment could also be used to improve the general provision of fire suppression services in the region of influence. These services would continue to be funded by the plant's property taxes and the sales and use tax revenues generated by Units 6 & 7 and workforce expenditures in the region of influence.

During peak construction period, to maintain pre-Units 6 & 7 construction ratios, seven additional active firefighters would be required in the region of influence. The operations workforce would reach its peak in month 71 of construction, well after the peak construction period (Figure 4.4-1). During the operations period, two additional active firefighters and associated equipment would be required above the preconstruction levels in the region of influence (Table 5.8-14). Therefore, assuming that within the region of influence, seven additional active firefighters were hired during peak construction period, only two of those firefighters would be required by the end of construction (when the number of workers onsite would drop to 806). Firefighters could be retained to supplement the general provision of fire protection services in the region of influence, thereby reducing the ratios from their pre-Units 6 & 7 construction levels. Units 6 & 7-related tax payments, including both property taxes and sales and use taxes made by Units 6 & 7 and its employees, could continue to assist in funding these services.

Medical Services

Information concerning medical services in the region of influence is provided in Subsection 2.5.2.7.3.

Medical services and emergency response are addressed in the Emergency Plan. Minor injuries to construction workers would be assessed and treated by onsite medical personnel. Other injuries would be treated at hospitals in the region of influence, depending on the severity of the injury. Agreements would be in place with some local medical providers to support emergencies.

The opportunities for medical care in Miami-Dade County are provided in Table 2.5-41. According to information in Table 2.5-41, in 2006, there were 9330 staffed hospital beds and an average daily census of 4524 in the region of influence. As identified in Table 2.5-3, the 2000 population of the region of influence was 2,253,362. Adding 4731 residents to the region of influence population would increase the population by 0.2 percent (Subsection 4.4.2.1). A 0.2-percent increase in the average daily census would increase that number to 4533, well below the total number of staffed hospital beds in the region of influence. Additionally, the 0.2-percent increase in the annual admissions and the annual outpatient visits would not be noticeable or burden existing medical service capacity. Therefore, the impacts of construction on medical services would be SMALL and mitigation would not be warranted.

4.4.2.2.8 Education

It is estimated that approximately 1033 school-aged children would be part of the in-migration during the construction period. Because the Miami-Dade County Public School District covers the entire region of influence, it was assumed that the school-aged children would reside in Miami-Dade County. This subsection addresses the public and private school system and postsecondary institutions in the region of influence. The source for the data presented is Subsection 2.5.2.8, except where cited.

4.4.2.2.8.1 Miami-Dade County School District

It is assumed that each in-migrating worker with a family, during the construction period, would have 0.8 school-age children. Therefore, the in-migrating construction workforce with families of 1292 people would bring approximately 1033 school-aged children (Table 4.4-1). This analysis conservatively assumes that school-aged children would attend public schools.

As described in Subsection 2.5.2.8, the district enrolled 347,774 students in 2007–2008. The new and expanded public primary and secondary facilities will provide capacity for an additional 12,826 students by 2012–2013. The additional 1033 students would represent an increase of 0.3 percent of the 2007–2008 enrollment in the Miami-Dade County Public School District and 8 percent of the additional capacity expected to be available by 2012–2013. Because the additional capacity is greater than the estimated number of in-migrating students and the county public school enrollment has steadily decreased recently, the education system in the county could accommodate students that would accompany the construction workers.

Impacts to public education in the region of influence, Miami-Dade County Public School District, would be SMALL and would not warrant mitigation.

4.4.2.2.8.2 Homestead and Florida City Area

As stated in Subsection 2.5.2.8, the Homestead and Florida City area educational infrastructure will be able to support an additional 800 students by 2012–2013 after the additions and new schools are completed. The construction-related student population in the Homestead and Florida City area could increase by 442 students (Table 4.4-1) and be spread out over the 17 area schools. These students would represent an increase of 2.1 percent of the 21,042 students enrolled in 2006–2007 in the Homestead and Florida City area, and 55 percent of the additional capacity expected to be available by 2012–2013. Therefore, when spread over preK–12 grades, it is unlikely that the school-aged children of the in-migrating construction workers would affect class size, teacher ratios, or facility capacity in the area schools.

Impacts to public education schools in the Homestead and Florida City area, which are a part of the Miami-Dade County Public School District system, would be SMALL and would not warrant mitigation.

4.4.2.2.8.3 Private Schools – Pre-Kindergarten through 12

Miami-Dade County

The assumption was made that the same percentage of in-migrating school-aged children would attend private school as those who currently attended private school (15.4 percent). Of the 1033 in-migrating children, 159 may attend private school. As described in Subsection 2.5.2.8.2, there was a total enrollment of 61,597 students in Miami-Dade county private schools. The 159 new students represent less than 0.3 percent of the total enrollment. Impacts to private education in the region of influence would be SMALL and not warrant mitigation.

Homestead and Florida City

The assumption was made that the same percentage of in-migrating school-aged children would attend private school as those who currently attended private school (6.9 percent) in Homestead and Florida City. Of the 442 in-migrating children, approximately 30 may attend private school. As mentioned in Subsection 2.5.2.8.2, there was a total enrollment of 1560 students in Homestead and Florida City. The 30 new students represent less than 2.0 percent of the total enrollment. Impacts to private education in the Homestead and Florida City area would be SMALL and not warrant mitigation.

4.4.2.2.8.4 Conclusion

The Florida Education Finance Program and equalized funding legislation would ensure that the Miami-Dade County Public School District would receive additional funding to support the educational services provided for the new students. However, the legislation also means that the

project-related increases in property tax may not go directly to the Miami-Dade County Public School District (Subsections 2.5.2.3 and 4.4.2.2.2). FPL would provide the local communities with timely information regarding the construction activities, giving the school district time to make accommodations for the additional influx of students. It is concluded that impacts to the Miami-Dade County Public School System and to the schools in the Homestead and Florida City area would be SMALL and would not warrant mitigation.

4.4.2.2.8.5 Postsecondary Institutions

Subsection 2.5.2.8.3 addresses postsecondary institutions, colleges and universities, vocational schools, and technical colleges in the region of influence and 50-mile radius. The peak workforce during construction would not be reached until approximately month 28 of construction activities. FPL would provide the local education institutions, including postsecondary institutions, with timely information regarding the construction activities, giving the institutions several years to make accommodations for the influx of construction workers or worker family members that may seek postsecondary education or training. The institutions could also modify curriculum offerings and/or contract with FPL to provide onsite and offsite academic courses and job-specific training.

4.4.3 ENVIRONMENTAL JUSTICE

Environmental justice refers to a federal policy under which federal agencies identify and address, as appropriate, disproportionately high and adverse human health, environmental, or low-income populations. The NRC has a policy on the treatment of environmental justice matters in licensing actions (69 FR 52040).

The USCB 2000 data at the block group level was used to identify concentrations of minority and of low-income populations. Subsection 2.5.4 defines minority and low-income populations, and Figures 2.5-24 through 2.5-30 identify minority and low-income populations within 50 miles. There are 1625 census block groups that are at least partially within 50 miles, 1222 of which are wholly in the region of influence (Miami-Dade County). It is assumed that 100 percent of the in-migrating construction workforce would settle in Miami-Dade County; therefore, the health and environmental impacts and socioeconomic impacts evaluated in this environmental justice analysis are focused on Miami-Dade County. Of the 1222 block groups in Miami-Dade County, 341 have significant African-American populations, 376 have significant racial aggregate populations, and 755 have significant Hispanic populations. The plant property is in a block group meeting the other race, the aggregate of races, and the Hispanic ethnicity criteria. Two hundred thirty (230) block groups contain a significant percentage of low-income households in Miami-Dade County. The closest low-income block group is approximately 4 miles north of the plant property.

For the environmental justice analysis, two types of impacts were evaluated: health and environmental impacts and socioeconomic impacts. The following paragraphs summarize the magnitude of each type of impact to the general population and address whether minority and low-income populations would experience disproportionately high and adverse impacts. The evaluation identified the most likely pathways by which adverse environmental impacts associated with construction could affect human populations, determined the level of significance of the impact, and assessed whether characteristics of the minority or low-income populations would result in disproportionately high and adverse impacts to those populations. Several socioeconomic resources were also evaluated to determine if construction-related activities could disproportionately, in a high and adverse manner, impact minority or low-income populations. If the impacts to the general population were found to be SMALL, and there were no resource dependencies, preexisting health conditions, or location-dependent reasons that would affect the level of significance of the impact to minority or low-income populations, it was concluded there would be no disproportionately high and adverse impact on low-income or minority populations.

4.4.3.1 Health and Environmental Impacts

Impacts from construction of a nuclear power plant would be similar to impacts from other large construction projects. There are three primary pathways for health and environmental impacts: soil, water, and air.

Construction activities would involve moving large quantities of soil for construction of Units 6 & 7, modification to the equipment barge unloading area, transmission lines, and pipelines. The majority of these impacts would be on the Turkey Point plant property. Water-related health and environmental impacts include sedimentation and, less likely, spills of petroleum products. However, any land-disturbing activities that could adversely affect water quality would be of relatively short duration, would be permitted and overseen by state and federal regulators, and would be guided by an approved stormwater pollution prevention plan. Modifications to the equipment barge unloading area would be performed under permits issued by the USACE. Further, surface flow from the construction areas on the Turkey Point plant property would be to the industrial wastewater facility. Any spills would be mitigated according to a construction phase spill prevention, control, and countermeasures plan. Impacts to surface water quality would be SMALL (Subsection 4.2.3.1). In the unlikely event that small amounts of contaminants escape into the environment, they would have only a small, localized, temporary impact on the aquifer. Any impacts to groundwater quality would be SMALL (Subsection 4.4.3.2).

Construction activities could cause temporary and localized physical impacts such as noise, odors, vehicle exhaust, and fugitive dust emissions. In general, noise during construction activities would not significantly affect offsite areas. Construction of new transmission systems and expansion of substations would take place in agricultural, wetland, undeveloped, or very urban areas. Construction would be short-term, accelerated, and occur only during daytime.

Good road conditions and appropriate speed limits would minimize the noise level generated by the workforce commuting to the site. Thus, the noise impacts as a result of construction and the commuting workforce would be SMALL and would not warrant mitigation (Subsection 4.4.1.1).

Temporary and minor impacts to local ambient air quality could occur as a result of normal construction activities. Specific mitigation measures to control fugitive dust would be identified in a dust control plan, or similar document, prepared before the start of construction. Because of the size and population of the surrounding areas, the emissions from the small increase in local traffic would not noticeably affect the air quality in the area. Air quality impacts from construction and traffic would be SMALL and would not require mitigation (Subsection 4.4.1.2).

Health and environmental impacts to the general population from construction, via the three pathways, would be SMALL. Any soil disturbance, noise, vehicle exhausts, and fugitive dust emissions would not extend offsite. Impacts to groundwater and surface water quality would be SMALL. Any radiological doses to the public would meet public dose criteria. Therefore, it is concluded that there would be no disproportionately high and adverse impacts to minority or low-income populations within 50 miles of the site via soil, water, or air pathways that would affect the health and environment of populations studied in this environmental justice analysis.

4.4.3.2 Socioeconomic Impacts

This analysis estimates the Units 6 & 7 in-migrating construction-related worker households to be 1824. This represents 4 percent of the available housing in Miami-Dade County for the in-migrating, direct workforce if existing vacant housing, including seasonal housing, were available for the in-migrating workers. The current housing inventory within the region of influence is sufficient to accommodate 100 percent of the in-migrating workforce. Impacts to housing in the region of influence would be SMALL and mitigation would not be warranted. The Homestead and Florida City area is a likely area for the workers to live based on the proximity to the site and the current residential distribution of Turkey Point employees. This area's housing market would likely be affected the most. If, as expected, 43 percent of the construction workforce moved into the Homestead and Florida City area, the area could accommodate the workers during peak construction if the vacant housing met workers' requirements for type, size, price, condition, or other characteristics. Therefore, impacts to the housing in the Homestead and Florida City area would be SMALL because the area has enough housing to accommodate the in-migrating workers. Given the potential Units 6 & 7-related increase in quantity demand for housing, purchase prices of existing housing and rental rates could rise with the influx of workers during construction. County and local governments would benefit from the increased taxable value of existing housing and any new residential construction. Because the existing housing market in the region of influence could accommodate the expected in-migration, there would be no disproportionately high and adverse impacts to minority or low-income populations (Subsection 4.4.2.2.6).

As presented in Subsection 4.4.2.2.8, it is estimated that 1033 school-aged children would accompany the in-migrating construction workforce. This would represent a 0.3 increase over the 347,774 students that were enrolled in the Miami-Dade County Public School District during the 2007–2008 school year. New and expanded public primary and secondary facilities will provide capacity for an additional 50,635 students by November 2012. The estimated number of in-migrating school-aged children would represent 2 percent of this additional capacity. Schools in the Homestead and Florida City area will be able to support an additional 3200 students by November 2012, after additions and new schools are completed, accommodating the current overcapacity situation as well as the construction-related increase (444 students). Because the excess capacity is greater than the estimated number of in-migrating students, the education system in the county could accommodate students that would accompany the workers during construction. Therefore, there would be no disproportionately high and adverse impacts to minority or low-income populations.

As stated in Subsection 4.4.2.2.3, minimal land use conversion is anticipated as a result of the construction of Units 6 & 7. From a land use perspective, Miami-Dade County is likely to continue to urbanize. Commercial and residential development in Miami-Dade County is increasing with the demand of the growing population. The construction of Units 6 & 7 would create an additional increase in residential and commercial activity. However, because the county has a population of over two million and the Homestead and Florida City area is also experiencing growth, this would not create a discernible change in housing availability, change rental rates and housing values, or spur housing construction and/or conversion. Thus, minimal land use conversion is anticipated as a result of construction of Units 6 & 7. Offsite land use changes would be considered SMALL in Miami-Dade County and in the Homestead and Florida City area. Therefore, there would not be disproportionately high and adverse impacts to minority and low-income populations.

Construction workers commuting to and from the site would use U.S. Highway 1, SR 997, or Florida's Turnpike to reach the Homestead and Florida City area, and then take U.S. Highway 1 or SR 997/Krome Avenue south to the connections with SW 359th Street. Workers would then travel on SW 137th Avenue/Tallahassee Road, SW 328th Street/N. Canal Drive, and SW 344th Street/Palm Drive. Road extensions would be built from SW 344th Street to SW 359th Street, the new access road. Because the roads are in minority areas, these populations would be impacted by increased traffic and construction activities. In particular, African-American, Other Races, and Hispanic block groups are along and between SW 117th Avenue and SW 137th Avenue, where the road improvements would be made. As described in Subsection 4.4.2.2, impacts would be SMALL to MODERATE during peak construction. LARGE impacts could occur on the current access road for a few months before completion of the new access road. Mitigation measures would be implemented, such as staggering arrival and departure times, to minimize the impacts to transportation.

The construction of Units 6 & 7 could reduce unemployment, create new business opportunities for housing and service-related industries, and increase the personal income of the population in the region of influence. The impacts of construction on the economy of the region of influence would be positive and SMALL (Subsection 4.4.2.2.1). Minority and low-income populations would benefit from these positive impacts just as the general population would. There would be no disproportionately high and adverse impacts to minority or low-income populations; impacts would be positive and SMALL.

The potential impacts from construction on public services in the region of influence (Subsection 4.4.2.2.7) were also assessed. Collectively, Miami-Dade's municipal water supplies are operating at 54.79 percent capacity. The estimated increase in population as a result of in-migrating construction workforce and their families would not exceed the available capacity of the municipal water supplies in the region of influence. When the construction-related population increase (0.4731 mgd) is combined with the peak construction water use estimate at the site (0.7992 mgd), the total public water usage in the Miami-Dade County would be increased by 0.37 percent. Impacts to Miami-Dade County based on the construction-related population increase and the peak construction water demands at the site would be SMALL and would not warrant mitigation. The increased population to the Homestead and Florida City area, which is a likely candidate for the construction workers to relocate, is 2024 people. This demand could increase the public water usage in Homestead and Florida City systems collectively from 48.64 percent capacity usage to 53.41 percent capacity usage. Therefore, the estimated increase in population as a result of the construction-related workforce would not exceed the available capacity of the municipal water supplies in the entire region of influence or in the Homestead and Florida City area (Subsection 4.4.2.2.7.1). Therefore, the impacts to both areas would be SMALL and there would not be disproportionately high and adverse impacts to minority or low-income populations.

Sanitary/wastewater treatment during construction of Units 6 & 7 would initially be provided via potable facilities and/or a separate, packaged wastewater treatment facility. Therefore, there would be no impact on public wastewater facilities during construction. Portable toilet facilities would be used until the site's wastewater treatment facility could be completed. Therefore, onsite construction-related activities for Units 6 & 7 would have no impact on public wastewater services.

Population increase as a result of in-migration of the construction-related workers and their families would impact local wastewater treatment systems. The magnitude of the impact to local wastewater treatment systems is conservatively estimated by assuming 100 percent of the water used by the in-migrating construction population would go to a wastewater treatment facility. The construction-related population increase could require 0.4731 mgd of drinking water, and by extension, 0.4731 mgd of additional wastewater treatment capacity. The additional 0.4731 mgd would increase the wastewater processed by 0.47 percent in the region of influence. Impacts to wastewater treatment capacity in the region of influence would be SMALL and would not require

mitigation. As stated in Subsection 2.5.2.7, the Homestead WWTFs are currently operating at approximately 96.83 percent of capacity; however, the city of Homestead WWTF uses the SDWWTP system as backup and excess flows are diverted to the county wastewater treatment facilities. These excess flows are included in the SDWWTP flow reports. The wastewater generated in Florida City falls under the jurisdiction of the SDWWTP. The SDWWTP was running at 87.58 percent of its capacity in 2005. If the expected distribution of construction-related workers (43 percent or 2024 people) settled in the area of Homestead and Florida City, the overall capacity could be accommodated using both the Homestead WWTF and the SDWWTP as a result of the remaining capacity of both facilities. There is enough excess capacity to accommodate the estimated in-migrating construction-related workforce population. Impacts on wastewater treatment facilities as a result of Units 6 & 7-induced population increases for the city of Homestead and the SDWWTP would be SMALL and would not require mitigation. Therefore, the estimated increase in population as a result of the construction-related workforce would not exceed the available capacity of the wastewater systems in the entire region of influence or in the Homestead and Florida City area (Subsection 4.4.2.2.7.2). The impacts to both areas would be SMALL. Therefore, there would be no disproportionately high and adverse impacts to minority or low-income populations.

With respect to onsite law enforcement, FPL would employ its own security force. The estimated increase in population as a result of in-migrating construction workforce and their families is 4731. The resident-to-law enforcement officer ratio for the region of influence in 2007 was 723 to 1. This population increase would increase the resident-to-law enforcement officer ratio in the region of influence by 0.21 percent, creating a SMALL impact. In 2007, the Homestead and Florida City area ratio of residents-to-law enforcement officer was 286 to 1. With respect to the influx of workers and their families into Florida City and Homestead during peak construction period, 2024 people would increase the resident-to-law enforcement officer ratio by 5.1 percent, creating a SMALL impact. To accommodate the additional population caused by Units 6 & 7 construction, seven additional active law enforcement officers would be needed in the region of influence during peak construction period; five of which would be required in the Homestead and Florida City area. The impacts to the region of influence and the Homestead and Florida City area would be SMALL (Subsection 4.4.2.2.7.3). There would be no disproportionately high and adverse impacts to minority or low-income populations.

The estimated increase in population as a result of in-migrating construction workforce and their families is 4731, which would increase the residents-to-active firefighter ratios in the region of influence by 0.21 percent, creating a SMALL impact in the region of influence. The residents-to-active firefighter ratio in the region of influence in 2007 was 666 to 1. To maintain pre-construction ratios, seven additional active firefighters would be needed in the region of influence during peak construction period. This impact could be mitigated by the use of the increased property and sales/use tax revenues that would be generated by the construction. In 2007, the residents-to-

active firefighter ratio in the Homestead and Florida City area was 432 to 1. If the number of active firefighters in the Homestead and Florida City area remained at 2007 levels, the additional population of 2024 people would increase the residents-to-active-firefighter ratios in the region of influence by 5.1 percent, creating a SMALL impact. The impacts to the region of influence and the Homestead and Florida City area would be SMALL. There would be no disproportionately high and adverse impacts to minority or low-income populations.

Adding 4731 residents to the region of influence population would increase the population by 0.2 percent. A 0.2 percent increase in the average daily census of area hospitals would increase that number to 4533, well below the total number of staffed hospital beds in the region of influence. Additionally, the 0.2 percent increase in the annual admissions and the annual outpatient visits to area hospitals would not be noticeable or burden existing medical service capacity. Therefore, the potential impacts of construction on medical services would be SMALL and mitigation would not be warranted. Because the existing medical services in Miami-Dade County could accommodate the expected in-migration, there would be no disproportionately high and adverse impacts to minority populations.

As described in Subsection 2.5.4, local government officials, staff of social welfare agencies, and Indian tribes were contacted concerning unusual resource dependencies, practices, or health conditions that could result in potentially disproportionate impacts to minority and low-income populations. Multiple government entities in Broward and Miami-Dade counties were contacted. Collier and Monroe Counties were not contacted because neither county has block groups within the 50-mile radius with significant minority or low-income populations nor do they contain Indian reservations.

Many agencies had no information concerning activities and health issues of minority populations. Several agencies alluded to the extreme urban nature of the study area and implied that there was no possibility of any subsistence activity on the part of any group. Contacts with the Seminole and Miccosukee Indian tribes reported that the Indians residing in reservations within 50 miles do not depend on hunting, fishing, or gardening for subsistence.

In summary, there were no construction-related impacts identified that would have disproportionately high and adverse effects on the human health, environment, or socioeconomics of minority or low-income populations. Therefore, it is concluded that impacts from construction-related activities to minority or low-income populations would reflect impacts to the general population and would be SMALL to MODERATE.

Section 4.4 References

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Table 4.4-1 (Sheet 1 of 2)
Assumptions for Workforce Characterization During Peak Construction Period, Units 6 & 7

	Construction	Operations	Total
Workforce Characterization			
Peak number of workers onsite during construction (month 28)	3,548	99	3,647
Workforce Migration			
Percent of workforce migrating into Miami-Dade County	50%	50%	—
Total number of workers migrating into Miami-Dade County during construction peak	1,774	50	1,824
Percent of in-migrating workforce that migrates into Homestead and Florida City area	42.78%	42.78%	—
Total number of workers migrating into Homestead and Florida City area during construction peak	759	21	780
Families			
Percent of workers who bring families[(a)]	70%	100%	—
Percent of workers who do not bring families	30%	0%	—
Average worker family size (worker, spouse, children)[(a)(b)]	3.25	3.25	—
Number of workers who would move into Miami-Dade County and bring families	1,242	50	1,292
Number of workers who would move into Miami-Dade County and not bring families	532	0	532
Number of workers who would move into the Homestead and Florida City area and bring families	531	21	553
Number of workers who would move into the Homestead and Florida City area and not bring families	228	0	228
Total In-Migration — Families and Unaccompanied Workers			
Total number of workers who would bring families into Miami-Dade County (= total families in Miami-Dade County)	1,242	50	1,292
In-migrating workers family members (Miami-Dade County)	2,794	113	2,907
Total in-migrating workers accompanied by family, plus family members	4,036	163	4,199
Total number of workers who would not bring families into Miami-Dade County	532	0	532
Total number of workers and family members migrating into Miami-Dade County (= new population in Miami-Dade County)	4,568	163	4,731
Total number of workers who would bring families that would migrate into the Homestead and Florida City area (= total families in the Homestead and Florida City area)	531	21	553
In-migrating workers' family members (Homestead and Florida City area)	1,195	48	1,243
Total workers accompanied by family, plus family members, that would migrate into the Homestead and Florida City area[(c)]	1,726	70	1,796

Table 4.4-1 (Sheet 2 of 2)
Assumptions for Workforce Characterization During Peak Construction Period, Units 6 & 7

	Construction	Operations	Total
Total In-Migration — Families and Unaccompanied Workers (cont.)			
Number of workers who would migrate into the Homestead and Florida City area and not bring families	228	0	228
Total number of workers and family members that would migrate into the Homestead and Florida City area (= new population in Homestead and Florida City area)	1,954	70	2,024
School-age children			
Number of school-age children per family[(a)]	0.8	0.8	—
Number of school-age children in Miami-Dade County (0.8 per family)	993	40	1,033
Number of school-age children in Homestead and Florida City area (0.8 per family that would migrate to the Homestead and Florida City area)	425	17	442
Post-construction workforce retention			
Percent of in-migrating workforces that would leave Miami-Dade County, post-construction[(a)]	50%	—	—
Number of in-migrating workforces that would leave Miami-Dade County, post-construction	887	—	887
Number of in-migrating workforces and their families plus in-migrating workers without families that would leave Miami-Dade County, post-construction	2,284	—	2,284
Number of school-age children of in-migrating workers that would migrate to Miami-Dade County	993	40	1,033
Number of school-age children of in-migrating workers that would leave Miami-Dade County, post-construction	497	—	497
Percent of in-migrating workforces that would leave the Homestead and Florida City area, post-construction[(a)]	50%	—	—
Number of in-migrating workers that would leave the Homestead and Florida City area, post-construction	379	—	379
	Construction	Operations	Total
Number of in-migrating workers and their families plus in-migrating workers without families that would leave Homestead and Florida City area, post-construction	**977**	**—**	**977**
Number of school-age children of in-migrating workers that would migrate to the Homestead and Florida City area	425	23	442
Number of school-age children of in-migrating workers that would leave Homestead and Florida City area, post-construction	213	—	213

(a) Source: BMI Apr 1981.
(b) According to USCB 2007 American Community Survey Data Profile Highlights for Miami-Dade County and the state of Florida (USCB 2007), the average family size for Miami-Dade County in 2007 was 3.36. The average family size for the state of Florida was 3.08. Therefore, FPL assumes that an average family size of 3.25 for the construction workforce, as presented in the 1981 Battelle Memorial Institute study (BMI 1981), would also be a reasonable estimate for the operations workforce.
(c) Values presented may not total component values because of rounding.

Table 4.4-2
Direct and Indirect Employment

Employment	AP 1000 — 2 Units
Construction workforce peak (Table A)	3,548
Operations workforce onsite during construction peak (Table A)	99
Number of construction workers who migrate into Miami-Dade County (50% of construction workforce peak) (Table A)	1,774
Number of operations workers who migrate into Miami-Dade County (50% of operations workforce on site during construction peak) (Table A)	50
Employment multiplier for construction workers in Miami-Dade County (indirect portion only)	0.9535
Employment multiplier for operations workers in Miami-Dade County (indirect portion only)	2.1696
Indirect jobs resulting from in-migrating construction workers (1758 x 0.9314)[(a)]	1,692
Indirect jobs resulting from in-migrating operations workers (66 x 2.3678)[(a)]	108
Total number of indirect jobs (includes those resulting from both in-migrating workforces)	1,800
Number of persons unemployed in Miami-Dade County, 2007[(b)]	69,781

(a) Source: BEA 2009a.
(b) Source: From BLS 2009a.

Table 4.4-3
Workers as Percentage of Region of Influence Total Employment, Units 6 & 7 Construction Period

ROI Total Private Employment, 2007[(a)]			865,334
ROI Private Employment, Industry Sector 23 — Construction[(a)]			52,741
ROI Private Employment, Industry Sector 237 — Heavy and Civil Engineering Construction[(a)]			6,591
	Construction Workers	**Operations Workers**	**Total**
Workers during peak construction period[(b)]	3,548	99	3,647
Number of workers assumed to migrate into ROI (50%)	1,774	50	1,824
In-migrating workers as percentage of ROI 2007 total employment	0.21%	0.01%	0.21%
In-migrating workers as percentage of ROI 2007 employment, Sector 23	3.4%	0.1%	3.5%
In-migrating workers as percentage of ROI 2007 employment, Sector 237	26.9%	0.8%	27.7%
Indirect workers during construction period (already resident in ROI)[(b)]			1,800
Indirect workers as percentage of region of influence total employment in 2007			0.21%

(a) Source: BLS 2009a. Information reflects privately owned firms and all establishment sizes.
(b) Subsection 4.4.2.

Table 4.4-4 (Sheet 1 of 2)
In-Migrant Construction Worker Wages by Construction Month[a]

Construction Month	Number of Construction Worker In-migrants[b]	$ Earned by Construction Workforce[c]	Construction Month	Number of Construction Worker In-migrants[b]	$ Earned by Construction Workforce[c]	Construction Month	Number of Construction Worker In-migrants[b]	$ Earned by Construction Workforce[c]
–30	50	$237,071	7	1,320	$6,258,670	43	1,588	$7,526,999
–29	100	$474,142	8	1,361	$6,453,068	44	1,575	$7,467,731
–28	150	$711,213	9	1,402	$6,647,466	45	1,550	$7,349,196
–27	175	$829,748	10	1,443	$6,841,864	46	1,525	$7,230,660
–26	200	$948,283	11	1,484	$7,036,262	47	1,500	$7,112,125
–25	225	$1,066,819	12	1,525	$7,230,660	48	1,475	$6,993,590
–24	250	$1,185,354	13	1,566	$7,425,059	49	1,450	$6,875,054
–23	275	$1,303,890	14	1,607	$7,619,457	50	1,425	$6,756,519
–22	300	$1,422,425	15	1,648	$7,813,855	51	1,400	$6,637,983
–21	325	$1,540,960	16	1,689	$8,008,253	52	1,375	$6,519,448
–20	350	$1,659,496	17	1,771	$8,397,049	53	1,350	$6,400,913
–-19	375	$1,778,031	18	1,774	$8,411,273	54	1,325	$6,282,377
–18	400	$1,896,567	19	1,774	$8,411,273	55	1,300	$6,163,842
–17	425	$2,015,102	20	1,774	$8,411,273	56	1,275	$6,045,306
–16	450	$2,133,638	21	1,774	$8,411,273	57	1,250	$5,926,771
–15	475	$2,252,173	22	1,774	$8,411,273	58	1,200	$5,689,700
–14	500	$2,370,708	23	1,774	$8,411,273	59	1,150	$5,452,629
–13	541	$2,565,106	24	1,774	$8,411,273	60	1,100	$5,215,558
–12	582	$2,759,505	25	1,774	$8,411,273	61	1,050	$4,978,488
–11	623	$2,953,903	26	1,774	$8,411,273	62	1,000	$4,741,417
–10	664	$3,148,301	27	1,774	$8,411,273	63	950	$4,504,346
–9	705	$3,342,699	28	1,774	$8,411,273	64	900	$4,267,275
–8	746	$3,537,097	29	1,763	$8,356,747	65	850	$4,030,204
–7	787	$3,731,495	30	1,750	$8,297,479	66	800	$3,793,133

Table 4.4-4 (Sheet 2 of 2)
In-Migrant Construction Worker Wages by Construction Month[a]

Construction Month	Number of Construction Worker In-migrants[b]	$ Earned by Construction Workforce[c]	Construction Month	Number of Construction Worker In-migrants[b])	$ Earned by Construction Workforce[c]	Construction Month	Number of Construction Worker In-migrants[b]	$ Earned by Construction Workforce[c]
–6	828	$3,925,893	31	1,738	$8,238,211	67	750	$3,556,063
–5	869	$4,120,291	32	1,725	$8,178,944	68	700	$3,318,992
–4	910	$4,314,689	33	1,713	$8,119,676	69	650	$3,081,921
–3	951	$4,509,087	34	1,700	$8,060,408	70	600	$2,844,850
–2	992	$4,703,485	35	1,688	$8,001,141	71	550	$2,607,779
–1	1,033	$4,897,883	36	1,675	$7,941,873	72	500	$2,370,708
1	1,074	$5,092,282	37	1,663	$7,882,605	73	450	$2,133,638
2	1,115	$5,286,680	38	1,650	$7,823,338	74	400	$1,896,567
3	1,156	$5,481,078	39	1,638	$7,764,070	75	350	$1,659,496
4	1,197	$5,675,476	40	1,625	$7,704,802	76	325	$1,540,960
5	1,238	$5,869,874	41	1,613	$7,645,534	77	290	$1,375,011
6	1,279	$6,064,272	42	1,600	$7,586,267	78	250	$1,185,354
Subtotals:		$105,804,713			$283,856,762			$171,532,601
Grand Total, Construction Worker Wages								**$ 561,194,077**
Earnings Multiplier, Construction Industry Sector[d]								**1.8022**

(a) Source: Table 3.10-2
(b) The number shown represents 50 percent of the total construction workforce, because that is the percentage assumed to be migrating into the region of influence (Table 3.10-2).
(c) This column equals the number of workers times the average monthly wage of $4,741 (average annual wage of $56,897 divided by 12). Source for monthly average wages: BLS 2009a.
(d) Source: BEA 2009b.

Table 4.4-5
Sensitivity Analysis of Impacts to Region of Influence Economy from In-Migrant Construction Worker Wages

Construction Workforce Total Wages over 108-month Construction Period		**$561,194,077**
Earnings Multiplier for Construction Industry Sector [(a)]		**1.8022**
Total Personal Income in ROI, 2007 [(b)]		**$ 85,978,571,000**
Total Construction Workforce Wages that could be Spent in ROI	**Wage Dollars**	**Total Dollar Impact to Region (earnings multiplier applied)**
10%	$56,119,408	$101,138,396
20%	$112,238,815	$202,276,793
30%	$168,358,223	$303,415,189
40%	$224,477,631	$404,553,586
50%	$280,597,038	$505,691,982
60%	$336,716,446	$606,830,379
70%	$392,835,854	$707,968,775
80%	$448,955,261	$809,107,172
90%	$505,074,669	$910,245,568
100%	$561,194,077	$1,011,383,965

(a) Source: BEA 2009a.
(b) Source: BEA 2009b.

Table 4.4-6
Impacts by Year from In-Migrant Construction Worker Wages to Region of Influence Economy During Construction Period

Annual Construction Wages	Construction Month	Total Annual Wages	Total Annual Wages Spent in ROI (50%)[(a)]	Total Dollar Impact to Region (earnings multiplier applied)[(b)]	As a Percentage of ROI Personal Income in 2007 ($86 Billion)[(c)]
Year 1	–30 to –19	$13,157,431	$6,578,716	$11,856,161	0.01
Year 2	–18 to –7	$32,706,292	$16,353,146	$29,471,640	0.03
Year 3	–6 to 6	$59,940,990	$29,970,495	$54,012,826	0.06
Year 4	7 to 18	$88,142,936	$44,071,468	$79,425,599	0.09
Year 5	19 to 30	$100,766,958	$50,383,479	$90,801,106	0.11
Year 6	31 to 42	$94,946,869	$47,473,434	$85,556,623	0.10
Year 7	43 to 54	$83,152,595	$41,576,297	$74,928,803	0.09
Year 8	55 to 66	$60,808,669	$30,404,334	$54,794,691	0.06
Year 9	67 to 78	$27,571,338	$13,785,669	$24,844,533	0.03
TOTAL		**$561,194,077**	**$280,597,038**	**$505,691,982**	

(a) This impact assessment is based on the conservative assumption that 50 percent of worker wages would be spent within the ROI.
(b) Multiplier is 1.8022 (BEA 2009a).
(c) Source: BEA 2009b

Table 4.4-7 (Sheet 1 of 2)
In-Migrant Operations Worker Wages by Construction Month[a]

Construction Month	Number of Operations Worker In-migrants[b]	$ Earned by Operations Workforce[c]	Construction Month	Number of Operations Worker In-migrants[b]	$ Earned by Operations Workforce[c]	Construction Month	Number of Operations Worker In-migrants[b]	$ Earned by Operations Workforce[c]
–30	0	$–	7	0	$–	43	173	$946,594
–29	0	$–	8	0	$–	44	181	$993,238
–28	0	$–	9	0	$–	45	189	$1,037,138
–27	0	$–	10	0	$–	46	198	$1,083,781
–26	0	$–	11	0	$–	47	206	$1,127,681
–25	0	$–	12	0	$–	48	214	$1,174,325
–24	0	$–	13	0	$–	49	222	$1,218,225
–23	0	$–	14	0	$–	50	231	$1,264,869
–22	0	$–	15	0	$–	51	239	$1,308,769
–21	0	$–	16	0	$–	52	247	$1,352,669
–20	0	$–	17	0	$–	53	255	$1,399,313
–19	0	$–	18	0	$–	54	263	$1,443,213
–18	0	$–	19	0	$–	55	272	$1,489,856
–17	0	$–	20	0	$–	56	280	$1,533,756
–16	0	$–	21	0	$–	57	288	$1,580,400
–15	0	$–	22	0	$–	58	296	$1,624,300
–14	0	$–	23	8	$43,900	59	305	$1,670,944
–13	0	$–	24	17	$90,544	60	313	$1,714,844
–12	0	$–	25	25	$134,444	61	321	$1,761,488
–11	0	$–	26	33	$181,088	62	329	$1,805,388
–10	0	$–	27	41	$224,988	63	337	$1,849,288
–9	0	$–	28	50	$271,631	64	346	$1,895,931

Table 4.4-7 (Sheet 2 of 2)
In-Migrant Operations Worker Wages by Construction Month[a]

Construction Month	Number of Operations Worker In-migrants[b]	$ Earned by Operations Workforce[c]	Construction Month	Number of Operations Worker In-migrants[b]	$ Earned by Operations Workforce[c]	Construction Month	Number of Operations Worker In-migrants[b]	$ Earned by Operations Workforce[c]
–8	0	$–	29	58	$315,531	65	354	$1,939,831
–7	0	$–	30	66	$362,175	66	362	$1,986,475
–6	0	$-	31	74	$406,075	67	370	$2,030,375
–5	0	$–	32	82	$449,975	68	379	$2,077,019
–4	0	$–	33	91	$496,619	69	387	$2,120,919
–3	0	$–	34	99	$540,519	70	395	$2,167,563
–2	0	$–	35	107	$587,163	71	403	$2,211,463
–1	0	$–	36	115	$631,063	72	403	$2,211,463
1	0	$–	37	124	$677,706	73	403	$2,211,463
2	0	$–	38	132	$721,606	74	403	$2,211,463
3	0	$–	39	140	$768,250	75	403	$2,211,463
4	0	$–	40	148	$812,150	76	403	$2,211,463
5	0	$–	41	157	$858,794	77	403	$2,211,463
6	0	$–	42	165	$902,694	78	403	$2,211,463
Subtotals:					$9,476,913			$61,289,888
Grand Total, Operations Worker Wages during Construction Period								**$ 70,766,800**
Earnings Multiplier, Industry Sector 221113, Power Generation and Supply[d]								**1.7880**

(a) Source: Table 3.10-2
(b) The number shown represents 50 percent of the total construction workforce, because that is the percentage assumed to be migrating into the region of influence (Table 3.10-2).
(c) This column equals the number of workers times the average monthly wage of $5,488 (average annual wage of $65,850 divided by 12). Source for average monthly wages: BLS 2009b.
(d) Source: BEA 2009a

Table 4.4-8
Sensitivity Analysis of Impacts to Region of Influence Economy From In-Migrant Operations Worker Wages During Construction Period

Operations Workforce Total Wages over 108-month Construction Period		**$70,766,800**
Earnings Multiplier for Industry Sector 221113, Power Generation and Supply[(a)]		**1.7880**
Total Personal Income in ROI, 2007[(b)]		**$ 85,978,571,000**
Total Operations Workforce Wages that could be Spent in ROI	**Wage Dollars**	**Total Dollar Impact to Region (earnings multiplier applied)**
10%	$7,076,680	$12,653,104
20%	$14,153,360	$25,306,208
30%	$21,230,040	$37,959,312
40%	$28,306,720	$50,612,415
50%	$35,383,400	$63,265,519
60%	$42,460,080	$75,918,623
70%	$49,536,760	$88,571,727
80%	$56,613,440	$101,224,831
90%	$63,690,120	$113,877,935
100%	$70,766,800	$126,531,038

(a) Source: BEA 2009a.
(b) Source: BEA 2009b.

Table 4.4-9
Impacts by Year From In-Migrant Operations Worker Wages to Region of Influence Economy During Construction Period

Annual Operations Wages	Construction Month	Total Annual Wages	Total Annual Wages Spent in ROI (50%)[(a)]	Total Dollar Impact to Region (earnings multiplier applied)[(b)]	As a percentage of ROI Personal Income in 2007 ($86 Billion)[(c)]
Year 1	–30 to –19	$0	$0	$0	0.000
Year 2	–18 to –7	$0	$0	$0	0.000
Year 3	–6 to 6	$0	$0	$0	0.000
Year 4	7 to 18	$0	$0	$0	0.000
Year 5	19 to 30	$1,624,300	$812,150	$1,452,124	0.002
Year 6	31 to 42	$7,852,613	$3,926,306	$7,020,236	0.008
Year 7	43 to 54	$14,349,813	$7,174,906	$12,828,732	0.015
Year 8	55 to 66	$20,852,500	$10,426,250	$18,642,135	0.022
Year 9	67 to 78	$26,087,575	$13,043,788	$23,322,292	0.027
TOTALS		**$70,766,800**	**$35,383,400**	**$63,265,519**	

(a) This impact assessment is based on the conservative assumption that 50 percent of worker wages would be spent within the ROI.
(b) Multiplier is 1.7880 (BEA 2009a).
(c) Source: BEA 2009b.

Table 4.4-10
Combined Sensitivity Analysis of Impacts to Region of Influence Economy From All In-Migrant Worker Wages During Construction Period

Combined Workforce Total Wages over 108-month Construction Period		$631,960,877
Total Personal Income in ROI, 2007[(a)]		$ 85,978,571,000
% of Total Turkey Point Workforce Wages that could be Spent in ROI	Construction & Operations Worker Wage Dollars	Total Dollar Impact to Region (earnings multipliers applied)[(b)]
10%	$63,196,088	$113,791,500
20%	$126,392,175	$227,583,001
30%	$189,588,263	$341,374,501
40%	$252,784,351	$455,166,001
50%	$315,980,438	$568,957,502
60%	$379,176,526	$682,749,002
70%	$442,372,614	$796,540,502
80%	$505,568,701	$910,332,003
90%	$568,764,789	$1,024,123,503
100%	$631,960,877	$1,137,915,003

(a) Source: BEA 2009b.
(b) This column is the sum of construction worker wages with Construction sector multiplier (1.8022) applied (see Table 4.4-5), plus operations worker wages with Power Generation and Utility sector multiplier (1.7880) applied (see Table 4.4-8).

Table 4.4-11
Combined Impacts by Year of all Units 6 & 7 In-Migrant Worker Wages to Region of Influence Economy During Construction Period

Annual Wages	Construction Month	Total Annual Wages	Total Annual Wages Spent in ROI (50%)[a]	Total Dollar Impact to Region (earnings multipliers applied)[b]	Percentage of ROI Personal Income in 2007 ($86 Billion)[c]
Year 1	–30 to –19	$13,157,431	$6,578,716	$11,856,161	0.01
Year 2	–18 to –7	$32,706,292	$16,353,146	$29,471,640	0.03
Year 3	–6 to 6	$59,940,990	$29,970,495	$54,012,826	0.06
Year 4	7 to 18	$88,142,936	$44,071,468	$79,425,599	0.09
Year 5	19 to 30	$102,391,258	$51,195,629	$92,253,230	0.11
Year 6	31 to 42	$102,799,481	$51,399,741	$92,576,859	0.11
Year 7	43 to 54	$97,502,407	$48,751,204	$87,757,536	0.10
Year 8	55 to 66	$81,661,169	$40,830,584	$73,436,826	0.09
Year 9	67 to 78	$53,658,913	$26,829,456	$48,166,825	0.06
TOTALS		**$631,960,877**	**$315,980,438**	**$568,957,502**	

(a) This calculation is based on the conservative assumption that 50 percent of worker wages would be spent within the ROI.
(b) This column is the sum of construction worker wages with Construction sector multiplier (1.8022) applied (see Table 4.4-6), plus operations worker wages with Power Generation and Utility sector multiplier (1.7880) applied (see Table 4.4-9).
(c) Source: BEA 2009b.

Table 4.4-12
Estimated Corporate Income Tax per Potential $1 Million of Net Revenues

Florida Corporate Tax Revenues, 2007[a]	$2,442,500,000		
Unit Amount, Florida Net Taxable Income, Units 6 & 7	Tax Rate[b]	Tax Amount per $1 Million	% of FL Corporate Income Tax Revenues, 2007
$1,000,000	5.5%	$55,000	0.002%

(a) FDOR Undated.
(b) FDOR 2008a.

Table 4.4-13
Estimated Sales Tax Impacts, Units 6 & 7 Construction Compared to 2007 Tax Revenue, Miami-Dade County and Florida

Sales Tax Scenarios[a]	Low Cost	Mid-Cost "Base Case"	High Cost
Construction Costs, 14-year period [b]	$6,702,200,000	$7,684,300,000	$9,820,560,000
Taxable portion[c]	22.78%	22.78%	22.78%
Taxable amount in Miami-Dade County	$1,526,761,160	$1,750,483,540	$2,237,123,568
Tax Impacts in Miami-Dade County (MDC)			
MDC total sales tax revenues, 2007[d]			**$57,504,000**
MDC sales tax rate[e]	1.0%	1.0%	1.0%
MDC sales tax revenues from Units 6 & 7	$15,267,612	$17,504,835	$22,371,236
Average per year (14 years)	$1,090,544	$1,250,345	$1,597,945
as percentage of 2007 MDC sales tax revenues	1.9	2.2	2.8
Tax Impacts in Florida			
FL total sales tax revenues, 2007[f]			**$22,854,600,000**
FL Sales tax rate[g]	6.0%	6.0%	6.0%
FL Sales tax revenues from Units 6 & 7	$91,605,670	$105,029,012	$134,227,414
Average per year (14 years)	$6,543,262	$7,502,072	$9,587,672
as percentage of 2007 FL sales tax revenues	0.03	0.03	0.04

(a) Source: FPL Oct 2007. Assumes no change in sales tax rates.
(b) FPL uses a 14-year period that encompasses licensing, preconstruction, and construction activities
(c) Labor and services = 34 percent of construction costs; 67 percent would be from MDC providers, Therefore, 23 percent (rounded: 67 percent x 34 percent = 22.78 percent) would generate sales tax (FPL Undated).
(d) Source: MDC Dec 2007.
(e) Source: FDOR Nov 2007.
(f) Source: FDOR Undated.
(g) FDOR 2008b.

Table 4.4-14
Potential Sales Tax Impacts, Units 6 & 7 Construction Period Compared to 2007 Tax Revenue, Miami-Dade County and Florida

	Miami-Dade County	Florida
Year 2007 – Actual Revenues	$57,504,000[(a)]	$22,854,600,000[(b)]
5% of total	$2,875,200	1,142,730,000
10% of total	$5,750,400	2,285,460,000
20% of total	$11,500,800	4,570,920,000
Tax rate	1.0%[(c)]	6.0%[(d)]
Expenditures required to exceed projected collections by specified percentages[(e)]:		
5% of total	$287,520,000	$19,045,500,000
10% of total	$575,040,000	$228,546,000,000
20% of total	$1,150,080,000	$457,092,000,000

(a) Source: MDC Dec 2007.
(b) Source: FDOR Undated.
(c) Source: FDOR Nov 2007.
(d) Source: FDOR 2008b.
(e) Note: Assumes no change in sales tax rates.

Table 4.4-15
Estimated Population Increases from Units 6 & 7 Construction Workers over 2000 Populations, Florida, Miami-Dade County, Homestead, and Florida City

Population increase from construction period workforce and their families	**4,731**
Florida population, 2000[(a)]	15,982,378
% increase from operations	0.03%
Miami-Dade County population, 2000[(a)]	2,253,362
% increase from operations	0.2%
Expected percentage of in-migrating workers to locate in Homestead - Florida City area	42.78%
Expected number of in-migrating workers to locate in Homestead - Florida City area	**2,024**
Total, Homestead and Florida City population, 2000[(b)]	39,752
% increase	5.1%

(a) Source: USCB 2000b.
(b) Source: USCB 2000a

Table 4.4-16
FPL and Turkey Point Tax Payments, 2007, and as Percent of Taxing Entity's Total

FPL Tangible Personal Property Taxes (all Miami-Dade County Properties) Miami-Dade County, Schools, and Special Districts, 2007[a]				
Taxing Unit	**Taxes Paid by FPL**	**Percent of Total FPL Payments**	**Taxing Entity's Total Tax Revenues**	**FPL Payments as % of Total Tax Revenues**
Miami-Dade Schools	$2,761,267[b]	42.8%	$3,742,281,604[c]	0.07%
Miami-Dade County	$3,314,042[b]	51.4%	$1,128,076,000[d]	0.29%
State and Others				
Florida Inland Navigation District	$11,986[b]	0.2%	$28,346,330[e]	0.04%
South Florida Water Mgmt District	$185,729[b]	2.9%	$561,510,785[f]	0.03%
Everglades Construction Project	$31,059[b]	0.5%	$36,179,680[g]	0.09%
Children's Trust Authority	$146,714[b]	2.3%	$85,083,731[h]	0.17%
Subtotal	$375,488[b]	5.8%		
Total	$6,450,797	100.0%		
Turkey Point Property Taxes, Miami-Dade County and Miami-Dade Schools[i]				
Miami-Dade Schools	$3,316,641[j]	42.8%	$3,742,281,604[c]	0.09%
Miami-Dade County	$4,431,612[j]	57.2%	$1,128,079,000[d]	0.39%
Total	**$7,748,253**	**100.0%**		

(a) Source: FPL 2007. Note: Taxes are for all FPL properties located within Miami-Dade County and include properties other than the Turkey Point Plant.
(b) Source: FPL 2007.
(c) FDOE May 2008. Revenues for Miami-Dade Schools include revenues from federal, state, and local governments, and thus include revenues other than property taxes.
(d) Source: MDC Dec 2007.
(e) Source: FIND May 2008.
(f) Source: SFWMD Mar 2008.
(g) Source: SFWMD Oct 2001. Revenues for the Everglades Construction Project are based on a 2001 estimate of projected revenues for 2003.
(h) Source: TCT Feb 2008.
(i) These figures include tax payments on both real property and tangible personal property.
(j) Source: FPL 2008.

Table 4.4-17
Public Water: ROI: Change in Use and Capacity with Population Increase

System Name	Population Served	Primary Water Source[a]	2005 Daily Average Annual Flow (mgd)[a][b]	Rated Capacity (mgd)	Percent Capacity (2005)	Total Population with Construction Increase (4731)	Daily Average Annual Flow Increase at Peak of Construction	Percent Increase	Percent Use Capacity During Construction Adjusted for Population Increase Only
Total ROI	2,405,691		392.32	716.02	54.79	2,410,422	392.79	0.12	54.86
Miami-Dade Water and Sewer Department (WASD)	2,075,304	Surficial Aquifer System	346.5	622.56	55.66	—	—	—	—
Americana Village[a]	2,000	Surficial Aquifer System	0.26	0.5	52.00	—	—	—	—
Florida City[c]	13,105	Surficial Aquifer System	2.44	4	61.00	—	—	—	—
Homestead[c]	52,796	Surficial Aquifer System	7.77	16.99c	45.73	—	—	—	—
North Miami[c]	97,504	Surficial Aquifer System	12.86	32.00c	40.19	—	—	—	—
North Miami Beach[c]	164,982	Surficial Aquifer System	22.49	39.97c	56.27	—	—	—	—
Public Water; Homestead and Florida City: Use and Capacity with Population Increase									
Combined Homestead and Florida City	65,901	—	10.21	20.99	48.64	67,925	11.21	9.81	53.41
Florida City[c]	13,105	Surficial Aquifer System	2.44	4	61.00	—	—	—	—
Homestead[c]	52,796	Surficial Aquifer System	7.77	16.99	45.73	—	—	—	—

(a) Source: SFWMD 2005
(b) The total volume of water flowing into a water facility during any consecutive 365 days, divided by 365 days.
(c) Source: MDWASD 2008.

Table 4.4-18
Wastewater

System Name (Facility ID#)	Plant Capacity (MGD)	Annual Average Flow (MGD)	Flow as Percent of Design Capacity Preconstruction of Units 6 & 7	Flow as Percent of Design Capacity During Peak Construction of Units 6 & 7	Percent Difference Between Preconstruction and Peak Construction of Units 6 & 7
Miami-Dade County					
Total in Region of Influence	374.04	310.73	83.08	83.55	0.47
City of Homestead (FLA013609)	6	5.81	96.83	—	—
MDWASA South District WWTF (FLA042137)	112.5	98.53	87.58	—	—
Turkey Point Power Plant (FLA013612)	0.035	0.003	8.57	—	—
Miami-Dade Water and Sewer Department North District WWTP (FL0032182)	112.5	91.39	81.24	—	—
Central District WWTP (FLA24805)	143	115	80.42	—	—

Source: Socarras 2008

Table 4.4-19
Police Protection in the Region of Influence and the Homestead and Florida City Area, Adjusted for the Construction Workforce and Associated Population Increase

Area	Population (2000)	New Total Population During Peak Construction of Units 6 & 7	Sworn Law Enforcement Officers (2007)	Ratio of Residents per Law Enforcement Officer Preconstruction of Units 6 & 7	Ratio of Residents per Law Enforcement Officer Adjusted at Peak Construction of Units 6 & 7	Sworn Law Enforcement Officers Needed at Peak Construction of Units 6 & 7	Additional Sworn Law Enforcement Officers Needed
Miami-Dade County	2,253,362	2,258,093	3,118	723	724	3,125	7
Homestead and Florida City Area	39,752	41,776	139	286	301	146	7

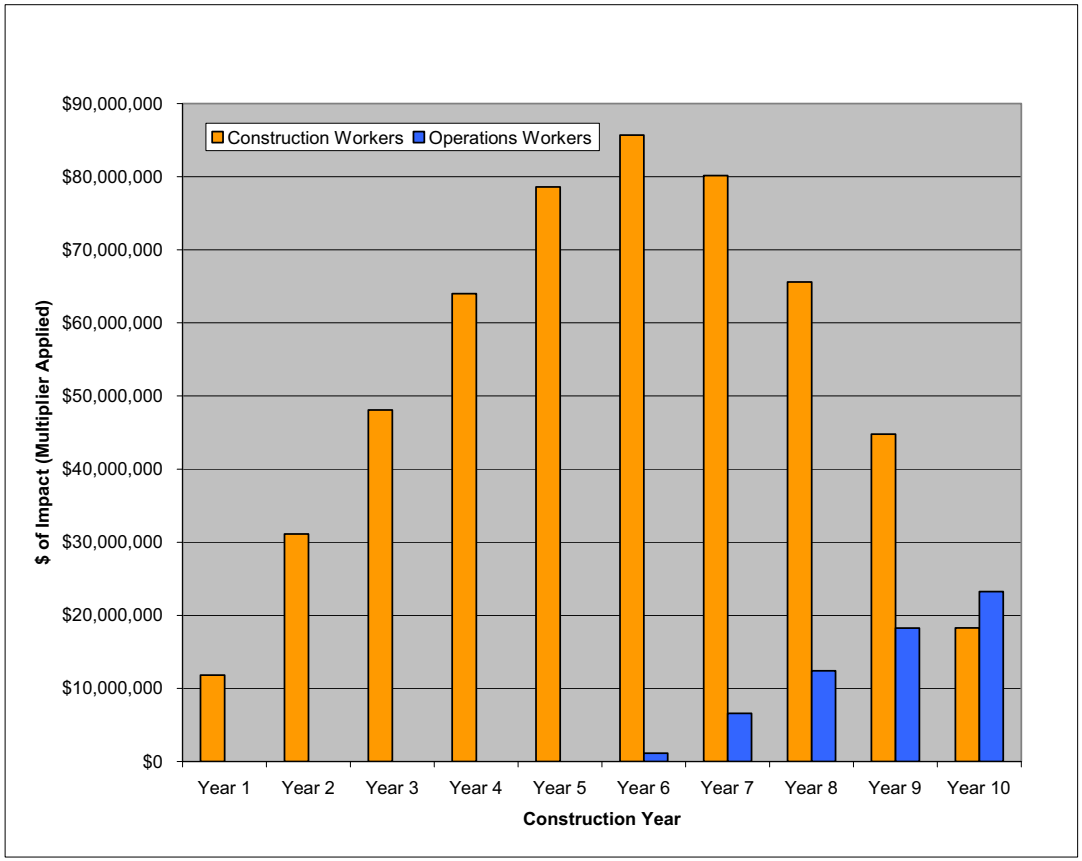
Source: FBI 2008.
Sums may not equal totals because of rounding.

Table 4.4-20
Fire Protection in the Region of Influence and the Homestead and Florida City Area, Adjusted for the Construction Workforce and Associated Population Increase

Area	Population (2000)	New Total Population During Peak Construction of Units 6 & 7	Active Firefighters (career, volunteer, and paid per call) (2007)	Ratio of Residents per Active Firefighter Preconstruction of Units 6 & 7	Ratio of Residents per Active Firefighter During the Peak Construction of Units 6 & 7	Active Firefighters Needed at Peak Construction of Units 6 & 7	Additional Active Firefighters Needed
Miami-Dade County	2,253,362	2,258,093	3,382	666	668	3,389	7
Homestead and Florida City Area	39,752	41,776	92	432	454	97	5

Source: U.S. Fire Administration 2007
Sums may not equal totals because of rounding.

Figure 4.4-1 Impacts by Year of Turkey Point In-Migrating Worker Wages to Region of Influence Economy During Construction Period



Source: Table 4.4-11.

4.5 RADIATION EXPOSURE TO CONSTRUCTION WORKERS

During the construction of Units 6 & 7, workers would be exposed to several potential sources of radiation. This section identifies the potential sources of radiation and estimates the doses that workers would receive during the construction of Units 6 & 7 as a result of the operation of Units 3 & 4. In addition, with Unit 6 scheduled to be operational two years earlier than Unit 7, Unit 6 would be a source of radiation for Unit 7 construction workers during those two years. Therefore, the dose contribution from Unit 6 sources of radiation is also evaluated.

Three types of sources are considered: liquid effluents, gaseous effluents, and direct radiation. Subsection 4.5.1 presents the site layout. Subsection 4.5.2 identifies the specific sources of each type while Subsection 4.5.3 estimates the maximum annual doses to the individual worker as well as the entire workforce.

4.5.1 SITE LAYOUT

The layout of the Units 6 & 7 plant area is shown in Figure 2.1-1. For the purpose of calculating doses to construction workers, it was assumed that all Unit 7 construction activity would take place inside the Unit 7 power block area. More specifically, it was assumed that over the course of the two years that Unit 7 workers would be exposed to radiation from Unit 6, the average location of the Unit 7 worker would be at the center of the Unit 7 reactor.

4.5.2 RADIATION SOURCES

While the new units are being constructed, there would be a potential for construction workers to be exposed to liquid and gaseous effluents as well as direct radiation.

As described in Subsection 3.3.2.3, potable water for Units 6 & 7 would be supplied from the Miami-Dade Water and Sewer Department (MDWASD). Therefore, the drinking water exposure pathway is not considered for the construction workers. Liquid effluents from Units 3 & 4 released into the industrial wastewater facility present a potential source of contamination for workers coming in contact with the wastewater or with soils that come in contact with the wastewater. However, these pathways would be managed to ensure that doses are negligible.

Sources of gaseous effluents at Units 3 & 4 include releases from gas decay tanks, containment purges, and incidental releases from plant operation. Based on the annual effluent reports from 2004 to 2008 (FPL 2004, FPL 2005, FPL 2006, FPL 2007a, FPL 2008), the composite maximum annual release is 35 Curies, primarily as a result of tritium, krypton, and xenon.

The primary sources of gaseous effluents from the operation of Unit 6 would be released from the gaseous radwaste system, the condenser air removal system, and building ventilation systems. The estimated annual isotopic activities in gaseous effluents from an AP1000 unit are shown in DCD Table 11.3-3 (WEC 2008).

Sources of direct radiation at Units 3 & 4 include tanks, filters, and demineralizers associated with fuel and waste storage and handling. However, these components are stored within shielded buildings, rendering dose rates outside to very near background levels and therefore making them negligible (FPL 2007d). Liquid effluents from Units 3 & 4 are released into the industrial wastewater facility, which are a potential source of direct radiation. There is a plan to add an independent spent fuel storage installation (ISFSI) east of Units 3 & 4 at a distance of approximately 3000 feet from the Units 6 & 7 construction area. The impact of all sources of direct radiation is assessed in Subsection 4.5.3.2.

Contained sources of radioactive material from Unit 6, including the refueling water storage tank, will be shielded such that the direct dose rate to Unit 7 is negligible (WEC 2008).

4.5.3 CONSTRUCTION WORKER DOSES

Construction worker doses are estimated from the gaseous effluent and direct radiation pathways. It is assumed that workers are at the construction site for 45 hours per week for 52 weeks a year for an exposure time of 2340 hours per year.

4.5.3.1 Gaseous Effluent Doses

The annual effluent reports for Units 3 & 4 show doses at the Turkey Point plant property boundary from gaseous effluents. Based on the reports from 2004 to 2008 (FPL 2004, FPL 2005, FPL 2006, FPL 2007a, FPL 2008), Table 4.5-1 shows the maximum dose rates at the Turkey Point plant property boundary as a result of inhalation, ground deposition, and plume pathways. These dose rates are based on an atmospheric dispersion factor (X/Q) of 5.8E–07 sec/m^3 (FPL 2007c), while the X/Q from the existing units to the Units 6 & 7 plant area is 2.9E–06 sec/m^3 (FPL 2007c). Since dose is proportional to X/Q, the site boundary dose rates are multiplied by the X/Q ratio of 5.0 (2.9E–06 divided by 5.8E–07) to estimate the dose rates in the construction area, as shown in Table 4.5-1.

The NRC-endorsed GASPAR II computer program (PNL 1987) is used to calculate the doses to construction workers from Unit 6 gaseous effluents. This program implements the radiological exposure models described in RG 1.109, “Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I,” and RG 1.111, “Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors,” to estimate the radioactivity releases in gaseous effluents and the subsequent doses. The following exposure pathways are considered in GASPAR II:

- External exposure to airborne plume
- External exposure to contamination deposited on ground

- Inhalation of airborne activity

The input parameters for the Unit 6 gaseous pathway are presented in Table 4.5-2 and the resulting doses are shown in Table 4.5-3.

The doses from Units 3 & 4 and Unit 6 are summed in Table 4.5-4 to obtain the total gaseous effluent doses. This table also shows the total effective dose equivalent (TEDE), calculated by multiplying the thyroid dose by a weighting factor of 0.03 and adding the product to the total body dose (ICRP 1979). The table indicates that doses from Units 3 & 4 are negligible compared to those from new Unit 6. This is because the doses from Units 3 & 4 reflect realistic operational measurements while those from Unit 6 are based on conservative theoretical calculations.

4.5.3.2 Direct Radiation Doses

Direct radiation measurements at the site indicate exposure rates that are consistent with those observed during the preoperational surveillance program (FPL 2007b). This is supported by an evaluation by the NRC of all existing light water reactors (LWRs), which concludes that: "…because the primary coolant of an LWR is contained in a heavily shielded area, dose rates in the vicinity of light water reactors are generally undetectable and are less than 1 mrem per year at the site boundary" (NUREG-1437, "Generic Impact Statement for License Renewal of Nuclear Plants," Section 4.6.1.2, 1996).

For conservatism, the dose rate in the Unit 7 construction area from Units 3 & 4 is assumed to be 1 mrem per year. Compared to this, the calculated dose rate of 0.009 mrem per year from a fully loaded ISFSI is negligible. When adjusted for an occupancy time of 2340 hours per year, the direct radiation dose from Units 3 & 4 is as follows:

$$(1 \text{ mrem/yr-unit})(2 \text{ units})(2340/8760) = 0.53 \text{ mrem}$$

As stated in Subsection 4.5.2, the direct radiation dose from Unit 6 would be negligible.

4.5.3.3 Total Doses

The doses to Unit 7 construction workers are summarized in Table 4.5-5.As indicated in Table 3.10-2, the peak workforce during any month that Unit 6 is operational and Unit 7 is under construction is no more than 2600 people. Although this peak is anticipated to last for less than a year, it is conservatively assumed that the peak is maintained over the course of an entire year for the purpose of calculating the maximum annual workforce dose.

Table 4.5-6 shows that construction worker doses meet the occupational limits of 10 CFR 20.1201. Tables 4.5-7 and 4.5-8 demonstrate that worker doses are also in compliance with the limits in 10 CFR 20.1301 and 40 CFR 190.10, respectively, for members of the public. Table 4.5-9 shows that the doses would not meet the design objectives of 10 CFR Part 50, Appendix I, for gaseous effluents if the construction area is considered to be an unrestricted area

and the construction workers are considered to be members of the public. However, doses to construction workers are not required to meet public dose limits.

Units 3, 4, and 6 could be operational during the construction of Unit 7. The site would be monitored during the construction period, as described in Section 6.2, and appropriate actions would be taken as necessary to ensure that doses to the construction workers are as low as reasonably achievable (ALARA).

Given that doses to the Unit 7 construction workers meet the public dose criteria of 10 CFR Part 20 and 40 CFR Part 190, it is concluded that the radiological impact on construction workers would be SMALL and no additional mitigation is required.

Section 4.5 References

FPL 2004. *Annual Radioactive Effluent Report*, January 2004 through December 2004, Turkey Point Units 3 and 4.

FPL 2005. *Annual Radioactive Effluent Report*, January 2005 through December 2005, Turkey Point Units 3 and 4.

FPL 2006. *Annual Radioactive Effluent Report*, January 2006 through December 2006, Turkey Point Units 3 and 4.

FPL 2007a. *Annual Radioactive Effluent Report*, January 2007 through December 2007, Turkey Point Units 3 and 4.

FPL 2007b. *2007 Annual Radiological Environmental Operating Report*, Turkey Point Units 3 and 4.

FPL 2007c. *Offsite Dose Calculation Manual for Gaseous and Liquid Effluents from the Turkey Point Plant Units 3 and 4*, Revision 14.

FPL 2007d. *Turkey Point Units 3 and 4 Updated FSAR*, Revision 16.

FPL 2008. *Annual Radioactive Effluent Report*, January 2008 through December 2008, Turkey Point Units 3 and 4.

ICRP 1979. International Council on Radiological Protection, Limits for Intakes or Radionuclides by Workers, Publication 30, Part 1, 1979.

PNL 1987. Pacific Northwest Laboratory, *GASPAR II — Technical Reference and User Guide*, NUREG/CR-4653, April 1987.

WEC 2008. Westinghouse Electric Company, LLC, *AP1000 Design Control Document*, Document No. APP-GW-GL-700, Tier 2 Material, Rev 17, September 2008.

Table 4.5-1
Units 6 & 7 Construction Area Dose Rates from Units 3 & 4 Gaseous Effluents

Organ	Dose Rate (mrem/yr)			
	Site Boundary[a]			Construction Area[b]
	Unit 3	Unit 4	Total	
Total Body	9.3E–4	9.2E–4	1.9E–3	9.3E–3
Thyroid	9.4E–4	9.3E–4	1.9E–3	9.3E–3
Skin	1.4E–3	1.3E–3	2.6E–3	1.3E–2

(a) Bounding values from 5 years of effluent reports (FPL 2004, FPL 2005, FPL 2006, FPL 2007a, FPL 2008)
(b) Site boundary total dose rate adjusted for construction area atmospheric dispersion factor (FPL 2007c)

Table 4.5-2
Unit 6 Gaseous Effluent Pathway Parameters

Parameter	Value	Basis/Source(s)
Release Source Terms	See AP1000 DCD[a] Table 11.3-3	The DCD table shows the activity releases by isotope.
Atmospheric Dispersion and Deposition Factors	See Table 2.7-16	Table 2.7-16 shows the dispersion and deposition data at Unit 7 for releases from Unit 6, based on the centerline distance between the two reactors. This represents the average distance from the Unit 6 release point to the construction worker over the course of a year.
Worker Breathing Rates	8000 m^3/yr	This is the maximum adult breathing rate from RG 1.109, Table E-5.

(a) Source: WEC 2008

Table 4.5-3
Unit 7 Construction Area Dose Rates from Unit 6 Gaseous Effluents

Pathway	Dose Rate (mrem/yr)		
	Total Body	Thyroid	Skin
Plume	12	12	60
Ground	8.7	8.7	10
Inhalation	1.3	8.3	1.3
Total	22	29	72

Table 4.5-4
Gaseous Effluent Doses to Unit 7 Construction Workers

	Annual Dose (mrem)			
Source	**Total Body**	**Thyroid**	**Skin**	**TEDE[c]**
Units 3 & 4[a]	0.0025	0.0025	0.0035	0.0026
Unit 6[b]	5.9	7.8	19	6.1
Total	5.9	7.8	19	6.1

(a) Construction area dose rates from Table 4.5-1 are adjusted for occupancy of 2340 hr/yr.
(b) Construction area dose rates from Table 4.5-3 are adjusted for occupancy of 2340 hr/yr.
(c) TEDE — Total effective dose equivalent calculated by multiplying the thyroid dose by 0.03 and adding it to total body dose.

Table 4.5-5
Total Doses to Unit 7 Construction Workers

	Annual Worker Dose (mrem)[a]			
Pathway	**Total Body**	**Thyroid**	**Skin**	**TEDE[b]**
Direct Radiation	0.53	0.53	0	0.53
Gaseous Effluents	5.9	7.8	19	6.1
Total	6.4	8.3	19	6.7
Annual Workforce Dose (person-rem)[c]				
Total	17	22	50	17

(a) Doses from Subsection 4.5.3.2 and Table 4.5-4 are added
(b) TEDE — Total effective dose equivalent
(c) Workforce dose is the product of worker dose and 2600 workers

Table 4.5-6
Comparison of Construction Worker Doses with 10 CFR 20.1201 Criteria for Occupational Doses

	Annual Dose (rem)	
Organ	**Worker**	**Limit**
TEDE[a]	0.0067	5
Organ other than lens of the eye	0.0083	50
Lens of the eye[b]	—	15
Skin	0.019	50

(a) TEDE — Total effective dose equivalent
(b) Dose to the lens of the eye is not available.

Table 4.5-7
Comparison of Construction Worker Doses with 10 CFR 20.1301 Criteria for Members of the Public

Criteria	Worker	Limit
Annual Dose (mrem TEDE)[(a)]	6.7	100
Unrestricted area dose rate[(b)] (mrem/hr)	0.0028	2

(a) TEDE — Total effective dose equivalent
(b) Dose rate is obtained by dividing the dose by the occupancy time of 2340 hr/yr

Table 4.5-8
Comparison of Construction Worker Doses with 40 CFR 190.10 Criteria for Members of the Public

	Annual Dose (mrem)	
Organ	**Worker**	**Limit**
Total Body	6.4	25
Thyroid	8.3	75
Other Organ — Skin	19	25

Table 4.5-9
Comparison of Construction Worker Doses with 10 CFR Part 50, Appendix I Criteria for Individuals in an Unrestricted Area

	Annual Dose (mrem)	
Criteria	**Worker**	**Limit**
Whole body dose from liquid effluents	0	3
Organ dose from liquid effluents	0	10
Whole body dose from gaseous effluents	5.9	5
Skin dose from gaseous effluents	19	15
Organ dose from radioactive iodine and radioactive material in particulate form from gaseous effluents	8.3	15

4.6 MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS DURING CONSTRUCTION

Sections 4.1 through 4.5 and 4.8 describe potential environmental impacts that could result from construction of Units 6 & 7. In accordance with NUREG-1555, potential adverse environmental impacts from construction activities are identified and addressed in this section, as well as the specific measures and controls to limit those adverse impacts. Some examples of measures and controls to limit such adverse environmental impacts are:

- Compliance with applicable local, state, and federal ordinances, laws, and regulations intended to avoid and minimize the adverse environmental effects of construction activities on air, water and land, workers, and the public.
- Compliance with existing permits and licenses for the existing Turkey Point units.
- Compliance with existing Turkey Point procedures and processes applicable to construction projects.
- Incorporation of environmental requirements of permits in construction contracts.

Table 4.6-1 summarizes the environmental impacts and corresponding measures and controls presented in Sections 4.1 through 4.5 and 4.8 along with the significance of potential impact. The significance of impact (SMALL, MODERATE, or LARGE) was determined by evaluating the potential effects after any controls or mitigation measures had been implemented. The significance levels used in the evaluation were developed using Council on Environmental Quality guidance, 40 CFR 1508.27, and those identified in 10 CFR 51, and in NUREG-1555. These standards establish three significance levels for characterizing environmental impacts: SMALL, MODERATE, or LARGE. The definitions of the significance levels are as follows:

- SMALL – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
- MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
- LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

In addition to the cumulative impacts attributable to the construction of the entire Units 6 & 7 facility that are summarized in Table 4.6-1, a breakdown or separation of "construction" and "preconstruction" environmental impacts has been estimated in Table 4.6-2 for the purpose of

assessing impacts attributable specifically to construction activities as defined in 10 CFR 50.10(a)(1).

Table 4.6-2 provides estimates of the percentage of impacts attributable to "construction" and to "preconstruction," as well as a summary of the basis for the estimates. The estimated construction related impacts presented in the table were based primarily on two factors, namely the area associated with the construction of SSCs and the labor hours associated with the construction of SSCs. Information related to these two factors is provided as follows:

- Construction Area — The total area that would be developed for Units 6 & 7 is estimated to be approximately 600 acres, exclusive of electric transmission lines. Of these developed areas, approximately 30 acres would be developed for the Units 6 & 7 powerblock (equated with the SSCs). The area that would be developed for the construction of SSCs, therefore, represents approximately 5 percent of the total area that would ultimately be developed (excluding electric transmission lines). Because this estimate does not include electric transmission lines, it is conservative. For the purposes of this assessment, the impacted area associated with SSCs is less than 5 percent.

- Labor Hours — Based on preliminary construction estimates for all phases of development for Units 6 & 7, the estimated labor hours associated with the construction of SSCs is approximately 36 percent of the total labor hours associated with the development of the entire project. For the purpose of this assessment, the labor hours associated with SSC construction is less than 35 percent.

Table 4.6-1 (Sheet 1 of 9)
Summary of Measures and Controls to Limit Adverse Impacts during Construction

Impact	Description of Potential Impact	Significance of Impact[a]	Planned Control Program
4.1 Land-Use Impacts			
4.1.1 The Site and Vicinity	Potential impacts from ground-disturbing activities including clearing, grubbing, grading, excavating, backfilling, and stockpiling soils on previously disturbed land	S	Site preparation and construction activities would be conducted in accordance with applicable federal, state, and local regulations. Environmental controls such as storm water management systems, erosion control, fugitive dust control, and spill containment controls would be implemented. Construction practices including controlled plant access for personnel and vehicular traffic, and restriction of construction activities to specified areas to minimize impacts.
4.1.2 Transmission Corridors and Offsite Areas	Potential impacts from constructing new transmission lines in both existing and new corridors (land disturbance includes the loss of some wetland acreage)	S	Restrictive land-clearing processes, in forested wetland areas for right-of-way clearing and preparation would be used. Turbidity screens and erosion control devices in areas of wetlands and water resources for access road/structure pad construction would be used. Existing access roads for ingress and egress to rights-of-way would be used where available. Standard industry construction practices would be used for the transmission line construction, including use of existing right-of-way, to the extent practicable, and environmental management, including such things as erosion control devices, matting to reduce compaction caused by equipment, use of wide-track vehicles when crossing wetlands, and restoration activities after construction.
	Potential impacts from permanently disturbing agricultural land to meet borrow material requirements (using FPL-owned property for borrow material would permanently disturb approximately 300 acres of land classified as agricultural land)	S	This land disturbance represents a small portion of the available agricultural land in the surrounding area, thus no mitigation would be required.
	Potential impacts from disturbing offsite land to install reclaimed water pipelines along both existing and new rights-of-way	S	Clearing of new and/or expansion of existing rights-of-way would include use of environmental best management practices such as those controls listed in Subsection 4.1.1 to minimize impacts to sensitive habitats. Existing rights-of-way and work within previously impacted areas (e.g., road) to the extent practicable would also minimize impacts from land disturbance.
	Potential impacts from disturbing offsite land to expand substations	S	Stormwater retention systems would be installed for expansions.

Table 4.6-1 (Sheet 2 of 9)
Summary of Measures and Controls to Limit Adverse Impacts during Construction

Impact	Description of Potential Impact	Significance of Impact[(a)]	Planned Control Program
4.1.2 Transmission Corridors and Offsite Areas (cont.)	Potential impacts from access road improvements	S	Access road improvements would include the following installation of silt fences, shoulders would be appropriately sloped, and surface water runoff would be managed with the installation of swales and culverts at suitable locations.
4.1.3 Historic Properties	Potential impacts from constructing on previously disturbed land	S	Work plans will be prepared for onsite and offsite areas. The work plans will contain recommendations for development of an Unanticipated Finds Plan and a Contractor Training Program.
4.2 Water-Related Impacts			
4.2.1 Hydrology Alterations 4.2.2 Water Use Impacts and 4.2.3 Water Quality	Potential impacts from hydrological alterations onsite including excavation, filling, creation of reservoir, and elevating land surface	S	Alterations would be limited by the presence of the industrial wastewater facility and the berm to the east of the return canal, and, therefore, would not result in impacts to down stream surface water bodies or resources.
	Potential impacts from the alteration of groundwater flow beneath Units 6 & 7 construction site due to placement of engineering fill, filling of 2 remnant canals,	S	A slurry diaphragm wall would be installed to a depth of approximately –65 ft NAVD around the power blocks during dewatering and excavating subsurface materials. The impacts would be limited to the vicinity of the slurry wall. The use of the slurry wall would allow dewatering of the power block areas with minimal impacts to groundwater directly outside of the slurry wall. No mitigation would be required.
	Potential impacts from hydrological alterations due to offsite construction of transmission lines, reclaimed water pipelines, and potable water pipeline	S	Construction activities would comply with federal and state regulations to site and construct the transmission lines and pipelines. Environmental best management practices would be used (including use of existing rights-of-way to the extent practicable, erosion control devices, matting to reduce compaction and restoration activities after construction). A storm water pollution prevention plan would be developed (SWPPP) for the construction activities or work would be performed under existing permits/plans.
	Potential impacts from erosion from borrow area and establishment of spoils areas	S	Onsite: Berms would be installed to direct runoff to industrial wastewater treatment system. Offsite: A perimeter berm could be used to restrict the flow of surface water onto the property. The berm could also be used in association with detention basins and a truck wash facility to reduce surface water runoff from the site and prevent soils from being unintentionally spread to offsite areas. Drainage ditches could be used to direct surface water flow away from the site and could be reconnected to any drainage features that once flowed through the property to maintain surface flow.

Table 4.6-1 (Sheet 3 of 9)
Summary of Measures and Controls to Limit Adverse Impacts during Construction

Impact	Description of Potential Impact	Significance of Impact[(a)]	Planned Control Program
4.2.1 Hydrology Alterations 4.2.2 Water Use Impacts and 4.2.3 Water Quality (cont.)	Potential impacts from enlargement of equipment barge unloading area would introduce sediment	S	Curtain wall technology would be used to isolate the affected area from the waters of the Biscayne National Park. The modification would be performed using cutoff wall technology (sheet piles) to isolate the equipment barge unloading area from the turning basin. Activities would be performed under a permit issued by the U.S. Army Corp of Engineers.
	Potential impacts from hydrological alterations to surface water flow and filling to raise elevation due to construction of roads and bridges	S	Existing roads would be used to the extent practicable. Ditches and the use of culverts would allow stormwater drainage to be maintained along the road route. During onsite construction, stormwater runoff would be directed to retention basins before being discharged to the industrial wastewater facility. Should modification to the existing draining ditches or drainage features be required, the impacts would be temporary and the disturbed areas would be returned to preconstruction conditions. All work would be performed in accordance with site-obtained permits. During offsite construction, surface water would be routed to areas that could accept the additional surface flow that would then alter the flow in the vicinity of the road.
	Potential impacts from excavation dewatering could impact surface water, groundwater, and wetlands	S	Cutoff wall technology including the use of a slurry wall could be used to limit potential impacts during construction dewatering activities. The water from dewatering activities would be discharged into the cooling canals of the industrial wastewater facility.
	Potential impacts from the installation of radial collector wells	S	The construction activities would be performed in accordance with the required local, state, and federal guidelines and accepted industry practices. The necessary permits would be obtained before beginning construction activities. The delivery pipeline routes would be recontoured afterward. Excavated material would be stockpiled in designated spoils areas. Sedimentation barriers would be installed to limit potential impacts to surface water bodies. Sedimentation basins would also be used to minimize the potential for surface water runoff impacts to nearby water bodies in accordance with FDEP regulations. Once construction activities are complete, the drainage would be restored to preconstruction conditions.
	Potential impacts from the installation of radial collector wells could alter groundwater flow primarily as a result of dewatering	S	Sheet piles could be used to limit potential impacts during construction dewatering activities. Water from dewatering activities would be added to the industrial wastewater facility.
	Potential impacts from the installation and use of deep injection wells	S	The deep injection wells and the required monitoring wells would be installed in accordance with an FDEP injection well permit and any local permit requirements. During the construction of the injection wells and associated equipment, any surface water runoff would be directed to the cooling canals of the industrial wastewater facility.

Table 4.6-1 (Sheet 4 of 9)
Summary of Measures and Controls to Limit Adverse Impacts during Construction

Impact	Description of Potential Impact	Significance of Impact[(a)]	Planned Control Program
4.2.1 Hydrology Alterations 4.2.2 Water Use Impacts and 4.2.3 Water Quality (cont.)	Potential impacts associated with accidental spills which could adversely impact surface waters and groundwater	S	The necessary construction activities would be performed under a new SWPPP or under a modification of an existing Turkey Point SWPPP and associated spill prevention plan that could include oil and fuel containment. Any minor spills of diesel fuel, hydraulic fluid, lubricants, or other construction-related pollutants during construction of the project would be cleaned up quickly to prevent them from moving into the groundwater or flowing to a nearby surface water.
4.3 Ecological Impacts			
4.3.1 Terrestrial Ecosystems	Potential impacts from construction activities could reduce the regional diversity of plants or plant communities	S	Threatened species would be avoided to the maximum extent practical.
	Potential impacts to nesting crocodiles and listed species could be disturbed by construction activities	M: American crocodiles S: other listed species	A project-specific management plan for crocodiles and other listed species has been created for this construction activity. Mitigation measures may include warning signs and education material (for construction personnel) as to the presence and status of crocodiles and restrictions of nocturnal activities. Traffic access at the north end of the cooling canals of the industrial wastewater facility may pose a threat to crocodiles crossing this road and would be mitigated by installation of a wildlife corridor to provide pathways for crocodiles to travel between wetlands on either side of this road. Construction of transmission facilities within the cooling canals of the industrial wastewater facility may avoid known crocodile nests and be conducted between nesting seasons.
	Potential impacts from equipment barge unloading area enlargement activities, increased barge traffic, and dredging, if needed, could disturb manatees	S	A management plan for in-water activities to minimize potential impacts to manatees would be implemented. This plan would include use of observers to spot manatees during in-water activities and reduction of in-water activities if manatees were observed within the basin.
	Potential impacts to wetland habitat	M	Impacts to wetlands would be mitigated by active mitigation (e.g., installation of culverts under existing road beds to allow sheet flow of water), “land swapping”, and/ or purchase of wetland credits from the Everglades Mitigation Bank or other regional mitigation opportunities.
	Potential impacts from construction noise and vibration could displace some wildlife	S	Measures to reduce noise and vibration levels during construction may include staggering work activities, and use of noise dampeners and noise control equipment on vehicles and equipment.

Table 4.6-1 (Sheet 5 of 9)
Summary of Measures and Controls to Limit Adverse Impacts during Construction

Impact	Description of Potential Impact	Significance of Impact[(a)]	Planned Control Program
4.3.1 Terrestrial Ecosystems (cont.)	Potential impacts from new tall structures and the use of cranes could lead to avian collisions	S	No mitigation measures would be required.
	Potential impacts from light pollution during facility construction and operation can alter behavior of birds and bats	S	To the extent practicable, unnecessary lights would be turned off at night, lights turned downward or hooded directing light downward, and lower-powered lights used during construction to minimize impacts on wildlife.
	Potential impacts from the construction of new transmission corridors (Woodstork have nested in two Everglades National Park colonies—the alternative transmission corridor is located in the core foraging area of both wood stork colonies)	S	Impacts to wetlands within the core foraging area would mitigated as prescribed by regulatory agencies. To mitigate the potential for collisions or electrocutions, avian friendly design standards would be used as provided for in the Avian Protection Plan.
4.3.2 Aquatic Ecosystems	Potential impacts from accidental spills associated with construction activity could adversely impact surface waters and aquatic ecosystems	S	Spill prevention techniques would include locating storage areas for petroleum products at a safe distance from surface waters. Any spills of diesel fuel, hydraulic fluid, or lubricants during construction would be cleaned up to prevent spilled fuel or oil from impacting aquatic resources. A Spill Prevention, Control, and Countermeasure (SPCC) Plan would be implemented in accordance with EPA regulations (40 CFR Part 112). Spills would be attended to and not allowed to flow to nearby surface water.
	Potential impacts associated with the enlargement of the equipment barge unloading area and facilities and dredging, if needed, would temporarily increase suspended sediments and disturb the immediate area	S	The modification would be performed using cutoff wall technology (sheet piles) to isolate the equipment barge unloading area from the turning basin. Dredging, if necessary, will conform to guidance provided by the Army Corp of Engineers and dredging permit conditions.
	Potential impacts from the construction of radial collector wells and supporting infrastructure could impact red mangroves and subsequently the mangrove rivulus, a state and federal species of concern.	S	Construction activities would be controlled so as to minimize any impacts to red mangroves or mangrove rivulus.

Table 4.6-1 (Sheet 6 of 9)
Summary of Measures and Controls to Limit Adverse Impacts during Construction

Impact	Description of Potential Impact	Significance of Impact[(a)]	Planned Control Program
4.4 Socioeconomic Impacts			
4.4.1 Physical Impacts	Potential impacts associated with noise during construction activities	S	Noise surveys indicate that noise generated from construction activities would be attenuated by distance from the source and, therefore, would not significantly affect offsite areas. Thus, no mitigation would be required.
	Potential impacts from fugitive dust and fine particulate matter emissions	S	Specific mitigation measures such as stabilizing construction roads and unsuitable spoils piles, limiting speeds on unpaved construction roads, using water for dust control, covering haul trucks, and revegetating road medians and slopes would be implemented in a dust control plan.
	Potential impacts from emissions from construction activities	S	Phase construction to minimize daily emissions. Perform proper maintenance of construction vehicles to maximize efficiency and minimize emissions.
	Potential aesthetic impacts from the on-site construction of tall structures and use of cranes	S	The current viewscape from Units 1-5 includes other tall structures. Thus, the viewscape would not be significantly altered and no mitigation would be required.
	Potential aesthetic impacts from the construction of transmission corridors	M	Impacts to the natural and built environment would be minimized to the extent feasible through the selection process (i.e., to the extent practicable follow existing corridors), engineering options, and construction techniques used.
	Potential impacts from the delivery of construction materials and from workers commuting to the site that would increase peak hourly traffic on area roads	M	A new entrance and access roads would be constructed to access Units 6 & 7 and existing roads would be improved.
4.4.2 Social and Economic Impacts	Potential impacts from the increase in population due to in-migration of peak workers during construction	MDC: S H&FC: S	No mitigation would be required.
	Potential impacts from the loss of construction jobs, population, wage income, and income due to the out-migrating construction workforce as construction is completed	MDC: S H&FC: S-M	Out-migration would occur gradually over the last few years of the construction phase, and the loss of construction workers would be partially offset by the higher-income incoming operations workers. Timely communication would be maintained with municipal and county government authorities and nongovernmental organizations to disseminate project information that could have socioeconomic impacts in the community. Timely information would be provided to the local media, enabling businesses and individuals to make informed decisions and economic choices.

Table 4.6-1 (Sheet 7 of 9)
Summary of Measures and Controls to Limit Adverse Impacts during Construction

Impact	Description of Potential Impact	Significance of Impact[(a)]	Planned Control Program
4.4.2 Social and Economic Impacts (cont.)	Potential impacts from indirect jobs reducing the unemployment in the region of interest	S, positive	The assumption is that all indirect jobs would be filled by people currently residing within the region of interest. No mitigation would be required.
	Potential impacts from workers' wages on the local economy	MDC: S, positive H&FC: S, positive	No mitigation would be required.
	Potential impacts from the collection of taxes during the construction period of Turkey Point Units 6 & 7	MDC: S, positive H&FC: S-M, positive	No mitigation would be required.
	Potential impacts from new residential or commercial development	MDC: S H&FC: S	Communication would be maintained with local and regional governmental and nongovernmental organizations, including but not limited to the Department of Planning and Zoning and Department of Community and Economic Development, to disseminate project information in a timely manner. This would allow these organizations to be given the opportunity to plan accordingly.
	Potential impacts from increased traffic on roads due to deliveries of fill and construction materials to Units 6 & 7	S	Fill deliveries would not coincide with the peak commuting hour and construction materials deliveries would be made throughout the day and not be concentrated during the peak hour of travel.
	Potential impacts from increased traffic on the roads in the vicinity as a result of construction workers	MDC: S H&FC: L	A new entrance and access roads with three lanes would be constructed. Existing roads would be widened and turning lanes added.
	Potential impacts from increased traffic on roads in the vicinity as a result of outage workers	MDC: S H&FC: S	Impacts are small and temporary. The refueling schedule for Unit 6 would occur after the peak construction period.
	Potential aesthetic impacts from onsite construction structures, and noise and vehicle exhaust impacts from construction activities	MDC: S H&FC: S	No mitigation would be required.
	Potential impacts from the increased use of recreational facilities due to the increase in population	MDC: S H&FC: S	No mitigation would be required.

Table 4.6-1 (Sheet 8 of 9)
Summary of Measures and Controls to Limit Adverse Impacts during Construction

Impact	Description of Potential Impact	Significance of Impact[(a)]	Planned Control Program
4.4.2 Social and Economic Impacts (cont.)	Potential impacts from the decrease in available housing due to the population increase associated with construction	MDC: S H&FC: S	The construction workforce would gradually increase reaching its peak after 3 years. The current housing inventory is sufficient to accommodate 100 percent of the in-migrating workforce.
	Potential impacts from the additional water demand due to in-migrating workers	MDC: S H&FC: S	The increased demand from the estimated increase in population as a result of the construction-related workforce would not exceed the available capacity of the municipal water supplies. Communication would be maintained with local and regional governmental planning organizations such as the Miami-Dade County Department of Planning and Zoning, the Miami-Dade Water & Sewer Department (MDWASD), and South Florida Water Management District. Information could be shared such as project activity scheduling, and projected workforce in-migration, thereby giving the organizations time to prepare for demands on services.
	Potential impacts from additional wastewater requiring treatment due to in-migrating workers' water usage	MDC: S H&FC: S	The increased demand from the estimated increase in population as a result of the construction-related workforce would not exceed the available capacity of the Homestead WWTF and the MDWASD South District Wastewater Treatment Plant. Early communication would be maintained with local and regional governmental organizations, including planning commissions and local and regional economic development agencies, such as the Miami-Dade Planning and Zoning Department, to disseminate construction-related information in a timely manner. Local governments and planning groups would have time to plan for the influx. Infrastructure upgrades and expansions could be funded, at least in part, by construction-related property and sales use tax payments.
	Potential impacts from the increase in the residents-per-law enforcement officer and residents-per-firefighter ratios	MDC: S H&FC: S	Increased property and sales/use tax revenues generated during construction could be used to fund additional law enforcement officers and firefighters. However, expanding fire suppression services, including the hiring of additional personnel, would likely begin before a sufficient amount of these tax revenues would be available to local governments. Therefore, local governments could access other funding sources or issue bonds until the tax revenues would become available. Also, the peak construction workforce would not be in place until month 78 of construction activities, giving local governments time to plan and budget accordingly. Additionally, communication would be held regularly with local and regional governmental officials about the proposed Units 6 & 7 construction and its schedules, allowing local and regional officials ample opportunity to plan for the population influx.
	Potential impacts from the increased demand for medical services	S	No mitigation would be required.

Table 4.6-1 (Sheet 9 of 9)
Summary of Measures and Controls to Limit Adverse Impacts during Construction

Impact	Description of Potential Impact	Significance of Impact[(a)]	Planned Control Program
4.4.2 Social and Economic Impacts (cont.)	Potential impacts from increased student enrollment in public schools	MDC: S H&FC: S	The peak workforce during construction would not be reached sooner than the third year of construction, giving the school district a few years to make accommodations for the additional students. Schools could install modular classrooms, and recruit additional teachers, as the school population would increase between the start of construction activities and the peak of construction in 2016. Local communities would be provided with timely information regarding the proposed activities at Units 6 & 7, giving the school district several years to make accommodations for the additional influx of students.
4.4.3 Environmental Justice	Potential for disproportionately high adverse impacts to low-income and minority populations	Not applicable	No mitigation would be required.
4.5 Radiation Exposure to Construction Workers			
4.5 Radiation Exposure to Construction Workers	Potential radiation exposure to Unit 6 & 7 construction workers due to the operation of Units 3 & 4 and from Unit 6 after it becomes operational. Estimated dose would be within public dose criteria of 10 CFR 20 and 40 CFR 190	S	The plant area would be monitored during the construction period, and appropriate actions would be taken as necessary to ensure the doses to the construction workers are as low as is reasonably achievable.
4.8 Nonradiological Health Impacts			
4.8.2 Occupational Health	Potential for occupational injuries or illnesses due to construction activities	(b)	(b)

(a) The assigned significance levels [(S)mall, (M)oderate, or (L)arge] are based on the assumption that for each impact, the associated proposed mitigation measures and controls (or equivalents) would be implemented (10 CFR 51, Appendix B, Table B-1, Footnote 3).
(b) Impact is potential and estimates are based on national and Florida rates; therefore, impact severity and potential mitigation measures are not assigned.

FDEP = Florida Department of Environmental Protection
H&FC = Homestead and Florida City (area)
MDC = Miami-Dade County
SWPPP = Stormwater Pollution Prevention Plan

Table 4.6-2 (Sheet 1 of 12)
Separation of Preconstruction and Construction[(a)] Impacts

ER Section	Combined Preconstruction and Construction Impact Significance	Separation of Impacts; Significance and Percent		
		Preconstruction	Construction	Basis for Separation
4.1 Land-Use Impacts				
4.1.1 The Site and Vicinity	S	S (100)	S (0)	Impact caused by preparation of site for construction (e.g., clearing, grubbing) and, by definition, is not construction
4.1.2 Transmission Corridors and Offsite Areas				
4.1.2.1 Proposed Transmission Corridors	S	S (100)	NA	Transmission corridors not included in definition of construction
4.1.2.2 Offsite Substations	S	S (100)	NA	Offsite areas not included in definition of construction
4.1.2.3 Fill Borrow Areas	S	S (100)	NA	Offsite areas not included in definition of construction
4.1.2.4 Makeup Water Systems	S	S (100)	NA	Offsite areas not included in definition of construction
4.1.2.5 Access Roadways	S	S (100)	NA	Offsite areas not included in definition of construction
4.1.3 Historic Properties				
4.1.3.1 Onsite Facilities and Construction Areas	S	S (5)	S (95)	View offsite limited to large structures located in powerblock area. Preconstruction includes cranes erection and use. Construction work assembles buildings.
4.1.3.2 Offsite Transmission Line Corridors	S	S (100)	NA	Transmission corridors not included in definition of construction
4.1.3.3 Other offsite areas	S	S (100)	NA	Service facilities not included in definition of construction

Table 4.6-2 (Sheet 2 of 12)
Separation of Preconstruction and Construction[a] Impacts

ER Section	Combined Preconstruction and Construction Impact Significance	Separation of Impacts; Significance and Percent		
		Preconstruction	Construction	Basis for Separation
4.2 Water-Related Impacts				
4.2.1.1.1 Construction and Laydown Areas				
Surface Water	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
Groundwater	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
4.2.1.1.2 Spoils Area Establishment				
Surface Water	S	S (100)	NA	Disturbance area located outside powerblock area
Groundwater	S	S (100)	NA	Disturbance area located outside powerblock area
4.2.1.1.3 Access Roads, Heavy Haul Road, Bridges, and Equipment Barge Unloading Area Improvements				
Surface Water	S	S (100)	NA	Disturbance area located outside powerblock area
Groundwater	S	S (100)	NA	Disturbance area located outside powerblock area
4.2.1.1.4 Security Facilities				
Surface Water	S	S (100)	NA	Disturbance area located outside powerblock area
Groundwater	S	S (100)	NA	Disturbance area located outside powerblock area
4.2.1.1.5 Construction Utilities				
Surface Water	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
Groundwater	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]

Table 4.6-2 (Sheet 3 of 12)
Separation of Preconstruction and Construction[a] Impacts

ER Section	Combined Preconstruction and Construction Impact Significance	Separation of Impacts; Significance and Percent		
		Preconstruction	Construction	Basis for Separation
4.2.1.1.6 Construction Facilities and Preparation Activities				
Surface Water	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
Groundwater	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
4.2.1.1.7 Constructing FPL Reclaimed Water Treatment Facility				
Surface Water	S	S (100)	NA	Disturbance area located outside powerblock area
Groundwater	S	S (100)	NA	Disturbance area located outside powerblock area
4.2.1.1.8 Constructing Radial Collector Wells				
Surface Water	S	S (100)	NA	Disturbance area located outside powerblock area
Groundwater	S	S (100)	NA	Disturbance area located outside powerblock area
4.2.1.1.9 Deep Injection Wells				
Surface Water	S	S (100)	NA	Disturbance area located outside powerblock area
Groundwater	S	S (100)	NA	Disturbance area located outside powerblock area
4.2.1.1.10 Onsite Connector Transmission Corridors				
Surface Water	S	S (100)	NA	Disturbance area located outside powerblock area
Groundwater	S	S (100)	NA	Disturbance area located outside powerblock area

Table 4.6-2 (Sheet 4 of 12)
Separation of Preconstruction and Construction[(a)] Impacts

ER Section	Combined Preconstruction and Construction Impact Significance	Separation of Impacts; Significance and Percent		
		Preconstruction	Construction	Basis for Separation
4.2.1.1.11 Potable Water Pipelines				
Surface Water	S	S (100)	NA	Disturbance area located outside powerblock area
Groundwater	S	S (100)	NA	Disturbance area located outside powerblock area
4.2.1.2 Offsite Facilities				
4.2.1.2.1 Borrow Areas				
Surface Water	S	S (100)	NA	Offsite areas not included in definition of construction
Groundwater	S	S (100)	NA	Offsite areas not included in definition of construction
4.2.1.2.2 Transmission Corridors	S	S (100)	NA	Transmission corridors not included in definition of construction
4.2.1.2.3 Reclaimed Water Pipelines				
Pipeline – Surface Water	S	S (100)	NA	Offsite areas not included in definition of construction
Pipeline – Groundwater	S	S (100)	NA	Offsite areas not included in definition of construction
Treatment Facility – Surface Water	S	S (100)	S (0)	Disturbance area located outside powerblock area
Treatment Facility – Groundwater	S	S (100)	S (0)	Disturbance area located outside powerblock area

Table 4.6-2 (Sheet 5 of 12)
Separation of Preconstruction and Construction[a] Impacts

ER Section	Combined Preconstruction and Construction Impact Significance	Separation of Impacts; Significance and Percent		
		Preconstruction	Construction	Basis for Separation
4.2.1.2.4 Offsite Roads				
Surface Water	S	S (100)	NA	Offsite areas not included in definition of construction
Groundwater	S	S (100)	NA	Offsite areas not included in definition of construction
4.2.1.2.5 Potable Water Pipeline	S	S (100)	NA	Offsite areas not included in definition of construction
4.2.2 Water Use Impacts				
4.2.2.1 Surface Water	None	None	None	Analysis concludes no impacts because no use
4.2.2.2 Groundwater				
4.2.2.2.1 Onsite Areas	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
4.2.2.2.2 Offsite Areas	S	S (100)	NA	Offsite areas not included in definition of construction
4.2.3 Water-Quality Impacts				
4.2.3.1 Surface Water				
Onsite Areas	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
Offsite Areas	S	S (100)	NA	Offsite areas not included in definition of construction
4.2.3.1 Groundwater				
4.2.3.2.1 Onsite Areas	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
4.2.3.2.2 Offsite Areas	S	S (100)	NA	Offsite areas not included in definition of construction

Table 4.6-2 (Sheet 6 of 12)
Separation of Preconstruction and Construction[a] Impacts

ER Section	Combined Preconstruction and Construction Impact Significance	Separation of Impacts; Significance and Percent		
		Preconstruction	Construction	Basis for Separation
4.3 Ecological Impacts				
4.3.1 Terrestrial Ecosystems				
4.3.1.1 Potential Impacts to the Units 6 & 7 Site and other Onsite Areas				
4.3.1.1.1 Plants and Plant Communities	S	S (100)	S (0)	Impact caused preparation of site for construction (e.g., clearing, grubbing) and, by definition, is not construction
4.3.1.1.2 Threatened and Endangered Species				
Crocodile	M	M (50)	M (50)	Impact significance based on combination of level of physical activity and proximity to habitat. 50/50 split is reasonable between preconstruction and construction
Wood storks	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
Manatees	S	S (100)	S (0)	Area of potential impact, barge basin and channel, not in powerblock area
Eastern Indigo Snake	S	S (100)	S (0)	Area of potential impact, uplands, not in powerblock area
4.3.1.1.3 Other Important Species	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
4.3.1.1.4 Wetlands	M	M (100)	S (0)	Impact caused by preparation of site for construction (e.g., clearing, grubbing) and, by definition, is not construction

Table 4.6-2 (Sheet 7 of 12)
Separation of Preconstruction and Construction[a] Impacts

ER Section	Combined Preconstruction and Construction Impact Significance	Separation of Impacts; Significance and Percent		
		Preconstruction	Construction	Basis for Separation
4.3.1.1.5 Other Construction Impacts				
Noise	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
Avian collisions	S	S (0)	S (100)	Impacts most likely limited to large structures located above ground in powerblock area
Light pollution	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
4.3.1.2 Potential Impacts of Makeup Water Systems				
4.3.1.2.1 Reclaimed Water Pipelines and Pipelines	S	S (100)	NA	Offsite areas not included in definition of construction
4.3.1.2.1 Radial collector wells	S	S (100)	S (0)	Area of potential impact not in powerblock area
4.3.1.3 Potential Impacts to Off-site Areas				
4.3.1.3.1 Transmission Corridors	S	S (100)	NA	Transmission corridors not included in definition of construction
4.3.1.3.2 Borrow material	S	S (100)	NA	Offsite areas not included in definition of construction
4.3.1.3.3 Access Roads and Potable Water Pipeline	S	S (100)	NA	Offsite areas not included in definition of construction
4.3.2 Aquatic Ecosystems				
4.3.2.1 General Impacts to Aquatic Resources				
4.3.2.1.1 Sedimentation	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
4.3.2.1.2 Turbidity	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]

Table 4.6-2 (Sheet 8 of 12)
Separation of Preconstruction and Construction[a] Impacts

ER Section	Combined Preconstruction and Construction Impact Significance	Separation of Impacts; Significance and Percent		
		Preconstruction	Construction	Basis for Separation
4.3.2.1.3 Petroleum Spills	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
4.3.2.1 General Impacts to Aquatic Resources (cont.)				
4.3.2.1.4 Habitat Disturbance	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
4.3.2.2 Potential Impacts to the Units 6 & 7 Site and Other On-Site Aquatic Resources				
4.3.2.2.1 Equipment Barge Unloading Area	S	S (100)	S (0)	Area of potential impact, barge basin and access channel, not in powerblock area
4.3.2.2.2 Drilling deep injection wells	None	None	None	No aquatic habitats impacted
4.3.2.2.3 Parking and Laydown Areas	S	S (100)	S (0)	Area of potential impact not in powerblock area
4.3.2.3 Potential Impacts to Off-Site Aquatic Resources				
4.3.2.3.1 Reclaimed Water Pipelines	S	S (100)	NA	Offsite areas not included in definition of construction
4.3.2.3.2 Radial Collector Wells	S	S (100)	S (0)	Area of potential impact not in powerblock area
4.3.2.3.3 Transmission Corridors	S	S (100)	NA	Transmission corridors not included in definition of construction
4.3.2.3.4 Roadway improvements	S	S (100)	NA	Offsite areas not included in definition of construction
4.3.2.3.5 Borrow Material	S	S (100)	NA	Offsite areas not included in definition of construction

Table 4.6-2 (Sheet 9 of 12)
Separation of Preconstruction and Construction[a] Impacts

ER Section	Combined Preconstruction and Construction Impact Significance	Separation of Impacts; Significance and Percent		
		Preconstruction	Construction	Basis for Separation
4.4 Socioeconomic Impacts				
4.4.1 Physical Impacts of Construction				
4.4.1.1 Noise				
Onsite	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
Transmission corridors	S	S (100)	NA	Transmission corridors not included in definition of construction
Offsite	S	S (100)	NA	Offsite areas not included in definition of construction
Traffic	S	S (65)	S (35)	Labor hours[c]
4.4.1.2 Air	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
4.4.1.3 Aesthetics				
Onsite	S	S (0)	S (100)	View offsite limited to large structures located in powerblock area. Preconstruction includes cranes erection and use. Construction work assembles buildings.
Offsite, eastern transmission corridors	S	S (100)	NA	Transmission corridors not included in definition of construction
Offsite, western transmission corridors	M	M (100)	NA	Transmission corridors not included in definition of construction

Table 4.6-2 (Sheet 10 of 12)
Separation of Preconstruction and Construction[a] Impacts

ER Section	Combined Preconstruction and Construction Impact Significance	Separation of Impacts; Significance and Percent		
		Preconstruction	Construction	Basis for Separation
4.4.1.4 Traffic				
Commuter	M	M (65)	M (35)	Labor hours[c]
Fill movement	M	M (25)	M (75)	Fill for island, most, estimated at 75 percent of work activity, for deepest excavation (powerblock area) to bring to finish grade
Barge	S	S (100)	S (0)	Area of potential impact, barge basin and access channel, not in powerblock area
4.4.2 Social and Economic Impacts				
4.4.2.1 Demography	S	S (65)	S (35)	Labor hours[c]
4.4.2.2 Impacts to the Community				
4.4.2.2.1 Economy				
Unemployment in Region of Influence	S	S (65)	S (35)	Labor hours[c]
4.4.2.2.1.1 Construction In-Migrants	S	S (65)	S (35)	Labor hours[c]
4.4.2.2.1.2 Operations In-Migrants	S	S (0)	S (100)	Assumed that operations workers onsite during peak construction would be training for jobs in powerblock area
4.4.2.2.1.4 End of Construction Period	S-M	S-M (65)	S-M (35)	Labor hours[c]
4.4.2.2.2 Taxes				
4.4.2.2.2.1 Personal and Corporate Income Taxes	S	S (0)	S (100)	Unit 6 operating while Unit 7 construction finishing
4.4.2.2.2.2 Sales and Use Tax	S-M	S-M (65)	S-M (35)	Labor hours[c]

Table 4.6-2 (Sheet 11 of 12)
Separation of Preconstruction and Construction[a] Impacts

ER Section	Combined Preconstruction and Construction Impact Significance	Separation of Impacts; Significance and Percent		
		Preconstruction	Construction	Basis for Separation
4.4.2.2.2 Taxes (cont.)				
4.4.2.2.2.3 Other Sales and Use-Related Taxes	S	S (65)	S (35)	Labor hours[c]
4.4.2.2.2.4 Property Taxes – County and Special Districts	S-M	S (0)	S-M(100)	Plant book value based primarily on power block features
4.4.2.2.2.5 Property Taxes – Independent School District	S	S (0)	S (100)	Plant book value based primarily on power block features
4.4.2.2.3 Land Use				
4.4.2.2.3.1 Land Use	S	S (65)	S (35)	Labor hours[c]
4.4.2.2.3.2 Construction-Related Population Growth	S	S (65)	S (35)	Labor hours[c]
4.4.2.2.4 Transportation	M	M (65)	M (35)	Labor hours[c]
4.4.2.2.5 Aesthetics and Recreation				
4.4.2.2.5.1 Aesthetic Impacts to Recreation	S	S (5)	S (95)	View offsite limited to large structures located in powerblock area. Preconstruction includes cranes erection and use. Construction work assembles buildings.
4.4.2.2.5.2 Use Impacts to Recreation	S	S (65)	S (35)	Labor hours[c]
4.4.2.2.6 Housing	S	S (65)	S (35)	Labor hours[c]
4.4.2.2.7 Public Services				
4.4.2.2.7.1 Water Supply Facilities	S	S (65)	S (35)	Labor hours[c]
4.4.2.2.7.2 Wastewater Treatment Facilities	S	S (65)	S (35)	Labor hours[c]

Table 4.6-2 (Sheet 12 of 12)
Separation of Preconstruction and Construction[a] Impacts

ER Section	Combined Preconstruction and Construction Impact Significance	Separation of Impacts; Significance and Percent		
		Preconstruction	Construction	Basis for Separation
4.4.2.2.7 Public Services (cont.)				
4.4.2.2.7.3 Law Enforcement, Fire, and Medical Services	S	S (65)	S (35)	Labor hours[c]
4.4.2.2.8 Education	S	S (65)	S (35)	Labor hours[c]
4.4.3 Environmental Justice				
4.4.3.1 Health and Environmental Impacts	S	S (95)	S (5)	Separation between preconstruction and construction based on acreage[b]
4.4.3.2 Socioeconomic Impacts	S	S (65)	S (35)	Labor hours[c]
4.5 Radiation Exposure to Construction Workers	S	S (65)	S (35)	Labor hours[c]
4.8 Non-radiological Health Impacts	Not assigned	(65)	(35)	Labor hours[c]

(a) "Construction," as defined in 10 CFR 50.2 "Definitions," refers to the construction of "safety-related structures, systems, or components (SSCs) of a facility."
(b) Acreage – Work on powerblock area is assumed to be nuclear safety related and, therefore, construction. As shown in Table 3.9-2 and Figure 3.9-1, the powerblock area would occupy approximately 30 acres, or 5 percent, of a total 600 acres of disturbed land. Preconstruction would occupy the remainder, or 95 percent, of the acreage.
(c) Labor Hours - Work on powerblock area is assumed to be nuclear safety related and, therefore, construction. Preliminary construction estimates for a similar reactor facility (*Levy Nuclear Plant Units 1 and 2 COL Application, Part 3, Environmental Report*), suggest labor hour breakdown would be as follows: preconstruction 65 percent and construction 35 percent.
L = LARGE — For the issue, environmental impacts are clearly noticeable and are sufficient to destabilize important attributes of the resource.
M = MODERATE — Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
NA = Not applicable.
S = SMALL — Environmental effects are not detectable or are so minor they will neither destabilize nor noticeably alter any important attribute of the resource. For the purposes of assessing radiological impacts, impacts that do not exceed permissible levels in U.S. Nuclear Regulatory Commission regulations are considered SMALL.

4.7 CUMULATIVE IMPACTS RELATED TO CONSTRUCTION ACTIVITIES

This section addresses cumulative impacts to the region's environment that could result from the construction of Units 6 & 7. A cumulative impact is defined in Council of Environmental Quality regulations (40 CFR 1508.7) as an "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions."

To determine cumulative impacts, the impacts of the construction of Units 6 & 7, as described in Chapter 4, are combined with other past, present, and reasonably foreseeable future actions at and in the vicinity (within 6 miles of Units 6 & 7) that would affect the same resources, regardless of what agency (federal or nonfederal) or person undertakes such other actions. The cumulative impacts addressed in this section are those expected to overlap with the impacts of the proposed construction as a result of timing and geographic area. The geographic area that was used when considering cumulative impacts for the various resource areas is described in Table 4.7-1. Not all of the impacts of the proposed construction would be cumulative with other past, present, and reasonably foreseeable actions. For example, impacts that would not extend beyond the boundaries of the Units 6 & 7 construction site (the Units 6 & 7 plant area) would not be cumulative with other projects. In addition, the impacts of Units 6 & 7 construction are based on existing environmental conditions, so the construction impact analyses have already accounted for present actions when the existing state of the resource is used as a comparison for impacts. For example, impact analysis for water quality and aquatic ecology resources uses existing conditions as the baseline for determining impacts. The baseline accounts for the discharges to surface and groundwater from the past as well as the present because discharges directly influence water quality parameters. The aquatic ecology resources baseline would account for past and present actions that play a role in the vitality of aquatic populations and their habitat's ability to sustain a viable population.

With regard to the timing consideration for cumulative impacts, the schedule for preconstruction, limited work authorization (LWA), and construction activities is presented in Section 3.9. Pre-LWA activities would begin approximately the third quarter of 2011, followed without lapse by LWA and construction activities, with completion of construction activities for Unit 6 in the third quarter of 2018 and Unit 7 in the third quarter of 2020. Therefore, the time frame for future projects to be considered cumulative to those impacts from Units 6 & 7 construction activities is 2011 to 2020.

Other projects in the area considered for cumulative impacts are:

- **Continued operation and maintenance of Units 1 through 5**

The existing facilities on the Turkey Point plant property are two natural gas/oil conventional boiler units (Units 1 & 2), two pressurized water nuclear reactors (Units 3 & 4), and one combined-cycle natural gas unit (Unit 5). These facilities would continue their operations and outages, in the case of the nuclear units, during the construction of Units 6 & 7. The existing workforce for Units 1 through 5 is a total of 977 workers (Table 2.5-3) and the Turkey Point entrance used by these workers is from SW 344th Street/Palm Drive. These units operate under existing permits, procedures, and environmental programs that include measures designed to minimize impacts to the environment. A closed-loop system of canals is used by Units 1 through 4 to provide cooling. This system is a permitted industrial wastewater facility. Unit 5 uses mechanical draft cooling towers for heat dissipation. These towers receive water from the Upper Floridan aquifer for use as makeup water and route their blowdown to the industrial wastewater facility.

- **Planned uprates to Units 3 & 4**

A power uprate for Units 3 & 4 is scheduled for completion in 2012. This uprate construction would be to the interior of existing structures. FPL plans to perform the physical work associated with the Turkey Point uprate project beginning in 2010 and ending in 2012, primarily during two scheduled refueling outages for each unit. The maximum workforce would be approximately 1400 workers performing both the uprate project and normal outage activities onsite for approximately 60 days and no additional operations workers would be required.

- **A new independent spent fuel storage installation (ISFSI) for Units 3 & 4**

Construction of the Units 3 & 4 ISFSI is scheduled to begin in 2009. The Units 3 & 4 ISFSI construction activities would be completed before or soon after the pre-LWA activities in 2011, well before the peak Units 6 & 7 construction activities.

- **The EMB, which is FPL owned land adjacent to the Turkey Point plant property that is held in trust as a wetland mitigation bank**

The Everglades Mitigation Bank (EMB) is a 13,249-acre site approximately 5 miles south of Florida City, just southwest of the Turkey Point plant property and east of U.S. Highway 1. The EMB is permitted by the state of Florida and the Army Corps of Engineers. Access to the EMB is available from U.S. Highway 1, Card Sound Road, and from the L-31E Levee via SW 344 Street/ Palm Drive. The EMB consists of land located between U.S. Highway 1 and Card Sound Road and east of Card Sound Road extending to Card Sound, then north along the L-31E Canal (FDEP 1996, 2003; USACE and SFWMD Aug 2002).During the operations time frame the EMB activities would be in accordance with permit conditions.

- **The Comprehensive Everglades Restoration Project (CERP) to be undertaken adjacent to the Turkey Point plant property**

The CERP projects in the vicinity of Units 6 & 7 are the Biscayne Bay Coastal Wetlands (BBCW) and C-111 Spreader Canal (USACE and SFWMD 2009a, b, c). The BBCW project is designed to rehydrate wetlands and reduce point source discharge to Biscayne Bay (USACE and SFWMD 2009b). The project includes the construction of pump stations, spreader swales, stormwater treatment areas, flowways, levees, culverts, and backfilling canals in southeast Miami-Dade County. The project covers 13,600 acres from the Deering Estate at Canal-100C, south to the Turkey Point plant property, generally along L-31E Canal. When contacted in February 2009, the South Florida Water Management District's (SFWMD) project manager indicated that the schedule for construction of the project was uncertain due to funding constraints, but that it is anticipated that construction would occur during the 2010 to 2020 timeframe.

The C-111 Spreader Canal involves the redistribution of water to recharge the South Dade Wetlands to include the EMB (USACE and SFWMD 2009c). The construction of this project would begin after a final environmental impact statement is issued, which is scheduled to be completed in July 2009. The SFWMD's project manager for the C-111 Spreader Canal, when contacted in February 2009 concerning the current state of the project, explained that the project has been divided into two components. The first component to be constructed is the Western Features portion which includes a number of features including a reservoir, pump station, and work at L-31E. Construction of this portion of the project is scheduled to begin in September 2009 and should be completed in approximately 12 months. The Western Features portion of the project includes features which are anticipated to result in some increases in the average water table in the marsh land adjacent to the Turkey Point plant property. This increase in the water table would also assist in retarding saltwater intrusion into the groundwater in the same area. The second portion of the project is construction of a spreader canal to replace the lower C-111 Canal. The extent of the spreader canal is yet to be designed, but the general area would be beginning at the C-111 Canal (just west of the western side of the Everglades National Park) to just east of Card Sound Road. The planning for this last portion is anticipated to begin after construction commences for the first phase, with construction perhaps starting in 2013 or 2014. The construction period would be on the order of 18 months.

- **A new Florida Gas Transmission Company (FGT) natural gas pipeline**

The FGT pipeline will be 6.5 miles long and parallel existing FGT pipelines and FPL transmission lines. The pipeline will be installed along SW 97 Avenue north of Turkey Point and travel south toward Turkey Point. The pipeline is planned to be in service in 2010 to 2011 (FGT Sep 2008).

- **FPL Princeton-Turkey Point 230 kV transmission line**

This new transmission line would be installed primarily within the existing Clear Sky-to-Davis 230 kV corridor. The line is expected to be placed in service in 2011.

4.7.1 LAND USE

Onsite construction activities are planned for disturbed land and/or land with existing structures. In addition, protective measures are required during construction activities in accordance with applicable permits. Land use impacts to offsite areas as a result of the construction of transmission lines, substations, the reclaimed water pipelines, and potable water pipelines have been characterized as SMALL. Therefore, the impacts to land use from construction would be SMALL and would not require mitigation.

A review of the adopted 2015-2025 Comprehensive Development Plan for Miami-Dade County indicates that land in the immediate vicinity of Turkey Point, in unincorporated Miami-Dade County, would remain protected land, open land, parkland, or agricultural land and would not be subject to development. Land farther to the west in the urban areas of Homestead and Florida City had land use designations that would allow development in accordance with local zoning restrictions (MDC Nov 2007).

The projects presented above were considered for cumulative land use impacts. The existing facilities at Turkey Point as well as the Units 3 & 4 uprate would not impact land use. The Units 3 & 4 ISFSI would be constructed on land among existing structures near Units 3 & 4 where the ground was disturbed during their construction. The CERP projects would restore wetlands in the vicinity, which would provide a land use benefit. The Princeton-Turkey Point 230 kV line and the FGT pipeline would be primarily constructed within existing corridors. The EMB would continue to preserve wetlands and would not contribute or detract from land use impacts. The cumulative land use impacts would be SMALL.

The projects presented above were considered for cumulative impacts to historical properties. Those projects that would disturb land that was not previously disturbed would have the potential for impacts to historical properties. The existing facilities at Turkey Point, including the Units 3 & 4 uprate and the EMB, do not involve land disturbance and would not involve new structures. The Units 3 & 4 ISFSI does involve land disturbance, but it would be constructed among existing structures so its existing location was previously disturbed. The CERP projects involve land disturbance and, therefore, have the potential to impact historic or cultural sites during construction. The projects' construction activities would be focused in areas where the land is previously disturbed to install the cooling canals of the industrial wastewater facility, thereby decreasing the likelihood of impacts to historic or cultural sites. Should such impacts occur, they could be additions, but temporary, with those of Units 6 & 7 construction. Therefore, cumulative

impacts to historic properties would not be more severe than the impact to historic properties posed by the construction of Units 6 & 7.

4.7.2 HYDROLOGY AND WATER USE

4.7.2.1 Surface Water

Subsection 4.2 addresses hydrologic alterations affecting surface water as a result of the construction of onsite and offsite structures. The water bodies and areas that would be affected by the construction of Units 6 & 7 are the mudflats (consisting of wet organic soil material) in the plant area, the remnant canals in the plant area, a dead-end canal located northwest of the plant area, the nuclear administration building, training building, and parking area on land north of the Units 6 & 7 plant area consisting of mangrove swamps/wetlands, and the barge turning basin. Offsite canals, surface drainage features, and wetlands could be affected from crossing by the reclaimed water pipelines, potable water pipelines, transmission lines, access road, and bridges. The analysis concluded that impacts would be SMALL.

Units 1 through 4 use the industrial wastewater facility for heat dissipation. Unit 5 uses mechanical draft cooling towers for heat dissipation. These towers receive water from the Upper Floridan aquifer for use as makeup water and route their blowdown to the industrial wastewater facility. The operations of Units 1 through 5 do not impact surface water beyond the industrial wastewater facility. The construction activities for Units 6 & 7 would impact the industrial wastewater facility, but the impacts would not extend to offsite areas.

The Units 3 & 4 uprate involves construction activities conducted in the interior of existing structures, so hydrologic alterations would not be made and the cooling canals in the industrial wastewater facility would continue to be used after the uprate is completed. The Units 3 & 4 ISFSI would be incorporated into Turkey Point's stormwater management program and would not have the potential to impact surface water.

The EMB would continue to preserve wetlands and would not contribute or detract from surface water and water use impacts. The purpose of the CERP projects is to make beneficial hydrologic alterations that would have large beneficial surface water impacts. The Princeton-Turkey Point 230 kV line would be constructed using environmental best management practices, including erosion-control devices, matting to reduce compaction caused by equipment, use of wide-track vehicles when crossing wetlands, and restoration activities after construction. FGT plans to cross canals along the route using the horizontal directional drill method where the pipeline is placed beneath the water body, minimizing impacts. Both the Princeton-Turkey Point 230 kV line and the FGT pipeline would be constructed early in the Units 6 & 7 construction schedule and any impacts would be temporary and localized. Accordingly, the cumulative impacts to surface water would be positive and LARGE owing to the EMB and CERP projects. The hydrologic alterations

resulting from construction of Units 6 & 7 would be only a SMALL detractor to this overall beneficial impact of restoring wetlands in the area.

4.7.2.2 Groundwater

Section 4.2 describes hydrologic alterations as a result of the construction of onsite and offsite structures and their potential to affect groundwater in the Floridan and Biscayne aquifers and concludes that these alterations would have a SMALL impact to groundwater resources. In addition, the analysis considered impacts to groundwater from dewatering activities at both onsite and offsite construction locations. The impacts were characterized as localized, temporary, and SMALL.

The other Turkey Point facilities use water supplied by Miami-Dade County and, therefore, do not impact groundwater resources. The EMB and CERP would provide beneficial impacts to groundwater because of their preservation and restoration of wetlands providing recharge to subsurface waters. Construction of the Princeton-Turkey Point 230 kV line would follow environmental best management practices and include use of environmental controls to minimize impacts such as matting to reduce compaction caused by equipment. The FGT pipeline would be required to follow Federal Energy Regulatory Commission guidelines to minimize impacts to groundwater resources. Therefore, these facilities and projects would not contribute to adverse groundwater impacts, so the cumulative impact including the construction of Units 6 & 7 would be SMALL.

4.7.2.3 Water Use

The water needed for construction activities would be supplied by Miami-Dade County from their potable water supply. No water would be withdrawn from surface water or groundwater wells for use in onsite or offsite construction activities. Therefore, there would be no impacts to water resources due to water use aside from the potential impact to public water supplies, which are considered as one aspect of the socioeconomic impacts.

4.7.2.4 Water Quality

The clearing, excavating, filling, grading, dewatering, and soil stockpiling associated with the construction of Units 6 & 7 and offsite facilities (i.e., transmission lines, reclaimed water pipelines, potable water pipelines, the FPL-owned fill source) could potentially impact water quality. However, the impacts of constructing Units 6 & 7 would be minimized from the application of environmental controls that would be part of an erosion, sedimentation, and pollution control plan and implementation of environmental best management practices, including structural and operational controls to prevent the movement of pollutants (including sediments) into wetlands and water bodies via stormwater runoff. The construction activities associated with the enlargement of the equipment barge unloading area would inevitably disturb sediments and soils

that could increase turbidity immediately in the turning basin, which could migrate to Biscayne Bay. The water quality impacts that could result from the construction of Units 6 & 7 were characterized as SMALL (Section 4.2).

The other projects previously identified could also impact water quality. The area expected to be disturbed by the other projects is more than one acre. Therefore, those construction activities would also have to implement erosion, sedimentation, and pollution control plan and environmental best management practices in compliance with the EPA's Phase I stormwater regulations. Construction of the Princeton-Turkey Point 230 kV line would follow environmental best management practices and include use of environmental controls to minimize impacts. The FGT pipeline would be required to follow Federal Energy Regulatory Commission guidelines to minimize impacts to surface and groundwater resources. The application of the erosion and pollution prevention plans and environmental best management practices to the CERP projects would minimize impacts to water quality to those that are SMALL and temporary. The cumulative impact to surface water quality, should any of these individual SMALL, temporary impacts become additive, would also be SMALL given the application of control measures that protect water quality.

The projects were also assessed for cumulative impacts to groundwater quality. As stated above, the existing units, Units 6 & 7 construction activities, as well as the CERP, FGT, and Princeton-Turkey Point 230 kV construction activities would be subject to pollution prevention plans. Implementation of such plans would ensure that the impact of any spills would be minimized by quick responses and the use of appropriate spill cleanup equipment. Therefore, cumulative impacts to groundwater quality would be SMALL.

4.7.3 ECOLOGY (TERRESTRIAL AND AQUATIC)

4.7.3.1 Terrestrial

Cumulative impacts to terrestrial resources were assessed for the Turkey Point plant property and offsite areas. The operation of the Units 3 & 4 ISFSI would not impact terrestrial resources. The EMB would have no negative impacts on terrestrial resources. The Units 3 & 4 uprate construction would be to the interior of existing structures, so this project would not contribute to cumulative impacts to terrestrial resources. Existing Turkey Point facilities and operations are subject to management/conservation plans designed to protect important species with a particular focus on the American crocodile. Some of the features of the management/ conservation program are:

- Habitat preservation and creation of habitat suitable for crocodile nesting and basking
- Establishment of exclusion zones at known nesting sites (nest sanctuaries)

- Daytime and nighttime monitoring surveys to document nesting activity and use of the cooling canals
- Capture and tagging of hatchlings using Avid microchip technology
- Relocation of hatchlings to low-salinity habitat during early life stages to increase survival
- Recapture, monitoring, and release of individuals to document growth and survival

As described in Subsection 2.4.1.2, Turkey Point's conservation efforts have contributed to the increase in population of the American crocodile. In addition, other species of concern are protected with project-specific management plans (Section 4.3).

Therefore, the existing Turkey Point facilities would have only a small contribution to the cumulative impact.

The portions of CERP that are adjacent to the Turkey Point plant property could potentially lead to temporary cumulative impacts to terrestrial resources. The objective of the project is to restore wetlands and, therefore, restore habitat for terrestrial species that inhabit wetlands. Portions of the CERP projects are in the area designated as critical habitat for the American crocodile (see Figure 2.4-3) and, therefore, would be subject to controls to ensure the protection of local populations. The CERP projects would serve to enhance wetland habitat and would ultimately provide a beneficial impact to local populations. As addressed in Subsection 4.7.2.4, these projects would have to implement measures to protect water quality. Given the temporary nature of the impacts, the objective of the CERP projects to restore and enhance habitat, and the application of measures to protect water quality and crocodile populations, they would have a SMALL impact on terrestrial resources that would contribute to temporary cumulative impacts. The terrestrial impact of Units 6 & 7 construction was characterized as SMALL to MODERATE. The additive and possibly synergetic affect of both Units 6 & 7 construction and the CERP projects construction activities would be temporary. Therefore, the overall cumulative impact to terrestrial resources during Units 6 & 7 construction would be MODERATE.

4.7.3.2 Aquatic

The other projects presented above were considered for cumulative impacts to the aquatic ecological resources to the north and west of the Turkey Point plant property, as well as the downstream points (i.e., Biscayne Bay and Card Sound). The impact to aquatic resources from the construction of Units 6 & 7 and offsite facilities is characterized as SMALL in Subsection 4.3.2.

The other projects described above were considered for potential cumulative impacts on aquatic resources. Operation of the Units 3 & 4 ISFSI would not result in an impact to aquatic resources

because it is a storage facility that does not use water and does not have environmental emissions that would be additive with construction of Units 6 & 7. Likewise, the interior construction activities of the Units 3 & 4 uprate would also not impact aquatic resources. The EMB would not have adverse impacts on aquatic resources. Operating the existing units would have impacts to aquatic ecology through their continued use of the industrial wastewater facility. However, the SMALL aquatic ecology impact from the construction of Units 6 & 7 would be isolated to impacted areas and would not be additive to the impacts of the existing facilities.

Impacts as a result of construction at offsite locations could be cumulative with impacts from the CERP projects, Princeton-Turkey Point 230 kV line, and the FGT pipeline. However, as stated in Subsection 4.7.2, these other projects would apply measures to protect surface water resources and aquatic ecological resources. Therefore, impacts would be temporary, occurring during construction activities. The Princeton-Turkey Point 230 kV line and FGT pipeline would be in service in 2011, before the peak Units 6 & 7 construction activities. The objective of these other projects is to restore wetlands, so aquatic ecological resources would benefit from these projects in the long term. The cumulative impacts to aquatic resources would be SMALL.

4.7.4 SOCIOECONOMIC RESOURCES

Impacts to socioeconomic resources stem from the physical impacts of construction and from demands placed on the region by the workforces needing housing and public services, and also spending their salaries and paying taxes. The other facilities and projects considered for cumulative impacts are those described above. These facilities and projects would have both positive and negative socioeconomic impacts to the Homestead and Florida City area, the geographic area in the region of interest chosen for assessing cumulative impacts. These positive and negative socioeconomic impacts stem from physical impacts (noise, air emissions, and visual intrusions), current spending of salaries, payment of taxes, and use of public services.

The offsite physical impacts of constructing Units 6 & 7 would be SMALL with the exception of traffic impacts (Subsection 4.4.1) and visual impacts from new transmission lines (Subsection 4.4.1), which would be MODERATE. The other construction projects (i.e., the CERP Project, Princeton-Turkey Point 230 kV line, and the FGT pipeline) would have physical impacts that are temporary and localized to their immediate area.

The facilities and projects presented above were considered for their potential to result in cumulative socioeconomic impacts as a result of workforces. Because the socioeconomic analysis presented in Subsection 4.4.2 uses existing socioeconomic conditions and forecasts based on existing conditions as a baseline, the impacts of the existing facilities would already have been accounted for in the impact analysis that concluded the impacts would be SMALL with the exception of transportation, which would be MODERATE during Units 6 & 7 construction. In addition to normal operations of the existing units, the nuclear units, Units 3 & 4, would also have

periodic outages. Previous outages have required 600 to 900 employees. These additional workers could temporarily increase traffic and housing demands. As addressed in Subsection 4.4.2.2.4, the existing units and new Units 6 & 7 would be using different entrances into Turkey Point, but would be using portions of the same feeder roadways. Outages could further impact these feeder roads if peak travel times for these workforces overlapped.

As presented in Subsection 4.4.2.2.6, available housing in the Homestead and Florida City area is more than adequate to accommodate the in-migrating population projected to settle there. In addition, the area has 953 full-hookup recreational vehicle spaces and 1410 hotel/motel rooms (Subsection 4.4.2.2.6). The occupancy rate for hotel/motel rooms in the area varies widely, with 50 percent occupancy rate reported for October 2007 and 89 percent reported for February 2007 (Subsection 2.5.2.6.4). Therefore, the additional demand for temporary housing created by outage workers could be accommodated in the Homestead and Florida City area, but at times temporary housing could be scarce. Miami-Dade County has 41,728 hotel/motel rooms (Subsection 2.5.2.6.4), so even if hotel/motel rooms become scarce in the Homestead and Florida City area, the additional workers have temporary housing opportunities in the region of interest.

The socioeconomic impact of constructing the Units 3 & 4 ISFSI would peak well before the start of Units 6 & 7 construction because ISFSI construction would be complete in 2011. The operation of the Units 3 & 4 ISFSI would support Units 3 & 4 operations and may require only a limited number of additional workers.

As stated above, the Units 3 & 4 uprate would require a maximum of 1400 workers for 60-day intervals and would not require additional operations workers. Based on the worker numbers and schedule of activities given in Sections 3.9 and 3.10, the number of workers for Units 6 & 7 onsite at the end of 2013 (Month–6, Table 3.10-2) would be 2066. Using the Units 6 & 7 workforce estimate of 2066 and adding the maximum uprate workforce (1400 workers), the total would be 3466 workers, which is below the peak workforce used in characterizing the impacts of the Units 6 & 7 workforce of 3647 (Subsection 4.4.2). Therefore, the cumulative impacts of the Units 3 & 4 uprate and Units 6 & 7 construction during the overlapping time period, summer 2011 to spring 2012, would be less than the impacts at the peak Units 6 & 7 construction activities, as described in previous sections of Chapter 4. Furthermore, the impacts of the Units 3 & 4 uprate project would result in no destabilizing impacts to housing, transportation, or public facilities or services. Therefore, the impact of the Units 3 & 4 uprate is not considered for cumulative impacts beyond the impacts on the construction workforce.

The EMB would have socioeconomic benefits to the area that are difficult to quantify as it preserves the natural state of the land. The more tangible socioeconomic benefits would include any taxes paid by FPL on the property and compensation to FPL employees that oversee it. However, these socioeconomic impacts would be accounted for in the baseline used for

assessing Units 6 & 7 construction impacts and, therefore, EMB is not further considered for cumulative impacts.

Considering the two CERP projects, the SFWMD project managers indicated, when contacted in February 2009, that workforce estimates have not been developed to date. Given the schedule uncertainty and the lack of socioeconomic information on the BBCW project, it is not considered for cumulative socioeconomic impacts. The C-111 Spreader Canal project construction activities would take place east of U.S. Highway 1, with the exception of placement of culverts under this highway and Card Sound Road. The most direct route to the construction site for the activities other than the culvert placements and possibly filling activities would be to travel west on SW 344th Street/Palm Drive away from Turkey Point. The route for filling activities could use U.S. Highway 1, but entry points to reach the canals would likely be south of the U.S. Highway 1's junction with State Road 997. Given that a worker estimate could not be developed and the transportation routes to these construction activities and Turkey Point would diverge at SW 344 Street/Palm Drive, the C-111 Spreader project is not considered further for cumulative impacts.

The socioeconomic impacts of the Princeton-Turkey Point 230 kV line and FGT pipeline would occur during their construction when supplies are being purchased and workers are in the area spending their salaries and being accommodated by temporary housing. Construction of these projects would be completed and they would be in service in 2011 long before the peak Units 6 & 7 construction activities.

The positive socioeconomic impacts would be additional local and state revenues from tax collections, both sales tax on construction materials and sales and property taxes paid by workers. These tax revenues would be cumulative with the Units 3 & 4-related tax revenues. In addition, the projects would infuse money into the general economy through the purchase of materials, supplies, fuel, energy, and services and workers spending their salaries.

Other socioeconomic impacts as a result of the additional population in-migration could put a potential strain on community services such as transportation infrastructure, recreational facilities, law enforcement and fire protection, medical services, water supplies, wastewater treatment, and schools.

As presented in Subsection 4.4.3, environmental justice impacts were assessed for the construction of Units 6 & 7 and it was concluded that there were no construction-related impacts identified that would have disproportionately high and adverse effects on the human health, environment, and socioeconomics of minority or low-income populations. Therefore, no cumulative environmental justice impacts are expected.

4.7.5 SUMMARY

Cumulative impacts to land use, hydrology and water use, ecology, and socioeconomics as a result of the construction of Units 6 & 7 along with the operation and maintenance of the existing units, the Units 3 & 4 uprate, the Units 3 & 4 ISFSI, EMB, CERP projects, Princeton-Turkey Point transmission line, and FGT pipeline were assessed. The cumulative impacts range from SMALL adverse to beneficially LARGE and are summarized in Table 4.7-2.

Section 4.7 References

FDEP (Florida Department of Environmental Protection) 1996. *Mitigation Bank Permit No. 132637449*, issued October 21, 1996.

FDEP 2003. *FPL, Everglades Mitigation Bank, Phase II, Permit No. 0193232-001*, issued October 17, 2003.

FGT (Florida Gas Transmission Company, LLC) Sep 2008. *FGT Phase VII Expansion Project PF08-14-000, Resource Report No.1*, General Project Description, September 2008.

MDC (Miami-Dade County) Nov 2007. *Adopted 2015–2025 Comprehensive Development Master Plan* land use map, November 2007. Available at http://www.miamidade.gov/planzone/CDMP_landuse_map.asp, accessed on September 9, 2008.

USACE and SFWMD (US Army Corps of Engineers and South Florida Water Management District) Aug 2002. *Comprehensive Everglades Restoration Plan, Biscayne Bay Coastal Wetlands Project Management Plan (PMP) August 2002 - Final.* Available at http://www.evergladesplan.org/pm/pmp/pmp28biscayne.aspx, accessed on May 20, 2009.

USACE and SFWMD 2009a. *CERP Projects & Feasibility Studies: Section Overview, CERP Projects*. Available at http://www.evergladesplan.org/pm/projects/landing_projects.aspx, accessed on May 20, 2009.

USACE and SFWMD 2009b. *Comprehensive Everglades Restoration Plan, Projects, Biscayne Bay Coastal Wetlands*. Available at http://www.evergladesplan.org/pm/projects/proL28_biscayne_bay.aspx, accessed on May 20, 2009.

USACE and SFWMD 2009c. *Comprehensive Everglades Restoration Plan, Projects, CIII Spreader Canal Western Project*. Available at http://www.evergladesplan.org/pm/projects/proL29_c111.aspx, accessed on May 20, 2009.

Table 4.7-1
Geographic Areas Used in Cumulative Analysis

Resource	Geographic Area
Land Use	Homestead and Florida City area
Hydrology & Water Use	Surface Water: Surface water at, adjacent to, or downstream of proposed action offsite areas and Turkey Point Groundwater: Biscayne aquifer underlying south Miami-Dade County and the Floridan aquifer
Ecology	Terrestrial: immediate surrounding area Aquatic: Surface water to the north of Turkey Point encompassing the reclaimed and potable water pipelines that are part of the proposed action and to the west to U.S. Highway 1 and the downstream points from this land area (i.e., Biscayne Bay and Card Sound).
Socioeconomics	Homestead and Florida City area

Table 4.7-2 (Sheet 1 of 4)
Summary of Adverse Cumulative Impacts

Category	Description of Cumulative Impact	Potential Cumulative Impacts Significance
Land Use	1. Units 6 & 7 – construction on previously disturbed land, designated for industrial use 2. Operation and maintenance of existing units – none 3. Units 3 & 4 Uprate – none 4. Units 3 & 4 ISFSI – construction among existing structures, property is designated for industrial use 5. EMB - none 6. CERP – restore wetlands, providing a land use benefit 7. CERP C-111 Spreader Canal – restore wetlands, providing a land use benefit 8. Princeton-Turkey Point - none 9. FGT Pipeline - none	Small
Historic Properties	1. Units 6 & 7 – work plans submitted 2. Operation and maintenance of existing units – none 3. Units 3 & 4 Uprate – none 4. Units 3 & 4 ISFSI – none 5. EMB – none 6. CERP – not available 7. CERP C-111 Spreader Canal – not available 8. Princeton-Turkey Point - same as Clear Sky-Davis transmission corridor 9. FGT pipeline - none	None

Table 4.7-2 (Sheet 2 of 4)
Summary of Adverse Cumulative Impacts

Category	Description of Cumulative Impact	Potential Cumulative Impacts Significance
Hydrology & Water Use	**Surface water:** 1. Units 6 & 7 – hydrologic alterations on the Turkey Point plant property and offsite impacts as a result of crossing of canals, wetlands, and surface drainage features 2. Operation and maintenance of existing units – none 3. Units 3 & 4 Uprate – none 4. Units 3 & 4 ISFSI – none 5. EMB – none 6. CERP – beneficial hydrologic alterations to restore wetlands 7. CERP C-111 Spreader Canal – beneficial hydrologic alterations to restore wetlands 8. Princeton-Turkey Point – potential small, temporary 9. FGT pipeline – potential small, temporary minimized by horizontal directional drill crossings **Water Use:** 1. Units 6 & 7 – none 2. Operation and maintenance of existing units – none 3. Units 3 & 4 Uprate – none 4. Units 3 & 4 ISFSI - none 5. EMB – none 6. CERP – not available 7. CERP C-111 Spreader Canal – not available 8. Princeton-Turkey Point – none 9. FGT pipeline – as permitted, if any **Groundwater:** 1. Units 6 & 7 – hydrologic alterations at the construction site, dewatering 2. Operation and maintenance of existing units – none 3. Units 3 & 4 Uprate – none 4. Units 3 & 4 ISFSI – none 5. EMB – beneficial 6. CERP – beneficial 7. CERP C-111 Spreader Canal – beneficial 8. Princeton-Turkey Point – potential small, temporary 9. FGT pipeline – potential small, temporary **Water quality:** 1. Units 6 & 7 – land disturbance activities could impact water quality as a result of runoff, potential for spills 2. Existing Turkey Point facilities – potential for spills 3. Units 3 & 4 Uprate – none 4. Units 3 & 4 ISFSI – none 5. EMB – none	Surface water: Large positive Groundwater: Small Water quality: Small

Table 4.7-2 (Sheet 3 of 4)
Summary of Adverse Cumulative Impacts

Category	Description of Cumulative Impact	Potential Cumulative Impacts Significance
	Water quality (cont.) 6. CERP – land disturbance activities could impact water quality as a result of runoff, potential for spills 7. CERP C-111 Spreader Canal – land disturbance activities could impact water quality because of runoff, potential for spills 8. Princeton-Turkey Point – land disturbance activities could impact water quality due to runoff, potential for spills 9. FGT pipeline – land disturbance activities could impact water quality due to runoff, potential for spills	
Terrestrial Ecology	1. Units 6 & 7 – land disturbance and construction traffic near crocodile population inside critical habitat area, would implement mitigation measures 2. Operation and maintenance of existing units – operate under management/conservation plans 3. Units 3 & 4 Uprate – none 4. Units 3 & 4 ISFSI – none 5. EMB – none 6. CERP – land disturbance in critical habitat area, subject to stormwater requirements to protect water quality and subject to critical habitat requirements to preserve crocodile populations 7. CERP C-111 Spreader Canal – land disturbance in critical habitat area, subject to stormwater requirements to protect water quality and subject to critical habitat requirements to preserve crocodile populations 8. Princeton-Turkey Point – land disturbance activities outside of critical habitat area 9. FGT pipeline – land disturbance activities outside of critical habitat area	Moderate
Aquatic Ecology	1. Units 6 & 7 – hydrologic alterations at the construction site and offsite impacts as a result of crossing of canals, wetlands, and surface drainage features, dredging in equipment barge unloading area 2. Operation and maintenance of existing units – none 3. Units 3 & 4 Uprate – none 4. Units 3 & 4 ISFSI – none 5. EMB – none 6. CERP – beneficial hydrologic alterations to restore wetlands 7. CERP C-111 Spreader Canal – beneficial hydrologic alterations to restore wetlands 8. Princeton-Turkey Point – potential small, temporary 9. FGT pipeline – potential small, temporary minimized by horizontal directional drill crossings	Small

Table 4.7-2 (Sheet 4 of 4)
Summary of Adverse Cumulative Impacts

Category	Description of Cumulative Impact	Potential Cumulative Impacts Significance
Socioeconomic	1. Units 6 & 7 – physical impacts of construction and in-migrating population of 4741 no environmental justice impacts 2. Operation and maintenance of existing units – 600 – 900 outage workers 3. Units 3 & 4 Uprate – none (bounded by subsequent Units 6 & 7 peak workforce) 4. Units 3 & 4 ISFSI – none (completed before pre-LWA work) 5. EMB – none 6. CERP – estimated in-migrating population of 1950 7. CERP C-111 Spreader Canal – Not available 8. Princeton-Turkey Point – construction activities prior to Units 6 & 7 peak construction 9. FGT pipeline – construction activities prior to Units 6 & 7 peak construction	Physical Impacts of Construction: Small Socioeconomic (except transportation): Small; Transportation: Moderate Environmental Justice: None

4.8 NONRADIOLOGICAL HEALTH IMPACTS

4.8.1 PUBLIC HEALTH

Potential nonradiological health impacts of Units 6 & 7 construction are addressed in this section. The potential impacts to the public from water discharges, air emissions, and noise are addressed in Subsections 4.2.3 and 4.4.1.

4.8.2 OCCUPATIONAL HEALTH

Constructing the units and associated transmission lines would involve risks to workers from accidents or occupational illnesses. These risks could result from such incidents as construction accidents (e.g., falls and burns), exposure to toxic or oxygen-replacing gases, and other causes.

The Bureau of Labor Statistics maintains a statistical database that includes national and state-by-state total recordable cases, which is a measure of work-related injuries or illnesses that include death, days away from work, restricted work activity, and medical treatment beyond first aid. The 2007 nationwide total recordable cases rate published by the Bureau of Labor Statistics for utility sector construction was 4.7 per 100 workers (BLS 2008a). The same statistic for Florida is 4.9 per 100 workers (BLS 2008b). These rates were used to estimate the number of total recordable cases for the construction of Units 6 & 7. The national and state total recordable case rates were multiplied by the number of workers (Table 3.10-2) and the resulting estimates are presented in Table 4.8-1. The annual average total recordable cases for the 108-month period encompassing preconstruction, limited work authorization, and construction activities were estimated for both units as well as the peak annual (12 months) total recordable cases.

Section 4.8 References

BLS (Bureau of Labor Statistics) 2008a. *Table 1. Incidence rates of nonfatal occupational injuries and illnesses, 2007.* Available at http://www.bls.gov/iif/home.htm, accessed March 27, 2009.

BLS 2008b. *Table 6. Incidence rates of nonfatal occupational injuries and illnesses by industry and case types, 2007, Florida.* Available at http://www.bls.gov/iif/home.htm, accessed March 26, 2009.

Table 4.8-1
Estimated Total Recordable Cases (TRCs)

Time Frame	TRC Incidence at US Rate[(a)]	TRC Incidence at FL Rate[(a)]
Annual average	103[(b)]	107[(b)]
Peak 12-month period (Months 17-28)	167[(c)]	174[(c)]

(a) Based on nonfatal incidence rates developed by the U.S. Bureau of Labor Statistics (BLS 2008a, BLS 2008b).
(b) Average of monthly TRCs for the 108-month preconstruction, limited work authorization, and construction period monthly TRCs = number of employees for month/100 x annual rate per 100 workers/12 months per year. Ex. 1000/100 x 4.7/12 = 3.917 TRCs.
(c) Sum of monthly TRCs for 12-month period of greatest number of construction workers as presented in Table 3.10-2. This 12-month period is Months 17-28.