

Turkey Point Units 6 & 7
COL Application
Part 3 — Environmental Report

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CHAPTER 10 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

In accordance with NUREG-1555, this chapter presents the potential environmental consequences from construction and operation of Units 6 & 7. This chapter describes the environmental consequences in four major subsections:

- Unavoidable adverse environmental impacts of construction and operations (10.1)
- Irreversible and irretrievable commitments of resources (10.2)
- Relationship between short-term uses and long-term productivity of the human environment (10.3)
- Benefit-cost balance (10.4)

Environmental impacts are quantified to the maximum extent practical and further categorized on a three-level standard of significance—SMALL, MODERATE, or LARGE. This standard of significance was developed based on the Council on Environmental Quality guidelines set forth in the footnotes to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, as shown below:

- **SMALL** — Environmental effects are not detectable or are so minor 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.

10.1 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

Unavoidable adverse impacts are predicted adverse environmental impacts that cannot be avoided and for which there are no practical means of mitigation. This section considers unavoidable adverse impacts from construction and operation of Units 6 & 7 and associated facilities and offsite facilities such as transmission corridors, potable and reclaimed water pipelines, FPL-owned fill source, and access roads.

10.1.1 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS OF CONSTRUCTION

This subsection and Table 10.1-1 are based on the details of construction impacts presented in Chapter 4, focusing on unavoidable adverse impacts. Full and detailed descriptions of impacts

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are presented by resource area in Chapter 4, which include both positive and adverse impacts as well as applicable mitigation measures. Table 4.6-1 summarizes the impacts and mitigation measures by section. The impacts of segregation of construction activities, as summarized in Table 4.6-2, are not considered here since this is considered a subset of the activities and mitigation measured summarized in Table 4.6-1. Table 10.1-1 summarizes the predicted adverse impacts associated with construction, grouping the impacts by the impact categories of land use, hydrological and water use, terrestrial and aquatic ecological, socioeconomic, radiological, atmospheric and meteorological, and environmental justice as provided for by NUREG-1555. For each predicted adverse impact, Table 10.1-1 presents a brief statement(s) of actions that would be taken to mitigate the impacts and finally identifies and quantifies, when practical, those adverse impacts that would remain even after the effective implementation of the mitigation measures.

Construction of Units 6 & 7 and associated facilities on the plant property, along with the new transmission lines, reclaimed and potable water pipelines, access roads, and FPL-owned fill source would produce unavoidable adverse impacts. Construction impacts would be limited to Miami-Dade County. Areas affected by construction of new transmission lines, reclaimed and potable water pipelines, access roads, and FPL-owned fill source could experience temporary localized impacts such as loss of natural habitat, loss or displacement of wildlife, and temporary increased noise and pollutant emissions (fugitive dust and equipment exhaust).

Selection of the transmission corridors was guided by a corridor selection process and is consistent with the requirements of the Florida Power Plant Siting Act. The objective of the corridor selection process was to select certifiable corridors that balance land use/ socioeconomic, environmental, engineering and cost considerations.

Adverse impacts attributable to construction activities would generally be SMALL. Exceptions are a MODERATE ecological impact as a result of construction activities and traffic near American crocodile habitat including construction of transmission lines across the cooling canals of the industrial wastewater facility, a MODERATE ecological impact on wetlands habitat, both on the Turkey Point plant property and at offsite construction locations, a MODERATE visual impact on aesthetics from construction within transmission corridors and a MODERATE transportation impact on local roadways as a result of additional commuter traffic and material delivery vehicles once new road improvements are available. Based on the road improvements being completed, the traffic impacts would be temporary and MODERATE.

10.1.2 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS OF OPERATIONS

This subsection is based on the details of operation impacts presented in Chapter 5, focusing on unavoidable adverse impacts. Full and detailed descriptions of impacts are presented by resource area in Chapter 5, which includes both positive and adverse impacts and potentially

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applicable mitigation measures. **Table 5.10-1** summarizes the impacts and mitigation measures by section.

Table 10.1-2 summarizes the predicted adverse impacts associated with operation of Units 6 & 7, grouping the impacts by the impact categories of land use, hydrological and water use, terrestrial and aquatic ecological, socioeconomic, radiological, atmospheric and meteorological, and environmental justice as provided for by NUREG 1555. For each predicted adverse impact, **Table 10.1-2** presents a brief statement(s) of actions that could be taken to mitigate the impacts and finally identifies and quantifies, when practical, those adverse impacts that would remain even after the effective implementation of the mitigation measures. Unavoidable adverse impacts from the operation of Units 6 & 7 include

- Permanent dedication of land
- Withdrawal of water from beneath Biscayne Bay to provide makeup water for the cooling system
- Disturbance of terrestrial ecosystems from permanent land dedication
- Salt deposits and noise from operation of the cooling towers
- Radiological and air pollutant emissions
- Radioactive and nonradioactive waste that requires disposal
- Increased demands on public infrastructure from population increase and plant water needs
- Increases in local traffic volume
- Visual impacts on the landscape from industrial structures

Operation of Units 6 & 7 and associated facilities on the plant property, along with the new transmission lines, reclaimed and potable water pipelines, and access roads would produce unavoidable adverse impacts. Operation impacts would be limited to Miami-Dade County. Areas affected by operation of new transmission lines, reclaimed and potable water pipelines, and access roads could experience localized permanent impacts such as loss of natural habitat.

Unavoidable adverse impacts attributable to operation activities would generally be SMALL. Exceptions include a SMALL to MODERATE impact on terrestrial ecosystems, and a MODERATE transportation impact on traffic levels for local roadways.

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Table 10.1-1 (Sheet 1 of 6)
Construction-Related Unavoidable Adverse Environmental Impacts

| Category | Adverse Impact | Actions to Mitigate Impacts | Unavoidable Adverse Environmental Impact |
|----------|---|--|---|
| Land Use | <p>Earth would be disturbed on Turkey Point plant property, transmission corridors, reclaimed and potable water pipelines, access roads, and FPL-owned fill source.</p> | <p>Environmental controls such as stormwater management systems; construction practices including erosion control and dust control; control plant access for personnel and vehicular traffic; and restrict construction activities to specified areas to would be used to minimize impacts. Procedures to address inadvertent discovery of historic, archaeological, or paleontological resource would be developed.</p> | <p>Disturbance of acreage including wetlands that are mitigated through regional mitigation opportunities, disturbance of land for fill materials, additional acreage for transmission lines and pipelines rights-of-way.</p> |
| | <p>Construction activities on Turkey Point plant property, transmission corridors, reclaimed and potable water pipelines, access roads, FPL-owned fill source in and near wetlands would impact wetlands.</p> | <p>Turkey Point Plant Property and offsite areas: Wetland impacts would be avoided and minimized to the extent practicable, for the transmission lines (to the extent practicable, existing corridors would be used), reclaimed and potable water pipelines, access roads, FPL-owned fill source, and by restricting construction activities to specified areas. Use environmental best management practices for clearing and construction to minimize impacts. Use equipment that minimizes environmental impacts such as erosion-control devices, mattings, and wide-track vehicles when crossing wetlands. Conduct restoration activities where necessary after construction. Offset the potential loss of any disturbed wetlands with regional mitigation opportunities.</p> | <p>Though wetland impacts are unavoidable, losses would be offset with regional mitigation opportunities.</p> |

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Table 10.1-1 (Sheet 2 of 6)
Construction-Related Unavoidable Adverse Environmental Impacts

| Category | Adverse Impact | Actions to Mitigate Impacts | Unavoidable Adverse Environmental Impact |
|----------------------------|---|--|---|
| Hydrological and Water Use | Hydrological alterations as a result of site preparation and construction activities including excavation, dewatering, filling, and elevating land surface as well as creation of a reservoir onsite. | <p>Turkey Point plant property: water drainage from spoils areas, FPL reclaimed water treatment facility, nuclear administration and training buildings would be directed to the existing cooling canals of the industrial wastewater facility. Water drainage from the radial collector wells would be controlled by environmental best management practices. Also the berm east of the return canal would serve to mitigate impacts from construction activities within the Units 6 & 7 plant area.</p> <p>Access Roads: 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 construction on Turkey Point plant property, stormwater runoff would be directed to retention basins or other erosion control devised before release to the cooling canals of the industrial wastewater facility. Should modification to the existing drainage ditches or drainage features be required, the impacts would be temporary and the disturbed areas could be returned to preconstruction conditions. Re-vegetation could be required. All work would be performed in accordance with site-obtained permits.</p> <p>Transmission lines and reclaimed/potable water pipelines: Standard construction industry practices would be used. A Stormwater Pollution Prevention Plan (SWPPP) for the proposed construction activities would be developed or the work would be performed under existing FPL permits/plans for these types of activities.</p> <p>FPL-owned fill source: Standard construction industry practices would be used. Surface water flow would be controlled through the use as such practices as berms, drainage ditches, and/or stormwater retention basins.</p> | Hydrological alterations as a result of site preparation and construction activities including excavation, dewatering, filling, and elevating land surface as well as creation of a reservoir onsite. |

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Table 10.1-1 (Sheet 3 of 6)
Construction-Related Unavoidable Adverse Environmental Impacts

| Category | Adverse Impact | Actions to Mitigate Impacts | Unavoidable Adverse Environmental Impact |
|------------------------------------|---|--|--|
| Hydrological and Water Use (cont.) | Impacts to surface water and groundwater from sediment and pollutants as a result of site preparation and construction activities including excavation, dewatering, filling, and elevating land surface as well as creation of an onsite reservoir. | <p>Develop an erosion, sedimentation, and pollution control plan. Implement environmental best management practices, including structural (i.e., erosion-control devices and detention ponds) and operational controls to prevent the movement of pollutants (including sediments) into wetlands and water bodies via stormwater runoff.</p> <p>Dewatering activities and enlargement of the equipment barge unloading area would include use of a slurry wall, and cutoff wall techniques, as appropriate.</p> <p>The water from dewatering activities would be directed to the cooling canals of the industrial wastewater facility.</p> | None |
| | Installation of deep injection wells. | The deep injection wells and the required monitoring wells would be installed in accordance with a Florida Department of Environmental Protection (FDEP) injection well permit requirements and any local permit requirements. During the construction of the injection wells and delivery system, any stormwater runoff would be released to the cooling canals of the industrial wastewater facility. | None |
| | Accidental spills could adversely impact surface waters and groundwater. | Construction activities would be performed under a new 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. This would also mitigate impacts to local surface water because spills would be quickly attended to and not allowed to flow to nearby surface water. | None |

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Construction-Related Unavoidable Adverse Environmental Impacts

| Category | Adverse Impact | Actions to Mitigate Impacts | Unavoidable Adverse Environmental Impact |
|------------------------|--|---|--|
| Terrestrial Ecological | Conversion of land, including wetlands for construction of Units 6 & 7 and supporting structures. | Restrict construction activities to specified areas. Loss of wetlands could be offset with the regional mitigation opportunities. | Construction activities for Units 6 & 7 would impact wetlands, primarily hypersaline mudflats. |
| | Crocodyles and listed species could be disturbed by site preparation and construction activities and traffic. | A project-specific management plan for crocodiles and other listed species was created for this construction activity. Mitigation measures may include creation of freshwater refugia on the berms for young crocodiles, vegetation management on the berms to promote a native plant community that is more conducive to crocodile use, use of warning signs and education material (for construction personnel) as to the presence and status of crocodiles and restrictions of nocturnal activities around the cooling canals of the industrial wastewater facility. Traffic on access road 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 would avoid known crocodile nests and be conducted between nesting seasons. | None |
| | Construction noise and vibration could displace some wildlife and tall structures and cranes and light pollution could affect birds. | 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. To the extent practicable, unnecessary lights would be turned off at night, lights turned downward or hooded (directing light downward), and lower-power lights used. | Some wildlife individuals would be displaced. |

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Construction-Related Unavoidable Adverse Environmental Impacts

| Category | Adverse Impact | Actions to Mitigate Impacts | Unavoidable Adverse Environmental Impact |
|--------------------------------|--|---|---|
| Terrestrial Ecological (cont.) | Transmission lines would be located within nine wood stork colonies' core foraging area. | Impacts to wetlands within the core foraging area would be mitigated as prescribed by regulatory agencies. To mitigate the potential for collisions or electrocutions, avian-friendly design features would be used as provided for in the FPL Avian Protection Plan. | None |
| Aquatic Ecological | Equipment barge unloading area enlargement activities, increased barge traffic, and dredging, if needed, could disturb manatees. | A management plan has been prepared to minimize impacts on manatees as a result of the expansion and increased use of the turning basin. | None |
| Socioeconomic Impacts | Exposure of construction workers to temporary elevated noise levels, fugitive dust and fine particulate matter emissions from construction activities, and other occupational hazards. | Construction activities would be conducted in accordance with Occupational Safety and Health Administration safety standards. Develop and implement a dust control plan, or similar planning document to minimize dust. | None |
| | Increased population and subsequent increased demand for public water, wastewater treatment, police and fire services, medical services, and increase in student population. | The construction workforce will gradually increase. Communication would be maintained with local and regional governmental officials about the Units 6 & 7 construction and its schedules, allowing local and regional officials opportunity to plan for the population influx. Increased property and sales/use tax revenues generated during construction could be used to fund additional law enforcement officers and firefighters. Communication would be maintained with local and regional nongovernmental organizations, including 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. | Population increase in Miami-Dade County 5139. Number estimated to settle in Homestead-Florida City area 2199. |
| | Increased traffic in roads due to construction personnel and deliveries of borrow fill and materials. | Improvements would be made to local access roads, including existing road widening and the addition of turn lanes. | Additional vehicles would travel to Units 6 & 7 and result in moderate impacts to traffic once the new access road and other road improvements are available. |
| | Using public water supply for construction activities. | None | Peak construction activities would require an estimated 565 gpm of potable water from the Miami-Dade County. |

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Table 10.1-1 (Sheet 6 of 6)
Construction-Related Unavoidable Adverse Environmental Impacts

| Category | Adverse Impact | Actions to Mitigate Impacts | Unavoidable Adverse Environmental Impact |
|--------------------------------|--|---|--|
| Radiological | Potential radiation exposure to Units 6 & 7 construction workers as a result of the operation of Units 3 & 4 and from Unit 6 after it becomes operational. | None | Potential radiation exposure from operating units. |
| Atmospheric and Meteorological | Temporary and localized noise, fugitive dust, and exhaust emissions during construction. | 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. Develop and implement a dust-control plan, or similar planning document to minimize dust. | Temporary and localized noise, fugitive dust, and exhaust emissions during construction. |
| Environmental Justice | No disproportionately high or adverse impacts to minority or low-income populations were identified. | None | None |

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Operations-Related Unavoidable Adverse Environmental Impacts

| Category | Adverse Impact | Actions to Mitigate Impacts | Unavoidable Adverse Environmental Impact |
|----------------------------|---|---|---|
| Land Use | Land use would be permanently dedicated to Units 6 & 7 and associated facilities until decommissioning. | None | Land dedicated to Units 6 & 7 and associated facilities. |
| | Land use for transmission lines and access roads would be dedicated to these uses, precluding the land from being developed as residential, industrial, or certain agricultural properties. | None | Land dedicated to transmission infrastructure that is not currently in FPL-owned rights-of-way. |
| | Deposits of low concentrations of salt from operation of the cooling towers. | None | Salt deposits would occur at the southern end of the plant area. Salt deposits of 10 kg/ha/month are generally confined to the plant property and in the cooling canals of the industrial wastewater facility, with the exception of the eastern and southeastern perimeters of the plant property. |
| | Generation of nonradiological and low-level radioactive waste that would require disposal in offsite permitted facilities. | Implement waste minimization plan. | Landfill space would be used for disposal of radioactive and nonradioactive wastes from Units 6 & 7 and not available for disposal of other wastes. |
| | Generation of spent fuel requiring disposal in a DOE facility licensed by NRC. | None | Disposal facility capacity would be used by disposal of spent fuel. |
| | Permanent commitment of land per year for each AP1000 due to the operations and processes associated with provision, utilization, and ultimate disposal of fuel. | None | Permanent commitment of 34 acres of land per year for fuel cycle operations and processes that would support Units 6 & 7. |
| Hydrological and Water Use | As a second 100 percent source of makeup water for the cooling system, water would be withdrawn from a saltwater aquifer beneath Biscayne Bay via radial collector wells. | Compliance with permit requirements. | Maximum of 86,400 gpm would be withdrawn when this source of makeup water is needed. |
| | Operation of the radial collector wells could impact the Biscayne aquifer and surface water (Biscayne Bay and the cooling canals). | Compliance with permit requirements as applicable and monitoring of local groundwater and surface water. | None |
| | Public potable water would be supplied to the site by Miami-Dade County for the operation of Units 6 & 7, except for use as cooling water. | None | Public water in the amount of 936 gpm (1.35 mgd) to 2553 gpm (3.68 mgd) would be supplied. |
| | Operation of the deep injection wells could impact the upper Floridan aquifer | Compliance with UIC permit requirements including monitoring at the plant area to ensure proper operation of the injections wells | None |

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Operations-Related Unavoidable Adverse Environmental Impacts

| Category | Adverse Impact | Actions to Mitigate Impacts | Unavoidable Adverse Environmental Impact |
|------------------------------------|--|--|---|
| Hydrological and Water Use (cont.) | Some maintenance activities could involve earth moving and dewatering and could lead to temporary hydrological alterations and impacts to surface water and/or groundwater quality on the plant property and offsite areas. | Soil retention and erosion control measures such as silt barriers would be used to reduce impacts in accordance with an SWPPP developed for Units 6 & 7 and/or offsite facilities. Water from the dewatering process would be routed to the cooling canals of the industrial wastewater facility (if onsite) or handled by environmental best management practices and any applicable permits. | None |
| | Any contaminants (e.g., diesel fuel, hydraulic fluid, antifreeze, lubricants, or other pollutant) spilled during operations, and not contained or remediated, could affect the groundwater and surface water quality. | Operational activities would be performed under an SWPPP and a spill prevention plan. Any minor spills of diesel fuel, hydraulic fluid, lubricants, or other construction-related pollutants during operations Units 6 & 7 would be cleaned up quickly. | None |
| | Water consumption and discharges during fuel cycle activities. | None | Annual water use would be 2.95E10 gallons for both units. |
| Terrestrial Ecological | Salt deposits from operation of the cooling towers would not impact salinity levels of the cooling canals of the industrial wastewater facility significantly, which are critical habitat for the threatened American crocodile. | Continue FPL crocodile program that mitigates the impacts to American crocodile hatchlings from the existing elevated salinity levels. | None |
| | Potential impacts to wildlife from noise from the Units 6 & 7 cooling towers. Noise from cooling towers at greater than 200 feet would be less than the level known to startle or frighten some birds and small mammals. | None | None |
| | Maintenance activities would be conducted in transmission corridors and the reclaimed water pipelines rights-of-way potentially impacting soils and wetlands. | Environmental best management practices would be implemented to reduce soil erosion and sedimentation. FPL has right-of-way vegetation management programs and procedures intended to minimize impacts. The same procedure establishes strict guidelines for use of herbicides, application according to federal, state, and local regulations. | None |

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Operations-Related Unavoidable Adverse Environmental Impacts

| Category | Adverse Impact | Actions to Mitigate Impacts | Unavoidable Adverse Environmental Impact |
|--------------------|---|---|--|
| Aquatic Ecological | Salt deposits from operation of the cooling towers would not impact salinity levels of the cooling canals of the industrial wastewater facility significantly. | None | None |
| | Maintenance activities would be conducted in transmission and the reclaimed and potable water pipelines corridors potentially at or near water bodies, wetlands, and the South Florida Water Management District (SFWMD) canals and could potentially impact water quality. | Vegetation management in forested wetlands will be in compliance with Florida Statute 403.814 General permits. Mangrove areas will be maintained below 14 feet. Herbicides approved for the site by federal and state rules will be used on exotic and incompatible species. Care will be taken to retain a cover of compatible species. Vegetation fuel loads will periodically be evaluated and mitigated to protect the reliability of the lines and surrounding private property. The same procedure establishes strict guidelines for use of herbicides, application according to federal, state, and local regulations. | None |
| Socioeconomics | Potential impact to members of the public from noise emitted by Units 6 & 7 cooling towers. | None | Noise levels beyond 400 feet from the cooling towers are estimated to be <65 decibels adjusted (dBA), a level characterized by NRC in NUREG-1555 as of small significance. |
| | New transmission lines may induce shock in objects beneath or near lines, could emit corona-induced noise at very low or inaudible levels, and would have visual impacts. | Build new transmission lines to the National Electrical Safety Code to limit shock from induced currents. Other impacts have no mitigation. | None |
| | Potential for occupational injuries and illnesses. | Implement existing Units 3 & 4 industrial safety program at Units 6 & 7. | None |
| | Increased population and subsequent increased demand for public water, wastewater treatment, police and fire services, medical services, and increase in student population. | Increased property, sales/use, and corporate tax revenues could be used to fund additional law enforcement officers and firefighters. | Population increase in Miami-Dade County 1310. Number estimated to settle in Homestead-Florida City area 559. |
| | Increased traffic on local roads used to access Turkey Point. | Road improvements would be developed for the construction traffic and these or a portion of these may remain in service during operations. | Traffic would increase due to additional operations and outage workers. |
| | Additional structures would be within the viewscape. | None | Additional structures would be within the viewscape. |

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Operations-Related Unavoidable Adverse Environmental Impacts

| Category | Adverse Impact | Actions to Mitigate Impacts | Unavoidable Adverse Environmental Impact |
|--------------------------------|--|--|---|
| Radiological | Potential health impacts to members of the public from exposure to radiological releases. | Conduct radiological monitoring program as required. Conduct meteorological monitoring. | Modeling using the design and operational parameters of Units 6 & 7 results in estimated doses to the public that are within the design objectives of 10 CFR Part 50 Appendix I and within regulatory limits of 40 CFR Part 190. |
| | Potential doses to biota from gaseous effluents would be less than the 100 millirad/day. | Conduct radiological monitoring program as required. | Potential doses to biota from Units 6 & 7 would be well within the 100 millirad/day guideline from the International Atomic Energy Agency. |
| | Potential health impacts to workers from radiation exposure. | Conduct radiological monitoring program as required. | Maximum annual occupational dose to operations workers of 67 person-rem per unit. |
| Atmospheric and Meteorological | Plumes from Units 6 & 7 cooling towers. | None | Plumes would remain primarily on site and minimal ground-level fogging and no icing was predicted. |
| | Air emissions due to intermittent operation of auxiliary systems such as emergency diesel generators. | Comply with state of Florida permit limits and regulations for operating air emission sources. | Small quantities of pollutants emitted during intermittent operation of auxiliary systems. |
| | Relatively small quantities of air pollutants would result from the uranium fuel cycle. | None | Potential impacts to air and water quality from uranium fuel cycle. Gaseous effluents would be less than 0.08 percent of all 2005 U.S. sulfur dioxide emissions and less than 0.02 percent of all 2006 U.S. nitrogen oxide emissions. |
| Environmental Justice | There would be no disproportionately high and adverse impacts to minority or low-income populations within 50 miles of the proposed site via soil, water, or air pathways that would affect the health and environment of populations. | None | None |
| | There would be no disproportionately high and adverse impacts to minority or low-income populations from operations-related activities with the exception of transportation. | None | Increased traffic could lead to impacts along the commuting routes. |

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10.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

This section describes the predicted irreversible and irretrievable environmental resource commitments that would result from construction and operation of Units 6 & 7. The term *irreversible commitments* of resources describes environmental resources that would be potentially changed by the construction or operation of Units 6 & 7 and that could not be restored at some later time to the condition present before construction or operation. Irretrievable commitments of resources are generally materials that would be used for Units 6 & 7 in such a way that they could not, by practical means, be recycled or restored for other uses.

10.2.1 IRREVERSIBLE COMMITMENTS OF RESOURCES

In addition to the materials used for the nuclear fuel, irreversible commitments of environmental resources associated with Units 6 & 7 are described in [Subsections 10.2.1.1](#) through [10.2.1.7](#).

10.2.1.1 Land Use

Land designated for spent nuclear fuel storage and radioactive and nonradioactive waste disposal would be committed to those uses and could not be used for other purposes. When Units 6 & 7 cease operations and the plant is decommissioned in accordance with NRC requirements, the land that supports the power plant facilities could be returned to support other industrial or non-industrial uses. If the need for the transmission lines, substations, and access roads cease, the land occupied by these facilities could also be returned to support other industrial or non-industrial uses. Below grade structures such as the reclaimed water and potable water pipelines have little to no impact on land use. The FPL-owned fill source would become a water management area and hence serve as a beneficial long-term resource.

10.2.1.2 Hydrological and Water Use

Site preparation activities (e.g., excavation and filling, dewatering, land surface modifications) would pose hydrologic alterations; however, these impacts would be temporary and SMALL. All of the cooling water (reclaimed and saltwater) would be consumed either through cooling tower drift, evaporation, system blowdown, or disposal via deep injection wells. Additionally, potable water would be consumed during the construction and operation of Units 6 & 7. Because the use of these resources is entirely consumptive, they would not be available for other uses. The impact to the resource would be SMALL for the operational life of the plant, and impacts would cease when operations cease.

It is expected that normal releases of contaminants into the environment from Units 6 & 7 will have negligible effects on surface and groundwater uses and will be in compliance with an Underground Injection Control (UIC) permit issued by the Florida Department of Environmental Protection (FDEP). [Sections 3.6](#) and [5.5](#) discuss the FDEP requirements for a UIC permit. This

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permit will ensure that discharges are controlled from systems such as discharge lines, sewage treatment facilities, radwaste treatment systems, water treatment waste systems, and facility service water. The effect on water quality due to the operation of the Units 6 & 7 will be monitored to ensure compliance with the issued UIC permit for construction and operation.

10.2.1.3 Aquatic and Terrestrial Biota

Land preparation activities would include the removal of present ground surface materials and the import of fill material to elevate the Turkey Point plant area ground level above the current elevation. Land preparation and construction activities would displace some wildlife, and would temporarily and adversely affect the abundance and distribution of local flora and fauna at several locations on the Turkey Point plant property. Permanent replacement of mangrove habitats and aquatic habitats at several filled-in canals would occur. Adverse impacts to the American crocodile are not anticipated at the Turkey Point plant property since the mitigation programs already in place would continue.

Similar impacts would occur on the new transmission corridors, access roads, water supply pipeline corridors, and FPL-owned fill source. When construction is complete, flora and fauna would recover in areas that are not directly adjacent to or part of operations.

Impacts to aquatic and terrestrial Biota would be SMALL, with the exceptions as previously described.

10.2.1.4 Socioeconomic

Because five power generation units exist on the Turkey Point plant property, construction of Units 6 & 7 would pose only a slight alteration of the regional viewscape. The change in viewscape could be restored after plant operations cease and the facilities are decommissioned. The construction and operation of Units 6 & 7 would also create short-term and long-term changes in the population, the nature and character of the local community, and the local socioeconomic structure. Indirect or secondary growth and associated changes in the character of the socioeconomic structure would also occur. Some of the impacts on infrastructure and services are mitigated through property and worker taxes and payments made in lieu of taxes. Other changes such as noise and traffic congestion would only be partially mitigated.

10.2.1.5 Releases to Air and Surface Water

Vehicle and construction equipment operation would release GHGs and other air pollutants to the air from land preparation and other construction activities. Surface water runoff could increase sedimentation to local surface waters. These impacts would be localized and temporary. Operations would also produce low-quantity emissions (e.g., diesel generator exhaust and vehicle exhaust would release GHG emissions and other air pollutants). Very small quantities of

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low-concentration radioactive gases and particulates would also be released to the air and surface water.

Water vapor from mechanical draft cooling towers would be the main constituent of emissions during operation. Under some weather conditions, water vapor from these towers could form a visible plume that would vary in size and opacity. The frequency of the occurrence and length of these visible plumes would generally be greatest in the winter months when the ambient air temperatures are cooler.

The release of treated hazardous and radioactive effluents would represent a SMALL adverse impact on water quality. The release of hazardous and radioactive air emissions would represent a SMALL adverse impact on air quality. Hazardous and radioactive air and water constituents would be monitored at their release points. All releases from Units 6 & 7 would comply with issued permits and are not expected to measurably affect the air and surface water resources

10.2.1.6 Disposal of Hazardous and Radioactively Contaminated Waste

Units 6 & 7 would generate radioactive, hazardous, and non-hazardous waste. Each waste type will require proper storage, on-site management, and disposal or treatment in accordance with applicable permits and regulations. Radioactive waste will be disposed in radioactive landfills in accordance with regulations governing radioactive waste. Final disposition of hazardous waste will be managed in accordance with the permit and regulatory requirements governing permitted hazardous waste treatment, storage, and disposal facilities. Non-hazardous waste will be beneficially used, recycled, or disposed of in accordance with applicable permits and regulations governing non-hazardous waste. Universal wastes generated by the facility may be recycled with an authorized universal waste handler in lieu of land disposal in a FDEP-permitted industrial landfill. Used oil may be recycled via permitted used-oil handlers. Land committed to the disposal of radioactive and hazardous waste is an irreversible impact because it is committed to that use and can be used for few other purposes.

10.2.1.7 Uranium Fuel Cycle

The uranium fuel cycle involves several stages, and each stage poses environmental impacts. At the uranium mine, uranium ore is extracted from the ground and typically milled. The product is then prepared into uranium hexafluoride and processed for isotopic enrichment. The enriched uranium product is then fabricated into fuel and loaded into a nuclear power plant. When the fuel is spent, it is removed from the reactor and stored on site. Each stage of the uranium fuel cycle generates various forms of low-level and high-level waste.

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10.2.2 IRRETRIEVABLE COMMITMENTS OF RESOURCES

As shown in **Table 10.2-1**, large quantities of metals, concrete and other construction materials would be required to construct Units 6 & 7. Asbestos and other materials considered hazardous would generally not be used, or would be used in limited quantities and in accordance with safety regulations and practices. Some of the construction materials would ultimately become contaminated or irradiated over the life of power plant operations. Based on current technology, these materials could not be reused or recycled. Instead, these materials would, therefore, require isolation from the biosphere for hundreds or thousands of years, and would represent an irretrievable commitment of resources.

Although the total quantity of construction materials is large, use of such quantities in large-scale construction projects such as nuclear reactors, hydroelectric and coal-fired plants, and many large industrial facilities (e.g., refineries and manufacturing plants) represents a relatively small incremental increase in the overall use of such materials. Even if these materials are eventually routed for disposal, the impact would be SMALL with respect to the national or global consumption of these materials.

The primary resources that are irreversibly and irretrievably committed by operations would be the uranium used in fuel and the energy required to create the fuel. The estimated consumption of enriched uranium for Units 6 & 7 is 25.35 tons per year. The World Nuclear Association studies supply and demand of uranium and states that an 80-year supply of uranium is available based on known deposits and current usage. Exploration for uranium deposits has increased in recent years and it is expected to continue and lead to greater supplies as the demand increases (World Nuclear Association 2008). Therefore, the uranium that would be used to generate power by Units 6 & 7, although irretrievable, would have a SMALL impact with respect to the long-term availability of uranium worldwide.

Other irretrievable commitments of resources include materials used for the normal industrial operations of the plant that cannot be recovered or recycled or that are consumed or reduced to unrecoverable forms, such as elemental materials that would become radioactive.

Section 10.2 References

World Nuclear Association 2008. *Supply of Uranium*. Available at <http://www.world-nuclear.org/info/inf75.html>, accessed February 16, 2009.

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Table 10.2-1
Material Quantities Required for Construction of Units 6 & 7

| Materials | Quantity Required |
|--|--------------------------|
| Concrete | 154,400 cubic yards |
| Rebar | 20,000 tons |
| Structural steel | 12,800 tons |
| Power cable | 1,620,000 linear feet |
| Small bore pipe (less than 3-inch diameter) | 460,000 linear feet |
| Large bore pipe (3-inch diameter or larger) | 136,000 linear feet |
| Aluminum, boron, titanium, tungsten, and other natural resources | Small quantities |

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10.3 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY OF THE HUMAN ENVIRONMENT

This environmental report has focused on the analyses and conclusions associated with the environmental and socioeconomic impacts from activities during the construction and operation of Units 6 & 7. These activities are considered to be short-term uses for purpose of this section. In this section, the long-term is considered to begin at the moment Units 6 & 7 have been decommissioned.

This section includes an evaluation of the extent to which the short-term uses preclude any options for future use of the Units 6 & 7 plant area and associated facilities. Construction and operation of an independent spent fuel storage installation (ISFSI) are not part of the proposed action and are therefore not discussed in this section. The ISFSI is described in [Sections 4.7](#) and [5.11](#).

10.3.1 CONSTRUCTION OF UNITS 6 AND 7 AND LONG-TERM PRODUCTIVITY

[Subsection 10.1.1](#) summarizes the potential unavoidable adverse environmental impacts of construction of Units 6 & 7 and the mitigative measures proposed to reduce those impacts. Some adverse environmental impacts would remain after all practical measures to avoid or mitigate the impacts have been applied. However, none of these impacts represent a long-term effect that would preclude any options for future use of land associated with Units 6 & 7. The acreage disturbed by construction activities would be larger than that required for the actual structures, associated facilities, and offsite facilities (e.g. FPL-owned fill source, transmission lines, access roads, reclaimed and potable water pipelines) because of the need for such facilities as construction laydown, support areas, and parking areas for the construction workforce. Clearing this acreage, in addition to the noise of the construction, would displace some wildlife and remove vegetation. Once the construction activities are completed, some disturbed areas could be restored. It is expected that wildlife would then return to the restored areas.

Noise generated by some construction activities would increase the ambient noise levels in the vicinity of the plant property. However, upon completion of these activities, the ambient levels would return to the levels comparable to the preconstruction ambient noise levels. The workforce would be protected by adherence to the 29 CFR 1910.95 requirements for occupational noise exposure. There would be no effects on the long-term productivity of Units 6 & 7 as a result of these impacts

Increased traffic volume as a result of construction personnel and material deliveries would increase congestion and traffic delays on local roadways. Additional traffic associated with plant operations would also contribute to congestion and traffic delays on local roadways, but at a lower level than construction.

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Construction of Units 6 & 7 would be beneficial to the local area through the generation of new construction-related jobs, local purchases by the construction workforce, and payment of taxes to the area. Some socioeconomic impacts that occur as a result of increased population due to construction would cease once construction is complete and the workforce leaves the area. However, some changes incurred because of increased tax revenues would persist into the foreseeable future. In those cases, construction would have some positive impact on the long-term economic productivity of the area. Construction would not affect long-term productivity of the environment.

10.3.2 OPERATION OF UNITS 6 & 7 AND LONG-TERM PRODUCTIVITY

Subsection 10.1.2 summarizes the potential unavoidable adverse environmental impacts of operation of Units 6 & 7 and the measures proposed to reduce or eliminate those impacts. Some adverse environmental impacts could remain after all practical measures to avoid or mitigate them have been applied. However, none of these impacts would pose long-term effects that would preclude any options for future use of the Turkey Point plant property.

The Turkey Point plant property currently supports five large power generation facilities—two oil/gas-fired units, one combined-cycle unit, and two nuclear units. Therefore, operation of Units 6 & 7 would represent a continuation of the current and planned use of the land. However, once Units 6 & 7 cease to operate and the plant is decommissioned to NRC standards, the land would be available for other industrial or non-industrial uses.

Units 6 & 7 would require large volumes of water for heat rejection. This requirement would be satisfied by a combination of reclaimed water delivered from Miami-Dade County and saltwater withdrawn from radial collector wells under Biscayne Bay. All of this water would be consumed through cooling tower drift, evaporation, system blowdown, or disposal via deep injection wells. Additionally, potable water would be consumed during the construction and operation of Units 6 & 7. Because the use of these resources are entirely consumptive, they would not be available for other uses, and would therefore impact the availability of water for other uses. After Units 6 & 7 cease to operate and the plant is decommissioned, water withdrawals for Units 6 & 7 would cease.

The operation of Units 6 & 7 would slightly increase annual air emissions because of emergency diesel generators. These generators would be operated infrequently and usually for short duration. This equipment would be operated in accordance with applicable federal, state, and local regulations, and would not create any measurable impacts on regional air quality. In addition, as described in **Subsection 5.3.3**, precipitation and atmospheric dispersion would limit the accumulation of salt in the soil near the cooling towers. In addition, the salt deposition analysis has determined that salt deposit levels attributable to salt drift from the cooling towers would remain below levels at which ecological impacts might occur, and would therefore pose no

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long-term ecological impacts. No future issues for the long-term uses of the site would result from the impacts of increased air emissions or salt deposits. Once the plant ceases to operate and is decommissioned, impacts to the air quality would cease.

The operation of the deep injection wells installed on Turkey Point plant property for effluent disposal and wastewater disposal into the Boulder Zone could potentially impact groundwater within the Boulder Zone over the life of the plant but would not impact the Biscayne aquifer. Well systems would be installed to monitor the impacts attributable to operation of the deep injection wells and the radial collector wells. Once the plant ceases to operate and is decommissioned, impacts to groundwater and surface waters would cease.

Impacts as a result of radiological emissions would be SMALL because the Units 6 & 7 would be operated in accordance with state and federal regulations and a program would be implemented to monitor radiological emissions and their impact of land, flora, fauna, and air. Data would be analyzed against previous results to identify concerns. Once the plant ceases to operate and is decommissioned, radiological releases would cease. No future issues associated with the radiological emissions from operation Units 6 & 7 would affect the long-term uses of the Turkey Point plant property.

Some socioeconomic changes associated with the operation of the plant would likely continue after the plant is decommissioned. Property taxes paid by FPL to Miami-Dade County would provide revenues to the county for the foreseeable future to sustain services that support the Miami-Dade County population.

Taxes paid by FPL to Miami-Dade County would have a long-term effect on the productivity of the county. Workers that establish residence in Miami-Dade County would not only spend a portion of their income in the county, but would also pay property, sales, and use taxes. Long-term tax revenues would depend on the number of operations personnel that remain in Miami-Dade County and their ability to obtain employment at the same pay level they received as plant operations employees. The economic impacts to Miami-Dade County from Units 6 & 7 would be considered a benefit.

10.3.3 SUMMARY OF RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

The impacts attributable to construction and operation of Units 6 & 7 would result in some adverse short-term impacts. The principal short-term benefit is the production of electrical energy. The economic benefit of Units 6 & 7 and the associated workforce is large compared with the economic benefit from other potential uses for the site. The economic benefit is expected to be the type that would continue even after Units 6 & 7 are decommissioned, such as the continuation of commercial establishments that arose as a result of Units 6 & 7 service of power production, the presence of retired and former workforce in the area, and the presence of a well-

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trained and educated workforce for the benefit of subsequent employers. Because the plant would eventually be decommissioned and restored, there would be no impacts to long-term productivity of the site.

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10.4 BENEFIT–COST BALANCE

This section provides the benefit-cost analysis for construction and operation of Units 6 & 7 on the Turkey Point plant property. **Subsection 10.4.1** describes the benefits of constructing and operating new nuclear units. **Subsection 10.4.2** describes costs of constructing and operating the units. **Subsection 10.4.3** provides a high-level summary of the benefits and costs addressed in **Subsections 10.4.1** and **10.4.2**.

10.4.1 BENEFITS

10.4.1.1 Need for Power

As described in Chapter 8, FPL submitted its Petition to Determine Need for Units 6 & 7 Electrical Power Plant (FPL Oct 2007c) to the Florida Public Service Commission (FPSC) in October 2007. The FPSC granted FPL's petition by a final order in April 2008. The factors for consideration by the FPSC included: (1) the need for electric system reliability and integrity, (2) the need for fuel diversity and supply reliability, (3) the need for baseload generating capacity, (4) the need for adequate electricity at a reasonable cost, and (5) whether the proposed plant is the most cost-effective alternative available. The FPSC also annually reviews FPL's resource planning process, which is described in detail in FPL's annual Ten Year Power Plant Site Plan. The most current version was filed in April 2010 (FPL Apr 2010).

The Final Order Granting Petition for Determination of Need for Proposed Nuclear Power Plants includes the following:

- Florida has a well-defined, systematic, and comprehensive resource planning program that adequately reviews resources and growing demand for additional base load, eliminating the need for additional NRC review.
- FPL has the need for 8350 MW of additional capacity for the period 2011–2020 to meet its reserve margin criteria.
- The FPSC, statutorily charged by the state of Florida with determining whether Units 6 & 7 would be necessary, has reviewed the pertinent information and has determined a need for the proposed units. Further, the Florida Reliability Coordinating Council process for gathering need-for-power data provides further satisfaction of NRC criteria at the regional level.
- The integrated resource planning process gives NRC the assurance that the need for power is real and that the benefits of satisfying that need would be realized.
- The benefits to be derived from the addition of Units 6 & 7 include fuel savings, emissions avoidance, enhanced fuel diversity, and improved system reliability.

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Also, a summary of the 2010 Ten Year Power Plant Site Plan and integrated resource plan indicates that FPL's need for power is further based on the following (FPL Apr 2010):

- Within FPL's service territory, the projected load growth for the summer peak is projected to increase to 25,785 MW by 2019 with an increase of 3434 MW over the 2009 actual summer peak.
- There are no other additional new generating units proposed that meet capacity needs in the 2015 through 2019 time period.
- FPL's resource plan reflects concern for maintaining and enhancing fuel diversity in the FPL system and maintaining a balance between load and generating capacity in Southeastern Florida. FPL recognizes that the addition of new nuclear units will result in significant system fuel savings, system emission savings (including CO₂), and gains in system fuel diversity. FPL has addressed the revised in-service dates for Turkey Point Units 6 & 7 for planning purposes in the May 3, 2010 nuclear cost recovery filing with the FPSC (FPL May 2010a).

10.4.1.2 Fuel Diversity

Fuel diversity is the key to affordable and reliable electricity. A diverse fuel mix protects electric companies and consumers from contingencies such as fuel unavailability, price fluctuations, and changes in regulatory practices (EEI Mar 2003). History teaches that it is risky to develop an over-reliance on any one energy source. Industry experience over the past 30 years has demonstrated that a balanced energy portfolio is the key to providing America with a growing supply of affordable electricity (NRRI Mar 2005).

An electric system that relies on one or two fuels to generate a significant portion of the electricity needed to meet its customers' demand, all else being equal, is less reliable than a system that uses a more balanced, fuel-diverse generation portfolio (FPL Oct 2007a). An over-reliance on a single fuel source is a potential vulnerability to the long-term security of the nation's energy supply (USDOE 2008).

The Florida legislature, as part of the 2006 Florida Energy Act, amended Florida statutes to explicitly require the FPSC to consider the need for fuel diversity when making its determination of need for new electricity generating capacity (FPL Oct 2007b). At the same time, the legislature directed the commission to establish alternative mechanisms for recovering nuclear power plant costs (FPL Oct 2007c), a change that helps ensure availability of nuclear power as an option in maintaining fuel diversity in Florida.

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There are only a few technologies suited to providing baseload capacity in Florida today and in the foreseeable future: nuclear, gas-fired combined-cycle, and advanced, clean coal technology such as supercritical pulverized coal or integrated gasification combined-cycle (IGCC).

The FPSC denied FPL's request to construct advanced clean coal units. This action further limits the number of available technologies. In addition, IGCC continues to present many unanswered questions about its commercial viability and operational reliability. FPL today depends upon natural gas for most of its energy needs. This dependence is expected to grow to 70 percent by 2024 if FPL does not build Units 6 & 7 and, instead, adds an equivalent capacity of combined-cycle generation.

In summary, fuel diversity is recognized nationally and within Florida as critical to attaining a reliable electrical system. Nuclear power is the key to maintaining fuel diversity. The construction and operation of Units 6 & 7 would provide the benefit of fuel diversity to FPL and the state.

10.4.1.3 Avoided Emissions

Nuclear power generation results in significant local and national air quality benefits. Power plants that use natural gas and coal for electrical generation produce air emissions (e.g., nitrogen oxides, sulfur dioxide, and carbon dioxide). Of increasing concern is carbon dioxide due to its contribution as a greenhouse gas.

It is reasonably anticipated by most electric industry observers and others that there will be some form of greenhouse gas regulation. Whether it is federal, regional, or state, it is anticipated that such regulation will include requirements for significant greenhouse gas reductions within the timeframe that FPL must plan for additional capacity. The Florida governor, by executive order, has established aggressive greenhouse gas reduction targets (FPL Oct 2007d):

By 2017: Reduce greenhouse gas emissions to 2000 levels

By 2025: Reduce greenhouse emissions to 1990 levels

By 2050: Reduce greenhouse emissions to 80 percent of 1990 levels

Nuclear generation is generally considered a "non-emitting" technology because nuclear units emit no greenhouse gas as they operate to produce electricity (FPL Oct 2007e).

Subsection 9.2.3.1 indicates that a coal-fired alternative to Units 6 & 7 would emit approximately 14 million tons of carbon dioxide per year and **Subsection 9.2.3.2** indicates that the gas-fired alternative would emit approximately 6 million tons per year. In other words, a substantial benefit of Units 6 & 7, if constructed, is the avoidance of 6 to 14 million tons of greenhouse gas emission per year. However, there is no plausible scenario in which the state's greenhouse gas targets could be achieved in a cost-effective manner without new nuclear resources (FPL Oct 2007d).

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10.4.1.4 Advantage of Nuclear Power

Concerns about greenhouse gases and global climate change make it reasonable to expect that, eventually, the United States may have to strictly curb emissions from fossil-fuel electric generation plants, conceivably to the point of displacing coal- and gas-fired electricity generation. (If environmental policies restrict carbon emissions in the future, the cost of building and operating fossil-fired plants could increase by 50 to 100 percent.) Nuclear power is the only technology currently available that is a viable alternative to fossil-fired plants for baseload generation. The long lead time required to bring a new nuclear power plant online to displace fossil fuel power is one of the reasons for national concern with maintaining a nuclear energy capability (UC Aug 2004).

10.4.1.5 Tax Payments

As described in [Subsection 4.4.2.2](#), construction and operation-related activities would generate sales tax revenue. Corporate income taxes are a second source of revenue for the state, while property taxes are primarily paid to Miami-Dade County.

During the 123-month construction period, workers and their families would spend part of their income in the region on taxable items from restaurants, hotels, and retail shops, contributing to tax revenue. Increased sales and use tax could result from the purchase of taxable materials and services to construct Units 6 & 7. Sales and use tax collections from the construction and operation of Units 6 & 7 would contribute less than 1 percent to Florida sales tax revenue. Some of this revenue would be returned to the counties to help fund local services.

FPL would pay increased corporate income taxes to the state of Florida once Units 6 & 7 generate additional income by producing power. However, to the extent that FPL purchases goods and services in the state during the construction phase, this contributes to the earnings of other corporations. Similarly, the purchases made by the construction workforce and other households whose jobs are indirectly related to the construction activity would contribute toward corporate income. The Florida sales tax revenue collected from the construction of Units 6 & 7 would generate an estimated \$175.1–\$255.5 million to the state. Also the Miami-Dade County sales tax revenue collected during construction would generate an estimated \$29.2–\$42.6 million for the county.

As addressed in [Subsection 5.8.2](#), several sources of tax revenue and public expenditure are related to the operation of Units 6 & 7. These include sales taxes, property taxes, and corporate income taxes. Sales taxes would be levied on materials purchased during operation of Units 6 & 7 as well as on goods and services purchased by workers. Sales taxes on such purchases would be a beneficial impact to the local economy. Similarly, there may be direct and indirect beneficial

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economic impacts from sales tax revenue generated from goods and services purchased by workers who do not currently work in the region.

FPL would pay corporate income taxes on its increased net state income. However, as described in [Subsection 4.4.2.2.1](#), any tax increase attributable to the increased income of Units 6 & 7 would be paid at the consolidated entity level. The Turkey Point property tax revenue would be generated from real property and tangible personal property of FPL.

10.4.1.6 Local and State Economy

In all, construction and operations workers during Units 6 & 7 construction period would earn a total of more than \$709.3 million over the 123-month construction period. Depending on the proportion of wages spent, the creation of Units 6 & 7 jobs would inject approximately \$1.3 billion into the economy during the life of the construction project. In addition, the injection of new income would create jobs in the economy and create business opportunities for housing and service-related industries. The construction of Units 6 & 7 would contribute positively to the regional economy through purchases of capital and materials that are produced in the region.

As described in [Subsection 5.8.2](#), the operation workforce for Units 6 & 7 would consist of 806 employees, with an estimated 50 percent of the workers migrating into Miami-Dade County to support the operation of Units 6 & 7. FPL anticipates that 172 (43 percent of the 50 percent in-migrant workers) would migrate to the Homestead and Florida City area. The remaining 50 percent of the workers would be expected to be current residents in the area. In addition, in-migration of 403 workers would create additional indirect jobs in the region because of the multiplier effect. FPL estimates that the influx of 403 workers would create approximately 874 indirect jobs in Miami-Dade County for a total of 1277 new jobs.

Construction and operation workers are expected to live and spend most of their salaries within the local area and surrounding region. In addition, these workers are likely to spend some portion of their salaries in the local area for gasoline, beverages, food, and incidental items. Because construction workers would be at this location for some time, there would be a multiplier effect where money is spent and re-spent in the local area and later in the region. By patronizing local retail and service sector businesses, construction workers may temporarily increase sales. The economic multiplier effect is one way of measuring secondary effects and means that every dollar earned by in-migrant construction and operation worker results in the creation of an additional 1.5902 dollars in the regional economy.

10.4.1.7 Other Benefits

[Section 10.3](#) describes the relationship between short-term uses and long-term productivity of the human environment. Additional benefits not described in [Section 10.3](#) include:

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- Reduced dependence on foreign energy supplies.
- Reduced foreign trade deficit.
- Reduced depletion of finite fossil fuel supplies.

10.4.1.8 Benefit Summary

Table 10.4-1 is a summary of the benefits of the proposed action. In **Subsection 9.3.3**, FPL evaluated environmental impacts of construction and operation of the proposed project at four alternative sites (Glades, Martin, Okeechobee 2, and St. Lucie). **Table 10.4-1** also provides a comparison of the costs of construction and operation of the project as opposed to those at the four alternative sites.

10.4.2 COSTS

10.4.2.1 Internal Costs — Proposed Action

10.4.2.1.1 Introduction

Construction costs and operation costs are generally described using established cost information developed by several resources. There are many cost studies available in the literature with a wide range of cost estimates. While the Final Order Granting Petition for Determination of Need for Proposed Nuclear Power Plants confirms that the proposed action is the preferred alternative in nearly all future fuel cost and environmental compliance cost scenarios, the following is a sampling of studies that examines these costs:

- New Nuclear Power Plant Licensing Demonstration Project ABWR Cost/Schedule/COL Project at TVA's Bellefonte Site, Tennessee Valley Authority (TVA) (TVA Aug 2005)
- Nuclear Power's Role in Generating Electricity, Congressional Budget Office (CBO May 2008)
- Study of Projected Electricity Generating Costs, Organization for Economic Co-operation and Development, Nuclear Energy Agency (NEA) (NEA 2005)
- The Economic Future of Nuclear Power, University of Chicago (UC) (UC Aug 2004)
- The Future of Nuclear Power, an Interdisciplinary MIT Study, Massachusetts Institute of Technology (MIT) (MIT 2003)
- Annual Energy Outlook, Energy Information Administration (EIA) (EIA Jan 2004)

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- Nuclear Power Joint Fact Finding, The Keystone Center (Keystone 2007)
- Power Plants: Characteristics and Costs, Congressional Research Service (CRS 2008)

The CBO, Chicago, MIT, and NEA studies are based on costs for plants recently constructed overseas and use input from the EIA. The TVA study was a bottom-up estimate based on materials and labor costs. The Congressional Research Service study was based on, when available, submittals to state public service commissions.

It is frequently difficult to compare study results because of differing assumptions and analytic approaches. In addition, studies do not always identify inputs that would facilitate explanation of the reason for differing results. As the Congressional Research Service states, published information on plant costs often do not clearly distinguish which components are included in an estimate, or different analysts may use different definitions (CRS 2008). Therefore, FPL relies most heavily on the estimate of Units 6 & 7 costs that it prepared for approval by the FPSC (FPL Oct 2007f for detail; FPL Oct 2007g for summary).

Commonly used terminology to explain the different cost includes:

- **Overnight cost** — Sometimes called “overnight capital cost,” this is a convention for expressing the cost of construction as if the plant could be built overnight. The cost is expressed as an absolute dollar value or a dollar value per unit of net (exclusive onsite use) electrical generation capacity, such as dollars per kilowatt or dollars per megawatt. The cost does not include escalation or interest costs during construction or during the time between estimate and assumed start of construction. The data are useful for comparing costs of alternative nuclear technologies and becomes the basis for broader cost estimates. Variables affecting interpretation of published information include whether basis is recent construction history or materials and labor costs buildup; inclusion of owner's costs (e.g., licensing, land, site preparation, cooling system, switchyard, transmission facilities, project management, and contingencies); economies of scale due to number of units to be built at site; and dollar-year of estimate.
- **Construction cost** — Sometimes called “all-in cost,” this adds to overnight cost escalation and interest during construction and during the time between a cost estimate and the start of construction. It is expressed in the same units as overnight cost and is useful for identifying total cost of construction and for determining the effects of construction delays. Variables affecting interpretation of published information include completeness of overnight cost estimate; assumptions on escalation and interest rates, debt/equity ratio, length of construction period, and contingencies; and dollar-year of estimate.

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- **Levelized Cost** — Sometimes called “levelized annual cost,” this is the constant real wholesale price needed to recover construction and operation costs of the plant. The cost is expressed as cent or dollar value per amount of net electrical generation over time, such as cents per kW-hour. Levelized cost has been used in the past for comparing cost-competitiveness between alternative generation technologies (e.g., nuclear versus coal). Variables affecting interpretation of published information include completeness of intermediary cost estimates (overnight and construction), choices for discount rate, construction duration, plant life span, capacity factor, cost of debt and equity and split between debt and equity financing, depreciation time, tax rates, and premium for uncertainty. Estimates include decommissioning but, because of the effect of discounting a cost that would occur as much as 40 years in the future, decommissioning costs have relatively little effect on the levelized cost.

For various reasons, levelized cost estimates are being recognized as an inadequate analytical approach to use in comparing competing resource options. Estimate methodologies historically have been based on the premise that construction cost recovery begins upon start of commercial operation. However, some states are beginning to allow recovery of construction costs as they are incurred to reduce overall project costs (by reducing carrying charges) and to reduce ratepayer “sticker shock” once operation begins. This change also means that cost recovery is not necessarily “levelized” in the traditional sense. Finally, such changes in state practices are not always consistent between alternative generation technologies, making cross-technologies estimates using traditional levelized cost methodologies even more problematic.

The studies report cost estimates for different years, such as \$1800 in 2003 dollars. In order to compare estimates from different studies, FPL escalated or discounted all estimates to 2007 dollars.

10.4.2.1.2 Overnight Cost

The general studies present a range of overnight cost estimates from \$2000 to almost \$6000 per kW in 2007 dollars. As with a levelized cost approach on a per kW-hour basis, a comparison of overnight cost on a per kW-basis is an inadequate approach for comparing resource options. For example, there are two limitations to applying these overnight cost figures to Units 6 & 7. First, it is not clear how completely some of the studies incorporate the cost of land. It is reasonable to conclude that construction costs for completed reactors would include owner’s costs and that, therefore, EIA projections include owner’s costs. The FPL study expressly includes \$0 for land cost because FPL would use a site of an existing power plant. The second limitation to the overnight cost information is that it does not include the cost of transmission facilities. It is noted that, while NRC has historically considered transmission costs to be internal costs, transmission costs might be excluded from estimates for publicly owned utilities. FPL would need to incur

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internal cost for additional transmission lines, land within the transmission corridor, and any construction needed for substation expansion or renovation.

Total overnight cost would range from \$7.9 to \$11.4 billion, as shown in [Table 10.4-2](#).

10.4.2.1.3 Construction Cost

FPL estimated the construction cost for Units 6 & 7 to range from \$5823 to \$8497 per kW in 2012 dollars as shown in [Table 10.4-2](#). Total construction cost would range from \$12.8 to \$18.7 billion as shown in [Table 10.4-2](#).

10.4.2.1.4 Levelized Cost

Overnight capital costs account for a third of the levelized cost, and interest costs on the overnight costs account for another 25 percent (UC Aug 2004). The general studies identified show a wide range of operation cost estimates. Levelized cost of electricity estimates range from \$36 to \$83 per megawatt hour (3.6 to 8.3 cents per kWh).

Due to the fundamental problems inherent in a levelized cost approach to comparing, the state of Florida and FPL did not use levelized cost in their evaluation of the need for Units 6 & 7 and an estimate has not been generated. Instead, FPL has modeled a number of economic scenarios that incorporate a range of potential fuel prices and possible environmental compliance costs, including a range of greenhouse gas emission reduction costs. As part of this analysis, a range of economic outcomes in which one fuel technology (nuclear or combined-cycle) is the cost-preferred solution relative to the other in reducing the capacity gap was identified. The results of the analysis were presented as a breakeven capital cost for each individual case.

10.4.2.2 Internal Costs — Generation Alternatives

NRC precedent has established that project cost information for alternatives is relevant only if the alternatives are environmentally preferable to the proposed action (NRC Feb 2009). As described in [Section 9.2](#), FPL has concluded that coal- and gas-fired generation were not environmentally preferable alternatives to the proposed action. In keeping with NRC precedent, FPL has not included internal cost estimates for the generation alternatives.

10.4.2.3 External Costs

10.4.2.3.1 Land Use

Disturbance of land is one of the costs of constructing the new nuclear reactor units and appurtenant structures. Units 6 & 7 would be part of the Turkey Point plant property that is currently zoned by Miami-Dade County for permitted use for nuclear reactors. As described in [Sections 4.1](#) and [5.1](#), locating the new reactors on the Turkey Point Plant Property is expected to

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have SMALL adverse impacts. Appropriate best environmental management practices would be implemented to minimize the potential for land use impacts including erosion and sedimentation and any unavoidable impacts to wetlands would require mitigation.

10.4.2.3.2 Hydrological and Water Use

There are costs associated with providing water for various needs during construction and operation of the new units. As described in [Sections 4.2](#) and [4.4](#), construction of Units 6 & 7 is estimated to require a maximum of 565 gpm of potable water, used for such activities as dust abatement, mixing concrete, hydrotesting and flushing, and potable water used by the construction workforce. Miami-Dade County would be the source for construction water requirements.

As described in [Section 3.3](#), water consumption during operations activities would total 2.95E10 gallons annually for both units. Cooling water makeup sources are reclaimed water and saltwater using radial collector wells. Potable water in the amount of 936 gpm (1.35 mgd) to 2553 gpm (3.68 mgd) would be supplied for non-cooling water use. Units 6 & 7 wastewater would be injected underground via permitted deep injection wells. Hydrological and water use impacts are anticipated to be SMALL.

10.4.2.3.3 Terrestrial and Aquatic Biology

Some costs associated with loss of terrestrial and aquatic populations and habitats during construction are anticipated. As described in [Section 4.3](#), conversion of approximately 300 acres of primarily mudflat and wetland habitat would occur. However, these impacts would not significantly reduce the regional diversity of plants or plant communities due to the scarce natural conditions of the site. The potential losses from the project are not expected to be large enough to affect the long-term stability of terrestrial and aquatic resources in the area and the overall impact is anticipated to be SMALL.

10.4.2.3.4 Air Emissions

Relatively small amounts of air emissions from diesel generators and vehicles would be generated during construction and operation of the facilities. Cooling tower drift deposits salt on the plant property and adjacent areas, but the levels are not likely to result in any measurable impact on vegetation. Air emission impacts are anticipated to be SMALL.

10.4.2.3.5 Radioactive Emissions, Effluents, and Wastes

Minor radioactive air emissions are released into the atmosphere and discharged into deep injection wells. Low-level and high-level radioactive wastes are generated and need to be

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disposed of according to local, state, and federal permitting regulations. Overall radioactive emissions, effluents, and waste impacts are anticipated to be SMALL.

10.4.2.3.6 Socioeconomic

It is anticipated that the region affords necessary infrastructure and services to meet the demands of the construction and operation workforce. If additional infrastructure and services are needed to meet the demands of the people moving into the area to support the construction and operation of the new units, these costs would be offset by the beneficial increased tax revenues to the local economy and the overall beneficial economic input to the region from those individuals and families.

10.4.2.4 Alternative Sites

In [Subsection 9.3.3](#), the environmental impacts of construction and operation of the proposed project at four alternative sites (Glades, Martin, Okeechobee 2, and St. Lucie) were evaluated. [Table 10.4-1](#) identifies the unavoidable adverse environmental impacts of construction and operation of the project as proposed at the four alternative sites.

10.4.3 SUMMARY

In accordance with guidance provided in NUREG-1555, Rev. 1, (ESRP 10.4), this section summarizes the benefits and costs of the proposed construction and operation of Units 6 & 7. This table also provides information regarding selected mitigation measures for potential impacts. Costs that are environmental impacts are those anticipated after proposed mitigation measures are implemented.

The costs of mitigation are not easily determined at this time. It is anticipated that mitigation would be built into the overall design (for example, scheduling to ensure construction is completed in the shortest possible time, using construction best management practices to limit erosion, fugitive dust, runoff, spills, and air emissions, and providing first-aid stations at the construction site). Relying on early and frequent communication between FPL and the affected communities could help to minimize cost and ensure effective management of the construction and operation of Units 6 & 7.

In summary, there is a resource need in the region of influence by 2022, with that need increasing every year thereafter. Following a comprehensive review and consideration of the factors discussed earlier, the FPSC determined that Turkey Point Units 6 & 7 will provide needed system reliability, fuel diversity, baseload capacity, reasonable affordable electricity, and the most cost-effective sources of power (FPSC 2008). It has been determined that the new nuclear facility should be located at the existing plant property in Miami-Dade County, Florida. Units 6 & 7 will

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result in a reduction in emissions with respect to comparably sized coal- or gas-fired alternative power generating facilities.

While the additional direct and indirect creation of jobs for the construction and operation of the new facility may place a temporary burden on local services and infrastructures, the annual taxes and revenue generated by the new workers contribute to the local economy and the region's productivity.

In conclusion, the construction and operation of the proposed project is needed by the service area and the benefits outweigh the economic, environmental, and social costs.

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Table 10.4-1 (Sheet 1 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|---|---|---|---|---|---|
| Project Description | Units 6 & 7 are at an existing fossil fuel and nuclear power generating facility, located in Miami-Dade County, Florida. The site is owned by FPL. | The Glades site is a greenfield site in Glades County, Florida. | The Martin site is an existing fossil fuel power generating facility in Martin County, Florida. The site is owned by FPL. | The Okeechobee 2 site is a greenfield site in Okeechobee County, Florida. | The St. Lucie site is an existing nuclear power generating facility in St. Lucie County, Florida. The site is owned by FPL. |
| Benefits | | | | | |
| Electricity Generated and Generating Capacity | Westinghouse AP1000 reactors for Units 6 & 7 have a rated total gross thermal megawatt output per unit of 3,415 MWt with a gross electrical output each of approximately 1,100 MWe. | The electricity generated and generating capacity would be similar to that of Units 6 & 7. | The electricity generated and generating capacity would be similar to that of Units 6 & 7. | The electricity generated and generating capacity would be similar to that of Units 6 & 7. | The electricity generated and generating capacity would be similar to that of Units 6 & 7. |
| Fuel Diversity | Nuclear generation provides an option to either a natural gas or coal baseload facility for electricity supply. Does not have price volatility of natural gas and reduces emissions. Unlike coal, fuel availability issues are limited. | Nuclear generation provides an option to either a natural gas or coal baseload facility for electricity supply. Does not have price volatility of natural gas and reduces emissions. Unlike coal, fuel availability issues are limited. | Nuclear generation provides an option to either a natural gas or coal baseload facility for electricity supply. Does not have price volatility of natural gas and reduces emissions. Unlike coal, fuel availability issues are limited. | Nuclear generation provides an option to either a natural gas or coal baseload facility for electricity supply. Does not have price volatility of natural gas and reduces emissions. Unlike coal, fuel availability issues are limited. | Nuclear generation provides an option to either a natural gas or coal baseload facility for electricity supply. Does not have price volatility of natural gas and reduces emissions. Unlike coal, fuel availability issues are limited. |
| Licensing Certainty | Resolution of design criteria through certification; resolution of site, construction and operational issues in COL Application; reliance on nuclear as generation. | Resolution of design criteria through certification; resolution of site, construction, and operational issues in COL Application; reliance on nuclear as generation. | Resolution of design criteria through certification; resolution of site, construction, and operational issues in COL Application; reliance on nuclear as generation. | Resolution of design criteria through certification; resolution of site, construction, and operational issues in COL Application; reliance on nuclear as generation. | Resolution of design criteria through certification; resolution of site, construction, and operational issues in COL Application; reliance on nuclear as generation. |
| Carbon Reduction | Nuclear power reduces carbon emissions by not producing 14 million tons per year CO ₂ as coal or 6 million tons per year CO ₂ as natural gas. | Carbon emissions reduction would be similar to Units 6 & 7. | Carbon emissions reduction would be similar to Units 6 & 7. | Carbon emissions reduction would be similar to Units 6 & 7. | Carbon emissions reduction would be similar to Units 6 & 7. |
| Increased Customer Choice | Retail choice of “clean” energy source in addition to menu of renewable sources. | Retail choice of “clean” energy source in addition to menu of renewable sources. | Retail choice of “clean” energy source in addition to menu of renewable sources. | Retail choice of “clean” energy source in addition to menu of renewable sources. | Retail choice of “clean” energy source in addition to menu of renewable sources. |

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Table 10.4-1 (Sheet 2 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|------------------|--|--|--|---|--|
| Benefits (cont.) | | | | | |
| Local Economy | <p>Addition of 3950 new employees to the workforce for construction of the new units.</p> <p>A workforce of approximately 806 employees would be needed for operation.</p> <p>Construction and operation workforce provide an economic benefit to the community.</p> | A similar size workforce as Units 6 & 7 is anticipated. | A similar size workforce as Units 6 & 7 is anticipated. | A similar size workforce as Units 6 & 7 is anticipated. | A similar size workforce as Units 6 & 7 is anticipated. |
| Aesthetic Values | <p>Selection of design and cooling tower technology allows for minimal aesthetic impacts.</p> <p>Site contains existing nuclear power facility structures.</p> | <p>Selection of design and cooling tower technology allows for minimal aesthetic impacts.</p> <p>No current facilities on site.</p> | <p>Selection of design and cooling tower technology allows for minimal aesthetic impacts.</p> <p>Site contains existing fossil fuel power facility structures.</p> | <p>Selection of design and cooling tower technology allows for minimal aesthetic impacts.</p> <p>No current facilities on site.</p> | <p>Selection of design and cooling tower technology allows for minimal aesthetic impacts.</p> <p>Site contains existing nuclear power facility structures.</p> |
| Air Quality | Major beneficial impact in terms of avoidance of power plant emissions. | Major beneficial impact in terms of avoidance of power plant emissions. | Major beneficial impact in terms of avoidance of power plant emissions. | Major beneficial impact in terms of avoidance of power plant emissions. | Major beneficial impact in terms of avoidance of power plant emissions. |
| Land Use | Land to be used for Units 6 & 7 is owned by FPL and would be part of the existing power generating facility. | The Glades County site is on land that is currently a greenfield site. The land would need to be rezoned for development of the nuclear units. | Land to be used for the Martin site would be part of the existing power generating facility. Additional lands would need to be obtained for a cooling water storage reservoir. | The Okeechobee 2 site is on land that is currently a greenfield site. The land would need to be rezoned for development of the nuclear units. | Land to be used for the St. Lucie site is owned by FPL and would be part of the existing power generating facility. |

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Table 10.4-1 (Sheet 3 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|---|---|---|---|---|---|
| Benefits (cont.) | | | | | |
| State/Local Tax Payments during Construction and Operations | Construction will generate tax revenues from sources including income tax, retail sales tax on materials, supplies, and selected construction services; retail sales tax on expenditures by workers; and corporate income taxes paid by contractors. During operation of the facility, local government tax revenues will accrue from property taxes and permitting and impact fees. Tax payments would occur annually over the life of the new reactor units. The impacts to the local tax base are considered SMALL and beneficial. | Construction will generate tax revenues from sources including income tax, retail sales tax on materials, supplies, and selected construction services; retail sales tax on expenditures by workers; and corporate income taxes paid by contractors. During operation of the facility, local government tax revenues will accrue from property taxes and permitting and impact fees. Tax payments would occur annually over the life of the new reactor units. The impact to the local tax base is considered LARGE and beneficial. | Construction will generate tax revenues from sources including income tax, retail sales tax on materials, supplies, and selected construction services; retail sales tax on expenditures by workers; and corporate income taxes paid by contractors. During operation of the facility, local government tax revenues will accrue from property taxes and permitting and impact fees. Tax payments would occur annually over the life of the new reactor units. The impact to the local tax base is considered SMALL and beneficial. | Construction will generate tax revenues from sources including income tax, retail sales tax on materials, supplies, and selected construction services; retail sales tax on expenditures by workers; and corporate income taxes paid by contractors. During operation of the facility, local government tax revenues will accrue from property taxes and permitting and impact fees. Tax payments would occur annually over the life of the new reactor units. The impact to the local tax base is considered LARGE and beneficial. | Construction will generate tax revenues from sources including income tax, retail sales tax on materials, supplies, and selected construction services; retail sales tax on expenditures by workers; and corporate income taxes paid by contractors. During operation of the facility, local government tax revenues will accrue from property taxes and permitting and impact fees. Tax payments would occur annually over the life of the new reactor units. The impact to the local tax base is considered SMALL and beneficial. |

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Table 10.4-1 (Sheet 4 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|----------------------------------|---|---|---|---|---|
| Benefits (cont.) | | | | | |
| Effects on Regional Productivity | <p>Anticipate an increase in regional productivity through the influx of construction and station operation workers. Workers will create additional new indirect (service-related) jobs in the region through the multiplier effect of direct employment.</p> <p>Construction workforce and their families will increase the population in the area.</p> <p>The expenditures of construction and facility operation workers for food, shelter, and services will create jobs, which will have a SMALL positive impact on the region's economy. Job creation will inject millions of dollars in the region's economy, reducing unemployment and creating business opportunities.</p> | <p>Anticipate an increase in regional productivity through the influx of construction and station operation workers. Workers will create additional new indirect (service-related) jobs in the region through the multiplier effect of direct employment.</p> <p>Construction workforce and their families will increase the population in the area.</p> <p>The expenditures of construction and facility operation workers for food, shelter, and services will create jobs, which will have a SMALL positive impact on the region's economy. Job creation will inject millions of dollars in the region's economy, reducing unemployment and creating business opportunities.</p> | <p>Anticipate an increase in regional productivity through the influx of construction and station operation workers. Workers will create additional new indirect (service-related) jobs in the region through the multiplier effect of direct employment.</p> <p>Construction workforce and their families will increase the population in the area.</p> <p>The expenditures of construction and facility operation workers for food, shelter, and services will create jobs, which will have a SMALL positive impact on the region's economy. Job creation will inject millions of dollars in the region's economy, reducing unemployment and creating business opportunities.</p> | <p>Anticipate an increase in regional productivity through the influx of construction and station operation workers. Workers will create additional new indirect (service-related) jobs in the region through the multiplier effect of direct employment.</p> <p>Construction workforce and their families will increase the population in the area.</p> <p>The expenditures of construction and facility operation workers for food, shelter, and services will create jobs, which will have a SMALL positive impact on the region's economy. Job creation will inject millions of dollars in the region's economy, reducing unemployment and creating business opportunities.</p> | <p>Anticipate an increase in regional productivity through the influx of construction and station operation workers. Workers will create additional new indirect (service-related) jobs in the region through the multiplier effect of direct employment.</p> <p>Construction workforce and their families will increase the population in the area.</p> <p>The expenditures of construction and facility operation workers for food, shelter, and services will create jobs, which will have a SMALL positive impact on the region's economy. Job creation will inject millions of dollars in the region's economy, reducing unemployment and creating business opportunities.</p> |

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Table 10.4-1 (Sheet 5 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie | |
|--|--|--|--|--|--|--|
| Benefits (cont.) | | | | | | |
| <p>Technical and Other Non-monetary Improvements (for example, New Recreational Facilities and Improvements to Local Facilities)</p> | <p>Anticipate that existing local and county police, fire, and medical facilities and/or personnel would be able to accommodate the influx of construction and facility operation workers.</p> | <p>Anticipate that existing local and county police, fire, and medical facilities and/or personnel would be able to accommodate the influx of construction and facility operation workers.</p> | <p>Anticipate that existing local and county police, fire, and medical facilities and/or personnel would be able to accommodate the influx of construction and facility operation workers.</p> | <p>Anticipate that existing local and county police, fire, and medical facilities and/or personnel would be able to accommodate the influx of construction and facility operation workers.</p> | <p>Anticipate that existing local and county police, fire, and medical facilities and/or personnel would be able to accommodate the influx of construction and facility operation workers.</p> | |
| | <p>Anticipate that the existing water supply and wastewater treatment facilities can accommodate the added increase in population.</p> | <p>Anticipate that the existing water supply and wastewater treatment facilities can accommodate the added increase in population.</p> | <p>Anticipate that the existing water supply and wastewater treatment facilities can accommodate the added increase in population.</p> | <p>Anticipate that the existing water supply and wastewater treatment facilities can accommodate the added increase in population.</p> | <p>Anticipate that the existing water supply and wastewater treatment facilities can accommodate the added increase in population.</p> | <p>Anticipate that the existing water supply and wastewater treatment facilities can accommodate the added increase in population.</p> |
| | <p>Anticipate that the existing education and social service facilities can accommodate the increase in population.</p> | <p>Anticipate that the existing education and social service facilities can accommodate the increase in population.</p> | <p>Anticipate that the existing education and social service facilities can accommodate the increase in population.</p> | <p>Anticipate that the existing education and social service facilities can accommodate the increase in population.</p> | <p>Anticipate that the existing education and social service facilities can accommodate the increase in population.</p> | <p>Anticipate that the existing education and social service facilities can accommodate the increase in population.</p> |
| | <p>Construction and operation activities should not have long-term, adverse impacts to recreational use of the surrounding area.</p> | <p>Construction and operation activities should not have long-term, adverse impacts to recreational use of the surrounding area.</p> | <p>Construction and operation activities should not have long-term, adverse impacts to recreational use of the surrounding area.</p> | <p>Construction and operation activities should not have long-term, adverse impacts to recreational use of the surrounding area.</p> | <p>Construction and operation activities should not have long-term, adverse impacts to recreational use of the surrounding area.</p> | <p>Construction and operation activities should not have long-term, adverse impacts to recreational use of the surrounding area.</p> |
| | <p>Neither technical developments nor recreational enhancements are anticipated at this time from the construction and operation of the proposed nuclear facility. In addition, minor road improvements would occur near the proposed nuclear facility, on an as-needed basis, to support construction and operation activities.</p> | <p>Neither technical developments nor recreational enhancements are anticipated at this time from the construction and operation of the proposed nuclear facility. In addition, minor road improvements would occur near the proposed nuclear facility, on an as-needed basis, to support construction and operation activities.</p> | <p>Neither technical developments nor recreational enhancements are anticipated at this time from the construction and operation of the proposed nuclear facility. In addition, minor road improvements would occur near the proposed nuclear facility, on an as-needed basis, to support construction and operation activities.</p> | <p>Neither technical developments nor recreational enhancements are anticipated at this time from the construction and operation of the proposed nuclear facility. In addition, minor road improvements would occur near the proposed nuclear facility, on an as-needed basis, to support construction and operation activities.</p> | <p>Neither technical developments nor recreational enhancements are anticipated at this time from the construction and operation of the proposed nuclear facility. In addition, minor road improvements would occur near the proposed nuclear facility, on an as-needed basis, to support construction and operation activities.</p> | <p>Neither technical developments nor recreational enhancements are anticipated at this time from the construction and operation of the proposed nuclear facility. In addition, minor road improvements would occur near the proposed nuclear facility, on an as-needed basis, to support construction and operation activities.</p> |

Turkey Point Units 6 & 7
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Table 10.4-1 (Sheet 6 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|---------------------------|---|---|---|--|---|
| Benefits (cont.) | | | | | |
| Environmental Enhancement | <p>Reduction in carbon emissions with the use of nuclear power.</p> <p>It is necessary to transport fill material to this site to increase the site elevation before construction for tidal purposes.</p> <p>Land acquisition would not be required at the Units 6 & 7 site because the site is already owned by FPL and is designated for power plant activities.</p> <p>Units 6 & 7 would use a combination of sources for cooling water makeup: reclaimed water obtained from treated wastewater and water obtained from the seawater aquifer under Biscayne Bay using radial collector wells.</p> <p>For heat rejection, a closed-loop system with mechanical draft cooling towers would be used.</p> | <p>Reduction in carbon emissions with the use of nuclear power.</p> <p>Because portions of the Glades site are within the 100-year floodplain, it is necessary to utilize fill material to increase the site elevation before construction. Fill material is assumed to be available from on-site excavations.</p> <p>Because this site is a greenfield site, it is estimated that 3,360 acres of land acquisition would be required.</p> <p>Freshwater sources (surface or groundwater) are available to supply the water needs for the Glades site, including the Caloosahatchee River/Canal, and the water would be transferred to the site via underground pipelines.</p> <p>For heat rejection, a closed-loop system with mechanical draft cooling towers would be used.</p> | <p>Reduction in carbon emissions with the use of nuclear power.</p> <p>The Martin site is outside of the 100-year floodplain and would, therefore, not require modification to site elevation.</p> <p>Land acquisition would be required at the Martin site for the cooling water storage reservoir. It is estimated that approximately 2,800 acres of land acquisition would be required.</p> <p>Freshwater sources (surface or groundwater) are available to supply the water needs for the Martin site, including the St. Lucie Canal, and the water would be transferred to the site via underground pipelines.</p> <p>For heat rejection, a closed-loop system with mechanical draft cooling towers would be used.</p> | <p>Reduction in carbon emissions with the use of nuclear power.</p> <p>Because portions of the Okeechobee site are within the 100-year floodplain, it may be necessary to utilize fill material to increase the site elevation before construction. Fill material is assumed to be available from on-site excavations.</p> <p>Because this site is a greenfield site, it is estimated that 3,360 acres of land acquisition would be required.</p> <p>Freshwater sources (surface or groundwater) are available to supply the water needs for the Okeechobee site, including the Kissimmee River, and the water would be transferred to the site via underground pipelines.</p> <p>For heat rejection, a closed-loop system with mechanical draft cooling towers would be used.</p> | <p>Reduction in carbon emissions with the use of nuclear power.</p> <p>Because the St. Lucie site is within the 100-year floodplain, it is necessary to transport fill material to this site to increase the site elevation before construction.</p> <p>Land acquisition would not be required at the St. Lucie site because the site is already owned by FPL and is designated for power plant activities.</p> <p>The St. Lucie site would employ the same type of ocean water intake and canal transfer system used for existing St. Lucie Units 1 & 2.</p> <p>For heat rejection, a closed-loop system with mechanical draft cooling towers would be used.</p> |

Turkey Point Units 6 & 7
COL Application
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Table 10.4-1 (Sheet 7 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|---|---|---|---|---|--|
| Benefits (cont.) | | | | | |
| <p>Construction Cost</p> <p>Note: Cost value is a roll-up of the internal cost values for constructing the facility, which include land, labor, materials, and equipment.</p> | <p>The proposed reactors at Units 6 & 7 will each be rated with a net electrical output of greater than or equal to 1,000 MWe.</p> <p>In accordance with Subsection 4.4.2, FPL estimates a total escalated construction cost of \$18.7 billion, which includes the cost of constructing Units 6 & 7.</p> | <p>The proposed reactors will be similar to the proposed reactors at the Units 6 & 7 site (net electrical output of greater than or equal to 1,000 MWe).</p> <p>Construction costs will be similar to the Units 6 & 7 site.</p> | <p>The proposed reactors will be similar to the proposed reactors at the Units 6 & 7 site (net electrical output of greater than or equal to 1,000 MWe).</p> <p>Construction costs will be similar to the Units 6 & 7 site.</p> | <p>The proposed reactors will be similar to the proposed reactors at the Units 6 & 7 site (net electrical output of greater than or equal to 1,000 MWe).</p> <p>Construction costs will be similar to the Units 6 & 7 site.</p> | <p>The proposed reactors will be similar to the proposed reactors at the Units 6 & 7 site (net electrical output of greater than or equal to 1,000 MWe).</p> <p>Construction costs will be similar to the Units 6 & 7 site.</p> |
| <p>Transmission System</p> | <p>The Units 6 & 7 site would require a transmission system, consisting of three additional 230 kV transmission lines and two additional 500 kV lines to connect the new nuclear units to the existing FPL transmission system. The lines would be routed approximately 89 miles along two separate transmission corridors.</p> | <p>It was assumed that the Glades site would require approximately 121 miles of new transmission corridor to connect the new nuclear units to the existing FPL transmission system at the Andytown Substation in Broward County.</p> | <p>It was assumed that the Martin site would require approximately 31 miles of new transmission corridor to connect the new nuclear units to the existing FPL transmission system at the Corbett substation in Palm Beach County.</p> | <p>It was assumed that the Okeechobee 2 site would require approximately 38 miles of new transmission corridor to connect the new nuclear units to the existing FPL transmission system at the Corbett substation in Palm Beach County.</p> | <p>It was assumed that the St. Lucie site would require approximately 63 miles of new transmission corridor to connect the new nuclear units to the existing FPL transmission system at the Corbett substation in Palm Beach County.</p> |
| <p>Operating Cost</p> <p>Note: Cost value is a roll-up of the Internal cost values for operating the facility which include labor, materials, and services.</p> | <p>The nuclear industry's average production cost in 2007 was 1.68 cents per kWh.</p> | <p>Costs would be similar to the Units 6 & 7 site.</p> | <p>Costs would be similar to the Units 6 & 7 site.</p> | <p>Costs would be similar to the Units 6 & 7 site.</p> | <p>Costs would be similar to the Units 6 & 7 site.</p> |

Turkey Point Units 6 & 7
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Table 10.4-1 (Sheet 8 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|-------------------------|--|--|---|---|---|
| Benefits (cont.) | | | | | |
| Land Use | <p>The Units 6 & 7 plant area is a 220-acre area located on the existing FPL-owned 9400-acre plant property, on which five electric generating units are currently operational. The site is currently zoned for permitted use for nuclear reactors through an unusual use approval by Miami-Dade County (Section 4.1).</p> <p>The site consists of hypersaline mudflats; open water, dwarf mangroves, upland and wetlands spoils areas, man-made remnant canals, mangrove heads, and fill areas/roadways (Section 2.2). Most of the site (61 percent) is comprised of mudflats surrounded by man-made cooling canals.</p> <p>Based on land disturbance totals and the change of land use from agricultural to industrial, land use impacts from the project are anticipated to be SMALL.</p> | <p>The Glades site is approximately 3,360 acres (excluding offsite project components) and is developed for agricultural and farm use. The topography of the site is generally flat with a mean elevation of 15 feet. Approximately 306 acres of wetlands are within the project area, excluding the conceptual transmission corridor. The site is surrounded by sugarcane fields.</p> <p>Based on a potentially affected area of approximately 9,287 acres (including the conceptual transmission corridor) and the permanent change of land use from agricultural to industrial, land use impacts at the Glades site and the transmission corridor would be LARGE.</p> | <p>The Martin site is an existing 11,300-acre area that includes five fossil-fired power units and a solar unit. The plant site is owned by FPL although additional land would need to be acquired given that a new 3,000-acre cooling water storage reservoir would be required. The site includes an area of mixed pine flat wood and scattered small wetlands, a 1,200-acre area that has been set aside as a mitigation area, and a 400-acre peninsula of wetland forest, the Barley Barber Swamp, that is preserved as a natural area. Approximately 163 acres of wetlands are within the project area, excluding the conceptual transmission corridor.</p> <p>Because the site already hosts multiple power generation units, construction of additional power units would not alter site land use. Based on a potentially affected area of approximately 4,674 acres, most of which would occur off the existing Martin plant site</p> | <p>The Okeechobee 2 site is a 3,360-acre undeveloped site (excluding offsite project components). The site is not owned by FPL but is considered potentially available. The site is used primarily for farmland and agriculture. The county has substantial cattle, dairy, and citrus operations. The site is generally flat with a mean elevation of 28 feet. Approximately 1,500 acres of wetlands are within the project area, excluding the conceptual transmission corridor.</p> <p>Based on a potentially affected area of approximately 6,567 acres (including the conceptual transmission corridor) and the permanent change of land use from agricultural to industrial, land use impacts at the Okeechobee 2 site and the transmission corridor would be LARGE.</p> | <p>The St. Lucie site is an FPL-owned nuclear power generation station located on the 1,130-acre site on Hutchinson Island. The site is bordered by the Atlantic Ocean and the Indian River Lagoon. The nominal site elevation is 0 to 5 feet above sea level, which falls within the 100-year floodplain. West of the facility, the land gradually slopes downward to a mangrove fringe bordering the intertidal shoreline of the Indian River Lagoon. East of the facility, land rises from the ocean shore to form dunes and ridges approximately 15 feet above mean low water. Two county parks with beach access lie within the property boundary.</p> <p>Because the site already hosts nuclear power generation units, construction of additional power units would not alter area land use. Based on a potentially affected area of approximately 2,828 acres (including the conceptual transmission corridor and</p> |

Turkey Point Units 6 & 7
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Table 10.4-1 (Sheet 9 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|-------------------------|--|--|--|--|--|
| Benefits (cont.) | | | | | |
| Land Use (cont.) | | | (including the reservoir, conceptual transmission corridor, and approximately 39 miles of access road improvements), land use impacts at the Martin site and the transmission corridor would be MODERATE. | | access road improvements), land use impacts at the St. Lucie site and the transmission corridor would be SMALL. |
| Materials | Construction materials include concrete, fill material, aggregate, rebar, conduit, cable, piping, building supplies, and tools. Operating materials include uranium. | Construction materials include concrete, fill material, aggregate, rebar, conduit, cable, piping, building supplies, and tools. Operating materials include uranium. | Construction materials include concrete, aggregate, rebar, conduit, cable, piping, building supplies, and tools. Operating materials include uranium. | Construction materials include concrete, fill material, aggregate, rebar, conduit, cable, piping, building supplies, and tools. Operating materials include uranium. | Construction materials include concrete, fill, material, aggregate, rebar, conduit, cable, piping, building supplies, and tools. Operating materials include uranium. |
| Equipment | Typical construction equipment will include cranes, cement trucks, excavation equipment, dump truck, and graders. Equipment for the new facility would include the necessary components for the facility such as the reactors, turbines, cooling systems, water processing/treatment systems, and cooling towers. | Typical construction equipment will include cranes, cement trucks, excavation equipment, dump truck, and graders. Equipment for the new facility would include the necessary components for the facility such as the reactors, turbines, cooling systems, water processing/treatment systems, and cooling towers. | Typical construction equipment will include cranes, cement trucks, excavation equipment, dump truck, and graders. Equipment for the new facility would include the necessary components for the facility such as the reactors, turbines, cooling systems, water processing/treatment systems, and cooling towers. | Typical construction equipment will include cranes, cement trucks, excavation equipment, dump truck, and graders. Equipment for the new facility would include the necessary components for the facility such as the reactors, turbines, cooling systems, water processing/treatment systems, and cooling towers. | Typical construction equipment will include cranes, cement trucks, excavation equipment, dump truck, and graders. Equipment for the new facility would include the necessary components for the facility such as the reactors, turbines, cooling systems, water processing/treatment systems, and cooling towers. |
| Services | Support services and supplies would be needed during construction. Security, maintenance, trash removal, and/or landscaping services may be needed during operation of the facility. | Support services and supplies would be needed during construction. Security, maintenance, trash removal, and/or landscaping services may be needed during operation of the facility. | Support services and supplies would be needed during construction. Security, maintenance, trash removal, and/or landscaping services may be needed during operation of the facility. | Support services and supplies would be needed during construction. Security, maintenance, trash removal, and/or landscaping services may be needed during operation of the facility. | Support services and supplies would be needed during construction. Security, maintenance, trash removal, and/or landscaping services may be needed during operation of the facility. |

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Table 10.4-1 (Sheet 10 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|-------------------------|--|--|--|---|---|
| Benefits (cont.) | | | | | |
| Water Use | <p>Construction for Units 6 & 7 is estimated to require a maximum of 565 gpm of water, used for such activities as dust abatement, mixing concrete, hydrotesting and flushing, and potable water use by the construction force. Miami-Dade County would be the source for construction water requirements (Section 4.2). As described in Section 3.3, water consumption during fuel cycle activities would total 2.95E10 gallons annually for both units. Cooling water makeup sources are reclaimed water from county-treated wastewater and water drawn from the seawater aquifer underlying Biscayne Bay using radial collector wells. Public water in the amount of 936 gpm (1.35 mgd) to 2,553 gpm (3.68 mgd) would be supplied for non-cooling water use. Units 6 & 7 wastewater will be injected underground via permitted deep injection wells.</p> <p>Hydrological and water use impacts are anticipated to be SMALL.</p> | <p>Consumptive water use for a nuclear facility at the Glades site would be similar to that which is proposed for Units 6 & 7 at the Turkey Point site.</p> <p>Major freshwater surface water sources exist that could meet the water use needs of the facility. Lake Okeechobee offers a potential water supply of more than 360 cfs, and the annual average flow of the Caloosahatchee River/Canal near the site is approximately 592 cfs. The estimated groundwater potential at the Glades site is approximately 155 cfs. These water sources are suitable to satisfy potable and process water demands associated with construction and operation at the Glades site.</p> <p>Water use impacts are anticipated to be SMALL.</p> | <p>Consumptive water use for a nuclear facility at the Martin County site would be similar to that which is proposed for Units 6 & 7 at the Turkey Point site.</p> <p>Major freshwater surface water sources exist that could meet the water use needs of the facility. Lake Okeechobee offers a potential water supply of more than 360 cfs, and the annual average flow of the St. Lucie Canal near the site is approximately 842 cfs. The estimated groundwater potential at the Martin site is approximately 155 cfs. These water sources are suitable to satisfy potable and process water demands associated with construction and operation at the Martin site.</p> <p>Water use impacts are anticipated to be SMALL.</p> | <p>Consumptive water use for a nuclear facility at the Okeechobee 2 site would be similar to that which is proposed for Units 6 & 7 at the Turkey Point site.</p> <p>Major freshwater surface water sources exist that could meet the water use needs of the facility. Lake Okeechobee offers a potential water supply of more than 360 cfs, and the annual average flow of the Kissimmee River near the site is approximately 919 cfs. The estimated groundwater potential at the Okeechobee 2 site is approximately 155 cfs. These water sources are suitable to satisfy potable and process water demands associated with construction and operation at the Okeechobee 2 site.</p> <p>Water use impacts are anticipated to be SMALL.</p> | <p>Consumptive water use for a nuclear facility at the St. Lucie site would be similar to that which is proposed for Units 6 & 7 at the Turkey Point site.</p> <p>Existing St. Lucie Units 1 & 2 receive water from the city of Ft. Pierce and the Ft. Pierce Utilities Authority for potable and service uses at the plant. The freshwater is derived from groundwater sources on the mainland, and plant operations do not involve any additional groundwater withdrawal. Average potable water usage at the plant is approximately 131,500 gpd with no restrictions on supply. The addition of two more power units would nominally double this daily potable water requirement.</p> <p>Water is withdrawn from the Atlantic Ocean in a once-through arrangement to cool St. Lucie Units 1 & 2. A closed loop, tower-cooled system would be developed for the new power units, whereby consumptive losses are replaced from the Atlantic Ocean and blowdown water is routed to the Atlantic Ocean.</p> <p>Water use impacts are anticipated to be SMALL.</p> |

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Table 10.4-1 (Sheet 11 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|-----------------------|---|---|--|---|---|
| External Costs | | | | | |
| Air Quality | The construction and operation of the power facility would meet applicable federal, state, and local air quality permitting regulations. | The construction and operation of the power facility would meet applicable federal, state, and local air quality permitting regulations. | The construction and operation of the power facility would meet applicable federal, state, and local air quality permitting regulations. | The construction and operation of the power facility would meet applicable federal, state, and local air quality permitting regulations. | The construction and operation of the power facility would meet applicable federal, state, and local air quality permitting regulations. |
| Terrestrial Biology | <p>Terrestrial species that are listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) and the state of Florida and have the potential to occur within the Units 6 & 7 site and vicinity are described in Subsection 2.4.1. Conversion of approximately 300 acres of primarily mudflat habitat would not significantly reduce the regional diversity of plants and plant communities (Section 4.3). Some potential impacts to wetlands and sensitive species may occur, but mitigation is available to offset any affects. Impacts from the project to terrestrial ecological resources are anticipated to be SMALL (Sections 4.3, 5.3, and 5.6).</p> | <p>Terrestrial species that are listed as threatened or endangered by the USFWS and the state of Florida and have the potential to occur within Glades County are presented in Table 9.3-8. Glades County has a low number of sensitive species, there are no known sensitive species onsite, and the transmission corridor is relatively short; however, up to 1,873 acres of wetlands (approximately 650 acres of high quality wetlands) could be affected by project construction and operation (including those found in the conceptual transmission corridor). Impacts to terrestrial resources, including threatened and endangered species from construction and operation of the nuclear plant and transmission corridor at the Glades site, would be MODERATE.</p> | <p>Terrestrial species that are listed as threatened or endangered by the USFWS and the state of Florida and have the potential to occur within Martin County are presented in Table 9.3-10. There are no known sensitive species onsite, and the transmission corridors would be relatively short. Impacts to terrestrial resources, including threatened and endangered species from construction and operation of the nuclear plant and transmission corridor at the Martin site, would be SMALL.</p> | <p>Terrestrial species that are listed as threatened or endangered by the USFWS and the state of Florida and have the potential to occur within Okeechobee County are presented in Table 9.3-12. Okeechobee County has a low number of sensitive species; there are no known sensitive species onsite. The site area includes a relatively small area of undisturbed woodlands that could be potentially affected by project construction and operation. However, it also includes over 2,000 acres of wetlands, including approximately 1,300 acres of high quality wetlands that could be potentially affected. Impacts to terrestrial resources, including threatened and endangered species from construction and operation of the nuclear plant and transmission corridor at the Okeechobee 2 site, would be MODERATE.</p> | <p>Terrestrial species that are listed as threatened or endangered by the USFWS and the state of Florida and have the potential to occur within St. Lucie County are presented in Table 9.3-14. There are no designated critical terrestrial habitats for endangered species in the vicinity of St. Lucie Units 1 & 2. Important wetland habitat (mangrove) would be permanently lost from plant construction and the widening of SR A1A. There are beach and dunes, mangrove, and tropical hammock habitats that are important, as they represent important coastal ecosystems that have been reduced by development. Also, these habitats support a variety of animal species. Impacts to terrestrial resources, including threatened and endangered species from construction and operation of the nuclear plant and transmission corridor at the St. Lucie site, would be MODERATE.</p> |

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Table 10.4-1 (Sheet 12 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|-------------------------------|--------------------------|--|--------|--------------|---|
| External Costs (cont.) | | | | | |
| Terrestrial Biology (cont.) | | <p>Most of the site is an active sugarcane field that is unsuitable habitat for most wildlife species because of the lack of native vegetation and the amount and frequency of human disturbance. The site has been modified to allow for irrigation using an irrigation/ drainage ditch network throughout the site. Any wetland functions that are impacted during construction would be replaced or restored.</p> | | | <p>St. Lucie County has a low number of sensitive species, but endangered species are present at the site and important coastal habitat is found nearby. The project would impact nearly 1,000 acres of wetlands from onsite and offsite construction activities, including over 400 acres of mangrove habitat. Construction of the transmission corridor would also potentially affect over 2,000 acres. Impacts from construction would be MODERATE.</p> <p>Impacts from operation include drift from vapor plumes that would be high in salt and minerals. However, surrounding ecosystem is adapted to higher salinity and use of drift eliminators would help reduce impacts to SMALL.</p> |

Turkey Point Units 6 & 7
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Table 10.4-1 (Sheet 13 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|-------------------------------|--|---|--|--|--|
| External Costs (cont.) | | | | | |
| Aquatic Biology | <p>Aquatic species that are listed as threatened or endangered by the USFWS and the state of Florida and have the potential to occur within the Units 6 & 7 site and vicinity are described in Subsection 2.4.2.</p> <p>Units 6 & 7 wastewater, including cooling water tower blowdown discharge, will be injected underground via permitted deep injection wells, so there will be no discharge impacts to aquatic resources.</p> <p>Cooling water makeup sources are reclaimed water from county-treated wastewater and water drawn from the seawater aquifer underlying Biscayne Bay using radial collector wells, so there will be no entrainment or impingement of aquatic organisms and no resultant disruption of existing populations.</p> <p>Impacts from project to aquatic ecological resources are anticipated to be SMALL (Sections 4.3 and 5.3).</p> | <p>Aquatic species that are listed as threatened or endangered by the USFWS and the state of Florida and have the potential to occur in Glades County are presented in Table 9.3-8.</p> <p>Wastewater, including cooling water tower blowdown discharge, will be injected underground via permitted deep injection wells, so there will be no discharge impacts to aquatic resources.</p> <p>Proposed facilities at the site will include cooling towers that would reduce the amount of cooling water withdrawal required for plant operation. Through the use of cooling towers with an appropriate intake design, potential adverse impacts from entrainment or impingement of aquatic organism would be SMALL and would not significantly disrupt existing populations.</p> | <p>Aquatic species that are listed as threatened or endangered by the USFWS and the state of Florida and have the potential to occur in Martin County are presented in Table 9.3-10.</p> <p>Wastewater, including cooling water tower blowdown discharge, will be injected underground via permitted deep injection wells, so there will be no discharge impacts to aquatic resources.</p> <p>Proposed facilities at the site will include cooling towers that would reduce the amount of cooling water withdrawal required for plant operation. Through the use of cooling towers with an appropriate intake design, potential adverse impacts from entrainment or impingement of aquatic organism would be SMALL and would not significantly disrupt existing populations.</p> | <p>Aquatic species that are listed as threatened or endangered by the USFWS and the state of Florida and have the potential to occur in Okeechobee County are presented in Table 9.3-14.</p> <p>Wastewater, including cooling water tower blowdown discharge, will be injected underground via permitted deep injection wells, so there will be no discharge impacts to aquatic resources.</p> <p>Proposed facilities at the site will include cooling towers that would reduce the amount of cooling water withdrawal required for plant operation. Through the use of cooling towers with an appropriate intake design, potential adverse impacts from entrainment or impingement of aquatic organism would be SMALL and would not significantly disrupt existing populations.</p> | <p>Aquatic species that are listed as threatened or endangered by the USFWS and the state of Florida and have the potential to occur in St. Lucie County are presented in Table 9.3-14.</p> <p>Operation under the NPDES permit should result in the maintenance of a balanced, indigenous population of fish, shellfish, and other aquatic organisms in the vicinity of the discharge structure.</p> <p>Proposed facilities at the site will include cooling towers that would reduce the amount of cooling water withdrawal required for plant operation. Through the use of cooling towers with an appropriate intake design, potential adverse impacts from entrainment or impingement of aquatic organism would be minor and would not significantly disrupt existing populations. However, because of the known presence of endangered species at the site, the impact from plant construction would be considered MODERATE.</p> |

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Table 10.4-1 (Sheet 14 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|-------------------------------|---|--|---|--|--|
| External Costs (cont.) | | | | | |
| Aquatic Biology (cont.) | | | | | Plant operation is not expected to entrain more turtles, fish or cause more takes, and impacts from operations would be considered SMALL. |
| Socioeconomic | <p>Socioeconomic impacts associated with the construction and operation of Units 6 & 7 is described in Sections 4.4 and 5.8.</p> <p>The overall population level is anticipated to be sufficiently large that the impact on area employment from construction and operation of Units 6 & 7 would be low. It is expected that the impact on housing and community services would be negligible. The site area appears to have sufficient population centers within commuting distance such that its public services sector would be able to absorb the population in-migration associated with plant construction and operation with minimal impact.</p> | <p>The region of influence that includes Glades, Hendry, Lee, and Okeechobee Counties has a 2006 population estimate of 663,439, which is a 26.7 percent increase from the 2000 population.</p> <p>The economies of the four counties in the region of influence are dominated primarily by educational, health, and social services; agriculture, forestry, fishing and hunting, and mining; and retail trade. Most of the labor force resides in Lee County.</p> | <p>The region of influence that includes Martin, Okeechobee, Palm Beach, and St. Lucie Counties has a 2006 population estimate of 1,706,536, which is a 14.8 percent increase from the 2000 population.</p> <p>The economies of the four counties in the region of influence are dominated primarily by educational, health, and social services; agriculture, forestry, fishing and hunting, and mining; and retail trade. Most of the labor force resides in Palm Beach County.</p> | <p>The region of influence that includes Martin, Okeechobee, Palm Beach, and St. Lucie Counties has a 2006 population estimate of 402,347, which is a 23.2 percent increase from the 2000 population.</p> <p>The economies of the four counties in the region of influence are dominated primarily by educational, health, and social services; retail trade; and agriculture, forestry, fishing and hunting, and mining. Most of the labor force resides in St. Lucie County.</p> | <p>The region of influence that includes St. Lucie, Martin, Indian River, and Palm Beach Counties has a 2006 population estimate of 1,796,230, which is a 14.9 percent increase from the 2000 population.</p> <p>The economies of the four counties in the region of influence are dominated primarily by educational, health, and social services; agriculture, forestry, fishing and hunting, and mining; and retail trade. Most of the labor force resides in St. Lucie County.</p> |

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Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|-------------------------------|---|---|---|---|--|
| External Costs (cont.) | | | | | |
| Socioeconomic (cont.) | <p>The region affords necessary infrastructure and services to meet the demands of the construction and operation workforce. If additional infrastructure and services are needed to meet the demands of the people moving into the area to support the construction and operation of the new facility, these costs should be offset by the beneficial increased tax revenues to the local economy and the overall beneficial economic input to the region from those individuals and families.</p> <p>Socioeconomic impacts from construction and operational activities of the project are anticipated to be SMALL and beneficial for all aspects but transportation. A negative MODERATE impact of the project to the local area could occur from increased traffic.</p> | <p>70 percent of the construction workers and 85 percent of the operation workers would relocate from outside the region of influence. The total projected increase in population attributable to the peak total construction workforce at the Glades site would be 6,669 people, a 1.3 percent increase in the region of influence population.</p> <p>This would pose a SMALL impact on the population for the region of influence. The total population increase attributable to project operations is 2,901 people, posing a SMALL impact on population for the region of influence.</p> | <p>Because of the location of the Martin site to population centers, 50 percent of the construction workers and operation workers would relocate from outside the region of influence. The total projected increase in population attributable to the peak total construction workforce at the Martin site would be 4,729 people, a 0.3 percent increase in the region of influence population.</p> <p>This would pose a SMALL impact on the population for the region of influence. The total population increase attributable to project operations is 1,706 people, posing a SMALL impact on population for the region of influence.</p> | <p>70 percent of the construction workers and 85 percent of the operation workers would relocate from outside the region of influence. The total projected increase in population attributable to the peak total construction workforce at the Okeechobee 2 site would be 6,669 people, a 2.0 percent increase in the region of influence population.</p> <p>This would pose a SMALL impact on the population for the region of influence. The total population increase attributable to project operations is 2,901 people, posing a SMALL impact on population for the region of influence.</p> | <p>50 percent of the construction workers and operation workers would relocate from outside the region of influence. The total projected increase in population attributable to the peak total construction workforce at the St. Lucie site would be 4,729 people, a 0.3 percent increase in the region of influence population.</p> <p>This would pose a SMALL impact on the population for the region of influence. The total population increase attributable to project operations is 1,310 people, posing a SMALL impact on population for the region of influence.</p> |

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Table 10.4-1 (Sheet 16 of 18)
Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|-------------------------------|--------------------------|---|--|---|--|
| External Costs (cont.) | | | | | |
| Socioeconomic (cont.) | | <p>The creation of direct and indirect jobs is projected at 4574 new jobs in the region of influence during the peak construction period, a 2 percent increase in the total labor force. This would potentially reduce unemployment and would likely create business opportunities for goods and service-related industries and the housing industry. Overall, the economic benefits attributable to project construction would be beneficial and SMALL within the region of influence.</p> <p>An estimated 1,050 workers would be required for the operation of the two nuclear power units. This is projected to result in a total of 2055 jobs in the region, a 0.9 percent increase in the total labor force in the region of influence. The socioeconomic impacts attributable to project operation would be beneficial and SMALL.</p> | <p>The creation of direct and indirect jobs is projected at 3208 new jobs in the region of influence during the peak construction period, a 0.5 percent increase in the total labor force. This would potentially reduce unemployment and would likely create business opportunities for goods and service-related industries and the housing industry. Overall, the economic benefits attributable to project construction would be beneficial and MODERATE in Okeechobee County and SMALL in the other counties within the region of influence.</p> <p>An estimated 1,050 workers would be required for the operation of the two nuclear power units. This is projected to result in a total of 1197 jobs in the region, a 0.2 percent increase in the total labor force in the region of influence.</p> | <p>The creation of direct and indirect jobs is projected at 4259 new jobs in the region of influence during the peak construction period, a 3.2 percent increase in the total labor force. This would potentially reduce unemployment and would likely create business opportunities for goods and service-related industries and the housing industry. Overall, the economic benefits attributable to project construction would be beneficial and SMALL within the region of influence.</p> <p>An estimated 1,050 workers would be required for the operation of the two nuclear power units. This is projected to result in a total of 2203 jobs in the region, a 1.7 percent increase in the total labor force in the region of influence. The socioeconomic impacts attributable to project operation would be beneficial and SMALL.</p> | <p>The creation of direct and indirect jobs is projected at 3178 new jobs in the region of influence during the peak construction period, a 0.5 percent increase in the total labor force. This would potentially reduce unemployment and would likely create business opportunities for goods and service-related industries and the housing industry. Overall, the economic benefits attributable to project construction would be beneficial and SMALL within the region of influence.</p> <p>An estimated 806 workers would be required for the operation of the two nuclear power units. This is projected to result in a total of 907 new jobs in the region, a 0.1 percent increase in the total labor force in the region of influence. The socioeconomic impacts attributable to project operation would be beneficial and SMALL.</p> |

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Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|-------------------------------|--|--|--|--|---|
| External Costs (cont.) | | | | | |
| Socioeconomic (cont.) | | The impact on housing and community services would be negligible. The site area appears to have sufficient population centers within commuting distance such that its public services sector would be able to absorb the population in-migration associated with plant construction and operation with minimal impact. | The impact on housing and community services would be negligible. The site area appears to have sufficient population centers within commuting distance such that its public services sector would be able to absorb the population in-migration associated with plant construction and operation with minimal impact. | The impact on housing and community services would be negligible. The site area appears to have sufficient population centers within commuting distance such that its public services sector would be able to absorb the population in-migration associated with plant construction and operation with minimal impact. | The impact on housing and community services would be negligible. The site area appears to have sufficient population centers within commuting distance such that its public services sector would be able to absorb the population in-migration associated with plant construction and operation with minimal impact. |
| Environmental Justice | <p>No anticipated short-term impact on availability of housing units in the area during construction.</p> <p>Local infrastructure surrounding Units 6 & 7 site is described in Section 2.2. There are sufficient roads that provide access to plant property. However, some additional construction of local access roads to the Units 6 & 7 site would be required.</p> <p>The impact of the construction and operations workforces on transportation would be MODERATE (Sections 4.4 and 5.8).</p> <p>Radiological exposure would be below limits to workers and public.</p> | <p>No anticipated short-term impact on availability of housing units in the area during construction.</p> <p>There are sufficient roads that provide main access to the proposed Glades site. However, construction of local access roads would be required. Railroad spurs would also be required.</p> <p>The impact of the construction and operations workforces on transportation would be MODERATE.</p> <p>Radiological exposure would be below limits to workers and public.</p> | <p>No anticipated short-term impact on availability of housing units in the area during construction.</p> <p>There are sufficient roads that provide main access to the Martin site. However, construction of local access roads would be required. Railroad spurs would also be required.</p> <p>The impact of the construction and operations workforces on transportation would be LARGE.</p> <p>Radiological exposure would be below limits to workers and public.</p> | <p>No anticipated short-term impact on availability of housing units in the area during construction.</p> <p>There are sufficient roads that provide main access to the proposed Okeechobee 2 site. However, construction of local access roads would be required.</p> <p>The impact of the construction and operations workforces on transportation would be LARGE.</p> <p>Radiological exposure would be below limits to workers and public.</p> | <p>No anticipated short-term impact on availability of housing units in the area during construction.</p> <p>There are sufficient roads that provide main access to the St. Lucie site. However, improvement to local roads would be required.</p> <p>The impact of the construction and operations workforces on transportation would be MODERATE.</p> <p>Radiological exposure would be below limits to workers and public.</p> |

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Summary of the Benefits and Costs of the Construction and Operation of Units 6 & 7

| Category | Turkey Point Units 6 & 7 | Glades | Martin | Okeechobee 2 | St. Lucie |
|-------------------------------|---|---|---|---|---|
| External Costs (cont.) | | | | | |
| Environmental Justice (cont.) | Loss of resources is described in Section 10.1 , 10.2 , and 10.3 . It is expected that losses will be mitigated to minimize the impact of the loss. | Loss of resources is described in Section 10.1 , 10.2 , and 10.3 . It is expected that losses will be mitigated to minimize the impact of the loss. | Loss of resources is described in Section 10.1 , 10.2 , and 10.3 . It is expected that losses will be mitigated to minimize the impact of the loss. | Loss of resources is described in Section 10.1 , 10.2 , and 10.3 . It is expected that losses will be mitigated to minimize the impact of the loss. | Loss of resources is described in Section 10.1 , 10.2 , and 10.3 . It is expected that losses will be mitigated to minimize the impact of the loss. |

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**Table 10.4-2
Turkey Point Nuclear Units 6 & 7 Cost Estimate Range**

| | Low Range | | High Range | |
|---|------------------|-------------|------------------|-------------|
| | Total Dollars | Cost per kW | Total Dollars | Cost per kW |
| Power Plant Island and Supporting Construction | \$6,202,567,649 | | \$9,034,535,498 | |
| Transmission and General Plant Costs | \$1,615,537,787 | | \$2,340,204,748 | |
| Nuclear fuel inventory cost for the first core ^(a) | \$34,998,943 | | \$42,752,556 | |
| Total Overnight Cost (2012\$) | \$7,853,104,379 | \$3,570 | \$11,417,492,801 | \$5,190 |
| Escalation | \$1,374,646,749 | | \$2,020,718,864 | |
| AFUDC | \$3,583,932,972 | | \$5,256,076,173 | |
| Total Estimated Project Cost (Year Spent\$) | \$12,811,684,100 | \$5,823 | \$18,694,287,838 | \$8,497 |

(a) Leased fuel assumed